

# PlanetTogether Knowledge Base

Complete Reference Guide - Generated December 12, 2025

184 Articles across 45 Categories

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Error Codes

## AI Chatbots

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### PlanetTogether Bot Library

[Source](#)

PT Knowledge Base Get answers about PT app based on existing KB articles AI Factory Builder - Starter Edition Create a spreadsheet that includes a simple scenario with simulated data for a specific company or a segment of manufacturing for import into PT Starter Web App. AI Factory Builder Create a spreadsheet that includes a standard scenario with simulated data for a specific company or a segment of manufacturing for import into PT. The required xml file and a brief instruction video can be obtained in LMS Course AI Factory Builder V2 Upload customer source documents to create an import spreadsheet that combines customer data with simulated data for a specific company. Compatible with the Simple Excel Integration Package. Feature Assistant Assists consultant or customer by suggesting PT features to address specific pain points. APS Translator Translate manufacturing documents or simple text between English and other languages and obtain downloadable files. Use DeepL Translate for translating documents while maintaining their original formatting. Blog Writer Generate educational blogs that include PT expert insights. Company Insights Provides a comprehensive overview of any company Test Plan from Audio Transcript Generates detailed test plan based on a transcript of test steps Excel to SQL Database Create a SQL database from an Excel spreadsheet PT Website General knowledge about PlanetTogether Partner Lead Generator Gathers information about potential partners and provides info on the partnering program

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### PlanetTogether Knowledge Base V12

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## Boards

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### Activities Board

[Source](#)

Key Concept The Activities Board is used to analyze scheduled job activities, fine-tune the schedule via manual modifications as necessary, and/or report progress on running activities. This board offers users many options to manually move or reschedule activities one at a time or in bulk, or even edit activities and operations from within the board. Jump to section: Activity Scheduling Tiles (Primary and Secondary) Activity Actions Tile Unscheduled Jobs Tile Activity Move Tile Activity Comments Tile Activity Status Tile Required Capabilities Tile Operation Details Tile Activity Scheduling Grid Tiles (Primary and Secondary) The Activity Scheduling tiles can be used to visualize statistics of scheduled resources, track Metrics related to those statistics, or for drag/drop manual rescheduling. A user preference labelled Synchronize Activity Grid layouts is available which when enabled will synchronize the grid layouts between the Primary and the Secondary scheduling tile grids. Show Resource Filter Quickly filter the visible activities in the grid using the Resource Filter to view activities scheduled on one or more specific resources. Use the Multi Select option to allow for multiple selections from the list of available departments and resources. Select Objects Selected in Gantt When this option is enabled, the Activity Scheduling tile grid will automatically filter to only show activities of the operations that are selected in the Gantt board. It might be helpful to dock the Gantt board and Activities board or unpin one of the boards so that both can be viewed at the same time. Drag/Drop Scheduling One or more Activity grid rows can be selected (for multiple row selection, use

Shift on the keyboard while clicking on rows to select multiple consecutive rows or Ctrl+click to select multiple non-consecutive rows) and then dragged and dropped within one of the grids or from one grid to another to effectively move or reschedule the selected activity(ies). The result of the move will be indicated by a color code in the Move Result grid column and a reason for the color code in the Move Result Reason column. All reason and color combinations: "Exact Move" (#FF05806F) - Move was successful "Activity not eligible on resource" (#FFFFFF0F0) - The Activity is not eligible on the target resource "Activity locked on resource" (#FFB56FF2) - The Activity is locked on the target resource "Moving from resource is not allowed" (#FFFFFF0F0) - Moving from this resource is not allowed "Path is not eligible" (#FFF2E205) - Alternate Path must exist, have 1 lead activity, and differ from the current path "Activity is in production" (#FFF08000) - The Activity is in production "Material Constraint" (#FFFF00FF) - The Operation has a material constraint "Predecessor Constraint" (#FFF0CC3E) - The Operation is constrained by a predecessor "Operation On Hold until" (#FFFFFF00) - The Operation is on hold "MO On Hold until" (#FFFFFF00) - The Manufacturing Order is on hold "Job On Hold until" (#FFFFFF00) - The Job is on hold "Moved without constraint" (#FF0B6B5E) - The Activity is constrained by the clock "Moved without constraint" (#FF24E36A) - The Activity was moved with no constraints See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Activity Actions Tile The Activity Actions tile allows users to perform various actions on one or more Activities. Select one or more Activities from either the Primary or the Secondary Activity Scheduling tile grids, then click the desired Action button to perform the action on the selected activity(ies). If grid row selections are made to both the Primary and Secondary Activity Scheduling tile grids then the chosen action will be executed on the Activity objects from the grid that was most recently selected from (the actions cannot/will not be executed on selections from both grids). Note that all of the same actions may be performed via the right-click menu of any grid row. Available Actions Management: Open: Open the Job Details dialog associated with the selected grid Activity row. Only one grid row selection is supported. If more than one row is selected, only one Job Details dialog will open (the one associated with the Activity with the lowest numbered grid row). Hide Other Jobs: Hide all other jobs from the Gantt temporarily. Click anywhere in the Gantt chart to restore visibility of the hidden jobs. Set Job Color: Select a color from the color picker to overwrite the existing Job color Show Job Flow: Focus attention on the Activities of the Job(s) of the selected Activity(ies) by auto-generating a temporary Gantt View configuration. Delete the Gantt View or select another Gantt View from the dropdown to switch back to the previous view. Show Connected Jobs Flow: Focus attention on the Activities of the Job of the selected Activity and all of the connected jobs, such as jobs with hard pegged materials, by auto-generating a temporary Gantt View configuration. Delete the Gantt View or select another Gantt View from the dropdown to switch back to the previous view. Delete Jobs: Delete the job(s) associated with the selected Activity(ies) Job Properties: Open the Job Properties tile with the properties of the Job associated with the selected Activity in focus. Reports: Show Job Traveler Report: Open the standard Job Traveler report for the job(s) associated with the selected Activity(ies). Reporting: Materials: A shortcut to open the Materials board with a filter applied to focus on the materials required for the selected Activity. Only one grid row selection is supported. Find In Gantt: Opens the Gantt board with the selected activity in focus. Only one grid row selection is supported. Activity Status: Open the Activity Status tile to report progress against the selected activity. Scheduling: Set Sub-Job Need Date and JIT Date: Recalculates the the Need Dates JIT start dates of the sub-jobs of the selected job(s) (those that are feeding it material or which are pegged via lot codes). This option only becomes available when Set Sub-Job Need Dates is enabled in System Settings → Scheduling Options or User Settings → Optimize Settings. Reset Job JIT Date: Recalculates the the JIT start date(s) of the selected job(s). Optimize Selected Jobs and Supplying Jobs: Performs an optimizes for the selected job(s) and any job(s) that are supplying materials for the selected job(s). Optimize Selected Jobs: Performs an optimize for only the job(s) selected. This optimize does not include any of the jobs supplying materials for the selected jobs. Compress: Reschedule all Activities of each Job(s) associated with the selected Activity(ies) to schedule as early as possible without displacing other scheduled activities based on the most constrained operation of each job. WIP Compress: Reschedule all Activities of each Job(s) associated with the selected Activity(ies) to schedule as close to their JIT date without displacing other scheduled activities. Move Activities: Open the Activity Move tile from the Activities board to perform a manual move of the selected Activity(ies) to a specific time and resource (where eligible). Unschedule Job: Unschedule the job(s) associated with the selected Activity(ies). Ignore Constraints: Change all stock material requirements on the selected Activity(ies) from Constrained by Available Date to Ignored-Constraint, and from Constrained by Earlier of Lead Time and Available Date to Ignored-LeadTimeConstraint so that subsequent scheduling actions will not enforce material constraints. Restore Constraints: Change all stock material requirements on the selected Activity(ies) back from Ignored-Constraint to Constrained by Available Date, and from Ignored-LeadTimeConstraint

to Constrained by Earlier of Lead Time and Available Date so that subsequent scheduling actions will once again enforce material constraints. Expedite: Do ASAP: Reschedule all Activities of the selected Job(s) to begin as early as possible, as early as the start of the schedule (constraints allowed). Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Preserve the Frozen Span: Reschedule all Activities of the selected Job(s) to begin as early as possible without entering the Frozen Span area. Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Preserve the Stable Span: Reschedule all Activities of the selected Job(s) to begin as early as possible without entering the Stable Span area. Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. To DateTime: Reschedule all Activities of the selected Job(s) to begin as close as possible to the specified date. Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Add Cycles To: Fill capacity before the start of the next Cleanout Interval: Increase the production output of the selected Activity in order to completely consume the capacity on the scheduled resource up to the next scheduled Cleanout capacity interval on the resource. Fill capacity before the start of the next Offline Interval: Increase the production output of the selected Activity in order to completely consume the capacity on the scheduled resource up to the next scheduled Offline capacity interval on the resource. End near the end of first Capacity Interval used: Increase or decrease the production output of the selected Activity in order to have it finish at the end of the Capacity interval that it's currently scheduled to start on. End near the end of last Capacity Interval used: Increase or decrease the production output of the selected Activity in order to have it finish at the end of the Capacity interval that it's currently scheduled to finish on. End near the start of next Activity: Increase the production output of the selected Activity in order to have it finish at the start of the next Activity that's scheduled on the same resource. End near the start of next Cleanout Interval: Increase the production output of the selected Activity in order to have it finish at the start of next scheduled Cleanout capacity interval on the resource. End near the start of next Offline Interval: Increase the production output of the selected Activity in order to have it finish at the start of next scheduled Offline capacity interval on the resource. Gantts: Connected Jobs: Opens the Connected Jobs Gantt tile from the Jobs board with all of the jobs associated with all selected Activity rows loaded into the Gantt chart. Job Watch: Opens the Job Watch Gantt tile from the Jobs board with all of the jobs associated with all selected Activity rows loaded into the Gantt chart. Lock to current Resource: Job: Lock all activities of the job(s) associated with the selected Activity(ies) to their currently scheduled resource. Manufacturing Order: Lock all activities of the manufacturing order(s) associated with the selected Activity(ies) to their currently scheduled resource. Operation: Lock all activities of the operation(s) associated with the selected Activity(ies) to their currently scheduled resource. Unlock from current Resource: Job: Unlock all activities of the job(s) associated with the selected Activity(ies) from their currently scheduled resource. Manufacturing Order: Unlock all activities of the manufacturing order(s) associated with the selected Activity(ies) from their currently scheduled resource. Operation: Unlock all activities of the operation(s) associated with the selected Activity(ies) from their currently scheduled resource. Anchor in Time: Activity: Anchor the selected activity(ies) at their currently scheduled point in time. Job and supplying Manufacturing Orders: Anchor all activities of the job(s) and supplying manufacturing order(s) of the selected activity(ies) at their currently scheduled point in time. Manufacturing Orders: Anchor all activities of the manufacturing order(s) of the selected activity(ies) at their currently scheduled point in time. Operation: Anchor all activities of the operation(s) of the selected activity(ies) at their currently scheduled point in time. Unanchor in Time: Activity: Unanchor the selected activity(ies) from their currently anchored point in time. Job and supplying Manufacturing Orders: Unanchor all activities of the job(s) and supplying manufacturing order(s) of the selected activity(ies) from their currently anchored point in time. Manufacturing Orders: Unanchor all activities of the manufacturing order(s) of the selected activity(ies) from their currently anchored point in time. Operation: Unanchor all activities of the operation(s) of the selected activity(ies) from their currently anchored point in time. Hold: Job: Pops up a dialog to enter a "Hold Until" date and time and a reason for the hold. Once confirmed, the job(s) associated with the selected activity(ies) will be placed on hold until the specified date and time. Manufacturing Order: Pops up a dialog to enter a "Hold Until" date and time and a reason for the hold. Once confirmed, the manufacturing order(s) associated with the selected activity(ies) will be placed on hold until the specified date and time. Operation: Pops up a dialog to enter a "Hold Until" date and time and a reason for the hold. Once confirmed, the operation(s) associated with the selected activity(ies) will be placed on hold until the specified date and time. Un-Hold: Job: Removes the "On Hold" status of the job(s) associated with the selected activity(ies). Manufacturing Order: Removes the "On Hold" status of the manufacturing order(s) associated with the selected activity(ies). Operation: Removes the "On Hold" status of the operation(s) associated with the

selected activity(ies). Lock to Current Path: Manufacturing Order: Lock the manufacturing order(s) associated with the selected activity(ies) to their currently scheduled Path. Unlock from Current Path: Manufacturing Order: Unlock the manufacturing order(s) associated with the selected activity(ies) from their currently locked Path. Unscheduled Jobs Tile This tile shows a grid view of all unscheduled jobs and offers quick actions to put those jobs on the schedule. Select one or more grid rows and click one of the toolbar actions, or drag and drop the job(s) onto the Activity Scheduling grid where they're eligible to schedule to manually insert them into the schedule. ASAP: Schedule the selected job(s) as close to the start of the clock as possible (similar to a "Shift+Expedite"). Preserve Frozen Span: Schedule the selected job(s) as close to the end of the frozen span as possible (similar to a standard "Expedite"). JIT: Schedule the selected job(s) as close to their JIT date as possible. Activity Move Tile The Activity Move tile allows users to manually reschedule one or more activities to a specific resource and a specific date and time or relative to a significant point (e.g. the end of the planning horizon) or relative to another currently scheduled activity. Step 1: Select Activity(ies) to Move Select one or more activities from either the Primary or Secondary Activity Scheduling tile grid, then the Activity Move tile will update in real time with available options based on the selections. Step 2: Select an Eligible Target Resource Eligible resources are visualized by rows with white backgrounds in the leftmost Resource grid of the Activity Move tile, while ineligible resources are visualized by rows with a pink background. The currently selected resource row will have a light blue background. Step 3: Select a Time to Start Once the Activity(ies) and Resource are selected, choose when to schedule the activity(ies) by selecting a radio option and providing supplemental information from the "Select Time to Start" area. Choose one of: Significant Point: Choose the desired Significant Point from the dropdown of options Specific time: Specify the desired date and time Just Before/After: Choose Just Before or Just After, then select a scheduled activity from the grid directly beneath these options. Once ready, click the Move to resource and time button near the title bar of the Activity Move tile to complete the move. Activity Comments Tile Use the Activity Comments tile to view or enter Job, Operation, or Manufacturing Order notes or Activity comments. This can be helpful for communication between the shop floor operators and schedulers or for anyone to include extra details about the various tasks. Activity Status Tile The Activity Status tile is used to visualize and/or report progress on an activity, or to quickly change the activity's Quantity per Cycle, Setup Time, Cycle Hours, Post-Processing Time, Cleanout Time, or Cleanout Grade. Production Status: Update the status of the activity. Note that an Activity cannot be reset back to Waiting or Ready status once it's in production ("Started", "Setting Up", "Running", etc.) and cannot be Paused unless its status is either "Setting Up" or "Running". Quantity: Expected Finish Qty: The amount expected to be produced by the activity. Defined by the job settings; cannot be edited here. Expected Scrap Qty: The amount expected to be scrapped by the activity. Defined by the job settings; cannot be edited here. Reported Finish Qty: The quantity of the activity that has been completed to date. Editable input. Reported Scrap Qty: The quantity of the activity that has been scrapped to date. Editable input. Expected Quantity per Cycle: The Quantity per Cycle that is currently configured on the Activity. Manual Override Quantity per Cycle: Enter a new value here to override the configured expected value. Allocate material from on-hand inventory: When enabled, a proportional amount of all required materials to perform the activity will be allocated to the activity from on-hand inventory based on the Reported vs. Expected finish quantities, effectively consuming or removing the material from inventory. Release product to warehouse: When enabled, the reported finish quantity will be added to on-hand inventory. Reported Start Date: Specifies a date and time that the activity started. Reported Finish Date: Specifies a date and time that the activity finished. Set to Scheduled Dates: Quickly set the reported start and finish times to those of the currently scheduled times. Time: Expected Setup: The duration of Setup time expected to be incurred by the activity. Expected Cycle: The cycle time for this activity. Expected Run: The duration of Run/Cycle/Production time expected to be incurred by the activity. Calculated by the system according to Cycle Hours, Quantity per Cycle, and number of cycles that the Activity will perform. Expected Post-Processing: The duration of Post-Processing time expected to be incurred by the activity. Defined by the job settings; cannot be edited here. Expected Clean: The duration of Clean time expected to be incurred by the activity. Defined by the job settings; cannot be edited here. Reported Setup: The duration of Setup time that has been incurred by the activity to date. Editable input. Reported Post-Processing: The duration of Post-Processing time that has been incurred by the activity to date. Editable input. Reported Clean: The duration of Clean time that has been incurred by the activity to date. Editable input. Reported Run: The duration of Run/Cycle/Production time that has been incurred by the activity to date. Editable input. Manual Override Setup: Override the activity's Expected Setup duration. Editable input. Manual Override Cycle: Override the activity's Cycle Hours. Editable input. Manual Override Post-Processing: Override the activity's Expected Post-Processing duration. Editable input. Manual Override Clean: Override the activity's Expected Clean duration. Editable input. Cleanout Grade: The Grade value

of the activity's Clean. This is used by the system when determining when to reset sequence-dependent clean calculations. Editable input. People: Define the People Usage for the activity Use All Available People: Consume the capacity of all available people from the capacity interval that the scheduled activity falls on. Use the number specified below: Consume or require a specific number of people to perform the activity. This is not a scheduling constraint. If a capacity interval with fewer than this number of people has available capacity then the activity will be considered eligible to schedule there. If scheduled on such an interval then the activity will take longer to complete by a factor of the missing number of people (e.g. if an activity is set to require "2" people but an available capacity interval only has "1" person assigned to it then the activity will take 2x as long to complete). Use the text input provided to specify the number of people required. Uses an even multiple of the number specified, up to the Capacity Interval limit: Consume or require a multiple of a specific number of people to perform the activity, up to the available number of people on the Capacity Interval. This is a scheduling constraint. If a capacity interval has fewer than this number of people available then the activity will not be considered eligible to schedule there. The actual number of people used will scale up in intervals of the specified number until as many available people on the capacity interval are utilized. Use the text input provided to specify the minimum and multiple of number of people required. Comments: Include additional comments for informational purposes, if desired. Finish at Expected Values: Click this button to automatically finish the activity at the specified Expected Finish and Scrap Quantities. There is no need to enter any Reported Quantities when using this button. Finish at Reported Values: Click this button to finish the activity at the currently specified Reported Finish and Scrap Quantities. Required Capabilities Tile This tile offers a quick interface to view or even adjust the required capabilities for the selected Operation. Note that any changes made to the capability requirements will cause the entire job associated with the operation to unschedule since this type of change impacts the schedulability of the operation. Select Resource Requirement If there are more than one resource requirement configured on the operation then first select the resource requirement to view or edit from the dropdown of options. Once one is selected, the table below which shows the required capabilities will become editable. Add or Remove a Required Capability Adding or removing a required capability is as simple as checking or unchecking any of the Capability Requirements from the "Selected" column of the grid, then clicking the "Save Changes" button. Note that any changes made to the capability requirements will cause the entire job associated with the operation to unschedule. Operation Details Tile This tile offers a quick access interface to view or modify properties of the selected Operation. For details of each property and setting and their function, see: Operation Dialog

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## Buffer Management Board

### [Source](#)

Key Concept Buffers are used in scheduling to reduce the risk of delays due to variability. They are set on different objects based on their type, but they generally add a span of time before an item is due. Buffer penetration is calculated as a percentage based on the time the predecessor operation moves into the buffer span, which will set the warning level. The Buffer Management Board is the primary tool used to monitor risky buffer penetration. Monitoring time buffers allows planners to focus on jobs at risk of critical delays that can affect on-time delivery and possibly starve drum resources. The Buffer Management Board is used for three main purposes: Identify which manufacturing orders and purchase orders are at risk concerning their various DBR buffers so that they can be expedited. Determine the level of urgency after clarifying the risk level in terms of throughput and revenue. Compare plant performance in terms of buffer penetration. Options This top section can control what is shown in the graphical chart and the bottom grids. This section allows the user to focus on the information of interest. After changing the values found in this section, click on Apply to update the chart and grids based on the current options. Plants: This section displays a list of all plants in the data model. Check one or more plants to filter data for those specific plants. Chart Controls: These values only affect the chart, not the grids. Primary/Secondary Group: These settings work together to determine how the data is displayed in the chart. Primary and Secondary Values can be grouped by Plant, Buffer Type, or Warning Level. If the Secondary Group option is set to "None," then a simple graph is shown using the options specified for the Primary Group. If the Secondary Group option is set to another value, those values are shown grouped within the Primary Group. Note: If warning levels are shown as the primary group, and the second group is set to "None," then the chart is colored in Green/Yellow/Orange/Red

according to the warning level. Values: This control determines what type of data is plotted along the Y-axis of the chart. Throughput: The sum of the throughputs of the manufacturing order jobs. Note that if the same job appears more than once on the list, it is only counted once. Revenue: The sum of the revenues for the manufacturing order jobs. Note that if the same job appears more than once on the list, it is only counted once. Count: The total number of purchase orders and manufacturing orders included in the grids. Item Quantity: The sum of the quantities of the manufacturing orders. Note that if the same manufacturing order appears more than once on the lists, it is counted only once. Drum Work Hours: The sum of the work hours scheduled on the drums for all drum buffer manufacturing orders in the grid. Buffer Types: Buffers are used to minimize delays by accounting for possible variability in the schedule. In the buffer management view, the information shown in the bar graph can be filtered to show only the relevant types of buffers. The buffer types available are Material, Drum, Shipping, and Stock. Material: Material buffers pertain to purchase orders. Drum: Drum buffers pertain to manufacturing orders. Shipping: Shipping buffers pertain to manufacturing orders. Stock: Stock buffers pertain to purchase orders. Warning Levels: There are four warning levels related to the amount of buffer penetration occurring. If only one warning level is checked, the chart is colored according to the selected warning level. The higher the buffer penetration, the closer the operation is to being late. Late (Red): More than 100% buffer penetration. Critical (Orange): More than 66% buffer penetration. Warning (Yellow): Between 33% and 66% buffer penetration. OK (Green): Less than 33% buffer penetration. Note: The warning level filter works in conjunction with the M.O. Penetration Type described below for manufacturing orders. The warning level is based on the level of the penetration type specified. M.O. Penetration Type Current: This is based on the current date and time and the manufacturing order's current status. Projected: This is based on where the manufacturing order is currently scheduled. Note: Purchase orders only have current penetration since they are not scheduled. Chart The chart provides an easy way to compare various buffer-related measures specified in the top Options section. Grids The grids section is used to view the amount of buffer penetration for each purchase order or manufacturing order to easily identify which orders are at risk of being late or causing a delay. The grids are divided into four tabs according to buffers: Material, Drum, Shipping, and Stock. Users can see current and projected penetration percentages, the warning level associated with the amount of penetration, and any additional information about the purchase order or manufacturing order. The Drum Buffers and Shipping Buffers tabs allow users to drill down into the Job/Manufacturing Order by clicking the "Open Job" button or double-clicking the row selector. Drum Buffers are a time span added before constrained resources (called "Drums") to avoid starving those resources and prevent reducing throughput. Shipping Buffers are added from the manufacturing order's need date to set the shipping need date. Therefore, manufacturing orders should be done before the shipping need date to avoid Shipping Buffer Penetration.

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## Capacity Planning Board

### Source

Key Concept Capacity Planning is one of the main functions of PlanetTogether. Finite capacity planning is of great concern to manufacturers as there are a limited number of hours in a day and a limited amount of production that can be accomplished in those hours. The Capacity Planning board allows users to manage resources and visualize capacity in use and available capacity over a specified period of time. The tools available should help to reveal possible bottlenecks in the schedule before they occur on the shop floor. Jump to section: Resources Grid Resource Actions Tile Assigned Capability Chooser Tile Resource Bulk Edit Tile Resource Performance Report Resource Production Report Resource Capacity Utilization Report Resource Schedule Report Resource Production Availability Chart Unutilized Capacity Chart Resource Capacity Chart Resource Units Chart Resource Utilization Chart Resource Utilization by Number of People Chart Tile Resources Grid Use the Resources grid to view information about each Resource in the data model. Apply filters to the grid to help to narrow down the data presented in each of the Report and Chart tiles. Use the Find in Gantt button in the toolbar to bring the selected resource into focus in the Gantt board. Use Grid Edit Mode to edit resource settings. For Department and Plant settings, refer to the respective tiles in the Scenario Data Board. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Capacity Planning Board Grid Properties Resource Actions Tile The Resource Actions tile allows users to perform various actions on one or more Resources. Select one or more

Resources from the Resources grid, then click the desired Action button to perform the action on the selected resource(s). Note that all of the same actions may be performed via the right-click menu of any grid row. Available Actions Management: Duplicate Resource: Create a duplicate of the selected resource. Select All: Select all grid rows. New Resource: Create a new resource. When clicked, the user will be prompted to select with department and plant the resource should be created in. Delete Resource(s): Delete the selected resource. Reporting: Show Resource Schedule Report: A shortcut to open the Resource Schedule Report tile with the selected resource data in focus. Show Resource Production Report: A shortcut to open the Resource Production Report tile with the selected resource data in focus. Show Activity List for Selected Resource: A shortcut to open the Activities board with a filter applied to only show scheduled activities for the selected resource. Find in Gantt: Bring the selected resource into focus in the Gantt board Scheduling: Activate: A quick way to Activate a previously Deactivated resource. Deactivate: A quick way to Deactivate a previously Activated resource. All activities scheduled on the resource must be unscheduled or rescheduled first. Compress Resource: Compress all scheduled activities on the resource according to the Compress Settings. Assigned Capability Chooser Tile This tile is used to manage capability assignments per resource. Select a row from the Resources grid of a resource whose capabilities need updated, then proceed to check the box next to each of the capability names that should be assigned to the selected resource. Finally, be sure to Save the edits. The tile is only able to edit the assigned capabilities of a single resource. If multiple grid rows are selected at the time of editing then only the first one which was selected will be editable. Resource Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more resources. Select one or more rows from the Resources grid, then choose properties and values that should be applied to each selected resource. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles Resource Performance Report The Resource Performance Report provides insight into the number of setups, cycles (runs), and post-processes that have occurred to generate a performance score. This is done by comparing the expected run hours and quantities to the reported ones of finished activities, where the standard is 100%. Thus, resources performing slower than standard will have performance scores above 100%, while resources performing faster than standard will have performance scores below 100%. Select one or more rows from the Resources grid and statistics for all selected Resources will be plotted in the report. Resource Production Report The Resource Production Report plots scheduled production quantities of each product made on the selected Resource over a period of time grouped in time buckets. Data for only 1 Resource can be plotted at a time. Time Bucket Select the time bucket in the dropdown in the top left corner of the report (Hour, Day, Week, Month, Custom, etc.). The time bucket duration determines the amount of time to include production statistics for in each plotted point (cell) in the report table. Start Time Choose a start time for the report using the date and time pickers. Time Horizon Choose either "Short-Term" or "Planning Horizon" to determine how far ahead to view scheduled production statistics for the selected resource. Export Use the Export icon button to export the report to the desired format (XLSX, PDF, HTML, or CSV). Resource Capacity Utilization Report The Resource Capacity Utilization Report is a chart and report combination that compares the total capacity of a resource to the utilized capacity. The gray section on the chart shows the total capacity and the blue section is the utilized capacity. The duration, start and end dates, and production type can be change along the top of the chart. The bottom section shows a grid stating the total vs utilized capacity based on the specified time bucket. Users can hold the Shift key and select multiple resources. The cart will show the totals of both resources, and the grid will have it broken out by resource. Resource Schedule Report The Resource Schedule Report offers details of each Activity scheduled on the selected Resource over a specified period of time. Data for only 1 Resource can be plotted at a time. Refresh Use the Refresh button to refresh the data in the Report after making scheduling changes. Useful for when the Refresh Automatically option is disabled. Duration Define the duration from the Report Start date that scheduled Activity information should be plotted for the selected Resource. Report Start Select the start date of the report using the date and time pickers. Show Material Requirements When enabled, Material Requirements will be listed for each plotted Activity Refresh Automatically When enabled, the report table will refresh automatically as the schedule changes. Export Use the Export icon button to export the report to the desired format (XLSX, PDF, HTML, or CSV). Resource Production Availability Chart The Resource Production Availability Chart plots the scheduled availability of each selected Resource over a period of time grouped in time buckets. This represents the amount of Online capacity on a resource which is not being utilized. For example, if the Time Bucket is "1 week" and the Unit of Measure is "Available %" then the plotted data reflects the average availability per selected resource across all shifts in 1 week buckets of time between the defined Start and End dates. Unit of Measure Choose to view the availability in terms of number of hours, percentage of total hours, or a decimal value between 0 (no availability) and 1 (completely available, no online capacity is used). Time Bucket Select the time bucket in the

dropdown next to the Unit of Measure dropdown selection. The time bucket duration determines the amount of time to include resource availability statistics for in each plotted point. Start Date Choose a start date for the chart using the date picker. End Date Choose an end date for the chart using the date picker. Job Commitments Choose from the list of single or multiple Job Commitment levels in order to view resource availability based strictly on the scheduled jobs that have the selected Job Commitment level(s). Chart Style Choose from a Line Chart, Bar Chart, Area Chart, etc. in order to visualize the data in different formats. Toggle Legend Toggle visibility of the Resource Selection Legend on/off. Legend Use the Resource Selection Legend to select which resources to plot in the chart. Unutilized Capacity Chart The Unutilized Capacity chart is a specialized chart that plots the number of hours that a resource remains idle where it could have been otherwise performing some work if its available online capacity intervals were configured differently. Capacity will be reported as Unutilized when, for example, an operation is allowed to start on one capacity interval of a resource, but then the next online interval doesn't allow it to continue (perhaps it's configured to not be [ ] Used for Run but the started operation is still running); then the capacity is consumed because the scheduled operation spans that time period, but no work is done since the interval is not capable of performing the work. Resource Capacity Chart The Resource Capacity Chart plots the total capacity of each selected Resource over a period of time grouped in time buckets. This represents the amount of Online capacity on a resource. Unit of Measure Choose to view the total capacity in terms of number of hours or a relative decimal value between 0 (no online capacity) and 1 (online 24/7). Time Bucket Select the time bucket in the dropdown next to the Unit of Measure dropdown selection. The time bucket duration determines the amount of time to include resource capacity statistics for in each plotted point. Start Date Choose a start date for the chart using the date picker. End Date Choose an end date for the chart using the date picker. Chart Style Choose from a Line Chart, Bar Chart, Area Chart, etc. in order to visualize the data in different formats. Toggle Legend Toggle visibility of the Resource Selection Legend on/off. Legend Use the Resource Selection Legend to select which resources to plot in the chart. Resource Units Chart The Resource Units chart displays the total number of units (product quantity) each resource is scheduled to produce within each time bucket. This gives clear view of the planned output for each machine or work center. Resource Utilization Chart The Resource Utilization Chart shows how much of a resource's available capacity is being used. This helps to identify which resources are heavily loaded and which are underutilized. Resource Utilization by Number of People Chart The Resource Utilization by Number of People Chart shows how much of a resource's available capacity is being used while factoring in the number of people being utilized. For example, if a shift is configured with its Number of People set to "3" and an operation is scheduled at that time to use all 3 people for 8 hours, then the utilized hours will total  $8 * 3 = 24$  hours. This helps to identify which resources are heavily loaded and which are underutilized.

See Also Plants, Departments, and Resources Gantt Board Scenario Data Board Resource Mappings Department Mappings Plant Mappings

## Customers Board

### Source

Key Concept The Customers Board is still very much a work in progress. Currently the only thing that can be done within the Customers Board is to manage information and properties associated with each customer. The long-term vision for this board is to have tools available to generate reports based on customer data (think: revenue generated per customer, on-time vs. late deliveries per customer, order types and volume over time per customer, etc.) which should help to predict customer behavior, visualize customer trends, and gauge customer loyalty and satisfaction based on those trends. With this knowledge, organizations can choose to prioritize certain customer's orders or find ways to engage with their customers so that they may better understand the data and improve relationships and customer retention. Jump to section: Customers Grid Customer Actions Tile Customer Bulk Edit Tile Customer Sales Orders Charts Tile Customer Jobs Charts Tile Customer Job Watch Gantt Customers Grid Use the Customers grid to create or delete customer objects or export customer data. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Customers Board Grid Properties Customer Actions Tile The Customer Actions tile allows users to perform various actions on one or more Customer objects. Select one or more rows from the Customers grid, then click the desired Action button to perform the action on the selected customer(s). New Create a new customer object with default values. Copy Create a new customer object as a copy of the existing selected customer object. Select All Select all grid rows. Alternatively, use the Ctrl+A keyboard shortcut. Delete Delete the selected customer object. Customer Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more customers. Select one or more rows from the Customers grid, then choose properties and values that should be applied to each selected customer. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles Customer Sales Orders Charts Tile The Customer Sales Orders Charts tile offers some graphical insights into each customer's associated sales orders. Users may view On-Time vs. Late orders and may choose to view the number of units or pieces ordered, or total revenue. Select one or more customers from the grid to see each customer's data plotted in the chart. Hover over the plotted data to see specific statistics. Customer Jobs Charts Tile The Customer Jobs Charts tile offers some graphical insights into each customer's associated jobs. Users may view On-Time vs. Late jobs and may choose to view the number of units or pieces ordered, or total revenue. Select one or more customers from the grid to see each customer's data plotted in the chart. Hover over the plotted data to see specific statistics. Customer Job Watch Gantt Tile Select one or more customers from the grid to see each customer's associated scheduled jobs isolated in the Job Watch Gantt. Each Activity Block on the Gantt chart can be interacted with in the same manner as the Gantt Board charts. Tooltips are enabled and cannot be disabled. Show All Eligible Resources: When enabled, all resources which are eligible to schedule any of the activities of any of the watched jobs will appear in the Gantt, even if none of the activities of the watched jobs are scheduled there. See Also Customer Mappings Job Mappings Sales Order Mappings

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## Database Manager Board

### [Source](#)

**Key Concept** The Database Manager Board allows users to connect to and edit data from any SQL database. Generally, PlanetTogether instances are connected to SQL databases to import the data used for scheduling and to publish the schedule data out. The Database Manager Board allows users to connect to a database so that they can easily view and customize the data as needed. This tool is handy for schedulers to modify configuration tables that can alter the import (for example, by adding a Resource or an Attribute) directly in PlanetTogether without going into SQL Server or their ERP system where the data often originates. Jump to section: Connect to a server Connect to a database Browse a database Edit a database Connect to a server To connect to a SQL server, click the Connect to a server button at the top of the board. Enter an appropriate Server Name, choose to use Windows Credentials or enter a SQL user name and password, then click Connect. Connect to a database Upon establishing a successful connection to the server in the aforementioned Connect to a server step, the dialog will update to show a dropdown list of all databases that the user has access to. Select one from the list and click Confirm. It's possible to quickly select a different database after establishing a connection to another by using the Select Database dropdown selection from the top menu then simply clicking the name of the desired database from the list. Browse a database Once a connection is established to the server and a database is selected, its Tables and Views will appear in the left side of the board. Expand either the Tables or Views menus and click once on any of the tables or views to select them and load all of their data in the grid view on the right side of the board. Use column filters to search for specific text within any grid column. Edit a database In order for a database table or view to be editable in the Database Manager Board view, the table or view must have a primary key column defined. If users try to save edits to any table or view that does not have a primary key column defined then they will receive an error: Update was not successful because the specified table does not have a primary key column. For information about how to create a primary key column or to assign one, see this article from Microsoft: Create Primary Keys. Once a primary key column exists, users can make required edits directly in the grid in the Database Manager board, then click the Save Table Changes button in the top navigation to save the edits.

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## Gantt Board

### [Source](#)

**Key Concept** PlanetTogether offers a Gantt chart to display scheduled activities of jobs ordered along a timeline broken out per shop floor resource to help schedulers and shop-floor personnel to visualize the schedule in an easy-to-read display. Each activity is rendered as a horizontal block with customizable overlaid text and various customizable color indicators for things like activity statuses, constraints, delivery timing, and bottlenecks. Each block can easily be dragged and dropped along the Gantt to another point in time and/or onto another resource or alternate path where it's eligible to schedule to simplify fine-tuning of the schedule. Jump to section: Gantt Chart Toolbar Options Resources Grid Activity Blocks: Segments & Labels Tooltips Product Campaigns Drag and Drop Scheduling Activity Block Right-Click Actions Job Watch Gantt Tile Activity Status Tile Job Properties Tile Capacity Tools Tile Resource Utilization by Number of People Tile Resource Utilization Chart Tile Resource Units Chart Tile Resource Production Availability Chart Tile Unutilized Capacity Chart Tile Resource Capacity Chart Tile Gantt Chart The Gantt view consists of a Toolbar across the top with many options and features, a Resources grid on the left side with various information related to each Resource, and the Gantt chart itself where scheduled activities are visualized by rectangular activity blocks in the center of each resource swimlane, resource scheduling capacity is visualized by capacity interval blocks rendered at the bottom of each resource swimlane, and product campaigns can be visualized by campaign blocks at the top of each resource swimlane. Plant View Gantt layout configurations can be customized and selected from a dropdown to display all resources in all plants, all resources in a specific plant, only resources found within a department, or a mix and match of any specific resources from any department that the user wants to view in one chart. The benefit of using a Gantt chart is to facilitate the visibility of the schedule and make it easier to see potential problems like bottlenecks and late deliveries. Toolbar Options The toolbar options are found at the top of the Gantt chart. These options allow users to zoom in and out of the

chart, find jobs and resources, and customize the information displayed on the activity blocks. Resize to fit rows: Adjust the height of the Gantt swimlane rows so that the visible resource swimlanes are displayed to fit the screen. A minimum height is enforced if there are many visible resource swimlanes which may result in the need to scroll up/down in the resource grid to view all swimlanes. Zoom in: Zoom in by a small increment. Zoom out: Zoom out by a small increment. Zoom Gantt: Zoom to various intervals from a list of options. Below is a list of keyboard shortcuts to achieve the same zoom levels: Ctrl + N = Now Ctrl + T = Today Ctrl + W = Week Ctrl + Shift + T = Two weeks Ctrl + M = Month Ctrl + Y = Year Ctrl + F = Frozen span Ctrl + S = Stable Span Ctrl + Shift + H = Planning Horizon Variable Zoom: Show a magnified window on the Gantt for a multi-zoom level view. When enabled, a portion of the left side of the Gantt chart will be highlighted in blue and will show a zoomed-in perspective of the leftmost scheduled activities. Zoom factor: Used in conjunction with Variable Zoom, sets the zoom level seen in the magnified window. Higher numbers reflect a more "zoomed in" view. Job Lookup: Find a Job by its Name or External Id. If found, the Gantt chart will zoom to focus on the job and the job will be displayed with a blue flashing overlay. Resource Lookup: Find a Resource by its Name. If found, the Gantt chart will scroll to focus on the resource swimlane and the resource grid row will be given a blue background for emphasis. Print Gantt: Print or export to PDF any of the user's custom Gantt layouts. The dialog gives users the option to select one custom Gantt layout to print, or offers a Print All button to print or export two or more select Gantt layouts (or all layouts, if desired). Select Layout: Use the dropdown in the top right corner to select the Gantt layout to be printed or exported. Page Setup: Adjust paper size, page orientation, and margin settings. Print: Print the selected layout. An additional prompt will appear to allow users to select the destination printer, or choose to save as a PDF. Export Directory: Choose where to store the exported files. Export: Export the files according to the current configured settings. Print All: Opens a dialog to allow the user to select one or more custom Gantt Layouts for printing or exporting. Upon clicking Accept, the Export process will automatically begin and the selected layouts will be exported according to the current configured settings. Duration: Select the number of hours/days/weeks of the chosen layout(s) which should be exported. Time Per Page: Define how much time should be displayed per each printed or exported page. Tooltips: When enabled, a tooltip window will appear as users scroll their mouse over Activity Blocks. The window contains information about scheduled activities and capacity intervals. The contents of the tooltip window can be customized per user. For more information, see: User Settings. Fade: This feature is used in conjunction with the drop-down menu found immediately to its right. When enabled, all activity blocks apart from the one selected will fade to a transparent color. The drop-down menu allows users to opt to fade in additional activity blocks related to the selected one. Job: Fade in all activities of the Job that is associated with the selected Activity. Manufacturing Order: Fade in all activities of the Manufacturing Order that is associated with the selected Activity. Operation: Fade in all activities of the Operation that is associated with the selected Activity. Activity: Fade in only the selected Activity. Inventory: Fade in all activities which have a common inventory association with the selected Activity. All Relations: Fade in all activities of the Job that is associated with the selected Activity, as well as any activities which have a common inventory association. Options: Anchor Activities in time after drag-and-drop or Expedite: When enabled, any activity that is dragged and dropped or expedited will automatically be anchored in time. For more information, see: Locking and Anchoring. Lock Activities to Resources after drag-and-drop or Expedite: When enabled, any activity that is dragged and dropped or expedited will automatically be locked to the scheduled resource. For more information, see: Locking and Anchoring. Move to Exactly the place specified: When enabled, dragging and dropping an activity to schedule on top of another scheduled activity will force the existing scheduled activity to move to a later point in time to make room for the newly placed one. When disabled, existing scheduled activities have priority and the dragged and dropped one will schedule immediately after the existing scheduled activity if placed on top of the existing block. Expedite Successors after an Activity is moved: When enabled, any successor operation(s) to a drag-and-drop-moved activity will automatically be expedited to schedule as close to the newly scheduled activity as possible. Existing scheduled activities may be rescheduled later as a result. Show Scheduling Hints: When enabled, scheduling hints will appear as vertical lines with labels in the Gantt chart whenever an activity is selected. Select an activity by clicking once on the activity block. Hints include: constraint release times (material availability, predecessor operation or MO end date, head start release date, etc.), JIT start date, and job need date, job finish date, among others. Show Highlighting: When enabled, all activity block segments are replaced by Job Color highlighting so that all activity blocks in the Gantt are a solid color which reflects their associated job's configured Job Color. Show Activity Links: When enabled, lines are drawn on the Gantt when an activity is selected to show linkages between the selected activity and other activities. Select an activity by clicking once on the activity block. Linkages shown include: predecessor and successor operations, operations that supply material, operations that consume material,

helper resource activities, among others. Information about each activity link can be displayed by clicking on the line as its drawn in the Gantt. View as Daily Activities: This view provides an easier-to-read view of the work to be done each day by resource. Each activity block spans the entire day's width, making it easier to read the text for each order. This view is useful for floor shop personnel who wish to see what will be worked on each day. If multiple operations are scheduled on the same day, they will appear stacked on top of each other with gray areas on each side so that each block spans the entire day. Note: if the scheduled activity starts on one day and ends the day after, the width of the activity block will span the entire two days. Display Settings: A shortcut to the User Settings screen where the activity blocks, segments, and labels can be customized. For more information about customizing activity blocks, see: User Settings. Plant View Gantt Layout Configuration: Select from a dropdown of all default or custom Plant View Gantt layout configurations. Each configuration may display a filtered set of resources in various sort orders according to the user's Plant View Configuration settings. For more information about creating and customizing Plant View Configurations, see: User Settings. Resources Grid The Resources grid can be expanded to show various resource data. Each column can be dragged and dropped to be rearranged in the order of the user's preference. The order of the columns will be stored as part of the user's Workspace Profile. Helpful shortcuts: Double-click any resource grid row to be taken to the Capacity Planning board with the selected resource in focus to view or edit its properties. Right-click any resource grid row to perform various actions or view various reports Activity Blocks: Segments & Labels Each user may customize the Activity Blocks in the Gantt according to their preferences to show them the most useful data and information to them. Their settings are all stored as part of their Workspace Profile which can be shared with other users, if desired (see: Workspace Profiles Dashboard). Click the Display Settings button from the Gantt Toolbar or navigate to User Settings from the Users menu dropdown in the main toolbar. Find the Gantt Activity Block and Segments settings under the Gantt section of the User Settings Board. Each Activity Block consists of two parts: Segments and Labels. Segments Segments are represented by colored horizontal bars in each Activity Block. Each Segment represents some unique piece of data or information related to the operation to give schedulers quick visual cues or indicators related to the Job, Operation, or Activity's production status, timing, progress, bottlenecks, and/or any custom piece of data or information users might want to incorporate into the Segments. The color of the segment will change to reflect the status or value of the property being displayed. Each of the colors represented at each possible status or value of the property related to the segment can be customized by clicking on the color block from the User Settings screen and choosing the desired color. There are many different Segments and users have the option to display all of them or they can pick and choose which one or ones they prefer to see. From User Settings → Segments, toggle each segment on/off as desired. Segment types include: Commitment: Display the Job's Commitment level based on the property of the same name. Estimate: This is often an automatically generated job used to forecast demand or work without a firm job or demand behind it. Planned: Similar to estimate, there is more certainty to a planned job, but it is still an order that may not have a firm job behind it. Firm: This is a job that has been created by customer demand via a sales order for a work order. Released: This is a job that has been created by customer demand and has been released to the shop floor for production. Material Status: Display information related to the Source(s) (or lack thereof) of all Materials required by the Activity. At least one of the "Item Types" checkboxes must also be checked for this segment to appear and provide any useful information. Material Sources Planned: One or more Materials are not available but are covered by existing Jobs or Purchases Material Sources Available: One or more Materials are available and are covered by existing Jobs or Purchases Material Sources Unknown: One or more Materials are not available and are not covered by existing Jobs or Purchases Material Sources Firm: One or more Materials are not available but are covered by existing Jobs or Purchases which are Firm. Buffers: Display the level of buffer penetration for either material, drum, shipping, or stock buffers. OK: Less than 33% buffer penetration. Warning: Between 34% and 66% buffer penetration. Critical: More than 66% buffer penetration. Late: This activity is late. DBR Penetration Type: There are two types of buffer penetration types for manufacturing orders Current: This is based on the current PC time and the manufacturing order's current status. Projected: This is based on where the manufacturing order is currently scheduled on the Gantt. Priority: Display a color associated with the priority number assigned to the job. Define the Low and Medium range, then the High range is assumed to be anything higher than the highest Medium range setting. Use the "Preview value" input to visualize in the Settings screen what color a particular Priority value will look like based on the defined parameters. Status: Display the current Scheduled Status of the Activity On-Hold: The Activity is On Hold Paused: The Activity is Paused. Waiting: The Activity is waiting for some constraint before it can be eligible to start - a material, a predecessor operation, or a predecessor manufacturing order. Ready: The Activity has all of its constraints satisfied (material, predecessor operations, MO release date) and is ready to start. Started: The

Activity has had time or quantity reported or worked on so is considered "Started". Setting-Up: The Activity is currently in the "Setup" phase of production (pre-production). Running: The Activity is currently in the "Run/Cycle" phase of production. Post-Processing: The Activity is currently in the "Post-Processing" phase of production (post-production). Transferring: The Activity's production phases are finished and the product(s) that it produces are being transferred to inventory or to the next resource. Progress: Display the production progress of the Activity as a completion percentage in terms of the Reported Good Quantity compared to its Required Finish Quantity.

Process: Display the various phases of the Activity's production -- Setup, Cycle/Run, Post-Processing, and Storage. Each status is displayed as a vertical bar within the segment whose width is determined by the length of time to complete the process step, and each can have its own custom label text. Use Setup Code Colors: When enabled, the Setup Color defined on the Operation will override the Setup segment color selection when drawn in the Gantt.

Setup: A label or color indicator for the Setup phase of the Activity. Run: A label or color indicator for the Run/Cycle phase of the Activity. Post-Process: A label or color indicator for the Post-Processing phase of the Activity. Storage: A label or color indicator for the Storage phase of the Activity. Clean: A label or color indicator for the Clean phase of an Activity. Max Delay: Display indicators when an operation is in violation of its Max Delay Hours settings between it and its predecessor or successor operation. Ends Early: The operation is scheduled to end too early compared to where the successor operation is currently scheduled. The time between its Scheduled End Date and the successor's Scheduled Start Date is greater than Max Delay Hours. Starts Late: The operation is scheduled to start too late compared to where its predecessor operation is currently scheduled. The time between its Scheduled Start Date and its predecessor's Scheduled End Date is greater than Max Delay Hours. Both: The operation has both a predecessor and successor operation in violation of its Max Delay Hours setting. Timing: Display the timing of the Job associated with the Activity as a comparison of its Scheduled Start and Finish dates against its Need Date. Too Early: The activity is scheduled to end earlier than its Need Date minus the job's defined MaxEarlyDeliveryDays. The default value is "0" (zero) which effectively disables the feature/flag. Any job with a value of "0" in the MaxEarlyDeliveryDays field will never be considered to be scheduled "Too Early". On-Time: The activity is scheduled to finish no earlier than its Need Date minus the job's Max Early Delivery Days, nor any later than its Need Date minus the job's Almost Late Days. If either Max Early Delivery Days or Almost Late Days is set to "0" (zero) then those conditions do not apply. If neither of the conditions apply then an activity is considered "On Time" if it is scheduled to finish before its Need Date. Almost Late: The activity is scheduled to finish before its Need Date but later than its Need Date minus the job's Almost Late Days. The default value for Almost Late Days is "0" (zero) which effectively disables the feature/flag. Any job with a value of "0" in the Almost Late Days field will never be considered "Almost Late". Late: The activity is scheduled to finish after its Need Date. A constraining predecessor job or operation is forcing this activity to schedule later than its Need Date. Capacity Bottleneck: The activity is scheduled to finish after its Need Date and is causing downstream operations to be late as a result. Material Bottleneck: The activity is scheduled to finish after its Need Date due to its required materials not being available. It's causing downstream activities to also be late as a result. Release Bottleneck: The activity is bottlenecked by a set release date on the Manufacturing Order. Attribute: Display color-coded information based on user-defined Attributes on the Operation, Job, and/or Product. Choose which data gets displayed by toggling the various switches. Each of the available switches may enable a new segment within the Attribute Segment which presents the data. Each attribute whose Show In Gantt flag is True will be displayed in a new segment within the Attribute Segment. Its color will equal that of the Attribute Color property value assigned to the associated Attribute. Show Attribute Name: Display the Name of any Operation Attribute whose Show In Gantt flag is True. Show Attribute Number: Display the Number property value of any Operation Attribute whose Show In Gantt flag is True. Show Attribute Code: Display the Code property value of any Operation Attribute whose Show In Gantt flag is True. Job Color: Display a segment with the Job Name with a background color equal to the Color of the Job associated with the activity block. Product Color: Display a segment with the MO Product Name with a background color equal to the ProductColor of the Product that is produced by the Manufacturing Order of the associated activity block. Advanced Sorting If a user enables the user preference to Show advanced user settings, then they will see advanced options to define a Segment Priority, Minimum Height, and Proportional Height Weight to each segment. Segment Priority: The segment priority determines the sort order in which the segment appears in the Gantt. Lower numbered priority values will be sorted before higher valued segments. Minimum Height: Define the minimum segment height in pixels. Proportional Height Weight: A percentage value weight which determines the segment height proportional to other enabled/visible segments. Labels Activity Block Labels refer to the visible text displayed in the Gantt block. Labels can be configured separately for each individual Segment that is enabled to be displayed,

## Grid Edit Mode

[Source](#)

Key Concept Each of the boards which utilize a grid to present object property values and data is equipped with a Grid Edit mode which allows users to quickly add notes or update editable object property values. Jump to section: Standard Functionality Grid Editor Workspace Profile Standard Functionality When Grid Edit mode is enabled, the grid layout cannot be modified so start by selecting or creating a grid layout which displays the desired editable properties, then click the Edit Mode icon at the top of the board grid to enable Edit Mode. Once enabled, editable property values have a white background in the grid while non-editable properties display with a gray background. As users make modifications to any property value, their changes are not immediately saved. They can see their changes via a yellow background in the grid cell whose value was updated. Any number of changes can be made, then when the user is done they can opt to save or revert the changes before disabling Grid Edit mode to go back to browsing. Grid Editor Workspace Profile A Workspace Profile is available to download and import for users who may frequently be modifying many property values and want a quick way to select preconfigured layouts with the most commonly edited and editable properties organized in a manner that groups like-properties and like-objects together. Download the Workspace Profile here: [ INSERT LINK HERE ] Follow the steps in the Workspace Profile Dashboard article's Import section to import the profile from the downloaded file so that it can be easily selected from the User dropdown in the main toolbar. See Also Activities Board Capacity Planning Board Customers Board Inventory Plan Board Jobs Board Materials Board Purchase Orders Board Routing Templates Board Sales Orders Board

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## Import Mappings Board

[Source](#)

Key Concept The Import Mappings Board is the gateway to the Interface Setup Wizard. The wizard guides users through the process of creating and testing an interface to a backend system database. Users have flexibility to import some or all object types available, then configure database field-to-PlanetTogether property mappings. SQL queries can be used to filter the incoming data from the selected database table/view, and/or in any of the property mapping inputs for conditional values or any number of use cases. Jump to section: Welcome Resource Objects Inventory Objects Job Objects Mappings Pages Interface Welcome Users will be presented with a Welcome screen the first time they visit the Import Mappings board. Give it a quick once-over then it probably makes sense to check the box to [x] Skip this welcome screen next time. The Welcome screen presents the option of using a Custom Interface instead of importing from a database, but this is not typically used. This option requires creating a custom program file named CustomInterface.dll placed in the ProgramFiles folder. Click the Next button in the lower right corner to proceed to select which Resource Objects should be imported. Resource Objects Resource Objects deal primarily with the physical setup of the manufacturing facility and will consist of how machines and capital are organized into a tiered structure. Additionally, Resource Objects are meant to reflect the manufacturer's capacity to do work and the type of work that can be done. Select which objects to include during the Refresh operation using the toggles next to each line item. Use these links to navigate to the specific object mappings articles: User Mappings Plant Mappings Department Mappings Capability Mappings Cell Mappings Resource Mappings Capability Assignment Mappings Resource Connector Mappings Allowed Helper Resource Mappings Resource Attribute Mappings Capacity Interval Mappings Recurring Capacity Interval Mappings Product Rule Mappings Attribute Setup Table Mappings Attribute Code Table Mappings Setup Code Table Mappings Click the Next button in the lower right corner to proceed to select which Inventory Objects should be imported. Inventory Objects Inventory Objects pertain to the materials and products that the manufacturer purchases and produces and stores in inventory. Thus, Item and Inventory Objects will deal with raw and intermediate materials and SKUs and the warehouses that stock them. Objects range from physical inventory and warehouses, to planned purchase orders to stock, sales order demands, and forecasted demands. Select which objects to include during

the Refresh operation using the toggles next to each line item. Use these links to navigate to the specific object mappings articles: Item Mappings Warehouse Mappings Warehouse Plant Mappings Inventory Mappings Lot Mappings Sales Order Mappings Forecast Mappings Purchase To Stock Mappings Transfer Order Mappings Click the Next button in the lower right corner to proceed to select which Job Objects should be imported. Job Objects Job Objects refer to work order or production order information. Job Objects include the routing information for the products that need to be created, as well as other business information like customer information, order quantities, and due dates. Where Resource Objects define what can be produced, Job Objects define how the items are produced and will ultimately inform the Resource Objects of what should be produced on a given day. For more information about how PlanetTogether breaks down Jobs into individual components, see: Job Structure. Select which objects to include during the Refresh operation using the toggles next to each line item. Use these links to navigate to the specific object mappings articles: Job Mappings Manufacturing Order Mappings Resource Operation Mappings Internal Activity Mappings Resource Requirement Mappings Required Capability Mappings Material Mappings (BOM) Product Mappings Operation Attribute Mappings Successor Manufacturing Order Mappings Alternate Path & Node Mappings Customer Mappings Mappings Pages Interface The User Interface on each of the mappings pages makes the SQL field-to-PlanetTogether property mapping task intuitive and very flexible to accommodate the multitude of ways customers may have their SQL data sources configured. Select From Use the Select From text input to start building a SQL SELECT statement to fetch data from one or more SQL tables or views that contain the data related to the object mappings page currently in focus. Certain portions of the SELECT statement are built into PlanetTogether already so this is just an area to input a table or view name along with any additional SELECT instruction/logic needed after the FROM portion of the statement to retrieve the necessary data from the database. Distinct: When enabled, the SELECT statement becomes a SELECT DISTINCT statement so that only unique rows of data will be returned. Limit rows when mapping: This editable value only impacts the Preview Mapped Data and Browse Source Data buttons under the Filter (SQL WHERE Clause) section of the mappings interface. It limits the number of rows returned by these buttons to only the number defined. The default value is 1,000. To view all rows when Previewing or Browsing the data, enter a "0" zero in this field. Filter (SQL WHERE Clause) Use the WHERE clause text input to filter the data returned by the SELECT statement, if necessary. This input is optional. Note that the WHERE portion is implied so enter text into this field as if the SELECT statement already ends with WHERE. Auto-delete for omitted records: When enabled, objects which are not present in the SQL data source and thus not included in the incoming import data will automatically be deleted from PlanetTogether during the Refresh process. Users may enable this logic for none, some, or all object types that offer the toggle switch. Preview Mapped Data: Click this button to query the database and display a dialog that previews only the mapped data according to the configured Select From and Filter (SQL WHERE Clause) and Limit rows when mapping and all of the property mappings from the Mappings Grid below. Browse Source Data: Click this button to query the database and display a dialog that returns all SQL data according to the defined Select From and Filter (SQL WHERE Clause) and Limit rows when mapping settings. Mappings Grid Enter SQL Field names or conditional statements into the Source column to map those field values to the appropriate PlanetTogether Property. Property: The name of the PlanetTogether Property Type: The data type of the Property Required: A True/False flag to indicate whether or not the Property is required to have a value imported. Source: A SQL Field name or SQL conditional statement that may or may not contain a value (many Properties allow NULL values). The data type of this Field or value must match the Property Type. Sample Data Grid Preview a row of data from the selected table or view. Grid columns Field: The SQL field name. Type: The data type of the Field. Sample: The Value of the Field in SQL. Buttons Refresh Field List and Sample Data: Fetch one random row of data from the SQL data source and display the data in the grid. Copy matching fields: Quickly map any SQL Fields to PlanetTogether Properties if they share the same name (i.e. the SQL Field is named the same as the PlanetTogether Property). Next Sample: Fetch a new row of random data from the SQL data source and display the data in the grid. Test: Test the import process to see if the current configuration might produce errors. Perform Import: Import only the mapped data of the current mappings page. Object Help Click the Object Help button to be taken to the Knowledge Base article that describes each of the PlanetTogether Properties that can be mapped for the Objects whose mappings are currently being viewed. Clear All Remove all entries from the Source column of the Mappings Grid. Test Test the connection to the SQL data source using the provided inputs and mappings configuration. Perform Import Import data from the current Mappings page and any dependent objects. For example, Perform Import from the Plant Mappings page will only import Plant data (it has no dependencies), whereas Perform Import from the Resource Operation Mappings page will also import all Plant, Department, Resource, Capability, Inventory, and Job objects (or else Resource Operations might not have anywhere to import

to). Save Settings Save Automatically: Any changes made to any field within the Import Mappings board pages will be saved instantly. Prompt to save on exit: Changes made to the Import Mappings pages will not be saved automatically. The user will be prompted whether or not to save their changes when they close the Import Mappings board, or when they exit the Client application. Don't save automatically: Changes made to the Import Mappings pages will not be saved automatically. The user must click the Save Mappings button in order to save. Page Navigation Find the Mappings page navigation in the lower right corner. Use Back and Next to move forward or back 1 page at a time, or use the dropdown to find a specific Mappings configuration. The Mappings pages are listed in the order that they get imported into the system (the non-alphabetical sort is intentional!).

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## Inventory Plan Board

### Source

Key Concept Proper inventory management is essential to ensure that demands are met while minimizing the costs incurred by carrying excess inventory. In PlanetTogether, the Inventory Plan Board offers detailed inventory-level information for every item and material used throughout the production process and provides users with a visual representation of supply and demands. The inventory plan will allow planners to ensure sufficient materials to supply incoming demands and enough time to purchase or manufacture additional materials. Jump to section: Inventory Grid Transfer Orders Tile Inventory Bulk Edit Tile Forecast Manager Tile Adjustments Report Inventory Plot Report Inventory Grid The inventory grid contains information about all inventory items, such as where those items are stored, any on-hand quantities, and total supplies and demands for that item. Each row represents a different inventory item. In addition, the inventory grid is searchable, which allows users to quickly find items by typing the item's name in the search box found at the upper-left corner of the grid. Select grid rows from the inventory grid when interacting with the other tiles in the board to see data related to the selected grid row. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Transfer Orders Tile The Transfer Orders tile gives visibility into transfer orders in the data model. Transfer orders represent transfers of inventory from one warehouse to another at designated times so that jobs or operations which require material from a specific warehouse may be scheduled to consume the material from the appropriate warehouse. Save: Save any pending edits from the in-grid editor. New: Create a new transfer order. Delete: Delete the selected transfer order(s). Clear: Clear all transfer order data from the scenario. Inventory Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more inventory records. Select one or more rows from the Inventory grid, then choose properties and values that should be applied to each selected inventory record. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles Forecast Manager Tile Demand forecasting aims to accurately predict the demand and schedule production accordingly. Forecasts represent projected demand for a specific item over time. Select any item from the Inventory Grid to manage its Forecasts in the Forecast Manager tile. From the tile users can view, adjust, remove, and/or generate forecasts of demands for the selected item. Forecasts are treated as demand signals for MRP within PlanetTogether so if using MRP to generate jobs, it will generate them according to forecasted demands. Forecast Orders can be imported from the SQL data source or manually generated in the PlanetTogether Client interface. Generate Forecasts Click the button from the Forecasts Manager tile toolbar to bring up the Forecast Generator dialog. Select or modify each of the inputs according to forecast projections for the selected item. Forecast interval: Select from quarterly, monthly, weekly, or daily intervals. Number of intervals to forecast: Enter the number of intervals to be forecasted. First interval date: Enter the date (Need Date) of the first interval to be forecasted. Quantity of the first interval: Enter the quantity required of the first forecasted interval. Consecutive Intervals: Equal the first (constant): All forecasts will be generated with the same quantity as the first interval. Increase: The quantity will increase by the specified percentage amount with each forecasted interval. Decrease: The quantity will decrease by the specified percentage amount with each forecasted interval. Click the Generate button to generate forecasts according to the selected parameters. Adjust Forecasts Select any forecast from the Forecast Manager tile, then click the button from the toolbar to bring up the Adjust Forecast Quantities dialog. Value: Adjust the Required Quantity to a specific value. Scale: Adjust the Required Quantity up or down by a specific percentage of the original quantity. Up/Down: Select a radio option to scale the quantity up or down. Click the Adjust button to adjust the quantity of the selected forecast according to the selected parameters. Include

Forecasts in Inventory Calculations When this toggle switch is enabled, Forecasts will be factored into inventory levels over time. Since Forecasts are demands, they are visualized as negative impacts to inventory. From the Inventory Plot Report, Forecasts can be identified by exposing the Reason column. Adjustments Report The Adjustments Report displays demand, supply, and ending (net) inventory for an item over time for a specified time horizon. Period: The Period determines the time bucket duration for each column. For example, if the period is set to "1 week" then each column represents the inventory adjustments for the item occurring each week. Horizon: The Horizon defines whether the information included in the report is contained only in the Short-Term span or for the entire Planning Horizon. The Short-Term span and Planning Horizon durations are set in the System Settings under Scheduling Options. Inventory Warnings: The Net Inventory row is color-coded to show inventory levels at each Period time bucket and how they compare to various factors like Max Inventory, Safety Stock, Shortages, or sufficient supply to meet all demands. Above Max Inventory: Represents an item that is overstocked in inventory and is incurring unnecessary carrying costs. The max inventory field triggers this warning flag, and these items are highlighted in orange. Below Safety Stock: Represents an item below the safety stock but has sufficient inventory to handle incoming demands. These items are highlighted in yellow. Shortage: Represents an item in inventory that is beneath the safety stock level, is outside of its lead time and has a demand for that item. These items are highlighted in red. OK: Represents an item above the safety stock and has enough inventory to handle incoming demands. These items are highlighted in green. Inventory Plot Report The Inventory Plot Report offers both a plot chart and a grid view of all inventory adjustments made over the course of the schedule. Select any item from the Inventory grid to plot its adjustments over time in this plot report tile. Toggle on Show Adjustments After Planning Horizon to include adjustments in the chart and grid which are scheduled past the planning horizon. Chart The chart displayed in the top half of the report displays inventory levels at various points in time. The chart will start at the beginning of the planning horizon with the current on-hand level and will end at the date and time of the last scheduled adjustment. Controls are offered to adjust the visible start and end date/time by dragging and dropping the circles with blue dots on either side of the condensed chart directly underneath the bar chart: Plotted Values The Plotted Values table displays information about inventory adjustments made at each plotted point. This may include combined quantities of two or more adjustments that get applied at the same time and therefore are both contributing to the inventory level at the plotted point on the chart. Inventory Details The Inventory Details table displays each specific inventory adjustment made at each point in time. It is the most detailed view of all adjustments from jobs, purchase orders, sales orders, forecasts, etc. over the course of the scheduled planning horizon. Show Materials: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Show Materials button to open the Materials board with a temporary filter applied to show information about the selected scheduled adjustment. Open Job: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Open Job button to open the Job Details dialog of the job associated with the selected adjustment. Find Operation: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Find Operation button to open the Gantt board with a focus on the operation associated with the selected adjustment. Export: Export the grid in one of the optional formats (HTML, PDF, XLSX, or CSV). Grid Properties: Field Name Description Available Level The amount of total inventory that is available to be consumed at the time of the adjustment. Change Qty The quantity difference of the inventory level introduced by the adjustment. Customer The name of the Customer associated with the Job or Sales Order associated with the adjustment. Date The date of the adjustment. Date and Time The date and specific time of the adjustment. Forecast The name of the Forecast associated with the adjustment. Inventory Level The total inventory level at the time of the adjustment. Item Name The Name of the Item associated with the adjustment. Job Id The ExternalId of the Job associated with the adjustment. Job Name The Name of the Job associated with the adjustment. Lot Code The Lot Code associated with the Job Product adjustment. MO Name The Name of the Manufacturing Order associated with the adjustment. Need Date The Need Date of the Job associated with the adjustment. Operation Id The ExternalId of the Job Operation associated with the adjustment. Operation Name The Name of the Job Operation associated with the adjustment. Priority The Priority of the Job associated with the adjustment. Product Group The Product Group of the Item associated with the adjustment. Product Name The Product Name of the primary product of the Manufacturing Order associated with the adjustment. Reason A description of the reason for the adjustment. Sales Order The Name of the Sales Order associated with the adjustment. Sales Order ExternalId The ExternalId of the Sales Order associated with the adjustment. Sales Order Line The Line Number of the Sales Order associated with the adjustment. Storage Area The Name of the Storage Area that was impacted by the adjustment. Storage Area Available Level The combined amount of available inventory in the impacted Storage Area at the time of the adjustment. Storage Area Level The combined amount

of all inventories/items in the impacted Storage Area at the time of the adjustment. Transfer Order The Name of the Transfer Order associated with the adjustment. See Also Warehouse Mappings Plant Warehouse Mappings Item Mappings Inventory Mappings Lots Mappings Forecast Mappings Transfer Order Mappings

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## Jobs Board

[Source](#)

**Key Concept** In PlanetTogether, jobs represent top-level objects that generate requests for the shop to produce one or more items or products by a specific time. The Jobs Board helps users to visualize the schedule-ability and statuses of the jobs in the data model, allows them to manually adjust or create jobs, and setup custom layouts and metrics and KPI trackers to better visualize throughput, profitability, and schedule execution accuracy. [Jump to section: Jobs Grid Job Actions Tile Create Job Tile Job Bulk Edit Tile Job Generator Tile Job Demand Tile Job Watch Gantt Tile Connected Jobs Gantt Tile Browse Data Tile Jobs Grid](#) The Jobs Grid offers a grid view with a plethora of data pertaining to all jobs in the data model, including (but not limited to) its Name or ID, Need Date, Product, Quantity, Scheduled Status (including Start and End Dates), Customer information, Cost and Revenue information, and various flags about the production status to help to quickly see if it's Early or Late or Failing to Schedule for some reason. Double-click any grid row to bring up the Job Dialog window to make adjustments to the selected job and its Manufacturing Orders, Alternate Paths, Operations, and Activities. Right-click any grid row to bring up a menu of Actions that can be performed on the selected job. Select grid rows from the Jobs grid when interacting with the other tiles in the board to see data related to the selected grid row. [See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Job Actions Tile](#) Use the Job Actions tile to perform quick actions on one or more selected jobs from the Jobs grid. [Management Open: Open the Job Details Dialog of the selected job. Copy: Copy the selected job.](#) Displays the Job Details Dialog screen to make adjustments to the copy before the copy is created. Users may optionally Cancel the creation of the job copy from the Job Dialog, or proceed to make adjustments to the job and Save and Close from the Job Dialog to create the job copy. [New: Create a new job from scratch via the Job Details Dialog. Delete: Delete the selected Job\(s\).](#) Scheduling Optimize Selected Jobs: Performs an optimize for only the job(s) selected. This optimize does not include any of the jobs supplying materials for the selected jobs. Ignore Constraints: Change all stock material requirements on the selected Activity(ies) from Constrained by Available Date to Ignored-Constraint, and from Constrained by Earlier of Lead Time and Available Date to Ignored-LeadTimeConstraint so that subsequent scheduling actions will not enforce material constraints. Restore Constraints: Change all stock material requirements on the selected Activity(ies) back from Ignored-Constraint to Constrained by Available Date, and from Ignored-LeadTimeConstraint to Constrained by Earlier of Lead Time and Available Date so that subsequent scheduling actions will once again enforce material constraints. Anchor: Anchor the job and all of its operations to their currently scheduled point in time. [See also: Locking and Anchoring Unanchor: Remove the Anchored status from the job and its operations.](#) Insert Jobs Individually: Insert each of the selected jobs one at a time into the schedule via CoPilot. A new scenario will be created with the resulting schedule. Insert Jobs as a Group: Insert each of the selected jobs as a group into the schedule via CoPilot. If any one of the jobs is unable to be scheduled, then all of them will fail to schedule. A new scenario will be created with the resulting schedule. Hold: Put the job On Hold to effectively prevent scheduling it before a certain date and time. The user will be presented with a Hold Job dialog where they must enter a date and time when the job should be held until. They may optionally provide a Reason for Hold as well, for informational purposes. Unhold: Remove the Hold status from the job and its operations. Unschedule: Remove the job from the schedule. Lock: Lock the selected job and its operations to their currently scheduled resource. [See also: Locking and Anchoring Unlock: Remove the Locked status from the selected job and its operations.](#) Find in Gantt: Quickly locate the selected job in the Gantt chart on the Gantt board. Expedite Do ASAP: Reschedule all Activities of the selected Job(s) to begin as early as possible, as early as the start of the schedule (constraints allowed). Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Preserve the Frozen Span: Reschedule all Activities of the selected Job(s) to begin as early as possible without entering the Frozen Span area. Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Preserve the Stable Span: Reschedule all Activities of the selected Job(s) to begin as early as possible without entering the Stable Span area.

Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. To specific date and time: Reschedule all Activities of the selected Job(s) to begin as close as possible to the specified date. Their Supplying Manufacturing Orders will also be expedited if the user's expedite settings are configured to [x] Include Supplies. Create Job Tile Use the Create Job tile to create a job as a copy of an existing job or routing template, or create a new job from scratch. Copy Job From the Copy Job tab, select any job row from the Jobs grid to quickly populate the information in the Copy Job form, or select an existing job from the Select job to copy dropdown. Input other basic information as needed, then click Create Job to create a new job as a copy of the selected job. New Blank Job Click the New Blank Job button to open the Job Details Dialog to begin creating a new job from scratch. Job Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more jobs. Select one or more rows from the Jobs grid, then choose properties and values that should be applied to each selected job. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles Job Generator Tile Use the Job Generator tile to create many copies of one or more selected jobs. Optionally, randomize values of various job properties. This job generation method is meant for creating sample jobs for mock schedules and is not intended to be used for production scheduling purposes. Number of Copies of each Job: Define how many copies of each selected job will be generated. Number of Jobs to be copied: The current number of selected jobs from the Jobs grid that will be copied. All selected jobs will be copied. Job Copy Prefix: Define a prefix for each of the generated job copies Job Names. Job Start Value: Define a numerical value to start counting from while generating job copies. This value gets appended to the end of the Job Name of the first job created, then subsequent jobs increment up by 1 each time. Convert any Templates to Jobs: If using the Generator tile from the Routing Templates board then the selected grid rows are job templates. Enable this feature to convert copies of Routing Templates to Jobs, or disable this feature to preserve the Routing Template status and create additional Routing Template copies instead. Randomize Values: When enabled, various property values can be randomized using the table provided. Randomize Values Use the Randomize Values table to set Minimum and Maximum ranges to various property values that the generator may use while creating copies of the selected jobs. Dates and Numbers Need Dates Required Quantity Revenue Priority Minutes per Cycle Setup Hours Setup Number Products Randomize Product and Colors Use must also enter Product and/or Color data into the provided table if this option is enabled Use Color as Operation Attribute Customers Randomize Customers Select which customers to include in the randomization from the multi-select dropdown input. Other Randomize Commitments Randomize Colors of Job Copies Job Demand Tile Select a job from the Jobs Grid to see more information about the demand signal(s) that the job is satisfying or pegged to. This can be especially helpful for MRP-generated jobs or lot-peggued jobs to see which demands (sales orders, forecasts, or other job material requirements) are satisfied by the selected job. Original Demand The Original Demand lists the forecast or sales order or job that caused the job to be created during MRP. Pegged Demand Pegged Demand designates the supply of materials for a specific job. Demand pegging allows you to know you have the materials set aside to complete the job. The allocated materials cannot be used for any other job. Job Watch Gantt Tile Select one or more jobs from the Jobs Grid to plot their scheduled operations in the Job Watch Gantt tile. This Job Watch Gantt is very similar to the one in the Gantt Board except the only way to select which jobs are "watched" is to select them in the Jobs Grid. Each Activity Block on the Gantt chart can be interacted with in the same manner as the Gantt Board charts. Tooltips are enabled and cannot be disabled. Show All Eligible Resources: When enabled, all resources which are eligible to schedule any of the activities of any of the watched jobs will appear in the Gantt, even if none of the activities of the watched jobs are scheduled there. Connected Jobs Gantt Tile Select one or more jobs from the Jobs Grid to plot their scheduled operations and all operations of other connected jobs in the Connected Jobs Gantt tile. Jobs are considered "Connected" if they supply or receive an item to/from another job. Each Activity Block on the Gantt chart can be interacted with in the same manner as the Gantt Board charts. Activity links and tooltips are enabled and cannot be disabled. Show All Eligible Resources: When enabled, all resources which are eligible to schedule any of the activities of any of the watched jobs will appear in the Gantt, even if none of the activities of the watched jobs are scheduled there. Browse Data Tile Browse, search, and export all jobs data for analytical/informational purposes. The visible data in the tile grids is limited to showing only the data related to selected jobs from the main Jobs grid. Use the export icon near the top of the tile to export any filtered grid to an XLSX, PDF, HTML, or CSV file. See Also Job Structure Job Details Dialog User Defined Fields (UDFs) Job Mappings Manufacturing Order Mappings Alternate Path & Node Mappings Resource Operation Mappings Resource Requirement Mappings Required Capability Mappings Material Mappings Product Mappings Operation Attribute Mappings

## KPIs Board

### Source

**Key Concept** The KPIs Board allows users to see the costs and benefits of the current schedule. There are a wide variety of indicators or criteria that can be tracked, and the graph will show how each schedule change affects the tracked criteria. In addition, each point on the graph serves as a possible undo point, and the planner can use the graph to "undo" back to any action by simply right-clicking clicking on the point and selecting "Undo back to this point".

**KPIs Grid** Use the KPIs grid on the right side of the page to view and filter the visible plotted KPIs, their current value, and their value just prior to the latest snapshot. Configure grid layouts and save them for quick access/viewing at a future date. Export the grid to Excel, PDF, or other formats for external analysis.

**Toolbar** Save KPI Snapshot Click this button to manually save a snapshot of the KPI statistics that are produced by the current schedule. The point will be plotted on the KPI chart.

**Options** Store KPI Snapshots After each Publish: When enabled, a KPI snapshot will be saved when any user publishes the schedule. After each Import: When enabled, a KPI snapshot will be saved when any user imports data via a Data Refresh. After each schedule change: When enabled, a KPI snapshot will be saved when any user performs any scheduling action (drag/drop, expedite, Optimize, Compress, etc.). Maximum number of Snapshots to store: Define the number of snapshots that should be stored and plotted at any time. Tip: Store KPI snapshots automatically at specified times and/or intervals using Automatic Actions in System Settings. For more information, see: Automatic Actions KPI Visibility Use this dialog to select which KPIs should be calculated by the system. The default colors can be configured here for each KPI as well.

**Compare Scenarios Mode** When enabled, the KPI data for any scenario with the "Compare Scenario" setting enabled in its settings will be compared to the currently active scenario. See Also Predictive KPI Tiles

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## Materials Board

### Source

**Key Concept** The Materials Board offers insights into the data pertaining to material requirements and their sources of all scheduled jobs, manufacturing orders, and operations. Use the data to see where materials are coming from to supply each consuming operation and when they are needed. This data can help material planners to ensure that the release and procurement of materials are in sync to meet demands. Jump to section: Materials Grid Material Requirement Actions Tile Material Bulk Edit Tile Materials Grid The Materials grid displays important information about the materials that are used to supply jobs and operations. For example, columns will display the date the material is needed by, the date in which the material is available, which warehouse is supplying the material, as well as if there is a shortage of material. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Material Requirement Actions Tile Use the Material Requirement Actions tile to perform quick actions on one or more selected materials/jobs from the Materials grid. Access the same actions from the right-click menu without needing to open the tile. Reporting Inventory Plot: Open the Inventory Plot tile from the Inventory Plan board with the selected material in focus. This action only supports one grid row selection at a time. If multiple grid rows are selected, only the most recently selected one will be used, as indicated by the > arrow icon next to the grid row number: Find in Gantt: Find the operation associated with the selected grid row in the Gantt. The Gantt board will come into focus with the associated operation targeted. Production Report Issued Material: Use this to manually update the Issued Quantity on the selected material adjustment. After material is issued, when the operation starts, rather than the entire required quantity of the material requirement being deducted from inventory, the required quantity minus the issued quantity is deducted from inventory as if the issued amount has already been deducted. For example, if the required quantity of the operation is 50 and the qty of reported issued material is 10, a quantity of 40 will be deducted from inventory when the operation is scheduled to start. NOTE: This can be visualized by using the Issued Quantity column in the grid. Issued from Inventory: Similar to Report Issued Material, use this to manually update the Issued Quantity on the selected material adjustment and immediately deduct the specified amount from the current on-hand inventory. For example, if the required quantity of the operation is 25 and the quantity issued from inventory is 10, then 10 will be deducted from inventory and Issued Quantity on the operation's material requirement will reflect 10 so that when the operation schedules to start it will only consume 15 more pieces from inventory. Management Select All: Select all grid rows. Alternatively, use the Ctrl+A keyboard shortcut. Material Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more material requirements. Select one or more rows from the Materials grid, then choose properties and values that should be applied to each selected requirement. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles

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## Metrics Board

[Source](#)

**Key Concept** The Metrics Board offers a dashboard view of all Metrics configured in the scenario. Each metric slide in the Metrics Board offers detailed information about the last scheduling action and how it impacted the metric count, as well as a quick link to navigate to the filtered grid layout which is producing the metric statistics so that users may further analyze why the metric is reporting the statistics that it is. For information about configuring Metrics and Targets, see: [Layouts, Metrics, and Targets](#). Jump to section: [Categories and Sorting Data Analysis](#) Categories and Sorting Metrics are separated into categories based on the board grid from which they originate: Jobs, Sales Orders, Inventory Plan, Materials, Purchase Orders, etc. Each categorized set of metrics is sorted by its configured priority where the highest priority metrics will be listed first. Data Analysis Details about the metric, its statistics, and how close it is to meeting its target can be viewed in a popup dialog that appears as users hover their mouse over the various icons and text in each metric slide. Quick focus Click anywhere in any of the metric slides to bring its grid layout into focus for deeper analysis of the data. Metric title Hover the mouse over the metric title to reveal the name, grid, and applied property filters of the layout that is producing the metric. Target information Hover the mouse over any of the target icons to see more detailed information about the target and statistical analysis of how close the current schedule is from reaching the target. Data change information When the count or percentage of a metric with Changes Highlighting enabled changes from the last schedule modification, a red or green arrow indicator will appear along with a count and a percentage statistic of the change impact. Hover the mouse over these statistics to see more information about what recent action resulted in the change. See also: [Layouts, Metrics, and Targets](#)

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## Object Bulk Edit Tiles

[Source](#)

**Key Concept** Bulk Edit object editors allows for the modification of one or more properties applied to one or more objects of the same type (think -- multiple resources or jobs or sales orders or customers; etc.). This tile is especially helpful for creating demos and sample data, but also has some practical production scheduling use cases as well. Standard Functionality With the Bulk Edit tile open, select one or more grid rows from the main board grid. All selected rows will have the bulk edit(s) applied to them. Use Ctrl+A to select all visible rows, or use Ctrl+Click or Shift+Click to select multiple rows as needed. With one or more rows selected, choose a property from the Property dropdown selection. Depending on which property is chosen, the Value input may change to a checkbox for boolean values, a dropdown selection for properties whose values are predeterminate, or a text input for properties which accept numbers or strings of text. Enter or select the desired value for the chosen property. As soon as one Property to Value combination is chosen, a new dropdown selection will appear under the Property section. This is optional to allow users to choose to update more than a single property's value as needed for all of the selected objects. Finally, once all Property to Value combinations are ready, click Save to apply the change(s) to all selected grid objects. Alternatively, click Clear to clear all pending changes and start over from a blank Bulk Edit tile. See Also [Activities Board](#) [Capacity Planning Board](#) [Customers Board](#) [Inventory Plan Board](#) [Jobs Board](#) [Materials Board](#) [Purchase Orders Board](#) [Routing Templates Board](#) [Sales Orders Board](#) [User Management](#)

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## Purchase Orders Board

[Source](#)

**Key Concept** Purchase Orders (sometimes referred to in PlanetTogether as Purchases to Stock) are orders for additional material from external or internal vendors, generally created for raw or intermediate materials. They represent an increase in the supply of materials and help keep the inventory plan up to date with incoming and

outgoing inventory when materials are used to supply jobs. The Purchase Orders Board offers insights into scheduled and received Purchase Orders over the current scheduled planning horizon and allows users to manage their Purchase Orders and/or create new ones as needed. Jump to section: Purchase Orders Grid Purchase Order Actions Tile Purchase Order Bulk Edit Tile Purchase Orders Grid The Purchase Orders grid offers details of each Purchase Order in the data model, including their scheduled receipt and scheduled availability dates, the item being purchased, the quantity, the vendor or buyer, etc. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Purchase Order Actions Tile Use the Purchase Order Actions tile to perform quick actions on one or more selected purchase orders from the Purchase Orders grid. Management Delete: Delete the selected Purchase Order(s). New: Create a new Purchase Order. This action will bring up a Purchase to Stock dialog with the following fields and options: Name: Enter a name for the Purchase Order. External Id: Optionally enter a unique External Id for the Purchase Order. If left blank then one will automatically be generated and assigned when the Purchase Order is created. Description: A text description of the Purchase Order. Used primarily for informational purposes. Notes: Additional text notes related to the Purchase Order. Used primarily for informational purposes. Attributes: Custom attributes assigned to the Purchase Order. Used primarily for informational purposes, though these can be used in conjunction with software customizations/extensions. User Defined Fields:Custom user defined fields (UDFs) assigned to the Purchase Order. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). Purchase Details: Item: Select the item to be purchased from the dropdown of items from inventory. Item Description: This field is populated once an Item is selected. Its value comes from the Item Description property that is defined on the item in inventory. Warehouse: This field is populated once an Item is selected. Its value comes from the Warehouse in which the item is configured to be stored in inventory. Scheduled Receipt Date: Define a date and time that the Purchase Order is scheduled to be received. Actual Receipt Date: Optionally, define a date and time that the Purchase Order was received. Quantity Ordered: Define the quantity of the item to be ordered. Quantity Received: Optionally, define the quantity of the item which has already been received. Vendor ExternalId: A name or other identified of the Vendor of the materials. Buyer ExternalId: The individual responsible for the purchase. Lot Code: Optionally enter a lot code to associate with the purchase. For use with Lot Controlled Planning. Firm: Toggle whether the order is Firm or not. If using MRP to generate/regenerate Purchase Orders then Firm P.O.s will be preserved during regeneration while non-firm P.O.s will be deleted (and recreated, if necessary according to demand signals). Closed: Toggle whether the order has been Closed. Closed orders have no impact on inventory levels but can be helpful for tracking statistics and KPIs over time. Transfer: Unload Span: The amount of time it takes to unload the order once it's received. This amount of time will be added to the date and time of the Scheduled Receipt Date to determine the Unload End Date which will also impact the Available Date which determines when the purchased materials can be used for scheduling. Transfer Span: The amount of time it takes to transfer the material to the Warehouse. This amount of time will be added to the date and time of the Scheduled Receipt Date to determine the Available Date for when the purchased materials can be used for scheduling. Close: Close the selected Purchase Order(s). Closing without Receiving will not impact inventory levels. This effectively cancels the order if it's scheduled to be received in the future. Receive Order: Receive and close the selected Purchase Order(s). The order will be closed and the Quantity Ordered will be received in inventory. Adjustment: This action displays a dialog to allow the user to enter an amount received that may differ from the Quantity Ordered. They are also given the option to Close the order or keep it open. If kept open and the entered Quantity Received is less than the Quantity Ordered then the remaining amount will be added to inventory at the Scheduled Receipt Date (plus transfer time, if any). Select All: Select all grid rows. Alternatively, use the Ctrl+A keyboard shortcut. Purchase Order Bulk Edit Use the bulk edit tile to make changes to one or more properties for one or more purchase order. Select one or more rows from the Purchase Orders grid, then choose properties and values that should be applied to each selected order. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles

## Routing Templates Board

[Source](#)

Key Concept The Routing Templates board is a place to view and configure job templates that can be used to

quickly create jobs for items which are produced in the plant. Jobs can be created from templates using MRP or CTP (Capable to Promise), or more manually using other available tools. As a general best practice, it's recommended to configure each Template to produce "1" (or at least the minimum possible that can be produced) of its product so that MRP, CTP, and other tools used to generate jobs from the template can easily scale to the appropriate demanded quantity. Jump to section: Routing Templates Grid Routing Template Actions Tile Create Job Tile Template Generator Tile Template Route Tile CTP Estimate Tile Routing Template Bulk Edit Tile Routing Templates Grid Use the Routing Templates grid to view various data associated with each template in the data model. Double-click any grid row to bring up the Job Dialog window to make adjustments to the selected template and its Manufacturing Orders, Alternate Paths, Operations, and Activities. Right-click any grid row to bring up a menu of Actions that can be performed on the selected template. Select grid rows from the inventory grid when interacting with the other tiles in the board to see data related to the selected grid row. See Also: Layouts, Metrics, and Targets Grid Personalization Object Bulk Edit Tiles Grid Edit Mode Routing Templates Actions Tile Use the Routing Templates Actions tile to perform quick actions on one or more selected templates from the Routing Templates grid. Management Delete: Delete the selected Template(s). Copy: Copy the selected Template. Displays the Job Dialog screen to make adjustments to the copy before the copy is created. By default, the [ ] Template indicator is disabled/false in the Job Dialog as if the Copy action is meant to copy the existing Template into an actual Job. If attempting to copy the template as a new template, be sure to manually check the [x] Template indicator. Users may optionally Cancel the creation of the job copy from the Job Dialog, or proceed to make adjustments to the job and Save and Close from the Job Dialog to create the copy. Open: Open the Job Dialog of the selected job. New: Create a new job from scratch via the Job Dialog. Select All: Select all grid rows.

Alternatively, use the Ctrl+A keyboard shortcut. Create Job Tile Use the Create Job tile to create a job from an existing routing template, or to create a new routing template from scratch. Job from Template Select any Routing Template from the Select source routing template dropdown, or click on any grid row from the Routing Templates grid to select it. Adjust other basic information as needed (Name, Customer, Need Date, and Quantity), then click Create Job to create a new job from the template. New Blank Route Click the New Blank Job button to open the Job Details Dialog to begin creating a new routing template from scratch. The Template property will be set to True by default when the dialog opens. Template Generator Tile Use the Template Generator tile to create many jobs or templates as copies of one or more selected template. Optionally, randomize values of various job properties. This job and template generation method is meant for creating sample jobs and templates for mock schedules and is not intended to be used for production scheduling purposes. For more information about each of the properties and settings that can be configured, see: Jobs Board - Job Generator Tile. Template Route Tile The Template Route tile gives a quick overview of the route(s) that a product takes to be produced in terms of its sequence of operations. Double-click any of the operation steps in the Template Route grid to bring up an editor dialog to quickly modify any of the values. CTP Estimate Tile "CTP" stands for Capable to Promise. The CTP Estimate tile is meant to offer a quick way to analyze whether or not an ad-hoc customer order can be fulfilled on time based on the current schedule and when the customer needs it. A "Results" breakdown gives details about whether or not the order can be fulfilled on time. If the requested delivery date cannot be met, PlanetTogether will provide a realistic delivery date. Upon initiating the CTP Estimate dialog to simulate whether or note the added demand can be satisfied, a job may optionally be generated from the results so that it may be placed on the schedule. Select any grid row from the Routing Templates grid to populate the CTP Estimate tile with product information, then enter other required and optional information and settings before finally clicking Submit to perform the CTP simulation. CTP Options Naming the CTP CTP Name: This is an identifier for the CTP job to be created. This is particularly helpful if the option to reserve capacity & material until the option is used. Description: This is a description of the job to be simulated. Reservation Inventory Inquiry: This can be used to check the inventory levels for the particular product to be produced. Reserve Capacity and Materials until: This option allows the CTP to reserve capacity and materials until a user-defined date, allowing the customer to have some time to determine whether to go through with the order. By enabling the option, a job will be created in the data model and will be put on the schedule so that the materials and capacity are effectively reserved. If the PlanetTogether clock is advanced to a point in time after the defined date then the CTP job will automatically cancel and will be excluded from scheduling. Scheduling Type Optimize: This option will run an optimize after creating the CTP. Expedite to Clock: This option will expedite the job to the current clock to do the job ASAP. Expedite to JIT: Expedites the job to its JIT Start Date. Product Availability: This tab allows users to select the Required Quantity, Need Date, and Path ID (for use with Alternate Paths) to be reserved for the simulated job. Warehouse: This is the warehouse that CTP can draw materials from. Item: This is the item to be produced. Required Quantity: This is the required quantity of

items to be produced for the simulated job. Need Date: This is when the simulated job would need to be finished before it is considered late. Required Path ID: This is the path routing to be used for the simulated job. Every job will have one Alternate Path, but if there is more than one then the desired one can be selected from a dropdown. Once these elements are in place, the Capable To Promise can be saved by clicking Submit. Submitting the CTP will display the Scheduled Start and Finish Date and the result of the CTP (if the job is projected to be late, on time, early, etc.) Priority: The priority tab allows the user to control additional aspects of how the CTP might be scheduled by allowing users to define: Revenue: This is the revenue that the CTP would generate should the job go through. This value can be used in the optimize rules if higher revenue values are given more weight. Throughput: This number can be used in optimize rules where higher throughput values are scheduled earlier. Priority: This number can be used in optimize rules where lower numbers have a higher scheduling priority. Hot: This will flag the CTP as a Hot Job and take effect if there are optimized rules to prioritize hot flags. Hot Reason: This is the reason that the CTP is defined as Hot. Notes: Include additional notes, if desired. Warehouses: This tab allows users to define which warehouses CTP can draw materials from, as well as choose a Can Span Plants value (true/false). This tab lists all available warehouses, their Name, Description, and whether it is eligible to supply the CTP. The drop-down menu has the following options: Individual materials must come from the same Warehouse: All materials supplying the CTP must come from the same warehouse if this option is chosen. Individual materials can come from multiple Warehouses: In this option, the materials requirements of the CTP can be supplied from multiple warehouses is required. New Job CanSpanPlants Value: Opt to use the value of this property from the template or to set it manually in the CTP dialog. Bottleneck Constraints: When the CTP is submitted, constraints that may make the operations late will appear here. Thus, schedulers can quickly see the details of the operation and the number of late days. In addition, listing the bottleneck constraints in this tab allows schedulers to easily identify the bottleneck operations causing the job to be late and see whether the schedule can be changed to produce the item(s) on time. Items with Stock Material Constraints When creating a CTP for item(s) with stock material constraints for products that are manufactured in the plant, the CTP job will be created to produce all of the required supplemental manufactured item(s) if the following prerequisites are met: The item(s) must be set to be "Manufactured" (Inventory Plan -> Source). There must be an associated template in the scenario that can be used to produce the item(s). Successfully satisfying the prerequisite criteria results in one job being generated with multiple manufacturing orders, where each order produces the required manufactured item that needs produced in order to satisfy the entire demand of the CTP request (the "Item" that is submitted for CTP analysis, plus any required Stock Material items which can be manufactured). Failing to meet the required prerequisite criteria may result in the job scheduling past the planning horizon if the required materials are not available. Note: CTP will not generate Purchase Orders to satisfy demand for purchased stock material requirements. Routing Template Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more routing template. Select one or more rows from the Routing Templates grid, then choose properties and values that should be applied to each selected templates. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles See Also Job Structure MPS/MRP (Material Resource Planning) Job Details Dialog User Defined Fields (UDFs) Job Mappings Manufacturing Order Mappings Alternate Path & Node Mappings Resource Operation Mappings Resource Requirement Mappings Required Capability Mappings Material Mappings Product Mappings Operation Attribute Mappings

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## Sales Orders Board

### Source

Key Concept Sales orders are generally customer orders for finished products. They are used to track demand in the Inventory Plan (as they consume inventory) and are often used in conjunction with the MRP function. Use the Sales Orders board to maintain customer orders and make manual adjustments as needed. Jump to section: Sales Orders Grid Sales Order Actions Tile Sales Order Details Tile Sales Order Bulk Edit Tile Sales Orders Grid The Sales Orders grid offers details of each Sales Order in the data model, including their required available/delivery date, the item and quantity being purchased, customer, and revenue data such as price per unit and total sale amount. Right-click any grid row to bring up a menu of Actions that can be performed on the selected order. Select grid rows from the Sales Orders grid when interacting with the other tiles in the board. Use Grid Edit Mode to modify any details of a Sales Order directly in the grid. See Also: Layouts, Metrics, and Targets Grid Personalization Predictive KPI Tiles Object Bulk Edit Tiles Grid Edit Mode Sales Order Actions Tile Use the Sales Order Actions tile to perform quick actions on one or more selected sales orders from the Sales Orders grid. Management New SO: Create a new Sales Order from scratch. Delete: Delete the selected Sales Order(s). Close: Close the selected Sales Order(s). Closing an order effectively prevents it from acting as a demand signal and consuming inventory. Select All: Select all grid rows. Alternatively, use the Ctrl+A keyboard shortcut. Scheduling Ship: Mark the order as shipped (completed). In order to be able to Ship the order there must be enough inventory on hand to fulfill the order. Ship with Adjustment: Ship an adjusted amount of the order to effectively mark it as partially or wholly complete. In order to be able to Ship any amount of the order there must be enough inventory on hand to fulfill the shipped amount. Sales Order Details Tile Use the Sales Order Details tile to manually create new Sales Orders. Manually enter each of the required fields into each of the nested grids, then click Save to save the new order, or Delete to discard all changes. Required fields: Name LineNumber ItemExternalId QtyOrdered RequiredAvailableDate Required for MRP: MustSupplyFromWarehouseExternalId UseMustSupplyFromWarehouseExternalId Sales Order Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more sales orders. Select one or more rows from the Sales Orders grid, then choose properties and values that should be applied to each selected order. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles See Also MPS/MRP Planning

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## Scenario Data Board

### Source

Key Concept The Scenario Data Board allows users to manage all data objects and complex rules and constraints in the data model which are not related to customers, jobs, and orders. Jump to section: Capacity Intervals Tile Capacity Intervals (Recurring) Tile Attributes Tile Insights Tile Allowed Helpers Tile Capabilities Tile Departments Tile Plants Tile Cells Tile Inventory Management Tile Product Rules Tile Resource Connectors Tile Data Tables Tile Generalize Data Tile Clear Scenario Data Tile Capacity Intervals Tile Resource capacity is defined by the intervals of time in which resources are available to work on jobs and how much work can be scheduled during each interval. These parameters are defined in Capacity Intervals and Recurring Capacity Intervals which are then assigned to resources. Thus, a resource's capacity is determined by a combination of its Resource Properties and its assigned Capacity Intervals. Capacity Intervals in PlanetTogether can be configured to represent "Online" or "Offline" spans of time on a resource with special considerations for "Overtime", "Potential Overtime", and "Cleanout" designations. Use the Capacity Intervals tile to manage non-recurring capacity interval data in the scenario, or to assign non-recurring intervals to one or more resources. Select grid rows from the Capacity Intervals grid when interacting with the toolbar buttons to perform the toolbar actions on the selected grid row(s). New: Create a new interval with default values Open: Open the Capacity Interval editor dialog to edit properties of the selected interval. This dialog can also be accessed by double-clicking any grid row. Copy: Create a new interval as a copy of the selected interval. Delete: Delete the selected interval(s). Clear: Clear all non-recurring capacity interval data in the scenario. Assigned Resources: View or adjust the assigned resources of the selected interval via the Assigned Resources dialog. Export: Export the Capacity Intervals grid to the desired available

format (XLSX, PDF, HTML, or CSV). See also: Capacity Interval Mappings Capacity Interval Resource Mappings Capacity Interval Editor Dialog Use the Capacity Interval editor dialog to edit a capacity interval configuration. Name: A user friendly name for the interval. Description: A text description of the interval. For informational purposes. Interval Presets: Choose between preset capacity interval configuration templates to quickly assign standard settings to common capacity interval types. Once a preset is used, each option and setting may be manually changed, if desired. Cleanout: An Online interval which only allows for scheduling Cleans. The following settings are set: Color: Royal blue Status: Online Overtime: Disabled Can Start Activity: Disabled Prevent Operations from Spanning: Disabled Reset Attributes Changeovers: Disabled Use only when Late: Disabled Used for Setup: Disabled Used for Run: Disabled Used for Post Processing: Disabled Used for Storage Post Processing: Disabled Used for Clean: Enabled Online: A typical Online interval with standard options and constraints. The following settings are set: Color: Green Status: Online Overtime: Disabled Can Start Activity: Enabled Prevent Operations from Spanning: Disabled Reset Attributes Changeovers: Disabled Use only when Late: Disabled Used for Setup: Enabled Used for Run: Enabled Used for Post Processing: Enabled Used for Storage Post Processing: Enabled Used for Clean: Enabled Overtime: The standard Online interval with standard options and constraints plus the Overtime setting enabled. Overtime impacts the costs associated with running activities on the interval according to resource hourly cost settings. The following settings are set: Color: Dark red Status: Online Overtime: Enabled Can Start Activity: Enabled Prevent Operations from Spanning: Disabled Reset Attributes Changeovers: Disabled Use only when Late: Disabled Used for Setup: Enabled Used for Run: Enabled Used for Post Processing: Enabled Used for Storage Post Processing: Enabled Used for Clean: Enabled Potential Overtime: An Overtime interval which is only utilized to schedule Late activities. The following settings are set: Color: Light red Status: Online Overtime: Enabled Can Start Activity: Enabled Prevent Operations from Spanning: Disabled Reset Attributes Changeovers: Disabled Use only when Late: Enabled Used for Setup: Enabled Used for Run: Enabled Used for Post Processing: Enabled Used for Storage Post Processing: Enabled Used for Clean: Enabled Maintenance: An Offline interval which disallows operations from spanning across it and resets sequence-dependent Setup and Cleans calculations. The following settings are set: Color: Orange Status: Offline Overtime: Disabled Can Start Activity: Disabled Prevent Operations from Spanning: Enabled Reset Attributes Changeovers: Enabled Use only when Late: Disabled Used for Setup: Disabled Used for Run: Disabled Used for Post Processing: Disabled Used for Storage Post Processing: Disabled Used for Clean: Enabled Holiday: An offline interval which disallows operations from spanning across it. The following settings are set: Color: Yellow-orange Status: Offline Overtime: Disabled Can Start Activity: Disabled Prevent Operations from Spanning: Enabled Reset Attributes Changeovers: Disabled Use only when Late: Disabled Used for Setup: Disabled Used for Run: Disabled Used for Post Processing: Disabled Used for Storage Post Processing: Disabled Used for Clean: Disabled Offline: An Offline interval where work cannot be performed by operations which are allowed to span offline intervals may span across it as needed. The following settings are set: Color: Gray Status: Offline Overtime: Disabled Can Start Activity: Disabled Prevent Operations from Spanning: Disabled Reset Attributes Changeovers: Disabled Use only when Late: Disabled Used for Setup: Disabled Used for Run: Disabled Used for Post Processing: Disabled Used for Storage Post Processing: Disabled Used for Clean: Disabled Capacity: Interval Status: Select from one of the interval types to determine whether or not work can be performed during the interval. Online: The resource is available to perform work. Offline: The resource is not available to perform work. If an Offline interval is placed on top of an Online interval then the Offline interval "wins" and the resource is considered unavailable. Interval Settings: Color: Choose any color to assign to the interval. The color can help to distinguish between different interval statuses and configurations when viewed from the Gantt. Can be dragged/resized: When enabled, the capacity interval is allowed to be dragged and resized in the Gantt by users who have permission to maintain capacity intervals, and who have the similar user settings enabled. When disabled, the capacity interval cannot be dragged and resized in the Gantt by any user. Can be deleted: When enabled, the capacity interval is allowed to be deleted by users who have permission to maintain capacity intervals. When disabled, the capacity interval cannot be deleted by any user. Timing: Define the start and end times of the interval. Start: The date and time that the interval should start. End: The date and time that the interval should end. Duration: A calculation of the length of time between the defined Start and End times to determine the duration of each occurrence of the interval. Capacity: Adjust the amount of capacity hours based on the timing duration and number of people assigned to the interval. Number of People: Define the number of people available during the Online and Overtime interval. Typically used on labor pool resources where two or more operators may be required to complete an activity, or where multiple activities can schedule at the same time when the work is divided among each person. Capacity Hours: A calculation of hours between the defined Start and End times multiplied by the Number of People available to determine the total number of capacity hours

per each occurrence of the interval. Capacity Code: A Capacity Code can be set on intervals which should only be used for particular orders or operations. An Operation's Resource Requirement Capacity Code field can be defined so that if it matches the Capacity Code set on the interval then it will be eligible to schedule there. Operations which do not have a Capacity Code defined on the resource requirement, or which have a code which does not match the interval code value will not be allowed to schedule on the interval. Options and Constraints: Overtime: When enabled, the resource is available to perform work. Cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. When disabled, cost calculations for performing work on the interval use the Standard Hourly Cost on the resource. Can Start Activity: When enabled, the interval can be used to start the first process of an activity (either Setup, if applicable, or Cycle). Prevent Operations from Spanning: When enabled, the resource is not available to perform work, and no idle work is allowed to pause to span across this interval. This is typically a good option for resource maintenance or cleaning where schedulers don't want to start progress on an operation or activity, then pause for its offline maintenance, then pick back up the activity after the offline interval. Reset Attributes Changeovers: When enabled, calculations which dictate sequence-dependent setups and cleans will be reset to 0. Use Only when Late: When enabled, activities will only schedule on the capacity interval if they are late (the schedule clock date time is later than the activity's JIT start date). Used for Setup: When enabled, the capacity interval can be used to perform Setup processes. Used for Run: When enabled, the capacity interval can be used to perform Cycle processes. Used for Post Processing: When enabled, the capacity interval can be used to perform Post-Processing processes. Used for Storage: When enabled, the capacity interval can be used to perform Storage Post-Processing processes. Used for Clean: When enabled, the capacity interval can be used to perform Clean processes. Recurrence: Recurrence Pattern: None: The interval occurs only once and never repeats. Daily: The interval repeats daily with an option to skip a number of days between each interval. Weekly: The interval repeats weekly on the defined days of the week with an option to begin the weekly recurrences after skipping a specified number of weeks from the Start date. Monthly: The interval repeats on the same day of the month each month with an option to begin the monthly recurrences after skipping a specified number of months from the Start date. Yearly: The interval repeats on the same day of the year each year. Recurrence End: End of Planning Horizon: The interval recurs indefinitely according to the defined Recurrence Pattern frequency. End After [ ] Occurrences: The interval ends after a specified number of occurrences according to the defined Recurrence Pattern frequency. End By: The interval recurs according to the defined Recurrence Pattern frequency until the specified date and time. Short Term Capacity: Temporarily change the number of people in a recurring capacity interval. Specify the adjusted number of people and how many intervals this change should be applied to, starting with the first occurrence of the interval on the schedule. Number of People Override: Specify the number of people who will be available for the short term span. Number of Intervals to Override: Specify the number of intervals that the Number of People Override should be applied to, starting with the first occurrence of the interval on the schedule. Notes: Additional text notes related to the interval. For informational purposes. Assigned Resources Dialog Use the Assigned Resources dialog to view or modify the resource assignments of recurring or non-recurring capacity intervals. From the Scenario Data board tiles, double-click any non-recurring or recurring capacity interval, or click once to select an interval from its grid and click the Assigned Resources button to display the dialog. Alternatively, access the dialog from the Gantt board by right-clicking any capacity interval and selecting the Assigned Resources option. From the dialog, there are quick buttons at the top to Select All to assign the interval to all resources that are visible in the grid below, or Deselect All to unassign the interval from all visible resources. Each of the visible grid columns may be filtered in the event that a user wants to apply one or more filters so that they may use the Select All or Deselect All buttons to quickly assign or unassign the interval to/from many resources at once which match the filtered criteria (all resources in a specified Department, for example). Be sure to Save and Close changes before exiting the dialog. Capacity Intervals (Recurring) Tile Resource capacity is defined by the intervals of time in which resources are available to work on jobs and how much work can be scheduled during each interval. These parameters are defined in Capacity Intervals and Recurring Capacity Intervals which are then assigned to resources. Thus, a resource's capacity is determined by a combination of its Resource Properties and its assigned Capacity Intervals. Capacity Intervals in PlanetTogether can be configured to represent "Online" or "Offline" spans of time on a resource with special considerations for "Overtime", "Potential Overtime", and "Cleanout" designations. Use the Capacity Intervals (Recurring) tile to manage recurring capacity interval data in the scenario, or to assign recurring intervals to one or more resources. Select grid rows from the Capacity Intervals (Recurring) grid when interacting with the toolbar buttons to perform the toolbar actions on the selected grid row(s). New: Create a new interval with default values Open: Open the Capacity Interval editor dialog to edit the properties of the selected interval. This dialog can also

be accessed by double-clicking any grid row. Copy: Create a new interval as a copy of the selected interval. Delete: Delete the selected interval(s). Clear: Clear all recurring capacity interval data in the scenario. Assigned Resources: View or adjust the assigned resources of the selected interval via the Assigned Resources dialog. Export: Export the Capacity Intervals grid to the desired available format (XLSX, PDF, HTML, or CSV). See also: Recurring Capacity Interval Mappings Capacity Interval Resource Mappings Attributes Tile Attributes are custom properties that can be assigned any string or integer value and assigned to various objects. These are meant to be used to track various data that PlanetTogether doesn't already have a standard property for. They can also be used to configure and determine operation setup or clean processes. At this time, attributes can only be assigned to job operations, but in the future attributes may be expanded to support other functionality on other data objects. Attributes are similar to User Defined Fields, though they have added native functionality like operation Setup and Clean process calculations, and can be used by various optimize factors to create custom operation sequencing optimization. The Attributes tile allows users to view settings associated with existing attributes, or to manually configure or reconfigure them. The grid is directly editable in this tile for ease of use. New: Create a new attribute. Save: Save edits made to attribute settings via grid edit mode. Copy: Copy the selected attribute grid row to create a new one. Delete: Delete the attribute(s) selected in the grid. Clear: Clear all attributes data Grid Edit Mode: Grid Edit mode is always enabled in this grid. Use the grid to edit any of the configurable properties of the attributes. See also: Attributes Cleans Setup Time Attribute Mappings Operation Attribute Mappings Insights Tile The Insights tile provides insights on how scenario data could impact scheduling. The types of insights users might observe: Job Lateness Insights: Provides insights into late jobs, detailing when they are needed and when they are scheduled to finish. Job Hold Insights: Provides insights into why and how long a Job is on hold for. Operation Material Insights: Provides insights on an operation's material requirements by detailing, which of its material requirements are not Planned and ones with tight supplies. Operation Latest Constraint Insights: Provides insights on what the latest constraint of an operation and it's date is. Production Quantity Insights: A large number of transfers to inventory required per producing operation (based on number of cycles and the item's transfer quantity); alerts if there need to be more than 100 transfers Material Quantity Insights: A large number of overlapping cycles of a consuming operation whose material requirement allows for production overlap by production cycle; alerts if there are more than 100 cycles that may overlap based on the item's transfer quantity and the operation's number of cycles Activity Scheduled Setup Insights: Provides insights on the total duration of an activity's scheduled setup Operation Hold Insights: Provides insights into why and how long an operation is on hold for. Manufacturing Order Hold Insights: Provides insights into why and how long a Manufacturing Order is on hold for. Allowed Helpers Tile The Allowed Helpers feature allows users to restrict which helper resources are considered eligible to help a specific primary resource in the event that an operation requires two or more resources to run simultaneously to complete the task. This restriction is enforced as a scheduling constraint only when using the Optimize function. A scheduler may still manually move the helper portion of the operation to another capable resource even if the other capable resource is not listed as an allowed helper of the resource where the primary resource requirement is scheduled. Use the Allowed Helpers tile to view or manage Allowed Helpers data in the scenario. "+" New: Create a new Allowed Helper resource association by clicking the "+" plus sign in the tile control pane in the bottom left corner . A new Primary Resource row will appear in the grid. First, select a primary resource from the dropdown selection Next, click the icon next to the primary resource selection Now choose an eligible Helper Resource from the dropdown selection To add more eligible helpers, click the "+" plus icon in hte tile control pane in the bottom left corner with the mouse focussed inside of the Helper Resource grid within the selected Primary Resource. Save: Click to save pending changes to the allowed helper resource associations. Delete: Select an Allowed Helper or Primary resource row from the grid, then click Delete to remove the entry. Note that the deletion is not saved until the user clicks the Save button. Note: The keyboard delete key has the same effect on the selected row(s). Reload: Click to reload the Allowed Helpers grid to the last saved configuration. See also: Allowed Helper Resource Mappings Resource Requirement Mappings Required Capability Mappings Import Mappings Board Capabilities Tile A capability is defined by the type of work or skill that a resource can do. Each resource can have multiple capabilities, and each capability can be linked to multiple resources. Each resource requirement of an operation indicates the required capability(ies) that a resource must have to be considered eligible to perform the operation. If two or more capabilities are required of a single resource requirement o

## Sequence Planning Board

### Source

**Key Concept** The Sequence Planning board is a place to score various optimize factors to help influence the order in which jobs and operations are scheduled, and which resources are used for each task by PlanetTogether's schedule optimization logic. An ideal sequencing plan results in a streamlined production process, minimizes waste, and reduces errors and the need for rework. Multiple plans can be created and used for experimentation to see what works best, or for resource-specific optimization preferences. □ Tip: Before creating any sequencing plans, it's best to read up on PlanetTogether's Optimization logic and to understand how it generates Optimization Scores to help to make informed decisions when choosing which factors to give weight to based on what matters most to your data model and organization. Jump to section: Optimize Factors Grid Scoring Global Minimum Score Optimize Factors: Descriptions & +/- Impact Sequence Planning Actions Tile Optimize Factors Details Tile Optimize Factors Category Scaling Tile Optimize Factor Analysis Tile Sequencing Plan Mapping Tile Optimize Factors Grid The Optimize Factors grid displays the settings and scores that are configured for the currently loaded plan and provides details of all factors that can be configured. Users may quickly switch to view different plans in the scenario from a dropdown menu, similar to loading different layouts on other board grids. There is also the ability to store and switch between grid layouts, and export the grid into various formats. Users may create as many plans as makes sense for their organization. Each resource in the data model may be assigned up to five plans - one deemed the "Normal" plan and four others deemed "Experimental" plans. Use the Sequencing Plan Mappings Tile to map plans to resources, then choose whether to use the Normal or one of the Experimental plans during optimization in the Schedule dropdown from the main toolbar. Double-click any of the Factor grid rows to open the Optimize Factor Details tile in order to give pointed weight to any factor. Use the Sequence Planning Actions tile to create New plans, Copy existing plans, Rename the currently selected plan, Delete the currently selected plan (it must not be mapped to any resource's Normal or Experimental plans), Import a plan from a saved export file, Export a plan to an external file, or to Set a Global Minimum Score. Grid Properties Score Impact The impact of any factor may be designated as positive ("+") or negative ("-"). When positive, the points determined by the Calculation logic will be added to the optimize score at the time of scoring. When negative, the points will be deducted from the optimize score. Points This value reflects the number of points assigned to the optimize factor. Effective Points This value reflects the Points value adjusted up or down (or not at all) by the Optimize Factors Category Scaling logic. Category A general category assigned to each optimize factor for quick sorting and organization. Constant If True (checked) then the calculated score will not vary from one operation to the next for this optimize factor. Constant factors require less compute so Optimize may run more efficiently (faster). If False (unchecked) then the calculated score may have different factors to consider at different points in time during scheduling, so Optimize may slow down as a result of the system needing to perform more calculations. Description A description of the Optimize Factor. Calculation Insights into how the Optimize Factor will impact the Optimize Score. See Also: Grid Personalization Scoring The points and scoring system is fairly arbitrary in that users get to define the minimum and maximum values. They could choose to adhere to a -100 to +100 scale, or -1,000,000 to +1,000,000 scale according to their personal preference. Assign point values to any number of the available factors and toggle whether the point value should have a positive or negative impact on optimize scores using the Optimize Factor Details tile. By default, each factor's individual point impact on optimize scores is proportional to the total number of points issued to all factors. For example, if the sum of all Points of all factors is 100 and one of the factors has a score of 25 then that factor's impact on the optimization scores is weighted at 25%. This default factor may be adjusted using the category sliders in the Optimize Factors Category Scaling tile if users would prefer factors of certain categories to be given more or less weight. Even more granularity is offered in the Optimize Factor Details tile which allows a Lock Score toggle switch to be enabled if there are certain factors whose impact should not be altered by the category scaling sliders. When assigning points to any factor, be sure to read and understand its Calculation since the information will help to understand whether or not the score impact should be set to positive or negative. The Calculation is visible in the Optimize Factors Grid as well as in the Optimize Factors Details tile where points are given when hovering over the calculator icon. It provides details about the mathematical logic used by the factor as it's used to calculate the optimization score. Global Minimum Score Choose to set a Global Minimum Score in order to prevent scheduling an operation if its total calculated score does not meet or exceed a minimum value. This feature can be used to leave gaps in resource capacity if operations are released to schedule and eligible at an available point in time but it might be considered more desirable to wait and schedule it later, either closer to its JIT start date or on another resource when it becomes

available. The minimum score set will be highly variable. By default, it is a very large negative number, essentially meaning there are no constraints on the score and where the activity schedules. When setting this factor, keep in mind depending on the factors being used, it may make sense to use a negative number for this value. Note that each individual optimize factor may also be assigned a Minimum Score from the Optimize Factor Details tile, but that option is specific to the factor rather than the global setting which considers the total score of all factors. □

Tips: If it seems that the operations are scheduling later than believed they should, try reducing the global min or possibly making it a negative number. Exposing the Optimize Score and Score Details on the Activities Board will help find the right score. If a job is expected to schedule sooner, and the optimize score shows as .80, try making the minimum -10 and see how much sooner it moves. Finding the right number will take some trial and error. Keep in mind, the minimum may be different per resource and/or sequencing plan. Optimize Factors: Descriptions & +/- Impact This table lists all standard available factors and their descriptions and an assessment of what the impact would be of applying positive versus negative points on the optimization score. Factor Description [+] vs. [-]

Impact Alternate Path Preference Give weight to preferred paths [+]: Alternate Paths with a high Preference property value will be given higher optimize scores. [-]: Alternate Paths with a low Preference property value will be given higher optimize scores. Attribute Number Prioritize based on attribute number value. Calculation:

[Attribute.Number] \* [Effective Points] [+]: The higher the attribute Number values, the higher the optimize score.

[-]: The higher the attribute Number values, the lower the optimize score. Attribute Number Sawtooth Alternates ascending and descending attribute setup numbers for all specified attributes. [+]: Optimize score increases when the Attribute Number value of the specified attribute is different from the previously scheduled operation's Attribute Number and is in the opposite direction (higher vs lower) of the previously scheduled trend in attribute numbers. Recommended. [-]: Optimize score decreases when the Attribute Number value of the specified attribute is different from the previously scheduled operation's Attribute Number and is in the opposite direction (higher vs lower) of the previously scheduled trend in attribute numbers. Clean Cost Calculates a score based on the sequence-dependent clean cost of scheduling the activity. [+]: Optimize score increases as the Clean cost increases. [-]: Optimize score decreases as the Clean cost increases. Recommended. Clean Duration Calculates a score based on the sequence-dependent clean duration of the activity. [+]: Optimize score increases as the Clean duration increases. [-]: Optimize score decreases as the Clean duration increases. Recommended. Close to Exceeding Max Delay Scores operations according to how close they are from reaching or violating their predecessor's assigned Max Delay Hours. [+]: Optimize score increases the closer the operation gets to reaching the Max Delay Hours. Recommended. [-]: Optimize score decreases as the operation gets closer to violating Max Delay. Closest Fit Quantity Prioritizes operations based on how closely their quantity fits within the range defined by the resource's minimum and maximum quantity. [+]: Optimize score increases the closer the activity's remaining quantity is to the max quantity of the resource without exceeding the max quantity. [+]: Optimize score decreases the closer the activity's remaining quantity is to the max quantity of the resource without exceeding the max quantity. Closest Fit Volume Prioritizes operations based on how closely their quantity fits within the range defined by the resource's minimum and maximum volume. [+]: Optimize score increases the closer the activity's remaining quantity is to the max volume of the resource without exceeding the max volume. [+]: Optimize score decreases the closer the activity's remaining quantity is to the max volume of the resource without exceeding the max volume . CTP Job Priority based on whether the job is an estimate for CTP [+]: If the job was created by CTP and its Commitment level is still Estimate then the optimize score increases. [-]: If the job was created by CTP and its Commitment level is still Estimate then the optimize score decreases. Customer Priority Prioritize based on Job's highest customer priority, if the job has at least one customer. A lower priority number indicates a higher priority. [+]: Optimize score will increase based on the value of the lowest numbered Priority property (representative of the highest priority customer) of all customers associated with the job. Recommended. [-]: Optimize score will decrease based on the value of the lowest numbered Priority property (representative of the highest priority customer) of all customers associated with the job. Eligible Plants Prioritize based on the number of eligible plants. Negative Effective Points can penalize operations that could schedule in other plants [+]: Optimize score increases if the operation is eligible to schedule in more than 1 plant. [-]: Optimize score decreases if the operation is eligible to schedule in more than 1 plant. Higher Cleanout Grade Prioritize operations where the cleanout grade is higher. [+]: Optimize score increases for higher Cleanout Grade values. Recommended. [-]: Optimize score decreases for higher Cleanout Grade values. Hot Additional EffectivePoints for Hot jobs [+]: Optimize score increases if the job is flagged as a Hot job. Recommended. [-]: Optimize score decreases if the job is flagged as a Hot job. Inventory Carrying Cost Prioritize operations based on their number of eligible resources. Effective Points per 100 units of carrying cost [+]: Optimize score increases as the cost of carrying inventory

increases based on the operation's Carrying Cost property value. [-]: Optimize score decreases as the cost of carrying inventory increases based on the operation's Carrying Cost property value. Recommended. Job Commitment Give weight based on Job Commitment [+] Optimize score increases if the job's Commitment matches that of the configured multiplier score. [-]: Optimize score decreases if the job's Commitment matches that of the configured multiplier score. Job Entry Date Prioritize jobs based on entry date [+] Optimize score increases with each passing day after it was entered into the data model. [-]: Optimize score decreases with each passing day after it was entered into the data model. Job First Shortage Date Prioritizes jobs based on their First Shortage Date's distance away from the Scheduled Date [+] Optimize score increases with each passing day after its First Shortage Date. [-]: Optimize score decreases with each passing day after its First Shortage Date. Job Need Date Prioritizes jobs based on their Need Date's distance away from the Clock Date. Priority increases for Need Dates earlier than the Clock Date and decreases for Need Dates after the clock date. [+] Optimize score increases with each passing day after the Job Need Date. Recommended. [-]: Optimize score decreases with each passing day after the Job Need Date. Job Priority A constant score based on the Job's priority [+] Optimize score increases the higher the value of the Priority property on the associated job. [-]: Optimize score decreases the higher the value of the Priority property on the associated job. Recommended to prioritize jobs with smaller/lower Priority property values where lower values indicates higher priority jobs. Job Throughput Prioritize based on the job's throughput calculation (the revenues generated by production minus all variable expenses incurred). [+] Optimize score increases as the job throughput calculation increases. Recommended. [-]: Optimize score decreases as the job throughput calculation increases. Largest Quantity Fit Prioritize operations based on whether their quantity is enough to fully fill the resource based on its Max Quantity. If the operation is allowed to auto-split based on Resource Quantity Capacity, then prioritize larger capacity resources. [+] Optimize score increases the closer the required quantity is to the resource's max quantity without exceeding it. Larger capacity resources are prioritized. Recommended. [-]: Optimize score decreases the closer the required quantity is to the resource's max quantity without exceeding it. Larger capacity resources are de-prioritized. Largest Volume Fit Prioritize operations based on whether their volume is enough to fully fill the resource based on its Max Volume. If the operation is allowed to auto-split based on Resource Volume Capacity, then prioritize larger capacity resources. [+] Optimize score increases the closer the required volume is to the resource's max volume without exceeding it. Larger capacity resources are prioritized. Recommended. [-]: Optimize score decreases the closer the required volume is to the resource's max volume without exceeding it. Larger capacity resources are de-prioritized. Least Eligible Resources Prioritize operations based on their number of eligible resources [+] Optimize score increases as the number of eligible resources increases. [-]: Optimize score decreases as the number of eligible resources increases. Least Waste Quantity Fit Prioritizes operations based on minimizing the gap between the activity's required quantity and the resource's available quantity, ensuring the best fit to reduce waste. [+] Optimize score increases the closer the required quantity is to the resource's max quantity without exceeding it. Recommended. [-]: Optimize score decreases the closer the required quantity is to the resource's max quantity without exceeding it. Least Waste Volume Fit Prioritizes operations based on minimizing the gap between the activity's required volume and the resource's available volume, ensuring the best fit to reduce waste. [+] Optimize score increases the closer the required volume is to the resource's max volumewithout exceeding it. Recommended. [-]: Optimize score decreases the closer the required volume is to the resource's max volume without exceeding it. Low Level Code Prioritize based on the job products position in the bill of materials. See also: MPS/MRP Optimize [+] Optimize score increases as the Low-Level Code (generated by MRP Optimize plan) increases. [-]: Optimize score decreases as the Low-Level Code (generated by MRP Optimize plan) increases. Lower Cleanout Grade Prioritize operations where the cleanout grade is lower. [+] Optimize score increases for lower Cleanout Grade values. Recommended. [-]: Optimize score decreases for lower Cleanout Grade values. MO In-Process Prioritize manufacturing orders based on whether any activity is started, setting up, running, or in post-processing. Finished activities are not In-Process [+] Optimize score increases if any activity's status indicates that it is currently in progress. Recommended. [-]: Optimize score decreases if any activity's status indicates that it is currently in progress. MO Is Scheduled Prioritize manufacturing orders with at least one activity currently scheduled. [+] Optimize score increases if any activity of the same MO is currently scheduled. Recommended. [-]: Optimize score decreases if any activity of the same MO is currently scheduled. MO Released Prioritize based on the days after the MO Release Date [+] Optimize score increases with each day after the MO Release Date. Recom

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## Storage Areas Board

### [Source](#)

**Key Concept** The Storage Areas Board offers detailed inventory-level information for every item stored in a storage area and material used throughout the production process. It provides users with a visual representation of supply and demands as inventory moves into and out of each storage area. Jump to section: Storage Areas Grid Storage Area Plot Report Storage Areas Grid The storage areas grid contains information about all storage areas and the warehouses they're associated with. Each row represents a different storage area. Select grid rows from the storage areas grid when interacting with the other tiles in the board to see data related to the selected grid row. See Also: Layouts, Metrics, and Targets Grid Personalization Grid Edit Mode Storage Area Plot Report The Storage Area Plot Report offers both a plot chart and a grid view of all inventory adjustments made within the selected storage area over the duration of the current schedule. Use the provided Item dropdown menu to filter the plotted chart values and the inventory details grid. Toggle on Show Adjustments After Planning Horizon to include adjustments in the chart and grid which are scheduled past the planning horizon. Select any item from the Storage Area grid to plot its adjustments over time in this plot report tile. Chart The chart displayed in the top half of the report displays inventory levels at various points in time. The chart will start at the beginning of the planning horizon with the current on-hand level and will end at the date and time of the last scheduled adjustment. Controls are offered to adjust the visible start and end date/time by dragging and dropping the circles with blue dots on either side of the condensed chart directly underneath the bar chart: Plotted Values The Plotted Values table displays information about inventory adjustments made at each plotted point. This may include combined quantities of two or more adjustments that get applied at the same time and therefore are both contributing to the inventory level at the plotted point on the chart. Inventory Details The Inventory Details table displays each specific inventory adjustment made at each point in time. It is the most detailed view of all adjustments from jobs, purchase orders, sales orders, forecasts, etc. over the course of the current schedule. Toolbar Options: Show Materials: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Show Materials button to open the Materials board with a temporary filter applied to show information about the selected scheduled adjustment. Open Job: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Open Job button to open the Job Details dialog of the job associated with the selected adjustment. Find Operation: Click to select any Job Product or Job Material row adjustment from the Inventory Details grid, then click the Find Operation button to open the Gantt board with a focus on the operation associated with the selected adjustment. Export: Export the grid in one of the optional formats (HTML, PDF, XLSX, or CSV). Grid "Level" Properties: Inventory level adjustments over time are tracked in two ways: Total Inventory Level and Available Inventory Level. If a job product uses Material Post Processing, then that job's product will display as two entries in the grid: once when the job is scheduled to finish (Reason label reflects "Job Product Stored"), then another after the material post processing duration has passed (Reason label reflects "Job Product Available"). This helps to align consumption with available inventory rather than stored inventory. Inventory Level: The total stored inventory level of the item in the storage area. Available Level: The total available inventory level of the item in the storage area. Storage Area Level: The total stored inventory level of all items in the storage area. Storage Area Available Level: The total available inventory level of all items in the storage area. Grid Properties: Field Name Description Available Level The amount of total inventory that is available to be consumed at the time of the adjustment. Change Qty The quantity difference of the inventory level introduced by the adjustment. Customer The name of the Customer associated with the Job or Sales Order associated with the adjustment. Date The date of the adjustment. Date and Time The date and specific time of the adjustment. Forecast The name of the Forecast associated with the adjustment. Inventory Level The total inventory level at the time of the adjustment. Item Name The Name of the Item associated with the adjustment. Job Id The ExternalId of the Job associated with the adjustment. Job Name The Name of the Job associated with the adjustment. Lot Code The Lot Code associated with the Job Product adjustment. MO Name The Name of the Manufacturing Order associated with the adjustment. Need Date The Need Date of the Job associated with the adjustment. Operation Id The ExternalId of the Job Operation associated with the adjustment. Operation Name The Name of the Job Operation associated with the adjustment. Priority The Priority of the Job associated with the adjustment. Product Group The Product Group of the Item associated with the adjustment. Product Name The Product Name of the primary product of the Manufacturing Order associated with the adjustment. Reason A description of the reason for the adjustment. Sales Order The Name of the Sales Order associated with the adjustment. Sales Order ExternalId The ExternalId of the Sales Order associated with the adjustment. Sales Order Line The Line Number of the Sales Order associated with

the adjustment. Storage Area The Name of the Storage Area that was impacted by the adjustment. Storage Area Available Level The combined amount of available inventory in the impacted Storage Area at the time of the adjustment. Storage Area Level The combined amount of all inventories/items in the impacted Storage Area at the time of the adjustment. Transfer Order The Name of the Transfer Order associated with the adjustment. See Also Items, Inventories, Warehouses, & Storage Areas Warehouse Mappings Plant Warehouse Mappings Storage Area Mappings Item Mappings Inventory Mappings Lots Mappings Item Storage Mappings Item Storage Lots Mappings Forecast Mappings Transfer Order Mappings

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## Boards > Grid Properties

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### Capacity Planning Board Grid Properties

#### Source

Plant Annual Percentage Rate: This rate is factored into various financial KPIs in the KPIs board. Attributes: Custom attributes assigned to the Plant. Used primarily for informational purposes, though these can be used in conjunction with software customizations/extensions. Bottleneck Threshold: Defines the threshold for the percentage of Capacity Bottlenecked Activities that can be scheduled before the Plant is flagged as a bottleneck. Daily Interest Rate: This rate is factored into various financial KPIs in the KPIs board. Daily Operating Expense: This rate is factored into various financial KPIs in the KPIs board. Description: A text description of the Plant. Used primarily for informational purposes. External Id: A unique identifier for the Plant. Heavy Load Threshold: Defines the threshold for the percentage of a Plant's capacity allowed to be allocated in the short term before it's flagged as being "Heavily Loaded". Invested Capital: An informational field to track the amount of money which has been spent to date on equipment, maintenance, loans, etc. Name: The Name given to the Plant. Operating Cost for Online Days: Used in various cost calculations and KPIs. Operating Days: The number of days within the planning horizon in which at least one resource is online according to all online or overtime capacity interval assignments. Notes: Additional text notes related to the Plant. Used primarily for informational purposes. Stable Span: A period of time designated for which schedule changes should rarely occur in order throughout the entire Plant. It serves as a visual guideline in the Gantt, and schedule Optimizations can be configured to start outside of this period to ensure any activities scheduled within this time period are not impacted by the Optimize function. This time span begins at the end of the defined Frozen Span. For more information, see: Plant Stability Stable Span End: The ending date and time of the Plant Stable Span. User Defined Fields: Custom user defined fields (UDFs) assigned to the Plant. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). Department Frozen Span: A period of time designated for which schedule changes should rarely occur on all Resources in the Department. It serves as a visual guideline in the Gantt, and schedule Optimizations can be configured to start outside of this period to ensure any activities scheduled within this time period are not impacted by the Optimize function. This time span begins at the start of the schedule. The Use Department Frozen Span option must be enabled for this value to override the Frozen Span setting that is configured at the scenario-wide level in the System Settings. For more information, see: Plant Stability Use Department Frozen Span: When enabled, the Frozen Span for the Resources in the Department will use the Department-specified Frozen Span setting rather than the scenario-wide Frozen Span defined in the System Settings. Description: A text description of the Department. Used primarily for informational purposes. Notes: Additional text notes related to the Department. Used primarily for informational purposes. Attributes: Custom attributes assigned to the Department. Used primarily for informational purposes, though these can be used in conjunction with software customizations/extensions. User Defined Fields: Custom user defined fields (UDFs) assigned to the Department. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). Resource Active: When enabled, the resource is considered eligible to schedule activities. When disabled, no activities can be scheduled on the resource. Activities Scheduled Count: The number of activities currently scheduled on the resource. Allow Drag and Drops: When enabled, activities scheduled on the resource can be adjusted from the Gantt via drag/drop scheduling. Assigned Capabilities: An

overview of the Capabilities currently assigned to the resource. Quickly add/remove capabilities by clicking the box in the "Assigned" column. Attribute Code Table Name: The name of the Attribute Code Table assigned to the resource, if any. Auto Join Span: Batch Type: Batch Scheduling can be done by percent or by volume. Percent: Activities are batched until 100% of the batch is filled. The percent occupied by each activity is calculated by dividing the activity's Required Finish Qty by its Qty Per Cycle. Volume: Activities are batched until the activities' Required Finish Quantities equals the resource's batch volume. Batch Volume: The maximum number of units included in a batch when using batch by volume. Batch Volume: The number of jobs that can be batched together on the resource. If an activity's Required Quantity is larger than this value, the job will fail to schedule. Bottleneck: Bottleneck Percent: Buffer: The length of time to act as a buffer between the operation scheduled on the Drum resource and its predecessor operation. Defines when the predecessor operation (or materials) must be available to supply the drum resource operation. For more information, see: Drum-Buffer-Rope Scheduling Can Offload: Can Work Overtime: Capacity Type: Specifies whether a resource has infinite or finite capacity. If finite then it also determines and whether the resource is single-tasking or multi-tasking. Infinite Capacity: The resource can perform any amount of work simultaneously. Single Tasking: The resource can only perform one activity at a time. Multi-Tasking: The resource can perform multiple activities at a time. The number of concurrent activities that can be scheduled is determined by either the Operation's resource requirement Attention Percent where multiple activities could schedule simultaneously as long as the total Attention Percent between them is equal to or less than 100%, or by the Activity's People Usage and Number of People required to perform the Activity and the number of people available on the Capacity Interval where the operations schedule. For more information, see: Multi-Tasking Resources Cellular Scheduling: Compatibility Group: Consecutive Setup Times: Calculates Setup time on scheduled activities as the sum of all setup time incurred by the various ways to configure Setup. Current Setup Code: Current Setup Number: Cycle Efficiency: An efficiency multiplier which indicates whether the resource is capable of performing the Cycle phase of scheduled activities faster or slower than the defined Cycle time set on the Operation. Values greater than "1" represent a resource running slower by a factor of the specified amount, while values less than "1" represent a resource running faster by a factor of the specified amount. Department Id: Description: A text description of the Resource. Used primarily for informational purposes. Drum: When enabled, the resource is considered the Drum, setting the pace for the rest of the shop floor. The drum buffer can also be set from this window. Note: Drum-Buffer-Rope release rules must be in effect for these values to impact the optimization engine. For more information, see: Drum-Buffer-Rope Scheduling Exclude from Gantts: Excludes / hides the resource from all Gantt views (Resource Gantt, Job Watch Gantt, Connected Jobs Gantt, etc.). Experimental Sequencing Plan One: Experimental Sequencing Plan Two: Experimental Sequencing Plan Three: Experimental Sequencing Plan Four: External Id: Gannt Row Height Factor: Head Start: The amount of time that an activity can schedule on this resource before its Just-In-Time Start Date. Lower values will schedule the job closer to its JIT start date. Used in combination with the Release Rule to Use Optimize Setting "JIT With Resource Head Start". Id: Image: Specifies the image that represents the resource in various Gantt views. Image Name: Limit AutoJoin to Same Shift: Manual Scheduling Only: Max Cumulative Quantity: Max Quantity: The maximum amount of production that the resource can perform in a single activity. For the resource to be considered eligible for an activity to schedule, its required finish quantity must be less than or equal to this value. Max Quantity Per Cycle: The maximum amount of production per cycle that the resource can perform. For the resource to be considered eligible for an activity to schedule, its operation's quantity per cycle value must be less than or equal to this amount. Max Same-Setup Span: Maximum Volume: Minimum Number of People: Minimum Quantity: The minimum amount of production that the resource must produce in a single activity. For the resource to be considered eligible for an activity to schedule, its required finish quantity must be equal to or greater than this value. Minimum Quantity Per Cycle: The minimum amount of production per cycle that the resource must produce. For the resource to be considered eligible for an activity to schedule, its operation's quantity per cycle must be equal to or greater than this value. Name: Normal Sequencing Plan: Notes: Additional text notes related to the resource. Used primarily for informational purposes. Omit Setup on First Activity: Omit Setup on First Activity in Shift: Online Non-Overtime Costs: Overtime Hourly Cost: Defines the cost of running activities on the resource that schedule on Overtime capacity intervals. Plant Id: Resource Type: Generally used for reporting purposes and to categorize various costs like Machine vs Labor. Sequential: Setup: Define a setup duration to be applied to all activities scheduled on the resource. Note: This is not related to the "Setup Included" options. If a value is chosen here, it will be applied to all activities scheduled on the resource (even if the "Setup Included" is set to "Never"). The "Setup Included" options are related to operation changeovers. Setup Code Table Name: The name of the Setup Code Table assigned to the resource. Setup Efficiency: An efficiency multiplier which indicates whether the

resource is capable of performing the Setup phase of scheduled activities faster or slower than the defined Setup time set on the Operation. Values greater than "1" represent a resource running slower by a factor of the specified amount, while values less than "1" represent a resource running faster by a factor of the specified amount. Setup Included: Defines when activities scheduled on the resource will incur Setup time, as well as how the Setup duration will be calculated. Dropdown select options to define when to incur setup: When Product Changes: Setup is incurred when the manufacturing order's product of the scheduled activity is different from the MO product of the previously scheduled activity. When Setup Code Changes: Setup is incurred when the scheduled operation's Setup Code is different from the Setup Code of the previously scheduled operation. When Either Changes: Setup is incurred when either the MO product of the scheduled activity is different from the MO product of the previously scheduled activity, or when the scheduled operation's Setup Code is different from the Setup Code of the previously scheduled operation. Always: Setup is always incurred, with no exception. Never: Setup is never incurred. Note: This is related to operation changeovers. If a "Setup" duration is defined on the resource then setup will still be incurred. When Setup Number Changes: Setup is incurred when the scheduled operation's Setup Number is different from the Setup Number of the previously scheduled operation. When Setup Number Increases: Setup is incurred when the scheduled operation's Setup Number is greater than the Setup Number of the previously scheduled operation. When Setup Number Decreases: Setup is incurred when the scheduled operation's Setup Number is less than the Setup Number of the previously scheduled operation. Use Setup Code Tables: Setup is incurred based on the scheduled operation's Setup Code and how it might be impacted by applicable Setup Code Table logic. Use Operation Attributes: Setup is incurred based on the scheduled operation's Attribute logic. Boolean properties that define how Setup duration is calculated: Use Operation Setup Time: The amount of setup incurred is based on the Operation's configured Setup time. Consecutive Setup Times: The amount of setup incurred is the sum of all configured sources of Setup time (the Resource's Setup duration, the Operation's Setup time, Operation Attributes, and/or Setup Tables). Omit Setup on First Activity: If enabled, Setup is omitted on the first scheduled activity on the resource. Omit Setup on First Activity in Shift: If enabled, Setup is omitted on the first scheduled activity of each shift/capacity interval recurrence. Stage: Standard Hourly Cost: Defines the cost of running activities on the resource that schedule on normal Online capacity intervals. Tank: Transfer Span: Use Operation Setup Time: Work Center: Work Center External Id: Custom Properties Custom attributes and UDFs can be displayed in the Resources grid. Attributes: Custom attributes assigned to the Resource. Used primarily for informational purposes, though these can be used in conjunction with software customizations/extensions. For more information, see: Resource Attribute Mappings User Defined Fields: Custom user defined fields (UDFs) assigned to the Resource. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). See Also Capacity Planning Board Plant Mappings Department Mappings Resource Mappings

## Customers Board Grid Properties

[Source](#)

Customer Name Specify the name of the Customer or company. Description A text description of the Customer. Used primarily for informational purposes. External Id A unique identifier of the Customer. Used to associate the Customer with Job, Sales Order, Purchase Order, or Forecast objects. Type Define the customer type for informational purposes. Customer: These types purchase goods from the plant. Supplier: These types supply materials to the plant. Vendor: These types are typically resellers of goods produced in the plant. Color Code Define a color code for better tracking and visibility in grids throughout the software interface. ABC Code An informational field that can be used in various ways. Group Code An informational field that can be used in various ways. Priority Define a priority for the customer. This can optionally be factored into the system's optimize factors and sequencing plans to prioritize orders for certain customers. Typically, lower priority values are treated with more urgency/priority during scheduling. Region An informational field that can be used in various ways. Notes Additional text notes related to the Customer. Used primarily for informational purposes. Attributes Custom attributes assigned to the Customer. Used primarily for informational purposes. User Defined Fields Custom user defined fields (UDFs) assigned to the Customer. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). See Also Customers Board

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## Concepts > Analytics

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### Analytics with Power BI

[Source](#)

Key Concept Detailed production, scheduling, inventory, and sales reports via Power BI are made available to qualifying customers at <https://app.planettogether.com>. Explore the plethora of standard reports that PlanetTogether has designed and published, or create custom reports using Power BI Embedded technology directly from the web application. Each customer organization has the freedom to customize how the reports are presented to their team in the web application, from organization and categorization of each report, to user permissions to grant access per user to specific report categories. More information about each available report can be found here: Web App Reports. Availability Detailed scheduling reports with Power BI are available for all PlanetTogether customers with Pro licenses whose software instances are hosted in PlanetTogether's cloud environment. Access the Web Application Qualified customers may contact PlanetTogether support to gain access to the web application. See Also Web App Reports

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## Predictive KPI Tiles

### Source

Key Concept Many boards contain predictive KPI tiles which allow users to create and track data related to their preferred Key Performance Indicators over time. The data plotted in these KPI tiles will update in real time with changes made to the Board's primary grid and give insights into the KPI data over the course of the scheduled horizon. Each KPI Tile can be opened simultaneously to allow users to visualize multiple KPI charts at the same time. KPI Tile Visibility Find the predictive KPI tiles labeled as "Object KPI # N" in each respective Board's tile menu. The number of visible KPI tiles per board can be configured per user in their User Preferences. Each user may choose to hide KPI tiles or view as few as zero or as many as 10 per board. Predictive KPI tiles are offered on the following boards: Activities Capacity Planning Inventory Plan Jobs Materials Purchase Orders Sales Orders Chart Properties Choose one or two date properties to plot along with a KPI property. Duration Select the time bucket duration for each plotted data point, as well as the timeline or time window to plot. Show Only Selected Objects When disabled, the plotted data includes statistics for all rows from the Board grid. When enabled, only data for rows which the user has selected is plotted. Scenario Comparison Compare data for the predictive KPI across multiple scenarios if/when there are other scenarios in the instance which have Compare Scenario enabled in their settings.

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## Concepts > Constraints

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## Allowed Helpers

### [Source](#)

**Key Concept** The Allowed Helpers feature allows users to restrict which helper resources are considered eligible to help a specific primary resource in the event that an operation requires two or more resources to run simultaneously to complete the task. This restriction is enforced as a scheduling constraint only when using the Optimize function. A scheduler may still manually move the helper portion of the operation to another capable resource even if the other capable resource is not listed as an allowed helper of the resource where the primary resource requirement is scheduled. If no allowed helpers are defined, then any resource with the appropriate capabilities specified in the resource requirement of the operation can be used as the scheduled helper for the primary resource.

**Jump to section:** Configuring Allowed Helpers Scheduling Operations with Allowed Helpers Configuring Allowed Helpers Allowed Helpers logic may be imported from the connected data source via the Allowed Helper Resource Mappings, or manually configured in the Scenario Data Board's Allowed Helpers tile.

**Scheduling Operations with Allowed Helpers** The same scheduling and capacity restrictions as apply to scheduling any operation with Helper Resource requirements applies here as well, except when using Allowed Helpers the helper resource(s) chosen by the Optimize function must always be one of the specified eligible helpers. If the required capacity constraints cannot be satisfied on all required resources (the primary and all of its helpers) then the operation will schedule past the planning horizon. From the Gantt chart, if any scheduled helper activity is selected then some visual cues may help the scheduler select an eligible and capable resource to help should they choose to reschedule the activity manually. Note that they will also be able to drag it to schedule on a capable but ineligible resource according to Allowed Helper rules, so beware of the cues to help guide any schedule change decisions.

**Eligibility Visibility** In the Eligibility column of the Resource Grid, users may see the following after they've selected one or more Activities in the Gantt chart:

- Eligibility Indicators: A green arrow indicates that the Resource is eligible to schedule the selected Activities.
- A purple arrow indicates that the Resource is eligible per capability requirements, and is configured as an Allowed Helper based on where the primary requirement is scheduled.
- An orange arrow indicates that the Resource is eligible per capability requirements, but is not considered an Allowed Helper based on where the primary requirement is scheduled.
- A blue arrow indicates that the Resource is eligible as the defined Default Resource.
- A yellow circle indicates that the Resource is eligible to schedule the selected Activities on an Alternate Path.

**Visualizing Helper Resources in the Gantt:** If an operation uses one or more helper resources, clicking once on any scheduled activity block in the Gantt with the Show Activity Links option enabled will draw a blue activity link between the two scheduled activities.

**See Also** Helper Resources Capacity Planning Board Scenario Data Board Gantt Board Resource Mappings Allowed Helper Resource Mappings Resource Requirement Mappings Required Capabilities Mappings

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## Compatibility Codes

### [Source](#)

**Key Concept** Compatibility Code Tables define lists of Operation Compatibility Codes which are either allowed or disallowed to schedule concurrently within a group of resources. Resources may be assigned one or more Compatibility Code Tables, and each table may be assigned to any number of resources. All resources which are assigned a common table are considered to be part of a group. Resources that are part of the compatibility group of the table which is scheduled at any point in time will only be able to process operations concurrently if the operations are configured with a compatibility code that complies with the table logic, or if the operation is configured to not use a compatibility code. Allowed list tables contain the set of codes that can be scheduled concurrently. Disallowed list tables define a set of codes that cannot schedule together. Multiple allowed and/or not allowed list tables can be assigned to the same resource. If there is more than one Allowed list table assigned to a resource, the tables will be treated as incompatible with each other. Only codes within the same Allowed list table can schedule concurrently. Disallowed list table logic will override any Allowed list combinations. This may be helpful to model multiple food processing lines which are located in the same room, for example, requiring that the same product be processed at the same time on the independent lines. In order to prevent cross-

contamination, this solution can prevent allergen products and non-allergen products from being processed at the same time on different lines. This could also be helpful in cases where the same material input line feeds two machines. Compatibility codes could be used to ensure that the two machines can only run operations which use the same material concurrently at any point in time. Jump to section: Compatibility Code Table Management Job Operation Configuration Standard Configurations Advanced Configurations Setups and Cleans Considerations Sequence Optimization Considerations Compatibility Code Table Management Compatibility Code Tables are created manually in the client user interface, or imported from an ERP/SQL master data source. Each compatibility code table may define a compatible (allowed) code list, or an incompatible (disallowed) code list. An allowed list defines the complete set of codes that can be scheduled concurrently. A disallowed list defines a set of codes that can never schedule together. Data Import Compatibility Code Tables are imported via Compatibility Code Table Mappings logic. Manual Creation Compatibility Code Tables can be created or deleted manually from the Data Tables tile from the Scenario Data Board. The table type is CompatibilityCodeTable. Select a table and click the Open button, or double-click the grid row to open the editor dialog. Toggle on the Allow List option if the code table will be used to list codes which are allowed to schedule concurrently, otherwise toggle it off. Enter one CompatibilityCode grid row for each code that should be associated with the table. Navigate to the Resources using this table tab to select which resources should use the table. Be sure to Save changes when finished. Job Operation Configuration Job Operations must be configured with a Compatibility Code in order to restrict resources to only perform compatible work concurrently. If specified, any scheduled Operation's Compatibility Code must match one of the compatibility codes of other operations scheduled on resources with the compatibility group. Each operation must also have the Use Compatibility Code property set to True. Operations whose Use Compatibility Code property is set to False are allowed to schedule concurrently with other operations which use compatibility code logic. For importing these data, see: Resource Operation Mappings. Standard Configurations Standard configurations are those with two or more Allowed code lists assigned to each resource in a group where each list defines a separate list of codes which can schedule together but cannot schedule with other codes in other Allowed lists. Keep in mind that when an operation with a code from an Allowed list schedules, only operations with codes in the same allowed list are eligible to schedule concurrently on other resources in the group. This remains true even if the operation's code is not part of any Allowed or Disallowed list. Example In this simple example, compatibility codes NonKosher and NonAllergen are allowed to schedule together, while codes Kosher, Dairy, Soy, and Peanuts are not allowed to schedule with any other code. Table configuration: Allow List Compatibility Code List Assigned Resources TRUE NonKosher NonAllergen All resources TRUE Kosher All resources TRUE Dairy All resources TRUE Soy All resources TRUE Peanuts All resources All code tables are assigned to all resources in the plant. All resources are capable of running any of the operations. All operations are released to schedule at the start of the schedule clock. After optimization, we see the various compatibilities being enforced: Codes NonAllergen and NonKosher are scheduled concurrently, and each of the other unique codes schedule independently from one another even though capable resources have capacity to schedule more work. Sample Scenario File Download and load the Scenarios\_CompatibilityCodes\_12.2.0.25.dat and login as user "admin" (no password) and activate the SimpleCodes scenario. Advanced Configurations Multiple Allergen Groups If there are more than one Allowed lists assigned to a resource, the lists will be treated as incompatible with each other. Only codes within the same allowed list can schedule concurrently. Disallowed lists will override any Allowed list combinations. Consider this example where there are multiple allergen groups combined with an incompatible allergen code list. Allergen Group 1 table is an allowed list of allergens that can schedule together. Allergen Group 2 is an allowed list of allergens that can schedule together, but not with Allergen Group 1 allergens. Incompatible Allergens is a disallowed list. Allergen Group 1 Allergen Group 2 Incompatible Allergens A E A B F D C G G D H H Assume that each of the tables are assigned to resources 1, 2, and 3. If an operation with Compatibility Code A schedules first on a resource, then the other two resources can only schedule codes A, B, and C. Nothing from Allergen Group 2 is allowed to schedule concurrently, and code D is incompatible with A according to the Incompatible Allergens list. If an operation with Compatibility Code F schedules first on a resource, then all of Allergen Group 2 are allowed to schedule at the same time on the other resources since code F is not included in the Incompatible Allergens list. Alternatively, if either G or H schedule first on a resource, it will limit the allowed codes for the other two resources to codes E and F since both G and H are incompatible to schedule together according to the Incompatible Allergens list. Sample Scenario File Download and load the Scenarios\_CompatibilityCodes\_12.2.0.25.dat and login as user "admin" (no password) and activate the ComplexCodes scenario. Same Allergen Codes, Different Groups If resources that use the same allergen codes should be in separate groups, duplicate tables can be used. Multiple Tables, Overlapping Values Multiple Allowed

tables which are assigned to the same resources can have overlapping values. For example, Allergen Group 2 from the table above could also have code A. In this case, codes from either table can initially schedule. Once a shared code is scheduled, only codes shared between the tables will be allowed. When there are no more concurrent operations scheduled, the codes will reset, again allowing codes from either table. Visualizing Compatibility Codes Compatibility Codes of scheduled operations can be visualized in the Gantt or in the Activity Scheduling grids. Gantt The label text of any Gantt segment can display the Operation Compatibility Code value and/or the Resource Compatibility Group values (where groups are defined by the Compatibility Code Table names which are assigned to the resource). Optionally, the Compatibility Code can also be imported onto the operation as a custom Attribute and assigned a unique Color according to the Code value, then this combination of color-coded visibility can be displayed in the Attribute Segment from the Segments section of User Settings. Activity Scheduling Grids The activity scheduling grid tiles in the Activities board can be configured to show Resource Compatibility Group assignments as well as Operation Compatibility Codes of scheduled operations. Setups and Cleans Considerations It's often sensible to configure change-overs in the form of Setups or Cleans whenever there is a change in compatibility codes scheduled on a resource or resource group. For the most flexible and dynamic solutions, it's recommended to incorporate custom Operation Attributes into the operations which utilize compatibility code logic and configure the attributes to trigger

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## Item Compatibility

### Source

This functionality is deprecated in software versions 12.2.0.1 and newer. For more robust functionality related to compatibility code scheduling, see: Compatibility Codes Key Concept Item Compatibility Groups can be assigned to resources and designated on production operations in order to force all resources within the group to focus on producing a single product or group of products at a time. When set up correctly, resources that are part of the compatibility group will only be able to process operations simultaneously if the operations are configured with the same compatibility code. This may be helpful to model multiple food processing lines which are located in the same room, for example, requiring that the same product be processed simultaneously on the independent lines. In order to prevent cross-contamination, there may need to be a way to prevent allergen products and non-allergen products from being processed simultaneously on different lines. Another use case is if the same material input line feeds two machines, then they can only run operations that use the same material at any point in time. Jump to section: Configure Resource Groups Configure Job Operations Configure Resource Groups Resources must be grouped together by assigning them to a Compatibility Group. Resources which are part of the same compatibility group can only run operations concurrently if the operations have the same Compatibility Code specified in their job operation's settings. Each resource may only be assigned to a single Compatibility Group. For importing these data, see: Resource Mappings. Configure Job Operations Job Operations must be configured with a Compatibility Code in order to restrict resources to only perform compatible work simultaneously. If specified, any scheduled Operation's Compatibility Code must match the Compatibility Code of other Operations scheduled on resources with the Compatibility Group of the same name. Each operation must also have the Use Compatibility Code property set to TRUE. For importing these data, see: Resource Operation Mappings. Example Use the compatibility code "Allergen" on all operations of the process to produce food items that contain peanuts, then use the code "Non-Allergen" for all other food types. Set the "Allergen" Compatibility Group on the appropriate resources which are impacted by the contamination containment requirement. This way, no other food type could schedule at the same time as an item categorized as "Allergen." See Also Resource Mappings Resource Operation Mappings Job Details Dialog

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## Resource Connectors

### [Source](#)

Old Article Versions This article is updated to reflect the latest software functionality. For older software versions, download and refer to the appropriate document version: Software Versions Download Link 12.2.0 and 12.2.1 ResourceConnectors\_12.2.1.pdf Key Concept Resource connectors specify a flow relationship between two or more resources. A resource can have connections to one or more downstream resources which can enforce a constraint during scheduling to restrict which resource(s) successor operations of the same manufacturing order can be scheduled. A resource can be considered a From Resource or a To Resource in multiple connectors where the From Resource is the upstream resource where the work starts, and the To Resource is a downstream resource where the work is considered eligible to continue. It's possible to configure multiple connectors which define the same From/To resource connections in order to add multiple simultaneous material connections. This is practical when modeling a solution for single or some other finite number of pipe feeds from a tank resource, for example. Jump to section: Resource Connectors Management Scheduling Behavior Resource Connectors Management Resource Connectors are created manually in the client user interface, or imported from an ERP/SQL master data source. These are dependent on existing Resource objects in the data model. Data Import Resource Connectors are imported via Resource Connector Mappings logic. Manual Creation Resource Connectors can be created or deleted manually from the Resource Connectors tile in the Scenario Data Board. The grid in this tile is always editable, so users may use the grid to fine-tune the default connector settings. Be sure to Save any changes before closing the tile or running a simulation. See descriptions of each property in the Resource Connector Mappings page. Scheduling Behavior Successor links between resources act as a scheduling constraint during optimization whereby a successor operation of a manufacturing order may only be allowed to schedule on one of the defined To Resources when the predecessor is scheduled on the defined From Resource. This is not a hard constraint, however, as a scheduler may still drag and drop the successor operation to another capable resource if they wish. The Eligibility column in the Gantt grid will act as a warning that the move violates the resource connector logic. See Also Scenario Data Board Capacity Planning Board Resource Connector Mappings Resource Mappings Department Mappings Plant Mappings Storage Areas as Tanks Storage Area Connectors

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## Storage Area Connectors

### [Source](#)

Key Concept Storage Area Connectors act as constraints on when, how, and if inventory can be transferred between specific Resources and Storage Areas. Connectors can define storage area in-flow (storage) rules which determine whether a product produced on a resource can be stored in a particular storage area, and/or storage area out-flow (withdrawal) rules which determine which storage area can supply operation stock material requirements based on which resource the operation is scheduled on. Typically, these rules help shape how storage tanks and silos are used in a manufacturing facility and how PlanetTogether can use them during scheduling. A single Connector may define only in-flow rules or out-flow rules, or may specify both in-flow and out-flow for the resources and storage areas defined in the Connector. A single connector will only ever use one Resource at a time, but can use multiple Storage Areas simultaneously, depending on the flow limit configuration. A single Connector must specify at least one Storage Area and at least one Resource, but may specify many Storage Areas and/or many Resources. The relationship does not need to be 1-to-1; it may be 1-to-many or many-to-1 or 1-to-1. For example, one Connector might specify one Resource that can use many Storage Areas to store its products. For Resources that can use many different Storage Areas for either in-flow or out-flow, flow limits can be defined which determine how many simultaneous interactions can take place. For example, a Resource has the possibility of feeding into 6 separate Storage Areas, but only 3 of the 6 can be used simultaneously by the connector, the in-flow limit would be 3. Jump to section: Storage Area Connectors Management Connector Usage Timing Storage Flow Limits Use Cases & Examples Storage Area Connectors Management Storage Area Connectors are created manually in the client user interface, or imported from an ERP/SQL master data source. These are dependent on existing Resource and Storage Area objects in the data model. Data Import Storage Area

Connectors are imported via Storage Area Connector Mappings. Each Storage Area Connector must define one or more of the following in-flow and/or out-flow combinations: In-flow (storage): Storage Area Connector In Mappings and Resource Storage Area Connector In Mappings Out-flow (withdrawal): Storage Area Connector Out Mappings and Resource Storage Area Connector Out Mappings It's invalid to have only a Storage Area In and Resource Out (or Storage Area Out and Resource In) combination; Each Storage Area In mapping must be accompanied by one or more Resource In mappings, and vice-versa. Manual Creation Storage Area Connectors can be created or deleted manually from the Storage Area Connector tab of the Warehouses section of the Inventory Management tile in the Scenario Data Board. The grids in this tile are always editable, so users may use the grid to fine-tune the connector settings. Be sure to Save any changes before closing the tile or running a simulation. See descriptions of each property in the Storage Area Connector Mappings page. Connector Usage Timing When a Connector gets used is determined by the Inventory Available Timing on an operation's product (an in-flow connection), and/or the Material Used Timing of a consuming operation's stock material requirement (an out-flow connection). When multiple Connectors might be available for inventory storage or withdrawal by a scheduled operation, all compatible Connectors will be considered, but only one connector will be used. When using Production Overlap (Inventory Available Timing on the product is set to By Production Cycle), if Item Transfer Qty is set, then material will be moved to storage in batches of that quantity as the operation completes its cycles. Otherwise, it will be moved at the end of each cycle in quantities equal to the Quantity Per Cycle. This results in the connector being in use for the entire duration of the operation while material is being transferred into the storage area. Any of the other available Inventory Available Timing options will move the product to storage instantaneously at the specified production timing event (At Run End, Post-Processing End, etc.) plus any time required for Material Post Processing. The same concept is valid for withdrawing material out of a Storage Area using a Connector. If the Material Used Timing is set to either During Setup, By Production Cycle or First And Last Cycle, the connector will be in use during that material transfer. All the other options, such as Production Start, moves the material instantaneously. When a connector is in use because it is moving material to or from a Storage Area, it cannot be used by another operation. Storage Flow Limits For Resources that can be used many Storage Areas for either in-flow or out-flow, flow limits can be defined which determine how many simultaneous interactions can take place. Simultaneous flows can also be disabled, if desired. The following Storage Area Connector settings dictate simultaneous flow configurations: CounterFlow: A boolean (true/false) flag to indicate whether material can flow in both directions at once. CounterFlowLimit: A numerical value that indicates how many Storage Area receipts and distributions (combined in-flows and out-flows) can occur simultaneously among all Storage Areas configured in the Connector. StorageInFlowLimit: A numerical value that indicates how many in-flow Storage Area receipts can occur simultaneously among all Storage Areas configured in the Connector. StorageOutFlowLimit: A numerical value that indicates how many out-flow Storage Area distributions can occur simultaneously among all Storage Areas configured in the Connector. To summarize, StorageInFlowLimit and StorageOutFlowLimit constrain how many Storage Areas can be used by the connector simultaneously. CounterFlow limits whether the connector can be used to move material in and out of storage simultaneously, constrained by the CounterFlowLimit. Use Cases & Examples Case 1: A Single-Item Tank supplied and replenished by the same Resource This case demonstrates an example of a tank that is only allowed to store one item at a time and is always supplied from the same resource. Scenario: A paint manufacturing company creates custom paint colors in 500-gallon batches. A batch of "Deep Ocean Blue" is mixed in a Blending Machine (a Resource) and then held in a specific Holding Tank before being sent to the Canning Line. It is absolutely critical that this Holding Tank is completely empty before the next batch, perhaps "Sunset Orange," is produced and stored in it. Mixing even a small amount of leftover blue paint with the orange would ruin the new batch. Data Model Configuration: The 500-gallon Holding Tank is configured as a Storage Area with Single Item Storage enabled. Job operation Products for various paint colors are configured to output units measured in Gallons (e.g. an output of "1" equals 1 gallon). Each item that might be stored in the 500-gallon Holding Tank is configured with an Item Storage Max Quantity of 500 units. A Storage Area Connector is created to define the relationship between the equipment. An in-flow rule on the Connector links the Blending Machine (Resource) to the Holding Tank (Storage Area). StorageAreaConnectorIn = Blending Machine ResourceStorageAreaConnectorIn = Holding Tank One or more out-flow rules (StorageAreaConnectorOut + ResourceStorageAreaConnectorOut) can optionally be set on the Connector to link the Holding Tank to one or more specific Canning Line resources, although this isn't necessary unless the Holding Tank can only be used by specific Canning Line resources. Defining a StorageInFlowLimit is not necessary in this case. The system would only ever allow a single operation to schedule on the Blending Machine resource. Scheduling Impact: This configuration enforces a critical quality control rule. The scheduling logic is constrained from scheduling any batch

on the Blending Machine until a Canning Line resource has consumed all 500 gallons of the currently stored batch. Setup on the next scheduled production batch is modeled to account for cleaning of the storage area before the next batch of content is stored within it. Case 2: A WIP item produced by many resources may be stored in one of many tanks in a tank farm which are connected via a shared pipe network; Packaging lines are limited to withdraw from specific tanks This case demonstrates a situation where a particular liquid gets produced by many processing resources before being stored in one of many interconnected tank storage areas. It also limits which packaging lines can withdraw the liquid from specific tanks. Scenario: A facility has a "tank farm" with ten holding tanks for a liquid product. These tanks are all connected to a single, complex manifold system that leads to three different packaging lines. Due to the physical piping, Packaging Line A can only draw product from Tanks 1-4, Line B can only draw from Tanks 5-8, and Line C, a specialized line, can only draw from Tanks 9 and 10. Data Model Configuration: 10 Storage Areas are configured which can each store the same raw material. This is the "tank farm". Connector 1: Storage to Packaging Line A out-flow connections allow distribution to Packaging Line A from Tanks 1-4. Connector 2: Storage to Packaging Line B out-flow connections allow distribution to Packaging Line B from Tanks 5-7. Connector 3: Storage to Packaging Line C out-flow connections allow distribution to Packaging Line C from Tanks 8-10. Scheduling Impact: This configuration ensures that packaging lines which are only within range of specific holding tanks schedule to consume material only from the appropriate holding tanks. Case 3: Multiple resources can fill a Storage Area with various materials This case demonstrates a situation where 3 resources might each produce different products or materials that can each be stored simultaneously in a single Storage Area within a Warehouse. Scenario: In a plastics factory, three different machines are preparing materials to be used by a large injection molding press. Extruder #1: Produces blue PVC pellets Extruder #2: Produces red PVC pellets Grinder: Processes factory scrap and old parts into grey regrind pellets Right next to the large injection molding machine is a single elevated platform called the "Molding Feed Zone" (a single, partitioned Storage Area). On this platform sit three separate large hoppers. While they are all in one functional area, each hopper is a distinct partition that must hold only one specific type of material to prevent color contamination in the final product. Partition A: Hopper for up to 500 blue pellets Partition B: Hopper for up to 500 red pellets Partition C: Hopper for up to 500 grey regrind pellets Data Model Configuration: A Storage Area is created called the Molding Feed Zone to represent the partitioned hopper Item Storage configuration for each of blue, red, and gray pellets define a MaxQty in the Molding Feed Zone of 500 units each A Storage Area Connector allows each of Extruder #1, Extruder #2, and Grinder resources to supply the Molding Feed Zone storage area with in-flow connections. With only one connector in, only one resource will be able to fill into the Molding Feed Zone at a time. If all three resources are able to fill the Molding Feed Zone at once, there would be three separate connectors. Scheduling Impact: When these resources produce these products, they will be required to store them in the specified storage area. If the storage area's inventory levels for any one of the products has reached its maximum, no jobs will be allowed to schedule to produce the product until the hopper has been emptied. This prevents over-production of any specific pellet color. See Also Items, Inventories, Warehouses, & Storage Areas Item Mappings Warehouse Mappings Inventory Mappings Storage Area Mappings Item Storage Mappings Storage Area Connector Mappings Storage Area Connector In Mappings Resource Storage Area Connector In Mappings Storage Area Connector Out Mappings Resource Storage Area Connector Out Mappings

## Successor Manufacturing Orders

### [Source](#)

Key Concept Manufacturing orders can optionally be given predecessor-successor relationships to act as scheduling constraints so that one order never gets scheduled to start before its predecessor is completely finished. When a manufacturing order is configured as a successor of another, all operations of the predecessor order must be scheduled to finish before the first operation of the successor is allowed to be released to schedule. Other release rules still apply to the successor order (just-in-time start date minus JIT slack allowance); this successor manufacturing order logic adds a scheduling constraint to other existing constraints. Any manufacturing order may be configured to be the successor of any other - the two may be part of the same job, or may be orders of different jobs. Configuration Successor manufacturing orders can be manually configured from the Successor M.O.s tab of the Job Details Dialog in the grid in the lower half of the dialog. Click the "+" plus icon in the lower left corner to add a new Successor MO requirement, or select an existing grid row and click the "-" minus icon or press "Delete" on the keyboard to delete the selected Successor MO requirement. At minimum, each successor requirement must specify the SuccessorJobExternalId and the SuccessorManufacturingOrderExternalId. Optionally, the SuccessorPathExternalId and SuccessorOperationExternalId may be defined. Circularities Beware of creating circular successor relationships where each order becomes the required successor of the other. This creates an impossible scheduling constraint and can cause optimize to slow dramatically as it loops through the logic until finally leaving the associated jobs in a "failed to schedule" state. See Also Successor Manufacturing Order Mappings Job Mappings Manufacturing Order Mappings Alternate Path & Node Mappings Resource Operation Mappings

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## Concepts > Custom Object Properties

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### Attributes

#### [Source](#)

Key Concept Attributes are custom properties that can be assigned any string or integer value and assigned to various objects. These are meant to be used to track various data that PlanetTogether doesn't already have a standard property for. They can also be used to configure and determine operation setup or clean processes. At this time, attributes can only be assigned to job operations, but in the future attributes may be expanded to support other functionality on other data objects. Attributes are similar to User Defined Fields, though they have added native functionality like operation Setup and Clean process calculations, and can be used by various optimize factors to create custom operation sequencing optimization. Jump to section: Attribute Object Management Attribute Setups and Cleans Visualizing Attributes Sequence Optimization using Attributes Attribute Object Management Attributes are created or imported as data objects, then can be associated with other data objects such as Job Operations. Certain properties of each attribute can be imported with a default value, and optionally these values can be overridden when the same attributes are associated with other objects. For example, the Attribute object can be assigned a default Color, but the assigned Color can also be overridden by defining a different Color when the attribute is associated with a specific Operation. Data Import Attribute objects are imported via Attribute Mappings logic, then can optionally be associated with job operations via Operation Attribute Mappings. Manual Creation Attributes can be created or deleted manually from the Attributes tile from the Scenario Data Board. The grid in this tile is always editable, so users may use the grid to fine-tune the default attribute settings. See descriptions of each property in the Attribute Mappings page. Once attributes are created, they can be added to job operations where they can be given numerical or string values via the Job Details Dialog. Any properties or settings configured at the Operation level will override the default values of the same properties set in the Attributes tile of the Scenario Data board. The same Job Details Dialog is used to delete attribute associations from operations. To delete one or more attributes, select one or more rows from the operation

attributes grid, then press the Delete key on the keyboard, or click the - minus button near the bottom of the grid. Attribute Setups and Cleans Attributes may optionally be used to dictate operation Setup and Clean processes. An individual attribute may only be used for either Setups or Cleans; it cannot be used for both. The AttributeType property defines whether the attribute should be used for Setup or Clean processes, then the AttributeTrigger property defines when the attribute should trigger a Setup or Clean process. Many of the triggers are sequence-dependent, meaning the attribute will incur Setup or Clean time depending on the order in which operations are scheduled on the same resource. When a sequence-dependent process is applied to an operation, it is always applied to the successor or latest scheduled operation in the sequence which triggers the process to be incurred. In order for attribute-defined operation Setups and Cleans to schedule on a resource, the resource must have one or both of the following properties defined: SetupIncluded must be set to UseOperationAttributes for Setup processes UseAttributeCleanouts must be set to True for Clean processes For more information, see: Setup Time Cleans Attribute Mappings Resource Mappings Visualizing Attributes While managing attribute objects is done in the Attributes tile of the Scenario Data board, operation attributes and their values may be visualized in various grids and in Gantt segments and labels. Gantt The Gantt board offers users an optional Attribute Segment which can be enabled to display details of each attribute assigned to a scheduled operation in the scheduled activity block on the Gantt. Users have options to show the attribute Name, Code, and/or Number. The color of each segment will match the attribute's assigned Color. Only attributes whose ShowInGantt property is set to True can be visualized in the Gantt. When all options are enabled, each attribute assigned to an operation whose ShowInGantt property is set to True will be displayed in its own individual segment. The data will be written to the segment in the following format: [AttributeName] [AttributeNumber] [AttributeCode] For example, this Gantt block shows a single attribute: Here is an example of two attributes assigned to the same operation: Activities Board Grids Attribute Code, Number, and Color values may be visualized in the Activities board primary and secondary scheduling grids. Only attributes whose HideInGrids property is set to False can be visualized in the grids. When selecting columns of properties to visualize in the grid, each attribute is represented by 3 column names (where "AttributeName" will match that of the attribute): AttributeName Code AttributeName Color AttributeName Number Sequence Optimization using Attributes Attributes may be factored into PlanetTogether's schedule sequencing optimization. This gives schedulers ultimate flexibility to customize schedule optimization logic to tailor it to specific business and operational needs. Only attributes whose UseInSequencing property is set to True can be used during schedule optimization. From the Sequence Planning board, the applicable optimize factors can be identified by their Category assignment, Attributes. Each factor may be assigned some number of points from the Optimize Factor Details tile, then each individual attribute that should be factored into optimize scoring for that particular optimize factor can be selected. If certain attributes should be weighted higher than others, an additional Multiplier option is available. For more information, see: Optimization Sequence Planning Board See Also Setup Time Cleans Optimization Attribute Mappings Operation Attribute Mappings Resource Mappings Scenario Data Board Gantt Board Activities Board Sequence Planning Board

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## User Defined Fields (UDFs)

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Old Article Versions This article is updated to reflect the latest software functionality. For older software versions, download and refer to the appropriate document version: Software Version(s) Download Link 12.1.4.x thru 12.2.1.x UserDefinedFields\_12.2.1.pdf Key Concept User Defined Fields can be used to include extra data or information about objects imported into PlanetTogether for which the software does not already offer a property. Any number of UDFs can be added to Jobs, Manufacturing Orders, Operations, Resources, and more. They can be made visible in various board grids (Jobs, Activities, Sales Orders, etc.) and can be added to Gantt Labels and Tooltips. Custom software extensions can also access them. Jump to section: Adding and Modifying User Defined Fields Visualize User Defined Fields Adding and Modifying User Defined Fields Data Import Each user field must first be defined via the User Field Mappings, then they can be assigned to their respective data objects in the various Import Mappings Board pages per each object type which supports them (Jobs Mappings, Resource Operation Mappings, etc.). Manual Entry A User Fields board is accessible via the settings dropdown of the main toolbar: This board allows users to create user fields which can later be assigned to objects that match the field's defined Object Type. Use the grid to edit the object property values. Once the fields are created, they can be assigned to Jobs and Operations via the Job Details popup dialog. From the Job Properties tab, find a User Fields tab which includes controls to add or remove UDFs. Once a UDF is added, its properties and values can be edited in the User Fields grid directly. All other objects require users to input UDFs via the object grid editors where the syntax must be carefully followed. Syntax Each UDF has two parts: field\_externalid: The unique ExternalId of the UDF value: The UDF's value The two definitions must be separated by a "~" tilde. Multiple user fields assigned to the same object must be separated by a ";" semi-colon. SQL statement concatenations are supported in the import mappings, if necessary. Here is a template to use for each imported UDF: field\_externalid~value Note that int, long, double, and decimal types will be formatted with thousand-separators every 3rd digit when viewed in grids (commas in English, or decimals or spaces in other languages as appropriate). Use string type for numbers which should not be formatted. UDFs can be configured for the following objects: Capabilities Capacity Intervals Cells Customers Departments Forecasts Items Jobs Job Operations Manufacturing Orders Plants Product Rules Purchase to Stock Resource Connectors Resources Sales Orders Transfer Orders Users Warehouses EXAMPLE This would assign one Field called "UnitOfMeasure" whose value is set to that of the SQL field named "UOM". 'UnitOfMeasure~' + UOM This example would create two Fields, "UnitOfMeasure" and "Revenue": 'UnitOfMeasure~' + UOM + 'Revenue~' + Revenue The imported UDF can then be visualized in the associated grid (Sales Orders in the example above): Note that after adding one or more new UDFs via manual entry or data refresh the user's PlanetTogether Client application must be restarted before the new fields can be visualized in the associated object grid(s). Visualize User Defined Fields After adding one or more new UDFs to any data object via the Client UI or via Data Refresh, the user's active Client application must be restarted before the new UDFs can be visualized in the interface. Simply exit or logout of the application, then sign back in. Grids UDFs whose display\_in\_UI flag is TRUE can be visualized in any grid which displays the related object data. For example, the Customers board grid can display any UDFs that were imported on any of the existing Customer objects in the data model. Simply use the Column Chooser to hide/show any of the custom UDF properties in the grid layouts. They are named the same in grid columns as the assigned UDF Name property. Gantt Segment Labels Various UDFs can be visualized in Gantt segment labels from the User Settings → Segments section. Click the appropriate [ Label ] button to customize a segment label and add any UDF by searching for the field name in the search box of Available Fields, or manually with the following syntax: [.] Example of a Job UDF called CustomerStatus: [Job.CustomerStatus] For more information, see: Activity Blocks - Segments & Labels See Also Import Mappings Board Layouts, Metrics, and Targets Grid Personalization Gantt Board

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## Concepts > Jobs

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## Alternate Paths

### Source

Key Concept In PlanetTogether, Alternate Paths specify the precedence relationships between operations, thus indicating the path or route that is followed through the plant to produce a product. A manufacturing order may have one path, or may be configured with many possible paths. Each path represents a unique way for the same work to be done, thus PlanetTogether will only schedule the job on one of the defined paths. When multiple paths are used, each path may be configured to be allowed to be scheduled automatically by PlanetTogether's sequence optimization logic, or each may be configured so that it only schedules on the path via a manual schedule adjustment by the scheduler. Some common use cases for utilizing multiple paths are:

- Define variations in the Bill of Materials (BOM) between paths in order to allow for different materials or material sources or costs
- Define variations in the resource(s) which perform the work
- Define one or more paths that include a sub-contractor which may increase costs but will be able to help to finish the job faster

Jump to section: [Alternate Path Configuration](#)

[Path Requirements Preference](#)

[AutoUse Linear Sequence vs. Parallel Operations](#)

[Operation Overlap Max Delay](#)

[Operation Transfer Path Validity](#)

[Automatic Alternate Path Selection](#)

[Manual Alternate Path Selection](#)

[Incompatible Features with Automatic Path Selection](#)

[Alternate Path Configuration Access](#)

an MO's paths from the Alternate Paths tab of the Job Details dialog:

[Path Requirements](#)

Each Manufacturing Order of each Job will have at least one Path. If an MO is imported without a specified path, the system will create a linear path according to the order in which each of the MO's operations are imported. Each Path must contain at least one Operation. There is no maximum limit to the number of Operations per Path. Each Path may only contain unique operations. If multiple Paths require the same process or operation then their Operation Names and all settings may be identical, but their External Ids must be unique.

[Optional Path Configurations Preference](#)

Assign a numerical value to each path which can optionally be factored into a Sequencing Plan to give higher optimize scoring to the first operation of paths with a higher preference (see factor: [Alternate Path Preference](#)).

[AutoUse](#): Specify when each path may be considered for scheduling during schedule optimization. Accepted values:

- [IfCurrent](#): The Path may only be chosen only if it is marked as CurrentPath of the Manufacturing Order. Other paths may still be chosen unless the MO's LockToCurrentAlternatePath setting is TRUE.
- [RegularRelease](#): The Path is released for scheduling based on standard operation release timing and optimize settings (JIT start date minus JIT slack days minus offline capacity on eligible resources).
- [ReleaseOffsetFromDefaultPathsLatestRelease](#): The Path is released for scheduling only after the number of scheduling days defined in the AutoUseReleaseOffsetDays have passed since the Manufacturing Order's Default Path has been released. This can help to ensure that the Default Path is released for scheduling before other paths.

[Linear Sequence vs Parallel Operations](#): Any Path may be configured with two or more linear or parallel operations. A linear sequence assumes that one operation must complete before the next operation is allowed to start (though Operation Overlap may be configured to allow linear sequenced operations to at least partially overlap). Define the linear sequence using predecessor and successor relationships via [PredecessorOperationExternalId](#) and [SuccessorOperationExternalId](#) properties in the path's operation nodes.

Example: Op010 has no predecessors (no operation defines it as its successor), so it starts the sequence. Op020 is defined as the successor of Op010. Op030 is defined as the successor of Op020. Op070 is defined as the successor of Op030. Op070 has no successor, so is the last in the sequence.

Running parallel operations assumes that two or more operations of a path may run simultaneously. Parallel operations which run at the start of the path may be configured using basic Predecessor/Successor logic where none of the parallel operations are configured to be the successor of any other operation, and each of the parallel operations may optionally define the same operation to be their successor. Alternatively, if at least one operation must run before any parallel operations are able to start then it's most logical to configure a linear sequence, but use Operation Overlap to allow the parallel operations to overlap with one another.

Example: Neither Op040 nor Op050 have a predecessor, and both define Op060 as their successor. In this case, both operations Op040 and Op050 may schedule to run in parallel. Finally, Op060 may start only after both Op040 and Op050 are completed since it is configured as a successor to both operations.

[Operation Overlap](#): Linear operations of a Path may be configured to partially or completely overlap with one another. To achieve this, first define the OverlapType, then define by how much the operations are allowed to overlap via either the OverlapTransferHrs or OverlapPercentComplete depending on the OverlapType defined.

[OverlapType options](#):

- [NoOverlap](#): The entire Predecessor Operation must complete before the Successor Operation can begin.
- [TransferQty](#): The Successor Operation can begin once the first Operation has produced a

specified quantity (specified in the OverlapTransferQty field in the Operation Mappings). TransferSpan: Successor Operation can begin after the first Operation has been running for a specified time (specified in the OverlapTransferHrs field of the Alternate Path Node). AtFirstTransfer: Successor Operation can start once a specified number of items is produced and transferred to inventory (specified in the TransferQty property in the Item Mappings for the product produced by the operation). TransferSpanAfterSetup: Successor can begin after the OverlapTransferHrs plus any Setup time. PercentComplete: Successor can begin after the predecessor operation has been completed to a percent specified in the OverlapPercentComplete field in the Alternate Node Mappings. Example: Overlap Production Operation Op040 starts the sequence; its successor is Op050. Op040 is configured to allow Op050 to overlap with it after it's 50% completed via settings OverlapType: PercentComplete and OverlapPercentComplete: 50. Operation Op060 is the last operation in the sequence and must wait for Op050 to complete before it can start. Example: Overlap Setup It's possible to allow the successor operation to overlap with the predecessor by precisely the amount of time required to setup the successor operation, even if setup is dynamically calculated by an attribute code table or other means of dynamic setup duration. In this example, an attribute called "Setup" is configured to incur 2 hours of setup with the code changes from "A" to "B", or 4 hours of setup with the code changes from "B" to "A". Each job is only 2 operations and the second operation is allowed to only overlap with its predecessor the duration of its setup. To achieve this result, the path route must be configured with the following: Overlap Type is set to Transfer Span Overlap Transfer Hours is set to 0 hours Transfer Start is set to End of Post Processing Transfer End is set to End of Setup This configuration allows the successor to be released so that there is zero time span between the end of post-processing of the predecessor operation and the end of the setup of the successor operation. Max Delay: The Max Delay feature specifies the maximum amount of time that the start of a successor operation can be delayed after its predecessor is scheduled to end. For example, when MaxDelayHrs is set to 0, the successor operation in the Path should schedule to start immediately after the predecessor is scheduled to finish. Warning: Using Max Delay may slow down optimization and scheduling performance, especially if using it between many operations. If the MaxDelayHrs setting cannot be enforced during optimization, the job may schedule past the planning horizon, or it may schedule within the horizon and a warning will be logged for the scheduler to review and act upon. To configure a maximum delay between two operations, define a value for the MaxDelayHrs property in the predecessor operation's settings of the Alternate Path Node. Note: In order for Max Delay to be enforced during scheduling, an option in System Settings → Scheduling Options must be enabled: Example: Operation Op050 is the successor of Op040. The materials that Op040 are producing may expire or go bad if they are not used by Op050 within ~2 hours of being produced, so MaxDelayHrs will be set to 2 in order to ensure that operation Op050 will schedule in time to consume the material before it expires. Tip: The Max Delay Gantt segment, label text, and scheduling hint lines can help schedulers visualize Max Delay settings and violations and help them adhere to Max Delay settings when performing drag/drop moves in the Gantt. User Settings → Segments Use segments to give visual cues to violations of Max Delay settings between operations. Label Text Scheduling Hints Start After: When the predecessor operation is selected in the Gantt, a Start After hint indicates the earliest point in time that the predecessor can start in order to adhere to the defined Max Delay Hours. Start Before: When the successor operation is selected in the Gantt, a Start Before hint indicates the latest point in time that the successor can start in order to adhere to the defined Max Delay Hours Operation Transfer: For various processes, there may be a required minimum amount of time between when one operation ends and its successor begins. It's a sort of "Minimum Delay" as it acts in the opposite manner of Max Delay. This delay or transfer can be modeled via the TransferHrs property on any alternate path node. This property specifies the minimum number of hours to delay the start of the successor operation after the predecessor finishes. The successor operation will be delayed by at least number of hours specified after the end of the predecessor operation's post-processing step. Optionally, the TransferStart and TransferEnd properties can be used to alter the default logic of starting the transfer at the end of post-processing. This may allow the successor operation to overlap some of the transfer time. TransferStart: The point in time when the transfer from this operation to its successor should start. TransferEnd: The point in time when the transfer from this operation to its successor should end. Choose StartOfOperation for a standard calculation from the TransferStart. Accepted values for each of these fields: StartOfOperation: At the start of the operation. EndOfOperation: At the end of the operation. EndOfPostProcess: At the end of the operation's post-processing. EndOfStorage: At the end of the operation's Tank Storage. EndOfRun: At the end of all cycles/run. EndOfSetup: At the end of the operation's setup. Example: The predecessor operation is configured with a 2-hour transfer span, but also incurs 1 hour of post-processing. The transfer can begin as soon as the Run or Cycles are complete (EndOfRun), so the successor operation is allowed to start 2 hours after the completion of the

predecessor's Run, leaving only a 1-hour gap between the two operations rather than 2 hours: Additionally, the optional TransferDuringPredecessorOnlineTime property specifies that the TransferHrs should occur during the Predecessor Operation's Online capacity interval instead of calendar hours. For example, if an Operation completes at the end of a shift and has four hours of transfer time, the transfer time will not occur until the start of the next shift. If False, the transfer time will start immediately and could be completed before the next shift.

**Path Validity:** Each path can be configured with a Validity Start and Validity End date. On an optimize, the system will pick the valid path at the time of scheduling. On a manual move, when Show Move Validation is enabled (User Settings → Move Settings) the system will constrain the move based on the start and end dates of the scheduled path. It will show a warning when trying to drag and drop to a time where the scheduled path is not valid. In order to move to another path that is valid during the desired time, user will need to use ALT+drag and drop to move to another path. There is a Gantt region setting available in User Settings → Scheduling Hints → Gantt Regions. Turning on the Show Before Path Validity Region and Show After Path validity Region will show a red shaded region on the Gantt where the scheduled path is not valid when the job is clicked. Automatic Alternate Path Selection Certain configuration options may enable the standard Optimize function to consider two or more Paths of any Manufacturing Order. Configuring automatic path selection System Settings Under the Scheduling section of the Scheduling Options section of the System Settings is an important option that can be used to enable automatic path selection: Allow jobs with at least one unsatisfiable path to schedule on an eligible path: When toggled ON, if an order with two or more paths has at least one path which is not eligible to schedule, then only paths which are eligible to schedule will be considered during optimization. When toggled OFF, if an order has one or more paths which are not eligible to schedule then the entire job will fail to schedule. Manufacturing Order Settings It's recommended to define the preferred path via the DefaultPathExternalId property on the Manufacturing Order. This enables the use of the AutoUse property value ReleaseOffsetFromDefaultPathsLatestRelease to help with Path selection prioritization. In order for the Optimization logic to consider other paths in the order, the LockToCurrentAlternatePath property must be set to FALSE. Alternate Path Settings Only two of the three AutoUse settings support automatic path selection: RegularRelease: The Path will be released according to standard scheduling release logic of the first operation in the Path (Need Date minus Standard Hours minus JIT Slack minus offline resource capacity). It's recommended to use this setting for the preferred or default Path. ReleaseOffsetFromDefaultPathsLatestRelease: Combine this with the AutoUseReleaseOffsetDays property to define a number of days that this Path should be ignored during scheduling from the time that the default Path is released to schedule. For example, if the DefaultPath of the Manufacturing Order is released to schedule on May 1 and an alternate path is configured with AutoUse setting ReleaseOffsetFromDefaultPathsLatestRelease and AutoUseReleaseOffsetDays set to 3, then the alternate path will be released for scheduling no earlier than May 4 (+3 days after the release of the default path). IfCurrent: A Path whose AutoUse is set to IfCurrent will only be considered eligible for automatic selection if it is already the currently scheduled path at the time that optimization is performed. Preference: Optionally give a numerical preference value to each path. This may come into play when the first operation of multiple paths may be eligible to schedule on the same resource and are both released to schedule. The optimize factor Alternate Path Preference can be configured to give extra points to the first operation of the preferred path. The following conditions will cause the Manufacturing Order to be scheduled on its Current Path Only during optimize and expedite: Any activity progress is reported The MO has one or more finished activities The MO has one or more started activities The MO's LockedToCurrentPath property is set to TRUE Any activities are Locked to the currently scheduled resource(s) Any activities are Anchored The MO is scheduled to start before the optimized start time Note: When using the expedite function, there are two exceptions to the list above: Resource Locks will not prevent the manufacturing order from being scheduled on different alternate paths. An Anchor won't restrict a manufacturing order to the current path if the Anchor After Expedite Setting is turned on. Manual Alternate Path Selection When an Activity Block is selected in the Gantt, the Eligibility column of the Gantt grid will display a yellow circle if the resource is eligible for one or more of the MO's Alternate Paths to schedule there. A scheduler may hold the Alt key on their keyboard, then click and drag and drop the selected activity block onto a resource with a yellow circle in order to reschedule the order on the eligible alternate path. If more than one alternate path are eligible to schedule on the resource where the activity block is dropped, then the user will be presented with a popup window to select which path they'd like to schedule the order. Warning: Keep in mind that optimizing the schedule may result in the order moving to another path if certain settings are enabled to allow optimization to select alternate paths. This behavior can be prevented by setting the LockToCurrentAlternatePath setting to TRUE on the Manufacturing Order. Incompatible Features with Automatic Path Selection Job.CanSpanPlants

MO.CanSpanPlants Multi-Plant Scenarios MO.LockedPlant Batching Manufacturing Orders Successor and Predecessor Manufacturing Orders See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Alternate Path & Node Mappings Job Details Dialog Gantt Board

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## Job Details Dialog

### Source

**Key Concept** The job details dialog is a popup view of all of the data that defines a single job. It can provide critical details and insights to help identify bottlenecks, or can be used as a means to update certain settings or values of a job or any of its manufacturing orders or operations. The dialog can be accessed by many different methods from many different screens typically by double-clicking or right-clicking and choosing to "Open" any component related to the job (the job entry itself in the Jobs Board grid; one of its scheduled activities on the Gantt or in the Activities grid; from the Inventory Plot tile that references the job; from a material requirement entry in the Materials Board grid; etc.). Jump to section: Job Properties Gantt View Grid View Operation Details General Status Scheduling Batching/Setup Advanced Resources Buy-Direct Materials Stock Materials Products Subassemblies Attributes User Fields Notes Job Properties Job Name: A user-friendly name to identify the job. External Id: A unique identifier for the job. Id: A system-generated unique identifier for the job. Need By: The date and time which the job must be completed by before it is considered late. Customer: One or more customers that the job is associated with. Destination: An indication of the geographical region or address where the products that are produced by the job will be sent. For informational purposes. Description: An optional text description of the job. For informational purposes. Order Number: This can be used to specify the customer order number (the Sales Order(s) that the job is supplying). If using MRP in PlanetTogether to generate jobs then this field will be populated by MRP with the Job Name(s) and/or Sales Order Name(s) of the demand signal(s) which initiated MRP to generate the job. For informational purposes. Note: If using MRP in PlanetTogether to generate jobs to satisfy demand from other jobs, this field does not necessarily represent which job(s) its produced material will be allocated to. The only way to predict and enforce hard-peged material production to consuming jobs is to use Lot Controlled Planning. Commitment: This is mostly an informational field, though a job's Commitment can influence how other scheduling actions interact with the job if certain optional settings are defined. For example, jobs with certain commitments can be excluded from optimization or prioritized during optimization. A job can be designated to be in one of four possible commitment levels at any time: Estimate: A job with this commitment level typically represents an experimental job like a Capable to Promise (CTP) job which can be used to estimate whether or not work can be done, and if so by when. These are typically less of a priority than jobs which are scheduled to supply firm orders. Planned: A job with this commitment level is usually a computer-generated order that a planner has not yet fully committed to. The most common example is an MRP-generated job created to satisfy a material requirement for a higher-level job, but which still may require additional review before the planner and scheduler can commit to doing the work. Planned jobs can be imported or generated when using MRP within PlanetTogether to generate jobs. Firm: A job with this commitment level is typically one that has been firmed by a planner and which the plant is committed to producing or completing. Released: A job with this commitment level is typically one that has been released to the shop floor to begin work as soon as capacity allows. Hold Until: When the Hold Until checkbox is checked, the job's operations will not be released to schedule until after the date specified in the box below the checkbox. Color Code: The color code assigned to the job. This color can optionally be visualized in the Jobs Board grid or in Gantt labels. Finished: A true/false indicator to show whether or not the job is finished. If any operation of the job is in progress (some quantity or time has been reported on one or more activities) then a total job completion percentage will be displayed. Flags: Reviewed: A true/false indicator to show if a planner has reviewed the job. Only set during import for NEW Jobs and thereafter is expected to be controlled manually. Printed: A true/false indicator to show if the Job's Traveler Report has been Printed. Shipped: A true/false indicator to show if the job has been shipped to the recipient. For informational purposes. Cancelled: A true/false indicator to show if the job has been cancelled. If True, the job will not be scheduled. Do Not Schedule: A true/false indicator to determine if the job should be scheduled. If True, the job will not be scheduled. Do Not Delete: A true/false indicator to determine if the job should not be allowed to be deleted. If True, then the job cannot be deleted by the system during MRP job generation, or manually by any user. Template: A true/false indicator to show if the job is

designated as a routing template for use by MRP and CTP functions. Job templates are not scheduled as jobs and can only be visualized from the Routing Templates Board (not the Jobs Board). Invoiced: A true/false indicator to show if an invoice has been sent for the Job. For informational purposes. Additional Job Properties The tabular pane to the right of the main job properties offer additional insights into the job's scheduling status, financials, and other analytical data. Scheduling: This tab displays the scheduling status of the Job, including a list of the Latest Constraints, the Start Date, and the End Date of the Job. Financials: This tab is used to control and display financial information about the job, including Revenue, Throughput, Profit, and Costs. Performance: This tab displays an overview of the Job's performance, calculated to compare the Expected Run and Setup Hours with the Standard Hours where Standard Hours are the combined total number of hours of Setup plus Run/Cycle time. The Expected number of hours may vary depending on which resource(s) the job schedules on and those resource's capacity and efficiency ratings. Entry Entry Date: The date the job was created or imported into the data model. Maintenance Method: This property can be used to track how the jobs are maintained. ERP/Imported: The job was imported into PlanetTogether. MRP Generated: The job was created by MRP in PlanetTogether. Manual: The job was manually created in PlanetTogether. Max Early Delivery Days: The maximum number of days the job should be allowed to schedule early before it is considered "Too Early". This is not a scheduling constraint. Almost Late Days: The number of days before the job's need date that the job should be flagged as "Almost Late". Jobs which are scheduled to finish "Almost Late" can be visualized in the Jobs Board grid and in Gantt labels. Can Span Plants: A true/false indicator to determine if the job is allowed to split its operations between two or more plants in the data model. If false then all operations of the job must schedule within the same plant. Priority Priority: A numerical value used to specify a combination of importance and urgency. Lower numbers are considered more urgent/important wherever PlanetTogether might use them (Gantt labels, optimize factors, etc.). Importance: A numerical value used to indicates the value of the job relative to other jobs. Class: The job's classification which can be used to distinguish the purpose of the work request. For informational purposes. Production Order: The job produces items to supply demand. Quote: The job is an estimate to determine potential finish dates and costs to produce items. Safety Stock: The job is meant to replenish inventory to reach desired safety stock levels. Transfer Order: The jobs is a request or means for items to be transferred from one warehouse to another. Template: The job is used as a template to create other jobs from. Buffer Stock Replenishment: The job uses the buffer penetration of the primary product's inventory instead of the drum or shipping buffer penetration. Sales Order: The job is a customer order for finished products. Type: A free-form input to allow a PlanetTogether user to specify a custom job type of their choosing. For informational purposes. Hot: A true/false indicator to flag a job as "Hot", meaning it should be treated as a very high priority. Optimize factors can be given weight to prioritize scheduling "Hot" jobs, and they can be visualized in the Jobs Board grid and on the Gantt. An additional text field is supplied for notes as to why the job is flagged as "Hot". Supplied Sales Jobs: Notes: Additional text notes related to the job. For informational purposes. User Fields: Custom user defined fields (UDFs) assigned to the job. Used primarily in conjunction with software customizations/extensions. For more information, see: User Defined Fields (UDFs). History: A brief history of the job since being entered. Analysis: A more in-depth look at the scheduling information. This tab details all of the job's operations, whether they are bottlenecked, and how late the operation is. Gantt View This view provides a graphical (read-only) overview of the structure of the Job as well as the Start and End dates for the scheduled Jobs. In addition, the information is displayed in the Gantt View for the following: Job: If the Job is scheduled, then the top row of the Gantt is shown in green and indicates the total duration of the Job. Manufacturing Order: If the Manufacturing Order is Scheduled, then a blue row is drawn to indicate the total duration of the Manufacturing Order. Alternate Path: A row is drawn for each Alternate Path in each Manufacturing Order. The Current Path is expanded automatically to show the Operations within it. In addition, red arrows are drawn between Operations and their Successors as defined in the Alternate Path. Operation: A row is created and a block drawn for each Operation in each Manufacturing Order. If the Operation is Scheduled, then the blocks are drawn at the Scheduled Start and Scheduled End times. If the Operation is not Scheduled, then the blocks are drawn to start at the current PC time, and their length is based on the Work Content of the Operation. Operations that are Scheduled and Late are colored Orange. In addition, each block is labeled with the Operations: Name, Description, Resources Used, and Work Content. You can also see this text in the tool-tip displayed when you point the cursor at the Operation. The timeline along the top of the Gantt can be scrolled and zoomed. By default, it starts at the current PC clock for unscheduled Jobs and at the Job Scheduled Start for scheduled Jobs. You can scroll by using the arrows at either side of the timeline or by dragging the timeline using the mouse. You can change the zoom by holding the Ctrl key and dragging the mouse along the timeline. Grid View The Grid View provides a hierarchical view of all of the job's data. For example, its Manufacturing Orders, each Manufacturing

Order's Operations, Alternate Paths, and Successor Manufacturing Orders and all data related to each of those objects. When a Manufacturing Order is selected from the Manufacturing Orders grid, its operations, alternate paths, and successor MO data can be viewed in the respective tabs of the Manufacturing Order Details section. While browsing the grids it's important to note that: Cells with white backgrounds can be edited while those with gray backgrounds are calculated fields. Use the "+" add and "-" delete controls at the bottom of each grid to add or delete table rows An alternate way to delete a row in a table is to click once anywhere within the row to select it and press the Delete key on the keyboard. Columns can be reordered within a grid by clicking and holding the mouse over the column header and dragging it to the desired location. Users may use the standard grid Column Chooser to hide, show, or rearrange the sort order by right-clicking any column header and selecting Column Chooser. Each horizontal and vertical line separating the grid cells can be dragged to resize the cells and display more information.

**Operation Details** The Operation tab of the Job Details dialog displays the configuration settings of each operation of each manufacturing order of a job. Load the configuration of various operations by selecting the Grid View option from the lower half of the Job Details dialog, then selecting the Operations tab. Each operation in the grid below can be selected by clicking once anywhere in the grid row.

Jump to section: General Status Scheduling Batching/Setup Advanced Financials Resources Buy-Direct Materials Stock Materials Products Subassemblies Attributes User Fields Notes General General information about the Operation. Name: Editable text identifier for the Operation. External Id: The External identifier of the Operation. Must be unique to the associated Manufacturing Order. Description: Additional text for describing the Operation. Unit of Measure: The defined mode of quantity. Used for informational purposes only. Required Qty: The quantity of product that the Operation must produce. Qty Per Cycle: The quantity of product produced during each production cycle. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Start Qty: A calculated field that indicates the total amount of product that the operation will produce based on the Required Qty plus the expected scrap quantity (calculated by the defined Planned Scrap % times the Required Qty). Planned Scrap %: Percent of parts expected to be scrapped. Used to calculate Start Qty. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Time Standards: Setup: The amount of time required to prepare the resource to run the Operation. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Cycle: The time required to perform one production cycle. This is used with Qty Per Cycle to determine the run the length of the Operation based on the Expected Good Qty. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Post Processing: The amount of time that a resource may be occupied after Processing has been completed. This can be used to model cleanup time, drying time, cool down time, etc. The release of material may be constrained by the Post Processing time, and no operations can schedule on the resource during post-processing. Whether a resource will be occupied also depends on the Resource Requirement's UsageStart and UsageEnd settings. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Tank Post Processing: Deprecated in software version 12.3.0 and newer. The amount of time a Tank Resource is unavailable after all of the material has been removed. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Storage: The amount of time that a resource may be occupied after Post Processing has completed. This is typically used to model WIP storage when the storage of material needs to consume the resource's capacity and prevent other operations from scheduling. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Clean Time: The amount of time that a resource may be occupied after the operation's Cycle, Post Processing, and Storage have completed. For more information, see: Cleans. Clean-out Grade: A numerical Grade value to assign to the Clean Time. This grade is a way to numerically rank which cleanout should be scheduled in the event that multiple cleans would otherwise need to be scheduled simultaneously. Under these conditions, the highest grade value takes precedence. For more information, see: Cleans. Manual Update Only: When enabled, a data refresh will not overwrite the property's value. Applies to both Clean Time and Clean-out Grade. Status View and/or report progress on the operation and each of its activities. Finished: An indication that the selected activity of the operation is or is not yet finished. Time Based Reporting: When enabled along with automatic progress reporting, reported Setup, Run, and Post-Processing Hours will be automatically updated in addition to reported finished quantity as the schedule clock is advanced beyond the start of the activity. Rework: A flag that can be set to track operations which are required due to a previously failed effort to produce the same product for the same order. Automatically Report Progress when Clock Advances past Scheduled Start: When enabled, progress on the activity will automatically be reported as the clock advances beyond its scheduled start date. Automatically Finish when Clock Advances past Scheduled End: When enabled, the activity will be marked Finished and its products added to inventory when the clock is advanced past its scheduled end date. Finish All Activities: A button to mark all

activities of the operation as finished. Percent Finished: A visual indication of the progress made toward the completion of the operation. Omitted: A flag to manually omit the operation to prevent it from scheduling, or an indication that the operation was omitted from scheduling due to other settings or incompatibilities with its configuration. Not Omitted: The operation is not omitted from scheduling. Omitted by User: The user has flagged the operation to be omitted from scheduling. Omitted Automatically: The scheduling engine has omitted the operation from scheduling On-Hold: A flag to put the operation on hold from scheduling. Users can choose from a list of reasons which can be configured in System Settings. Hold Until: Use "Not Set" to leave the operation on hold indefinitely, or define a date and time when the operation should be released to be scheduled. Split: An indication of whether or not the selected activity was created by a split of the operation. Whole Number Splits: An indication of whether activities must be split into quantities with whole numbers, this is only possible if the original quantity is a whole number. Prevent Splits from Incurring Setup: When True, split activities of this operation will not incur any Setup time. Prevent Splits from Incurring Clean: When True, split activities of this operation will not incur any Clean time. Activities Grid Properties Id: A system-generated unique ID associated with the activity object. External Id: The assigned External Id of the activity, unique to the Operation. Production Status: A dropdown selection of various statuses of production. Waiting: The activity is waiting for all constraints to be met before it can be released to schedule. Ready: There are no constraints besides capacity preventing it from scheduling. Setting-Up: The activity has started and is in the "Setup" phase. Started: The activity has started but is not currently running. Maybe some quantity is finished but the activity is on hold. Running: The activity is currently in progress on the scheduled resource. Post-Processing: All cycles have completed for the activity and it's in its final Post Processing phase. Finished: The activity is finished. Manual Update Only: A Boolean flag which indicates whether the activity's Status and Reported Quantities can only be updated manually or not. If True then the status will not be impacted by updates made during a data Refresh unless the System "Incoming Data" Option to "Allow ERP Production Status to override manually updated status" is configured to allow the ERP production status to override the manual updates made in the PlanetTogether Client. See: System Settings - Incoming Data. ActualResourcesUsed: A list of resource External Ids which were used to perform the work of a finished operation. Anchored: A Boolean flag to indicate whether or not the activity is anchored at the currently scheduled time. Schedulers can effectively anchor the activity using this dialog. Anchor Start Date: The date that the activity is anchored to start. Anchor Drift Hrs: The number of hours of Anchor Drift that was caused by the most recent scheduling action. BatchAmount: CleanOutGrade: The Cleanout Grade of the associated Activity. Inherited from the Operation. CleanTimeHrs: The Clean duration of the Activity. Typically inherited by the Operation's time standard, but can be overridden at the activity level. CleanTimeManualUpdateOnly: When True, CleanTimeHrs is assumed to be manually controlled by the user so data refreshes will not override the activity's CleanTimeHrs setting. CleanTimeOverride: When True, the Activity's CleanTimeHrs will override the Operation's CleanTimeHrs. Comments: Optional comments about the activity can be entered here. Comments2: Optional comments about the activity can be entered here. CycleHrs: The number of hours required to perform one production cycle. Typically inherited by the Operation's time standard, but can be overridden at the activity level. CycleSpanManualUpdateOnly: When True, CycleTimeHrs is assumed to be manually controlled by the user so data refreshes will not override the activity's CycleTimeHrs setting. CycleSpanOverride: When True, the Activity's CycleTimeHrs will override the Operation's CycleTimeHrs. Expected Finish Qty: The calculated quantity of product that is expected to be produced by the activity. In Production: A Boolean flag to indicate whether or not the the activity is currently running. Jit Start: Calculated JIT (Just-In-Time) start date of the activity based on the job's Need Date and the required work hours of all of the job's operation in relation to this activity. Late: A Boolean flag which indicates whether or not the activity is scheduled to finish later than its need date. Locked: An indication of whether the activity is Locked to a specific resource or Unlocked and free to schedule on any capable resource. People Usage: Define which People Usage strategy the activity should adhere to when scheduling. Use All Available: The activity will consume all available people from the capacity interval where it is able to schedule. Use Specified Nbr: The activity will consume only the specified number of people defined in the "Nbr Of People" property from the capacity interval where it is able to schedule. If it does not consume all of the people available and the resource has Multi-tasking capacity then other operations may schedule to run on the same resource at the same time if capacity allows. This is not a scheduling constraint. If there are fewer people available on a capacity interval on an eligible resource then the activity may still schedule there but it will take longer to run by a factor of the missing number of people and the defined run rate. See also: Multi-tasking Resources.

## Job Structure

### Source

Key Concept In PlanetTogether, each job has the following multi-level structure:

- Job: A Job is the highest level of the structure. It specifies the total number of products ordered by one or more customers and the date the order needs to complete and ship.
- Manufacturing Order: A Manufacturing Order is a request to manufacture a specific quantity of a single product. A job can specify one manufacturing order for a product or can be divided into multiple manufacturing orders.
- Manufacturing Order Relationships: Successor MO relationships which act as a scheduling constraint to ensure that the work for one MO completes before its successor is allowed to start. MOs can also run concurrently with their predecessor by using overlapping MO configuration logic.
- Alternate Paths: Alternate Paths indicate the path followed through the shop to produce a product by specifying precedence relationships between operations. Each manufacturing order has one or more alternate paths.
- Path Nodes: Each alternate path comprises one or more Nodes that specify an operation and one or more successor operations, if applicable.
- Operation: An Operation is a single processing steps of a manufacturing order. Each manufacturing order contains one or more operations. Operations can be connected by establishing predecessor-successor relationships using the alternate path of the manufacturing order.
- Operations specify the Cycle Time, Setup Time, Expected Yield, Resource Requirements, Material Requirements, etc.
- Resource Requirements: Specifies the number of production resources that are required to operate. Each operation must have at least one resource requirement, considered the primary requirement. Requirements for additional resources can be configured to help the primary resource and may be configured to help for the entire duration of the operation or for only a portion of the primary requirements work (for example, only during setup or only during cycle time, etc).
- Capability Requirements: Specifies the required capabilities of each resource requirement. A capability is a type of work that can be performed. Each resource is assigned various capabilities that it is capable of performing. Each resource requirement must have at least one capability requirement. When two or more capability requirements are defined on a resource requirement, PlanetTogether must find a resource which has each of the required capabilities assigned to it in order to schedule the resource requirement.
- Material Requirements: Specifies the materials needed to perform the operation (effectively its Bill of Materials). Material requirements can be configured as scheduling constraints to prevent operations from scheduling or starting before the material is available.
- Products: Specifies the product(s) produced by the operation.
- Activities: An Activity is the duration of work scheduled on the resource(s) defined by the Operation's Resource Requirements. It uses resource capacity and has a defined start and end date. An Operation has only one activity unless the work has been split into multiple parts, where each activity schedules a portion of the operation's required production.
- Activities specify the Production Status, Reported Quantity, Reported Time, etc.
- Resource Usage (Blocks): Resource Usage Blocks are the time reserved on a resource to perform a single activity. Multiple blocks may belong to a single activity, based on the operation's Resource Requirements. Blocks are seen as rectangles on the Gantt Chart. Each activity has one block for each resource requirement in operation.
- Successor Manufacturing Orders: Successor Manufacturing Orders are manufacturing orders from either the same or different job that are constrained from scheduling until their predecessor manufacturing orders have finished.

See Also: [Jobs Board](#) [Job Details Dialog](#) [Activities Board](#) [Gantt Board](#)

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## Stock Materials (Bill of Materials)

### [Source](#)

Key Concept Stock Material Requirements, often referred to as the Bill of Materials (BOM), specify the materials needed for an operation (processing step) within a job. These requirements are essential for production planning and can be configured to act as a constraint during the scheduling process. A single job operation can be configured to require one or more stock material requirements. Each Stock Material Requirement details the name and unique ID of the required item as well as the quantity needed. All demands specified as Stock Material Requirements are tracked in inventory and can be visualized in the Inventory Plot tile of the Inventory Plan Board. The Materials Board grid provides a granular, operation-level view of every material requirement that is scheduled to be consumed, showing the material name, required quantity, the job that needs it, and key dates and other data like when the material is needed and when it is projected to be available. Data Object Management Stock Material Requirements are created manually or imported as data objects. Stock Material Requirements: Define the materials needed for an operation (processing step) within a job. Operations: Job operations define processing steps of a manufacturing order. Each manufacturing order contains one or more operations. Data Import Stock Material Requirements are imported via Material Mappings logic Operation objects are imported via Resource Operation Mappings logic Manual Creation Stock Material Requirements can be created and modified from the Stock Materials tab of any Operation within the Job Details dialog. Operations can be created and modified by creating or editing a Job from the Jobs Board. Operations are created and modified from the Job Details Dialog. See Also Job Structure Material Mappings Resource Mappings Job Details Dialog

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## Concepts > Manual Scheduling

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### Compress the Schedule

#### [Source](#)

Jump to section: Compress Idle Time JIT Compress Compress Idle Time Key Concept This feature removes idle time in the schedule by "compressing" all unanchored activities to schedule to start earlier on their currently scheduled resource(s) without changing their sequence or violating any constraints. This effectively fills in gaps of online resource capacity between scheduled operations. Options Compress operations starting between: Use the two dropdowns provided to specify the scope of the compress to avoid impacting more scheduled operations than desired. Depending on the selection made in the first dropdown, the options that are made available in the second dropdown may be reduced to prevent an illogical range configuration. Upon performing the Compress action, all operations which are scheduled to start within the specified points in time will be compressed to schedule as early as possible while preserving the current sequence of scheduled operations and while enforcing relevant constraints (material availability, release rules, etc.). Keep in mind that this may result in operations compressing to an earlier date and time than the specified "starting between" boundary settings which may impact the schedule in the frozen zone. Start of the schedule: The start of the schedule clock will act as the earliest boundary that operations will be considered for compressing. End of Frozen Span: The end of the frozen span can be set as the earliest or latest point in time that operations will be considered for compressing. If it's set as the earliest point in time, then no operations scheduled to start within the frozen span will be compressed. If it's set as the latest point in time, then any operation which is scheduled to start before the end of the frozen span and after the configured earliest time to consider will be considered for compressing. End of Plant Stable Span: The end of the plant stable span can be set as the earliest or latest point in time that operations will be considered for compressing. If it's set as the earliest point in time, then no operations scheduled to start within the plant stable span will be compressed. If it's set as the latest point in time, then any operation which is scheduled to start before the end of the plant stable span and after the configured earliest time to consider will be considered for compressing. End of the Short Term Span: The end of the Short Term Span can be set as the earliest or latest

point in time that operations will be considered for compressing. If it's set as the earliest point in time, then no operations scheduled to start within the Short Term Span will be compressed. If it's set as the latest point in time, then any operation which is scheduled to start before the end of the short term span and after the configured earliest time to consider will be considered for compressing. End of schedule: This option can only be set as the latest time to consider compressing. All operations which are scheduled to start later than the configured earliest time to consider will be considered for compressing. Specific Date/Time: A specific date and time can be set as either the earliest or latest point in time that operations will be considered for compressing. When defining the earliest point in time, any operation that is scheduled to start later than the specified date and time will be considered for compressing. When defining the latest point in time, any operation that is scheduled to start earlier than the specified date and time and later than the configured earliest time to consider will be considered for compressing. Compress Limit to Resources: Select which resources should be considered by the compress functionality. If no resources are selected, then all resources will be included in the compress process. Release Rule to use: Specify the release rule to use in order to prevent operations from being compressed to a point where they are starting too early. JIT with Resource HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the Head Start Span specified for each resource. JIT with Global HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the number of JIT Slack days specified in the text input. This logic is applied to all resources. Drum-Buffer-Rope: Each manufacturing order is released based on its DBR Release Date minus the JIT Slack Days specified in the text input. Account for Offline Intervals: When enabled, the Head Start Span or global JIT Slack days will factor into the release date of each order in terms of the number of hours of online capacity on each resource. When disabled, the Head Start Span or global JIT Slack days will factor into the release date of each order simply in terms of calendar days. More information on release rules can be found in the Optimize Settings page. JIT Compress Key Concept The JIT (Just In Time) Compress function will move all unanchored scheduled activities out to a later date and time if they are currently scheduled to start before their JIT start date, or earlier in time if they are currently scheduled to start after their JIT start date and there is available capacity for it to schedule earlier. The sequence of all scheduled activities will remain intact while each eligible activity moves out to start as close as possible to its JIT start date without making it or other scheduled operations late.

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## Locking and Anchoring

### [Source](#)

Key Concept Locking and Anchoring are manual scheduling features. Locking allows for activities to remain scheduled on a particular resource when optimization is performed. Anchoring allows for activities to remain scheduled at a point in time when optimization is performed. Activities which are not locked or anchored are free to move around the schedule during optimization according to the standard optimization procedures. Jump to section: Locking How to Lock or Unlock an Activity How to Visualized Locked Status Anchoring Anchor Drift How to Anchor or Unanchor an Activity How to Visualize Anchored Status Locking An individual Activity or all activities of a Job, Manufacturing Order or Operation may be Locked to its currently scheduled resource. This feature is useful when multiple eligible resources are available, but a scheduler wants a specific resource to be used for a particular job or operation. When an activity is locked and a user performs an Optimize Schedule command, the ensuing optimization will ensure that the locked activity remains scheduled on the resource that it is locked to. When the activity is only locked and not also anchored, it may schedule earlier or later in time than it was previously scheduled. If an activity is locked, it may still be moved manually to a different resource via drag/drop in the Gantt, or from the Activities board. After the move is complete, the activity will be locked to the newly scheduled resource. Note: Locking an Anchored activity may greatly restrict when an activity can schedule. Locking is a scheduling constraint, while Anchoring is not; an activity may still be eligible to schedule at dates later than its Anchor Date. Locking an anchored activity may increase the chance of the activity scheduling later than its anchor date as fewer resources are available. For more information, review the Anchor Drift section of this article. How to Lock or Unlock an Activity Automatic Locking The Lock Move setting can be enabled in the Move Settings section of User Settings so that all activities which are manually moved via drag/drop in the Gantt or from the Activities board will be locked to the destination resource. This may also be toggled on/off from the Gantt

board Options menu The Lock Activities scheduled to start within the Frozen Zone can be enabled in the Scheduling Options section of System Settings so that all activities which schedule inside of the Department Frozen Span will automatically be locked to their currently scheduled resource. Manual Locking and Unlocking From the Gantt, right-click any scheduled activity block and click or hover over the Lock to current Resource option to expand an additional menu. From the expanded menu, select to lock all activities of a Job, Manufacturing Order, or Operation, or choose to only lock the selected Activity. If the selected activity is already locked, the menu will reflect unlocking options rather than locking. Job: Lock all scheduled Activities of the Job(s) associated with the selected Activity(ies) to their currently scheduled Resource(s). Manufacturing Order: Lock all scheduled Activities of the Manufacturing Order(s) associated with the selected Activity(ies) to their currently scheduled Resource(s). Operation: Lock all scheduled Activities of the Operation(s) associated with the selected Activity(ies) to their currently scheduled Resource(s). Activity (All Resources): Lock the selected Activity(ies) to all Resources that they are currently scheduled on (applicable to Activities with one or more Helper Resource requirements). Activity (This Resource Only): Lock the selected Activity(ies) scheduled on the Resource where the selected Activity(ies) are scheduled (Helper Resource requirements may not be locked to their scheduled Resource when using this option). From the Jobs board, all activities of jobs can be locked by selecting one or more grid rows, then selecting the button from the Job Actions tile, or by right-clicking any of the selected grid rows and selecting the option. If the selected job is already locked, the menu option will reflect Unlock rather than Lock. From the Activities board, users have options to lock all activities of a Job, Manufacturing Order, or Operation. Select one or more grid rows from the Activity Scheduling (Primary) grid, then select one of the Lock buttons from the Activity Actions tile, or right-click one of the selected grid rows and expand the Lock to current Resource menu and select one of the options from the menu. If the selected activity is already locked, the menu will reflect unlocking options rather than locking. How to Visualize the Locked Status Users can see which activities are locked from various software boards and tiles. Gantt Board From the Gantt, each locked activity's block will have a thick purple border across the top. It's also possible to optionally add the Locked/Unlocked status text to any segment's label text. Jobs Board From the Jobs board grid, the Locked column can be displayed to indicate whether the entire job is locked, unlocked, or partially locked (only some activities or operations of the job are locked). The Resource Names column might also be helpful to see which resource(s) the job is locked to. Job Details Dialog The Locked status and current resource can be found in two of the grids of the Job Details dialog: Activities Board Each of the Activity Scheduling (Primary) and Activity Scheduling (Secondary) tile grids from the Activities board have related columns which can be exposed: Job Locked MO Locked Operation Locked Activity Locked Anchoring An individual Activity or all activities of a Job, Manufacturing Order or Operation may be Anchored to its currently scheduled point in time. When an activity is anchored and a user performs an Optimize Schedule command, the ensuing optimization will ensure that the anchored activity remains scheduled as close as possible to its anchored date. Anchored activities are not released to schedule before their anchor date. If an anchored activity is manually moved or expedited, it will be re-anchored to its new scheduled start date. Anchor Drift An anchor date is not a hard scheduling constraint. It does prevent the activity from scheduling earlier than the anchor date, but not later. It's possible that the anchored activity may move out to a later date and time as optimization regenerates the schedule if the optimizer finds available capacity before the anchored activity where another released and eligible activity can schedule. When this occurs, the newly scheduled activity may run long enough that it has to push the anchored activity to schedule later so that the new activity can complete. This movement of an anchored activity is referred to as "Anchor Drift". If an anchored activity drifts during optimization, then subsequent optimizations will continue to try to schedule the activity back to its anchored date to prevent it from drifting out too far. Anchor drift can be visualized in the Gantt and in the Activities board Activity Scheduling grids. The more resource requirements an activity requires, the larger the drift is likely to be. This is because it will be harder to find a time when all required resources are simultaneously available to start the activity. For more information, see: Helper Resources. How to Anchor or Unanchor an Activity Automatic Anchoring The Anchor Move setting can be enabled in the Move Settings section of User Settings so that all activities which are manually moved via drag/drop in the Gantt or from the Activities board will be anchored to the newly updated scheduled start date. This may also be toggled on/off from the Gantt board Options menu The Anchor Activities scheduled to start within the Frozen Zone can be enabled in the Scheduling Options section of System Settings so that all activities which schedule inside of the Department Frozen Span will automatically be anchored to their currently scheduled start date. Manual Anchoring and Unanchoring From the Gantt, right-click any scheduled activity block and click or hover over the Anchor in Time option to expand an additional menu. From the expanded menu, select to anchor all activities of the Job and supplying Manufacturing Orders, the Manufacturing Orders only, the Operation, or only the selected Activity. If the

selected activity is already anchored, the menu will reflect Unanchor options rather than anchor. Job and Supplying Manufacturing Orders: Anchor all Activities of all Jobs and their supplying Manufacturing Orders associated with the selected Activity(ies) to their currently scheduled start date. Manufacturing Orders: Anchor all Activities of all Manufacturing Orders associated with the selected Activity(ies) to their currently scheduled start date. Operation: Anchor all Activities of the Operation(s) associated with the selected Activity(ies) to their currently scheduled start date. Activity: Anchor the selected Activity(ies) to their currently scheduled start date. From the Jobs board, all activities of jobs can be anchored by selecting one or more grid rows, then selecting the button from the Job Actions tile, or by right-clicking any of the selected grid rows and selecting the option. If the selected job is already anchored, the menu option will reflect Unanchor rather than Anchor. From the Activities board, users have options to anchor all activities of a Job and its supplying Manufacturing Orders, associated Manufacturing Orders only, only the Operation, or only the Activity. Select one or more grid rows from the Activity Scheduling (Primary) grid, then select one of the Anchor buttons from the Activity Actions tile, or right-click one of the selected grid rows and expand the Anchor in Time menu and select one of the options from the menu. If the selected activity is already anchored, the menu will reflect Unanchor options rather than anchor. How to Visualize the Anchored Status Users can see which activities are anchored from various software boards and tiles. Gantt Board From the Gantt, each anchored activity's block will have a thick royal blue vertical border across the left side. It's also possible to optionally add the Anchored/Free status text to any segment's label text. For Activities that have drifted, the royal blue left border is replaced by a yellow border if the drift is within the same day, or orange if the activity drifts a full day or more. Jobs Board From the Jobs board grid, the Anchored column can be displayed to indicate whether the entire job is anchored, free (unanchored), or partially anchored (only some activities or operations of the job are anchored). Job Details Dialog The Anchored status and current Anchored Start Date and Anchor Drift Hours can be found in the Activities grid on the Operation Status tab of the Job Details dialog: Activities Board Each of the Activity Scheduling (Primary) and Activity Scheduling (Secondary) tile grids from the Activities board have related columns which can be exposed: Job Anchored MO Anchored Operation Anchored Activity Anchored Activity Anchor Date Activity Anchor Drift See Also Gantt Board Jobs Board Activities Board System Settings User Settings Resource Capacity Helper Resources

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## **Splitting and Joining Jobs, Manufacturing Orders, and Operations**

### [Source](#)

Key Concept Manufacturing Orders and Operations occasionally need to be split into multiple Manufacturing Orders or Operations with smaller quantities. For example, manufacturing orders may need to be split when a partial shipment is made to a customer when there isn't enough capacity to finish the full order in time. In addition, operations may need to be split among multiple eligible resources so that the order is completed in one shift or one day. Splits can also be useful when different production resources are used to produce parts of the full order. Operations are often split to complete them faster as split activities can be scheduled in parallel, in sequence, on the same resource, or multiple resources, resulting in a shorter lead-time for the operation. There may be other times when consecutively scheduled operations on a resource are producing the same item and it may be desirable for them to be joined together as one. Splitting and joining can be done from the Gantt by right-clicking an activity block, selecting Splitting, and then selecting which level of the selected block should be split or joined. Jump to section: System Settings Split a Job Split a Manufacturing Order Split an Operation Join Job or Manufacturing Order System Settings Manual split capabilities can be enabled and disabled in the Scheduling Options section of System Settings. Split Operation: When enabled, operations can be split. Split Job: When enabled, jobs can be split. Split MO: When enabled, manufacturing orders can be split. Join: When enabled, jobs and manufacturing orders can be joined together to create a merged job or manufacturing order. Expedite after Split: When enabled, MOs, Jobs, or Operations are automatically expedited after they are split. Split a Job A Job may be split into two jobs based on the number of cycles required of the selected operation. A job may only be split if it has only one associated manufacturing order. Otherwise, each MO must be split separately. A job which has previously been split may be split again, if desired. To split a job, right-click a scheduled activity block in the Gantt and choose the Job option from the Splitting menu. From the resulting popup dialog, enter the number of cycles per each split portion of the job, then click the Split Job button: The Split Job popup dialog allows users to

input the number of cycles for the first split. Then, the remaining cycles will be calculated to become the number of cycles of the second job. Splitting a job has the following outcomes: A new job is created with a name automatically generated from the original job's name. Each operation of the job is split at the same ratio defined in the Split Job popup dialog of the selected operation. If an operation in the original job is finished, the corresponding operation in the new job will also be finished. Note: During imports, if a job has been split but the split jobs are not included in the import, they are still preserved to protect the changes made internally in PlanetTogether without requiring the split jobs to be imported. If the quantity or routing of the imported job is different from the original, the job will be updated to the new quantity and routing, and any unfinished jobs will be removed. Split a Manufacturing Order A Manufacturing Order may be split into two based on the number of cycles required of the selected operation. An MO which has previously been split may be split again, if desired. To split a MO, right-click a scheduled activity block in the Gantt and choose the Manufacturing Order option from the Splitting menu. From the resulting popup dialog, enter the number of cycles per each split portion of the MO, then click the Split MO button: The Split Manufacturing Order popup dialog allows users to input the number of cycles for the first split. Then, the remaining cycles will be calculated to become the number of cycles of the second MO. Splitting a manufacturing order has the following outcomes: A new MO is created within the same job with a name automatically generated from the original MO's name. Each operation of the MO is split at the same ratio defined in the Split Manufacturing Order popup dialog of the selected operation. If an operation in the original MO is finished, the corresponding operation in the new MO will also be finished. The split MOs can be visualized in the Manufacturing Orders tab of the grid view of the Job Details Dialog. Each MO's required quantity are split according to the ratio of split cycles to total number of cycles as defined in the Split Manufacturing Order popup dialog. In addition, the original manufacturing order will have two new fields: Split Count: The number of manufacturing orders split from the manufacturing order. Deep Split Count: The number of manufacturing orders from the manufacturing order or its splits. MOs generated by splitting have their Split field set to true in the job dialog to indicate that they are split. Note: During imports, if a manufacturing order has already been split, but the split MO's are not included in the import, they are still preserved to protect the changes made internally in PlanetTogether without requiring the split MO's to be imported. If the quantity or routing of the imported manufacturing order is different from the original, the manufacturing order will be updated to the new quantity and routing, and any unfinished MO's will be removed. Split an Operation To split an Operation among multiple resources, right-click on an activity block on the Gantt and choose the Operation option from the Splitting menu. This will open the Operation Splitting dialog: This dialog is used to split an operation into multiple activities or to un-split an operation, consolidating split activities into one. When an operation is split, the Remaining Finish Quantity is divided among the activities that make up the split operation. The way these quantities are divided is determined by the options selected in operation splitting dialog. Split off a % of the remaining finish qty: The specified percentage of the remaining quantity of all operation activities is split off to create a total of 2 activities: one with the specified percentage and the other with the remainder. 1 to 99% of the operation can be split off. Split into this number of activities: The operation is split into the specified number of activities, each receiving an equal portion of the required quantity. For example, specifying the number of "1" will un-split the activity. The maximum number of splits is 500 to prevent accidentally large numbers from disrupting the schedule. Note: if the option "Split into whole number quantities" is checked, then the maximum split count is limited to the current required quantity of the operation. Split so that all activities are less than. First, the operation is split using the maximum duration to determine how many activities to split across. Then, the maximum number of cycles that can be performed within the specified duration is calculated. Note: the resulting activities may be longer than the specified maximum duration when considering the setup and post-processing time, as only the standard run span will be less than the duration specified. In addition, resources may have values set for the cycle efficiency multipliers, which increase the standard run span so that the scheduled run span would exceed the maximum duration specified. Split among the eligible resources: The operation is split into the specified total number of eligible resources, with each activity receiving an even portion of the required quantity. Thus, the number of activities is limited by the number of eligible resources that can operate. Split into whole number quantities: If checked, quantities that are split off to create new activities are always integer (non-decimal) values. For example, if the remaining quantity was 10.5 and you wanted to split the operation into 2 activities, this would result in the split-off activity having a required finish quantity of 5. In contrast, the original activity would have a remaining quantity of 5.5. If this option were unchecked, then the same split would result in both activities having quantities of 25.25. Buttons Split: Performs the split as specified by the current dialog settings. Note: If an operation is already split, it will be un-split first and then split again. Un-Split: Deletes all but the original activity, moving all

required finish quantities and reported values to the remaining activity. Join Job or Manufacturing Order Operations of different manufacturing orders may be joined with the one(s) scheduled immediately to their left (there can be a gap in the schedule between them, but no other operations may be scheduled between them). Only a single Join action between two manufacturing orders may be performed at a time (although operations which have been joined already may again be joined with other adjacent operations, if desired). Two operations are considered eligible to join together if they are both scheduled on the same resource and are both producing the same product into the same warehouse and are either each part of separate jobs, or are each part of an already split manufacturing order of the same job. Two manufacturing orders of the same job are not eligible to be joined together unless they are the result of an already split MO. In order to join two MOs together, right-click the desired downstream (rightmost) activity block in the Gantt and choose the Join Job or Manufacturing Order option from the Splitting menu. Two MOs cannot be joined if the upstream activity block is selected. For manufacturing orders with multiple operations, a Join initiated on one operation of one resource will join together all operations of that MO with all operations of the earlier adjacent scheduled operation's MO. When two adjacent MOs are merged into one, the downstream MO (the one scheduled later) is merged into the upstream MO and is effectively removed from the data model. When joining two MOs from different jobs, this results in the downstream job being deleted, leaving behind only the upstream job. The output quantity of the resulting joined MO is the combined total of each of the joined MOs. Multi-operation selection Selecting two or more operations and using the Join feature gets a bit unpredictable. For example, the system will choose which two operations to join together depending on the order in which the operations are selected when using Ctrl+Click to select multiple (it will attempt to join the last one which was selected, regardless of which one was right-clicked or which one is actually downstream). If using Shift+Drag to select, then it seems a bit random which ones it might join together. The system also doesn't allow the user to Join a group of operations twice without un-selecting and re-selecting them after the first Join completes. For these reasons, it's advisable to only select one operation at a time to Join with its earlier adjacent scheduled MO. See Also Gantt Board Job Structure System Settings

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## Concepts > Modeling Techniques

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## Multi-Plant Data Model

### Source

**Key Concept** Generally speaking, a Plant is meant to represent an entire facility or location where production occurs. It is usually synonymous with a single physical factory. However, in PlanetTogether, a Plant consists of any number of Departments that contain any number of Resources used to produce goods. PlanetTogether allows plants which are interdependent on one another to be modeled together in order to take advantage of Multi-Plant Scheduling features. The multi-plant system allows for collaboration between plants whose processes are interconnected. When to Consider a Multi-Plant Model The following interdependencies between plants might motivate an organization to consider using PlanetTogether's multi-plant model: Certain orders can be fulfilled by one plant or another, depending on which has capacity. Some products require some intermediate components to be manufactured in one site, then transferred to another site for completion. The plants are physically close enough and equally capable that some operations of some orders may run in one plant and other operations of the same order in another nearby facility. When two or more plants share a warehouse and each needs to consider inventory levels when scheduling orders which depend on common materials. Multi-Plant Scheduling Features Can Span Plants The job and manufacturing order Can Span Plants properties must be set in order to allow operations of a single manufacturing order to schedule in different plants. If a Job's Can Span Plants property is set to True, then all of its manufacturing orders are eligible to be scheduled across different plants. However, each operation within the manufacturing order will be scheduled in the same plant unless the manufacturing order's Can Span Plants property is also set to True. Note: Individual operations cannot span plants unless the operation has been split. The application does not currently support, for example, a primary resource requirement to be scheduled in one plant while a helper resource requirement is scheduled in another plant. Lock Manufacturing Order to a Plant A manufacturing order can be locked to a plant to ensure that it is started and finished within that plant. A common reason for locking a manufacturing order to a plant is proximity to the customer who ordered the product. If a manufacturing order is locked to a plant, every operation belonging to the manufacturing order will also be locked to the specified plant. Schedule Optimization Single-pass optimization via the Schedule menu option generates a synchronized schedule across all plants. Plants can also be optimized individually using the Optimize Plant dropdown, if desired. Data Integration When multiple plants are modeled in the same instance workspace, all import data mappings are shared among all plants. When data is published to the publish database, data from all plants are published simultaneously unless the option to Ask which resources to publish when publishing is enabled which will prompt the user to select which resources they wish to publish. This will allow them to select resources from a single plant to only publish their schedule, if desired. Users and Data Visibility Users can see data from multiple plants in one session from the Gantt, various board grids, and the Metrics Board. User permissions and plant permissions can dictate whether individual users are able to schedule in one plant or both plants. Each user may hide or show various resources from various plants, as needed, in their Gantt view by creating custom Gantt layout configurations from User Settings. Drag-and-drop scheduling in the Gantt can occur within a plant as well as between plants. Software License Considerations The number of plants that can exist in a single data model is limited at the software license level. Each license is typically allowed a single plant unless it was negotiated to allow for more during the sales cycle. Contact a PlanetTogether sales representative or the PlanetTogether Support team to assist with resolving any license-related issues. Limitations of Multi-Plant Scheduling Performance can be impaired with high data volumes as plant data is combined. Data imports are generally performed across all plants (system-wide). Data access permission flexibility is limited. Plant permissions can be set so that a user can be a viewer or editor per plant. The system settings are shared across all plants, which creates less flexibility across multiple plants.

## Concepts > Planning

### MPS/MRP Optimize Plan Settings

[Source](#)

Key Concept In PlanetTogether, Material Requirements Planning (MRP) is an automated process that compares the demand for materials and finished goods to the existing on-hand inventories and planned supply to create jobs and purchase orders to satisfy those demands which cannot be satisfied by existing inventory. The MPS/MRP Optimize Plan feature can be configured to create jobs and/or purchase orders and then schedule them according to the configured Optimize Settings and the rules defined in the selected Sequencing Plan(s). Be conscious of whether you're using Shared Optimize Settings or Personal Optimize Settings, especially if working in a collaborative environment with multiple schedulers. Switching between Shared or Personal settings is done in the User Preferences dialog. Quickly visualize whether Shared or Personal settings are in use by expanding the Schedule dropdown from the main toolbar and observing the icon next to each of the setting headers. If the icon is the bust of a single person , then Personal settings are enabled. If the icon reflects the busts of 3 people , then Shared settings are enabled. For more information, see the User Preferences section of the User Management page. Jump to section: MPS/MRP Settings Preserve jobs during generation Purchase Order rule Access MPS/MRP Optimize Plan Settings from any of the following: The Plan dropdown from the Main Toolbar The MPS/MRP Settings section of System Settings (if using Shared settings) The MPS/MRP Settings section of User Settings (if using Personal settings) MPS/MRP Settings MRP Start Type: Specifies where in the schedule MRP planning should begin based on the demand signal's need date. FirstDemand: Plan all demands regardless of the need date. Clock: Plan demands whose need date is equal to or later than the current schedule clock. ShortTerm: Plan demands whose need date is no earlier than the end of the Short Term Span. SpecificDate: Choose a date and time to begin planning. Use the MRP Start Date to set the date and time. MRP Start Date: This input becomes active when MRP Start Type is set to the SpecificDate option. MPS/MRP Cutoff Duration: Only inventory requirements for a specified duration will be considered to generate jobs and/or purchase orders during the MRP process. Shorter-term MRP Cutoff dates are preferred in situations where demands further in the future do not need to be included in the schedule. The cut-off duration options are: Short-Term: The system will only plan for demand signals that can be satisfied within the Short-Term Span defined in the System Settings. Planning Horizon: The system will plan for demand signals that can be satisfied within the Planning Horizon defined in the System Settings. No Cutoff: The system will plan for all demand signals in the data model. Specific Duration: The system will plan for demand signals that can be satisfied within the duration selected by the user. Note: When the clock is advanced, the MRP Cutoff Date is extended by an amount of time equal to the clock advance duration to preserve the "horizon." If Personalized Optimize Settings are used, then these are not altered during clock advances. Net Change: When enabled, the system will only plan for demand signals that have changed since the last MPS/MRP Optimize Plan was executed. This reduces the time required for MRP to process and preserve jobs and purchase orders previously created for inventory plans that have not changed since the last MRP run. Inventories for items are excluded from the Net Change MRP run unless one or more of the following have changed for that item or one of its parent items: Sales Orders Forecasts Transfer Orders On-Hand Inventory Safety Stock Safety Stock Priority Jobs created, deleted, or changed in quantity (producing or consuming the item) JIT Compress: When enabled, the system will execute JIT Compress after each MPS/MRP Optimize Plan operation and cause MRP to generate lower-level supplies based on the JIT schedule of the jobs that consume them. Use JIT Dates: When enabled, demand signals from preserved jobs will use the jobs' JIT Start Date as the Demand Need Date. So, if a new job is created by MRP to satisfy a demand from a preserved job, the new job's Need Date will equal that of the preserved job's JIT Start Date. When disabled, the demand need date is determined by the scheduled start date of the preserved job. Source from Firm Orders: When enabled, demands can be sourced from Firm and Released orders, even if the material may not be available to satisfy the demand on time. Set sub-job Need Dates: Sub-jobs are jobs that are created to fulfill material requirements for successor jobs. The need dates for those jobs can be updated according to where the successor/parent job schedules using the following options: Use System Options: The Set Sub-Job Need Dates value set in the Scheduling Options section of the System Settings will dictate the behavior. To earlier of JIT and scheduled start date: The need date of the sub-job is set to the earlier of its JIT start date or its parent job's scheduled start date. To JIT date: The need date of the sub-job is set to the JIT start date of its parent job. To start date: The need date of the sub-job is set to the scheduled start date of its parent job. To bottlenecked Operation start date: The need date of the sub-job is set to the start date of whichever operation is causing a bottleneck. To overlap supply sources: The need date of the sub-job is set to the end date of the parent job minus the amount of time required for the sub-job to make its first transfer of product to inventory. Consume Forecasts: Forecast consumption will reduce (consume) forecast demand as sales orders are entered to avoid duplicating

demand. When enabled, running MRP will cause forecasts to be consumed by Sales Orders before the main MRP logic is executed which will prevent MRP from creating jobs to satisfy both Sales Order PLUS the full forecasted demand. Generate Jobs to satisfy demand and material requirements: When enabled, MPS/MRP Optimize Plan will create all jobs necessary to fulfill all demand signals. Preserve jobs during generation There are benefits to preserving some stability in production and purchase plans in most situations. For example, once jobs are released to the shop floor, it can be problematic to have them be deleted by MRP and replaced with new jobs. In addition, once a purchase order has been placed to a vendor, it may not be possible to change or cancel it. Toggle any of the available switches to preserve jobs with certain property values during MRP so that they will not be deleted by the system when generating new jobs to satisfy demand and material requirements: Released: Preserve jobs whose Commitment is Released. Planned: Preserve jobs whose Commitment is Planned. Firm: Preserve jobs whose Commitment is Firm Estimate: Preserve jobs whose Commitment is Estimate. Starting in the Plant Stable: Preserve jobs which have any activity scheduled to start within the Plant Stable Span. Previously Generated Jobs: Preserve jobs which were previously generated by MRP. Anchored: Preserve jobs which have any activity anchored in time. Locked: Preserve jobs which have any activity locked to a resource. Printed: Preserve jobs whose Printed flag is True. CTP: Preserve jobs which were created from a CTP (Capable To Promise) estimate. Note: The following jobs are always preserved: Jobs which are Started or Running Jobs whose Do Not Delete flag is True When running a Net Change MRP, jobs which produce inventories are not included in the Net Change MRP process. Purchase Orders with status Firm or Closed. Purchase Order rule Generate Purchase Orders to satisfy demand and material requirements: When enabled, MRP will create purchase orders to buy materials as needed based on the item and inventory planning fields. See Also MPS/MRP Planning Optimize Settings

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## MPS/MRP Planning

### Source

Key Concept In PlanetTogether, MRP (Material Requirements Planning) is an automated process that compares the demand for materials and finished goods to the on-hand and planned supply to generate planned jobs and/or purchase orders which can help to plan to satisfy unmet demands. Jump to section: When to use MRP MRP Data Requirements MRP Settings Batching The MRP Process When to use MRP The MRP Process is often performed by a business' ERP system. In this case, PlanetTogether is not used for this process, and jobs and purchase orders are imported from their external system. However, there may be times where performing MRP in PlanetTogether rather than the ERP system is preferable. Here are some points to consider when deciding which platform is best suited to perform MRP: How well is the ERP system's MRP function working for your business? If the current MRP process is working well for your business, it is probably better to continue using it as converting to a new MRP process requires an additional effort that may not be worth the time or cost. However, if the current process does not work, it would be preferable to use PlanetTogether to perform the MRP process. Do the jobs and/or purchase orders created in PlanetTogether need to be created in the ERP system as well? If yes, then there are two options to include the jobs/purchase orders in the ERP system: (1) manually enter them based on the suggestions from PlanetTogether or (2) import them from PlanetTogether. Option (1) is acceptable for small order volumes, but it is highly error-prone and time-consuming for large order volumes. Option (2) is usually preferred since it reduces time and the error risk of manual entry; however, some ERP systems do not have the ability to import this type of data. Does the MRP process in PlanetTogether offer benefits over the ERP-based or manual processes? Some of the common benefits of using PlanetTogether's MRP are (1) the simplicity of a "single-click" process than plans materials and resources in a cohesive system, (2) the speed of the MRP process performed by PlanetTogether, and (3) the plan that results from planning material and capacity together, rather than creating an infinite capacity material plan in an ERP system and then planning finite capacity in PlanetTogether. MRP Data Requirements To run MRP in PlanetTogether, the following data elements are required to be used as inputs: Warehouse(s). One or more warehouses must exist in the data model. Item(s). One or more items must exist in the data model. Inventory(ies). One or more inventories must exist in the data model. Inventories which must be processed by MRP need to have some properties defined: MrpProcessing: This specifies whether MRP should generate Purchase Orders or Jobs to supply the Item. Set this to GenerateJobs for items whose demands need jobs generated. The assigned TemplateJobExternalId routing template will be used to generate jobs to satisfy demands. Set this to

GeneratePurchaseOrders for items whose demands need purchase orders generated. Assign a PurchaseOrderSupplyStorageAreaExternalId to define which storage area the purchase orders should be stored in. ForecastConsumption is an optional property. This specifies how MRP should consume forecasts before the MRP logic is executed. For more information, see: [Inventory Mappings](#). Routing Template(s). Any item whose demands need jobs generated to satisfy must have an associated routing template which produces the item. A routing template (or job template) is best configured to be the minimum amount of time and material in order to produce the minimum amount of the product or item. When MRP generates jobs, it scales up required quantities and product output quantities according to the values defined in the template and the required quantity of the demand signals. The routing template must contain at least one manufacturing order, one operation, and produce a product. If using MRP to generate supplies for dependent demand (materials used by jobs), then material requirements are required in job operations. Using MRP to generate supplies for independent demand requires preserved jobs, sales orders, forecasts, and/or inventory safety stock to represent the demand. MRP Settings See the MPS/MRP Optimize Plan Settings page for detailed information on the various settings which can be customized to achieve the most desirable behavior. Batching MRP can be configured to support the batching of multiple demand signals into fewer supplying jobs or purchases. In order to enable batching, each of the four Item properties must be given a value greater than zero: Batch Size: The incremental size of each batch that can be produced or purchased. Jobs and purchase orders must be in integer multiples of this value. Batch Window: The amount of time from the need date of the first demand that other demands should be considered for batching. Minimum Order Quantity: The minimum job or purchase order quantity for each MRP-generated supply for the item. Maximum Order Quantity: The maximum job or purchase order quantity for each MRP-generated supply for the item. During MRP job and purchase order generation, demands will be batched together based on the criteria defined in the four properties noted above. Portions of demand signals can be batched into a job or purchase order in order to stay within the item's Maximum Order Quantity constraint. The remainder of partially batched demands will become part of another batch. Batch Rounding After all adjustments fitting into a batch are calculated, batch rounding occurs to round up the job's quantity to an integer multiple of the item's batch size. If the resulting batched total quantity is less than the item's Minimum Order Quantity, the batched quantity will round up to meet the Minimum Order Qty requirement. Rounding notes are added to the job, and any rounded-up quantity can be used for further allocation. The MRP Process When using the MPS/MRP Optimize feature, the system will create jobs and/or purchase orders and then schedule them according to the optimization settings and sequencing plan(s) rules defined. Additional information on the MRP Optimization settings can be found here. The MRP Process steps include: Jobs/POs are deleted: If generating jobs, all jobs not marked as "Preserved" in the MRP/MPS Settings are deleted. Likewise, all purchases to stocks which are neither Firm nor Closed are deleted if generating purchase orders. MRP Notes are cleared: MRP notes from the previous MRP run are cleared from inventory records in all warehouses. Material Constraints set to Non-Constraint: All scheduled jobs have their material requirement constraint type set to "Non-Constraint" to remain where they are in the MRP process if they are supplying jobs or purchase orders are deleted. Low-Level Codes are calculated: If generating jobs, Low-Level Codes are calculated in the following way: Each item has its LLC initialized to -1. A Level-Zero list is created using templates and is not used as materials for other templates. These items have their LLC set to zero. Each level-zero item has its list of materials scanned to set the LLC of the materials used by it and its materials. The LLC of each item is increased if it is deeper in the level-zero item's BOM than all of the previous level-zero items analyzed so far. Any item that still has its LLC set to -1 has its LLC set to one number higher than the highest LLC number. Note: In versions 11.45.1 and later, the Job's Low-Level Code can be displayed in the Jobs View column. Initial Optimization is performed: This creates a starting point with the current demands and supplies that have not been deleted. If generating Jobs: The following occurs for each low-level code from zero to the maximum number: Jobs are created at the current low-level code. This is done for each inventory that has it is MRP Processing set to "Generate Jobs" and has a template manufacturing order: MRP Notes: The inventory's MRP Notes are set to "MRP Processed as Manufactured/JobTemplate Item: ." Inventory Adjustments up to the MRP Cutoff are used: An inventory adjustment is a decrease or an increase in the projected inventory based on a demand (sales order, forecast, job material requirement, transfer out) or a supply (job product, purchase to stock, transfer in). Negative and positive inventory adjustments up to the MRP Cutoff date are used. Inventory is allocated: Any on-hand inventory above the Safety Stock is chronologically allocated to negative adjustments from the earliest to the latest. Partial allocations can also occur if there is not enough inventory to cover a single adjustment fully. Un-allocated positive adjustments are allocated: Any unallocated positive adjustments (not safety stock jobs) are allocated to the remaining negative adjustments not covered by the on-hand inventory. If a positive adjustment is

a job product allocated to one or more negative adjustments and is not released, then the job's need date is set to the first date on which the allocation occurs. New Jobs are created to supply remaining negative adjustments: If there are remaining negative adjustments after allocating on-hand inventory, existing positive adjustments, or new/unscheduled/excluded/failed to schedule jobs, then a new job is created the following way: Need Date: The job's need date is set to one of the following, depending on what is being supplied: Activity Scheduled Start Date, Sales Order Distribution Required Date, Forecast Shipment Required Date, or the Transfer Order Distribution Scheduled Ship Date. Note: The job's need date is not changed if its commitment is set to Release or Firm. Priority: The job's priority is the priority of the sales order, forecast, or job that it was created for. If the adjustment was for a transfer order, the job's priority is set to "5". Classification: The job's classification is set to sales order, forecast, or transfer order if the adjustment was one of these. Name and External Id: The job's name and external Id are set to "MRP x," where x is the auto-incrementing numeric Id of the job. Entry Method: The job's entry method is set to "MRP Generated." Template and Flags: The job's template and Do Not Schedule flags are set to false. Commitment: The job's commitment is set to "Planned." Quantity: If the adjustment's remaining allocation quantity is less than 0.00005, it is increased to that minimum allowed value. Otherwise, the quantity of the first manufacturing order (with the lowest ID based on its creation sequence) is set to the adjustment's remaining allocation quantity. The manufacturing order's quantity is adjusted in the following way: The MO's Required and Requested quantities are set to the new quantity. A ratio of the new quantity to the MO Template Required Qty is calculated. For every path in the MO and every operation in each path, the products, activities, and material requirements are adjusted to the new quantity. Note: rounding may occur here based on the scenario options precision settings. Operation Attributes: The operation attributes are "rolled-up" into the job recursively as needed based on each item's setting for "RollupAttributesToParent." Warehouse: For each product of each operation in the job, the warehouse is set to the warehouse where the source negative adjustment occurs. Note: if the item in a product is not stocked in the adjustment's warehouse, then it is not changed from the original template value for the warehouse. Batching: If an item is set up for Batching (when Batch Size, Batch Window, and MinOrderQty > 0 and MaxOrderQty >= MinOrderQty), then the following occurs to batch together multiple negative adjustments in one job: Adjustments are batched chronologically into one job as long as the following are true: The adjustment date/time is within the Batch Window (all Job Need Dates <= Adjustment DateTime < New Job Need Date + Item Batch Window) The combined quantity of the resulting job is equal to or less than the item's Max Order Qty. A portion of an adjustment can be batched into a job rather than the full adjustment quantity to stay within the item's MaxOrderQty constraint. Batch Rounding: After all adjustments fitting into a batch are calculated, batch rounding occurs to round up the job's quantity to an integer multiple of the item's batch size. If the resulting batched total quantity is less than the item's MinOrderQty setting, the batched quantity will round up to meet the Min Order Qty requirement. Rounding notes are added to the job, and any rounded-up quantity can be used for further allocation. Notes are added to each job to indicate the reasons for the jobs being created. Safety Stock Requirement: If the inventory has a safety stock requirement greater than zero, then the following steps are taken: Optimize: If new jobs were created, then a schedule optimization occurs to create an updated inventory plan. A safety stock job is created if the on-hand inventory plus excess scheduled production is less than the safety stock. Need Date: The job's need date is set to the PlanetTogether clock. Priority: The job's priority is set to the inventory safety stock job priority. Classification: The job's classification is set to "Safety Stock." Operation Attributes: The operation attributes are "rolled-up" into the job recursively as needed based on each item's setting for "RollupAttributesToParent." Warehouses: For each product of each operation in the job, the warehouse is set to the warehouse where the source negative adjustment occurs. Auto-Splitting: Jobs are auto-split if the item's job auto-split quantity is greater than the job's first manufacturing order's required quantity. New manufacturing orders are created for the job by splitting off manufacturing orders with a JobAutoSplitQuantity until the JobAutoSplitQuantity is reached for the original manufacturing order. Notes are added to the new manufacturing orders to indicate Auto-Splitting created them. If any manufacturing order has a required quantity less than the item's Min Order Quantity, then: If the quantity short is less than or equal to the item's Min Order Qty Roundup Limit, the manufacturing order's required quantity is increased to the Min Order Qty. Otherwise, the job is marked as "Do Not Schedule," and notes are added to indicate that the required quantity is too low. Material Requirements & Optimization: Material requirements are set to "Non-Constraint," Optimization is performed to schedule the newly generated jobs and update the resulting inventory plans. If generating Purchase Orders: Purchase to Stocks are generated in the following way for each warehouse and each inventory that has its MRP processing set to "Generate Purchase Orders": MRP Notes: The inventory's MRP Notes are set to "MRP Processed as Purchased Item: ." Optimize: If job generation was not enabled in the optimize settings, then an optimize is

performed here to reflect the optimize results on the purchase orders generation. This is, so the purchase order dates are based on the schedule after being optimized with the new settings. Delete purchase orders: Any purchases to stocks that are not set to Firm or Closed are deleted. Inventory Adjustments up to the MRP Cutoff are used. Inventory is Allocated: Any on-hand inventory is allocated to negative adjustments. If an adjustment is within the lead time, then all on-hand inventory may be allocated to it. Only inventory above the safety stock may be allocated if an adjustment is outside the lead time. The rest is reserved for safety stock. Partial allocations are allowed. Purchase To Stocks are created for the remaining adjustments to satisfy safety stock requirements: Name and External Id: Are set to "MRP x," where x is the next numerically generated Id. Qty Ordered: The quantity ordered is set to the quantity needed. Required Date: The required date for the safety stock purchase order is set on the PlanetTogether clock. Min Order Quantity is set the following way: If the quantity short is less than or equal to the item's Min Order Quantity Roundup Limit, then the Purchase To Stock Quantity Ordered is set to the item's Min Order Quantity, and the purchase to stock notes are modified to indicate this. If the quantity short is greater than the item's Min Order Quantity Roundup Limit, then the Purchase To Stock Quantity Ordered is set to the original quantity ordered plus the item's Min Order Qty Roundup Limit, and the purchase to stock notes are modified to indicate this. Batch Rounding is performed. Material Requirements returned to their original values: Material requirements that were changed to "Non-Constraint" are set back to their original values if new jobs and purchases to stocks were created. Optimization: a final optimization is performed to create a constrained and optimized schedule based on all information and constraints applied. Warnings: If any warnings are needed due to data issues, then the warnings are shown in the user interface System Message window. Each job created during MRP now stores the original demands that led to the job's creation and shows both of these in the Job Dialog: Original Demand: For level-zero jobs, these are the demands (i.e., sales orders, forecasts, etc.) that caused the job to be created. For level 1+ jobs, these are the original demands of the parent jobs at the time of the sub-job's creation. Pegged Demands: These are the demands of jobs currently supplied by the job (through material relationships or successor manufacturing order relationships). Special Cases and Considerations: If an item is specified as a material in a template, it is assigned the lowest Low-Level Code. This means that the item is planned after other levels and can potentially miss demand for itself. If an item has multiple templates, then the template with the lowest Job ID (the first created) is used to set the Low-Level Codes for its inventories. See Also MPS/MRP Optimize Plan Settings Warehouse Mappings Item Mappings Inventory Mappings Job Mappings Material Mappings Product Mappings Forecast Mappings Sales Order Mappings

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## Concepts > Publishing

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## Export and Publish Overview

### Source

Key Concept Data from any scenario within an instance workspace may be exported to various external sources. Data exports are primarily used for creating custom reports and updating external systems. The Exports can be invoked from the Publish menu in the user interface, or even programmatically from a custom program by submitting a Transmission to PlanetTogether requesting a Publish to occur. Data can be exported to a primary SQL publish database, or it can be exported to an Analytics SQL database. The exported data in either case is the same and is exported in the same format, but the Analytics database can be used more strategically for reporting purposes while the primary publish destination might be configured to only retain the most recently published schedule. Prerequisites Publish and/or Analytics Database Creation A SQL Server administrator must first create the Publish and/or Analytics export destination databases. It's recommended they follow the guidelines in the Standard Publish Database article to do so. Instance Workspace Configuration A PlanetTogether server administrator must first configure the instance workspace from the Instance Manager with database connection string information to connect to the instance workspace to the desired export destination database(s). Export data to Publish or Analytics destinations Publish options are available from the Publish menu in the main toolbar of the user interface: Ask which Resources to Publish when publishing: When enabled, a popup dialog will appear each time a user clicks to Publish or Publish Analytics which allows them to select one or more resources whose schedule should be published. When disabled, the schedule data of all resources is published. Publish objects dated within the next: Define the length of time from the start of the current PlanetTogether schedule clock that the publish logic should consider when publishing schedule data. Scheduled jobs data will be published if their scheduled start date is within this time period. Purchases to stock data (purchase orders) will be published if their scheduled receipt date is within this time period. Sales order data will be published if their required available date is within this time period. All objects without a date association are published (Plants, Departments, Resources, Customers, etc.). Browse Publish Data: Open a popup dialog to preview the data that will be published. The data is presented in grid form where each SQL table is presented as a separate grid. Publish: Initiate a data export to the configured Publish Destinations (from Publish Options). This will also simultaneously publish to the Analytics database if the publish option to Publish to Analytics Database is enabled. Publish Analytics: Initiate a data export only to the configured Analytics database. Detailed settings are available from the Publish Options section of System Settings: See Also Standard Publish Database System Settings Main Toolbar Instance Manager

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## Concepts > Reporting

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## Automatic Activity Reporting and Finishing

### Source

Key Concept PlanetTogether allows users to automatically update the progress of activities as work is completed on the shop floor. Automatic activity reporting occurs whenever the clock is advanced beyond the start of a scheduled activity. Optionally, activities may also be configured to automatically finish if/when the clock is advanced beyond the scheduled end date of the activity. There are two types of activity reporting: Quantity-Based Reporting which reports progress based solely on quantities completed, and Time-Based Reporting which reports progress based on both quantities and hours of work completed. If a Time (Hours) or Quantity is reported, but the activity status is not set to "Finished", then the scheduled length of the activity block will be adjusted based on the reported values. Note: This feature is based on operation cycles. For any progress to be reported, one cycle must be completed. The amount of progress reported will be determined by the number of full cycles of the activity can be completed in the amount of time between the scheduled start date and the PlanetTogether schedule clock date after the clock advance completes. Example: Cycle Time = 1 Hour Job = Scheduled for 3 Hours (i.e. 3 cycles)

Scenario 1: Clock advances +30 mins Because the clock advanced by less than a complete cycle time, no quantities or hours will be reported, and the Gantt activity block will not shrink. However, the start time will be reported.

Scenario 2: Clock advances +1 hour In this case, the clock advances by one complete cycle, so the activity block on the Gantt will shrink by one-third (depending on the resource capacity intervals). Therefore, there will also be a Reported Goods Qty equal to the quantity produced after 1 cycle and a Reported Hrs of 1 hour.

Configuration There are two options to configure automatic activity progress reporting in your data model: A global setting can be configured in a user's preferences which will apply to all jobs Individual operations can be configured to be allowed to report progress when the clock advances User Preferences A user administrator may edit any user's preferences from the User Preferences tile on the Users board, or any individual user may access and edit their own user preferences from the User Preferences dialog accessible from the User Menu of the main toolbar. Options under the Clock Advance section are available to Auto Report Progress and Auto Finish:

- Auto Report Progress: When enabled, progress will be automatically reported when the clock is advanced beyond the scheduled start date of any scheduled activities.
- Auto Finish: When enabled, activities will be finished automatically when the clock is advanced past their scheduled end date/time.

Operation Settings Automatic activity progress reporting can be configured for specific job operations if/when it may not be appropriate to enable globally for all operations. Time-based reporting can also optionally be enabled at the operation level. These settings can be imported into the data model via the Resource Operation Mappings, or configured or visualized in the client application from the Status tab of the Operation settings in the Job Details Dialog:

- Automatically Report Progress when Clock Advances past Scheduled Start: When enabled, progress will be automatically reported when the clock is advanced beyond the scheduled start date of any scheduled activities.
- The Reported Quantities and Hours are subtracted from the Required Quantity and Required Hours fields to calculate the Remaining Quantity and Hours.
- Automatically Finish when Clock Advances past Scheduled End: When enabled, activities will be finished automatically when the clock is advanced past their scheduled end date/time.

See Also Activities Board User Management Job Details Dialog Resource Operation Mappings

## Concepts > Resources, Departments, & Plants

## Capabilities

### Source

Key Concept A capability is defined by the type of work or skill that a resource can do. Each resource may have one or more capabilities, and individual capabilities may be assigned to multiple resources. Each operation's resource requirement indicates one or more required capabilities that a resource must have to be considered eligible to run the operation. Therefore, for an activity to schedule on a resource, the operation must reference the number of resources required and those resources' capabilities. Capabilities typically correspond to work centers in an ERP system. Still, they can also be created for special product attributes such as item classes, material types, or other constraints that defined whether a resource can perform a particular task.

Data Object Management Capabilities, Capability Assignments, Operations, Resource Requirements, and Capability Requirements are created or imported as data objects.

Capabilities: Define the type of work or skills.

Capability Assignments: Assign capabilities to resources to indicate what type of work each resource is eligible to perform.

Operations: Job operations define processing steps of a manufacturing order. Each manufacturing order contains one or more operations.

Resource Requirements: Resource requirements specify the number of production resources that are required to operate. Each operation must have at least one resource requirement, considered the primary requirement.

Capability Requirements: Capability requirements specify the required capabilities of each resource requirement. Each resource requirement must have at least one capability requirement.

Multiple Capability Requirements If two or more capabilities are required for a single resource requirement of an operation, a resource must have all of the required capabilities assigned to it in order for it to be considered eligible to perform the work.

Data Import Capability objects are imported via Capability Mappings logic

Capability Assignment objects are imported via Capability Assignment Mappings logic

Operation objects are imported via Resource Operation Mappings logic

Resource Requirement objects are imported via Resource Requirement Mappings logic

Capability Requirement objects are imported via Required Capabilities Mappings logic

Manual Creation Capabilities can be created and modified from the Capabilities tile of the Scenario Data Board. The same time is used to assign capabilities to resources.

Operations can be created and modified by creating or editing a Job from the Jobs Board.

Operations are created and modified from the Job Details Dialog. This is where Resource Requirements and Capability Requirements of the operation are also configured.

See Also Job Structure Plants, Departments, and Resources

Capability Mappings

Capability Assignment Mappings

Resource Operation Mappings

Resource Requirement Mappings

Required Capabilities Mappings

Scenario Data Board

Jobs Board

## Helper Resources

### Source

Key Concept Operations which require more than one resource to complete the work are considered to have a Primary resource along with one or more Helper resources. The Primary resource is defined by the resource that is time-constrained as it determines the run time of the operation. The Helper resources can be machines or laborers or both. Jump to section: Configuration Scheduling Visualize in Gantt Configuring Helper Resources Define Primary Resource: The user can define primary resources in the Job dialog (Operation → Resources → Resource Requirements → Primary), or the value may be imported via the PrimaryRequirement property of the Resource Requirement Mappings. Only one requirement can be deemed the Primary. Adding a Helper Resource for an Operation: Click the "+" plus sign in the bottom left corner of the Resource Requirements grid Select which capabilities are required of the new helper resource from the pop-up pane Save and Close Setting Usage Start and End for Helper Resources: Helper resource requirements can be configured to start and end at different times than the Primary resource by changing the UsageStart and UsageEnd properties. The Primary resource requirement must always start at Setup and end at PostProcessing, Storage, or StoragePostProcessing (one of the latter if the operation produces a product that gets stored in a Tank resource). UsageStart defines when the Operation starts using the required resource. This must be less than or equal to the UsageEnd value. UsageEnd defines when the Operation is finished using the required resource. This must be greater than or equal to the UsageStart value. Setup: Start or End usage of the resource during the Operation's Setup phase Run: Start or End usage of the resource during the Operation's Run/Cycle phase PostProcessing: Start or End usage of the resource during the Operation's Post-Processing phase Storage: Start or End usage of the resource during the Operation's Tank Storage phase. This is not valid to use on any operation that does not produce a product that is stored in a tank resource. StoragePostProcessing: Start or End usage of the resource during the Operation's Tank Storage Post-Processing phase. This is not valid to use on any operation that does not produce a product that is stored in a tank resource. Example: If a worker (labor Helper resource) is required only during the setup phase of an operation, then the UsageStart and UsageEnd fields would both be set to Setup. Scheduling Operations with Helper Resource Requirements The Online Capacity (calendars) of the required resources may dictate which gets set as the Primary and which are considered the Helpers. The Primary resource and its Helper resources must all be available (Online) at the same time for the operation to schedule. Therefore, when running an optimize, the PT scheduler uses the Online capacity of the Primary resource requirement to determine when the Helper(s) must also be Online. Any length of time where the PT scheduler can schedule the operation on an Online interval on the Primary requirement, the Helper(s) must also be Online for the same duration. If not (if there is any interruption at all and the Helper goes offline while the Primary is Online), then the operation is not considered eligible to schedule at that point in time. As a best practice, the capacity of the Helper(s) and the Primary resources should be in sync so that they're always Online and Offline at the same time, though this may not always be practical. Note: A Helper resource's Online capacity must be able to match that of the Primary resource in order for a job to be eligible to schedule at any point in time. If the Helper resource's Online capacity does not align with the Primary resource's Online capacity where a job first tries to schedule then the system will continue to attempt to schedule the job at a later point in time to where the Helper resource capacity matches that of the Primary. If there is no such point in time then the job will be scheduled past the planning horizon. Visualizing Helper Resources in the Gantt If an operation uses one or more helper resources, clicking once on any scheduled activity block in the Gantt with the Show Activity Links option enabled will draw a blue activity link between the two scheduled activities. See Also Resource Requirement Mappings Allowed Helpers Gantt Board

## Multi-Tasking Resources

### Source

Key Concept Multiple operations running concurrently on the same resource can be modeled in PlanetTogether with a combination of resource, operation, and capacity interval configurations. A single resource in PlanetTogether may be restricted to running a specific number of operations at any given time (the number of

which may even change over time), or a resource can be configured to run an infinite number of simultaneous operations. While there are many possible use cases for multi-tasking resources, one practical use case is modelling a labor resource as a pool of laborers. There may be an expected number of people working each shift who all have the same capabilities to work on certain jobs or operations, in which case they might all be modeled as a single labor pool resource whose capacity to handle multiple operations simultaneously scales up and down with the number of people available on each shift and the number of people required to work on each job or operation. Jump to section: Resource Configuration Attention Percent Number of People Infinite Capacity

**Resources Resource Configuration** A multi-tasking resource's Capacity Type property must be set to one of these values depending on whether its capacity is finite or infinite:

- **Multi-Tasking:** A finite number of activities can be scheduled to run at the same time based on available capacity and each operation's requirements.
- **Infinite:** Any number of activities may be scheduled to run at the same time. Sequence Dependent Setup is not allowed for Infinite or Multi-tasking resources, so when either of these Capacity Types are defined, the resource must also be configured to either Always or Never incur setup time on its scheduled operations via the Setup Included property.
- **Always:** Setup time is always incurred on scheduled operations according to the operation's configured setup time.
- **Never:** Setup time is never incurred on scheduled operations. These values can be imported via Resource Mappings, or modified manually from the Capacity Planning Board's Resources grid tile when switched to Edit Mode:

**Special Considerations** Setup time may be scheduled on a multi-tasking resource, but cannot be calculated in a sequence-dependent manner. When multiple activities schedule to run simultaneously their activity blocks stack on top of each other in the Gantt chart. If many activities schedule to run at the same time then it can be difficult or impossible to read the Gantt labels or to even select a specific desired activity block from the stack. This is especially true of Infinite capacity resources. Multi-tasking resources can create confusion when moving scheduled jobs around because the activities on the multi-tasking resources may switch their position in the Gantt chart from top to bottom or vice-versa based on the exact timing. Scheduling many operations on multi-tasking resources can significantly slow down the performance of the Optimize function since it has to factor in additional levels of capacity complexity. If performance becomes an issue, consider converting multi-tasking resources into many separate single-tasking resources. Multi-tasking resources support the "IfSchedulable" customization. If the function returns false, it won't be used to satisfy the resource requirement, regardless of the resource. It's possible for the Optimize logic to encounter a situation where a released operation repeatedly cannot be scheduled at the time the optimizer tries to schedule it due to its attention percent or number of people being greater than what is available on the resource due to other scheduled operations. It may continuously find other operations to schedule on the resource which are eligible but which then cause the same effect the next time the optimizer tries to schedule the original operation that it tried earlier. This may continue indefinitely until the operation is forced to schedule past the planning horizon due to a lack of available capacity. Keep this in mind if one or more jobs that require a multi-tasking resource are scheduling past the planning horizon, especially if they don't have any constraining material requirements.

**Attention Percent** One option to schedule multiple operations to run simultaneously is to define the Attention Percent on each operation which is eligible to run on a multi-tasking resource. The Attention Percent is the amount of the resource's "attention" or capacity required to run the operation. A resource is assumed to have a maximum attention percent of 100%, so the number of operations that may schedule simultaneously on a multi-tasking resource will be determined by how much of the resource's attention is required to perform each operation. The sum of the attention percent of all concurrently scheduled operations at any point in time may never exceed 100%. The Attention Percent of the operation can be imported via the Resource Requirement Mappings, or set manually in the Operation → Resources → Resource Requirements tab of the job dialog.

**Number of People** Another option to schedule multiple operations to run simultaneously is to define the number of people that are required to run each operation, then also define the number of people that are available at each online capacity interval shift. The PlanetTogether optimizer will then allow multiple activities to schedule on the resource as long as it has at least the required number of people available on the capacity interval.

**Activity Settings** There are two properties of the operation's activity(ies) that need updated in order to configure it to use a specific number of people:

- **People Usage:** Set the property to one of two values:

  - **Use Specified Nbr:** Only up to this number of the Resource's Capacity Interval's available people are allocated to the Activity. This is not a scheduling constraint. If there are fewer than this number available and there are no other activities scheduled on the resource, all of the people in the capacity interval will be allocated to the Activity and the activity's cycle time will be lengthened by a factor of the missing number of people.
  - **Use Multiple Of Specified Nbr:** A multiple of NbrOfPeople will be used. For instance, if an activity's NbrOfPeople is 4 and the resource's capacity interval has 11 people . 8 people will be used to process the activity. This is a scheduling constraint. If the capacity

interval does not have at least the specified number of people available then the activity will be considered ineligible to schedule there. Nbr of People: Define the specific number or the multiple increment that should be used when scheduling the operation. These properties are imported via the Internal Activity Mappings, or configured manually from the Operation → Status section of the job dialog: Capacity Interval Settings A specific Nbr of People can be defined on each occurrence of each Capacity Interval assigned to the multi-tasking resource. This will determine the maximum number of operations that may be able to schedule to run simultaneously on the capacity interval according to each operation's required number of people. This property is imported via Capacity Interval Mappings or Recurring Capacity Interval Mappings, or configured manually from the Capacity Interval Dialog which is accessible from the Capacity Interval management tiles of the Scenario Data Board, or from the Gantt Board by right-clicking any capacity interval and choosing either the Open Occurrence or Open Series option. Infinite Capacity Resources A resource whose Capacity Type is designated as Infinite is assumed to be able to schedule as many operations to run concurrently as demand requires of it at any point in time during an online (or overtime) capacity interval. See the Resource Configuration section of this article for details on how to configure a resource to have infinite capacity. The Gantt chart may get a bit crowded with many activity blocks stacked on top of one another. See Also Capacity Planning Board Resource Capacity Gantt Board Scenario Data Board Resource Mappings Resource Operation Mappings Capacity Interval Mappings Recurring Capacity Interval Mappings

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## Plant Stability

### Source

**Key Concept** When creating a schedule, it may be preferable to avoid making last-minute disruptions unless there is a problem such as a machine breaking down or a need to rush a crucial order through. Having too much volatility in the schedule in the short term is inefficient as it can create confusion and nervousness on the shop floor. PlanetTogether provides options to control the stability of the short-term schedule using "Frozen" or "Stable" time spans to prevent too many last minute changes. Jump to section: Department Frozen Span Plant Stable Span Department Frozen Span The Frozen Span represents a window of time at the beginning of the schedule, typically representative of a time span which should only ever have very few, if any, schedule changes made to it. With the appropriate settings in place, the Frozen Span can be reserved for manual scheduling so that Optimize and other automated functions do not impact any operations already scheduled there, but operations may be manually dragged and dropped in and around the Frozen Span area. The Frozen Span is assigned per Department and is visualized in the Gantt by a light blue overlay which starts at the beginning of the schedule and ends after the specified Department Frozen Span duration. In order to preserve the scheduled order of operations inside of the Frozen Span, schedule optimization can be configured to start optimizing at the end of the Frozen Span. From the Schedule dropdown, choose the option to Optimize Activities Starting At the End of the Frozen Span, then each time Optimize Schedule is performed, the Optimize logic will preserve the activities which are scheduled to start inside of the Frozen Span and will only optimize the sequence of the schedule thereafter. A similar setting can be configured for the Compress function which will result in only those activities scheduled within the Frozen Span being compressed while all other scheduled activities remain scheduled at their current time: Each Department in the data model is to be assigned a Frozen Span duration. This duration is typically imported with each department configuration via the Department Mappings, or the Frozen Span value can be edited in the user interface using Grid Edit mode in the Departments tile of the Scenario Data Board. Since it's not possible to filter on unique grid rows only, a single Department or Plant may be represented in the Resources grid many times (as in the screenshot above where there is 1 Plant and 2 unique departments but 12 grid rows - one row per Resource in each Department). In these cases, when editing a Department or Plant property in Grid Edit mode, only one of the grid rows needs to be modified, then when the edit is saved the change will automatically be applied to all relevant grid rows. System Settings Two System Settings can be configured for all users to enforce automatic locking and/or anchoring of activities which are scheduled to start inside of the Frozen Span to further enhance the stability of the schedule inside of the Frozen Span. Plant Stable Span The Plant Stable Span is specific to each plant in the data model and functions much like the Frozen Span does. It applies to all Resource of all Departments within the Plant and acts as an additional buffer to the Department Frozen Span. The Plant Stable Span is visualized in the Gantt by a light green overlay which starts at the end of the Department Frozen Span (or at the beginning of the schedule if no Department Frozen Span is defined) and ends after the specified Plant Stable Span duration. In order to preserve the scheduled order of operations inside of the Plant Stable Span, schedule optimization can be configured to start optimizing at the end of the Stable Span. From the Schedule dropdown, choose the option to Optimize Activities Starting At the End of the Plant Stable Span, then each time Optimize Schedule is performed, the Optimize logic will preserve the activities which are scheduled to start inside of the Plant Stable Span and Department Frozen Span and will only optimize the sequence of the schedule thereafter. A similar setting can be configured for the Compress function which will result in only those activities scheduled within the Plant Stable Span and Department Frozen Span being compressed while all other scheduled activities remain scheduled at their current time: The Plant Stable Span duration is typically imported with each department configuration via the Plant Mappings, or the Stable Span value can be edited in the user interface using Grid Edit mode in the Plants tile of the Scenario Data Board. See Also Locking and Anchoring Capacity Planning Board Scenario Data Board System Settings

## Plants, Departments, and Resources

### Source

Key Concept Resources in PlanetTogether represent the machines, laborers, workstations, tools, or other equipment which perform the work required on the factory floor. Each are assigned one or more Capabilities which determines the type of work that the resource is allowed to perform. Departments are a means to help to organize the grouping of resources in whatever manner makes the most sense for an organization. Their only impact on scheduling is the ability to set a frozen zone unique to each Department. Typically, Departments in PlanetTogether correspond to ERP work centers. Lastly, a Plant is meant to represent an entire facility or location where production occurs. It is usually synonymous with a single physical factory. However, in PlanetTogether, a Plant consists of any number of Departments that contain any number of Resources used to produce goods. A Plant also defines the scope of an Optimization. Optimization can be run on one or more Plants simultaneously, but not limited to only part of a Plant. PlanetTogether is designed to accommodate manufacturers with multiple plants whose processes are interconnected with one another. Data Object Management Plants, Departments, and Resources are created or imported as data objects. Note that once Resources are created, they cannot be assigned to other departments. Similarly, Departments cannot be reassigned to other Plants in multi-plant models. When reassessments are necessary, the Departments or Resources which need reassigned must be deleted and recreated under the appropriate Plant or Department parent object. Data Import Plant objects are imported via Plant Mappings logic; Department objects via Department Mappings; And Resource objects via Resource Mappings. Manual Creation Plants can be created and their properties modified from the Plants tile of the Scenario Data Board. Departments can be created and their properties modified from the Departments tile of the Scenario Data Board. Resources can be created and their properties modified from the Resources grid of the Capacity Planning Board. See Also Plant Stability Capacity Planning Board Gantt Board Scenario Data Board

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## Resource Capacity

### Source

Key Concept Resource capacity is defined by the intervals of time where resources are available to work on jobs and how much work can be scheduled at each interval. Thus, resource capacities are determined by a combination of the Resource Properties and Capacity Intervals. Jump to section: Associated Resource Properties Capacity Intervals Types of Capacity Associated Resource Properties If necessary, resource properties may manually be modified via Grid Edit Mode from the Capacity Planning board. Capacity Type: Specify if a resource has an infinite or finite capacity and whether the resource is single-tasking or multi-tasking. Infinite: The resource can perform any amount of work simultaneously. SingleTasking: The resource can only perform one activity at a time. That activity must be completed before additional work can be done. MultiTasking: The resource can perform multiple activities simultaneously based on the Number of People assigned to Online or Overtime capacity interval shifts assigned to the resource, or based on the operation's resource requirement Attention Percent property value. The attention percent is a numerical value for how much of the resource's attention is devoted to that activity. This feature can accommodate resources that have many people working at the same time. For example, if you have a resource with four people during the work shift, you can have four jobs running on the resource simultaneously. Suppose one person is not available for a change. In that case, you can quickly change the number of people assigned to that resource by modifying the number of people available on the capacity interval. The schedule will automatically update to allow fewer operations to run simultaneously on the resource. Efficiency Multipliers: These are resource-wide modifiers of the setup and cycle times that can be changed to reflect whether resources run faster or slower than usual. Setup Time: This value can be changed to reflect whether the setup time of the resource is faster or slower than usual. Values greater than one represent a resource setup that is faster than usual, while values less than one represent a resource setup that is slower than usual. Cycle Time: This value can be changed to reflect whether the run/cycle time of the resource is faster or slower than usual. Values greater than one represent a resource running faster than usual, while values less than one represent a resource running slower than normal. Understanding "25% Faster" Speed Increase: If something is

25% faster, it means the speed has increased by 25%. Time Decrease: However, this does not mean the time decreases by 25%. Instead, the time decreases by a factor related to the inverse of the speed increase. Why the Time Doesn't Decrease by 25% When you increase the speed by 25%, you're multiplying the original speed by 1.25. Since time and speed are inversely proportional (assuming the same amount of work or distance), the new time is calculated by dividing the original time by the speed multiplier. Mathematically: New Time=Speed MultiplierOriginal Time Calculating the New Runtime Given: Original Runtime = 60 minutes Speed Multiplier = 1.25 (25% faster) Step-by-Step Calculation: Calculate the New Runtime: New Runtime=1.2560 minutes=48 minutes Determine the Percentage Decrease in Time: Time Decrease Factor: Time Decrease Factor=1–(Speed Multiplier1 )Time Decrease Factor=1–(1.251)=1–0.8=0.20 or 20% Time Decreased by 20%, Not 25% Verify the Decrease in Time: Time Reduction=60 minutes×20%=12 minutesNew Runtime=60 minutes–12 minutes=48 minutes Addressing Your Calculation When you calculated 25% of 60 minutes as 15 minutes and subtracted it from 60 minutes to get 45 minutes, you're assuming that a 25% increase in speed results in a 25% decrease in time. However, due to the inverse relationship between speed and time, this isn't the case. To achieve a 25% reduction in time, you need a greater increase in speed. Calculating the Required Speed Multiplier for a 25% Time Reduction: Desired Time Reduction Factor: Desired Time Reduction Factor=1–0.25=0.75 Calculate the Required Speed Multiplier: Required Speed Multiplier=Desired Time Reduction Factor $\approx$ 0.751≈1.3333 Check the New Runtime: New Runtime=1.333360 minutes≈45 minutes Therefore, to reduce the runtime to 45 minutes (a 25% decrease in time), you need a speed multiplier of approximately 1.3333, meaning the system is 33.33% faster, not just 25% faster. Conclusion A speed increase of 25% (multiplier of 1.25) results in a time decrease of 20%, reducing the runtime from 60 minutes to 48 minutes. To reduce the runtime to 45 minutes (a 25% time decrease), you need a speed increase of approximately 33.33% (multiplier of 1.3333). Capacity Intervals Capacity Intervals define whether a resource is Online (capable of performing work), or Offline. They may recur, or they may be configured as a one-time capacity setting or shift. They are visually represented in the Gantt board at the bottom of each resource row. Capacity intervals may be maintained manually from the Scenario Data board, or from the Capacity Tools tile in the Gantt board. Each interval or occurrence of a recurring interval may also be edited directly from the Gantt by double-clicking the specific interval, or by right-clicking and choosing to Open Occurrence or Open Series to modify its settings. From the Capacity Tools tile on the Gantt, there are two options that can be turned on; Production Stage Indicator and Constraints Indicator. Production Stage Indicator will add a color to the capacity intervals denoting which production stages the interval can be used for. If it can be used for all stages, the interval will stay its' assigned solid color. □ Tip The colors displayed for each process align with each user's Process Segment colors in the User Settings → Segments → Process Segment. Constraint Indicator will add a color segment to the capacity based on which constraints are active for the interval. Overtime: Maroon Can Start Activity: Yellow Prevent Operations from Spanning: Purple Reset Attributes Changeover: Dark Blue Use only when Late: Mauve The Capacity Interval Dialog and all of the settings that can be configured is documented in detail in the Scenario Data board page. Interval Status Online: The resource is available to perform work according to the configured interval settings and constraints. Offline: The resource is not available to perform work. If an Offline interval is placed on top of an Online interval then the Offline interval "wins" and the resource is considered unavailable. Activities whose operation allows them to span offline intervals may be scheduled here but no progress will be made on the completion of the activity for the duration of the Offline interval. Interval Settings Color: Choose any color to assign to the interval. The color can help to distinguish between different interval statuses and configurations when viewed from the Gantt. Can be dragged/resized: When enabled, the capacity interval is allowed to be dragged and resized in the Gantt by users who have permission to maintain capacity intervals, and who have the similar user settings enabled. When disabled, the capacity interval cannot be dragged and resized in the Gantt by any user. Can be deleted: When enabled, the capacity interval is allowed to be deleted by users who have permission to maintain capacity intervals. When disabled, the capacity interval cannot be deleted by any user. Timing: Start: Define the start date and time of the capacity interval. End: Define the end date and time of the interval. Duration: A calculation of the duration of the interval for quick reference. △ Note Recurring capacity intervals cannot be configured with a duration longer than 24 hours in order to prevent recurrences from overlapping with one another. Capacity Nbr of People: Defines the number of people available for the duration of the interval. If the Resource Type is set to Multi-tasking, this number will determine how many operations can run simultaneously during the interval based on each operation's People Usage and Nbr of People settings, or the resource requirement's Attention Percent setting. Capacity Hours: The interval's total capacity hours is calculated as a multiple of its Nbr Of People by its Duration. For example, if the interval duration is 8 hours and the NbrOfPeople is 2, then the interval equates to 16 hours of total capacity. Capacity Code: A Capacity

Code can be set on intervals which should only be used for particular orders or operations. An Operation's Resource Requirement Capacity Code field can be defined so that if it matches the Capacity Code set on the interval then it will be eligible to schedule there. Operations which do not have a Capacity Code defined on the resource requirement, or which have a code which does not match the interval code value will not be allowed to schedule on the interval.

**Options and Constraints**

- Overtime:** When enabled, the resource is available to perform work. Cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. When disabled, cost calculations for performing work on the interval use the Standard Hourly Cost on the resource.
- Can Start Activity:** When enabled, the interval can be used to start the first process of an activity (either Setup, if applicable, or Cycle).
- Prevent Operations from Spanning:** When enabled, the resource is not available to perform work, and no idle work is allowed to pause to span across this interval. This is typically a good option for resource maintenance or cleaning where schedulers don't want to start progress on an operation or activity, then pause for its offline maintenance, then pick back up the activity after the offline interval.
- Reset Attributes Changeovers:** When enabled, calculations which dictate sequence-dependent setups and cleans will be reset to 0.
- Use Only when Late:** When enabled, activities will only schedule on the capacity interval if they are late (the schedule clock date time is later than the activity's JIT start date).
- Used for Setup:** When enabled, the capacity interval can be used to perform Setup processes.
- Used for Run:** When enabled, the capacity interval can be used to perform Cycle processes.
- Used for Post Processing:** When enabled, the capacity interval can be used to perform Post-Processing processes.
- Used for Storage:** When enabled, the capacity interval can be used to perform Storage Post-Processing processes.
- Used for Clean:** When enabled, the capacity interval can be used to perform Clean processes. For more detail, see the Capacity Interval section of the Scenario Data board page.

**Capacity Interval Presets**

- Online:** The resource is available to perform work. Cost calculations for performing work on the interval use the Standard Hourly Cost on the resource.
- Offline:** The resource is not available to perform work. If an Offline interval is placed on top of an Online interval then the Offline interval "wins" and the resource is considered unavailable. Activities whose operation allows them to span offline intervals may be scheduled here but no progress will be made on the completion of the activity for the duration of the Offline interval.
- Overtime:** The resource is available to perform work. Cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource.
- Potential Overtime:** The resource is available to perform work. Cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. By default, Potential Overtime is no different from Overtime intervals, but with a software extension the two can have different or conditional logic applied to them.
- Maintenance:** The resource is not available to perform work. No activity may be scheduled here, not even those which are allowed to span offline intervals. Any sequence-dependent setup or clean calculations will be reset when the first operation schedules after the end of the cleanout interval. This is typically a good option for resource maintenance or cleaning where schedulers don't want to start progress on an operation or activity, then pause for its offline maintenance, then pick back up the activity after the offline interval.
- Holiday:** The resource is not available to perform work. No activity may be scheduled here, not even those which are allowed to span offline intervals. This is typically a good option for forcing work to finish before a holiday or extended break, but where the sequence-dependent setup or cleanout calculations should not be reset once work resumes.
- Cleanout:** The resource is only available to perform Clean processes. It is considered online. For more detail, see the Capacity Interval section of the Scenario Data board page.

**Overlapping Capacity Intervals**

If capacity intervals overlap on the same resource, then the following rules are applied:

- Offline intervals will always override other types of intervals.
- No activities can schedule when an offline interval is present.
- Overlapping regular online and overtime intervals will increase the total capacity for the overlapping duration. In addition, the Nbr of People for each overlapping capacity interval will be added, which will increase the total capacity hours.

**Note:** It is recommended to avoid having multiple instances of overlapping capacity intervals. If the total resource capacity needs to be increased, it is better to modify the series of intervals to reflect the desired number of people and capacity.

**Note:** Recurring capacity intervals are also called a "series." On the Gantt, recurring and single occurrence capacity intervals can be differentiated by their appearance. Periodic intervals (series) will have diagonal lines throughout the interval block, whereas single occurrences will have a solid background color.

See Also Capacity Planning Board Gantt Board Scenario Data Board Multi-Tasking Resources Helper Resources Resource Mappings Capacity Interval Mappings Recurring Capacity Interval Mappings

## Tank Resources

### Source

⚠ Alert Tank resources described in this article are deprecated in software version 12.3.0. Tanks can now be modeled as Storage Areas where Storage Area Connectors can set constraints on which resource(s) can supply or consume from which Storage Areas. Key Concept Tank Scheduling is intended for manufacturers that use large storage vats to hold liquids such as beverages, chemicals, or formula blends for an indeterminate amount of time. These tanks are considered "in use" until downstream operations empty them. With Tank scheduling, the normal Item/Warehouse inventory plan is bypassed since the storage of the material is being recorded in the tank and ultimately emptied from the tank -- the material is never stored in any warehouse. Tanks are used as indefinite storage but come with the caveat that only a single item may be stored until the tank's contents are emptied. Emptying a tank entails creating job operations that consume the item which is stored in the tank, or allowing the contents of the tank to expire based on the stored item's configured shelf life duration. Jump to section: [Tank Scheduling Overview](#) [Tank Resource Configuration](#) [Job Operation Configuration](#) [Item Configuration](#) [Tank Drainage](#) [Tank Storage Inventory Tracking](#) [Tank Scheduling Overview](#) [Tank operations](#) utilize two unique processes: Storage and Storage Post-Processing. Storage is the amount of time that the item is stored in the tank after it's been produced and before consuming operations have consumed all of its contents or it has otherwise been drained or emptied. All tank operations must have some amount of storage or else they are immediately drained and no operations are allowed to consume the items produced. Storage Post-Processing or Tank Post-Processing is an optional phase which can be configured to act as a sort of cleanout of the tank before another operation is allowed to schedule to refill it with a new item or batch. An operation which schedules on a tank will consume its online capacity for the entire Setup, Run, Post-processing, Storage, and Tank Post-processing steps. Only one operation may schedule at a time on a tank resource, and only one item may be stored in the tank. A tank's contents must be completely drained or depleted before another operation will be allowed to schedule on the tank resource. Its contents may be consumed by other scheduled operations, or its storage duration limit may be reached at which point the tank will automatically drain. The storage duration limit is defined via the Shelf Life property on the item which gets stored in the tank. When using tanks with MRP or with Lot Control, the tank's contents may automatically be drained if there are no known demands that need scheduled to consume it. Tank storage minimum and maximum capacity limits may optionally be defined at the resource level. [Tank Resource Configuration](#) A property called Tank must be set to True in order for a resource to be allowed to store material within it. Optionally, the Resource Type may also be set to Tank for informational purposes, though it is not required. A tank resource's storage capacity may be defined using the Minimum Quantity and Max Quantity properties. Only operations which produce quantities of items within this range will be allowed to schedule on the tank resource. A tank resource's Capacity Type must be set to SingleTasking. See also: [Resource Mappings](#) [Job Operation Configuration](#) [Product](#) The operation must be configured to produce a product. The product must be configured to be stored in a tank via the StoreInTank Boolean flag set to True. [Resource Requirement](#) The operation's primary resource requirement must be configured to end (UsageEnd) at either Storage or Storage Post-Processing. [Stock Material Requirement](#) The stock material requirement of the operation(s) which consume material from a tank resource must not have a Warehouse (WarehouseExternalId) defined since the tank resource is not considered a warehouse. This will allow the system to supply the material from any warehouse or tank resource when it is made available. If an operation requires more volume or quantity than are stored in a single tank resource then multiple tanks may need to supply material to the operation. Since PlanetTogether treats each tank resource as separate warehouses, the [x] MultipleWarehouseSupplyAllowed Boolean option must be set to True on the Stock Material requirement to allow multiple tanks to supply the operation. By default, material is consumed from a tank resource at the scheduled start of the consuming operation. This timing can be altered by setting a different value on the TankStorageReleaseTiming property on the material requirement. The accepted values are: AtActivityStart: Release the tank's material when the activity consuming the material starts. AtEndOfActivitySetup: Release the tank's material when the activity consuming the material has finished Setup. AtEndOfProcessing: Release the tank's material when the activity consuming the material has finished processing. AtEndOfPostProcessing: Release the tank's material when the activity consuming the material in the tanks has finished its post-processing. See also: [Product Mappings](#) [Resource Requirement Mappings](#) [Material Mappings](#) [Item Configuration](#) For any item which gets stored in a tank, its Shelf Life (ShelfLifeHrs) property must be set to define

the maximum amount of time the item may remain in storage in a tank resource. If the item is stored in a tank for this amount of time without being consumed by other operations, then the tank's contents will empty automatically. See also: Item Mappings Tank Drainage Tanks empty automatically under the following conditions: If there is only a fractional remainder left (determined by scenario rounding settings), or When using MRP or Lot Pegging, if the simulation logic cannot identify any consuming operations which require the lot that is stored in the tank then it will automatically drain after the last scheduled operation consumes material from the tank. A sample custom software package is available which allows for specifying a drainage quantity on the producing operation so that if the stored amount drops to or below the specified quantity then the tank will be drained. The drained amount will appear in the inventory plan as a negative adjustment. To request the sample package, please contact PlanetTogether Support and specify for which software version it will be used. Tank Storage Inventory Tracking Since items which are stored in tanks are never stored in a standard PlanetTogether warehouse, each tank resource's production and consumption can be tracked from the Inventory Plan Board where each tank resource is visually represented as a warehouse with inventories equal to each item that may be stored within the tank resource(s). The grid can expose certain scheduled inventory properties such as number of adjustments, total demand, total supply, etc., and the specific details of each adjustment can be visualized from the Inventory Plot Report or the Adjustments Report tiles. The Inventory Plot Report in particular will list production, consumption, and emptying adjustments, including timestamps and job details for each adjustment over time. These apparent warehouses are simply visual representations of inventory adjustments for tank resources; they do not actually become warehouse objects in the data model. See Also Resource Mappings Product Mappings Resource Requirement Mappings Material Mappings Item Mappings Inventory Plan Board

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## Concepts > Scenarios

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### Scenario Management

#### Source

Key Concept Scenarios contain all the data for the factory model, including plants, departments, resources, items, inventories, operations, and financial information. In any planning area Workspace there is allowed to be one "production" scenario which typically acts as the master data and schedule. Users may create copies of scenarios in order to perform "what-if" analyses in order to test various features or functionality or changes to production and then assess the impact of the changes. Scenarios of a Workspace are presented in a dropdown menu which is accessible from the Main Toolbar. From this dropdown menu, users can see all of the scenarios from the Workspace that they have permission to view or edit. Of those available to them, users may load them into memory, copy them, view or edit them (depending on the configured permissions), unload them from memory, delete them, and/or view various metadata related to each scenario at a quick glance (the clock date and the last action(s) performed). Jump to section: Edit Settings Share a Scenario Copy a Scenario Load and Unload a Scenario Activate a Scenario Convert to Production Delete a Scenario Edit Scenario Settings From the Scenario Edit dialog, users can change the scenario name, assign a unique color label, isolate it from clock advances, isolate it from data imports, and enable or disable Scenario Comparison. This option is removed from software version 12.2.1 and newer since only one production scenario is now allowed to exist. A new Convert to Production button is added to swap non-production scenarios with the Production scenario when a non-production scenario should be promoted to become the new production scenario. "Production" Flag Enable the Production option in the Scenario Edit dialog to show a flag in the Scenarios dropdown to indicate that it's considered a Production scenario. There are no restrictions beyond what can be defined in the Share permissions related to what users may be able to do with a scenario that is flagged as a Production scenario (including deleting it). A single Workspace is permitted to contain more than one Production scenario and is also permitted to contain no Production scenarios at all. Compare Scenario Data can be compared between the currently active scenario and any others which have the Compare Scenario option enabled. Scenario comparisons are visible in the following areas of the software: All configured Metrics via the Metrics Board All KPIs from both the KPIs Board as well as each individual KPI Tile Isolate

from Import Enable the Isolate from Import option to only allow data refreshes to the scenario if the Refresh is performed when the scenario is active. If a user clicks to Refresh All Scenarios from another scenario which is not isolated, then any isolated scenarios will not have their data refreshed. Isolate from Clock Advance Enable the Isolate from Clock Advance option to only allow clock advances in the scenario if the Advance is performed when the scenario is active. If a user clicks to Advance All Scenarios from another scenario which is not isolated, then any isolated scenarios will not have their clock advanced. Scenario Color Changing the color of Scenarios helps users differentiate between them. Lighter colors may not be easy to see in lighter themes of PlanetTogether so if a lighter color is selected then a warning message may appear: Share Scenario Permissions Next to the Edit link is a number of users. This is the number of uses with whom the scenario is currently shared. Click it to edit the share permissions. From the Share dialog, users can define the Scenario Owner and elect whether or not to share the scenario to make it visible and/or editable to other users. The share permissions can be defined on a user-by-user basis, user permissions group-by-user permissions group basis, or can be quickly toggled on/off for all users. Quick actions let users choose to make the scenario Read-Only or Editable to the users with whom the scenario is shared. Scenario Owner Only the scenario owner and users in a permission group with permission to Manage all scenarios are allowed to edit the scenario settings, modify the scenario share permissions, and delete the scenario. Other users can only view or edit the data within the scenario, or they can create a copy of an existing scenario that is shared with them which will make them the owner of the newly created scenario. Share Scenario When the setting is toggled on, the scenario can be shared with other users. The share permissions per user are defined in the Permission Options column of the table below. Certain user permission groups can be configured to be allowed to Manage all scenarios which enables them to always be allowed to view, edit, or delete all scenarios in a Workspace. Permission Options for these users will always revert to Can Edit. Make Read-Only This button quickly updates all Permission Options settings to View Only for all users who are not part of a permission group that is allowed to Manage all scenarios. Made Editable This button quickly updates all Permission Options settings to Can Edit for all users Permissions Grid The Name column groups users by the Name of the User Permission Group that each user is assigned. The Permission Options column offers dropdown selection options for sharing with all users of a group, or specific users within any permission group. Use Group Access: The user's permissions are assumed by the user permission group's configured permission level (Can Edit/View Only/No Access). Can Edit: The user has permission to view and edit data in the scenario according to their User Permissions settings. View Only: The user has permission to view the scenario data according to their User Permissions settings. No Access: The user can't access the scenario. They don't even see it in the scenario dropdown list. Create a Copy of a Scenario Additional scenarios are created as copies of existing scenarios. Click the plus icon from any scenario panel to create a copy of it. This will present the user with a dialog to specify the new scenario name, color, and settings. Once copied, the new scenario can be activated and any data modifications to the scenario copy will not affect the original scenario it was copied from. If the "+" sign is grayed out and the button is disabled, the planning area Workspace has likely reached its maximum number of allowed scenarios. A scenario will have to be deleted before one can be created. The number of scenarios allowed in a Workspace is configured by a server administrator in the Other tab of the Instance Settings from the Instance Manager. Load and Unload a Scenario Scenarios can be loaded into or unloaded from memory in order to reduce the RAM consumption and improve performance of the desktop application. For any unloaded scenarios, click the Load icon to load it into memory. Note that this does not automatically activate the scenario after it's loaded. For any scenario which is currently loaded into memory, click the Unload icon to unload it and regain some memory. Note that there must be at least one loaded scenario at all times so this option may not be available if there is currently only one loaded. Activate a Scenario Click the Activate icon from any scenario panel displayed in the dropdown menu to switch between scenarios. If necessary, load the scenario into memory first before activating it. The name of the currently active scenario is displayed in the main toolbar next to the Boards menu. Convert to Production Click the Convert to Production icon to convert the non-production scenario to become the new Production scenario. Once clicked, the user will be prompted to proceed or cancel, and will have an opportunity to also opt to swap the name of the non-production scenario with the current production scenario. Delete a Scenario Click the delete icon to delete the scenario from the Workspace. WARNING This action cannot easily be undone. The only way to restore a deleted scenario is for a server administrator to restore the Workspace to a previous point in time from a recorded backup. Scenarios flagged as Production scenarios are eligible to be deleted by any user who has permission to delete, so use caution to double-check that the selected scenario is the one intended for deletion. Only a scenario owner or a user in a permission group which is allowed to Manage all scenarios can delete a scenario. See Also User Management Instance Manager Restore a Scenario from a Recording Backup

## Concepts > Sequencing

### Auto-Split Operations

[Source](#)

Key Concept Operations may be split into two or more activities automatically during optimization based on many configurable factors. Splitting operations allows the work to be spread across multiple resources in order to complete the work faster (as each split part may be run in parallel), or can be used to split the work across gaps in resource capacity. Splitting can also be used to break larger operations down into smaller parts so that each part may comply with maximum quantity or volume constraints across capable resources. Jump to section: Split by Resource Quantity Split by Resource Volume Split by Primary Resource Capacity Availability Split Successor by Predecessor Material Split Successor by Predecessor Quantity Ratio Resource Prioritization Split Setup Split by Resource Quantity Operations may be configured to split based on a resource's configured Maximum Quantity and/or Minimum Quantity values. As the optimization logic considers scheduling an operation on a resource, if the operation's Required Finish Quantity exceeds that of the resource's Maximum Quantity then it will be split according to its Min Auto Split Amount and Max Auto Split Amount settings. Configuration The Resource(s) must be configured with a Maximum Quantity greater than 0 which defines the largest allowed activity that can schedule there in terms of the activity's Required Finish Quantity. Optionally, the resource may be given a Minimum Quantity greater than 0 (but no more than the defined Maximum Quantity) if activities must also be restricted by how small they are. The job's Operation must have its Auto Split Type property set to ResourceQtyCapacity. It's also required that the Operation define a Min Auto Split Amount and/or a Max Auto Split Amount in order to define an allowed range in the size of each split activity in terms of its Required Finish Quantity. The maximum split amount must be set to a value that is equal to or greater than the defined minimum amount. Sample Scenario File Download and load the Scenarios\_AutoSplit\_12.2.0.25.dat and login as user "admin" (no password) and activate the SplitByQty scenario. Split by Resource Volume Operations may be configured to split based on a resource's configured Maximum Volume and/or Minimum Volume values. Measuring operation output in Volume can be more flexible than Quantity since Volume can take into account the item being produced without the need to change the operation quantity. Each Item can be assigned a Unit Volume property value which is used to calculate the volume produced by an operation. The total volume output is equal to Item.UnitVolume \* OperationProduct.TotalOutputQty. Alternatively, a Unit Volume value may be set on the operation product directly via the UnitVolumeOverride property. As the optimization logic considers scheduling an operation on a resource, if the operation's product's UnitVolume \* TotalOutputQty exceeds that of the resource's Maximum Volume then it will be split according to its Min Auto Split Amount and Max Auto Split Amount settings. It's expected that a resource either uses Volume or Quantity constraints, but not both. In the event that there is a Maximum Quantity constraint on a resource which also has a Maximum Volume constraint, if the operation is configured to split on Volume then it may not be able to schedule if the total operation required quantity is not less than the Maximum Quantity set on the resource. Configuration The Resource(s) must be configured with a Maximum Volume greater than 0 which defines the largest allowed activity that can schedule there in terms of the activity's Required Finish Quantity. Optionally, the resource may be given a Minimum Volume greater than 0 (but no more than the defined Maximum Volume) if activities must also be restricted by how small they are. The job's Operation must have its Auto Split Type property set to ResourceVolumeCapacity. Optionally, the Operation may also define a Min Auto Split Amount and/or a Max Auto Split Amount in order to define an allowed range in the size of each split activity in terms of its Required Finish Quantity. If Min Auto Split Amount is set, then the Max Auto Split Amount must be set to a value that is equal to or greater than the defined minimum amount. The Item produced by the operation should have its UnitVolume property set to some value greater than 0. Alternatively, a Unit Volume value may be set on the operation product directly via the UnitVolumeOverride property. Sample Scenario File Download and load the Scenarios\_AutoSplit\_12.2.0.25.dat and login as user "admin" (no password) and activate the SplitByVolume scenario. Split by Primary Resource Capacity Availability This option is only available in pre-release version 12.2.1.19 and newer Operations may be configured to split based on the capacity availability of the

resource(s) chosen to schedule the primary resource requirement. As the optimization logic considers scheduling an operation on a resource, if the operation is not allowed to span offline intervals (Can Pause for Offline Intervals is False) and the scheduler encounters an offline span, the operation will split so that it finishes at the end of the online span and resumes at the next online interval. The operation may also be configured with Min Auto Split Amount and Max Auto Split Amount settings as needed. If the Min and Max amounts are not defined, then it will be split based on the online capacity of capable resources. Configuration The Resource(s) must have a mix of online and offline (or cleanout) capacity assigned. The job's Operation must have its Auto Split Type property set to PrimaryCapacityAvailability. Optionally, the Operation may also define a Min Auto Split Amount and/or a Max Auto Split Amount in order to define an allowed range in the size of each split activity in terms of its Required Finish Quantity. If Min Auto Split Amount is set, then the Max Auto Split Amount must be set to a value that is equal to or greater than the defined minimum amount. In order for the auto-split logic to trigger, either the job's Operation must be configured to disallow pausing for offline intervals (Can Pause for Offline Intervals is False) and an Offline capacity interval will interrupt the scheduled operation, or a Cleanout capacity interval is scheduled to interrupt the scheduled operation. The lack of online capacity and ability so span the offline interval forces the operation to be split. Split Successor by Predecessor Material Successor operations within a manufacturing order which are dependent on materials produced by a split predecessor operation can be split based on the number of split activities of the predecessor operation. As the optimization logic considers scheduling a successor operation whose predecessor was split, if the predecessor operation produces an item which the successor consumes and the successor's Auto Split Type is PredecessorMaterials, then the operation will be split into the same number of activities as the predecessor was split. Configuration A manufacturing order must have at least two operations which run sequentially. The predecessor operation must be split into two or more activities, either by one of the auto-split options, or manually. The predecessor operation must produce an item or product which the successor is configured to consume as a stock material requirement. It's expected that the quantity produced by the predecessor and the quantity consumed by the successor are identical. Finally, the successor operation must have its Auto Split Type property set to PredecessorMaterials. Sample Scenario File Download and load the Scenarios\_AutoSplit\_12.2.0.25.dat and login as user "admin" (no password) and activate the SplitByPredecessorMaterial scenario. Split Successor by Predecessor Quantity Ratio Successor operations may be configured to split into an equal number of parts as its predecessor is split into. If the quantities of the predecessor and successor operation are not the same, then the system calculates a ratio of the quantities for the successor splits equal to the quantity ratio of the predecessor splits. For example, if a predecessor operation requires 15 production units and it's split into 3 activities which each produce 5, then it's quantity ration is  $5/15 = 1/3$ . Consider then if its successor operation requires 30 production units and is split into the same number of activities (3) at the same ratio (1/3) then each of the split activities of the successor will produce 10 units. This option is only compatible between predecessor-successor operations of the same manufacturing order. Configuration The job's Predecessor Operation must have its Auto Split Type property set to any value and scheduling conditions must result in the operation splitting into multiple activities. Additionally, the Successor Operation must have its Auto Split Type property set to PredecessorQuantityRatio. Optionally, the predecessor operation may also define a Min Auto Split Amount and/or a Max Auto Split Amount in order to define an allowed range in the size of each split activity in terms of its Required Finish Quantity, but note that these properties are not enforced on the successor operation which splits according to the predecessor's quantity ratio. Resource Prioritization Additional optimize factors are added to the Sequence Planning Board which allows users to prioritize the scheduling of activities based on various quantity or volume associations. For example, when an operation is split, it might be preferred to have the largest resources or vessels be filled first. In these cases, optimize factor points can be assigned to prioritize the largest quantity or volume fit first. Closest Fit Quantity: Prioritizes operations based on how closely their quantity fits within the range defined by the resource's minimum and maximum quantity. Closest Fit Volume: Prioritizes operations based on how closely their volume fits within the range defined by the resource's minimum and maximum volume. Largest Quantity Fit: Prioritizes operations based on whether their quantity is enough to fully fill the resource based on the resource's Max quantity. If the operation can automatically split based on ResourceQuantityCapacity, then prioritize larger resources. Largest Volume Fit: Prioritizes operations based on whether their volume is enough to fully fill the resource based on the resource's Max Volume. If the operation can automatically split based on ResourceVolumeCapacity, then prioritize larger resources. Least Waste Quantity Fit: Prioritizes operations based on minimizing the gap between the activity's required quantity and the resource's available quantity, ensuring the best fit to reduce waste. Least Waste Volume Fit: Prioritizes operations based on minimizing the gap between the activity's required volume and the resource's available volume, ensuring the best

fit to reduce waste. Smallest Quantity Fit: Prioritizes operations based on whether their min quantity is enough to fully fill the resource based on the resource's Min quantity. If the operation can automatically split based on ShiftSize, then prioritize smaller resources. Smallest Volume Fit: Prioritizes operations based on whether their volume is enough to fully fill the resource based on the resource's Min Volume. If the operation can automatically split based on ResourceVolumeCapacity, then prioritize smaller resources. Split Setup When an operation which incurs setup is split, each resulting activity of the split will incur the full amount of setup time by default. A Setup Split Type property set on the operation allows for additional flexibility to either schedule all of the operation setup on the first scheduled activity of the split operation, or to split the setup between each activity proportionally according to each split activity's required quantity. Configuration The operation which incurs setup must have its Setup Split Type property set to one of the following values: FirstActivity: All operation setup will be incurred by the first scheduled activity SplitByQty: Operation setup will be divided proportionally between each split activity according to its required quantity. Sample Scenario File Download and load the Scenarios\_AutoSplit\_12.2.0.25.dat and login as user "admin" (no password) and activate the SplitSetup scenario. See Also Capacity Planning Board Gantt Board Sequence Planning Board Job Details Dialog Resource Mappings Resource Operation Mappings

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## Cleans

### [Source](#)

Key Concept Resource cleans or cleanouts may be configured to schedule at the end of an operation. The clean duration may be defined explicitly on the scheduled operation, or the system can be configured to determine when cleans are needed and for how long based on the sequence of scheduled operations on a resource. More specifically, Clean Time can be defined as one of an operation's standard timed processes (along with Setup, Cycle, and Post-Processing), or operation Attributes can be used to model sequence-dependent cleanouts. A combination of both is also possible, and in the event that more than one cleanout event is triggered to be scheduled at the same time, the one with the highest Grade value will be scheduled. When a sequence-dependent clean is scheduled, it is scheduled at the end of the operation which precedes the operation that triggers the necessity to clean. Scheduled cleans are visible as part of the Process segment in the Gantt. Note A new UsageEnd value Clean on an operation's resource requirement is required in order to schedule clean processes. Jump to section: Cleanout Grade Resource Clean Time Operation Clean Time Operation Attribute Cleans Cleanout Trigger Tables Product Rules Sequence Dependency at the Start of the Schedule Visualizing Cleans Cleanout Grade Cleans can be modeled in a number of different ways. There may be times when multiple cleanouts could be triggered to schedule at the same time, but PlanetTogether will only ever schedule a single cleanout per operation. Each possible source of a cleanout can be assigned a Cleanout Grade value. This grade is a way to numerically rank which cleanout should be scheduled in the event that multiple cleans would otherwise need to be scheduled simultaneously. Under these conditions, the highest grade value takes precedence. If two cleanouts of the same grade are slated to be scheduled together, the longest duration clean is scheduled. After a cleanout completes, it effectively resets all cleanout triggers which have an equal or lower Cleanout Grade assigned as the one that was scheduled. Resource Clean Time Cleans may be configured at the resource level. These cleanouts will be considered for scheduling at the end of every operation that schedules on the resource. This might make sense if there needs to be a minimum cleanout duration scheduled after each operation completes on the resource. From Resource Mappings, the related properties to import this configuration are StandardCleanHours and StandardCleanoutGrade. They can also be configured in the client interface from the Capacity Planning Board via Grid Edit Mode from the properties Standard Clean Duration and Cleanout Grade. Operation Clean Time Cleans may be configured in the operation's time standards settings. These will be considered for scheduling at the end of the operation as long as the resource where the operation is scheduled is configured to Use Operation Clean Time. From Resource Operation Mappings, the related properties to import this configuration are CleanHours and CleanOutGrade. They can also be configured in the client interface from the Activities Board via Grid Edit Mode from the properties Standard Clean Span (Operation) and Cleanout Grade (Operation), or from the operation configuration tab of the Job Details Dialog. Resources must also be configured to use the operation time standard settings. From Resource Mappings, the UseOperationCleanout property must be set to True. Alternatively, the Use

Operation Clean Time property can be enabled from the Capacity Planning Board via Grid Edit Mode. Operation Attribute Cleans Operation attributes can be used to trigger sequence-dependent cleans. This means that the cleans will be scheduled only under certain conditions based on the order or sequence of scheduled operations on a resource. For example, if a custom attribute called "Color" updates from code "White" on one operation to code "Black" on the next scheduled operation on the resource, then a cleanout could be triggered based on the change in the Color attribute's code value. There are a handful of basic triggers that can be configured for situations where changes in the sequence will always trigger the same amount of cleanout time. Users also have the option to configure complex matrices which can dictate how much clean time should be scheduled based on changes in specific values of specific attributes between one scheduled operation and the next on the same resource. Each of these options requires that one or more Clean type attributes are imported into the data model and assigned to the relevant operations. See also: Attributes Attribute Mappings Operation Attribute Mappings Option 1: Attribute Code Changes A fairly straightforward option is to force a clean to schedule each time an attribute code changes from one scheduled operation to the next. In this case, the AttributeTrigger property associated with the attribute must be set to CodeChanges. Each operation which needs to consider this attribute when evaluating sequence-dependent cleans must be given a unique Code value in the operation attribute assignment. Whenever the attribute code changes from one scheduled operation to the next, the attribute's DefaultDurationHrs or the operation attribute's DurationHrs will determine the duration of the clean which gets scheduled at the end of the predecessor operation. Example In this example, an attribute called CodeChange has an assigned Code value of X on the first scheduled operation, and an assigned Code value of Z on the next scheduled operation. This triggers a 2-hour cleanout: Option 2: Attribute Number Changes A similar option is to force a clean to schedule each time an attribute number changes from one scheduled operation to the next. In this case, the AttributeTrigger property associated with the attribute must be set to NumberChanges. Each operation which needs to consider this attribute when evaluating sequence-dependent cleans must be given a unique numerical Number value in the operation attribute assignment. Whenever the attribute number changes from one scheduled operation to the next, the attribute's DefaultDurationHrs or the operation attribute's DurationHrs will determine the duration of the clean which gets scheduled at the end of the predecessor operation. Example In this example, an attribute called NumberChange has an assigned Number value of 2 on the first scheduled operation, and an assigned Number value of 3 on the next scheduled operation. This triggers a 3-hour cleanout: Option 3: Attribute Number Increases A more specific option is to force a clean to schedule each time an attribute number increases from one scheduled operation to the next. In this case, the AttributeTrigger property associated with the attribute must be set to NumberHigher. Each operation which needs to consider this attribute when evaluating sequence-dependent cleans must be given a unique numerical Number value in the operation attribute assignment. Whenever the attribute number increases from one scheduled operation to the next, the attribute's DefaultDurationHrs or the operation attribute's DurationHrs will determine the duration of the clean which gets scheduled at the end of the predecessor operation. Example In this example, an attribute called NumberHigher has an assigned Number value of 1 on the first scheduled operation, and an assigned Number value of 10 on the next scheduled operation. This triggers a 30-minute cleanout: Option 4: Attribute Number Decreases Alternatively, it's possible to force a clean to schedule each time an attribute number decreases from one scheduled operation to the next. In this case, the AttributeTrigger property associated with the attribute must be set to NumberLower. Each operation which needs to consider this attribute when evaluating sequence-dependent cleans must be given a unique numerical Number value in the operation attribute assignment. Whenever the attribute number decreases from one scheduled operation to the next, the attribute's DefaultDurationHrs or the operation attribute's DurationHrs will determine the duration of the clean which gets scheduled at the end of the predecessor operation. Example In this example, an attribute called NumberLower has an assigned Number value of 10 on the first scheduled operation, and an assigned Number value of 1 on the next scheduled operation. This triggers a 2-hour and 30-minute cleanout: Option 5: Attribute Code Change Matrix Finally, it's possible to define varying clean durations in an attribute code table matrix so that the duration may differ depending on the specific attribute code values that change from one operation to the next. In this case, the AttributeTrigger property associated with the attribute must be set to LookupByCode. Each operation which needs to consider this attribute when evaluating sequence-dependent cleans must be given a unique Code value in the operation attribute assignment, and an attribute code table matrix must be configured to define specific code value changes and the clean duration associated with each specific change. Whenever the attribute code changes from one scheduled operation to the next and the change in code values is mapped in the attribute code table, a clean will be scheduled at the end of the predecessor operation based on the defined DurationHours in the code table matrix (or DurationMinutes if configured in the

client interface). Example In this example, an attribute called CodeTable has an assigned Code value of A on the first scheduled operation, and an assigned Code value of B on the next scheduled operation. This triggers a 2-hour cleanout based on the attribute code table matrix match: Sample Scenario File Download scenarios\_Cleans\_12.2.0.25.dat and login as user "admin" (no password) and activate the AttributeCleans scenario. Cleanout Trigger Tables Cleanout trigger tables can be used to schedule cleans at incremental intervals based on various factors such as: The number of operations completed since the last clean; The number of product units produced since the last clean (either units of volume or quantity); The number of production cycles run since the last clean; The amount of time a resource has spent processing or running operations since the last clean; or The amount of calendar time that has passed since the last clean was run Note A cleanout type capacity interval can also be used to reset the count since the last clean. Cleanout trigger tables can be viewed and configured from the Data Tables tile of the Scenario Data Board. See also: Cleanout Trigger Table Mappings Option 1: Operation Count A data table whose type is OperationCountTrigger can define a cleanout Duration, Grade, Cost and TriggerValue interval. In this case, the TriggerValue specifies the number of operations which must schedule on a resource since the last cleanout was scheduled (either a cleanout process at the end of an operation, or a cleanout capacity interval). Option 2: Production Units A data table whose type is ProductionUnitTrigger can define a cleanout Duration, Grade, Cost, TriggerValue interval, and a ProductionUnit. Options for the ProductionUnit field are: Cycles: In this case, the TriggerValue specifies the total number of operation cycles scheduled on a resource since the last cleanout was scheduled. Quantity: In this case, the TriggerValue specifies the total output quantity of primary products produced by operations scheduled on a resource since the last cleanout was scheduled. ProductUnits: In this case, the TriggerValue specifies the total output production units (product Total Output Quantity \* UnitVolume) of primary products produced by operations scheduled on a resource since the last cleanout was scheduled. Option 3: Time A data table whose type is TimeCleanOutTrigger can define a cleanout Duration, Grade, Cost, TriggerValueHours interval, whether or not to consider Processing time or Post-Processing time in the calculation, and whether or not to trigger the cleanout at the end of the last scheduled operation on a resource. UseProcessingTime: When True, operation run/cycle time will be used to calculate when cleans needs to be scheduled according to the TriggerValueHours setting. UsePostProcessingTime: When True, operation post-processing time will be used to calculate when cleans needs to be scheduled according to the TriggerValueHours setting. This can be combined with UseProcessingTime. When both UseProcessingTime and UsePostProcessingTime are False, the system will simply use calendar time/hours to calculate when cleans should be scheduled. TriggerAtEnd: When True, the clean is scheduled at the end of the operation which triggers the clean. When False, the clean is scheduled at the end of the operation which is scheduled just prior to the operation which triggers the clean. Sample Scenario File Download scenarios\_Cleans\_12.2.0.25.dat and login as user "admin" (no password) and activate the TriggerTableCleans scenario. Product Rules Product rules can be used to influence clean duration when specific products are produced on specific resources. Product rules override Operation Clean Time settings but do not impact clean durations derived from operation attributes. In order to alter operation clean duration, define the duration in the CleanHrs property of the product rule, and set UseCleanHrs boolean property to True. Unit volume produced by an operation can also be manipulated by product rules. Where Volume = OperationProduct.TotalOutputQty \* Item.UnitVolume (or OperationProduct.TotalOutputQty \* OperationProduct.UnitVolumeOverride), the volume output by an operation can be altered via Product Rules where specific products that run on specific resources might output a different volume than the standard calculation. To override the volume calculation, define the unit volume multiplier in the CleanoutUnitsRatio property of the product rule, and set UseCleanoutUnits boolean property to True. The product rule ratio will override the item's unit volume ratio and/or the operation product's unit volume ratio override. For more information, see: Product Rules Product Rules Mappings Sequence Dependency at the Start of the Schedule Since many options to trigger a clean to be scheduled are sequence-dependent, it's important to consider whether or not a clean needs to be scheduled at the start of the PlanetTogether schedule. In order for the system to use its sequence-dependent logic to trigger a clean at or near the start of the schedule, a certain amount of finished job history must be preserved and/or imported into the system. PlanetTogether will use the finished job data on each resource in the same way that it uses scheduled jobs and operations downstream to determine when a clean needs to be scheduled. The amount of finished job history to preserve may vary depending on whether the configured sequence-dependent cleans need only a single previously-scheduled operation, or many. Ultimately, however much history is deemed necessary, it should either be kept in the system and deleted manually when it's no longer needed, or a certain number of finished jobs should be imported in order to meet the historical data requirement. When importing finished jobs, it's important to import the finished activity data via the Internal

Activity Mappings. It's especially important to import the ReportedStartDate, ReportedFinishDate, and ActualResourcesUsed for each finished activity, along with any operation attribute data which may be used by the Cleans scheduling logic. Finally, it's important to enable Track Actuals in the Data Options section of System Settings. This setting allows users to define a maximum age of finished operations for the system to keep track of and make visible in the Gantt. The duration defined here should be long enough that enough historical schedule data can be preserved in order for the system to accurately calculate and schedule cleans near the start of the schedule. Track Actuals Gantt blocks may also be enabled in the Block Settings area of User Settings. Visualizing Cleans Scheduled Cleans can be visualized in the Gantt or in the Activity Scheduling grids. Gantt The Process Segment of the Gantt blocks can be enabled from the Segments section of User Settings to show the various processes or steps of an individual operation, including the Clean process. Cleans will always be scheduled at the end of the operation after all other processes are complete. The label text of any segment can also be updated to include clean duration and grade values. Activity Scheduling Grids The activity scheduling grid tiles in the Activities board can be configured to show scheduled clean durations and grades, as well as other various cleans data (costs, reported clean time, etc.). See Also Attributes Product Rules Capacity Planning Board Gantt Board Activities Board System Settings User Settings Attribute Mappings Resource Mappings Operation Attribute Mappings Resource Operation Mappings Resource Requirement Mappings Cleanout Trigger Table Mappings

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## Manufacturing Order Production Overlap

### Source

Old Article Versions This article is updated to reflect the latest software functionality. For older software versions, download and refer to the appropriate document version: Software Version(s) Download Link 12.1.4.x thru 12.2.1.x ManufacturingOrderProductionOverlap\_12.2.1.pdf Key Concept Operations from different manufacturing orders may be configured to partially or completely overlap and run concurrently with one another. This is helpful when one operation of an order is meant to supply an operation of another order with some material and the producing operation is able to produce and transfer its completed production to inventory in batches as it completes cycles. While the producing operation is still in process, its completed materials are added to inventory and the consuming operation is able to start its production once enough materials become available. It's also possible to release all of an operation's production to inventory at the start of the producing operation so that the consuming operation is allowed to schedule to start at the same time. △ WARNING: Overlapping jobs or operations can become processor and memory intensive under certain conditions. Having many transfers of small quantities can lead to system performance issues so it's advisable to transfer in larger increments whenever logical. Jump to section: Partial Overlap Based On In-Process Production Item Transfer Quantity Operation Product Inventory Available Timing Operation Stock Materials Settings Complete Overlap via Immediate Inventory Release Operation Product Inventory Available Timing Operation Stock Material Constraint Type Partial Overlap Based On In-Process Production Two operations of different manufacturing orders may be allowed to partially overlap their production based on inventory transferring from one operation to the other while the producing operation is still in process. This requires a few different properties of various objects to be configured to allow in-process production to transfer its completed material to inventory, then the consuming operation to be able to consume it while the producing operation is still ongoing. Item Transfer Quantity In order for job operations to be able to transfer in-process materials to inventory, the item record for the product must have a Transfer Quantity defined. This quantity determines the amount of in-process materials that can be transferred to inventory while an operation is producing it. It may be set to as small a value as 1, although small transfers of in-process materials to inventory for large orders (1,000 units or more) can significantly impact optimization performance as it must calculate frequent on-hand material inventory adjustments to determine where consuming operations are eligible to schedule. Transfer Quantity and Operation Cycles In-process materials can only be transferred to inventory at a rate no faster than the operation's Quantity Per Cycle. For example, if Transfer Quantity at the Item level is set to 10 but the Quantity Per Cycle of the Operation is 100, then completed in-process materials will be added to inventory in batches of 100 as each cycle of the operation completes. Conversely, if Transfer Quantity is set to 100 and the producing operation's Quantity Per Cycle is 10, then completed in-process materials will be added to inventory in batches of 100, requiring 10 operation cycles to have completed before the consuming operation is

eligible to schedule. Operation Product Inventory Available Timing For any operation which produces an item that should be transferred to inventory while the operation is in process, the operation product's Inventory Available Timing must be set to any of these available options which support production overlap: At Operation Run End: All produced inventory is considered available at the end of the Operation's last run/cycle, plus any Resource Transfer time. This can ensure that the consuming operation can overlap with post-processing and storage. At Operation Post-Processing End: All produced inventory is considered available at the end of the Operation's post-processing step, plus any Resource Transfer time. This can ensure that the consuming operation can overlap with storage. By Production Cycle: If the item's Transfer Quantity is set, material will be moved to storage in batches based on that quantity. Otherwise, it will be moved at the end of each cycle. During Post-Processing: Material is transferred evenly over the full duration of Post-Processing. If Item Transfer Quantity is set, the material will be moved to storage based on that quantity. During Storage: Material is transferred evenly over the full duration of Storage. If Item Transfer Quantity is set, the material will be moved to storage based on that quantity. Operation Stock Materials Settings The Stock Material requirement of operations which consume materials from in-process operations must be constrained by the material's available date and and must allow for production overlap. Fulfill these requirements by setting the Constraint Type on the material requirement to Constrained by Available Date, and define at what point during the operation's processing that it should be allowed to consume the material via the Material Used Timing field. The options that enable overlapping with the producing operation are: During Setup: Material is required evenly over the duration of the setup. The item's Transfer Quantity will be used if set. By Production Cycle: A proportional amount of the material is required at each production cycle start. The quantity required per cycle is equal to the material requirement Total Required Quantity divided by number of cycles of the operation (multiplied by the ratio of the material requirement Total Required Quantity and the Operation Required Finish Quantity, which is typically 1). Last Production Cycle: All material is required on the final operation cycle start. First And Last Production Cycle: Confirms that the first cycle has enough material and that all remaining material is available for when the last cycle starts. This can be used when the material overlap doesn't need to check every cycle, but the consuming operation is delayed by the first production cycle material and delayed by the full required material at the end of the operation. This option is the best for production overlap optimization performance.  Tip If the operation consumes material by production cycle but material is required during setup, then enable the Require First Transfer At Setup setting on the material requirement so that the first transfer is allowed to happen during setup rather than being calculated from the start of run/production. Complete Overlap via Immediate Inventory Release Two operations of different manufacturing orders may be constrained so that one is only released to schedule once the other has been scheduled. This can be modeled by using a constraining material requirement on the dependent operation where the predecessor operation is configured to produce the material but releases it to inventory immediately upon starting its run cycles. This ensures that the required material of the successor is made available as soon as the predecessor operation is scheduled to start so that (resource capacity permitting) the two operations are allowed to schedule concurrently. Operation Product Inventory Available Timing In order to allow the entire output quantity of an operation's product to be made available in inventory for consuming operations as soon as the operation is scheduled to start, the Inventory Available Timing property must be set to the value At Operation Run Start. This will allow the consuming operation to start at the same time as the producing operation when the consuming operation is constrained to start based on the item's available date. Operation Stock Material Constraint Type To complete the modeling of the constraint, a Stock Material requirement must be added to the successor operation which consumes the inventory from the predecessor which is made available at the operation's run start. Achieve this by ensuring that the Constraint Type on the material requirement is set to Constrained by Available Date. See Also Item Mappings Product Mappings Material Mappings Inventory Plan Board Gantt Board Job Details Dialog

## Operation Batching

### [Source](#)

Key Concept Operation Batching is used when multiple identical jobs are simultaneously grouped on the same resource. For example, processes such as dye baths that group together different products can be processed simultaneously. In this case, the grouping is based on an operation attribute such as the color of the dye. For example, all operations with the same color attribute will be grouped and dyed as a single batch. One significant limitation is that batching operations require that all jobs in the batch have the same number of cycles, run rates, and batch codes. Therefore, batched operations will be represented as a single activity block on the Gantt.

Configuring Operation Batching Resources must be set up for operation batching by defining the Batch Type property, and optionally the Batch Volume. For importing these data, see: Resource Mappings. Batching can either be done by Percent or by Volume:

- Percent:** Activities are batched until 100% of the batch is filled. The percent occupied by each activity is calculated by dividing the activity's Required Finish Qty by its Qty Per Cycle. For example, a batch scheduled by percentage can have two jobs with a Batch Percent of 50%, three jobs with a Batch Percent of 33%, and so on. The accumulated jobs cannot exceed 100% of the operation's Cycle Qty.
- Volume:** Activities are batched until the activities' Required Finish Quantities equals the resource's batch volume. Jobs can be batched together if the cumulative Required Qty does not exceed the resource's batch volume.

**Batch Volume:** This is the maximum number of units included in a batch when using batch by volume. Note: When using the Percent Batch Type, the batch volume will be the minimum Required Qty, and the Qty Per Cycle of the operation will be the maximum batch size. When using the Volume Batch Type, the batch volume will be the maximum batch size (the sum of the Required Qty of all operations in the batch). Next, a Batch Code must be set on the operations. This can be done in the client interface by opening the Job Details dialog and navigating to the Batching/Setup tab of the Operation tab: For importing these data, see: Resource Operation Mappings. With the configurations in place, schedule optimization will batch operations together if they meet the appropriate criteria.

**Visualizing Batched Operation Details** When operations are batched together, their batch quantity, batched job names, and batch product list can be visualized in the Gantt Board, either in the Tooltips dialog or in the Gantt label text or in the Activity tab of the Job Properties tile.

**Special Considerations** Batch resources can only schedule activities that fit in one batch. Therefore, if an activity has a larger batch size than the resource's capacity, it will remain unscheduled. Batch resources can create and schedule the entire resource based on the last operation added to the batch.

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## Optimization

### [Source](#)

Key Concept Optimization is the process by which PlanetTogether creates a minute-by-minute schedule by assigning job operations to resources at points in time across a planning horizon duration. Optimization logic can be tailored to each organization's needs by adjusting various preferences and settings, using any number of available scheduling constraints, and defining a scoring mechanism in the form of a Sequencing Plan in order to ensure operations that meet certain criteria are prioritized over others. By understanding how optimize logically works through the queue of operations and puts them on the schedule, users will be able to better fine-tune their sequencing plan(s) to accommodate their most important business needs. Jump to section: High-Level Overview

**Operation Eligibility** Capacity Eligibility Operation Release Rules Optimize Scoring Step-By-Step Optimize Process

**High-Level Overview** Optimization is a linear process whereby PlanetTogether's simulation logic starts at a point in time and moves forward in time as resource capacity becomes available. The starting point can be configured in Optimize Settings. At each earliest moment in time where there is resource capacity on any resource, all operations which are released to schedule at that time are scored across all resources which have available online capacity. The operation with the highest optimize score is then scheduled to start at that point in time on the resource where it scored the highest. The remaining scored operations are then scheduled to fill capacity on all other available resources at that time, descending from the highest scored operation to the lowest. Once either resource capacity is filled at that point in time, or there are no more eligible operations to schedule, the process

moves forward in time in 1-second increments to the next point where there is both available resource capacity and eligible operations released to schedule. This process repeats until there are no more operations to schedule.

**Operation Eligibility** An operation is considered eligible to schedule on a resource at a point in time if all of the following criteria are met:

- Time constraint:** The operation must be released to schedule according to its Just-In-Time start date minus all applicable JIT slack.
- Capability constraint:** Each required resource must be assigned each of the required capabilities of the operation's resource requirement. This constraint is removed if the resource requirement defines a Default Resource.
- Capacity constraint:** Each required resource must have available eligible capacity. The amount of available capacity required may vary depending on whether only one resource is required or more than one, and/or whether the operation is configured to be allowed to span offline capacity intervals.

When more than one resource is required, each of the required helper resources must have at least as much available eligible capacity as the primary resource. If at any time for the duration of the operation while the primary resource is online one or more of the helpers goes offline, the operation is not considered eligible to schedule. Resource capacity is not considered a constraint when operations are scheduled past the planning horizon.

**Material constraint:** Each of the operation's constraining material requirements must be able to be fulfilled at the point in time being considered. Material constraints are not considered when operations are scheduled past the planning horizon.

**Resource constraint:** The operation must meet all of the resource's configured constraints (minimum/maximum quantities and quantities per cycle, cell eligibility, batch code eligibility, resource connector eligibility, attribute number range eligibility).

**Capacity Eligibility** A capacity interval may have constraints in place which determine what type of work can be scheduled there. At minimum, the interval must be configured to allow activities to start (CanStartActivity) in order to schedule an unscheduled operation, and must be able to either perform Setup (UsedForSetup) or run cycles (UsedForRun).

**Operation Release Rules** Operations are released to schedule according to their calculated JIT Start Date minus any allowed JIT slack, and only after all other configured constraints have been satisfied.

**JIT Start Date** An operation's Just In Time (JIT) Start Date is represents the latest date and time that the operation can start while still allowing it to finish on time (at or before its Need Date). PlanetTogether calculates an operation's JIT start date based on several factors:

- Job Need Date:** The job's need date acts as the need date of the last sequential operation of the job.
- Total required work span:** The total span of time required for Setup (standard or operation), Run, and Post-Processing are factored in so that the operation has enough time to complete all steps of its required processes and still finish on time. If the operation requires more time to run on certain resources based on Product Rules or Resource Efficiency settings, then PlanetTogether will calculate the JIT Start Date based on the longest required work span across all eligible resources.
- Sequence-dependent Setup and Clean durations:** are not factored into JIT Start Date calculations.

**Resource capacity:** The duration of offline capacity of a resource is factored in since each of the required processes are only allowed to progress during online resource capacity. When multiple resources are capable and eligible to schedule an operation, the operation's JIT Start Date calculation uses the resource with the least amount of online capacity prior to the operation's Need Date. In the event that the sample resource lacks the capacity to fulfill the operation's capacity requirement to still complete the operation on time, the JIT Start Date will be set to the start of the resource's first online capacity interval minus the capacity that the resource lacks.

**Material post-processing:** If the operation produces a product and it's configured to require material post-processing before the product is available in inventory to use by consuming jobs or operations, the material post-processing duration is factored into the JIT Start Date so that any consuming job or operation is not late due to having to wait for this post-processing period to pass.

**Transfer span:** If the operation is configured with a transfer span between it and its successor operation, then this transfer duration is factored into the JIT Start Date so that the successor is not scheduled late due to the transfer span constraint.

**Overlap:** The amount of overlap is taken into consideration. For example, if the predecessor operation runs for 24 hours, and the successor can overlap 12 hours, then the 12 hours of overlap will be considered in the JIT calculation. Therefore the JIT for successor operations will be 12 hours later than if there was no overlap.

**JIT Buffer Days:** If the operation is configured with a JIT Buffer Days duration (JITStartDateBufferDays) then this time is factored into the JIT Start Date.

**Notes** If there is a DefaultResource set and UseDefaultResourceJITLimit is set to false, JIT date will only calculate based on the capacity and work hours on the default resource. If UseDefaultResourceJITLimit is set to true, it will use capacity and work hours of all capable resources in JIT calculation. When calculating JIT before the first capacity interval, capacity is considered to be 24x7 online. Sequence dependent setup is not considered in JIT calculation. Only standard or operation setups.

Formula Operation Need Date minus the Operation Total Work Span of itself and all predecessor operations minus unavailable resource capacity (on the eligible resource with the least amount of capacity if there are more than one capable resource and one has less capacity than the rest) minus the operation's Product Material Post

Processing minus the Operation Transfer Span minus Operation JIT Start Date Buffer Days Op Need Date - Op Total Work Span(accounting for overlap time) - Offline Resource Time - Post Processing Time - Transfer Span - JIT Start Buffer Days ----- = Op JIT Start Date JIT Slack Options JIT Slack refers to the number of hours or days that an operation can be released to schedule prior to its JIT Start Date. There are a few options to configure JIT Slack at a global level and at the individual operation level. Optimize Setting: Release Rule A setting from the Schedule dropdown of the main toolbar can quickly change the global JIT Slack rules applied during schedule optimization. The Release Rule to Use options are as follows: JIT with Resource HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the Head Start Span specified for each resource. JIT with Global HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the number of JIT Slack days specified in the text input. This logic is applied to all resources. The duration is defined in the JIT Slack Days input field. Drum-Buffer-Rope: DBR calculations are used to manage the release date for operations that use one or more capacity-constrained resources flagged as Drum resources. Each manufacturing order is released based on its DBR Release Date minus the JIT Slack Days specified in the text input. Operation JIT Buffer Days If global settings may not be appropriate, then individual operations may be assigned a JIT Buffer Days value. This can be imported via the Resource Operation JITStartDateBufferDays property, or manually configured from the Job Details dialog or the Activity Scheduling grid editor. Technically, this setting deducts time from the JIT Start Date of the operation, so any number of buffer days or hours applied here are added to the JIT slack days defined in the optimize setting release rules. Constraints Many constraints may also impact the release date and time of an operation, including but not limited to: Predecessor operation completion Availability of constraining material requirements Lack of online resource capacity on the primary and any required helper resources Manufacturing Order release date Jobs excluded by Optimize Settings or the job's Do Not Schedule setting Optimize Scoring A key component to creating an optimal schedule is the scoring logic that PlanetTogether uses to sequence each scheduled operation. The Optimize Score is a numerical value calculated based on each of the configured optimize factors of the sequencing plan that is used during schedule optimization. Activities with higher Optimize Scores are selected to schedule earlier than those with lower scores (unless constraints are applied). The Optimize Score is recorded and represents the score that was calculated for the operation at the simulated time during the optimization when the activity was scheduled. The Optimize Score values can be seen in: The Activity Scheduling grids The Publish Database Gantt labels The Gantt tooltip window Optimization is a linear process whereby PlanetTogether's simulation logic starts at a point in time and moves forward in time as resource capacity becomes available. At each earliest moment in time where there is available resource capacity, all operations which are released to schedule at that time are scored across all resources which have available online capacity. The operation with the highest optimize score is then scheduled to start at that point in time on the resource where it scored the highest. The remaining scored operations are then scheduled to fill capacity on all other available resources at that time, descending from the highest scored operation to the lowest. Once either resource capacity is filled at that point in time, or there are no more eligible operations to schedule, the process moves forward in time in 1-second increments to the next point where there is both available resource capacity and eligible operations released to schedule. This process repeats until there are no more operations to schedule. Optimization scores can be manipulated by altering sequencing plan configurations. Plans can be curated to meet specific business needs, and may even be tailored to specific resources so that the scoring logic may be different per resource. Each resource may be assigned up to five separate sequencing plans - one "Normal" plan and four "Experimental" plans. Schedulers may choose to use a single plan for all resources during optimization, or they may choose to use the Normal or any one of the Experimental plans from the Schedule settings dropdown from the main toolbar. Experimenting with various sequencing plans can be a great practice to test different configurations which might produce different schedules for different business needs. For more details of how the optimize factor point assignments can impact the scores of operations, see the Scoring section of the Sequence Planning Board article. Step-By-Step Optimize Process PlanetTogether's optimization process requires many steps and takes in several considerations along the way. Here is a breakdown of each step of the process: Step 1: Available resource capacity is found Starting from the configured Optimize Activities Starting At setting in the Schedule dropdown of the main toolbar, the simulator searches for the earliest point in time where a resource has available capacity. Note If any jobs or operations are already scheduled at or after the defined Optimize Activities Starting At setting, they will be unscheduled so that they can be re-sequenced. Beginning of the Schedule: All of the jobs in the data model will be scheduled or rescheduled and sequencing will begin at the beginning of the schedule. End of the Frozen Span: All unscheduled jobs and all jobs which are scheduled to start after the Frozen Span will be scheduled or rescheduled. Sequencing will begin at the end of the

Frozen Span. This is helpful when you want to prevent rescheduling jobs at the beginning of the schedule. For more information, see: Plant Stability. End of the Stable Plan Span: All unscheduled jobs and all jobs which are scheduled to start after the Plant Stable Span will be scheduled or rescheduled. Sequencing will begin at the end of the Plant Stable Span. This is helpful when you want to prevent rescheduling jobs at the beginning of the schedule. For more information, see: Plant Stability. Specific Date/Time: The user can set a specific date and time to start the optimization process. All unscheduled jobs and all jobs which are scheduled to start after the selected date and time will be scheduled or rescheduled. Sequencing will begin at the selected date and time. Step 2: Release Dates are calculated Once available resource capacity is found, release dates are calculated for each unscheduled operation of each job. All operations which are released to schedule are added to a work queue. Step 3: Queued operations are assessed for eligibility All released operations are assessed for eligibility to schedule on each resource which has capacity at the simulation schedule time. Each resource is then assigned their own individual work queue of eligible operations. Step 4: Operations are scored Each resource's work queue of eligible operations are scored according to the resource's configured sequencing plan. Step 5: Operations are scheduled Beginning with the operation which scored the highest among all available resources, operations are scheduled to start until either resource capacity is filled at that point in time, or there are no more eligible operations to schedule. Step 6: Repeat The process moves forward in time in 1-second increments to the next point where there is available resource capacity and repeats all of the steps until there are no more operations which can possibly be scheduled. Example Data: Two Resources: Resource 1 and Resource 2, each with the same Capability. Two Jobs: Job 1 Need By 01/15 Priority = 1 Two Operations: Op 10: 1 day of work, requires 1 unit of Material A. Op 20: 3 days of work. Job 2 Need By 01/15 Priority = 3 Two Operations: Op 10: 1 day of work, requires 1 unit of Material A. Op 20: 3 days of work. Inventory 1 unit of Material A is On-Hand. 1 unit of Material A is On-Order with a purchase order due on 01/06. Optimize Parameters: Release Rule: JIT with 7 days slack Current Clock Date: 01/01 Optimize Rule: 50% weight on Need Date and 50% weight on Priority. Process: Release Dates are calculated for each job. Since both jobs have the same need date (01/15) and the same work hours (4 days total), their JIT release dates are identical = 01/04. (Need Date of 01/15 minus 4 days of work minus 7 days of slack). The first "event" to occur is the release of the two jobs on 01/04. The result of this event is that Op 10 for both jobs is added to the work queues for both resources. The next event is for the resource with the highest Id to review its queue and see if any work can be scheduled at the simulated event time. This resource calculates a "score" for the operations in its queue. The results are: Job 1, Op 10 Score = 11 (Need Date minus event date) x 50% + 1 (Priority) x 50% = 6 Job 2, Op 10 Score = 11 (Need Date minus event date) x 50% + 3 (Priority) x 50% = 7 Job 1 has a lower score and is selected first by Resource 1 since it was the first resource to select. Since there are enough materials on hand, the operation is scheduled to run on 01/04. The material is allocated to Job 1, reducing the on-hand material to zero. No other operations can schedule at this time, and since this is the only operation that can start (Job 2 is still awaiting material), it is scheduled to start on 01/04. The next event is the completion of Job 1 Op 10 on 01/05. This causes Resource 1 to become available, and it causes Job 1 Op 20 to become ready and added to the queues. The scores are again computed, and since this is the only operation that can start (Job 2 Op 10 is still waiting on materials), it is scheduled to start on 01/05. The next event is the arrival of the purchase order on 01/06. This triggers the resources to evaluate their queues. At this point, Job 2 Op 10 can start since the material was received. Since Resource 2 is the only idle resource at this time, it selects Job 2 Op 10 and schedules it to run on 01/06. The next event is the completion of Job 2 Op 10, which causes Op 20 to become ready and to schedule, completing the scheduling process. The events and resulting schedule are illustrated below: See Also Sequence Planning Board Optimize Settings Plant Stability Gantt Board Activities Board

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## Optimize Settings

### [Source](#)

Key Concept Schedule optimization initiates a process of automatically reconstructing all or part of the schedule to improve its quality and incorporate all recent data updates into the schedule. Optimization is performed based on the configured Optimize Settings and the rules defined in the selected Sequencing Plan(s). Be conscious of whether you're using Shared Optimize Settings or Personal Optimize Settings, especially if working in a collaborative environment with multiple schedulers. Switching between Shared or Personal settings is done in the

User Preferences dialog. Quickly visualize whether Shared or Personal settings are in use by expanding the Schedule dropdown from the main toolbar and observing the icon next to each of the setting headers. If the icon is the bust of a single person , then Personal settings are enabled. If the icon reflects the busts of 3 people , then Shared settings are enabled. For more information, see the User Preferences section of the User Management page. Jump to section: Optimize Activities Starting At Jobs to Exclude Sequencing Plan(s) to use Release Rule to use Set Sub-Job Need Dates Access Optimize Settings from any of the following: The Schedule dropdown from the Main Toolbar The Optimize Settings section of System Settings (if using Shared settings) The Optimize Settings section of User Settings (if using Personal settings) Optimize Activities Starting At This specifies the starting point for the optimization, and only activities that start after this specified time are included in the rescheduling. This feature may be useful if the schedule must remain stable in the short term for shop floor logistics or other reasons. The following options are available: Beginning of the Schedule: All of the jobs in the data model will be scheduled or rescheduled and sequencing will begin at the beginning of the schedule. End of the Frozen Span: All unscheduled jobs and all jobs which are scheduled to start after the Frozen Span will be scheduled or rescheduled. Sequencing will begin at the end of the Frozen Span. This is helpful when you want to prevent rescheduling jobs at the beginning of the schedule. For more information, see: Plant Stability. End of the Stable Plan Span: All unscheduled jobs and all jobs which are scheduled to start after the Plant Stable Span will be scheduled or rescheduled. Sequencing will begin at the end of the Plant Stable Span. This is helpful when you want to prevent rescheduling jobs at the beginning of the schedule. For more information, see: Plant Stability. Specific Date/Time: The user can set a specific date and time to start the optimization process. All unscheduled jobs and all jobs which are scheduled to start after the selected date and time will be scheduled or rescheduled. Sequencing will begin at the selected date and time. Jobs to Exclude This section gives planners control when choosing which Jobs are placed on the schedule. Any Jobs that match the toggled selections will not be scheduled during optimization. If they were previously scheduled, then they will be unscheduled. For example, a planner might want to only include Firm Jobs in the schedule as these are sure to be executed. However, a planner may also wish to see how the workload will be affected if Estimates, CTP, and/or Planned Jobs are included. Note: Individual Jobs can also be Excluded from the schedule by flagging them using the Do Not Schedule property. The following Exclude options are available: Planned: The job's Commitment is Planned (MRP-generated jobs are created with this commitment level). New: The job is newly created or imported and has never been scheduled. Estimates: The job's Commitment is an Estimate (Capable To Promise jobs are created with this commitment level). Unscheduled: The job was previously unscheduled by a planner. On-Hold: The job's On-Hold status is set to On-Hold. (A status of "Some Operations On-Hold" does not qualify). Note: if on-hold jobs are included in optimization, they will only be considered eligible to schedule after their defined Hold-Until date. Sequencing Plan(s) to Use This setting specifies which sequencing rules to use during optimization. Each resource may have up to five sequencing plan assignments - a Normal plan and up to four Experimental plans. For more information or to adjust sequencing plan assignments per resource, see: Sequencing Plan Mappings. Use one Plan for all Resources: The Sequencing Plan specified here will be used for all resources. Select a plan from the dropdown selection. Click the green icon to jump to the Sequencing Plan Board to edit the optimize factors of the selected plan. Use Normal Resource Rules: Use each resource's assigned Normal Sequencing Plan during the optimization. Use Experimental Resource Plan (One | Two | Three | Four): Use each resource's assigned Experimental Sequencing Plan (one, two, three, or four) during the optimization. Release Rule to Use Operations of a manufacturing order are not considered eligible to schedule by the Optimize function until the date and time that the MO is released. Release Rules determine when manufacturing orders are released for scheduling during optimization and therefore supersede the optimize rules. By default, a MO is released at its calculated Just In Time (JIT) start date which is calculated based on its Need Date, the expected duration of each of its operations, and the amount of online capacity on all required resources (when there are multiple capable resources to consider, PT calculates the JIT start date based on the resource(s) with the least amount of online capacity). Release Rules are one way to add "JIT Slack" to effectively allow the MO to be released to schedule earlier than its JIT start date. JIT with Resource HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the Head Start Span specified for each resource (imported via the HeadStartHrs property in the Resource Mappings, or manually set via the Capacity Plan editor). JIT with Global HeadStart: Each manufacturing order will be released to schedule based on the lead Activity's JIT Start Date minus the number of JIT Slack days specified in the text input. This logic is applied to all resources. Drum-Buffer-Rope: DBR calculations are used to manage the release date for operations that use one or more capacity-constrained resources flagged as Drum resources. Each manufacturing order is released based on its DBR Release Date minus the JIT Slack Days specified in the text input. Account for Offline Intervals:

When enabled, the Head Start Span or global JIT Slack days will factor into the release date of each order in terms of the number of hours of online capacity on each resource. When disabled, the Head Start Span or global JIT Slack days will factor into the release date of each order simply in terms of calendar days. This feature is useful in data models whose resources are offline for multiple days at a time (i.e. on weekends or for holidays). When PT only considers calendar days to calculate release dates, it considers these offline spans of time which may result in orders being released to schedule too late to get done on time since the multiple days of offline capacity was not taken into account when the JIT date was calculated. Example: Job A is due for shipment on Monday, June 12 at 8:00 PM. The most capacity constrained resource which is required to run the final operation of Job A is online for 16 hours each day, Monday through Friday and remains offline Saturday and Sunday. The operation requires a full 16 hour shift to complete. The plant is aggressively trying to plan for JIT scheduling so only allows for 1 day JIT slack on all resources. When not accounting for the resource offline time which span Friday at 8pm through Monday at 4am, the job's release date is calculated to be Saturday at 6:00pm. If the resource were online then maybe this wouldn't be a problem, but since the resource doesn't come online until Monday at 4am, the operation is not allowed to start until Monday at 4am. As long as there are no other operations considered eligible to schedule between Friday at 8pm and Monday at 4am, this one operation can schedule to finish on time. If there are any other eligible operations though then one of them will be scheduled late. Alternatively, if accounting for the resource offline time then the activity is released to schedule on Thursday at 12:00pm which allows it to finish at 12:00pm on Friday before the weekend. This gives plenty of time for other operations to schedule for the last 8 hours of online capacity on Friday, then the full 16 hour shift on Monday before the job is due.

**Set Sub-Job Need Dates** This option is only available in User Settings and is only used to determine the manual adjustment action to Set Sub-Job Need Date and JIT that is available from the Gantt and Activities boards right-click menu and Actions tile. Sub-jobs are jobs that are created to fulfill material requirements for successor jobs. The need dates for those jobs can be updated according to where the successor/parent job schedules using the following options:

- Use System Options: The Set Sub-Job Need Dates value set in the Scheduling Options section of the System Settings will dictate the behavior.
- To earlier of JIT and scheduled start date: The need date of the sub-job is set to the earlier of its JIT start date or its parent job's scheduled start date.
- To JIT date: The need date of the sub-job is set to the JIT start date of its parent job.
- To start date: The need date of the sub-job is set to the scheduled start date of its parent job.
- To bottlenecked Operation start date: The need date of the sub-job is set to the start date of whichever operation is causing a bottleneck.
- To overlap supply sources: The need date of the sub-job is set to the end date of the parent job minus the amount of time required for the sub-job to make its first transfer of product to inventory.

See Also [MPS/MRP Optimize Plan Settings](#) [System Settings](#)

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## Product Rules

### [Source](#)

**Key Concept** Product Rules can be used to define varying production rates, yields, and preferences for items which are produced in the plant based on which resource is used to produce them. These rules override the standard values set at the Job Operation, Resource, or Item level. Product rules provide additional flexibility for companies with varying production speeds, quantity or volume constraints, inventory transfer rates, or resource priority depending on the machine or labor personnel completing each operation. Jump to section: [Standard Functionality](#) [Manual Configuration](#) [Standard Functionality Dependencies](#) In order for an Item to be eligible to define one or more product rules for, its Item Source property must be set to Manufactured or PurchasedOrManufactured.

**Configuration Options** Each product rule defines any number of the available production efficiency overrides for a single Product □ Resource association. There may be cases where the same Product □ Resource association may be necessary for multiple rules where the particular operation also becomes a variable factor. In these cases, the operation can be assigned a Product Code which can be referenced from the Product Code property in the Product Rules table, effectively creating a Product □ Resource □ Operation association. Each rule can be used to override the following fields:

- SetupSpan / UseSetupSpan: Overrides the Operation SetupSpan when UseSetupSpan is True.
- ProductionSetupCost / UseProductionSetupCost: Overrides the cost of setting up when UseProductionSetupCost is True.
- CycleSpan / UseCycleSpan: Overrides the Operation CycleSpan when UseCycleSpan is True.
- QtyPerCycle / UseQtyPerCycle: Overrides the Operation QtyPerCycle when UseQtyPerCycle is True.
- PostProcessingSpan / UsePostProcessingSpan: Overrides the Operation PostProcessingSpan when UsePostProcessingSpan is True.

UsePostProcessingSpan: Overrides the Operation PostProcessingSpan when UsePostProcessingSpan is True.

StorageHrs / UseStorageHrs: Overrides the Operation Storage Hours when UseStorageHrs is True. CleanSpan / UseCleanSpan: Overrides the Operation CleanSpan when UseCleanSpan is True. CleanoutUnitsRatio / UseCleanoutUnits: Overrides the item's Unit Volume ratio and/or the operation product's unit volume ratio override when UseCleanoutUnits is True. CleanoutCost / UseCleanoutCost: Overrides the cost of running a cleanout when UseCleanoutCost is True. MinVolume / UseMinVolume: Overrides the Resource's MinVolume when UseMinVolume is True. MaxVolume / UseMaxVolume: Overrides the Resource's MaxVolume when UseMaxVolume is True. MinQty / UseMinQty: Overrides the Resource's MinQty when UseMinQty is True. MaxQty / UseMaxQty: Overrides the Resource's MaxQty when UseMaxQty is True. PlanningScrapPercent / UsePlanningScrapPercent: Overrides the Operation PlanningScrap Percent when UsePlanningScrapPercent is True. HeadStartSpan / UseHeadStartSpan: This will override the Operation HeadStartSpan when UseHeadStartSpan is True. This field can be used to specify a preference to run the item on the resource. For example, higher HeadStartSpan values will indicate that operations can be scheduled to the resource further before the Operation's JIT Slack. This will result in the resource being assigned to the operation earlier than resources with lower HeadStart values. Note: It is required to also define an Product Code on the product rule in order for the Headstart Span to be enforced.

MaterialPostProcessingSpan / UseMaterialPostProcessingSpan: Overrides the Operation MaterialPostProcessingSpan if UseMaterialPostProcessingSpan is True. TransferQty / UseTransferQty: Overrides the Item's Transfer Quantity when UseTransferQty is True. Priority / UsePriority: Overrides the Resource's Priority when UsePriority is True. Behavior Whenever an operation associated with a manufacturing order which produces a Product is scheduled to run on a Resource which has a Product Rule configured for that product, the defined production efficiency overrides from the Product Rule are used to calculate the values of whichever properties have the "UseThis" property set to True in the Product Rule. In order for any operation of a manufacturing order to be considered eligible to be impacted by a product rule, one or more of the M.O.'s operations must produce the product defined in the product rule. Simply assigning a Product Name to the M.O. without also configuring at least one of the operations to produce the product to inventory is not sufficient to trigger a product rule. All operations of a manufacturing order which produce the product which schedule on the resource defined in the Product Rule will have the same overrides applied to it unless the Product Rule also specifies a Product Code. If a Product Code is specified, then the Product Rule will only affect the efficiencies of the defined operation where the operation has its Product Code defined which matches the product rule's Product Code. If there is a product rule being used for the operation, it can be easily found by using the Find Product Rule button on the Products tab of the job dialog box. Manual Configuration Typically, Product Rules are imported via the Product Rules Mappings, though they can also be configured and maintained manually from the Product Rules tile of the Scenario Data Board. The tile is divided into 3 tables of data. On the top half, all manufactured items which are eligible for product rules are displayed on the left side. All resources are displayed on the right side. Across the bottom half of the tile, all currently configured Product Rules and their settings are displayed. Create a Product Rule To create a new Product Rule, first select a manufactured item from the top left grid. Next, select a resource from the top right grid that the rule should apply to. Optionally, enter a Product Code into the text input in between the 3 grids (though this can be edited later). Click the New button from the tile toolbar to add a grid row to the Product Rules grid based on the current selections. Edit a Product Rule Edit the production efficiency properties as desired by editing them in the grid cells directly. Be sure to check the box to "UseThis" which is associated with the property whose operation setting should be overridden by the Product Rule. For example, to use the Product Rule to define a CycleSpan of "10 minutes", enter "00:10:00" into the CycleSpan property cell and check the box in the UseCycleSpan grid cell, as shown here: Once the settings are defined, be sure to click the Save button from the tile toolbar to save the configuration. Delete Select Product Rules Click to select 1 or more grid rows from the configured Product Rules grid, then click the Delete button from the tile toolbar. Confirm Yes to delete the rule(s) if prompted. Clear All Product Rules Use the Clear button from the tile toolbar to clear all Product Rules data from the scenario. See Also Product Rules Mappings Item Mappings Resource Mappings Resource Operation Mappings Scenario Data Board Inventory Plan Board Capacity Planning Board Cleans

## Schedule Clock & Planning Horizon

[Source](#)

Key Concept In PlanetTogether, scheduling constraints are enforced within a time period referred to as the Planning Horizon. The Planning Horizon starts at the current Schedule Clock date and time, and ends after a defined duration. Within this horizon, material and capacity constraints are enforced by various scheduling processes (optimization, drag/drop, etc.). Beyond the end of the Planning Horizon, though, these constraints are ignored and operations which are short on their required materials or which need to schedule on resources which do not have available capacity within the horizon will be allowed to schedule without these constraints enforced. Operations and activities cannot be scheduled any earlier than the Schedule Clock which also defines the start of the Planning Horizon. It is possible, using Track Actuals, to view finished work in the Gantt and various grids from dates and times before the current Schedule Clock, but since the system has no concept of Resource Capacity earlier than this date, no required work can be scheduled there. Jump to section: Planning Horizon Advancing the Schedule Clock Planning Horizon The Planning Horizon duration is defined in the Scheduling Options section of the System Settings board within a planning area. This setting impacts all scenarios within the planning area. When optimizing, work is scheduled no earlier than the start of the planning horizon (defined by the Schedule Clock date and time), and may be scheduled far beyond the planning horizon. While capacity and material constraints are only enforced within the planning horizon, operations are not released to schedule until after their dependent predecessors' scheduled end date, and/or until they are released to schedule according to their Need Date minus JIT slack allowance. The Planning Horizon can be visualized in the Gantt Board. Dates and times before the start of the horizon are shaded a solid gray color. The horizon itself has clear horizontal borders drawn on each resource row with alternating light blue and white shaded areas representing each row, as well as vertical time interval indicators which assist with placement of drag/drop scheduling and drawing the eye to the particular date and time according to the current zoom level. The horizon is also the only area where capacity intervals are scheduled and visible. The area beyond the planning horizon is shaded a solid light yellow color. While operations and activities may schedule out here, note that they are potentially not adhering to any configured material or resource capacity constraints. Advancing the Schedule Clock The Schedule Clock is only advanced manually unless Automatic Actions are configured to advance it on a schedule. This enables flexibility in determining what schedule process works best for each organization. For example, some might work with daily schedules and thus are advancing the Schedule Clock daily, while others might work with weekly schedules and only advance once per week. It's important to note that once the clock has been advanced forward, there is no way to advance it backwards due to the system not being able to properly restore capacity intervals. The only way to revert a clock advance is to Undo the clock advance action, or restore the entire planning area data back to an earlier restore point on the PlanetTogether server. To advance the clock to a future date and time, use the Clock dropdown on the right side of the Main Toolbar. From the dropdown of options, users may select a specific date and time with quick buttons to update the selections to Today and Now or to Add 1 Day to the specified date and time. These buttons will not trigger any actual Clock Advance, they will simply update the date and time in the dropdown in preparation for the user to click one of the Advance Scenario(s) buttons. When there are multiple scenarios in the Workspace, users will see two options - Advance All Scenarios or Advance Active Scenario. The Advance All Scenarios button will advance the clock to the specified date and time for all scenarios in the Workspace which are not configured to be isolated from clock advances. The Advance Active Scenario button will only advance the clock to the specified date and time in the currently active scenario. If Quick Actions are enabled then the Clock quick action button advances the date of the clock for all scenarios in the planning area which are not configured to be isolated from clock advances to today's date, but preserves the same time of day that was set previously. See Also Main Toolbar System Settings Scenario Management

## Setup Time

[Source](#)

Key Concept Accurately modeling setup time is crucial to creating an accurate schedule. Setup Time in

PlanetTogether is meant to represent the amount of time required to prepare a resource for a production run. It gets executed at the start of a scheduled operation, and can be configured in many ways, including sequence-dependent setup which allows for varied setup to be configured where the setup time is determined by the sequence of the scheduled operations on a resource. Setup time is incurred at the start of an operation, before the first cycle begins. It is a fixed duration which does not scale according to the total number of cycles that the operation will complete. Considering there are a plethora of ways to configure when setup time should be incurred, it's possible that multiple configurations of setup will apply to the same scheduled operation at the time it schedules. When this occurs, PlanetTogether assumes that the longest setup duration of all applicable sources should be incurred. Consecutive Setup can be configured in various areas which, when enabled, will combine together all applicable setup time configurations which are configured with consecutive setup. Jump to section: Resource Setup Operation Setup Operation Attribute Setup Setup Table: Setup Code Table Setup Table: Attribute Code Table Setup Table: Attribute Number Range Table Product Rules Visualizing Setup Time Optimizing the Schedule to Reduce Setup Time or Cost Resource Setup Each resource has many configuration options which determine when setup is to be incurred on the resource and which setup time configuration strategy to use when determining how much setup to incur on scheduled operations. Setup Span A SetupHrs property can be imported via Resource Mappings, or the Setup duration may be defined from the Capacity Planning Board on any resource. This setup duration will be applied to an operation according to the Setup Included property value. If Consecutive Setup Times is marked True then this duration of setup may be added to other sources of incurred setup time.

**Setup Included WhenProductChanges:** Setup will be incurred when the MO Product of the scheduled operation's associated MO is different from that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**WhenSetupCodeChanges:** Setup will be incurred when the Setup Code of the scheduled operation is different from that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**WhenEitherChanges:** Setup will be incurred when either the MO Product or the Setup Code of the scheduled operation is different from that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**Always:** Setup time is always incurred on all operations scheduled on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**Never:** Setup time will never be incurred on any operation scheduled on this resource.

**WhenSetupNumberChanges:** Setup will be incurred when the Setup Number of the scheduled operation is different from that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**WhenSetupNumberIncreases:** Setup will be incurred when the Setup Number of the scheduled operation is higher than that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**WhenSetupNumberDecreases:** Setup will be incurred when the Setup Number of the scheduled operation is lower than that of the previously scheduled operation on this resource. The amount of setup time incurred is defined in the Setup property on the resource by default. The operation's defined setup time may also be considered if the Use Operation Setup Time property is set to True on the resource.

**UseSetupCodeTable:** Setup will be incurred according to applicable Setup Code table logic.

**UseOperationAttributes:** Setup will be incurred based on Operation Attribute configurations of each operation scheduled on this resource. Use Operation Setup Time When True, the scheduled operation's defined setup time will be considered as a possible source of incurred setup time. Consecutive Setup Times When True, the resource's configured SetupHrs or Setup duration will be added to other sources of incurred setup as if each source of setup duration must be completed one after the other (rather than one or the other). Omit Setup on First Activity When True, the first scheduled activity on the resource will never incur setup time. Omit Setup on First Activity in Shift When True, the first scheduled activity of each online or overtime capacity interval will never incur setup time.

**Current Setup** This functionality is deprecated in software version 12.2.0 and newer. The recommended approach to configuring the system to calculate setup at the start of the schedule is to use Track Actuals and import one or

more finished activities on each resource where setup should be incurred at the start. Current Setup codes can be defined in order to create a setup sequence for the first scheduled activity on the resource. The first scheduled activity's Product or Setup Code or Setup Number will be compared to the Current Setup property value to determine if and/or how much setup time to incur on the first scheduled activity. These values are typically imported to represent the Product or Setup Code or Setup Number value of the last finished activity on the resource since otherwise there is no point of reference when comparing differences between the previously scheduled activity and the first scheduled activity on the resource's schedule. Product: The External ID of the product which was produced on the most recently finished activity on this resource. Setup Code: The Operation Setup Code of the most recently finished activity on this resource. Setup Number: The Operation Setup Number of the most recently finished activity on this resource. Max Same-Setup Span  $\Delta$  Warning This feature is removed from software version 12.3.0 where Setup Code has also been removed. The same behavior can be mimicked by using the Same Attribute Code Runtime sequencing factor when Attributes are used to incur setup. This feature acts as a scheduling constraint which forces operations with varying setup codes to be scheduled on the resource after the specified duration in terms of combined operation run time. When set to any duration greater than 00:00:00, operations with the same Setup Code will only be allowed to schedule one after the other on the resource as long as their combined Run Time does not exceed the Max Same-Setup Span duration. An operation will not be considered eligible to schedule on the resource if its Setup Code matches that of the previously scheduled operation and its Expected Run Time when combined with previously scheduled operations' Run Times would exceed the Max Same-Setup Span duration. When combined with the Same Setup Code sequencing factor, this setting can force a sort of sawtooth schedule with regards to the Setup Code value between operations after the specified duration. Setup Time Efficiency Multipliers This feature impacts the setup time setup incurred by operations on the resource. This value can be changed to reflect whether the setup time of the resource is faster or slower than usual. Values greater than one represent a resource setup that is faster than usual, while values less than one represent a resource setup that is slower than usual. For example, if an operation is configured to incur 2 hours of setup time but the resource is configured with a Setup Time Efficiency Multiplier of "0.5" then the operation will actually incur  $(1/0.5) * 2 = 4$  hours of setup time. Adjust the ActivitySetupEfficiency property value to impact setup duration which is incurred by Operation or Activity Setup time standards, or Operation Attributes (excluding attribute table logic). Adjust the ChangeoverSetupEfficiency property value to impact setup duration which is incurred by Attribute Table configurations. See Also Resource Mappings Capacity Planning Board Track Actuals Internal Activity Mappings Operation Setup An operation's setup span is a simple way to define a static amount of setup that must be incurred by the operation. It may be imported via the SetupHrs property of the Resource Operation Mappings, or configured manually in the Job Details Dialog. In order for a Resource to incur Setup from the Operation Setup setting, the UseOperationSetupTime property of the resource must be set to TRUE. Activity Setup Override If an operation is split into multiple activities, each activity's setup duration may be configured independently of other activities of the same operation. See Also Resource Operation Mappings Job Details Dialog Internal Activity Mappings Operation Attribute Setup Custom Attributes can be configured on the Job Operation to incur setup time under various conditions. In order for the system to consider an attribute when determining Setup duration or cost, the attribute's AttributeType property must be set to Setup (which is the default value if no value is imported for the property). The conditions under which setup is to be incurred by the attribute is determined by the AttributeTrigger property value. If ConsecutiveSetup is marked True then the duration of setup incurred by the Attribute may be added to other sources of incurred setup time. AttributeTrigger options are as follows: Always: Setup will be incurred whenever an operation with this attribute is scheduled. CodeChanges: Setup will be incurred whenever this attribute's Code changes from one scheduled operation to the next on the same resource. NumberChanges: Setup will be incurred whenever this attribute's Number changes from one scheduled operation to the next on the same resource. NumberHigher: Setup will be incurred when this attribute's Number increases from one scheduled operation to the next on the same resource. NumberLower: Setup will be incurred when this attribute's Number decreases from one scheduled operation to the next on the same resource. LookupByCode: Uses an Attribute Code Table to determine the setup duration. LookupByRange: Uses an Attribute Number Range Table to determine setup duration. Never: The attribute is not used for Setup duration calculations. The setup duration is determined by either the DefaultDurationHours property of the Attribute, or the value of the DurationHrs property of the Operation Attribute when the DurationOverride property on the Operation Attribute is set to True. Attribute Code Tables or Attribute Number Range Tables will override these other sources of duration if the attribute is configured to trigger setup based on the table logic. The setup cost is determined by either the DefaultCost property of the Attribute, or the value of the Cost property of the

Operation Attribute when the CostOverride property on the Operation Attribute is set to True. Attribute Code Tables or Attribute Number Range Tables will override these other sources of cost if the attribute is configured to trigger setup based on the table logic. See Also Attributes Attribute Mappings Operation Attribute Mappings Job Details Dialog Setup Table: Setup Code Table Setup Code Tables may still be used in software versions 12.2.1 and older, but are removed from software version 12.3.0 and newer. Attribute Code Tables should be used instead. Each Operation may be assigned a Setup Code. The Setup Code is allowed to be any text string identifier, such as the color of the paint on a paint line or a batch code associated with the operation. Setup Code Tables define a matrix of code change relationships and the setup time and/or cost which should be incurred based on the Setup Code values of two consecutively scheduled operations on the same resource. This may result in varying setup duration and/or cost depending on the sequence of scheduled operations. For example, switching from Setup Code "Yellow" to code "Blue" will incur a setup time, but switching from "Yellow" to "Yellow" will have zero setup. Each Setup Code Table may be assigned to one or more resources. Only the resources in which the table is assigned will use its matrix logic to calculate setup time between operations. An operation's SetupCode property can be imported via the Resource Operation Mappings, or manually configured or maintained in the Batching/Setups tab of the Operation section of the Job Details Dialog. A Setup Code Table matrix can be imported via the Setup Code Table Mappings, or manually configured or maintained from the Data Tables tile of the Scenario Data Board. Setup Code property values can be visualized in Gantt block label text or the Activity Scheduling grids of the Activities Board. See Also Resource Operation Mappings Setup Code Table Mappings Job Details Dialog Scenario Data Board Setup Table: Attribute Code Table This solution assumes that custom Attributes exist in the data model and are configured for Setup calculations. See the Operation Attribute Setup section of this page for configuration information. Attribute Code Tables define a matrix of code change relationships and the setup time and/or cost which should be incurred based on the Code values of one or more Attributes of two consecutively scheduled operations on the same resource. This may result in varying setup duration and/or cost depending on the sequence of scheduled operations. For example, an Attribute named "Color" may be configured so that switching from code "Yellow" to code "Blue" will incur a setup time, but switching from "Yellow" to "Yellow" will have zero setup. A wildcard value can be defined on the table if there are values that need a setup or clean to or from any unspecified value. In this screenshot the wildcard symbol is defined as \*. Precedence defines whether the setup or clean time and/or cost incurred in the event that a lookup matches two different wildcard entries is defined by the wildcard entry whose wildcard character or string is used in the PreviousOp or the NextOp code column. Example If the scheduled sequence changes from Code "A" to Code "B" and the Code Table defines these wildcard rules (where "\*" is the wild code character): A to \* \* to B then Previous precedence would use the duration and cost incurred by the \* to B entry while Next precedence would use the A to \* entry. Each Attribute Code Table may be assigned to one or more resources. Only the resources in which the table is assigned will use its matrix logic to calculate setup time between operations. Attributes can be imported via Attribute Mappings, or manually configured or maintained in the Attributes tile of the Scenario Data Board. Operation Attributes can be imported via Operation Attributes Mappings, or manually configured or maintained in the Attributes tab of the Operation section of the Job Details Dialog. An Attribute Code Table matrix can be imported via Attribute Code Table Mappings, or manually configured or maintained from the Data Tables tile of the Scenario Data Board. Custom attributes and their Code values can be visualized in Gantt block label text or the Activity Scheduling grids of the Activities Board. See Also Attributes Attribute Mappings Operation Attribute Mappings Attribute Code Table Mappings Scenario Data Board Job Details Dialog Setup Table: Attribute Number Range Table This solution assumes that custom Attributes exist in the data model and are configured for Setup calculations. See the Operation Attribute Setup section of this page for configuration information. Attribute Number Range Tables define a matrix of numerical range change relationships and the setup time and/or cost which should be incurred based on the Number values of one or more Attributes of two consecutively scheduled operations on the same resource. This may result in varying setup duration and/or cost depending on the sequence of scheduled operations. For example, an Attribute named "Size" may be configured so that switching from number "5" to number "10" will incur some amount of setup time, while switching from number "10" to "20" might incur even more setup time. Each Attribute Number Range Table may be assigned to one or more resources. Only the resources in which the table is assigned will use its matrix logic to calculate setup time between operations. Attributes can be imported via Attribute Mappings, or manually configured or maintained in the Attributes tile of the Scenario Data Board. Operation Attributes can be imported via Operation Attributes Mappings, or manually configured or maintained in the Attributes tab of the Operation section of the Job Details Dialog. An Attribute Number Range Table matrix can be imported via Attribute Number Range Table Mappings, or manually configured or maintained from the Data

Tables tile of the Scenario Data Board. Custom attributes and their Number values can be visualized in Gantt block label text or the Activity Scheduling grids of the Activities Board. See Also Attributes Attribute Mappings

Operation Attribute Mappings Attribute Number Range Table Mappings Scenario Data Board [Concepts](#)

## > Warehouses, Items & Inventory

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### **Items, Inventories, Warehouses, & Storage Areas**

#### Source

Key Concept Items represent the individual products, raw materials, or components that are involved in the production process and are tracked and managed within PlanetTogether. Warehouses are areas where the items are stored. Storage Areas are separate sections within the warehouse for storing items, and may represent storage tanks or silos where material can be stored. When an Item is mapped to a Warehouse in PlanetTogether, the mapping is considered an Inventory record. When an Item is mapped to a Storage Area, the mapping is considered an Item Storage record. PlanetTogether is capable of forecasting inventory levels per warehouse over the time horizon of the schedule, and can be configured to constrain operations from scheduling until their required material is forecasted to be available. This helps to create accurate schedules which consider material availability. Tools are available in the user interface to display details of each item's inventory level over time. Metrics and Targets can also be configured to quickly alert planners and schedulers of material shortages, expired material consumption, or over-production or over-stock at points in time within the schedule horizon. Jump to section: Key Features and Functionality Multi-Warehouse Configurations Storage Areas as Tanks Data Object Management Key Features and Functionality Jump to sub-section: Storage Areas Job Operation Stock Material Requirements Job Operation Products Material Requirements Planning (MRP) Tracking Material Consumption Tracking Inventory Levels Purchase Orders (Purchases to Stock) Sales Orders Lot Control Shelf Life Storage Areas A Storage Area represents an area within a warehouse to store material. Each area can be configured as to what can be stored there, when, and how much. Single Item Storage defines whether or not the Storage Area can store multiple items at once. If this field is true, only one item can be stored at a time, material must be withdrawn or disposed before another item can be stored. If false, there is no limit to how many different items can be stored together. Within a storage area, a Max Quantity can be set per item. The system will not allow anymore than this value to be stored in the area for that item. If a Max Quantity is not set, it is assumed there is no maximum. A Disposal Quantity can also be set. When the value in the storage area drops below this amount, the field Dispose Immediately will define what happens. If the field is True, the remaining quantity is removed from the area as soon as it falls below the value. If set to False, it will remain in the storage area until the area is needed for another item, then will be disposed of to make room. Storage In Flow Limit and Storage Out Flow Limit fields define how many sources can fill or withdraw material from the storage area simultaneously. In order to enforce these constraints, the fields Constrain In Flow and/or Constrain Out Flow need to be true. Counter Flow defines if the storage area can be both filled and withdrawn from at the same time. Counter Flow Limit is the total number of simultaneous storage and withdrawal sources. If 0, only one direction can occur at a time. In order to constrain the counter flow, Constrain Counter Flow must be set to true. A storage area can be constrained to only fill from or supply materials to certain resource. This is defined by Storage Area Connectors. To see more about these constraints, see the article Storage Area Connectors. For more information, see: Storage Areas Board. Job Operation Stock Material Requirements Job operations can be configured to require one or more stock materials. These material requirements comprise what might be called the "bill of materials" (BOM) in other systems. Each requirement may specify: The name or unique ID of the Item The quantity required Which warehouse the item should be sourced from (optional) Which storage area the item should be sourced from (optional) Whether the required item should be considered a scheduling constraint based on the item's availability or lead time, or if it's a non-constraint Other more detailed settings and configurations may also optionally be defined. These options are detailed in the Material Mappings page and/or the Job Details Dialog page. Job Operation Products Job operations can be configured to produce one or more products to inventory. The inventory can be made available in batches while the operation is running, or it can be made available all at once at the start or end of the operation. Each operation product may specify: The name or unique ID of the Item The quantity produced Which warehouse the item will be stored in Which storage area the item will be stored in (optional) When the product will be available for other operations to use it Other more detailed settings and configurations may also optionally be defined.

These options are detailed in the Product Mappings page and/or the Job Details Dialog page. Material Requirements Planning (MRP) In PlanetTogether, MRP (Material Requirements Planning) is an automated process that compares the demand for materials and finished goods (jobs, sales orders, forecasts, and safety stock) to the on-hand and planned supply to generate planned jobs and/or purchase orders which can help to plan to satisfy unmet demands. Details of how to configure an environment to use the MRP feature can be found in the MPS/MRP Planning article. Tracking Material Consumption Each stock material requirement that is consumed from inventory over the course of the entire schedule horizon is listed in the Materials Board grid. Use the data to see where materials are coming from to supply each consuming operation and when they are needed. This data can help material planners to ensure that the release and procurement of materials are in sync to meet demands, and can be used to flag inventory shortages or expired material consumption. Tracking Inventory Levels Inventory levels per Warehouse over the span of the schedule horizon can be tracked in detail from the Inventory Plot Report tile of the Inventory Plan Board. This interactive tile loads in-depth details of all adjustments (production, purchases, and consumption) of the inventory that is selected in the Inventory grid. The resulting Inventory Details grid can be filtered as needed to gain specific insights on those adjustments over the course of the schedule horizon. For a detailed view of inventory levels per Storage Area, use the Storage Areas Board and the plot report available there. Purchase Orders (Purchases to Stock) Purchase orders represent an increase in the stock of materials added to inventory at specific dates and times. The Purchase Orders Board offers insights into scheduled and received Purchase Orders over the current schedule horizon and allows users to manage their Purchase Orders and/or create new ones as needed. Details of each configurable setting can be found in the Purchases to Stock Mappings page. Sales Orders Sales orders generally represent customer orders for finished products. They are used to track demand in the Inventory Plan (as they consume inventory) and are often used in conjunction with the MRP function. Use the Sales Orders board to maintain customer orders and make manual adjustments as needed. Lot Control When an item is lot controlled, each positive adjustment to inventory levels (on-hand lots, purchase orders, and job products) may optionally be assigned a lot code for tracking and pegging purposes. Similarly, each negative adjustment to inventory levels (job material requirements or sales orders) may be assigned one or more allowed lot codes which allow them to source their material from a specific production lot that matches the allowed code(s). The Lot Controlled Planning article details how to configure this feature and how it can be used to control inventory production and material consumption in batches. In software version 12.3.0 and newer, all items are lot controlled, though the use of lot codes for pegging production to consumption remains optional. Shelf Life Shelf life is a type of lot control which allows the system to calculate (or the scheduler to define) an expiration date on each lot that gets produced or added to inventory so that it may either be consumed before its expiration date, or else will expire and be discarded so that no operation may use its material. Operations may also be configured to be allowed to consume expired material which can help to bring awareness to the scheduling impact of materials expiring when combined with schedule analytics available in the Materials Board that can show which operations are consuming expired goods. Multi-Warehouse Configurations PlanetTogether supports tracking, sourcing, and supplying inventory from/to multiple warehouses. Any number of warehouses can be created and configured to supply one or more of the plants in the data model. Stock Material Requirements Job operation stock material requirements may either specify which warehouse the material must be sourced from via the WarehouseExternalId field, or allow the system to allocate any source from any available warehouse at the time of scheduling. Supply from multiple warehouses can be enabled via the MultipleWarehouseSupplyAllowed field. Job Item Production All job operation products must specify which warehouse the produced item will be stored in via the WarehouseExternalId field. If part of the batch needs to go into one warehouse and other parts to other warehouses, multiple product objects can be defined per operation with varying WarehouseExternalId destinations. Transfer Orders Transfer Orders can be used to model inventory transfers between two warehouses. Storage Areas as Holding Tanks Tank scheduling is intended for manufacturers that use large storage vats or silos to hold materials such as beverages, chemicals, or formula blends for an indeterminate amount of time. Storage areas and Storage Area Connectors can be used to show tank storage and consumption over time, and to model various constraints that each tank may adhere to. For example: which item(s) may be stored in it; its maximum storage quantity; whether it can store more than 1 item at a time; whether it can be filled and drained simultaneously; how many connections are allowed to fill or drain it simultaneously; and which resource(s) are allowed to supply or consume from it. Item Storage Use Item Storage Mappings to define which items are allowed to be stored in the tank storage area. Single Item Storage Typically, tanks and silos may only store a single material at a time. Set the SingleItemStorage setting on the Storage Area to True in order to enforce this constraint during scheduling so that scheduled job operations will never add materials to a storage area when it's

occupied by another material. When this is true, all stored material must be withdrawn or disposed before another item can be stored. Automatic Disposal It's quite common for small amounts of material left over at the end of a large batch to be disposed of. Define a minimum quantity threshold to be stored in the tank via the DisposalQty setting on the Item Storage. If the stored inventory level of the item in the storage area ever drops below this quantity, then the system will be allowed to discard the remaining material. Set the DisposeImmediately setting to True on the same Item Storage to trigger the disposal immediately upon breaching the minimum threshold. Otherwise, when this is disabled (False), the inventory will not be disposed until a scheduled job needs to use the tank to refill it with new material. Additionally, it may be prudent to dispose of expired materials so that a fresh batch of material can be stored in the tank. Each Item can be configured with a shelf life duration via the ShelfLifeHrs property. The system's default behavior is to automatically immediately dispose of all expired material according to its production date and the configured shelf life duration. Note that expired material may be preserved in the system if there are any job operations whose stock material requirement is configured to allow expired material to supply it via the AllowExpiredSupply property. Disposals can be visualized in the Inventory Plan's On-Hand Plot Report tile, or the Storage Area board's Plot Report tile. Maximum Inventory Threshold Each Item Storage mapping within a Storage Area can be configured with a Maximum Quantity via the MaxQty property. This becomes a scheduling constraint so that no job operation may schedule to store material in the storage area if it will violate this maximum inventory threshold for the item that it's producing. Storage Flow Constraints Storage In Flow Limit and Storage Out Flow Limit fields define how many sources can fill or withdraw material from the storage area simultaneously. In order to enforce these constraints, the fields Constrain In Flow and/or Constrain Out Flow need to be true. Counter Flow defines if the storage area can be both filled and withdrawn from at the same time. Counter Flow Limit is the total number of simultaneous storage and withdrawal sources. If 0, only one direction can occur at a time. In order to constrain the counter flow, Constrain Counter Flow must be set to true. □ Example Storage Area can be filled and pulled from simultaneously This case demonstrates a situation where a holding tank can be filled by as many as 3 resources while material is also being withdrawn from the tank as it supplies other resources with material. Scenario: In a craft brewery, the final stage before packaging is holding the finished, filtered beer in a Bright Beer Tank (BBT). This tank acts as a buffer to ensure the packaging lines have a continuous, uninterrupted supply. 3 fermentation vessels are each finishing the production of the same flagship IPA. As each batch finishes, it is transferred to a central holding tank. The brewery's piping allows only one fermenter to transfer beer into the BBT at a time. While the BBT holding tank is being filled from the fermentation vessels, the beer is also being fed through pipes to each of the Canning, Bottling, and Kegging lines. All three packaging lines can run simultaneously if needed. Data Model Configuration: A BBT holding tank acts as the Storage Area. The Storage Area is configured with flow limits: StorageInFlowLimit is set to 1. This constrains the Storage Area to only be filled by one of the 3 connectors at a time. StorageOutFlowLimit is set to 3. This allows the Storage Area to be drained by 3 connectors simultaneously. CounterFlowLimit is set to 4 since there is one source filling the area plus as many as 3 draining. ConstrainInFlow, ConstrainOutFlow, and ConstrainCounterFlow are all set to True. Scheduling Impact: Only one Vessel is allowed to schedule at any time to supply the BBT tank. Each of the Canning, Bottling, and Kegging lines are allowed to consume from the tank at the same time. IPA beer is added to the BBT tank in batches. Once there is enough liquid in the tanks for the canning and bottling lines to consume it, they are allowed to schedule even while the tank is still being filled. Storage Area Connectors Storage Area Connectors establish in-flow and out-flow connections between Storage Areas and Resources. Each connector can define which resource(s) can fill which storage area(s) via in-flow connections, as well as which storage area(s) can feed or supply which resource(s) via out-flow connections. Each connector is required to have at least one in-flow connection or one out-flow connection defined. Connectors can also enable or disable counter-flow (simultaneous in-flow and out-flow), and can optionally be configured to limit the number of simultaneous in-flow and out-flow connections. For more information, see: Storage Area Connectors. Job Operation Product Configuration Options RequireEmptyStorageArea: Set this operation product property to True to prevent tank storage areas from being "topped off" with the same material that is currently stored in the tank if there is room to add more. Set it to False if adding to a non-empty tank storage area is acceptable. Storage Visibility in the Gantt When a Storage Area Connector is configured with an in-flow relationship between a resource and a storage area, a Storage Level indicator can be visualized in the Gantt on the connected resource. The Storage Height slider in the Capacity Tools tile in the Gantt must be increased to the desired height for the storage level to be drawn on the Gantt. △ Warning This functionality has limitations in when storage levels will be drawn: Storage Area limitation: This is only compatible with storage areas that are configured with an in-flow connection in a single storage area connector. If a storage area is configured with in-flow connections in multiple storage area

connectors, then storage will not be drawn in the Gantt. Resource limitation: This is only compatible with resources that are configured with an in-flow connection in a single storage area connector. If a resource is configured with in-flow connections in multiple storage area connectors, then storage will not be drawn in the Gantt. Data Object Management Items, Warehouses, Inventories, Storage Areas, and Item Storages are manually created or imported as data objects. Data Import Item objects are imported via Item Mappings; Warehouse objects are imported via Warehouse Mappings which are then associated with Plants via Plant Warehouse Mappings; Inventory objects via Inventory Mappings. Storage Area objects are imported via Storage Area Mappings; Item Storage objects are imported via Item Storage Mappings; For lot controlled items, on-hand inventory must be imported as lots via Lots Mappings; In software version 12.3.0 and newer, all items are lot controlled, therefore on-hand inventory must be imported as lots via a combination of Lots Mappings to define the lot object, and Item Storage Lots Mappings to define which Storage Area(s) the lot is stored in and how much inventory is stored in each (one lot may be stored in multiple storage areas). Manual Creation Warehouses should be created first and configured to supply one or more Plants. These can be created and their properties modified from the Warehouses and Inventories tab of the Inventory Management tile of the Scenario Data Board. Be sure to expand the grid to show nested grids after creating the warehouse in order to view and configure the supplied plants. Be sure to Save all changes via the button in the top left corner. Items and Inventories are best created from the Items and Inventories tab of the Inventory Management tile of the Scenario Data Board. Similar to the warehouse creation process, after adding an item to the model, click the "+" sign to view the nested grids to allow for the assignment of the item to one or more warehouses. For lot controlled items, click the "+" sign next to the warehouse name to expand another nested grid to allow for viewing and defining inventory Lots associated with the inventory record. Be sure to Save all changes via the button in the top left corner. After Items and warehouse inventories are created, Storage Areas and their Item Storages can be created. At least one storage area is required per warehouse, and at least one item storage is required per storage area. These are created and their properties modified from the Warehouses and Inventories tab of the Inventory Management tile of the&n

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## **Lot Controlled Planning**

### Source

Old Article Versions This article is updated to reflect the latest software functionality. For older software versions, download and refer to the appropriate document version: Software Version(s) Download Link 12.1.4.x thru 12.2.1.x LotControlledPlanning\_12.2.1.pdf Key Concept A material lot refers to a batch of a product or material which was either manufactured or received together. Lots typically share a common characteristic, such as being purchased or produced on the same date or on the same production line, or by using the same batch of component materials. Each lot is identified by a unique code or ID that can be used for tracking its production and consumption over time. As a result, lot control helps with quality control and traceability and enables schedulers and planners to create schedules which adhere to specific constraints such as "first in, first out" or "last in, first out" allocation and shelf life duration. Assigning lot codes to material and product batches also aids in minimizing the impact of product recalls issued by vendors and manufacturers alike. In PlanetTogether, all items and inventories are lot controlled so that any positive adjustment to inventory levels (on-hand lots, purchase orders, and job products) of the material is stored and distributed as a unique lot. Each lot may optionally be assigned a Lot Code for tracking and pegging purposes. Similarly, each negative adjustment to inventory levels (job material requirements or sales orders) may be assigned one or more Allowed Lot Codes which allow them to source their material from specific production lots that matches one or more of the allowed codes. Shelf life lot control adds another dimension by forcing a lot to expire after a certain amount of time since it was received or produced so that consuming jobs or sales orders can't use expired materials. Jump to section: Configuration Options On-Hand Inventory Lot Production Lot Consumption Lot Traceability and Visibility MRP & Lot Control Configuration Options Lot Codes Imported Lots of on-hand inventory and Job Product lots may each be assigned a Lot Code. Lot code enforcement is handled by also setting the LimitMatISrcToEligibleLots property to True on the Lot or Job Product. Lot codes enforce pegging of a specific lot to a specific consuming job operation. If a Lot has a Code assigned and LimitMatISrcToEligibleLots is True, then it will only be allowed to be consumed by job operations whose material requirement specifies the lot code in the Allowed Lot Codes property (see below). Allowed Lot Codes The AllowedLotCodes property is set on the Stock Material Requirement of a job operation. It accepts a comma-

separated list of Lot Codes that the operation is allowed to source material from. △ Caution Be sure to only separate the list of values with commas; do not follow the commas with spaces. For example: ☐ Good: LotCode1,LotCode2 ☐ Bad: LotCode1, LotCode2 Shelf Life The ShelfLifeHrs property of an Item can define by when the item's lots should be consumed or else expire after a certain duration after their production. The system will use this value to calculate how long after a lot is produced that it can be stored in inventory and used to satisfy job operation material requirements. Shelf life is enforced as a scheduling constraint by default, but setting the AllowExpiredSupply property on the stock material requirement to True will prevent the item's lots from expiring and allow operations to consume expired material. When expired material is consumed, it can be visualized in the Materials board grid via columns Expired Material Used and Expired Quantity Used. These allow for alerts and metrics to be configured to alert schedulers and planners of expired materials being used so that they may make necessary manual adjustments to the production and/or consumption of the lot(s) as needed to ensure that the most of its inventory gets used before it expires. On-hand lots can optionally be assigned an ExpirationDate, but if this value is omitted then the system will use the LotProductionDate property (required) plus ShelfLifeHrs to determine the lot's expiration date. After a lot's expiration date has passed, if no operations are allowed to consume expired material, then a negative adjustment will be visible in the Inventory Plot Report of the Inventory Plan board which shows the amount of the lot that expires. A ShelfLifeWarningHrs property can be set that will trigger a warning when a material is scheduled to be consumed within this number of hours of its expiration date. Warnings can be visualized in the Materials Board grid where the field NearExpiry will be checked/true. The Activities Board grids also show a MaterialsNearExpiry field that will list all materials that are scheduled to be consumed within their warning range. On-Hand Inventory Since storage area inventory is tracked by production lots, on-hand inventory must also be represented by lots. On-hand lots can be imported (import lot objects via Lot Mappings and then set the quantity and storage destination via Item Storage Lot Mappings), or they can be created manually using the Inventory Management tile of the Scenario Data board. Lot Production Jobs Each job operation Product output is added to warehouse storage as a new Lot according to the operation's scheduled status and the operation product's Inventory Available Timing setting. Each job product may optionally be assigned a Lot Code which will require that consuming operations or sales orders also have the lot code listed as one of their Allowed Lot Codes in order to be eligible to consume from the lot. If no lot code is defined and the option to Limit Material Source to Eligible Lots is False (and combined with the UseLimitMatlSrcToEligibleLots property set to True), any job or sales order with a requirement for the item may consume the lot so long as the consuming demand does not have an Allowed Lot Code defined. Note: This functionality is not currently compatible with MRP-generated jobs. MRP will always set a lot code on all production of lot-controlled items. Purchase Orders Purchase orders may also be assigned a Lot Code. While typically imported via Purchases to Stock Mappings, lot codes may also be assigned to existing purchase orders in grid edit mode from the Purchase Orders board, or assigned at the time of manual creation via the New Purchase to Stock popup dialog. Lot Consumption Stock Material Requirements Job operation materials may be pegged to one or more lots of material by defining one or more lot codes in the Allowed Lot Codes property. Use a comma-separated list to define more than one allowed code (do not include a space between the values). If the expectation is to source material partially from one lot and partially from another (or partially from many), then the Allow Partial Supply property must be set to True. Additionally, if the allocation logic is expected to source from the oldest lot first or from the most recently produced lot, then the Material Allocation property must also be set accordingly. Use Oldest First: Source material from the oldest produced lot(s) first. Use Newest First: Source material from the most recently produced lot(s) first. Material consumption may optionally be delayed by a specified number of hours from the allowed lot(s) production date(s) in the condition that some amount of time needs to pass after the lot is produced or received before it can be consumed. Use the MinAgeHrs property to specify the delay duration. Material consumption of shelf-life controlled items may also optionally be configured with the MinRemainingShelfLifeHrs property which requires that the lot must have at least this number of hours of shelf life remaining before it expires in order for it to be considered eligible to be consumed by the operation. If it's desirable to allow expired materials to be consumed to give schedulers and planners better visibility into expiring lots, setting the AllowExpiredSupply property on the stock material requirement to True will prevent the item's lots from expiring and allow the operation to consume expired material. In cases where an operation is expected to consume a specific amount of an item from one lot and a specific amount of the same item from another lot, multiple material requirement entries can be assigned to an operation which list the same required item but different Required Quantity and/or Allowed Lot Codes values. In these cases, it is not necessary to flag Allow Partial Supply to True. Sales Orders Sales Orders for lot-controlled items may be assigned one or more Allowed Lot Codes in an effort to

hard-peg the order to one or more production jobs. Similar to stock material requirements, the Allowed Lot Codes property accepts a comma-separated list of codes when more than one are allowed to be distributed to the order. If multiple sources are allowed, then the Allow Partial Allocations property must be set to True, and the Material Allocation property may optionally be set according to the desired allocation order: Use Oldest First: Source material from the oldest produced lot(s) first. Use Newest First: Source material from the most recently produced lot(s) first. Note: This pegging is not a scheduling constraint for the production job(s), nor is it a sales order distribution constraint; it's mostly for informational purposes. The job(s) which produce the lot(s) will schedule according to standard release rules, sequencing factors, resource capacity, material availability, and other constraints while the sales order inventory adjustment will be listed in the Inventory Plot Report tile grid at the date and time that it is needed according to its Required Available Date rather than the date and time that the supplying job(s) are scheduled to finish. □ Tip When hard-pegging firm production orders to sales orders using lot codes, it's advisable to set the OrderNumber property on the job equal to the associated sales order(s) Name or External Id so that schedulers may easily see which sales order(s) are fulfilled by which job from the Jobs Board grid. More custom solutions and data can be included in custom job or sales order User Defined Fields as well to make other data visible in the respective board grids.

Lot Traceability and Visibility Inventory Plan Board A useful tool for tracking lot production and consumption is the Inventory Plot Report tile of the Inventory Plan board. In particular, the Inventory Details section grid offers the following insights: Dates and times of all production or consumption adjustments (property: Date and Time) The amount of material which was added or removed from inventory (property: Change Qty) The source of the production or consumption (property: Reason) The job name of the associated job, if applicable (property: Job Name) The sales order name of the associated sales order, if applicable (property: Sales Order) The lot code of the associated lot, if applicable (property: Lot Code) Filter criteria may be applied to any one of the grid columns in order to hone in on specific adjustments. For example, a filter could be applied to the Lot Code property to show all adjustments for a specific lot code.

Materials Board Lot consumption and production of all scheduled jobs may be tracked from the main grid of the Materials Board. In particular, the following grid properties offer valuable insights: Lot Codes (Material) Lots Used Operation Product Lot Code Supply Description Earliest Expired Usage Expired Material Used Uses Expired Material Expired Quantity Used Shelf Life Warning Hours Near Expiry Materials Near Expiry Filter criteria may be applied to any grid column, and many associated job, manufacturing order, path, operation, and activity properties may optionally be exposed to offer detailed insights into each scheduled material consuming operation.

Gantt Board Certain details of lot production and consumption can be visualized in the Gantt by exposing certain operation properties in segment labels and/or tooltip text. In particular, the following grid properties offer valuable insights: Operation Product Lot Code Operation Material Requirement Lot Codes Operation Material Requirement Lots Used Activity Produced Lot Expiration Additionally, with Activity Links enabled from the Gantt (and Inventory Links enabled in User Settings), selecting a scheduled activity block which produces a lot will draw links from it to each consuming scheduled activity block. The Job Watch Gantt tile may be helpful to isolate the production and consumption of a lot as well. To add a job to the Job Watch Gantt, right-click a scheduled activity block and select Analysis → Watch Job. From the resulting Job Watch Gantt tile, choose the option in the top left corner to Show Related Jobs to see all job production and consumption associated with the selected job.

Sales Orders Board Sales orders can be imported or manually configured to specify which lot codes are allowed to supply it. The allowed lot codes can be exposed in the main Sales Orders grid to help track sales order pegging.

Purchase Orders Board Purchase orders can be imported or manually configured to include a lot code to act as a production lot. The lot code can be exposed in the Purchase Orders grid from the Purchase Orders board to assist with tracking PO lot production.

User Defined Fields and Attributes User Defined Fields (UDFs) can be imported or manually added to Job, Operation, Item, and Sales Order objects. Similarly, custom Attributes may be imported or manually added to job Operations. These are custom fields that allow users to see and track data that matters most to them in the relevant boards and grids where PlanetTogether's default properties may fall short. Each UDF and Attribute can be exposed in any associated grid layout when configured to do so, so the inclusion of UDFs and Attributes related to lot production and consumption can assist in curating tools for planners and schedulers alike within the interface which otherwise would not be possible.

MRP & Lot Control PlanetTogether's MRP/MPS Planning feature adheres to some specific logic when it's used to generate jobs and/or purchase orders to satisfy demands from preserved jobs, sales orders, forecast orders, or safety stock. Some basic principals of MRP with regard to lot controlled planning: MRP won't generate jobs or purchase orders for demands which already specify allowed lot codes. In these cases, it is assumed that firm orders or purchase orders will be imported or manually created to supply the demands. When MRP generates jobs or purchase orders to satisfy any demand, it will assign MRP-generated lot codes to the

original demand and the created supply. Each time MRP is re-run, it will regenerate and assign new MRP lot codes to any preserved demand which does not have a preserved supply as long as the lot code follows the pattern of an MRP lot code (starts with "MRP" followed by a space, then some number of digits). See Also Item Mappings Lot Mappings Item Storage Lots Mappings Product Mappings Material Mappings Sales Order Mappings Purchase Order Mappings MPS/MRP Planning Inventory Plan Board Materials Board Jobs Board Gantt Board Sales Orders Board Purchase Orders Board MPS/MRP Planning

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## Concepts > Workspaces

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### Board Tile Settings

[Source](#)

**Key Concept** Each board has a set of tiles and a tile menu that spans the vertical space of the board along its left side. This document offers information about each of the tile settings that can be toggled for each board's tile menu. Access the Tile Settings by clicking the gear icon in the lower left corner of any board. Open tiles undocked as movable windows When enabled, each tile will open as an undocked window. Close open tiles Click this button to close all open tile of the local board. Open tiles on other boards which are not open or not currently in focus will not be impacted. Toggle Inline Menu When enabled, the tile menu will display "Inline" when opened or expanded, meaning it will displace the contents of the open tiles to make room for the tile menu to be fully visible alongside the tile windows. The menu will remain expanded until the user clicks the "hamburger" menu icon in the top left corner to collapse it. When disabled, the tile menu will display as an "Overlay" when opened or expanded, meaning it will expand visually over the top of any open tile window. The menu will collapse itself as soon as the user selects one of the tiles to open it, or if they click the "hamburger" menu icon in the top left corner.

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### Download Scenario

[Source](#)

**Key Concept** Users with appropriate user permissions may download the latest scenario file to their local system. This may be a way to create a scenario backup, or to fetch the latest scenario file so that it can be shared with PlanetTogether Support or a server administrator for troubleshooting purposes, etc. Simply click the menu option and choose a folder to write out the scenario to. See Also User Management Delivering Files to PlanetTogether Support Instance Manager Restore a Scenario from a Recording Backup

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### Grid Personalization

[Source](#)

**Key Concept** Grids in Version 12 are highly customizable. This article will detail how to use each grid customization feature to give users a personalized experience. Most grid customizations are stored as part of the active grid Layout which is stored in the active user's Workspace Profile. For more information about managing layouts and workspace profiles (including sharing them with other users), see: Layouts, Metrics, and Targets Workspace Profile Management Jump to section: Filter Editor Conditional Formatting Grouping Auto Filter Row Column Chooser Footer Row Column Locks and Anchors Export Grid Data Keyboard Shortcuts Select All: Use Ctrl+A to quickly select all grid rows. Filter Editor Use a right-click menu option Filter Editor... to display an advanced filter editor dialog which allows users to manage all filter criteria in the same dialog. The Filter Editor is best interacted with in the top section. The text input in the lower half offers the code view of the applied filter but is not necessary to interact with - the code will build itself as the filter groups and conditions are managed above by interacting with the various components. The Filter Editor displays filter criteria as a tree structure where nodes are filter conditions.

The entire expression is organized as a tree where parent nodes are logical operators that link individual filter conditions. Each component can be interacted with - the Field Name, the Criteria Operator, and the Operand Value to build a precise query. Simply click on the component and use the predictive suggestions or type to enter the desired criteria. Hover the mouse over the Group Operator in order to see Add/Delete controls to add a condition or delete the entire group of conditions. Depending on the type of property selected in the Field Name, the Criteria Operator may offer different options (i.e. "Exactly"; "Begins with"; "Contains"; etc. for text properties, or "Equals"; "Greater than"; "Less than"; etc. for numerical properties). Use the Apply button to preview the filter in the grid while keeping the editor open, or click OK to save the filter and close the editor dialog. Conditional Formatting Conditional formatting logic can be applied to each grid column. Access the Conditional Formatting Rules via a right-click menu option Conditional Formatting. The formatting rules will be applied based on the values of the property that was clicked. The Conditional Formatting options are very similar to the Microsoft Excel application's formatting options. First, expand the Conditional Formatting menu and choose to format based on Unique/Duplicate values, or various predefined rules, or even opt to build a custom condition. Depending on which option is chosen, a dialog will appear with inputs to specify both the criteria for when to apply formatting, as well as the style of formatting to apply when the criteria is met. There is also an option to Apply formatting to the entire row which will help to draw visibility to the condition by formatting the entire row rather than the specific cell that matches the criteria. The Custom Condition dialog offers a similar interaction as the Filter Editor. For ease of use, it is advisable here to select criteria using the top half of the dialog rather than the text/code section. Use the Manage Rules dialog to manage all rules applied to the grid. This dialog offers some more advanced functionality which allows users to customize the formatting style, apply rules to multiple columns, move prioritization of each rule up/down (helpful when multiple rules may apply to the same cell), or delete or unset a rule. Access the Manage Rules dialog from the Conditional Formatting sub-menu from the right-click menu: Here is a preview of the available options: Note that multiple conditions can be applied to the same cells/rows. If multiple conditional formatting rules match a cell's value then the one that is lowest down in the list of rules from the Manage Rules dialog will "win" and its formatting will be applied to the cell/row. The rule priority can be adjusted via the Manage Rules dialog by clicking once to select a rule and using the Up or Down buttons to move it Up in the list (lower priority) or Down in the list (higher priority). Grouping Use a right-click menu option Group By This Column to quickly group the grid data by the selected column property, or choose Show Group By Box to allow for one or more property columns to be dragged into the Group By Box to enable grouping and nested grouping of the data. Here is an example of the Jobs board grid grouped by Product Name: Group By Box With the Group By Box displayed, column headers can be dragged into the box to create grouping logic. When multiple columns are dragged into the Group By Box, nested groups of data are created. The hierarchy of parent-to-child nested grouping can be arranged by dragging and dropping the the column header either to the left of any existing grouped property to assign the new property as the parent, or to the right of the existing property to assign the new property as the child or secondary group. The hierarchy can be visualized by connected lines between each of the grouped properties. Right-click menu options are available to expand or collapse or clear all grouped data by clicking in any empty space within the Group By Box. A Group Summary Editor can be accessed by right-clicking any of the grouped properties and choosing the Group Summary Editor option. This dialog can be used to customize the visibility of various groups of data including the total grouped item count, as well as various statistics like the sum or average or minimum or maximum value, etc. of the grouped data depending on the property type that is being grouped. Auto Filter Row Use a right-click menu option Show Auto Filter Row to display a quick filter applicator that will appear near the top of each column. When enabled, the auto-filter row will appear along the top of the grid just underneath the column headers. The filter row offers a quick means to perform searches of each specific column data. Simply click the mouse into the white space and begin typing to search for some data from the associated column property. Click the icon to the left of the empty space to quickly select the filter application criteria. Different options may be displayed depending on the type of data that may be displayed in the column (dates, strings of text, numbers, etc.). The Filter Editor may be used to quickly clear out any/all applied filters, or select Clear Filter from the right-click menu of the property column header. Column Chooser The Column Chooser is accessible via the right-click menu from any grid column header. This dialog allows users to hide/show property columns in their current grid layout. Each board's grid may offer different properties to display relevant to the data objects associated with the board. Hidden/Shown Columns The dialog is split with the currently hidden columns on the left side and the currently visible columns on the right. Users may click once on any one or more properties from either side to select them, then drag and drop from one side to the other to either show the selected properties in the grid (if dragging from Hidden to Shown) or hide them (if dragging from

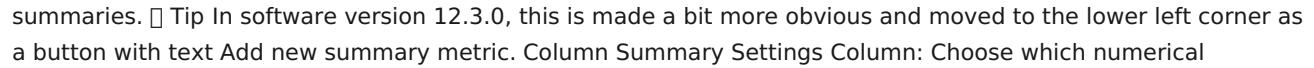
Shown to Hidden). A quick way to hide or show a property column is to double-click the column name from either the Hidden or Shown side and it will move itself to the opposite side. Each property column name from the Shown side can be click+dragged up or down to reorder the selected property among the other properties. Quick and arrow buttons are available to quickly hide or show all columns in a single click. Use the search inputs at the top of each of the Hidden Columns and/or Shown Columns to search for specific property names. Click the Preview button in the lower left corner of the dialog to apply the changes to the grid in the background without actually saving them. Click Save and Close to save the changes and close the Column Chooser dialog, or click Cancel to revert all changes and close the dialog. Footer Row A Footer can be displayed across the bottom of any main board grid to offer data such as summations of numerical values, average of all numerical values, minimum values, maximum values, or a count of the number of objects in each row. Right-click any column header from any main board grid and choose the option to Show Footer. When enabled, a blank footer row will appear at the bottom of the grid. Users may then right-click underneath any grid property column in the blank footer space and choose which data to display in that column's footer. If one property summary is already displayed, then an option to Add New Summary will be given so that more than one of the data summary options can be displayed at the same time. Different data summary options will be available depending on the type of data in the property column (dates, plain text, numbers, etc.). The footer can be hidden by right-clicking any of the grid column headers and choosing Hide Footer. Column Locks and Anchors Grid columns may be locked to the left or right of the screen or anchored in their currently ordered position so that those columns are always in view as users scroll left to right to view the various grid data. To lock or anchor a grid column, right click its grid column header and choose either Lock Left, Lock Right, or Anchor. A solid vertical border will be drawn on the grid when it's displaying a locked or anchored column. All locked columns will remain visible on the screen as the user scrolls left/right. Anchored columns will remain anchored to their current grid position as the user scrolls left, but will remain in view as the user scrolls to the right past the anchored property column. To disable locks or anchors, right-click the locked or anchored column and re-select the appropriate lock or anchor option. Export Grid Data Any grid layout can be exported to various formats: XLSX, CSV, PDF, or HTML. To export a grid layout, click the export icon to the right of the grid layout dropdown selection, then choose the desired format. A prompt will appear to select a folder to save the exported file. Choose an appropriate folder and rename the file if desired, then click Save. See Also Layouts, Metrics, and Targets Workspace Profiles Dashboard Grid Edit Mode

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## Layouts, Metrics, and Targets

### Source

Key Concept Metric indicators can be configured from any one of the main board grids (Jobs, Sales Orders, Materials, Inventory, Purchase Orders, etc.) to quickly visualize statistics related to any applied filtered layout/view of a grid. Simply apply a custom filter to one or more of the grid columns to create a filtered grid layout, then enable metrics to track the number of objects that match the filtered criteria at any given time. Each tracked metric will update with each scheduling change to give schedulers real-time feedback about how their changes are impacting what matters most to them and their organization. Take it a step further and define a target (goal) for the desired number of filtered layout results and the corresponding metric tile will include information about how close the current schedule is to meeting that target. Even more detail can be tracked by adding metric aggregate summaries - sum, average, minimum, or maximum values of any of the numerical columns which are visible in the associated grid layout. Jump to section: Layouts Metrics, Targets, and Summaries Sharing Metrics Metrics Board Layouts Layouts are custom configured views (filtered or not) of any grid data in PlanetTogether. Users can create as many layouts as needed from any of the various grid tiles. Each layout may contain unique configurations of visible columns and filters to hide and show the desired data in the order that it's most important to the user. Layouts are selected and configured from the layout dialog box visible at the top of each grid. Switch between existing layouts Quickly switch from one layout to another using the down arrow icon in the layout dialog box to expand the dropdown of options, then clicking on any of the layouts in the list to select it. Create a new layout Click the "+" icon in the layout dialog box to open the New Layout dialog. Enter a name for the new layout, then click Accept and Close to create a new layout as a copy of the currently selected one. The newly created layout will automatically be activated to allow for customization of the columns, filters, and metrics settings. Customize a layout Use any of the Grid Personalization features to hide or show particular columns, reorder

columns, apply filters to one or more of the columns, add column grouping logic, add conditional formatting, etc. to create the perfectly curated layout that shows precisely the data that matters. Any pending edits made to a layout must be saved before they are stored in memory. When edits are pending that need saved, two icons will appear in the layout dialog box next to the name of the currently selected layout: Use the checkmark icon to Save all changes, or use the back arrow to Revert all changes back to the previously saved version. Delete a layout Click the red "x" icon from the layout dialog box to delete the currently selected layout. Deleted layouts cannot be recovered except through importing or activating a shared Workspace Profile. Metrics, Targets, & Summaries A Metric in PlanetTogether is a custom performance indicator which helps to evaluate the performance of some specific object data property or sum of many properties based on the current data and schedule. A Target is a desired value or goal for the particular metric. A Summary metric may also be tracked to track the Sum, Average, Minimum, or Maximum value of any numerical property that is visible in the associated grid layout. Enable and configure a metric and target Metrics are enabled or activated from Layouts, so first create a grid layout which represents the data that should be tracked over time using a metric. Next, enable metric tracking on the layout data by clicking the icon next to the selected layout name. A dialog will appear where the metric can be configured: Metric Active: Toggle the switch to On to activate the metric for tracking in the Metrics Board. Priority Level & Color: Use the slider to select a Priority which will determine the sort order of the metric in the Metrics Board. Leave the preset color as-is, or toggle the Use Custom Color switch to reveal a color picker to choose any color desired. Counts: Configure how the metric count should appear in the metric slide in the Metrics Board. Show as: Select to show the count as a Number or a Percent Show Zeros: When enabled, if the associated grid layout has no matching grid rows, the metric will still be visible in the Metrics Board with a value of 0. When disabled, the metric will not appear in the Metrics Board if its value is 0. Show On Change Only: When enabled, the metric will only appear in the Metrics Board if the most recent scheduling change made an impact on the metric's value. Otherwise, if a schedule change did not impact the metric's value then it will not appear in the Metrics Board. Show Changes Highlighting: Toggle whether or not to show an indicator in the metric slide when the value increases or decreases. Changes Highlight Settings: When Changes Highlighting is enabled, choose whether Lower or Higher values are preferred so that preferred progress (up or down) shows a green indicator while unfavorable progress shows a red indicator. Targets: Toggle the option to Enable Targeting in order to see a quick comparison of the current metric value versus the desired target or goal value. Choose whether the target is represented as a Percentage or a Decimal, then set the Value of the desired target. Optionally set a Tolerance level as well to allow some flexibility in what gets reported as missing the target. Metric Preview: As the metric settings are configured, the metric preview will update in real time to give the user an idea of what to expect the metric to look like. Metric Summaries: Click the "+" plus sign in the top right corner of the Metrics Settings dialog to create a new Metric Summary, or use the tabular navigation in the same window to switch the view between existing metric summaries.  Column Summary Settings Column: Choose which numerical column's data should be tracked. Aggregate Type: Select from Sum, Average, Minimum, or Maximum aggregate types to track of the selected column. Metrics Shortcuts Right-click options are available from the Metrics Board. Simply right-click any metric tile in the Metrics Board to see quick options to edit Metric Settings or Disable Metric. Disable a metric or target To disable a target within a metric, navigate to the metric layout (click on the metric slide from the Metrics Board to quickly bring it into the forefront) and click the icon next to the layout dialog box to bring up the metric configuration dialog. Simply flip the Enable Targeting toggle to Off and save the change. To disable the entire metric, navigate to the metric layout, click the icon next to the layout dialog box to bring up the Metrics Settings dialog, then toggle the Metric Active switch at the top to the off position and save the change. Sharing Metrics Layouts and metrics and any related target information is stored as part of a user's Workspace Profile, so to share layouts and metrics with other users the relevant Workspace Profile settings must be shared. Once a workspace profile is shared, other users may import all of the profile settings or they may select to only import metrics and layouts into their existing profile. For more information about exporting, sharing, and importing workspace profiles, see: Workspace Profiles Dashboard. Metrics Board The Metrics Board offers a categorized dashboard of all configured Metrics. Hover the mouse cursor over any of the titles or numbered statistics or target icons to see more detailed information about the metric or target data. Click anywhere in any of the metric slides to bring its grid layout into focus for deeper analysis of the data. For more information, see: Metrics Board. See Also Grid Personalization User Settings Metrics Board Workspace Profiles Dashboard

## System Settings

### [Source](#)

Key Concept Use the System Settings to configure Workspace-wide settings and options (they impact all scenarios within the Workspace). Access System Settings via the dropdown option from the Main Toolbar. Jump to Section: Automatic Actions System Scheduling CoPilot Automatic Actions Configure certain actions to be performed at defined time intervals to allow the system to perform basic tasks on a schedule. Each of the Settings slides contains a toggle switch to enable/disable the action to run automatically, and a textbox entry to enter a custom CRON scheduling statement. CRON expression syntax looks a bit odd to the untrained eye. It's recommended to use this CRON expression generator to assist with curating the Automatic Actions schedule: CRON Expression Generator - Quartz Each CRON expression must provide 7 values separated by spaces. Here is a list of represented values, arranged from left to right in the CRON expression: Second Minute Hour Day Of Month Month Day Of Week Year \* \* \* \* \* | | | | | | | | +-- Year (range: 1970-2099) | | | | +--- Day of the Week (range: 1-7 or SUN-SAT) | | | | +--- Month of the Year (range: 0-11 or JAN-DEC) | | | +----- Day of the Month (range: 1-31) | | +----- Hour (range: 0-23) | +----- Minute (range: 0-59) +----- Second (range: 0-59) Note: The system assumes that the days and times reflect the UTC time zone and will be executed accordingly. Any number of actions may be enabled to run on a schedule, and each may be configured to run on the same schedule or on different schedules. Each action may even be configured to run on multiple schedules. When configuring multiple schedules for the same action, separate each CRON expression with a new line. Scheduling multiple actions to run at the same time may produce undesirable results if one action is dependent on another but its dependent doesn't finish before the next action is triggered (i.e. Optimize then Publish -- the appropriate schedule may not be published if Optimize is not given enough time to complete). The following actions can be scheduled to run automatically: KPI Snapshot: Use the KPI Settings slide to create KPI snapshots at the set intervals. Advance the Clock: Use the Advance Clock Settings to advance the clock to "now" at the set intervals for all scenarios which are not isolated from clock advances. The clock will be advanced to the day and time that the CRON scheduled task is executed. Compress the Schedule: Use the Compress Settings to compress the schedule according to the shared Compress Settings at the defined intervals. JIT Compress: Use the Compress Settings to JIT compress the schedule according to the shared Compress Settings at the defined intervals. Publish: Use the Publish Settings to publish the scenario data according to the configured Publish Options at the defined intervals. Refresh Data: Use the Import Settings to refresh data from the configured data source at the defined intervals for all scenarios which are not isolated from imports. Optimize Plan: Use the MPS/MRP Optimize Settings to run the MPS/MRP Optimize Plan function to regenerate jobs and a schedule according to the configured MPS/MRP Settings at the defined intervals. Optimize Schedule: Use the Optimize Settings to run the Optimize Schedule function to schedule jobs according to the configured Optimize Settings at the defined intervals. System Jump to sub-section: Data Options Undo Options User Options Publish Options Scheduling Options Data Options Track Actuals Track Actuals deals with the preservation of activity blocks in the Gantt for finished activities. Typically, a finished activity will be removed from the Gantt, but with a value greater than 0 for the Track Actuals Maximum Age (and with the user setting to [x] Display Block Actuals enabled), finished activity blocks will remain on the Gantt until the clock is advanced beyond the specified time frame from the activity's finish date. Track Actuals Maximum Age: The length of time (backwards) from the start of the schedule clock to an activity's finish date that Track Actual finished activity blocks will remain visible on the Gantt. Track Actuals Performance Thresholds: Visual indicators will be added to the finished activity block in the Gantt if its reported finish time was faster or slower than it was originally estimated to take (based on its cycle times and required quantity) by the defined percentage values. Activities which were reportedly finished faster than originally anticipated by a percentage greater than or equal to the configured Fast threshold will display a light green highlighted segment in the finished activity block. Activities which were reportedly finished slower than originally anticipated by a percentage greater than or equal to the configured Slow threshold will display a red highlighted segment in the finished activity block. Prevent auto delete of tracked actuals: When enabled along with Track Actuals Maximum Age, finished jobs which are omitted from import will not be auto-deleted as long as the duration between the jobs' Reported Finish Date and the current schedule clock does not exceed the Track Actuals Maximum Age duration. This assumes that the Job Mappings option to Auto-delete omitted records is enabled in the Import Mappings. Note: In order to visualize the Block Actuals finished activity blocks in the Gantt, the user setting to [x] Display Block Actuals must be enabled. Tracking Data Quantity Rounding: Round all quantity values in the system to the selected precision (number of

decimal places). Fine-tuning this setting can help with certain quantity rounding issues that arise when splitting jobs or operations and often when MRP is tasked with generating jobs with very specific quantities according to the job template configurations. TimeSpan Rounding: Round all timespan values using the number of decimal places specified. Rounds the time in TICKS that an activity needs to schedule. Fiscal Year End: This date is used to calculate the quarterly revenue KPI (This Qtr Revenue) Annual Percentage Rate: A global APR setting for all warehouses in the data model to be used to calculate carrying costs of WIP and finished goods. This value is used if the individual warehouse(s) in the data model do not specify any APR in their warehouse settings. Incoming Data Prevent ERP Job changes within the Stable Span: When enabled, jobs which are scheduled in the Frozen Span or Plant Stable Span will not be altered or updated by a data Refresh even if those objects have been updated in the ERP/SQL data source. Prevent ERP Job cancel or delete within the Stable Span: When enabled, a data Refresh from the ERP/SQL data source will not cancel or delete any jobs if they are scheduled in the Frozen Span or Plant Stable Span. Prevent ERP changes on Started jobs: When enabled, no changes will be made to jobs which are scheduled in the Frozen Span or Plant Stable Span by a data Refresh even if those objects have been updated in the ERP/SQL data source. Prevent ERP Cancel or Delete of Started jobs: When enabled, a data Refresh from the ERP/SQL data source will not cancel or delete any jobs with one or more operations whose status is any of Started, Setting Up, Running, Post-Processing, or Cleaning. Allow ERP Production Status to override manually updated status: When enabled, jobs or operations whose production status (or reported time or quantities or similar) have been updated manually by a PlanetTogether user are allowed to be overridden under the specified conditions in the next Update values from ERP setting. Update values from ERP: Never: This option has no effect on the default behavior. It's as if Allow ERP Production Status to override manually updated status remains disabled. If Values are Greater: If the values in the ERP/SQL data source are greater than the reported quantity or time values in PlanetTogether then they will be overridden with the ERP/SQL data source values. Always: Regardless of whether the values in the ERP/SQL data source are greater than or less than the reported quantity or time values in PlanetTogether, the values that were manually entered in PlanetTogether will be overridden by the values imported from the ERP/SQL data source. When capability does not exist: Define how to handle cases where an operation of a manufacturing order is imported from the ERP/SQL data source with a reference to a required capability which does not exist in the data model and/or which was not imported from the ERP/SQL data source. Reject MO: All operations of the associated Manufacturing Order will be omitted from the data import. Omit Operation: Only the operation which references the invalid capability requirement will be omitted from the Manufacturing Order. Create Capability: The capability will be added to the data model and the Manufacturing Order will be imported. Note that the capability will not be assigned to any resource so there would still be additional configuration to do before the operation would be eligible to schedule on a resource. Warn if Operation length is larger than: If the value is greater than 0 then a warning will be logged in the Message Logs if an operation is imported and its calculated schedule length/duration is greater than the defined value. Publishing Data Maximum number of Scenario Histories to store for each Scenario: This setting is used when recording scenario history. It is used to determine how many ScenarioHistory records to remove from the ScenarioHistoryManager to prevent the collection from getting too long. Undo Options Maximum seconds to perform Undo: The cumulative processing time of actions that trigger scenario data to accumulate for potential undos. Smaller values cause more frequent disk access but result in less time for an undo action. Larger values require less disk access but require more time to complete undo actions. Limit memory used for undo sets (in MB): The maximum number of MB used to store undo sets in memory. Checksum diagnostics: When enabled, connected client applications will check in with the server more frequently to ensure the data in the user's client application is not out of sync with the data stored on the server. Clear Undo History: Purge all undo sets from the scenario. This action cannot be undone. User Options Require passwords to be changed periodically: When enabled, all users in the system will be prompted to change their passwords at specified intervals. Not recommended for SSO integrations. Days between password changes: Define the number of days between prompts for users to change their password. Maximum number of failed login attempts: Define the number of acceptable failed login attempts before a user account is locked. If set to "0" then the default value of 10 is enforced. If a user fails to enter valid credentials this number of times then their account will be locked until a user administrator unlocks it. Enable password complexity rules: When enabled, password complexity rules are enforced according to the related settings. Minimum password length: Define a minimum password length (number of characters). Require at least 1 uppercase: When enabled, at least 1 uppercase letter is required in user passwords. Require at least 1 lowercase: When enabled, at least 1 lowercase letter is required in user passwords. Require at least 1 digit: When enabled, at least 1 digit (0-9) is required in user passwords. Require at least 1 special character: When enabled, at least 1 special character (!@#\$%^&\*+=) is required in user

passwords. Auto logoff users: When enabled, users who have been inactive for the amount of time specified in the Auto Logoff Timeout setting will be logged off. Auto logoff timeout: Define the number of minutes users must be inactive before being forced to log off. Inactive users will receive a message that they are being signed out due to inactivity and can decide to remain logged in when prompted. The Timeout Period is reset when the user changes tabs, acts (Clock Advance, Import, Publish, Optimize, MRP, etc.), or another action that causes a popup window to open. Publish Options Publish Destinations Publish to SQL Server: Publish to the SQL database defined in the workspace configuration on the PlanetTogether server. Publish to a Custom Program: Publish using a custom integrated program or application. A custom Microsoft .Net DLL can be called directly from PlanetTogether and passed to an in-memory dataset of the entire publish dataset. Please contact PlanetTogether Support for more information about configuring the application to use a custom program. Publish to XML: Publish to an XML file on the PlanetTogether server (saved to C:\Users\Public\Documents\APS Export Files). Publish all Activities for a Manufacturing Order if any are Published: This setting is used in conjunction with the Publish objects dated within the next setting from the Publish Options in the main toolbar dropdown. If not publishing the entire schedule, by enabling this option then if the publish is set to include one or more activities of a manufacturing order but also exclude one or more activities of the same MO since they are not scheduled within the defined time period, those otherwise excluded activities will be included in the published data. Limits for High-Volume Data Select which data objects should be published. When Retain Published Schedules is enabled under the History section, the Keep History column becomes active and specific objects must be selected if their history is meant to be kept in the publish database. If the object is not selected under Keep History then all related published data will be purged during the next publish. Run stored procedure after Publishing When enabled, the defined stored procedure will execute after the successful completion of the publish event. The defined stored procedure is expected to reside in the Workspace's configured Import database. When writing a stored procedure that gets used by the Publish process, 4 parameters are required to be defined with it: UserDefinedParameter: This is a text parameter that can pass information, like parameter strings, to the stored procedure. PublishDate: The date/time that will be stored in the PublishDate field in the Schedules table of the APS database. This can be used in the stored procedure to only update records that were just published, as opposed to including records from previous publishes (only necessary if storing history). Message: This is a return message that is displayed in the Log Viewer window if non-null. Undo: This can be set to 1 to cause an undo of the last action. This is typically only used for the Net Change Publish, thus enabling the stored procedure to validate the schedule change results and undo the change if necessary. An example of these declarations in a stored procedure: @UserDefinedParameter varchar(8000), @PublishDate DateTime, @Message varchar(8000) = " OUTPUT, @Undo bit = -1 OUTPUT An example of a simple stored procedure called "PT\_PutData": ALTER PROCEDURE [dbo].[PT\_PutData] @UserDefinedParameter VARCHAR(8000), @PublishDate DATETIME, @Message VARCHAR(8000) = " OUTPUT, @Undo BIT = -1 OUTPUT AS BEGIN -- SP logic goes here END An example of how to call the simple PT\_PutData procedure from the Procedures tab of the Publish Options section with the text "EP\_Test, PT\_Publish" defined for the @UserDefinedParameter parameter: PT\_PutData 'ERP\_Test, PT\_Publish' Run program after Publishing Run a program after Publish: When enabled, the defined program file will execute after the successful completion of the publish event. A Select Program File button is available to help users locate and select a program from their network or PC. Note that the path defined here is relative to the user's machine who executes the Publish event, so the program file that needs executed after the publish event must reside on their machine or the path to the program must represent the full path to the program file on a shared network server. Command line parameters may optionally be entered to pass to the program when it's executed. Publish dates using server's local time instead of UTC: When enabled, the dates reflected in the publish data will be represented in the server's local time zone rather than the default behavior of publishing dates according to the UTC time zone. History Retain Published Schedules: When enabled, certain data objects can be preserved in the publish SQL database for the specified amount of time in the related settings. Delete activity scheduled to start beyond the next: Purge any activity from the publish database whose scheduled start date is this many days or more after the current date. Delete all history older than: Purge any object from the publish database that is older than this amount of time from the current date. Delete non-production scenario history older than: Purge any non-production scenario data from the publish database that is older than this amount of time. Net-Change Net-change publishing is an automated publish which will trigger after any change to the schedule. Net-Change Publishing: When enabled, data will be published to the selected publish destinations each time a change is made to the schedule. Run stored procedure after Net-Change Publish: When enabled, the defined stored procedure will execute after each net-change publish. Requires Net-Change Publishing to also be enabled. The defined stored procedure is expected to reside in the Workspace's configured Import database.

Security for Reports that connect to Databases Specify the security type (Windows Integrated Security or Database Security) to use for any custom Reports which connect to a SQL Database. If using Windows Integrated Security then the reports will use the credentials of the Windows user that is configured on the PlanetTogether server to run the workspace "System" service. For server administrators, more information is available here. If using Database Security, enter the User Name and Password of the SQL user that the system should use to access to the database. Disable Refresh During Publish When enabled, the Refresh button will be disabled while a Publish is in process. This will prevent potential conflicts of data or API calls or stored procedures where the two operations call to the same external systems. Publish Analytics When enabled, the Publish button from the Publish dropdown from the main toolbar will publish to the Analytics database which is defined in the workspace configuration on the PlanetTogether server, in addition to any of the other selected publish destinations from the Data Published options section. Note: This does NOT need to be enabled in order for the Publish Analytics button from the Publish dropdown to publish to the configured Analytics database. Scheduling Options Job Demand Set sub-job Need Dates: Set or reset the Need Dates of sub-jobs during schedule optimization. This impacts all schedule optimization, not only MPS/MRP Optimize Plan. The Recalculate JIT on Schedule Change setting must also be enabled if this setting is set to anything besides Disabled. Disabled: Sub-job Need Dates will not be altered by the Optimize Schedule operation, although the same setting can be defined in the MPS/MRP options in the Plan dropdown from the main toolbar for use with the Optimize Plan MPS/MRP function. This setting must be set to Disabled in System Settings in order for the Plan dropdown setting to work. Otherwise, the option defined in the System Settings will override the setting in the Plan dropdown. To earlier of JIT and scheduled start date: The need date of the sub-job is set to the earlier of its JIT start date or its parent job's scheduled start date. To JIT date: The need date of the sub-job is set to the JIT start date of its parent job. To start date: The need date of the sub-job is set to the scheduled start date of its parent job. To bottlenecked Operation start date: The need date of the sub-job is set to the start date of whichever operation is causing a bottleneck. To overlap supply sources: The need date of the sub-job is set to the end date of the parent job minus the amount of time required for the sub-job to make its first transfer of product to inventory. Add prefix to MRP-generated jobs: Set sub-job Priorities: When enabled, the Priority property of all sub-jobs will be forced to the lowest value (highest priority) of its parent job's Priority. Set sub-job Hot flags: When enabled, the Hot property of all sub-jobs will be updated to match that of its parent job's Hot setting. Plant Spans Short-term Span: The duration from the start of the planning horizon to consider as the "Short-term Span". This span of time is referenced in a few areas of the software, such as the MPS/MRP Cutoff Duration setting, a Gantt zoom level option, and in various reports. Planning Horizon: The duration from the current PlanetTogether clock date and time that certain constraints (materials, capacity, max delay, etc.) are enforced during scheduling. The Planning Horizon duration is visually represented in the Gantt, and jobs which are unable to schedule within the horizon due to constraints are flagged in the Jobs Board grid via the Past Planning Horizon property. Lock Activities scheduled to start within the Frozen Zone: Any activity which is scheduled inside of the Department Frozen Zone will be locked to its currently scheduled resource. See: Locking and Anchoring. Anchor Activities scheduled to start within the Frozen Zone: Any activity which is scheduled inside of the Department Frozen Zone will be anchored at its currently scheduled time. See: Locking and Anchoring. Set Operation Commit Dates when Anchoring and Re-Anchoring: When enabled, an operation's Commit Dates will be updated when it is anchored or re-anchored at a point in time. See also: Plant Stability Scheduling Adjust MO Quantity: If enabled, the quantity of activity will be changed by dragging and dropping one side of an activity block. Max Delay: If enabled, this feature will force an operation's successors to be scheduled within a certain amount of time as defined by the MaxDelayHrs column of the Alternate Path settings. [ Deprecated; now default behavior ] Auto Select Alternate Paths: If enabled, Alternate Paths will automatically be selected. This option is useful when there are multiple methods of producing an item to let the system automatically select an alternate path when the needed date of the manufacturing order is approaching. Calculate Optimize Scores: If enabled, the optimize score will be calculated and can be visualized in the Activities Board grid. Note: Score calculatio

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## User Management

### Source

Key Concept PlanetTogether provides a collaborative experience between multiple levels and departments within a business by supporting any number of users who might each have unique permissions according to their role. A

user administrator can create permission groups which each is assigned unique permissions to view and/or edit various data, then assign each user to a group to assume those permissions. Jump to section: User Management Grid User Properties Tile User Preferences Tile Scenario Permissions Tile User Permissions Management Tile Plant Permissions Management Tile Users Bulk Edit Tile User Management Grid The User Management grid offers quick toolbar actions to perform various actions, and also gives insights into each user configured in the Workspace.

Toolbar Actions Open: Opens the User Properties tile where various user settings can be defined including (but not limited to) User and Plant Permission Group, User Name, and whether the user is Active or should be Deactivated. Select a grid row from the User Management tile grid to switch to edit other user's properties. New: Creates a new user with default settings. Copy: Creates a new user copying the settings from the user currently selected in the grid. Delete: Deletes the user selected in the grid. Note: Deleted users will be permanently removed from the system. Users can be marked as "inactive" in the User Properties dialog, preventing login but keeping the user information in the system. Clear: Deletes all users in the list except for the administrator user. Note: There must always be at least one administrator. Sign Out: Users with administrator permissions can force other users with active connections to sign out by selecting one or more users from the grid and clicking the Sign Out button. Note: The selected users will not be able to cancel this action. Note: It's possible to import User data from SQL. See: User Mappings See Also: Layouts, Metrics, and Targets Grid Personalization Object Bulk Edit Tiles Grid Edit Mode User Properties Tile Modify various user settings and properties in this tile. Select a row from the User Management grid to populate the User Properties tile with their settings, then edit as necessary. First Name: The user's first name Last Name: The user's last name User Access Status: An indication whether or not the user has permission to manage other users Password: An encrypted password input. Passwords can be changed by simply typing in a new password here and saving the change. Require Password Reset at next login: A flag to prompt the user to change the password the next time they login to the Workspace/Instance Active: A flag to indicate whether the user is active or not. Inactive users are not able to login. Web App User: A flag to indicate if the user is eligible to use the Shop Views application. Compression Type: The compression type can assist with scenario loading times when initially logging into the software if dealing with larger scenario file sizes and slower network speeds. Note: The default is Fast compression. For most connections, this setting should be left at Fast for optimal performance. However, users on slow network connections may see improved login speed and reduced action delay when using Normal or High settings. None: The scenario will not be compressed at all when transmitting to the client. Normal: Standard scenario compression is used. Fast: Less compression is used, which will take less time to compress but may make loading times longer if the scenario is larger. High: More compression is used, which may take a few seconds longer to load but will reduce the overall loading times. In some cases, High compression has been found to be unreliable. When retrieving the scenario data during login, high compression could fail and cause the client to disconnect from the server and fail to log in. It's recommended to use Normal compression instead of High in the cases where users are unable to connect. User Permission Group: Select which user permission group the user is associated with. Plant Permission Group: Select which plant permission group the user is associated with. Server Connection Count: Count of the selected user's active connections to the Workspace/Instance. User Name: The user name that the individual uses to login. External Id: A unique identifier of the user. Description: An optional text field where any descriptive notes can be added. Notes: An optional text field where any additional notes can be added. User Defined Fields: Custom user fields. These serve no functional purpose by default for user objects User Preferences User Preferences are user-specific settings that users without general permissions to manage all users can update for themselves as needed. A user administrator can also view and set these permissions as needed from the User Preferences tile in the Users board. Select a row from the User Management grid to populate the User Preferences tile with their settings, then edit as necessary. General First Name: The user's first name Last Name: The user's last name User Permission Group: The permission group name that is currently assigned to the user Reset Password: Click the button to display a popup dialog to allow the user to change their password. Display Language: The user's preferred language to view the Client application Time Zone: The user's preferred time zone to view dates and times in the Client application. Note: This does not need to be set to the same time zone that the user lives/works. It may make sense to set the time zone to that of the location of the Plant for which the schedule is being created. Publish on Exit Reminder: Opt whether or not to be prompted to Publish changes when exiting the application, or choose to automatically Publish changes when exiting. AskUser: The user will be prompted to publish the schedule if any schedule changes have been made since the last publish. Disabled: The user will not be prompted to publish and the schedule will not be published. PublishOnExit: The schedule will be published automatically if any schedule changes have been made since the last publish. Exit Dialog Timeout: When the user is prompted to Confirm or Cancel exiting the application, the popup will remain visible to them for

this defined duration. After this duration, the application will automatically close. Photo Sensitivity: When enabled, graphics which usually flash or that may make photosensitive individuals uncomfortable are suppressed and replaced with other means to draw their attention. Use Daylight Savings Adjustment: When enabled, all dates in the system are adjusted to accommodate daylight savings start and end which may vary depending on the selected time zone. This setting is best used when the scheduler is trying to match time zones with a plant that is in another time zone. The setting will ensure that the scheduler's shifts don't change differently than the plant's time zone. For most other time zone changes, it requires shifting capacity intervals by an hour. Show advanced user settings: Certain settings are considered more advanced as care should be taken before exposing them to all users. Restore to Defaults buttons for various System and User settings Advanced sorting controls of Gantt segments Synchronize Activity Grid layouts: When enabled, the Secondary Activity Scheduling tile layouts will be in sync with the Primary Activity Scheduling tile layouts. See: Activities Board Auto-reload Grid while in edit mode: When enabled, all board grids will automatically refresh when a schedule or data change is made by the current or other logged-in user, even while the current user is editing grid data in grid edit mode. Disabling this option can prevent disruptions while using grid edit mode, though does not always guarantee that all grid edits will be saved if the data that is edited was modified by some other user or means. User Prompts Show confirmation for undo or redo actions: Opt whether or not to be prompted to confirm when performing an Undo or Redo action. Auto-save Workspace Profile settings: Opt whether or not to automatically save changes to User settings and configurations. Show confirmation when deleting objects: (recommended) Opt whether or not to be prompted to confirm when deleting various objects. Clock Advance Auto Report Progress: Opt whether or not all clock advances issued by the user should automatically progress jobs that were in progress or previously scheduled to start before the clock date after the clock advance. Auto Finish: Opt whether or not all clock advances issued by the user should automatically finish jobs that were in progress or previously scheduled to finish before the clock date after the clock advance. Display the full date: Opt whether or not to display the full date and time in the Main Toolbar when the clock's date is the same as the current date. If disabled then only the clock time will display (not the date) if the clock date is the same as the current date. Optimize Use shared optimize settings: (recommended) When enabled, Optimize Schedule and Optimize Plan (MRP) settings are defined in the System Settings rather than User Settings and are shared among all users of the Workspace/Instance. When disabled, the user is presented with an option to select from any number of previously stored preset optimize settings configurations (see below). Use shared compress settings: (recommended) When enabled, Compress settings are defined in the System Settings rather than User Settings and are shared among all users of the Workspace/Instance. When disabled, the user is presented with an option to select from any number of previously stored preset compress settings configurations (see below). Optimize and Compress Preset Settings Configurations When either Use shared optimize settings or Use shared compress settings options are toggled off, a dropdown selection appears to allow the user to select an Optimize or Compress Settings Preset Configuration. Each user may create any number of preset configurations and may use the User Preferences dialog in the User menu from the Main Toolbar any time to switch between them as needed. These settings presets are meant to act as experimental configurations so that users may test various Optimize and/or Compress settings in order to fine-tune the behavior of these functions and how they impact the schedule. Once desirable settings are discovered, it's recommended to update the shared optimize or compress settings to match the preferred user-specific settings so that all schedulers in a multi-scheduler environment are using the same settings during optimize and compress. New: Click the green sign to create a new configuration preset configured with the default settings. Rename: Click the Rename button to change the name of the currently selected preset configuration. Copy: Click the Copy button to create a new configuration preset configured with the same settings as the currently selected configuration's. Delete: When more than one preset configuration exist, a red will appear in the User Preferences dialog next to the preset configuration name. Click this icon to delete the selected configuration. Once a configuration is selected, any changes made to the Optimize and/or Compress settings in User Settings will automatically save to the selected preset configuration. Move Prepend Setup On Move: When enabled, whenever activity blocks found to the left of other blocks are moved, the system will add the setup time before the current start of the activity block to prevent it from being completed later. Always Show Move Cursor: When enabled, the multi-move cursor will be displayed during drag/drop moves in the Gantt rather than a shadow of the block that is selected to be moved. Session Scenario Preferences: Choose which scenarios get loaded when the application launches. Load Last Session: All scenarios which were loaded in the last login session will be reloaded on startup. Load Production Scenario: Only the current Production scenario will be loaded on startup. Load Last Active Scenario: Only the last Active scenario will be loaded on startup. Load All Scenarios: All scenarios will be loaded on startup. Tip Choose one of Load Production Scenario or Load Last

Active Scenario for fastest application launch performance. KPI Number of KPI tiles to display: Choose how many custom KPI tiles per board to display (applicable to all boards where KPI tiles are available). Scenario Permissions Tile The Scenario Permissions tile allows for user administrators to view and manage permissions for all scenarios which exist in the Workspace. If a user belongs to a User Permissions Group which has the permission to manage all scenarios, then they will be allowed to view and edit all scenario permissions from this tile. Other users who have access to the Users board but do not have permission to manage all scenarios will be able to view scenario permissions but will not be able to edit them. Permissions are edited per user or per user group via the dropdown selections from the Permissions column. User Permissions Management Permissions groups define various permissions settings associated with groups of users. An administrator can create as many groups as needed and any number of users can be assigned to any group. One of the groups can be selected as the Default group where all newly added users will be assigned if those users are added manually or if they are imported without an assigned user group. Each user's assigned group is managed from the User Properties tile. Plant Permissions Management A separate Tile allows administrators to configure specific permission sets per plant for multi-plant scenarios. Similar to user groups, users can be assigned or associated with a Plant Permissions group so that those users in the group will all have the same permissions to view and/or schedule in the specified plant. Each user's assigned group is managed from the User Properties tile. Users Bulk Edit Tile Use the bulk edit tile to make changes to one or more properties for one or more users. Select one or more rows from the User Management grid, then choose properties and values that should be applied to each selected user. Finally, press the Save button to apply the changes. For more information, see: Object Bulk Edit Tiles

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## User Settings

### Source

Key Concept Several user settings are maintained to allow users to customize their experience with the Client application interface. This article details all of the settings each user can define for themselves. Access User Settings from the User menu dropdown in the top right of the main toolbar. Jump to Section: Gantt Layout Scheduling Gantt Gantt settings allow users to customize the objects in their Gantt board. Customize the appearance of activity blocks, Tooltip hover text, simplify the Gantt by removing certain objects or features, configure manual drag/drop move behaviors, and create custom Plant Resource View configurations. Jump to section: Block Settings Segments Move Settings Simplify Gantt Settings Tooltip Settings Block Links Settings Plant View Settings Scheduling Hints Block Settings: Note that all colors can be customized from this settings page by clicking on the color preview squares and selecting a preferred option. Block Actuals: When enabled, a visual indicator will be added to the Gantt blocks of any Activities in progress (started, running) or Finished (will remain on the Gantt) based on the user's defined color preferences for each Performance level (Fast, Normal, or Slow) and Status (Finished or Partially Finished). Click the "Label" buttons to customize the text that displays in the segment block. See Activity Blocks: Segments & Labels for more information. Block Actuals & Track Actuals In order to see the completed jobs on the Gantt, Track Actuals also needs to be set to a time grater than 0 hours. See System Settings for more information. Block Display: Labels to use in the Gantt: Opt whether to use a single Gantt block label or to display custom labels per each of the visible Gantt Segments. Highlight Un-reviewed Jobs: When enabled, jobs which are not flagged as having been "Reviewed" will be highlighted in the Gantt. Users can customize the Label and Tooltip settings here as well for Unreviewed jobs. Text Direction: Choose whether to view the text in Gantt segments horizontally, vertically, or dynamic based on block sizes and what will fit in the provided space. Wrap lines: Allow text wrapping inside of Gantt block segment labels. Padding: Adjust the amount of space between the Gantt block segment text and the block border. Use solid colors instead of dithered colors: Enabling this will help Gantt block label colors to look smoother in older 256 color display devices. Segments: Enable or disable visibility of each segment, customize the label text of each segment (if using Individual Segment Labels), and customize the colors of each of the various statuses. See Activity Blocks: Segments & Labels for more information. Commitment Segment: Visualize the job's Commitment level as defined by the Commitment property value. Material Status Segment: Visualize the statuses of the sources of required materials. At least one item type must be selected from the multi-select box in order for the segment to appear. Buffers Segment: Visualize penetration into Drum, Shipping, and Stock buffers. Priority Segment: Visualize job priority values as defined by the Priority property value. Priority Ranges: Define Low, Medium and High range values based on job Priority

values in the data model. Low range will begin at 0 and end at the first chosen value. Medium range will begin +1 after the low range and end at the second chosen value. All successive values are considered to be in the High range. Any value beyond the end of the defined high range will be treated as the highest value within the high range. Color Blending: Define a min and max color value for each priority range. The resulting segment color will be a blended color value based on the priority value within the range. Status Segment: Visualize the activity Status as defined by the Production Status property of the Activity. Progress Segment: Visualize completion progress of the activity. Process Segment: Visualize the amount of time spent in each of the various process steps of the activity (Setup, Run, Post-Processing, etc.). Max Delay Segment: Visualize Max Delay violations. Ends Early: The operation is scheduled to end too early; the gap between it and its successor is larger than the Max Delay setting allowance. Starts Late: The operation is scheduled to start too late; the gap between it and its predecessor is larger than the Max Delay setting allowance. Both: It both ends early and starts late. Timing Segment: Visualize the delivery timing of the completion of the activity based on its Need Date. Use this segment to also visualize bottlenecks caused by Material shortages, Capacity unavailability, or MO Release timing. Attribute Segment: Visualize colors from colors associated with custom operation Attributes. Job Color: Visualize the color of the associated job. Product Color: Visualize the product color of the associated manufacturing order. Move Settings: Various options related to manual activity drag/drop scheduling and Expedite. Move Settings: Anchor After Move: When enabled, the moved activity(ies) will automatically be anchored at the point in time where it is dropped. Lock After Move: When enabled, the moved activity(ies) will automatically be locked to the resource in which they are dropped. Exact Move: When enabled, drag/drop moves will start as close to the dropped date and time as constraints will allow. If another operation is scheduled at that point in time on the same resource(s), then the previously scheduled operation will be forced to move to a later date and time. When disabled, operations which are scheduled at the dropped point in time will remain where they are scheduled and the dropped operation will be scheduled immediately after the currently scheduled operation (this may still push any operation(s) scheduled after it to a later date and time). Expedite Successors: When enabled, drag/drop moving an activity to schedule at an earlier point in time will automatically expedite all successor activity(ies) of the moved activity(ies). Show Move Validation: When enabled, invalid manual drag/drop moves will present the user with the Move Manager dialog to give them visibility into when and where the selected operation(s) can be scheduled. Show Move Warnings: When enabled, invalid manual drag/drop moves will present the user with the Move Manager dialog to give them visibility into when and where the selected operation(s) can be scheduled. Compress Predecessors: When enabled, drag/drop moves which result in an operation being dragged to a point in time before its predecessor results in the predecessor operation(s) also being moved earlier to accommodate the drop time of the activity. Predecessors Do Not Move: Predecessor Activities don't move which causes the moving Activity to be constrained by the End Date of the latest Predecessor. Predecessors Compress: Predecessors will "Compress" meaning they can move back as far as possible without changing Operation sequence on the Resource they're scheduled on. The moving Activity will be constrained by the End Date of the latest Predecessor after the Compress. Predecessors Move: Predecessor will be able to move and change the sequence on the Resource they are scheduled on. If the move date intersects a scheduled block, the Predecessor will move to the End Date of the Scheduled Block, which may cause the moving Activity to not be able to move to the desired Move Date. Expedite Settings: Anchor After Expedite: When enabled, the moved activity(ies) will automatically be anchored at the point in time where it is expedited. Lock After Expedite: When enabled, the moved activity(ies) will automatically be locked to the resource in which they are expedited to. Include Supplies: When enabled, the supplying job(s) of the expedited activity will also be expedited to fulfill the activity at the desired time. When not enabled, activities can only be expedited as far forward as their material constraints allow. Simplify Gantt Settings: Use these settings to hide hours or days from the Gantt chart, hide capacity intervals or activities that start further into the future than are needed to see, and prevent various behaviors that are known to slow down the user interface while they are processing. Time Hiding: Select hours of the day and/or days of the week to hide from view in the Gantt. This is useful if there are never activities scheduled during certain time windows and users don't want to have to view the gaps in the schedule in the Gantt. Speed-Ups: Opt to hide capacity intervals and/or activities which start at or later than defined points in time in the future (where "now" is the PlanetTogether clock time, not necessarily the current date and time). Capacity Intervals: Opt to prevent dragging and resizing of various types of capacity intervals to prevent unwanted changes to the intervals while trying to scroll and perform other unrelated actions in the Gantt. Campaign Settings: Opt to alternate campaign colors by item group rather than the default behavior of just a single color used to represent all campaigns. Daylight Savings Settings: Opt to show a shaded region on the Gantt that will highlight the 1 hour of daylight savings adjustment. Tooltip Settings: When enabled, tooltip text will

appear while hovering the mouse over activity blocks or capacity intervals in the Gantt. Use the "Label" editor dialog to customize the information presented in the tooltip. This is the same setting/toggle as can be accessed in the Gantt chart toolbar directly where it's identified by this icon: . Label: Customize the tooltip text by clicking the "Label" button and using the Tooltip Script dialog to modify the visible text and data. Available Fields: Search or browse through the plethora of available object properties that can each represent some piece of data related to the Inventory, Job, MO, Operation, or Activity. Either double-click the desired property/field name, or drag and drop it from the Available Fields dialog over to the Label section. Label: Enter text freely into the Label section, and/or use property identifiers to create a tooltip that suits users needs. Include custom Attributes and User Defined Fields Attributes and UDFs can be displayed in the Tooltip dialog. They can be found as standard fields in the Label editor dialog window. If the attribute or UDF was imported or created in the current user session, it may be necessary to restart the client application before the custom fields can be visualized in the UI. In this example, the custom attribute is called "OperationAttribute01": Preview: This section previews what the tooltip text will look like according to the label settings. At least one activity must be scheduled for the Preview to be populated with any activity data. Keep Window Pinned: When enabled, the tooltip window will remain in a static location as the user hovers from one activity block to another. When disabled, the tooltip window follows the mouse and opens near the activity block that the user is currently hovering over. Show Insights: Insights can offer additional information about the scheduled activity including timing details or other scheduling analysis information. Fade Duration (ms): Define the amount of time the tooltip window takes to fade in or out. Fade Delay (ms): Define the amount of time to delay fading out the tooltip window. Show Delay (ms): Define the amount of time to delay the tooltip from appearing or updating when the mouse is moved to hover over an operation or capacity interval. Block Links: Use these settings to enable or disable particular types of activity links and to increase or decrease the thickness of the line drawn on the Gantt chart which symbolizes activity links. These options are used in conjunction with the Gantt option to "Show Activity Links". Plant View Settings: Custom Plant Views (or Gantt layouts) allow users to filter and sort the visible resources in the Gantt. Any user can create any number of Plant View layouts to suit their scheduling needs. Plant View layouts are saved as part of a user's Workspace Profile which can be shared with other users. Create a New Plant View layout by clicking the green icon in the Plant View dropdown select field. Use the Rename button to change the name of an existing layout. Use the Copy button to copy the currently selected layout to a newly created one. Use the Generate Plant Layouts button quickly generate or re-generate system-generated Plant and Department layouts. Click the View in Gantt button to quickly open the Gantt board with the currently selected layout preselected in the Gantt. Modify the selected layout by selecting checkboxes next to each of the Plants, Departments, and Resources that should be made visible. When Auto Enable New Resources is enabled, any newly added resources to the data model will automatically be added to the custom layout as a visible resource in the Gantt. Toggle on the Advanced Sorting option to sort the selected resources in a preferred order. Rearrange the order of the resources by simply dragging and dropping the order around in the Advanced Sorting window, or use the quick sort buttons Sort Alphabetically or Sort by Workcenter. Scheduling Hints: Toggle on/off which scheduling hints are visible in the Gantt when the Show Scheduling Hints setting is enabled from the Gantt toolbar. This can help to simplify the Gantt for end users. Gantt Lines: Choose which Gantt Hint lines are visible when an activity block is selected. Material Availability Line: The date and time when the latest required material is available. Product Consumed Line: The date and time when the selected operation's product is consumed by another scheduled operation. Drum Due Line: The date and time when the drum operation needs to be completed before it's considered late based on the Drum resource and drum-buffer-rope scheduling configuration. DBR Release Line: The date and time when the operation is released to schedule based on the drum-buffer-rope scheduling configuration. DBR Shipping Due Line: The date and time when the operation needs to be completed before it's considered late based on the defined DBR Shipping Buffer on the Manufacturing Order. Activity JIT Start Line: The just-in-time start date of the selected activity. Head Start Line: The earliest start date of the selected activity based on its JIT date minus head start/JIT slack. Job Need Line: The date and time that the last operation of the job must be completed by to be considered on time. Op Need Line: The date and time that the selected operation must be completed by to be considered on time. Job Finish Line: The date and time that the last operation of the selected job is currently scheduled to finish. Constraint Line: An indicator of the latest constraint of the selected operation which prevented it from scheduling any earlier. Successor Line: The scheduled start date of the successor operation. M.O. Need Line: The date and time that the last operation of the manufacturing order must be completed by to be considered on time. Earliest Constraint Line: Optimize Start Line: The date and time that optimization began when using the optimize setting to start optimizing at a specific time. Start After Line: A max delay hint to indicate the date and time that the operation must start at or after in order to

comply with max delay constraint settings. Start Before Line: A max delay hint to indicate the date and time that the operation must start at or before in order to comply with max delay constraint settings. Transfer Available Line: Gantt Regions Transfer Availability Region: A shaded region which spans the entire vertical height of the Gantt to show the transfer span between operations as configured in the alternate path. The region appears when the successor operation is selected. Layout Notification Settings: Opt whether or not to automatically hide certain categories/types of notifications after a specified period of inactivity. Bar Options: Hide automatically when no tiles are visible: Enable this option to hide the notification bar when no notification tiles are visible. Open Automatically: Selecting this option allows the notification bar to automatically appear at the bottom of the screen whenever a notification slide is triggered. Applicable to notification slide types with the Pop up the notifications bar when a slide becomes active setting enabled. Open with flyout button: Selecting this option prevents the notification bar from appearing when notification slides are queued and instead prompts the user to click a flyout button to open the notification bar if they so choose. Applicable to notification slide types with the Pop up the notifications bar when a slide becomes active setting enabled. Never open: Selecting this option prevents the notification bar from ever appearing. Notifications are still logged in the Message Log which is accessible from the Settings dropdown menu of the Main Toolbar. Seconds to close inactive tiles and info bubbles: Choose the number of seconds to display inactive slides in the notification bar before they automatically close. Note that slides will not close automatically unless the toggle switch is enabled to Hide automatically when inactive for the particular slide category/type. Scheduling Each of these settings impact a user's personal scheduling settings only. These personalized settings are used by users whose Optimize and/or Compress Preferences are configured with the shared Optimize settings disabled. When disabled, users are presented with a dropdown selection list of stored preset settings configurations. Choose a previously created settings configuration, or create a new one to work independently of previously defined settings. This can be helpful for experimenting with various optimization settings before committing to use one as the standard for production schedule optimization. For more information, see: User Preferences. If a user's preferences have the shared settings options enabled then their compress and optimize settings can be configured in the System Settings area. MPS/MRP Settings: Define MPS/MRP Optimize Plan settings to be used for Personal Optimize Settings. An alternative means to edit the same settings is to use the Plan dropdown from the Main Toolbar. For information about each of the settings in this section, see: MPS/MRP Optimize Plan Settings Any changes made to any of these settings will be stored in the user's currently selected Optimize Settings Preset Configuration. Optimize Settings: Define Optimize Schedule settings to be used for Personal Optimize Settings. An alternative means to edit the same settings is to use the Schedule dropdown from the Main Toolbar. For information about each of the settings in this section, see: Optimize Settings Any changes made to any of these settings will be stored in the user's currently selected Optimize Settings Preset Configuration. Set sub-job need dates: When the setting is defined here, the selected option will determine how sub-job need dates get reset by right-click and Actions tile options from the Jobs Board, Activities Board, and Gantt. Use System Options: The Set Sub-Job Need Dates value set in the Scheduling Options section of the System Settings will dictate the behavior. To earlier of JIT and scheduled start date: The need date of the sub-job is set to the earlier of its JIT start date or its parent job's scheduled start date. To JIT date: The need date of the sub-job is set to the JIT start date of its parent job. To start date: The need date of the sub-job is set to the scheduled start date of its parent job. To bottlenecked Operation start date: The need date of the sub-job is set to the start date of whichever operation is causing a bottleneck. To overlap supply sources: The need date of the sub-job is set to the end date of the parent job minus the amount of time required for the sub-job to make its first transfer of product to inventory. Compress Settings: Define Compress settings to be used for Personal Compress Settings. An alternative means to edit the same settings is to use the Compress dropdown from the Main Toolbar. For information about each of the settings in this section, see: Compress the Schedule. Any changes made to any of these settings will be stored in the user's currently selected Compress Settings Preset Configuration. See Also User Preferences System Settings Gantt Board Optimize Settings MPS/MRP Optimize Plan Settings Compress the Schedule

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## Workspace Profiles Dashboard

### [Source](#)

Key Concept A user's Workspace Profile defines how they see and interact with the customizable components of

the Client application user interface. The following settings and objects may be stored in each Workspace Profile: Layouts and Metrics Configurations Plant View Gantt Layout Configurations Board, Tile, and Grid Settings Gantt Segments and Labels Gantt User Settings Board and Tile Layout Arrangements and Window Sizes Users may create or import multiple Profiles and quickly switch between them from their local collection to perform various tasks where different data or information may be more relevant in one case or another. Users may also share (export) their Profiles so that other users may import them. Profiles can be exported to a shared collection that gets stored within the Workspace, or exported to a file that can be moved from one Workspace to another. Note that sharing of Profiles is not the same as the real-time sharing of the schedule and scenario data -- users import a snapshot of a shared Profile at a point in time, at which point they can make changes to it as they see fit and it will only impact their view of the workspace; their changes will not be reflected in the shared Workspace Profile of the user who originally shared it or anyone who also imported it to their local collection. Jump to section: Local and Shared profile collections Manage Import Export Auto Save Workspace Profile Templates Navigate to the Workspace Profiles Dashboard via the User Menu from the Main Toolbar: Local and Shared profile collections Local The local profile collection consists of profiles that the user has either created or imported into their Workspace. No user can see another user's local profile collection. In order to add a new profile to a user's local collection, they may use the Copy button to create a copy of an existing local or shared profile, or they may Activate or Import one from the shared collection or from a compatible .ptwst file. Shared The shared profile collection consists of profiles which have been exported to the shared collection by Workspace users. Any user who connects to the Workspace is able to see the same Shared collection. If a user chooses to Activate or Import a shared profile then it gets added to their local profile collection. A shared profile is never automatically saved or overwritten. The only way to update an existing shared profile is to Export an updated version of it which the user chooses to overwrite the existing shared profile of the same name. Manage From the Manage section of the Workspace Profiles Dashboard, users can create new local Workspace Profiles as copies of existing local or shared Profiles. They can also rename or delete local or shared Profiles if their user permissions allow. Actions Activate a Workspace Profile To activate a Workspace Profile is to load it into the current user's Workspace. Do this by selecting either the Local or Shared radio option and select an available Profile from the associated dropdown. The Local Profiles are loaded from the user's local client machine, while Shared Profiles are loaded from the PlanetTogether server. Once a Profile is selected, click the Activate button. A profile can also be activated by choosing it from the dropdown selection of the Workspace Profiles Dashboard section of the User Menu in the Main Toolbar: Create a New Workspace Profile To create a Workspace Profile, select either the Local or Shared radio option and select an available Profile from the dropdown. The Local Profiles are loaded from the user's local client machine, while Shared Profiles are loaded from the PlanetTogether server. Once a Profile is selected, click the Copy button. When prompted, enter a name for the new Profile and click Accept and Close. The newly created Workspace Profile will now appear in the dropdown list and can be activated. It's not automatically activated after being created, so users must activate it if they wish to use it. Rename a Workspace Profile Select either Local or Shared radio option and select the Workspace Profile from the dropdown list, then click the Rename button. Enter the new name when prompted and click Accept and Close. Delete a Workspace Profile Select either Local or Shared radio option and select the Workspace Profile from the dropdown list, then click the Delete button. Import Import a Workspace Profile from a file or from the Shared Collection that exists on the server from other users sharing their Profiles. Step 1: Import Options Select an appropriate radio option to Import from disk or Import from shared collection. If importing from disk, click the "..." ellipsis icon to browse the local system to find the appropriate .ptwst file. If importing from a shared collection simply select the desired Workspace Profile from the dropdown list of options. Click Next to continue. Step 2: Save Options Select the desired radio option here to either Create new, Overwrite existing, or Import to specific user. Create new: Create a new "Local" Workspace Profile. Enter the desired Profile name in the provided input box. Overwrite existing: Overwrite an existing "Local" Workspace Profile. Choose the existing local Profile from the dropdown of options. Import to specific user: Choose this option to create a new "Local" Workspace Profile for one or more users. Select each user to import the Profile for from the available multi-select dialog. If the selected user(s) already has a Profile of the same name then their existing Profile will be overwritten with the imported one. Click Next to continue. Step 3: Select workspace profile settings to import Click the Select All button to import all Workspace Profile settings, or pick and choose specific settings from the Profile to import. Optionally, toggle on the Reset existing settings not imported option to reset all settings back to their default values if they are not imported as part of the profile configuration. Click Import to complete the process. Export Export a Workspace Profile to a file or to the Shared Collection on the server for quick sharing with other users. Step 1: Export Options Select an appropriate radio option to Export to disk or

Export to shared collection. Select the desired Workspace Profile from the dropdown list of options. Click Next to continue. Step 2: Save Options Depending on the chosen export option, different Save Options may be available. Export to disk: Click the "..." ellipsis icon then select a folder path and provide a file name when prompted. Export to shared collection: Select a radio option to Create new or Overwrite existing Create new: Export the Workspace Profile as a new Profile to the shared collection. Enter the desired Profile name. Overwrite existing: Overwrite an existing Workspace Profile in the shared collection on the server. Choose from the dropdown list of options which Profile to overwrite. Click Next to proceed. Step 3: Select workspace profile settings to export Click the Select All button to export all Workspace Profile settings, or pick and choose specific settings from the Profile to export. Click Export to complete the process. Backup Profile Enable automatic profile backups to periodically save changes to the active Workspace Profile. Backup profile automatically: When enabled, the active user Workspace Profile will automatically save every 5 minutes. It's only stored in the user's local collection and will overwrite the profile of the same name if the Use custom suffix for auto-saved profile name is disabled. Use custom suffix for auto-saved profile name: When enabled, users can define a suffix to use to append to the automatically saved Workspace Profile name so that they might be able to easily visualize that the Profile was saved automatically when selecting, exporting, or managing Profiles. Be sure to Save (or choose to Revert if necessary) any changes made to the settings before navigating to another screen. Workspace Profile Templates The PlanetTogether team has curated some Workspace Profiles to help onboard new users so they don't have to start from scratch. Feel free to download and import these as needed: Standard: A standard, well-rounded profile fit for most users as a good starting point. Last updated: August 31, 2024 (version 12.2.0.25) Note: This template won't include any Gantt view layouts. It will likely be in user's best interest to navigate to User Settings -> Plant View Settings and click the Generate Plant Layouts button to generate Plant and Department layouts according to their data model. Default: The default profile with all of the default settings and no custom layouts or metrics. Import this to reset everything to defaults. For most complete results to reset everything to default settings, toggle the Reset existing settings not imported option on the final step before clicking the Import button: See Also Layouts, Metrics, and Targets Plant View Gantt Configurations Grid Personalization Gantt Labels and Segments

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## Feedback & Support

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### PlanetTogether Support Holidays

#### Source

PlanetTogether offers 24/5 support from Sunday 5pm Pacific to Friday 5pm Pacific time, excluding major US, Canada, and India holidays where coverage will be reduced or not available. Global Holiday Calendar No coverage will be available on these dates: New Year's Day Thursday, January 1, 2026 Christmas Day Thursday, December 25, 2025 United States Holiday Calendar Coverage will be limited during standard North American business hours. Martin Luther King Jr. Day Monday, January 20, 2025 President's Day Monday, February 17, 2025 Memorial Day Monday, May 26, 2025 Juneteenth Thursday, June 19, 2025 Independence Day Friday, July 4, 2025 Labor Day Monday, September 1, 2025 Columbus Day Monday, October 13, 2025 Veteran's Day Tuesday, November 11, 2025 Thanksgiving Day Thursday, November 27, 2025 Day after Thanksgiving Friday, November 28, 2025 Christmas Eve Thursday, December 24, 2025 Canada Holiday Calendar Coverage will be limited during standard North American business hours. Family Day Monday, February 17, 2025 Good Friday Friday, April 18, 2025 Victoria Day Monday, May 19, 2025 Saint Jean-Baptiste Day Tuesday, June 24, 2025 Canada Day Tuesday, July 1, 2025 British Columbia Day Monday, August 4, 2025 Labour Day Monday, September 1, 2025 National Day for Truth and Reconciliation Tuesday, September 30, 2025 Thanksgiving Day Monday, October 13, 2025 Remembrance Day Tuesday, November 11, 2025 Boxing Day Friday, December 26, 2025 India Holiday Calendar Coverage will be limited during Central European Time standard business hours. Makar Sankranti Tuesday, January 14, 2025 Holi Thursday, March 13, 2025 May Day Thursday, May 1, 2025 Independence Day Friday, August 15, 2025 Ganesh Chaturthi Wednesday, August 27, 2025 Eid e Milad Friday, September 5, 2025 Vijayadashmi Thursday, October 2, 2025 Diwali Monday, October 20, 2025 Guru Nanak Jayanthi Wednesday, November 5, 2025

## Feedback & Support > Product Feedback

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### Product Feedback

[Source](#)

This form is meant for feedback directly for the PlanetTogether Product team. Response times to new inquiries is typically 1-2 business days. For urgent matters, please contact the PlanetTogether Support team. Contact the PlanetTogether Product Team

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## Feedback & Support > Product Support

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### Request Support

[Source](#)

Contact Support

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## Getting Started > For Network Administrators & IT Professionals

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### Server Administration

[Source](#)

Find Server Administration links here: Server Administration.

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## Getting Started > For Schedulers & Standard Users

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### Client Sign-In Manager Application

[Source](#)

**Key Concept** The Client Sign-In Manager application is each user's gateway to the scheduling workspace environments that they are given access to. Each user must go through some (typically) one-time setup steps, then they may use the application to connect to or manage connections to the various workspaces that they interact with. Note: This article covers the next steps after downloading and installing the client application. Jump to section: Getting Started Add Workspaces Connect to a Workspace Options Default Installation Location Getting Started Each time the sign-in application starts up the user is required to provide login credentials. These credentials will be used to evaluate and authenticate the user to determine which instance workspaces they have access to connect to. If this is a user's first time connecting, a server administrator may be able to provide guidance as to which login option is most appropriate for the particular workspace(s) they're trying to connect to. **SSO Login:** This method uses Single Sign-On authentication. It must be enabled for the instance workspace by a server administrator (see: SSO Integration). Selecting it will display a popup dialog to enter company SSO login credentials. Once validated, the user may be directed to Connect to a Workspace if they've already mapped all available workspaces, or they may be directed to the Add Workspaces screen. **Workspace User Login:** This method uses basic PlanetTogether user authentication based on user/password information that is stored in the instance workspace. The user will be directed to the Add Workspaces section to enter their login credentials. Use this option when connecting to a new instance workspace for the first time. **Add Workspaces** Connect to a server from the Add Workspaces tab and add Workspaces to the sign-in application as needed for quick connections in future sessions. After adding a workspace, it remains stored in the Client Sign-In Manager until it is manually removed. If using

Single Sign-On then the user will not be presented with the Username and Password fields. For system administrators and for new instance workspaces with no configured users, the username "admin" with a blank password field is the default credential. Server: Enter or select from the dropdown the Server Name, domain host name, or IP address of the server that hosts the PlanetTogether Instance Workspace(s) that you're attempting to connect to. No protocol ("https://") or port number are necessary - just the host name. Use "localhost" to connect to a local instance workspace hosted on the same machine as the sign-in application. The client connects to port 7981 when communicating with the server to validate login credentials and fetch a list of Workspaces that the user has access to. Username: Enter a valid username. Password: Enter a valid password. Click the Sign-in button when ready to proceed. If you're connecting to a server that uses an insecure self-signed SSL certificate, you may receive an SSL Certificate is invalid error message after providing your login credentials. This is an indication that an SSL thumbprint needs to be configured in the Options section of the sign-in application before you'll be able to add and connect to the workspaces on the server. Select one or more workspaces from the Select workspaces to add dialog and click the Add Workspaces button when ready to proceed. If the workspace that you wish to connect to is already added to your sign-in application, you may click the Skip button to proceed to the workspace list where an option to Connect is available. Sign in to a Workspace After signing in to the Sign-In application with valid credentials and adding any new workspaces (if applicable), the user is presented with the Workspaces tab. From this section, users can maintain the list of workspaces that they frequently connect to, as well as see helpful status and user activity information. If the Connect button is green then the workspace is online and the user may click the button to connect to it. When connecting to a Workspace, the client must fetch files from the server (the latest scenario file and any extension files). It does so over the same port that is defined on the PlanetTogether server to run the Workspace Instance, typically in the 4000-4100 range. If the button is gray then the workspace is currently unavailable (it may be offline, or it may have been mapped with different user credentials than the ones used to login to the sign-in application and the current credentials are not valid for the particular workspace). The workspace status will refresh itself every 15 seconds. To force the list to refresh, navigate away from the Workspaces tab (try Options or Welcome) then navigate back to Workspaces. If any users are currently connected to a workspace, a number of Connected Users statistic will appear. Use the Remove button to remove the workspace from the stored list of workspaces in the Client Sign-In Manager. Options The Options section shows which version of the Client Sign-In Manager is in use and allows users to manage SSL thumbprints. There are two optional checkboxes as well: Automatically Check for Updates Enable this option to be informed when new versions of the Client Sign-In Manager are available for download. Minimize to system tray after launching the client Enable this option to automatically minimize the Client Sign-In Manager window to the Windows system tray (accessible via the "^" up arrow in the lower right corner of your primary monitor) after successfully signing in to a workspace. Note too that when the Client Sign-In Manager window is minimized manually that it also minimizes the Windows system tray which effectively closes the window but keeps the user signed in the background. Thumbprints An SSL certificate thumbprint may or may not need to be configured within the Client Sign-In Manager. If the server that hosts the PlanetTogether instance workspace(s) is using a trusted SSL certificate (purchased and signed by a trusted third party), then this step is not required. Otherwise, the server must use a self-signed certificate in which case it is required to configure the thumbprint so that the Client Sign-In Manager can establish a successful SSL handshake with the server. If needed, a server administrator may retrieve the certificate thumbprint from the "Server" section of the Instance Manager. Copy and paste the alphanumeric code into the Thumbprints box of the Client Sign-In Manager. The entry will save automatically. For users who connect to multiple servers, enter as many thumbprints as are needed; it is not limited to just one. Enter one at a time and click in the white space beneath the Thumbprints entries to save and expose the "new thumbprint" entry again to enter the next one. It is possible to Copy or Delete an existing thumbprint by right-clicking the thumbprint entry and choosing the desired Copy or Delete action. Default Installation Location on the Server The Client Sign-In Manager is installed in the %AppData%\PlanetTogether\ Windows user folder by default. The only option to "uninstall" it is to delete the installation folder manually. See Also Troubleshoot: Client Sign-In Manager Application Workspace Profiles Layouts, Metrics, and Targets User Management

## Desktop Client Installation Guide

### Source

Key Concept The PlanetTogether desktop client application allows users to connect to instance Workspaces which run on a PlanetTogether server. Jump to section: Installation Procedure Client Sign-In Manager Application

Installation Procedure Step 1: Install .NET This is a legacy requirement. As of software release version 12.2.1.71, installation of .NET 6 is no longer required. .NET 6.0 is only required to connect to PlanetTogether instances running software version 12.2.1.61 or older. In software version 12.2.1.62 and newer, the PlanetTogether sign-in application and client application each launch with .NET 8 components packaged within them, so no .NET package needs to be installed on the user's workstation. Skip this step if connecting to instances running software version 12.2.1.62 and newer. If connecting to an older software instance, install the required .NET 6.0 Core Runtime Windows Hosting bundle from Microsoft: .NET 6.0 Core Runtime Windows Hosting Bundle - Installer Step 2: PlanetTogether Installer If the above step was skipped and .NET 6.0 is not installed, download this version of the Version 12 Client installer which does not require a .NET installation: Version 12 Client Installer without .NET validation With .NET 6.0 Core Runtime Windows Hosting installed, download the PlanetTogether Version 12 Client Installer: PlanetTogether Version 12 Client Installer Once complete, run the downloaded PlanetTogetherClient12.exe installer to start the installation wizard. Step 3: Installation Wizard If upgrading the application from an older version to the latest, be sure to close any running iteration of it or else the installer won't be able to complete. While a window may not be open, the application may still be open in the background so be sure to check the system tray in the lower right corner for the icon and close it if necessary. Choose an installation path and click Install Client to proceed. The application will proceed to download and install. Upon successful installation, a Launch PlanetTogether button will be presented. Client Sign-In Manager Application Once the client has launched successfully, use the Client Sign-In Manager Application guide to configure the client and connect to a PlanetTogether Workspace.

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## Keyboard Shortcuts

[Source](#)

Key Concept Keyboard shortcuts can be used to quickly select all grid rows or toggle certain features on and off or zoom to various levels in the Gantt. Use this guide as a reference to find helpful keyboard shortcuts. Jump to section: Grids Gantt Workspace Settings Grids These keyboard shortcuts are functional on nearly all grids that can be interacted with throughout the interface. Description Shortcut Select all visible grid rows Ctrl + A Copy grid cell value Ctrl + C Scroll to the leftmost grid cell of the currently selected row Home Scroll to the rightmost grid cell of the currently selected row End Scroll to the leftmost and topmost grid cell Ctrl + Home Scroll to the rightmost and bottommost grid cell Ctrl + End Select an adjacent grid cell Up arrow; Right arrow; Down arrow; Left arrow Select right-adjacent grid cell Tab; Right arrow Scroll to the top visible grid row Page up Scroll to the bottom visible grid row Page down Gantt These shortcuts are functional with the Gantt Board in focus. Zoom and Scroll Description Shortcut Scroll the Gantt to Now (the current date and time) Ctrl + N Scroll the Gantt to Today (today's date at 12:00 am) Ctrl + T Zoom in or out to show one full Week (7 days) Ctrl + W Zoom in or out to show two full Weeks (14 days) Ctrl + Shift + T Zoom in or out to show one full Month (31 days) Ctrl + M Zoom in or out to show one full Year (365 days) Ctrl + Y Zoom and Scroll to show the entire Frozen Span Ctrl + F Zoom and Scroll to show the entire Plant Stable Span Ctrl + S Zoom and Scroll to show the entire Planning Horizon Ctrl + Shift + H Zoom the Gantt to a specific area. Ctrl + Lasso select (click and drag) Options Description Shortcut Enable/disable Highlighting Ctrl + H Enable/disable Activity Links Ctrl + Shift + L Schedule Adjustments Description Shortcut Move to alternate path Alt + Drag-Drop Optimize the schedule from the clicked point to the end of the schedule. O + Left click Compress the schedule of everything before the clicked point. C + Left click Expedite Manufacturing Order to date time (where the block was dropped) Shift + Drag-Drop Expedite Manufacturing Order ASAP Shift + E + Left click Expedite Manufacturing Order preserving frozen span Ctrl + E + Left click Expedite Manufacturing Order preserving stable span Ctrl + Shift + E + Left click Unschedule a Job. U + Left click Anchor/Un-Anchor the activity. A + Left click Lock/Unlock the operation. L + Left click Lock and Anchor of an activity. R + Left click Select multiple individual activity blocks. Dragging-and-dropping the selected blocks will Expedite the selected Jobs to the mouse location when dropped. Ctrl + Left click Move selected activity/activities to mouse cursor resource/time on Gantt. Ctrl + Right click Select a group of Activities. Shift + Lasso select (click and drag) Split Job starting from the clicked cycle. S + Left click Display the Split Job dialog. Shift + S + Left click Split Manufacturing Order starting from the clicked cycle. Shift + Ctrl + S + Left click Display the Split Manufacturing Order dialog. Shift + Ctrl + Alt + S + Left click Join the Job you clicked with the Job scheduled before it, resulting in a single Job. Or if there are two Manufacturing Orders from the same job next to each other, they are joined. J + Left click Capacity Interval Adjustments Description Shortcut Adjust the start time of an interval or series to the nearest half hour. Alt + Drag-drop Toggle a capacity interval between online and offline. T + Left click Change one capacity interval occurrence and all of its predecessors from a series into individual occurrences. I + Left click Workspace Settings These shortcuts can enable or disable certain settings of a user's Workspace. Description Shortcut Enable/disable tabular navigation Shift + Tab See Also Gantt Board Main Toolbar

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## Main Toolbar

[Source](#)

Key Concept The Main Toolbar is where users can trigger various actions or navigate to the various areas of the Client application to perform various activities and analyze the schedule data. It's the central hub used to navigate the user interface. Jump to section: Boards Scenarios Settings Help User Menu Debug Schedule Plan Compress Publish Undo & Redo Clock Refresh Boards Boards represent the various planning tools available to create, fine-tune, and analyze the schedule and all data in the model. Board windows can be repositioned, docked vertically or horizontally, unpinned to move freely between multiple monitors, or hidden to match the user's preferences and/or screen resolutions. Opening a New Board New boards can be opened by selecting from the Boards drop-down menu. Closing a Board With tabs enabled, boards can be closed by clicking on the "x" button found at the right corner of the board's tab. Without tabs enabled, selecting to open a new board effectively replaces the one being viewed (though previously opened boards remain open in the background). Split-Screen Board Grouping

Dock boards side-by-side or top-to-bottom by creating separate board groups. Create a new group by clicking the blue square rightmost icon while hovering over any board title. The new board will automatically appear in a 50/50 split view. Additional boards added using the grouping method will continue to divide them evenly on the screen. With tabular navigation enabled, users can click and drag the tabs around the screen to dock them at the top, right, bottom, left, or center. Board Functions and Features Select from the table below for more details about the functions and features of each board:

Activities	Buffer Management	Capacity Planning	Customers	Database Manager	Gantt Import	Mappings Inventory Plan	Jobs KPIs	Materials Metrics	Purchase Orders	Routing Templates
Sales Orders	Scenario Data Sequence Planning	Scenarios Each	PlanetTogether	Workspace	may contain many Scenarios.	Each user can be given permission to view (or not) and/or edit each scenario. The creator of a scenario has control over who they share the scenario with, and/or user groups may be given permission to manage all scenarios so that users who are assigned to the group may manage all scenarios regardless of share settings (see: User Management). Each scenario represents a unique set of data. Each starts out as a copy of an existing scenario, but any changes made within the scenario to settings, data, the schedule, etc. are only reflected in the active scenario. This functionality gives users opportunities to test various configuration or data model changes without impacting a Production or similar schedule/model. More information about the various settings and options related to Scenario Management can be found here: Scenario Management Settings	The Settings menu offers quick access to the Message Log, User Management, and System Settings as well as some user-specific options to enable or disable tabular navigation and Quick Actions. Message Log The Message Log is a place where all errors and notifications are logged. The messages are categorized to simplify browsing through the various types of messages that get logged. Use the Refresh All button to refresh all log messages on all tabs. Use the Send All button to send all log files via email (requires additional server configuration in the Instance Manager). Use the Clear All button to clear all log data from all tabs. Use the Show Details toggle to view the stack trace or more detailed information about each error or message logged. Use the Auto Clear Import Logs toggle to automatically purge all old data import errors from the Interface logs tab so that only import errors from the most recent data refresh are visible. Older logs will remain visible in the Interface from Server logs tab. Each tab has its own Refresh, Send, Copy, and Clear navigation buttons to perform each of the various actions on the local tab's messages only. Categorized logs: User: Errors which are specific to the logged-in user Interface: Errors or warnings related to data imported from SQL during the current user session. System: Errors with the Workspace/Instance System service External: Errors or warnings from external systems or programs that communicate with PlanetTogether Fatal: Failed processes or software functions (if recurring, contact Support as it may indicate a software bug or instability) Misc: Uncategorized errors and messages Scheduling Warnings: Warning messages from the scheduling engine Notifications: All user notifications from the current session Interface from Server: Errors or warnings related to data imported from SQL by other users or from previous user sessions. These are populated from the server logs to help all users visualize data import errors from recent import attempts, even if the import was not performed while the user was logged in. Users cannot clear these logs from the desktop application interface; they must be cleared from the server logs, if desired. Tabs This is a user-specific setting to enable or disable tabular board navigation. No tabs: No board tabs are visible. This is the best option for users who prefer to view a single board at a time and use the "Boards" dropdown menu to switch between boards. Show tabs: All open boards will contain a tab at the top with a "x" available to close the board. Tabs can be reordered or even dragged around to create separate board groups docked side-by-side or top-to-bottom with other board groups. Smart tabs: Tabs will appear at the top of all boards only when there are more than 1 board open in the local board group. If there is only 1 board open in the local board group then no tabs will be shown. This allows users to quickly navigate between a few different boards as needed and gives them the flexibility of closing all boards except for 1 in order to maximize the visible work space. Quick Actions This is a user-specific setting to enable or disable Quick Actions. On: When enabled, all of the actions that can be performed via the Main Toolbar become split into single-click buttons on the left and a dropdown arrow to access the settings for the button on the right. Off: When disabled, each menu item in the main toolbar expands a dropdown of options when clicked where settings can be configured and the actual action can be performed by clicking a button. Users This menu option opens the User Management board where user administrators can add or remove users and adjust user permissions. System Settings This menu option opens the System Settings board where global settings can be configured for all scenarios and all users within the Workspace. Help The Help menu provides insights about the Workspace environment (license and memory usage), as well as quick access to helpful tools. License Information The license Information dialog offers details about the permissions of the license used and software packages loaded into the Workspace. Basic information is provided as well, including the license expiration date, the			

company name the license is issued to, a generic description of the license, and whether the System and Data license attribute states are "Active" or "Inactive". Packages The Packages section shows which packages are included in the license, which are available to purchase, and which are currently loaded into the Workspace.

License Options The License Options section shows any applied restrictions to the number of plants or users that can be configured in the Workspace with the current license.

Memory Diagnostic The Memory Diagnostic dialog displays the number of each type of data object and how much memory each type of data object is consuming on the server and each connected desktop client.

Knowledge Base The Knowledge Base slide offers a quick link to this Version 12 Knowledge Base.

Knowledge Base Chatbot The Knowledge Base Chatbot slide opens an embedded chatbot window which communicates with the same Version 12 Knowledge Base Chatbot that is offered in this Version 12 Knowledge Base.

Keyboard Shortcuts The Keyboard Shortcuts slide offers a quick link to the Keyboard Shortcuts page offered in this knowledge base.

User Menu User-specific settings allow each user to customize the way they view and interact with the Client interface.

User Settings Several user settings are maintained to allow users to customize their experience with the Client application interface. For detailed information about each setting available in the User Settings dialog, see: [User Settings](#)

User Preferences User Preferences are user-specific settings that users without general permissions to manage all users can update for themselves as needed. For details of each setting and its behavior, see: [User Management: User Preferences](#)

Workspace Profiles Dashboard The Workspace Profiles Dashboard offers users the ability to import, export, or share Workspace Profiles. A user's Workspace Profile defines how they see and interact with the customizable components of the user interface of the Client application (consider: Layouts and Metrics; Plant View Gantt Configurations; Board, Tile, and Grid Settings; Gantt Label and Scheduling Settings; etc.). To learn more about how to manage and share Workspace Profiles, see: [Workspace Profiles Dashboard](#)

Logout Use this to gracefully exit the Client application. It's the same as clicking the "X" in the top right corner to close the client application window.

Debug Visibility of the Debug menu and its contents may be limited depending on each user's permissions.

Debug Console Typically used by the PlanetTogether Support team for playing back recorded actions, the Debug Console offers a simple command line interface to control playing back a set of recorded actions from the server. The instance must be started in Recording Client Delayed start-up mode, then the following commands can be executed in order to play back the recorded actions:

- de: Begin debug recording playback mode. Enter this first before attempting either of the playback commands.
- pbs: Play back a single recorded action. This option allows users to step through the recordings one at a time.
- pb: Play back all recorded actions. This option will play all actions back without stopping until it has played back all of the actions.

A user permission can be toggled to grant or deny visibility of this button.

Download Scenario Use the Download Scenario option to download the current data model in PlanetTogether's standard .dat scenario file format. The downloaded scenario can then be used as a backup/restore point, or used to load in another Instance / Workspace, or delivered to PlanetTogether Support to allow them to troubleshoot various issues. When selected, the user will be prompted to select which of the available scenarios in the Workspace should be downloaded, and whether or not to Clear Undo Sets. By clearing undo sets and selecting specific scenarios, the file size of the resulting download can be greatly reduced (albeit there will be less data in the file compared to the current Workspace). A user permission can be toggled to grant or deny visibility of this button.

Cancel Simulation If a long-running simulation is in process and users don't want to wait for it to complete, they can click this button to cancel it. When a cancellation is initiated, the system will interrupt the simulation process immediately and will reload the data model from the start of the most recent undo set, then proceed to play back each of the actions performed leading up to the last simulation (schedule move or optimize). It will stop playing back the actions when it encounters the simulation action that was cancelled, effectively recreating the scenario data from just before the cancelled action. A user permission can be toggled to grant or deny visibility of this button.

Schedule Use the Schedule dropdown to modify Optimize settings and to execute a Schedule Optimization. Information about each setting and option can be found here: [Optimize Settings](#)

Plan Use the Plan dropdown to modify MPS/MRP Planning settings and to execute a Plan Optimization. Information about each setting and option can be found here: [MPS/MRP Optimize Plan Settings](#)

Compress Use the Compress dropdown to modify Compress and JIT Compress settings and to execute either of these actions. Information about each setting and additional details of the Compress and JIT Compress functionalities can be found here: [Compress](#)

Schedule Publish Use the Publish dropdown to Browse Publish Data, Publish to the standard Publish database, or Publish to the configured Analytics database. Publish options and settings can be found in System Settings. Database configurations are setup by a server administrator in the Instance Manager.

Undo & Redo Users can Undo or Redo recent tasks. Certain User Permissions may dictate whether or not users are able to see and Undo other user's actions. The number of actions that are available to be undone can be

configured by a system administrator in the System Settings dialog under the Undo Options area. All Undo data and history can also be purged by a system administrator in the same System Settings dialog. To perform an Undo or Redo action, expand the dropdown next to the action icon and select which action to undo or redo. All dependent actions leading up to the user's selection will automatically be selected to be included in the Undo or Redo action. Finally, click the Undo or Redo button in the lower right corner of the dropdown to execute the selected action. Undo/Redo Individual Actions When enabled, individual user actions may be undone/redone without requiring that all actions since the selected individual action(s) also be undone/redone. The only types of actions that are currently supported are manual schedule moves (drag/drop, Activities Board Move Manager, Expedite, Compress, JIT Compress). If any other type of action is performed then all previous supported actions will no longer be eligible to be undone/redone. This feature was introduced as a means to support multiple schedulers making their own individual manual schedule adjustments so that they would be able to undo and redo their own manual move actions without impacting moves made by other schedulers. Clock

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## Modern User Interface

### Source

Key Concept PlanetTogether Version 12 boasts a modern interface design that features dock-able boards, tiles, tabs, sidebars, status panels, and more. The UI is designed to maximize the functional and visible space planners and schedulers have to work with, and is made to look and feel like a web-based application. Main Toolbar A minified toolbar at the top of the application offers quick access to the most commonly used functions and tools. Users can convert the default dropdown options in the main toolbar to "Quick Action" buttons to perform many actions with a single click (Optimize the Schedule, Run MRP Planning, Advance the Clock, etc.). For details of the functions of each toolbar option and action, see: Main Toolbar Boards & Tiles Dock-able "Boards" and "Tiles" are gateways to the plethora of data and planning configurations and settings that users may visit to analyze data, fine-tune the model, and visualize the schedule. Every Board and Tile is customizable to each user. Boards Boards are the top-level categories where various data elements are presented. With tabular navigation enabled, multiple boards may be opened at the same time and can be docked or arranged in the user's workspace to their personal preferences. Tiles Tiles are the elements that actually present the data to the user. Within each Board are various Tiles listed in a menu of icons that runs vertically across the left side of the Board. Each tile can be opened to view and/or manipulate various data related to the Board that the user is viewing. Tiles can be docked or arranged in the user's workspace to their personal preferences. Users are even able to "unpin" a Tile from a Board to allow them to drag the Tile to another monitor or location on the screen that does not require that the Board be open to view the Tile data. Tile Settings Click the gear icon at the bottom of the Tile menu of any board to access some global tile settings. Open tiles undocked as movable windows: When enabled, any new tile that opens will behave as an undocked window that can be dragged to any position on the user's screen, including to other monitors or screens. Toggle Inline Menu: When enabled, the tile menu can be expanded to include text or retracted to only show icons for each tile. When expanded, the tile menu does not overlay on top of the tiles behind it. When this option is disabled, the tile menu can be expanded temporarily to read the text but will retract back to icons only once a tile is selected. When the menu is expanded it overlays on top of the tiles behind. Close open tiles: This quickly closes all open tiles associated with the currently viewed board. Scenarios All scenarios within an instance can be viewed and maintained under a dropdown menu located at the top of the application interface. This dropdown allows users to copy existing scenarios to create new ones, activate existing scenarios to perform tests or create alternate schedules as needed, or modify scenario settings and share permissions. Each user will only see the scenarios which are shared with them in some capacity (read-only or editable). For additional details about managing and sharing scenarios, see: Scenario Management Themes By default, the "Light" theme is enabled, and a "Dark" theme is made available. It's possible to create a custom theme and have it loaded into each user's Workspace as well. Previews Light Dark See Also New Functions and Features

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## Integrations

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## Importing Data: Overview

### Source

Key Concept ERP systems contain most of the data needed to create a schedule in PlanetTogether, including: Plants, Departments, and Resources Resource Capabilities (sometimes called Operation Types) Warehouses and Inventories Jobs (including Manufacturing Orders, Operations, and Material requirements) Some of this data is fairly static, such as plants and departments, while jobs tend to be added, closed, and changed daily. All of the above data can be entered manually into PlanetTogether. Still, it is generally preferred to import as much as possible so that most data maintenance is in one place. For some data elements, the objects in PlanetTogether contain fields that do not have an ERP equivalent. In these cases, the values can be left at their default values, calculated by the system, or manually entered in PlanetTogether after the object is created via the client application interface. If a property value is omitted from the import data, then manual changes to the omitted property made in the client application interface will be preserved with subsequent data refreshes. The general data flow is from an ERP system to a SQL staging database, then into PlanetTogether. Once the schedule has been created within PlanetTogether, it can be published back to a separate SQL database where the schedule data can be moved or migrated to an ERP or other external system as needed. Note: Some data is entered directly in PlanetTogether and cannot be sent via the interface. This data, however, is straightforward to enter. It includes: Sequencing Plans System Settings Data Source Options PlanetTogether depends on a SQL database as its source of incoming data. The import database can be organized in any custom fashion, then the Import Mapping Wizard can be used to map fields from a SQL table or view to a PlanetTogether property. Each PlanetTogether instance workspace can be configured to connect to a single import database. This is configured in via the Instance Settings of the Instance Manager on the PlanetTogether server. A standard import database structure is documented here: Standard Import Database. Whether the PlanetTogether instance is hosted by PlanetTogether in our Azure Cloud, or hosted locally or on-premises, an instance data model can be maintained in Excel format which can be converted to SQL and imported into PlanetTogether. For more information, see: Microsoft Excel Integration. Trigger a Data Import Once the data source is defined and the import mappings are configured, users may import data as needed via the Refresh dropdown from the main toolbar of the client application. A data refresh can also be triggered by the Integration API for PlanetTogether cloud hosted instances which are configured to use the API. Data Types String PlanetTogether properties which accept strings of text are recommended to use the nvarchar type in SQL, especially if the data stored might use non-English (double-byte) characters. Double Accepts numerical values, including decimals/remainders. No thousands-separators should be used (commas for English numbers). Decimal Accepts numerical values, including decimals/remainders. Commas or other thousands-separators are allowed. Boolean PlanetTogether accepts TRUE/FALSE or 1/0 for Boolean values. Integer (Int32) Accept numerical values with no decimals/remainders. Colors Many properties in PlanetTogether allow users to define a color value (Jobs, Products, Attributes, etc.). Colors are identified by their hexadecimal code values. Color names like "White", "Blue", "Red", etc. are still supported, or colors may be imported as hexadecimal codes with transparency (e.g. '#FFFFFF' for White with no transparency, or '#FFDC143C' for Red with no transparency). The first two characters define the transparency (where "FF" is fully opaque), followed by 6 characters which define the hexadecimal color code. Click [here](#) to download an Excel sheet that contains ~140 hexadecimal code mappings to color names. See Also Standard Import Database Import Mappings Board Microsoft Excel Integration Integration API

## Integrations: Overview

### Source

Key Concept PlanetTogether can work as a standalone product, but is designed to work closely with a master data set like an Enterprise Resource Planning (ERP) or a Manufacturing Execution System (MES) system. With a master data integration, all company data is entered into the master data set, then only certain data which is required for scheduling is migrated to a SQL database before being imported into PlanetTogether. Once PlanetTogether produces an accurate schedule, it is typically published back to SQL where a procedure can execute to send the schedule data back to the master data system. When interfacing with a master data external system like an ERP, it is important to create an efficient link between the two systems so to not overburden hardware resources. Typically, this is done by creating one or more SQL stored procedures which copy data from the relevant tables in the master data set database into a staging database. Further manipulation or "massaging" of the data can be done through the use of SQL views. This helps to ensure that the master data system is not being queried constantly by PlanetTogether, thus tying up large amounts of hardware resources. This allows for better performance overall when using PlanetTogether. A local system integration can also be achieved for training and demonstration purposes using an Excel sheet as the master data set. A local SQL server can be configured to fetch the data from Excel and put it into a staging database where it can then be pulled in to PlanetTogether. Again, the use of one or more stored procedures and some configuration of the PlanetTogether instance can be used to fetch the data from the Excel sheet each time a user initiates the data refresh operation from the PlanetTogether client interface.

Jump to section: [ERP Integrations](#) [Microsoft Excel Integration](#) [Available Integrations](#) [ERP Integrations](#)

PlanetTogether can be integrated with most ERP systems, particularly any system with an open database or API or which can export data. There are three common "levels" of integration. The first level is the simplest, with the least amount of data required. The other levels have added capabilities and constraints, and therefore require more data. These are the common levels:

- Scheduling with Capacity Constraints
- The ERP generates Work Orders and Planned Orders
- PlanetTogether imports this data for scheduling/optimization
- PlanetTogether pushes schedule dates and resources back to the ERP
- Data Imported from the ERP to PlanetTogether: Plants, Work Centers, Machines
- Work Order Headers, Work Order Operations, Planned Order Headers, Planned Order Operations
- Data published from PlanetTogether to the ERP: Work Order Header, Scheduled Start Date, Scheduled End Date, and Firm Status (if Firming in PlanetTogether)
- Work Order Detail, Scheduled Start Date, Scheduled End Date, and Scheduled Machine
- Planned Order Header, Scheduled Start Date, and Scheduled End Date
- Planned Order Detail, Scheduled Start Date, Scheduled End Date, and Scheduled Machine
- Add Material Constraints
- Everything included in Level 1

PlanetTogether pulls Inventory, Purchase Orders, and Bill-of-Material data. PlanetTogether coordinates Material Constraints and prevents activities from scheduling before constrained material is ready.

Additional Data Imported from the ERP to PlanetTogether:

- Warehouses, Items, Inventories, Purchase Order Headers, lines, and shipments
- Work Order Material Requirements
- Work Order Products
- Planned Order Material Requirements
- Planned Order Products
- Transfer Order Headers
- Transfer Order Details
- Additional data published from PlanetTogether to the ERP
- None
- Add Production Planning
- Everything included in Levels 1 and 2
- Import Sales Orders, Forecasts and inventory replenishment controls
- Run MPS/MRP to generate Planned Orders and Planned Purchases
- Additional Data imported from the ERP to PlanetTogether:
- Sales Orders, Forecasts, Replenishment Control parameters (safety stock, min/max, buffers, batching rules, etc.)
- Item Routings
- Item Bills of Material
- Additional data published from PlanetTogether to the ERP:
- Planned Order Headers (to create Planned Orders in the ERP based on what was created by PlanetTogether)
- MPS/MRP

Microsoft Excel Integration Data can be imported into PlanetTogether from a Microsoft Excel workbook. This is useful for importing custom data for a demo or when doing preliminary factory modeling. The basic concept is that the data from Excel is pulled into a SQL database before being imported into PlanetTogether. The transfer of data from Excel to SQL is done via a stored procedure which can be configured to be executed at the time a user clicks the Refresh button in the client user interface so that the data that gets imported is always up to date with the latest changes made to the Excel workbook. Detailed documentation of PlanetTogether's Excel integration offering can be found here: [Microsoft Excel Integration](#) [Available Integrations](#)

PlanetTogether has developed connectors for the following master data sources:

- Kinaxis Maestro (formerly RapidResponse)
- AVEVA MES
- Microsoft Excel
- See Also Deploy Integration Files to the Server
- Microsoft Excel Integration Overview

## Integrations > Aveva MES

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### AVEVA MES Integration Data

#### [Source](#)

Key Concept Certain data properties and fields from AVEVA MES can be imported into PlanetTogether for scheduling. Some examples of data can be imported include: Resource entities (Work Center Groups and Work Centers) Machines, Warehouses, Items and Inventory Bill of Material Purchase and Production Orders Primary and Alternate Routing Lines and Production Order Components Recurring and Non-Recurring Capacity Intervals (manufacturing calendar) PlanetTogether also allows you to publish schedules back to AVEVA MES: Start and End dates at the task level Process route or Line route changes Scheduled Resource entity Integration file package download: AVEVA MES v3.zip Supported software versions: AVEVA MES 2023 or newer PlanetTogether 12.1.4.17 or newer Jump to section: AVEVA MES Fields PlanetTogether APS to AVEVA MES Data Mapping AVEVA MES Fields Work Orders (Header) Property AVEVA MES Table Field Work Order Number wo wo\_id Item Number wo item\_id Required Finish Quantity wo req\_qty Need Date wo req\_finish\_time\_local Work Orders (Detail) Process Routing (primary) Property AVEVA MES Table Field Work Order Number job wo\_id Operation Sequence job oper\_id (+ process\_id) Required Quantity job qty\_reqd Status job / job\_state state\_cd / state\_desc Process Routing (alternate) Property AVEVA MES Table Field Work Order Number job wo\_id Operation Sequence oper\_ent\_link oper\_id (+ process\_id) Required Quantity wo req\_qty Line Routing (primary) Property AVEVA MES Table Field Work Order Number job wo\_id Operation Sequence job oper\_id (+ target\_sched\_line\_id) Required Quantity job qty\_reqd Status job / job\_state state\_cd / state\_desc Line Routing (alternate) Property AVEVA MES Table Field Work Order Number job wo\_id Operation Sequence line\_ent\_link oper\_id (+ line\_id) Required Quantity wo req\_qty Bills of Material Property AVEVA MES Table Field Work Order Number wo wo\_id Routing Step job oper\_id Item Number job\_bom item\_id Resources Property AVEVA MES Table Field Resource ID ent ent\_id Resource Name ent ent\_name Capacity ent\_attr attr\_value Capabilities Property AVEVA MES Table Field Capability ID ent ent\_id Resource ID ent ent\_id Purchase Orders Property AVEVA MES Table Field Purchase Order Number po + po\_line po\_id + po\_line Item Number po\_line item\_id Warehouse "-1" Quantity Ordered po\_line quantity Expected Delivery Date po\_line reqd\_by\_local Capacity Intervals Property AVEVA MES Table Field Recurrance shift\_pattern recurring Name shift shift\_desc CapacityType shift\_pattern additive Days of Week shift\_schedule monday, tuesday, ..., sunday start time shift\_schedule start\_time end time shift\_schedule end\_time Publish Fields Property AVEVA MES Table Field Work Order wo, job wo\_id Route wo process\_id, target\_sched\_line\_id Start Time job sched\_start\_time\_local End Time job sched\_finish\_time\_local Scheduled Resource job target\_sched\_ent\_id PlanetTogether APS < > AVEVA MES Data Mapping Resource Objects Plants (MES entity attribute pt\_location = Plant) PlanetTogether Field (PT\_Plants table) MES Field (ent, ent\_attr, attr tables) PlantID ent\_id PlantDesc description (entity) PlantName ent\_name Departments (MES entity attribute pt\_location = Department) PlanetTogether Field (PT\_Departments table) MES Field (ent, ent\_attr, attr tables) DeptID ent\_id DeptDesc description (entity) DeptName ent\_name Capabilities PlanetTogether Field (PT\_Capabilities\_All table) MES Field (job table) CapabilityID oper\_id Resources PlanetTogether Field (PT\_Resources table) MES Field (ent, ent\_attr, attr tables) DeptID ent\_id ResourceID ent\_id ResourceName ent\_name PlantID ent\_id CapacityType attr\_value (for pt\_resource attribute) ResourceDesc description (entity) Capability Assignments (match on MES target\_sched\_ent\_id) PlanetTogether Field (PT\_CapabilityAssignments\_All table) MES Field (job table) CapabilityID oper\_id DeptID ent\_id PlantID ent\_id ResourceID target\_sched\_ent\_id Capacity Interval (recurrence = 'NotRecurring') PlanetTogether Field (PT\_Recurring\_Capacity\_Interval\_Mapping table)

### AVEVA MES Integration Overview

#### [Source](#)

Key Concept AVEVA and PlanetTogether have partnered to provide a standard integration solution template between AVEVA MES and PlanetTogether's Advanced Planning and Scheduling (APS) systems. This integration allows AVEVA MES to automatically provide PlanetTogether APS with all of the necessary information to create an optimal production schedule. The schedule results are then sent back to AVEVA MES to update the order information, providing the organization with an accurate, optimal, and forward-looking production schedule to work with. Integration file package download: AVEVA MES v3.zip Supported software versions: AVEVA MES 2023 or

newer PlanetTogether 12.1.4.17 or newer Jump to section: Refresh scheduling data Update AVEVA MES production order information Track the progress of orders Provide structure for complementary data Choosing Alternate paths Additional information and known limitations Refresh Scheduling Data The integration allows users to update the APS data used by PlanetTogether by extracting data from AVEVA MES. Users can then use the latest data from MES to create optimized production schedules. The data that is extracted from the AVEVA MES system is as follows. This synchronizes the MES execution model with the scheduling model at the resource or entities (name of the resource in AVEVA MES shown in parentheses). Plants (MES entities) Department (MES entities) Resources (MES entities) Warehouses (MES entities) Production orders (MES work orders and jobs) BOM (bill of material) Route (process or lines) The sequence of operations (process or line operation sequence) Production rate Alternate Paths (alternate BOMs and Routes) Reported Activity (MES job quantities) Reported Good Quantity (MES quantity produced) Reported Scrap Quantity (MES quantity rejected) Actual Start and Finish Times (MES actual start/finish time local) Inventory (MES item inventory) Items (MES items and attributes) Purchase orders (MES POs and PO line items) Attribute Setup Matrix (Manual Entry in PT using GAP tables) Shifts information (Manual Entry in MES. Turned off in PT by default.) All this information is updated when a refresh is initiated in PT so that the data is up to date. Update AVEVA MES Production Order Information Once the schedule has been optimized, the integration takes data from PlanetTogether and updates the AVEVA MES work order and jobs. The following MES data is updated: Scheduled start date Scheduled resources Line or Process route changes Track Production Progress As MES executes the orders, the APS system is kept synchronized. As a result, the status and progress of each order and related activities are updated, including: The order's status and each operation (Ready, Running, Suspended, etc.) The quantity produced so far The quantity rejected so far Actual Finish Time (local) Actual Start Time (local) Any update to the production rate (if it has changed) The inventory counts based on MES execution: Reduction from consuming Addition while producing Addition based on material reception and MES purchase order updates. Provide Structure for Complementary Data While AVEVA MES provides a great deal of data, some additional elements must be provided for either configuration or functionality. Below is the list of the main aspects: Warehouse mapping to align the different needs of granularity (allow for mapping/aggregating MES and scheduling inventory locations) List of MES item attributes to be used for setup data SQL Server table structure for all related setup data (static or matrix) SQL Server table for resource capacity information such as Downtime information coming from MES (not populated by the standard integration) Choosing Alternate Paths For AVEVA MES and PlanetTogether, Items can be produced on different routes. For MES, they are called Processes or Lines; for PlanetTogether, they are called Paths and Alternate Paths. The AVEVA MES integration allows you to manually move an order from one path to another using the PlanetTogether Alternate Path move (alt-drag-n-drop.) When making an alternate Path Move-in PlanetTogether, you will be prompted to select a different path; these paths are other possible alternative processes or lines that are valid for the MES. Once you publish the schedule, the MES work order will be updated to reflect any line or process changes. Additional Information and Known Limitations The AVEVA MES Integration template is based on standard MES configuration and out-of-the-box PlanetTogether APS functionality. However, some assumptions were made to keep the integration generic to accommodate the configuration flexibility inherent in AVEVA MES. This template is considered a starting point for projects. It is expected that modifications to this template will be required for each project since requirements could vary and become very project specific. By default, the receipt of purchased material is stored in a "Receiving Inspection" warehouse, which only exists in PlanetTogether. After a move to an alternate path, the schedule should be published. This will update AVEVA (MESDB) with the new Line or Process ID. PlanetTogether will see this as a change in route and automatically un-schedule the work after the next refresh. In order to place the work back where it was, you will need to optimize the schedule. There are limitations to the routes allowed when the initial operation requires a helper resource. This is avoided with routes that start with a single-resource operation. Please consult your implementation specialist for more details. For more details about the AVEVA MES-PlanetTogether integration, please contact your PlanetTogether representative, or PlanetTogether Support. See Also AVEVA MES Integration Data AVEVA MES Integration Setup

## AVEVA MES Integration Setup

### Source

Key Concept Use this walkthrough to setup a new PlanetTogether instance integrated with AVEVA MES. Integration

file package download: AVEVA MES v3.zip Supported software versions: AVEVA MES 2023 or newer PlanetTogether 12.1.4.17 or newer Jump to section: Install PlanetTogether Server Software Install the Integration Files Create a PlanetTogether Instance Configure SQL Databases Configure the PlanetTogether Instance AVEVA Configuration PT\_GapData\_AvevaMES Database Customization PlanetTogether Instance Workspace Publish Settings Test the Configuration Install PlanetTogether Server Software Use the PlanetTogether Server Software Installation Guide to install PlanetTogether Version 12.1.4.17 or newer. Install the Integration Files Download the AVEVA MES v3 integration files and extract its contents into the IntegrationFiles folder of the PlanetTogether server software installation location, typically: C:\ProgramData\PlanetTogether\IntegrationFiles Create a PlanetTogether Instance Follow documented steps to create a new instance running the installed PlanetTogether server software. If the first step was followed correctly, there should be an option to select the AVEVA-MES-v3 integration code when creating the instance: Configure SQL Databases Three databases must be created in SQL: An Import database named PT\_Import\_AvevaMES A Gap database named PT\_GapData\_AvevaMES A Publish database named PT\_Publish\_AvevaMES Create each database manually, then use the SQL scripts provided in the AVEVA MES v3 integration files package to populate the respective databases with the necessary tables and fields. The PlanetTogether instance service will read and write to the database. The service will be created during the instance creation process. It may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well. Configure the PlanetTogether Instance From the Instance Manager, double-click on the instance to open the Instance Settings. Import Database Settings From the Data Import tab, click the Import Database Settings button to display the connection string dialog. Enter the Server Name and the SQL Import Database Name PT\_Import\_AvevaMES and SQL user credentials, if using SQL user authentication, or select [x] Integrated Security to use a Windows user's credentials for communicating with the SQL database. Integrated Security When disabled, authentication to the specified SQL server and database is established via the User Name and Password fields of this database settings dialog which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the System service of the instance. By default, the Windows user is the standard Local System user which typically does not have access to SQL databases. Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. Click Save when satisfied with the connection string settings. Next, enable the checkbox to Run SQL before import, then enter the following stored procedure execution statement in the input to the right of the SQL to run before import label: EXEC PTsp\_GetData\_AvevaMES @SourceDB = 'MESDB', @GapDB = 'PT\_GapData\_AvevaMES' Publish Database Settings From the Data Publish tab, click the Publish Database Settings button to display the connection string dialog. Enter the Server Name and the SQL Import Database Name PT\_Publish\_AvevaMES and SQL user credentials, if using SQL user authentication, or select [x] Integrated Security to use a Windows user's credentials for communicating with the SQL database. Click Save when satisfied with the connection string settings. AVEVA Configuration Details regarding AVEVA MES configuration will be provided by an AVEVA representative. The information will summarize: Using attributes to identify the Plants to be included Using attributes to identify the Departments within each Plant Using attributes to identify both the Resources present in a Department for a Plant, and also the Resource's capacity type (Single-Tasking, Multi-Tasking, Infinite) Attributes to identify Warehouses Item Attributes used for display and sequence dependent setup calculations PT\_GapData\_AvevaMES Database Customization The PT\_GapData\_AvevaMES database can be used to supplement the data coming from AVEVA MES. Work with your integration specialist to configure the following: Attribute usage: This allows you to determine how the attributes will be used. For display purposes only, or for optimizing sequence dependent setup. Capacity Intervals: This allows you to import a maintenance schedule over the existing manufacturing calendar in PlanetTogether. Warehouse Aggregation: This allows multiple warehouses to be treated as a single storage location. PlanetTogether Instance Workspace Publish Settings Publish settings need to be configured in the PlanetTogether instance workspace so that the Publish action pushes the data to SQL and calls the appropriate stored procedure to push the data from SQL back to AVEVA. From System Settings → Publish Options, toggle on the Publish to SQL Server and the Publish all activities for a manufacturing order if any are published options: Include the following data objects, at minimum: Warehouses, Inventory, Demand Jobs Manufacturing Orders Operations Activities Activity Blocks Activity Blocks Intervals In the Procedures section, enable the option to Run stored procedure after Publishing and Publish dates using server's local time instead of

UTC (if it's an option; this is the default behavior in software versions 12.2.0.10 and newer so the option is removed). Add the following string to the box below Stored Procedure to Run after Publish (in import database): PTsp\_Publish\_AvevaMES "MESDB, PT\_Publish\_AvevaMES, [Default Background User]" Test the Configuration Use the Refresh dropdown menu in the top right corner of the PlanetTogether interface and click the Refresh Active Scenario button to perform a data import. Use the Publish dropdown menu from the main toolbar and click the Publish button to publish the data out of PlanetTogether. See Also AVEVA MES Integration Overview AVEVA MES Integration Data Server Installation Guide Instance Manager System Settings Main Toolbar

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## Integrations > Microsoft Excel

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### Full Excel Integration Package

#### Source

**Key Concept** The PlanetTogether team offers full data model Excel integrations for each major software release which can be used for local installations, on-premises installations, or PlanetTogether Cloud environments whose import database are connected to the Excel importer offered in the PlanetTogether web application. These integration files mimic a 1:1 mapping with each respective software version's import mappings structure. This allows for any data point to easily be mapped and imported into the data model without the necessity of modifying stored procedures in SQL or import mappings in PlanetTogether. Jump to section: Package File Downloads Local Installation and Usage Data Entry Connect to an Instance Workspace Package File Downloads For PlanetTogether Cloud-hosted environments, only the Excel workbook and import mappings files are needed. The appropriate import mappings file must be submitted to PlanetTogether Support in a request to deploy to a specific environment. For local or on-premises installations, download the full integration package and follow the installation steps to proceed with installation and local environment setup.

Software Version Excel Workbook Import Mappings Full Integration Package 12.1.4.x PT\_Import\_Excel.xlsx APSInterfaceSettings.xml Excel\_Full\_12.1.4.zip 12.2.0.x PT\_Import\_Excel.xlsx APSInterfaceSettings.xml Excel\_Full\_12.2.0.zip 12.2.1.x PT\_Import\_Excel.xlsx APSInterfaceSettings.xml Excel\_Full\_12.2.1.zip 12.3.0.x PT\_Import\_Excel.xlsx APSInterfaceSettings.xml Excel\_Full\_12.3.0.zip Local Installation and Usage Prerequisites Before proceeding to configure an Excel integration, PlanetTogether server software must be installed, which also requires installation of .NET 8.0 and SQL Server or SQL Express. Use the Server Software Installation Guide to setup a PlanetTogether server. Access to Microsoft Excel is also required, or another application which allows editing of XLSX files. The SQL server must be configured to support OLEDB connections. See the Microsoft Excel Integration Overview page for steps to configure SQL server.

1. Download the File Package First, be sure to download the Full Excel Integration file package. The integration files include: APSInterfaceSettings.xml: The Import Mappings configuration. PT\_Import\_Excel.xlsx: The Excel workbook template where data is maintained. It contains one sheet per each of the import mappings pages in PlanetTogether. Get\_Excel\_Data.sql: Use this SQL script to create the stored procedure which transfers data from the Excel sheet into the import database. PT\_Publish\_Excel.sql: Optionally, use this SQL script to create a standard publish database. This is only necessary if the schedule data in PlanetTogether will be published to SQL.

Integration.json: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance. PtDbDataSet.xsd: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance. To install the integration so that it may be used during software instance creation, download and extract the folder of files into the IntegrationFiles folder of the PlanetTogether software installation location, typically:

C:\ProgramData\PlanetTogether\IntegrationFiles When manually extracted correctly, each of the files listed above will reside in their own contained folder in the IntegrationFiles folder. For example:

C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\APSInterfaceSettings.xml  
C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\Integration.json  
C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\Get\_Excel\_Data.sql  
C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\PT\_Import\_Excel.xlsx  
C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\PT\_Publish\_Excel.sql  
C:\ProgramData\PlanetTogether\IntegrationFiles\Excel\PtDbDataSet.xsd

2. Create an Instance Use the Instance

Manager to create a new instance. For the quickest setup, select the appropriate Excel Integration Code from the dropdown list. If none are available, see the Integration Files section of this article to review the installation procedure. Choose to start from a New Scenario. Opt to not start the instance service yet since there is some configuration required before the instance and integration are functional.

**3. Import Database**

Create a new empty database named PT\_Import\_Excel which will act as the data source and import database. Once the database is created, open the Get\_Excel\_Data.sql file which was included in the Excel integration file download and execute it from a database management software application (e.g. Microsoft SQL Server Management Studio) to create the Get\_Excel\_Data stored procedure in the import database. Get\_Excel\_Data The Get\_Excel\_Data stored procedure is configured to fetch all data from each sheet of the workbook and insert it into a database table that matches the name of the sheet.

```
SET @trans_start = GETDATE()
SET @Sheet = 'User'
SET @SheetRename = @prefix + @Sheet
SET @Table = 'dbo.' + @SheetRename
IF EXISTS (Select 1 From INFORMATION_SCHEMA.TABLES where TABLE_NAME = @SheetRename)
EXEC('Drop Table ' + @Table)
EXEC('select * into ' + @Table + ' FROM OPENROWSET("Microsoft.ACE.OLEDB.16.0", "Excel 12.0;Database=' + @FilePath + "'", [' + @Sheet + '$]) WHERE [ExternalId] IS NOT NULL ')
SET @row_count = @@ROWCOUNT
SET @trans_end = GETDATE()
INSERT INTO _log_get_excel_data
SELECT @import_date, @FilePath, @Sheet, @SheetRename, @trans_type, @trans_start, @trans_end, @row_count
Each property in row 1 of each sheet is dynamically created and added to the corresponding database table, even if it has no data value in the Excel sheet. The import process will read and write to the database and may create and/or drop tables. It may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db_datareader, db_datawriter, and db_ddladmin permissions, though if deemed safe and appropriate, the db_owner designation works as well. In order to read the Excel file from disk, it may be necessary to use a sysadmin user. This is set in the Server Roles tab of the user properties. Other more secure SQL connection configurations are available. Seek assistance from a representative of your IT department to ensure compliance with local policies in regards to SQL database authentication and permissions.
```

**5. Publish Database**

This step is optional. If the finished schedule data does not need published from PlanetTogether to a SQL database, skip this step. Create a new empty database named PT\_Publish\_Excel. Once created, open the PT\_Publish\_Excel.sql from the downloaded integration files in a database management software application (e.g. Microsoft SQL Server Management Studio) and execute it to populate the database with two standard PlanetTogether publish stored procedures and one SystemData table. The publish database can be given any name, just be sure to use a global find/replace in the PT\_Publish\_Excel.sql document to replace all iterations of the text "PT\_Publish\_Excel" with the desired name. The publish process will read and write to the database and may create and/or drop tables and fields. It may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well.

**6. Instance Configuration**

**Import Database Connection**

From the Instance Manager, double-click the Excel integration instance, or click it once to select it and click the Edit button from the actions toolbar. From the Import Data tab, click the Import Database Settings button to display the database settings dialog. Configure the appropriate server name (SQL server name where the Excel import database is hosted) and the database name (typically PT\_Import\_Excel) and choose either Integrated Security or SQL user authentication. Once configured, click Save to proceed.

**Integrated Security**

When disabled, authentication to the specified SQL server and database is established via the User Name and Password fields of this database settings dialog which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the System service of the instance. By default, the Windows user is the standard Local System user which typically does not have access to SQL databases.

Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. Run SQL Before Import

Back at the Import Data tab of the instance settings dialog, select the box to Run SQL before import. In the text area to the right of this checkbox, enter a stored procedure EXEC execution command to execute the stored procedure to move the data from Excel into SQL. Note that the file path may vary depending on where the Excel sheet master data resides on the PlanetTogether server.

```
EXEC Get_Excel_Data @FilePath = 'C:\ProgramData\PlanetTogether\Excel 12.2.1.48\IntegrationFiles\Excel_Full_12.2.1\PT_Import_Excel.xlsx'
```

**Publish Database Connection**

The same process described above can be repeated from the Data Publish tab of the

instance settings dialog. Enter the server and authentication logic again, along with the database name. Save and close all changes. Data Entry The PT\_Import\_Excel.xlsx workbook from the downloaded integration files will act as the master data set. When the Excel integration option is selected during the new instance creation step, the integration files template is copied into the instance folder. It's recommended to use this copy of the file for the specific instance that its data will be imported into so that the original file remains intact as a template for copying into new instances as needed. The instance folder of files is located in the PlanetTogether software installation location. The Excel workbook can be found in the INSTANCE\_FOLDER\IntegrationFiles\Excel\_Full\_12.2.1 folder.

Example C:\ProgramData\PlanetTogether\Excel 12.2.1.48\IntegrationFiles\Excel\_Full\_12.2.1\PT\_Import\_Excel.xlsx

The Excel workbook contains one sheet per mappings page from the Import Mappings Board of the PlanetTogether client application. Navigate the sheets using the tabs across the bottom of the Excel interface. Right-click the < > left/right arrows in the bottom left corner to display a list of all sheets for quickly navigating to one that is far away from the one currently in focus. Each mappings sheet is pre-populated with every possible property that can be mapped and imported into PlanetTogether. Required properties are listed first (leftmost) and their column headers are colored with red text. Each property's value is required to be a certain data type (String, Integer, Decimal, Double, or Boolean) and some properties are restricted to only accepting specific values. For properties which only accept specific values, data validation is added to the respective column of the Excel sheet to allow users to select an allowed value from a dropdown list. Each property of each object mapping is documented in the Object Import Mappings section of this knowledge base to be used as a reference, as needed. Data Validation Data validation can be modified or disabled per column by clicking the column letter to select it, then navigating to Data → Data Validation and modifying the settings as needed. For more information, see Microsoft documentation: Apply data validation to cells Otherwise, each cell can be typed into freely and each row represents a new data object that will be imported into the PlanetTogether workspace. Keyboard Shortcuts We are by no means Microsoft Excel experts, but here are some helpful keyboard shortcuts to help to navigate the large workbook:

- Command Description Alt + ↓ Expand a dropdown list from the currently selected cell.
- Ctrl + Home Focus on the top leftmost cell of the currently active sheet.
- Ctrl + Page Down Navigate to the next right-adjacent sheet.
- Ctrl + Page Up Navigate back to the left-adjacent sheet.
- F6 Focus the cursor on the sheet tabular navigation. From here, use Right / Left keyboard arrows to navigate through the sheets. Press Enter to bring the selected sheet into focus.

Connect to the Instance Workspace Start the instance service from the Instance Manager if it's not running. Use the Client Sign-In Manager Application to sign in to the newly configured Excel instance workspace. Once logged in, expand the Refresh dropdown menu and click the Refresh Active Scenario or Refresh All Scenarios button in order to initiate the data import procedure. The data from the Excel template will populate in PlanetTogether. See Also Microsoft Excel Integration Server Installation Guide Instance Manager Client Sign-In Manager Application

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## Microsoft Excel Integration

### Source

Key Concept Data can be imported into PlanetTogether from a Microsoft Excel workbook. This is useful for importing custom data for a demo or when doing preliminary or simplified factory modeling. The basic concept is that the data from Excel is pulled into a SQL database before being imported into PlanetTogether. The transfer of data from Excel to SQL is done via a stored procedure. In a local or on-premises installation, the software instance can be configured to execute the stored procedure at the time a user clicks the Refresh button in the client user interface so that the data that gets imported is always up to date with the latest changes made to the Excel workbook. For PlanetTogether cloud-hosted environments, updates made to the Excel sheet must be uploaded via the PlanetTogether web application interface before the data changes can be imported into the instance workspace. Sample Excel Workbook Data Models PlanetTogether offers two sample Excel workbook strategies: a simple workbook which consolidates a lot of interdependent data objects and mappings into a much smaller number of sheets, or a full integration workbook which offers a 1-to-1 sheet and field mappings which contains a sheet per each of the mappings pages in PlanetTogether, and each sheet offers all data fields that can possibly be imported. For more information on each sample model, see: Simple Excel Integration Package Full Excel Integration Package Configure SQL Server to connect to Excel For local and on-premises installations, the following steps are required to query Excel from SQL: Install 64-bit Microsoft.ACE.OLEDB.16.0 driver: <https://www.microsoft.com/en-us/download/details.aspx?id=54920> Configure ACE OLE and Database Properties by executing these commands against the "master" database in Microsoft SQL Server Studio Manager USE [master] GO EXEC sp\_MSset\_oledb\_prop N'Microsoft.ACE.OLEDB.16.0', N'AllowInProcess', 1 GO EXEC sp\_MSset\_oledb\_prop N'Microsoft.ACE.OLEDB.16.0', N'DynamicParameters', 1 GO EXEC sp\_configure 'show advanced options', 1; RECONFIGURE; GO EXEC sp\_configure 'Ad Hoc Distributed Queries', 1; RECONFIGURE; GO Restart the SQL Server Windows Service Some servers require that the SQL Server Windows Service Log On user is configured to logon as the Local System account, as shown here: See Also SureStart Integration Methodology Full Excel Integration Package Simple Excel Integration Package Standard Import Database Standard Publish Database

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## Simple Excel Integration Package

### Source

Key Concept The PlanetTogether team has created a simplified Excel integration which can be used for local installations, on-premises installations, or PlanetTogether Cloud environments whose import database are connected to the Excel importer offered in the PlanetTogether web application. Jump to section: Package File Downloads Features Available in the Excel Template Navigating the Excel Template Customizing the Excel Template Local Installation and Usage Package File Downloads For PlanetTogether Cloud-hosted environments, only the Excel workbook and import mappings files are needed. The appropriate import mappings file must be submitted to PlanetTogether Support in a request to deploy to a specific environment. For local or on-premises installations, download the full integration package and follow the installation steps to proceed with installation and local environment setup. Software Versions Excel Workbook Import Mappings Full Integration Package 12.2.0.x 12.2.1.x PT\_Import\_Excel.xlsx APSInterfaceSettings.xml Excel\_Simple\_12.2.0.zip Features Available in the Excel Template This data model is meant for quick and simple Excel integrations. It can be expanded to include other data points, but may require significant alterations to the Excel workbook, the import mappings, and for local installations the SQL stored procedure. For complex integrations, it's recommended to use the full Excel integration which offers all PlanetTogether mapping table and fields to be imported. The following features are available with the standard SureStart integration: Feature Notes Plant Only single-plant models are supported Departments Any number of departments Resources Any number of resources and assigned capabilities Capacity Intervals Any number of recurring or non-recurring capacity intervals Warehouses Any number of warehouses Inventories Any number of items and inventories Jobs Any number of jobs; each are limited to one manufacturing order; each may have any number of paths/routes which may each have any number of operations Stock Material Requirements (BOM) Any number of required materials per operation may be configured as scheduling constraints or not Products Any number of products per operation may produce inventory to any warehouse Sales Orders Any

number of single- or multi-line sales orders Purchase Orders Any number of purchase orders Navigating the Excel Template The Excel workbook contains many sheets which allows users to define various data objects and fields which make up the scheduling data model. Guide This sheet offers an overview of the features included as well as a style guide defining what the various cell and column formatting indicates throughout the document. Plant Define the Plant object. Department\_Resources\_Capability Define Resource objects and assign them to a Department. Assign each resource one or more Capabilities. Shifts Define Capacity Interval objects. Shifts\_Resources Assign capacity intervals which were defined in the Shifts sheet to resources which were defined in the Department\_Resources\_Capability sheet. Items\_Inventory Define Item and Warehouse objects. Map warehouse objects to plants, and map item objects to warehouses. Routings Define Job objects and their dependencies: required quantity, need date, operations, paths, and operation sequence. BOM\_Input Define the stock material requirements per each operation which was defined in the Routings sheet. BOM\_Output Define the product(s) produced by each operation which was defined in the Routings sheet. SalesOrders Define Sales Order objects. PurchaseOrders Define Purchase Order objects. Customizing the Excel Template The Excel template can be modified and customized as needed in order to add or remove properties from the scope of the integration. Some fields in the Excel sheet are configured with data limitations or dependencies. For example, in the Shifts\_Resources sheet, column A uses data validation in SQL to ensure that the value mapped to the ResourceId property matches that of an existing ResourceId from the Department\_Resources\_Capability sheet. These validations can optionally be removed from the Data -> Data Validation section of the Excel workbook, but note that it may make the data in the workbook a bit more challenging to accurately update or manipulate. Web Application Considerations If using the PlanetTogether Web Application interface to upload the Excel data, any number of Excel workbook sheets can be added, and any number of columns can be added to any of the sheets. Each Excel sheet becomes a unique table in the import database, and each column with some value in the first cell becomes a field in the database. The data type is determined automatically by SQL based on the first value in the Excel sheet. If no values are imported, it assumes a string data type. After fields and/or sheets are added and the updated Excel workbook uploaded to the Web Application, the user is expected to navigate to the Import Mappings Board and map the new tables and fields to PlanetTogether data objects and properties. Local Installation Considerations If running an on-premises installation, adding fields to existing Excel sheets is simple - those fields will automatically be added to the existing tables so that they can be mapped from the Import Mappings Board. Adding new sheets to the workbook though becomes a bit more challenging as the Get\_Excel\_Data stored procedure will need to be modified to ensure that the new sheet gets converted to a SQL database table. Local Installation and Usage Prerequisite Before proceeding to configure an Excel integration, PlanetTogether server software must be installed, which also requires installation of .NET 6.0 and SQL Server or SQL Express. Use the Server Software Installation Guide to setup a PlanetTogether server. Access to Microsoft Excel is also required, or another application which allows editing of XLSX files. ACE OLE DB driver offered by Microsoft must also be installed and configured correctly. See the Microsoft Excel Integration page for more information.

1. Download the File Package First, be sure to download the Simple Excel Integration file package. The integration files include:
  - APSInterfaceSettings.xml: The Import Mappings configuration.
  - PT\_Import\_Excel.xlsx: The Excel workbook template where data is maintained.
  - Get\_Excel\_Data.sql: Use this SQL script to create the stored procedure which transfers data from the Excel sheet into the import database.
  - PT\_Publish\_Excel.sql: Optionally, use this SQL script to create a standard publish database. This is only necessary if the schedule data in PlanetTogether will be published to SQL.
  - Integration.json: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance.
  - PtDbDataSet.xsd: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance.
 To install the integration so that it may be used during software instance creation, download and extract the folder of files into the IntegrationFiles folder of the PlanetTogether software installation location, typically:  
 C:\ProgramData\PlanetTogether\IntegrationFiles When manually extracted correctly, each of the files listed above will reside in their own contained folder in the IntegrationFiles folder. For example:

```
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\APSInterfaceSettings.xml
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\Get_Excel_Data.sql
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\Integration.json
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\PT_Import_Excel.xlsx
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\PT_Publish_Excel.sql
C:\ProgramData\PlanetTogether\IntegrationFiles\SureStart\PtDbDataSet.xsd
```

2. Create an Instance Use the Instance

Manager to create a new instance. For the quickest setup, select the appropriate Excel\_Simple Integration Code from the dropdown list. If none are available, see the Integration Files section of this article to review the installation procedure. It is also recommended to select the New Scenario option from the Scenario File dropdown. Opt to not start the instance service yet since there is some configuration required before the instance and integration are functional.

**3. Import Database**

It's recommended to create a new empty database named PT\_Import\_Excel which will act as the data source and import database. Once the database is created, open the Get\_Excel\_Data.sql file which was included in the Excel integration file download and execute it from a database management software application (e.g. Microsoft SQL Server Management Studio) to create the Get\_Excel\_Data stored procedure in the import database. **Get\_Excel\_Data**

The Get\_Excel\_Data stored procedure is configured to fetch all data from each sheet of the workbook and insert it into a database table that matches the name of the sheet prefixed with the text "data\_".

```

Declare @prefix AS nvarchar(100) = 'data_' ... SET @trans_start = GETDATE()
SET @Sheet = 'Plant' SET @SheetRename = @prefix + 'Plant' SET @Table = 'dbo.'+@SheetRename IF EXISTS
(Select 1 From INFORMATION_SCHEMA.TABLES where TABLE_NAME = @SheetRename) EXEC('Drop Table '
+@Table) EXEC('select * into '+@Table+' FROM OPENROWSET("Microsoft.ACE.OLEDB.16.0", "Excel
12.0;Database=' +@FilePath+'", [' +@Sheet+$]) WHERE [PlantId] IS NOT NULL '); SET @row_count =
@@ROWCOUNT SET @trans_end = GETDATE() INSERT INTO _log_get_excel_data SELECT @import_date,
@FilePath, @Sheet, @SheetRename, @trans_type, @trans_start, @trans_end, @row_count Each property in row 1
of each sheet is dynamically created and added to the corresponding database table, even if it has no data value
in the Excel sheet. The import process will read and write to the database and may create and/or drop tables. It
may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method
is chosen, the user whose credentials are used will need to be able to read and write to the database, including the
ability to create tables. At minimum, the user must have db_datareader, db_datawriter, and db_ddladmin
permissions, though if deemed safe and appropriate, the db_owner designation works as well. In order to read the
Excel file from disk, it may be necessary to use a sysadmin user. This is set in the Server Roles tab of the user
properties. Other more secure SQL connection configurations are available. Seek assistance from a representative
of your IT department to ensure compliance with local policies in regards to SQL database authentication and
permissions.
```

**4. Publish Database**

This step is optional. If the finished schedule data does not need published from PlanetTogether to a SQL database, skip this step. Create a new empty database named PT\_Publish\_Excel. Once created, open the PT\_Publish\_Excel.sql from the downloaded integration files in a database management software application (e.g. Microsoft SQL Server Management Studio) and execute it to populate the database with two standard PlanetTogether publish stored procedures and one SystemData table. The publish database can be given any name, just be sure to use a global find/replace in the PT\_Publish\_Excel.sql document to replace all iterations of the text "PT\_Publish\_Excel" with the desired name. The publish process will read and write to the database and may create and/or drop tables and fields. It may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well.

**5. Instance Configuration**

**Import Database Connection From the Instance Manager**, double-click the Excel integration instance, or click it once to select it and click the Edit button from the actions toolbar. From the Import Data tab, click the Import Database Settings button to display the database settings dialog. Configure the appropriate server name (SQL server name where the Excel import database is hosted) and the database name (typically PT\_Import\_SureStart) and choose either Integrated Security or SQL user authentication. Once configured, click Save to proceed. **Integrated Security**

When disabled, authentication to the specified SQL server and database is established via the User Name and Password fields of this database settings dialog which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the System service of the instance. By default, the Windows user is the standard Local System user which typically does not have access to SQL databases. Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. **Run SQL Before Import**

Back at the Import Data tab of the instance settings dialog, select the box to Run SQL before import. In the text area to the right of this checkbox, enter a stored procedure EXEC execution command to execute the stored procedure to move the data from Excel into SQL. Note that the file path may vary depending on where the Excel sheet master data resides on the PlanetTogether server. **EXEC Get\_Excel\_Data @FilePath = 'C:\ProgramData\PlanetTogether\Excel\_Simple 12.2.0.27\IntegrationFiles\Excel\PT\_Import\_Excel.xlsx'**

**Publish**

Database Connection The same process described above can be repeated from the Data Publish tab of the instance settings dialog. Enter the server and authentication logic again, along with the database name. Save and close all changes. See Also Microsoft Excel Integration SureStart Integration Methodology Full Excel Integration Package Standard Import Database Standard Publish Database

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## SureStart Integration Methodology

### Source

**Key Concept** SureStart is a rapid implementation methodology for PlanetTogether that enables companies to utilize the core capabilities of PlanetTogether with minimal data requirements, in as little as 30 days. This agile methodology deploys tools that help users streamline scheduling, manage resource utilization, and provide real-time insights for effective decision-making. This is accomplished by loading core scheduling data via Excel spreadsheets and by relying initially on simple automated scheduling and manual schedule and data refinement rather than extensive automation. Sample Excel Workbook Data Models PlanetTogether offers two sample Excel workbook strategies: a simple workbook which consolidates a lot of interdependent data objects and mappings into a much smaller number of sheets, or a full integration workbook which offers a 1-to-1 sheet and field mappings which contains a sheet per each of the mappings pages in PlanetTogether, and each sheet offers all data fields that can possibly be imported. For more information on each sample model, see: Simple Excel Integration Package Full Excel Integration Package Custom Excel Workbook Data Models It may be desirable to create a custom formatted Excel workbook which organizes the data in a way that makes sense to the business. This could be useful if the data required for planning can be exported in a specific Excel format from an existing ERP or other master data source. In these cases, the custom workbook can be used to reduce the amount of manipulation required to get it to conform to one of the sample workbooks offered by PlanetTogether.

**Minimum Required Data** There are required properties and data dependencies in PlanetTogether which must be accounted for in order for their associated data objects to be valid and their associated features to function properly. These data can be imported, or any data which is not imported can be created and maintained from the desktop application interface directly. When importing the data, use the Standard Import Database article as a guide to realize which data are required per each mappings table.

**Resources:** Resources in PlanetTogether represent the machines, laborers, workstations, tools, or other equipment which perform the work required on the factory floor. Each are assigned one or more Capabilities which determines the type of work that the resource is allowed to perform. Resources must be assigned to a Department, and each Department must be assigned to a Plant. These data can easily be created in the PlanetTogether interface via the Scenario Data Board and the Capacity Planning Board.

**Data tables to consider when mapping:** Plant Mappings Department Mappings Resource Mappings Capability Mappings Capability Assignment Mappings Resource Capacity: Capacity Intervals define whether a resource is Online or Offline where an Online resource is capable of performing work, while an Offline is not. They may recur, or they may be configured as a one-time capacity setting or shift. No work can be scheduled if no online capacity interval is assigned to the resource. These data can be created in the PlanetTogether interface via the Scenario Data Board.

**Data tables to consider when mapping:** Capacity Interval Mappings Recurring Capacity Interval Mappings Capacity Interval Resource Mappings Inventories: Inventories indicate which items are stored in which warehouses. Each warehouse must also be assigned to one or more plants which they are capable of supplying with their inventories. These data can be created in the PlanetTogether interface via the Scenario Data Board.

**Data tables to consider when mapping:** Item Mappings Warehouse Mappings Plant Warehouse Mappings Inventory Mappings Jobs: Jobs represent top-level objects that generate requests for the shop to produce one or more items or products by a specific time. A job can specify one manufacturing order for a product or can be divided into multiple manufacturing orders. Each manufacturing order must specify at least one operation. An operation is considered one production or processing step of the order and is the actual work that gets scheduled on resources. Each operation must be assigned at least one resource requirement and capability requirement which determine the type of work that is needed and the type of resources that are needed to complete the work. Optionally, a bill of materials (BOM) can be required of an operation, and an operation can be configured to produce one or more items to be stored in inventory. These data can be created in the PlanetTogether interface via the Jobs Board, or job templates can be created in the Routing Templates Board which can then be copied to create actual jobs that can be scheduled.

**Data tables to consider when mapping:** Job Mappings Manufacturing

Order Mappings Resource Operation Mappings Resource Requirement Mappings Required Capability Mappings Material Mappings Product Mappings Workbook Formatting Considerations When importing data from an Excel workbook via the PlanetTogether Web Application, take note of the following behavior of the import process and adjust the workbook format as needed: Each sheet within the workbook becomes a SQL table. The table is named the same as the sheet. Each column with text in the first row is added to the table as a field. The field is named the same as the text used in the first row. The sheets and column headers can be named anything. Each field in Excel and SQL will be mapped to a corresponding PlanetTogether property where its name will be transformed as needed in order to conform to PlanetTogether's standard property naming convention. There is no need to define a data type for each column. The import process assumes each row accepts a string (nvarchar) since the PlanetTogether desktop application is capable of validating the data and converting it to the appropriate format needed for the property in the software. Import Mappings Once the data is imported successfully into the SQL import database, a user must configure the mapping of data from the Excel/database fields to PlanetTogether properties. This effort is achieved from the Import Mappings Board in the desktop application. See Also Microsoft Excel Integration Simple Excel Integration Package Full Excel Integration Package Standard Import Database Standard Publish Database

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## **Integrations > Standard PlanetTogether Integration**

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### **Standard Import Database**

#### Source

Key Concept PlanetTogether instance workspaces typically connect to a SQL database where data can be imported from. The import database is typically a staging database which acts as a link between a master data source like an ERP or MES system and the PlanetTogether scheduling application. This enables organizations to use one system to enter and manage all data (ERP, MES, etc.) so that the same data doesn't have to be re-entered into PlanetTogether for scheduling. A standard import database consists of one table per object which can possibly be mapped into PlanetTogether, where each table consists of all fields which can possibly be imported per each object. PlanetTogether categorizes data into three buckets: Resource Objects, Inventory Objects, and Job Objects. For some data elements, the definitions in PlanetTogether contain fields that do not have an ERP equivalent. In these cases, the values may be left at their default values (NULL values imported), calculated in the interface, or manually entered in PlanetTogether after the object is created via the interface. If a value is omitted in the import mappings, then manual changes made from the PlanetTogether user interface will be preserved when data is refreshed from the SQL source. Jump to section: Standard Database Creation Script Resource Objects Inventory Objects Job Objects Integration Approaches Standard Database Creation Script Use the provided .sql script to create the tables and fields of a standard import database. PT\_Import.sql APSInterfaceSettings.xml All field types are nvarchar(255) except for UserField fields which can often contain very long strings of text. These are designated nvarchar(MAX) to allow for strings longer than 255 characters. Using nvarchar allows for any text to be entered into any of the fields in the database. The data is validated though once it's imported into a PlanetTogether instance workspace. If the data does not conform to the expected data type per each imported field, then it won't be properly converted to the correct data type and will not be allowed to be imported. In these instances, the user who attempts to import the incompatible data will receive related errors from the Interface logs of the PlanetTogether user interface. The expected data types are denoted in the Import Mappings Board interface, and are also documented in each of the individual Import Mappings pages in this knowledge base.

Resource Objects Resource Objects deal primarily with the physical setup of the manufacturing facility and will therefore consist of how machines and capital are organized into a tiered structure. Resource Objects are meant to reflect the manufacturer's capacity to do work and the type of work that can be done. Required Resource Object Mappings Plants A Plant is meant to represent an entire facility or location where production occurs. It is usually synonymous with a single physical factory. However, in PlanetTogether, a Plant consists of any number of Departments that contain any number of Resources used to produce goods. PlanetTogether is a multi-plant capable system so there may be more than one Plant associated with the data model (software license permitting). Plants also play a role in inventory locations as Warehouses (see inventory objects) are associated with Plants. Table Name: Plants Recommended Fields: Field Name Field Description Data Type Required ExternalId

Unique identifier of the PLANT String ✓ Name PLANT Name String ✓ StableSpanHrs The plant stable span hours. For more information, see: Plant Stability. Double X All Plant Field Mappings Departments Departments are a means to help to organize the grouping of Resources in whatever manner makes the most sense for an organization. A resource must be associated with exactly one department. PlanetTogether uses departments for display usability as users can filter the resources they see based on department. Their only impact on scheduling is the ability to set a frozen zone unique to each Department. Typically, Departments in PlanetTogether correspond to ERP work centers. Example: CNC1, CNC2, and CNC3 machines are all a part of the department CNC whereas labor resources ED, RYAN, and KELLY are all a part of the department LABOR. Table Name: Departments Recommended Fields: Field Name Field Description Data Type Required ExternalId Unique identifier of the DEPARTMENT String ✓ Name DEPARTMENT Name String ✓ PlantExternalId ExternalId of the PLANT that the DEPARTMENT belongs to String ✓ DepartmentFrozenSpanHrs The Frozen Span Hours for the department. For more information, see: Plant Stability. Double X All Department Field Mappings Resources Resources in PlanetTogether represent the machines, laborers, workstations, tools, or other equipment which perform the work required on the factory floor. Table Name: Resources Recommended Fields: Field Name Field Description Data Type Required ExternalId Unique identifier of the RESOURCE String ✓ Name RESOURCE Name String ✓ PlantExternalId ExternalId of the PLANT that the RESOURCE belongs to String ✓ DepartmentExternalId ExternalId of the DEPARTMENT that the RESOURCE belongs to String ✓ NoDefaultRecurringCapacityInterval Prevents automatically assigning a default capacity interval to the RESOURCE, and prevents JOBS from scheduling on a newly-imported RESOURCE. Boolean X HeadStartHrs Specifies the number of hours that a job or operation can be released to schedule on the resource ahead of its calculated Just In Time (JIT) date. Double X All Resource Field Mappings Capabilities A capability defines the type of work or skill that a resource can do. Each resource can have multiple capabilities, and capabilities can be linked to multiple resources. In addition, each operation's resource requirement indicates the required capabilities that a resource must have to be considered eligible to operate. Therefore, for an activity to schedule on a resource, the operation must reference the number of resources required and those resources' capabilities. For example, a CNC machine may be able to DRILL, CUT, and MILL. Therefore these tasks (DRILL, CUT, and MILL) are considered capabilities. In the Job Objects section we will discuss Required Capabilities which links the capability requirement of the operation to the list of capabilities in PlanetTogether and in-turn the capable resource. Most ERP systems do not have an exact equivalent to the Capability. A common approach therefore is to use the Item or Work Center as the Capability. Using Item as Capability would mean that each Resource is given a list of Items it can create (or Item/Operation for multi-step processes). Using Work Center as Capability would mean that each Resource in the Work Center can do equivalent work. While this is not always accurate, it may be a good starting point, with manual rescheduling to assign specific machines being used as needed. Note that in addition to using a Capability, a Default Resource can be specified for an operation to assign a particular Resource to do the work, rather than choosing from any Resource with the Capability. This is useful when certain Resources are preferred or required over others for a particular production operation. Table Name: Capabilities Recommended Fields: Field Name Field Description Data Type Required ExternalId Unique identifier of the CAPABILITY String ✓ Name CAPABILITY Name String ✓ All Capability Field Mappings Resource Capabilities The resource capabilities table assigns each capability to one or more resource(s). Only Resources that are linked to the needed Capability(ies) of an operation may be assigned the work during scheduling. Table Name: ResourceCapabilities Recommended Fields: Field Name Field Description Data Type Required CapabilityExternalId ExternalId of the CAPABILITY String ✓ PlantExternalId ExternalId of the associated PLANT String ✓ DepartmentExternalId ExternalId of the associated DEPARTMENT String ✓ ResourceExternalId ExternalId of the associated RESOURCE String ✓ All Capability Assignment Field Mappings Recommended Resource Object Mappings Resource Capacity Intervals Resource Capacity Interval objects define the intervals of time where resources are available (or not) to work on jobs, including the type of work and how much work can be scheduled at each interval. Capacity Intervals define whether a resource is Online or Offline, and they may recur, or they may be configured as a one-time capacity setting or shift. Capacity Intervals can be thought of as shift intervals to determine when a resource is available. Each Capacity Interval may be assigned to any number of Resources. Table Name: CapacityIntervals Recommended Fields: Field Name Field Description Data Type Required ExternalId Unique identifier of the associated non-recurring CAPACITY INTERVAL String ✓ Name The Name of the non-recurring CAPACITY INTERVAL String ✓ StartDateTime The date and time that the non-recurring CAPACITY INTERVAL starts Datetime ✓ EndDateTime The date and time that the non-recurring CAPACITY INTERVAL ends Datetime ✓ IntervalPreset A preset CAPACITY INTERVAL type. Accepted values: Online Offline Overtime PotentialOvertime Cleanout Holiday Maintenance String X All Capacity Interval Field Mappings Table Name:

**RecurringCapacityIntervals Recommended Fields:** Field Name Field Description Data Type Required ExternalId Unique identifier of the associated recurring CAPACITY INTERVAL String ✓ Name The Name of the recurring CAPACITY INTERVAL String ✓ StartDateTime The date and time that the recurring CAPACITY INTERVAL starts Datetime ✓ EndDateTime The date and time that the recurring CAPACITY INTERVAL ends Datetime ✓ Recurrence The frequency in which the interval should recur. Accepted values: NotRecurring Daily Weekly MonthlyByDayNumber YearlyByMonthDay String ✓ RecurrenceEndType Determines when to end the recurrences. Accepted values: NoEndDate AfterMaxNbrRecurrences AfterRecurrenceEndDateTime String ✓ IntervalPreset A preset CAPACITY INTERVAL type. Accepted values: Online Offline Overtime PotentialOvertime Cleanout Holiday Maintenance String ✗ Sunday Boolean to control whether the interval is scheduled on Sundays during the recurrence period Boolean ✗ Monday Boolean to control whether the interval is scheduled on Mondays during the recurrence period Boolean ✗ Tuesday Boolean to control whether the interval is scheduled on Tuesdays during the recurrence period Boolean ✗ Wednesday Boolean to control whether the interval is scheduled on Wednesdays during the recurrence period Boolean ✗ Thursday Boolean to control whether the interval is scheduled on Thursdays during the recurrence period Boolean ✗ Friday Boolean to control whether the interval is scheduled on Fridays during the recurrence period Boolean ✗ Saturday

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## Standard Integration API

### [Source](#)

**Key Concept** A standard integration API is available for external applications to push and pull data from instances of PlanetTogether which are hosted in the PlanetTogether cloud environment. These REST API endpoints are offered with the intention to allow Value Added Reseller and Technology partner organizations to be able to create their own standard integration between PlanetTogether and a master data source like an ERP or MES system. Collaboration with the PlanetTogether Cloud Operations Support team is required in order to gain access to use the API. Collaboration with the PlanetTogether Product team is recommended to oversee efforts to create and maintain standard integrations between PlanetTogether and a master data source. In general, instances hosted in the PlanetTogether cloud environment share a single database for import and publish data, so these API endpoints can be used to manipulate either import or publish data. Import database tables are prefixed with [import], while publish database tables are prefixed with [publish]. API Endpoints Jump to section: CreateTable ImportDataToTable DeleteTableData DeleteAllTableData GetRecordsFromTable UpdateTableData TriggerImport CreateTable This endpoint will create a table in the database. The body of the request contains the column name and column data type. Supported data types: int varchar bool float long datetime string double decimal HTTP Request Method: POST URL: <https://api.planettogether.com/api/import/CreateTable/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of ImportDB table name (e.g. [import].[inventory]) Ocp-Apim-Subscription-Key: Azure API management key Sample Request body [ { "ExternalId": "string", "Name": "string", "Description": "string", "Notes": "string" } ] API Response "Success" or Error message ImportDataToTable This endpoint will insert data into a table in the database. The body of the request contains the column name and its value. HTTP Request Method: POST URL: <https://api.planettogether.com/api/import/ImportDataToTable/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of ImportDB table name (e.g. [import].[inventory]). The table must already exist in the database. Ocp-Apim-Subscription-Key: Azure API management key Sample Request body [ { "ExternalId": "Plant01", "Name": "Plant01", "Description": "Description of the Plant", "Notes": "Notes about the Plant" } ] API Response "Success" or Error message DeleteTableData This endpoint will delete rows of data from a table in the database which match all of the fields and values provided in the request body. HTTP Request Method: DELETE URL: <https://api.planettogether.com/api/import/DeleteTableData/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of ImportDB table name (e.g. [import].[inventory]) Ocp-Apim-Subscription-Key: Azure API management key Sample Request body [ { "ExternalId": "Plant01" } ] API Response "Success" or Error message DeleteAllTableData This

endpoint will delete all rows of data from a table in the database. HTTP Request Method: DELETE URL: <https://api.planettogether.com/api/import/DeleteAllTableData/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of ImportDB table name (e.g. [import].[inventory]) Ocp-Apim-Subscription-Key: Azure API management key Sample Request body [] API Response "Success" or Error message GetRecordsFromTable V2 This endpoint will retrieve records from a table from the database, and also return the total number of records in the table. Past version documentation: Version 1 HTTP Request Method: GET URL: <https://api.planettogether.com/api/import/GetRecordsFromTable/v2> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of Import or Publish database table name (e.g. [publish].[jobs]) Ocp-Apim-Subscription-Key: Azure API management key QueryString: SQL query to filter the results (note that the WHERE clause is implied) E.g. JobName like 'WO%' Limit: The number of records to return. By default, 1,000 records are returned. Offset: Number of records to skip. OrderBy: Define the sort order logic that should be used when querying the table. This overrides the default value of "1". The query sent to the database follows this pattern/syntax: SELECT \* FROM {tableName} WHERE {queryString} ORDER BY 1 OFFSET {offset} ROWS FETCH NEXT {limit} ROWS ONLY Note that since the query already contains an ORDER BY clause, attempting to use an ORDER BY clause in the QueryString header will result in a syntax error. Sample Request body [] API Response Record count and details of each record from the specified database table. UpdateTableData This endpoint will update records in the specified database table. HTTP Request Method: PUT URL: <https://api.planettogether.com/api/import/UpdateTableData/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape TableName: Name of ImportDB table name (e.g. [import].[inventory]) Ocp-Apim-Subscription-Key: Azure API management key QueryString: E.g. InventoryId='1933' Sample Request body [ { "Description": "Updated description text for the Plant", "Notes": "Updated notes for the Plant" } ] API Response "Success" or Error response TriggerImport This endpoint will trigger a data import/refresh into the specified scenario in the specified instance. HTTP Request Method: POST URL: <https://api.planettogether.com/api/import/TriggerImport/v1> Where is one of the following: dev qa prod Header requirement CompanyId: Company Id provided by PlanetTogether CompanyAPIKey: Security key provided by PlanetTogether InstanceName: Unique instance name in PlanetTogether solution landscape Ocp-Apim-Subscription-Key: Azure API management key ScenarioName: Name of the scenario to import the data into Sample Request body [] API Response "Success" or Error response See Also Standard Import Database Standard Publish Database

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## Standard Publish Database

### Source

Old Article Versions This article is updated to reflect the latest software functionality. For older software versions, download and refer to the appropriate document version: Software Version Download Link 12.2.1.x StandardPublishDatabase\_12.2.1.pdf Key Concept When integrating PlanetTogether with external systems, a SQL database is used to publish or export the schedule from PlanetTogether before the schedule data gets transmitted to an ERP, MES, or other external integration destination. PlanetTogether desktop application users have options to export the schedule data to a primary Publish database, or to an Analytics database. The exported SQL schema and data are identical between the two destinations. A common practice for many organizations is to configure the primary Publish database to retain only a single schedule while the Analytics database might be configured to allow for publishing many schedules so that reports can be used to see trends over time. Publishing to Analytics is entirely optional. Publish and Analytics Database Creation The Publish and Analytics SQL databases only needs to contain one table and two stored procedures to be compatible with PlanetTogether's Publish functionality. When a user first initiates a publish of the schedule from the instance workspace, all tables and fields will be created if they do not exist. Standard Database Creation Script Download this SQL script and execute its queries to create and/or alter a standard database called "PT\_Publish": PT\_Publish.sql It's recommended to first create an empty

database with the desired settings: Then execute the provided SQL queries to populate the database with the SystemData table and the two stored procedures. Alternatively, the provided .sql script can create the table too if the top section is uncommented. This may require altering the file paths defined in the FILENAME parameter to point to the appropriate installation location of SQL Server. Standard Publish Database Schema Schema Files per Software Version Software Version Schema File 12.1.3.x StandardPublishDBSchema\_12.1.3.15.sql 12.1.4.x StandardPublishDBSchema\_12.1.4.24.sql 12.2.0.x StandardPublishDBSchema\_12.2.0.27.sql 12.2.1.x StandardPublishDBSchema\_12.2.1.58.sql 12.2.1.x StandardPublishDBSchema\_12.2.1.129.sql 12.3.0.x StandardPublishDBSchema\_12.3.0.90.sql Table: [SystemData] Field Name Data Type Nullable Version nvarchar Yes ValidateDB bit Yes PrepareData bit Yes ClearCustomTables bit Yes Procedure: [ClearAllHistoryData] The procedure doesn't need to do anything, it just needs to exist. In a standard publish database, this procedure uses TRUNCATE TABLE to purge all data from all standard publish tables. This procedure is called when a user or action triggers an instance workspace to publish a schedule if the [ ] Retain Published Schedules publish option is disabled. When configuring an Analytics database, this procedure can be configured to do nothing, or it can be configured to only purge data which is older than some number of days, weeks, etc. Procedure: [ClearOldHistoryData] The procedure doesn't need to do anything, it just needs to exist. In a standard publish database, this procedure is called when a user or action triggers an instance workspace to publish a schedule if the [x] Retain Published Schedules publish option is enabled. The procedure uses the application settings Delete activity scheduled to start beyond the next, Delete all history older than, and Delete non-production scenario history older than to define what data gets purged from the publish database tables based on how old it is (when it was previously published). This allows for many published schedules to be preserved in the publish database so that scheduling trends may be tracked over time. When configuring an Analytics database, this procedure can be configured to do nothing, or it can be configured to only purge data which is older than some number of days, weeks, etc. Database Schema Table: [dbo].[Plants] Field Name Data Type Nullable Primary key PublishDate datetime No Yes InstanceId nvarchar(38) No Yes PlantId bigint No Yes Name nvarchar(max) Yes Description nvarchar(max) Yes Notes nvarchar(max) Yes BottleneckThreshold float Yes HeavyLoadThreshold float Yes ExternalId nvarchar(max) Yes DepartmentCount int Yes StableDays float Yes DailyOperatingExpense float Yes InvestedCapital float Yes AnnualPercentageRate float Yes Table: [dbo].[Departments] Field Name Data Type Nullable Primary key PublishDate datetime No Yes InstanceId nvarchar(38) No Yes PlantId bigint No Yes DepartmentId bigint No Yes Name nvarchar(max) Yes Description nvarchar(max) Yes Notes nvarchar(max) Yes ExternalId nvarchar(max) Yes PlantName nvarchar(max) Yes ResourceCount int Yes DepartmentFrozenSpanDays float Yes Table: [dbo].[Resources] Field Name Data Type Nullable Primary key PublishDate datetime No Yes InstanceId nvarchar(38) No Yes PlantId bigint No Yes DepartmentId bigint No Yes ResourceId bigint No Yes Name nvarchar(max) Yes Description nvarchar(max) Yes Notes nvarchar(max) Yes Bottleneck bit Yes BufferHours float Yes CapacityType nvarchar(max) Yes Drum bit Yes OvertimeHourlyCost float Yes StandardHourlyCost float Yes ExperimentalDispatcherOne bigint Yes ExperimentalDispatcherTwo bigint Yes ExperimentalDispatcherThree bigint Yes ExperimentalDispatcherFour bigint Yes NormalDispatcher bigint Yes Workcenter nvarchar(max) Yes CanOffload bit Yes CanPreemptMaterials

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## Object Import Mappings > Inventory Objects Mappings

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## Forecast Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required Forecasts \*ExternalId | String A unique identifier of the Forecast. Must be unique per Item. \*ForecastVersion | String The version of the forecast. The PlanetTogether software currently only supports one common version assigned to all imported forecasts, so while this can be assigned any string value, only forecasts which share a common ForecastVersion will appear in the Forecast Manager tile. If uncertain what to set for this value, just set it to "1". \*ItemExternalId | String The External identifier of the Item for which the Forecast is generated. \*Name | String Unique, changeable, text identifier of the Forecast. \*WarehouseExternalId | String The Warehouse in which the Item is stored. CustomerExternalId | String The External ID of the Customer that the Forecast is associated with. Description | String Text for describing the Forecast. Notes | String Comments or special considerations about this Forecast. Planner | String The scheduler who will manage the Forecast. Priority | Int32 Usually used to specify a combination of importance and urgency. The Balanced Composite Rule can use this. Lower numbers are more urgent/important. SalesOffice | String Specifies the sales office or other physical location that created the demand. This does not affect the Warehouse that satisfies the Forecast. It is for reference only. SalesPerson | String The sales employee who is responsible for this Forecast demand. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). Forecast Shipments \*ForecastExternalId | String The External identifier of the Forecast is to be shipped. \*RequiredQty | Decimal The Required Quantity of Items for the Forecast. \*RequiredDate | DateTime The Required Date for the Shipment. \*WarehouseExternalId | String The External identifier of the Warehouse associated with the Forecast. See Also Inventory Plan Board Import Mappings Board

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## Inventory Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ItemExternalId | String The External identifier of the Item whose stock (inventory) is being stored. \*WarehouseExternalId | String The External identifier of the Warehouse where the Item is being stored. AutoGenerateForecasts | Boolean If True, PlanetTogether automatically generates forecasts for this inventory item when its sales orders are updated. ForecastInterval | String This specifies the amount of time between each auto-generated forecast. Quarter Month Week Day NumberOfIntervalsToForecast | Int32 This defines how many forecasts should be auto-generated. BufferStock | Decimal This is used in setting Warning Levels. DbrReceivingBufferDays | Double The Receiving Buffer Days of the Inventory for the Purchase to Stock. DbrShippingBufferDays | Double The Shipping Buffer of the Item's Inventory. ForecastConsumption | String Forecast consumption is used as part of MRP. This specifies how MRP should consume forecasts before the MRP logic is executed. Accepted values: Backward: Will search for forecasts with the same or earlier period. Forward: Will search for forecasts with the same or later period. BackwardThenForward: Starts as a backward strategy but switches to forward when no more backward forecasts are available, and sales orders are not fully consumed yet. Spread: Finds the forecasts before and after the sales order then calculates the ratio between the sales order and forecast. The ratio amounts consume forecasts. ForecastConsumptionWindowDays | Double The number of days within the forecast consumption window. LeadTimeDays | Double The amount of time it takes between when the Item is ordered and delivered for this Warehouse. MaterialAllocation | String This field specifies how material will be allocated according to the production or procurement date of the material source. Accepted values: NotSet: No allocation rules are set. Default behavior is to allocate oldest material sources first. UseNewestFirst: The material requirement will source material from the most recently produced or procured material source. UseOldestFirst: The material requirement will source material from the earliest/oldest produced or procured material source. MaxInventory | Decimal Specifies the maximum quantity of items that can be stored in inventory. Used to set alerts when Inventory Levels are predicted to be above this value. MrpExcessQuantityAllocation | String Controls which parent jobs are adjusted to accept the increased allocation when MRP-generated jobs produce excess. Accepted values: None: Leave extra material as WIP in the warehouse or on the tank. This is the default. LastParentJob: Allocate the remainder to the last consuming job (by Need Date). AllParentJobsEqually: Divide the excess quantity equally among the parent

jobs. AllParentJobsProportionally: Divide the excess quantity proportionally to the parent job quantities. MrpProcessing | String This specifies whether MRP should generate Purchase Orders or Jobs to supply the Item. Accepted values: Ignore: MRP Optimize Plan will not generate jobs or purchase orders. GenerateJobs: MRP Optimize Plan will use the assigned TemplateJobExternalId routing template generate jobs to satisfy demands if MRP is configured to generate jobs. GeneratePurchaseOrders: MRP Optimize Plan will generate purchase orders to satisfy demands if MRP is configured to generate purchase orders. See also: MPS/MRP Planning. OnHandQty | Decimal Removed from software versions 12.3.0 and newer. This value reflects the amount of inventory that is available to work with in this Warehouse. If the associated Item uses Lot Control then on-hand inventory must be imported as one or more Lots. See also: Lot Controlled Planning Lots Mappings PlannerExternalId | String The External identifier of the Planner is responsible for monitoring and managing this Item's stock level at this Warehouse. PreventSharedBatchOverflow | Boolean This prevents partial batching (meaning more than one batch is needed) with other demands. This can be used to better control batch creation and prevent issues with lot pegging if partial quantity is pegged. PurchaseOrderSupplyStorageAreaExternalId | String The ExternalId of the Storage Area that should be used by MRP when it generates purchase orders to satisfy demands. Required when MrpProcessing is set to GeneratePurchaseOrders. SafetyStock | Decimal The target level of this Item to have on hand at this Warehouse is to provide the desired service level to customers. Falling below the safety stock will trigger a warning on the Inventory Plan to alert that additional material is required. SafetyStockJobPriority | Int32 Sets the Priority value of the MRP-generated Job replenishing the safety stock. This is used for optimization. Lower priority numbers are usually favored over higher numbers. SafetyStockWarningLevel | Decimal If a job's classification is "Safety Stock", then ignore the lateness if the current inventory is greater than the warning level. If the Job's classification is "Safety Stock" and the Job has Products associated with it, then this value will be set to true only if the Job is later than the Safety Stock Warning Level of the Product's Inventory. StorageCapacity | Decimal A Scheduling Extension can use it to limit scheduling based upon the availability of storage space. TemplateJobExternalId | String The External identifier of the Job/Routing Template used by MRP to generate Jobs for this item. See Also Item Mappings Inventory Plan Board Import Mappings Board

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## Item Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Item. BatchSize | Decimal The size of the Batch that can be produced or purchased. Jobs and Purchase Orders must be in integer multiples of this value. BatchWindowHrs | Double When batching demand to create Jobs or Purchase Orders, the batch should not reach out further than this value to reach the MaxOrderQty. Cost | Decimal The cost of the item. This value is used to calculate the value of inventory, reporting, and financial optimization. DefaultLeadTimeDays | Double Specifies the time it takes between when the items are ordered to when they are received. This is used by Material Requirements when there is no Inventory Record for the Item at any available warehouse. Description | String A text description of the Item. ItemGroup | String It can be used for visually grouping Items into categories. ItemType | String The type of item that is produced, stocked, or consumed. Mostly for informational purposes. Tool type items are the only type with any sort of functional implication. They exhibit unique behavior when reporting progress against an operation which either consumes or produces the item. No partial consumption or production is reported to inventory. Tool type items are also excluded from consideration when using the Update sub-job need date feature. Accepted values: FinishedGood Intermediate RawMaterial Resource SubAssembly ByProduct CoProduct Tool JobAutoSplitQty | Decimal The quantity to be split off of the job. Jobs are auto-split if the item's JobAutoSplitQty is greater than the job's first manufacturing order's required quantity. LotUsability | String Removed from software versions 12.3.0 and newer. Specifies how the lot can be used. See also: Lot Controlled Planning. Accepted values: Uncontrolled: Lot controlled planning is disabled. This is the default value if no other value is imported. ShelfLife: The item is lot controlled. Its lots are limited to be consumed within a certain time frame. Lot expiration is determined by the lot production date plus the value of the ShelfLifeHrs item property, or the expiration date can be imported and assigned to imported lots via Lots Mappings. Expired lots cannot be consumed and their inventory is removed at the time of expiration. Controlled: The item is lot controlled. Lot codes can be used to peg batches of material to consuming jobs/operations. ShelfLifeNonConstraint: The item is lot controlled. Its lots are limited to be consumed within a certain time frame, but expired lots remain in inventory and can still be consumed by jobs/operations. Layouts and Metrics can be enabled to visualize expired lot consumption so that a material planner may act to correct material allocations manually in order to reduce the amount of expired material. MinOrderQty | Decimal Each Job or Purchase Order for this item must be at least this quantity. Used in conjunction with BatchSize to calculate the minimum number of batches required. MaxOrderQty | Decimal Each Job and Purchase Order for this item must be no more than this quantity. Used in conjunction with BatchSize to calculate the maximum number of batches allowed. MinOrderQtyRoundupLimit | Decimal This value is added to the MinOrderQty when generating purchases to stocks when the quantity short is greater than this value. Name | String The name of the Item. Unique, changeable, text identifier. Notes | String Comments or special considerations about this Item. PlanInventory | Boolean Whether the item should be included in the Inventory Plan. RollupAttributesToParent | Boolean Whether the operation attributes are "rolled-up" into the job recursively as needed. ShelfLifeHrs | Double The amount of time that each lot of the Item will remain in inventory before expiring and being removed if it has not been depleted/consumed. ShelfLifeWarningHrs | Double Warning threshold time to be configured per item. The time desired to receive a warning when a material is consumed close to its expiry. Source | String Where the Item originates from. This value may dictate certain functional behavior. Accepted values: Purchased: The item is always purchased from a supplier. Manufactured: The item is manufactured in the factory. PurchasedOrManufactured: The item may be purchased from a supplier, or manufactured in the factory. Items whose source is either Manufactured or PurchasedOrManufactured may have Product Rules created and associated with them. TransferQty | Double As this product is produced, it is transferred to Inventory in quantities of this size when the operation product's InventoryAvailabilityTiming property is set to BasedOnTransferQty. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Inventory Plan Board Import Mappings Board Warehouse Mappings Plant Warehouse Mappings Inventory Mappings

## Item Storage Lots Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ItemExternalId | String The ExternalId of the Item to be stored. \*StorageAreaExternalId | String The ExternalId of the storage area where the item will be stored. \*WarehouseExternalId | String The ExternalId of the Warehouse where the associated storage area is located. \*LotExternalId | String The ExternalId of the associated Lot that is stored in the storage area. The Lot object is imported via Lots Mappings. \*Qty | Decimal The quantity of the lot that is stored in the storage area. It must be greater than 0. See Also Items, Inventories, Warehouses, & Storage Areas Lots Mappings Storage Area Mappings Item Storage Mappings Storage Areas Board

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## Item Storage Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ItemExternalId | String The External identifier of the Item. \*StorageAreaExternalId | String The External identifier of the storage area. \*WarehouseExternalId | String The External identifier of the Warehouse where the storage area is located. DisposalQty | Decimal Any quantity less than this that is stored in the storage area can be discarded in order to make room for other material. DisposeImmediately | Boolean Whether excess material under the DisposalQty will be discarded as soon as the quantity drops below the limit. If false, the material will only be discarded if it expires or it needs to be removed to store something else. If true, the material will be disposed as soon as it falls below the DisposalQty. MaxQty | Decimal The maximum quantity of the item that can be stored at any time in the storage area. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs).

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## Lots Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier for the Lot. \*ItemExternalId | String The External identifier for the item. \*Qty | Decimal Removed from software versions 12.3.0 and newer. Lot quantity is now imported via Item Storage Lots Mappings. The Lot Quantity. \*WarehouseExternalId | String The External identifier for the Warehouse storing the Lot. Code | String The Lot Code. ExpirationDate | DateTime The expiration date of the Lot. LimitMatlSrcToEligibleLots | Boolean Whether the material source should be constrained to the eligible lots. Note: If this is set to true, a Lot Code must also be set. LotProductionDate | DateTime Date of Lot Production UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Lot Controlled Planning Item Mappings Inventory Mappings Storage Area Mappings Item Storage Mappings Item Storage Lots Mappings Inventory Plan Board Import Mappings Board

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## Plant Warehouse Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*WarehouseExternalId | String The external identifier of the Warehouse. \*PlantExternalId | String The external identifier of the Plant to which this warehouse belongs. See Also Plant Mappings Warehouse Mappings Inventory Plan Board Import Mappings Board

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## Purchases To Stock Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier for the Purchase To Stock (Purchase Order). This value must be unique per each Purchase to Stock.

\*ItemExternalId | String The ExternalId of the item to be purchased. \*QtyOrdered | Decimal The number of units of the item that have been ordered. \*StorageAreaExternalId | String The ExternalId of the Storage Area where the order will be stored when received. \*WarehouseExternalId | String The ExternalId of the Warehouse where the order will be stored when received. ActualReceiptDate | DateTime The date and time at which the purchase order actually arrived at the warehouse. This can be used to track purchase order deliveries. BuyerExternalId | String The name of the individual who is responsible for this purchase. For informational purposes. Closed | Boolean If True, the Purchase to Stock is considered closed. Purchases to Stock are generally closed when all Required Quantities have been received. Description | String Additional text for describing the Purchase to Stock. Firm | Boolean This specifies that the Purchase to Stock is firm. Firm Purchases to Stock will not be deleted by MRP when MRP is used to generate Purchases to Stock/Purchase Orders. LimitMatISrcToEligibleLots | Boolean Whether the material consumption should be constrained to eligible lots when this Purchase Order is consumed. If True, eligible lots are determined by the Lot Code pegging (LotCode of the Purchase Order must match that of the AllowedLotCode of the Material requirement). UseLimitMatISrcToEligibleLots | Boolean Set to True to enforce the LimitMatISrcToEligibleLots property logic. LotCode | String The Lot Code is to be applied to the items being received, if applicable. Name | String Unique, changeable, text identifier for the Purchase Order. Notes | String Comments or special considerations about the Purchase Order object. OverrideStorageConstraint | Boolean If True, this material will be allowed to store in excess of the storage area's max quantity when received. If false, any material that can't be stored will be discarded. QtyReceived | Decimal The number of items that have actually been received. This value may be different from the QtyOrdered. RequireEmptyStorageArea | Boolean If True, the destination storage area must be empty or else the received material will be discarded. ScheduledReceiptDate | DateTime The date and time at which the purchase order is scheduled to arrive at the warehouse. TransferHrs | Double The time it takes for the materials to be transferred into the warehouse after they are received. Material is not considered usable in production until this time has passed after the Scheduled Receipt Date. UnloadHrs | Double If scheduling Docks, this is used to specify the amount of time it will take to unload the items. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs).

VendorExternalId | String The company that the Items or parts are ordered from. This ID must match that of an existing Customer object record. See Also Item Mappings Warehouse Mappings Plant Warehouse Mappings Customer Mappings Import Mappings Board MPS/MRP Planning

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## Resource Storage Area Connector In Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*PlantExternalId | String The ExternalId for the Plant in which the associated Resource is found. \*DepartmentExternalId | String The ExternalId of the Department in which the associated Resource is in. \*ResourceExternalId | String The ExternalId of the associated Resource which will be enabled to store material in the mapped storage area. \*StorageAreaConnectorExternalId | String The ExternalId of the associated storage area connector. \*WarehouseExternalId | String The ExternalId of the Warehouse where the associated storage area is located. See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Mappings Storage Area Connector Mappings Resource Storage Area Connector Out Mappings

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## Resource Storage Area Connector Out Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*PlantExternalId | String The ExternalId of the Plant in which the associated Resource is found. \*DepartmentExternalId | String The ExternalId of the Department in which the associated Resource is in. \*ResourceExternalId | String The ExternalId of the associated Resource which will be enabled to consume material from the mapped storage area.  
 \*StorageAreaConnectorExternalId | String The ExternalId of the associated storage area connector.  
 \*WarehouseExternalId | String The ExternalId of the Warehouse where the associated storage area is located. See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Mappings Storage Area Connector Mappings Storage Area Connector Out Mappings

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## Sales Order Mappings

### Source

Jump to section: Sales Orders Sales Order Lines Sales Order Line Distributions Property Name | Data Type Description & accepted values \* = Required Sales Orders Map data for each Sales Order object. \*ExternalId | String The External identifier of the Sales Order. \*Name | String The Sales Order name. Unique, changeable, text identifier for the Sales Order. CancelAtExpirationDate | Boolean If True, the Sales Order will be canceled at the Expiration Date defined. Cancelled | Boolean If True, the Job will not be scheduled. CustomerExternalId | String The unique External Id of the customer for which the Sales Order is created. Description | String Additional text to describe the Sales Order. Estimate | Boolean If True, then this is a quote (estimated order), not a firm order. ExpirationDate | DateTime If 'CancelAtExpirationDate' is True, then the Sales Order is marked as "Cancelled" when the PlanetTogether Clock passes this date. Notes | String Comments or special considerations about this Sales Order. Planner | String The user is responsible for planning this demand if planning by demand rather than by product or location. Project | String It can be used to track multiple demands tied to one project. SalesAmount | Decimal Specifies the sales amount for the sales order. SalesOffice | String Specifies the sales office or other physical location that created the demand. This does not affect the Warehouse that satisfies the order for reference only. SalesPerson | String The sales employee who is responsible for this demand. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). Sales Order Lines Map data for each Line of each Sales Order object. \*ItemExternalId | String The External identifier of the item associated with the Sales Order. \*LineNumber | String The identifier for a line item within the sales order. \*SalesOrderExternalId | String The External identifier for this Sales Order. Description | String Additional text to describe the Sales Order Line. UnitPrice | Decimal The sale price per unit. This can be used to maximize sales revenue. Sales Order Line Distributions Map data for each Distribution of each Line of each Sales Order object. \*LineNumber | String The identifier for a line item within the sales order. \*QtyOrdered | Double The total quantity for this Line Item Distribution is on order. This remains the same even if there is a partial shipment made. \*RequiredAvailableDate | DateTime The material must be available in stock to reach the customer by the Promised Delivery Date. \*SalesOrderExternalId | String The External identifier for this Sales Order. MustSupplyFromWarehouseExternalId | String Required if using MRP to generate jobs from the Sales Order. It can be used to force the Line to be supplied from the specified Warehouse. If not specified, then the material can come from any Warehouse (but is not compatible with MRP in a multi-warehouse data model). UseMustSupplyFromWarehouseExternalId | Boolean Required to be TRUE if using MRP to generate jobs from the Sales Order. When TRUE, this enforces the specified Warehouse in the MustSupplyFromWarehouseExternalId field to be the supplying Warehouse. AllowedLotCodes | String The Lot Codes that are allowed to supply the Sales Order. AllowPartialAllocations | Boolean This is currently a flag that specifies whether partial allocations of material can supply the Sales Order. Closed | Boolean If True, the Sales Order does not affect the plan. Hold | Boolean Whether the Sales Order was placed on Hold and work should not be done on it. HoldReason | String The reason why the Sales Order was put on Hold. Id | Int64 The identifier of the Sales Order Line Distribution. MaterialAllocation | String This field specifies how material lots will be allocated. Allowed values: NotSet: No Lot Allocation rules are set. UseNewestFirst: Material requirements will pull from the latest (most recent) material

source. UseOldestFirst: Material requirements will pull from the earliest (oldest) material source. MaterialSourcing | String This field specifies whether to allow more than one material source to supply the Sales Order demand. Allowed values: NotSet: No Material Sourcing rules are set. Any number of sources may be used. Exclusive: The material source must be exclusive to a single source. MaximumLatenessDays | Double If using the StockShortageRule of "PushLater" and the demand has been pushed this number of days past the Required Available Date, the Sales Order is marked as a "Missed Sale." MaxSourceQty | Decimal If specified, only sources of supply with this much material or less will be eligible to fulfill the demand for material. MinSourceQty | Decimal If specified, only sources of supply with at least this much material will be eligible to fulfill the demand for material. MinAllocationQty | Decimal If AllowPartialAllocations is True, this is the minimum amount that must be allocated to the shipment Priority | Int32 Indicates the importance of the shipment. Used during the allocation process to determine which requirements to allocate to first. Shipments with lower numbers are considered more important and receive allocation before shipments with higher numbers. Allocation is based upon the Allocation Rule specified during the time a Simulation is performed. QtyShipped | Decimal The number of items that have already been shipped. SalesRegion | String The geographic region for the shipment. For information only. ShipToZone | String Specifies the geographic area where the shipment is going for information only. StockShortageRule | String Specifies what should be done in stock planning when the shipment's full QtyOpenToShip cannot be satisfied. This can also be overridden during Optimize with a global rule. See Also Sales Orders Board Import Mappings Board MPS/MRP Planning

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## Storage Area Connector In Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*StorageAreaConnectorExternalId | String The ExternalId of the associated storage area connector. \*StorageAreaExternalId | String The ExternalId of the associated storage area. \*WarehouseExternalId | String The ExternalId of the Warehouse where the associated storage area is located. See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Mappings Storage Area Connector Mappings Resource Storage Area Connector In Mappings

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## Storage Area Connector Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The external identifier of the storage area connector. This value must be unique among all storage area connector objects. \*WarehouseExternalId | String The ExternalId of the Warehouse where the storage area is located. CounterFlow | Boolean A flag to indicate that material can flow in both directions at once. If false, the connector cannot be used simultaneously for filling and withdrawing from a storage area. If True, the connector can be used for both filling and withdrawing simultaneously. CounterFlowLimit | Int32 Indicates the total limit of storage areas both storing and withdrawing simultaneously. If CounterFlow is True, and CounterFlowLimit is 3, the connector can be used to fill or withdraw from 3 storage areas at once. Description | String A text description of the storage area connector. Name | String The name of the storage area connector. Unique, changeable, text identifier. Notes | String Comments or special considerations about this storage area connector. StorageInFlowLimit | Int32 Indicates how many storage areas the connector can fill at the same time. StorageOutFlowLimit | Int32 Indicates how many storage areas the connector can withdraw material from at the same time. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Mappings Storage Area Connector In Mappings Resource Storage Area Connector In Mappings Storage Area Connector Out Mappings Resource Storage Area Connector Out Mappings

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## Storage Area Connector Out Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*StorageAreaConnectorExternalId | String The ExternalId of the associated storage area connector. \*StorageAreaExternalId | String The ExternalId of the associated storage area. \*WarehouseExternalId | String The ExternalId of the Warehouse where the associated storage area is located. See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Mappings Storage Area Connector Mappings Resource Storage Area Connector Out Mappings

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## Storage Area Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the storage area. \*WarehouseExternalId | String The External identifier of the Warehouse where the storage area is located. \*Name | String The name of the storage area. Unique, changeable, text identifier. ConstrainCounterFlow | Boolean A true/false boolean used to enforce (or not) the CounterFlowLimit property in order to constrain whether material can be stored and withdrawn from a Storage Area at the same time. ConstrainInFlow | Boolean A true/false boolean used to enforce (or not) the StorageInFlowLimit property in order to constrain how many sources can store material in a Storage Area simultaneously. ConstrainOutFlow | Boolean A true/false boolean used to enforce (or not) the StorageOutFlowLimit property in order to constrain how many sources can withdraw material from a Storage Area simultaneously. CounterFlowLimit | Int32 The total limit of Simultaneous storage and withdrawal sources. If 0, only one direction can occur at a time. Description | String A text description of the storage area. Notes | String Comments or special considerations about this storage area. SingleItemStorage | Boolean Whether only a single item can be stored in the storage area at once. If true, material must be withdrawn or disposed before another item can be stored. StorageInFlowLimit | Int32 Defines how many sources can store material in the Storage Area simultaneously. If 0, only on-hand sources can exist. Material will only be withdrawn. StorageOutFlowLimit | Int32 Defines how many sources can withdraw material from the Storage Area simultaneously. If 0, Material in this Storage Area cannot be used. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Items, Inventories, Warehouses, & Storage Areas Storage Areas Board Storage Area Connectors Item Storage Mappings Storage Area Connector Mappings

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## Transfer Order Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required Transfer Orders Use Transfer Orders to initiate transfers of inventory from one warehouse to another. \*ExternalId | String The External identifier for the Transfer Order. Must be unique among all transfer orders. \*Name | String Unique, changeable, text identifier for the Transfer Order. \*Closed | Boolean If True, then the Transfer Order has no further effect on the Inventory Plan. Description | String Additional text for describing the Transfer Order. Notes | String Comments or special considerations about this Transfer Order. Priority | Int32 Usually used to specify a combination of importance and urgency. The Balanced Composite Rule can use this. Lower numbers are more urgent/important. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). Transfer Order Distributions \*ExternalID | String The External identifier for the Transfer Order Distribution. Must be unique per each Transfer Order. \*TransferOrderExternalId | String The External identifier for the Transfer Order. \*FromWarehouseExternalId | String The External identifier of the Warehouse that supplies the Items being transferred. \*ToWarehouseExternalId | String The warehouse receiving the items being transferred. \*ItemExternalId | String The External identifier of the Items being transferred. \*QtyOrdered | Double The number of items that are to be transferred to another Warehouse. \*QtyShipped | Double The number of items that have already been shipped to the receiving Warehouse (typically "0"). \*QtyReceived | Double The number of items that the receiving Warehouse has already received (typically "0"). \*ScheduledShipDate | DateTime The date and time at which the items are scheduled to leave the supplying Warehouse. \*ScheduledReceiveDate | DateTime The date and time at which the items are scheduled to arrive at the receiving Warehouse. \*Closed | Boolean If True, then the Transfer Order is considered Closed and has no further effect on the Inventory Plan. AllowPartialAllocations | Boolean If true, the transfer is allowed to source from multiple partial supplies. FromStorageAreaExternalId | String The ExternalId of the Storage Area that the material is going to be transferred from. If not assigned, the system can source the material from any Storage Area that has available material. MaterialAllocation | String This field specifies how material lots will be allocated. Accepted values: NotSet: No Lot Allocation rules are set. UseNewestFirst: Material requirements will pull from the latest (most recent) material source. UseOldestFirst: Material requirements will pull from the earliest (oldest) material source. MaterialSourcing | String Define eligible sources of the material. Accepted values: NotSet: No sourcing requirements are set. Exclusive: Only one source may be used to satisfy the demand. MinSourceQty | Double If specified, only sources of supply with at least this much material will be eligible to fulfill the demand for material. MaxSourceQty | Double If specified, only sources of supply with this much material or less will be eligible to fulfill the demand for material. OverrideStorageConstraint | Boolean If true, this material will be allowed to store in excess of the storage area's max quantity when received. If false, any material that cannot be stored will be discarded. PreferEmptyStorageArea | Boolean If true, the material must be stored in an Empty Storage Area. ToStorageAreaExternalId | String The ExternalId of the Storage Area where the material is going to be transferred to. If not assigned, the system can place the material in any Storage Area available to store the material. See Also Item Mappings Inventory Mappings Warehouse Mappings Warehouse Plant Mappings Storage Area Mappings Import Mappings Board

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## Warehouse Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The identifier of the Warehouse for external system references. This value must be unique per each Warehouse.

AnnualPercentageRate | Decimal APR for calculating carrying costs. Description | String Text for describing the Warehouse. Name | String The name of the Warehouse. Unique, changeable text identifier. NbrOfDocks | Int32 Removed from software versions 12.3.0 and newer. Each Warehouse can have a specified number of Docks. These Docks can be used to schedule receipt of Purchases To Stock as well as Shipments. Notes | String Comments or special considerations about this object. StorageCapacity | Decimal A Scheduling Extension can use it to limit scheduling based upon the availability of storage space. TankWarehouse | Boolean Removed from software versions 12.3.0 and newer. Specifies whether this warehouse is a tank warehouse. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Inventory Plan Board Import Mappings Board

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## Object Import Mappings > Job Objects Mappings

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### Alternate Path & Node Mappings

#### Source

Property Name | Data Type Description & accepted values \* = Required Jump to section: Alternate Paths Alternate Path Nodes Alternate Paths \*ExternalId | String An External identifier for the Alternate Path. Must be unique per Path per Manufacturing Order. \*JobExternalId | String The External identifier of the Job associated with the Alternate Path. \*MoExternalId | String The External identifier of the Manufacturing Order is associated with the Alternate Path. AutoBuildLinearPath | Boolean Specifies whether PlanetTogether will automatically construct a simple linear Path based on the available Operations. If True, PlanetTogether will automatically build a simple linear path. If False, the user will have to define the Operation flow manually. AutoUse | String This specifies when PlanetTogether will choose an Alternate Path Node to use for the Operation flow automatically during optimization. Accepted values: IfCurrent: The path is chosen only if it is marked as CurrentPath. RegularRelease: The Path is released, as usual, based on the optimized settings, activity JIT start dates, etc.

ReleaseOffsetFromDefaultPathsLatestRelease: A timespan defining when the Path becomes eligible for automatic selection. The Alternate Path will not be used before the default path's Release Date +

AutoUseReleaseOffsetDays. AutoUseReleaseOffsetDays | Double The number of days when the Path becomes eligible for automatic selection. The Alternate Path will only be usable after the default path's Release Date + this number of days. Name | String The name used to identify the Alternate Path. Preference | Int32 These values can be used in different ways by custom algorithms and serve as a visual indicator to the planner. ValidityStartDate | DateTime This date defines the earliest date and time that a path can be used. ValidityEndDate | DateTime This date defines the latest date and time that a path can be used. Note that this defines the latest start date of the path; the scheduled operations of the path may schedule to end after this date as long as the first operation starts no later than this date. Alternate Path Nodes \*JobExternalId | String The External identifier of the Job associated with the Path. \*MoExternalId | String The External identifier of the Manufacturing Order associated with the Path. \*PathExternalId | String The External identifier of the Path. \*PredecessorOperationExternalId | String The External identifier of the Predecessor Operation associated with the Path. AllowManualConnectorViolation | Boolean If True, Operations can be moved to invalid resources based on the Predecessor Resource connectors defined. This can be used to allow a temporary violation that is flagged to give users more flexibility to reconcile and make exceptions manually. AutoFinishPredecessor | String Specifies when the Predecessor Operation's Status will be automatically changed to Finished. Accepted values: NoAutoFinish: Users must manually change the status to Finished.

OnSuccessorSetupStart: The Predecessor Operation will be set to Finished when the Setup span of the Successor Operation starts. OnSuccessorRunStart: The Predecessor Operation will be set to Finished when the Run span of the Successor Operation starts. OnSuccessorPostProcessingStart: The Predecessor Operation will be set to

Finished when the Post-Processing span of the Successor Operation starts. OnSuccessorFinish: The Predecessor Operation will be set to Finished when its Successor Operation is complete.

IgnoreInvalidSuccessorOperationExternalIds | Boolean If True, invalid Successor Operations will be ignored.

MaxDelayHrs | Double The maximum hours that the successor Operation may be delayed before starting after its predecessor (this operation) finishes. OverlapPercentComplete | Decimal Specify the percentage of the Predecessor Operation that must be completed before the Successor Operation starts using PercentComplete Overlap Type. OverlapSetups | Boolean This is removed from software version 12.3.0 and newer. Overlapping setup can be achieved through other overlap configurations. Specifies whether Successors can start setting up before the setup is complete on this Operation. OverlapTransferHrs | Double Specifies the number of hours that must pass after the start of the Predecessor Operation before the Successor Operation can start when using TransferSpan Overlap Type. OverlapType | String When using overlapping Operations, an Operation does not have to wait for its Predecessor to finish before it can begin. Accepted values: NoOverlap: The entire Predecessor Operation must complete before the Successor Operation can begin. TransferQty: The Successor Operation can begin once the first Operation has produced a specified quantity (specified in the OverlapTransferQty field in the Operation Mappings). TransferSpan: Successor Operation can begin after the first Operation has been running for a specified time (specified in the OverlapTransferHrs field of the Alternate Path Node). AtFirstTransfer: Successor Operation can start once a specified number of items is produced and transferred to inventory (specified in the TransferQty field in the Item mappings). TransferSpanAfterSetup: Successor can begin after the OverlapTransferHrs plus any Setup time. PercentComplete: Successor can begin after the predecessor operation has been completed to a percent specified in the OverlapPercentComplete field in the Alternate Node Mappings.

SuccessorOperationExternalId | String The External identifier of the Successor Operation associated with the Path.

TransferDuringPredecessorOnlineTime | Boolean Specifies that the TransferHrs should occur during the Predecessor Operation's Online capacity interval instead of calendar hours. For example, if an Operation completes at the end of a shift and has four hours of transfer time, the transfer time will not occur until the start of the next shift. If False, the transfer time will start immediately and could be completed before the next shift.

TransferHrs | Double Specifies the number of hours it takes for the Items to be transferred from the Predecessor Operation to the Successor Operation. The successor cannot start until this time passes. Note: When used in combination with OverlapTransferSpan, the effect is additive.

TransferStart | String The point of the predecessor operation where the transfer begins calculating from. Choose EndOfPostProcessing for a standard calculation. Accepted values: StartOfOperation: At the start of this operation. EndOfOperation: At the end of this operation. EndOfPostProcessing: At the end of this operation's post-processing.

EndOfStorage: At the end of this operation's Tank Storage. EndOfRun: At the end of all cycles/run of this operation. EndOfSetup: At the end of this operation's setup. TransferEnd | String The point of the successor operation where the transfer calculation ends. Choose StartOfOperation for a standard calculation from the TransferStart. Accepted values: StartOfOperation: At the start of the successor operation. EndOfOperation: At the end of the successor operation. EndOfPostProcessing: At the end of the successor operation's post-processing.

EndOfStorage: At the end of the successor operation's Tank Storage. EndOfRun: At the end of all cycles/run of the successor operation. EndOfSetup: At the end of the successor operation's setup. UsageQtyPerCycle | Double The Quantity of the Operation that is needed for each cycle of the Successor Operation. This is used for calculating when a Successor activity can start in an overlap situation. See Also Alternate Paths Job Mappings Manufacturing Order Mappings Resource Operation Mappings Import Mappings Board

## Customer Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required Customer Mappings Map data for each Customer object.

- \*ExternalId | String An External identifier for the Customer. Must be unique per Customer.
- AbcCode | String An optional code to assign to the Customer for reporting or grouping purposes. This is typically unique.
- ColorCode | String A hexadecimal color code to represent the Customer visually for reporting or grouping purposes.
- CustomerType | String Specifies the type of Customer. Accepted values: Customer Supplier Vendor Defaults to type "Customer" if none is defined.
- Description | String A text description of the Customer.
- GroupCode | String An optional code to assign to the Customer for reporting or grouping purposes. This is typically shared with other Customers that can be considered part of a group.
- Name | String A common name used to identify the Customer.
- Notes | String Comments or special considerations about this Customer.
- Priority | Int32 A positive numerical value to represent the Customer's priority. This can be used for informational purposes, or used for prioritizing customer orders via the Customer Priority optimize factor in a sequencing plan. Lower values are given higher priority.
- Region | String An informational field which specifies a Region or location associated with the Customer.
- UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs)

Customer Connections Mappings Associate one or more Customers to each Job. Multiple CustomerExternalId's may be mapped to a single JobExternalId, but each association must be imported individually. Each CustomerExternalId-to-JobExternalId pairing must be unique.

- \*CustomerExternalId | String The external identifier of the Customer object which is associated with the JobExternalId. Each customer may be defined once per Job.
- \*JobExternalId | String The external identifier of the Job with which the CustomerExternalId is associated with. See Also Import Mappings Board Customers Board Job Mappings Jobs Board Sales Orders Mappings Sales Orders Board Purchases to Stock Mappings Purchase Orders Board

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## Internal Activity Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required

- \*ExternalId | String The External identifier of the Activity. This value must be unique per Activity per Operation.
- \*JobExternalId | String The External identifier of the Job associated with the Activity.
- \*MoExternalId | String The External identifier of the Manufacturing Order associated with the Activity.
- \*OpExternalId | String The External identifier of the Operation is associated with the Activity.
- \*RequiredFinishQty | Double The total quantity that this Activity needs to produce.
- ActualResourcesUsed | String A comma-separated list of Resource ExternalId's which were used to complete the activity. This is useful for Track Actuals data which allows finished activities to remain visible in the Gantt and used for sequence-dependent Setup and Clean calculations on specific resources.
- Anchor | Boolean If True, optimizations will attempt to start the Activity as close as possible to the AnchorStartDate.
- AnchorStartDate | DateTime The date and time at which the Activity is Anchored. (The 'Anchor' field must be set to 'True').
- BatchAmount | Decimal This field allows batching with a different value from batching based on the unit quantities produced (BatchSize set on the Item). For example, this can allow you to batch by volume, weight, size, etc.
- CleanHrs | Double Defines the time required for cleaning out each Resource that was used to run the operation.
- CleanoutCost | Decimal The cost of Production Cleanout. Used if Operation Cleanout is incurred.
- CleanOutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule.
- CleanTimeManualUpdateOnly | Boolean Whether the CleanHrs field can be updated through import.
- CleanTimeOverride | Boolean When True, the CleanHrs value of the Activity is used for scheduling. Otherwise, the activity uses the Operation CleanHrs.
- Comments | String Generic text to act as a section to include notes for schedulers or shop floor workers. For informational purposes.
- Comments2 | String Generic text to act as a section to include notes for schedulers or shop floor workers. For informational purposes.
- CycleHrs | Double The time required to perform one production cycle. This is used with QtyPerCycle to determine the run the length of the activity. This value will take precedence over the same property which is set at the operation level if they differ.
- CycleSpanManualUpdateOnly | Boolean Whether the CycleHrs field can be updated through data import. If True, then the CycleHrs field must be manually maintained by PT users rather than through data imports.
- CycleSpanOverride | Boolean When True, the CycleHrs value of the Activity is used for scheduling. Otherwise, the

activity uses the Operation CycleHrs. NbrOfPeople | Double If PeopleUsage is set to UseSpecifiedNbr, this is the maximum number of people allocated to the Activity. Fewer than this number will be allocated during time periods when the number of people available on the capacity interval assigned to the Primary Resource is less than this value. The setting is used with the Nbr Of People setting in the Resource's Capacity Interval to determine how long the operation will take and/or how many Operations can be run simultaneously. The minimum of this number and the number available in the Capacity Interval are used. To allow multiple Operations to run simultaneously, the Resource's Capacity Type must be set to Multi-Tasking, in which case the sum of NbrOfPeople across Operations running simultaneously must be less than or equal to the Capacity Interval's Nbr Of People. If PeopleUsage is set to UseMultipleOfSpecifiedNbr, this is the numeric interval of the number of people used to perform the operation. The number of people that get assigned to the operation is dependent on the number of people available on the Primary Resource's capacity interval. PlanetTogether will attempt to use as many people as are available but will only increase the number of people used in increments of this value until there are not enough people available on the capacity interval to increase the value any more. For example, if an activity's NbrOfPeople is 4 and the resource's capacity interval has 11 people, then 8 people will be used to perform the activity. Paused | Boolean If True, the current Setup or Run process has been temporarily suspended. Pausing the activity does not necessarily mean that it will be re-schedulable. Schedulability will depend on the activity's Production Status and Hold Status. This is primarily a visual indicator that the activity is not currently being worked on. PeopleUsage | String The method in which available people are used to perform the Activity. Accepted values: UseAllAvailable: All of the people available on the Resource's Capacity Interval are used by the Activity. UseSpecifiedNbr: Only up to this number of the Resource's Capacity Interval's available people are allocated to the Activity. This is not a scheduling constraint. If there are fewer than this number available and there are no other activities scheduled on the resource, all of the people in the capacity interval will be allocated to the Activity and the activity's cycle time will be lengthened by a factor of the missing number of people. UseMultipleOfSpecifiedNbr: A multiple of NbrOfPeople will be used. For instance, if an activity's NbrOfPeople is 4 and the resource's capacity interval has 11 people . 8 people will be used to process the activity. This is a scheduling constraint. If the capacity interval does not have at least the specified number of people available then the activity will be considered ineligible to schedule there. PlanningScrapPercent | Decimal The percent of produced parts that is expected to be scrapped. Used to calculate ExpectedGoodQty and ExpectedScrapQty. ProductionSetupCost | Decimal The cost of Production Setup. Used if Operation Setup is incurred. ScrapPercentManualUpdateOnly | Boolean Whether the PlanningScrapPercent field can be modified through data import. If True, then the PlanningScrapPercent field must be manually maintained by PT users rather than through data imports. ScrapPercentOverride | Boolean When True, the PlanningScrapPercent value of the Activity is used for scheduling. Otherwise, the activity uses the Operation PlanningScrapPercent. PostProcessingHrs | Double The number of hours of Post Processing required for the Activity. This can be used to model cleanup or cool-down time, etc. The release of material produced by the operation is constrained by the Post Processing time. Whether a resource will be occupied during Post Processing depends on the Resource Requirement's UsageStart and UsageEnd settings. PostProcessManualUpdateOnly | Boolean Whether the PostProcessingHrs field can be modified through data import. If True, then the PostProcessingHrs field must be manually maintained by PT users rather than through data imports. PostProcessOverride | Boolean When True, the PostProcessingHrs value of the Activity is used for scheduling. Otherwise, the activity uses the Operation PostProcessingHrs. ProductionStatus | String The current state of the Activity in production. This field determines which portions of the Activity are scheduled. For example, if the Status is Running, then no Setup Span will be scheduled. This value is set manually or imported, not set by PlanetTogether. If the status is SettingUp or Running, then the current resources will not be changed by an optimization unless the job is unscheduled manually or due to a routing change. Accepted values: Waiting: The Activity is waiting for material, previous operations, or a release date before it will be ready to start. Ready: The Activity can be worked on as soon as the necessary resources are available. Started: Either time or quantity has been reported for the activity, and it is currently in a Waiting or Ready state. SettingUp: The Activity is currently being set up on a resource. Once in Setup, the activity is scheduled near the front of the schedule and cannot be moved. Running: The activity is currently being run on a resource. If in Run status, the activity is scheduled near the front of the schedule and cannot be moved. PostProcessing: The activity is finished running but is now waiting for drying, cleanup, etc. If PostProcessing time is scheduled and Post Processing Uses Resource is true, then the activity is scheduled near the front of the schedule and cannot be moved. Otherwise, the activity is removed from the schedule. Finished: The activity is completed in production and is ready for the successor operation or inventory. Once finished, it is no longer scheduled. QtyPerCycle | Double The quantity of product produced during

each production cycle. QtyPerCycleManualUpdateOnly | Boolean Whether the QtyPerCycle field can be modified through data import. If True, then the QtyPerCycle field must be manually maintained by PT users rather than through data imports. QtyPerCycleOverride | Boolean When True, the QtyPerCycle value of the Activity is used for scheduling. Otherwise, the activity uses the Operation QtyPerCycle. ReportedCleanHrs | Double The number of hours incurred during the "Clean" phase of the activity as reported by the shop floor. ReportedCleanoutGrade | Int32 The Grade of the Clean phase of the activity as reported by the shop floor. ReportedEndOfRunDate | DateTime This property is renamed in 12.3.0 to ReportedEndOfProcessingDate The reported date and time that the activity's run time ended. This presumes that the activity is either finished or in the Post Processing phase (or Storage or Storage Post Processing if it ran on a Tank resource). When the activity's state is changed to Finished or Post-Processing, this value is set to the Clock Date unless its value has already been reported.

ReportedEndOfPostProcessingDate | DateTime The date on which the End Of Post Processing was reported for a finished activity. ReportedEndOfProcessingDate | DateTime The reported date and time that the activity's production cycles ended. This presumes that the activity is either finished or in the Post Processing phase (or Storage or Storage Post Processing if it ran on a Tank resource). When the activity's state is changed to Finished or Post-Processing, this value is set to the Clock Date unless its value has already been reported.

ReportedEndOfStorageDate | DateTime The date on which the End Of Storage was reported for a finished activity. ReportedFinishDate | DateTime The reported date and time that the activity was finished. ReportedGoodQty | Double The reported quantity of finished items produced thus far by the activity. ReportedPostProcessingHrs | Double The reported amount of post processing time that has been completed thus far on the activity.

ReportedRunHrs | Double The reported amount of run time that has been completed thus far on the activity.

ReportedScrapQty | Double The reported amount of product that has been scrapped while performing the activity thus far. ReportedSetupHrs | Double The reported amount of setup time that has been completed thus far on the activity. ReportedStartDate | DateTime The reported date and time that the activity was started.

ReportedStartOfProcessingDate | DateTime The reported date and time that processing began on the activity.

ReportedStorageHrs | Double The reported amount of storage time that has been completed thus far on the activity. SetupHrs | Double The number of hours required for setting up the Resource to run the Activity.

SetupTimeManualUpdateOnly | Boolean Whether the SetupHrs field can be updated through import. If True, then the SetupHrs field must be manually maintained by PT users rather than through data imports. SetupTimeOverride | Boolean When True, the SetupHrs value of the Activity is used for scheduling. Otherwise, the activity uses the Operation SetupHrs. StorageHrs | Double The number of hours required for the Activity's Storage process.

StorageManualUpdateOnly | Boolean Whether the StorageHrs field can be updated through import. If True, then the StorageHrs field must be manually maintained by PT users rather than through data imports.

StorageHrsOverride | Boolean When True, the StorageHrs value of the Activity is used for scheduling. Otherwise, the activity uses the Operation's StorageHrs. TankPostProcessingHrs | Double This field is removed from version 12.3.0. The TankPostProcessing process is replaced by a new Storage process and related fields. The number of hours required for post-processing after all material is consumed or removed from a Tank resource before another operation is allowed to schedule on the resource. TankPostProcessingHrsManualUpdateOnly | Boolean This field is removed from version 12.3.0. The TankPostProcessing process is replaced by a new Storage process and related fields. Whether the TankPostProcessingHrs field can be updated through data import. If True, then the

TankPostProcessingHrs field must be manually maintained by PT users rather than through data imports.

TankPostProcessingOverride | Boolean This field is removed from version 12.3.0. The TankPostProcessing process is replaced by a new Storage process and related fields. When True, the TankPostProcessingHrs value of the Activity is used for scheduling. Otherwise, the activity uses the Operation TankPostProcessingHrs. See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Import Mappings Board

## Job Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Job. Must be unique per each Job object. \*Name | String Unique, changeable, text identifier for the Job.

AgentEmail | String An extra property with no functional purpose. Use it to include any sort of additional information that maybe isn't appropriate to store elsewhere. AlmostLateDays | Double Jobs and Activities are

considered AlmostLate if they end within this period from the Need Date. Cancelled | Boolean If True, the Job will not be scheduled. CanSpanPlants | Boolean If True, then the Operations can schedule in more than one Plant. Otherwise, all Operations must be scheduled in only one Plant. (Inherited from BaseOrder.) Classification | String It can be used to distinguish the purpose of the work request. Accepted values: ProductionOrder: These jobs are created to produce items to supply demand. Quote: This is used when estimating the finish dates and costs for items. SafetyStock: This affects the Job Late Property based on the inventory safety stock warning level.

TransferOrder: These jobs are requests for items to be transferred from one warehouse to another. Template: This job is used as a template. BufferStockReplenishment: These jobs use the buffer penetration of the primary product's inventory instead of the drum or shipping buffer penetration. SalesOrder: These are usually customer orders for finished products. ColorCode | String A Color that can be used to distinguish the Job from other Jobs in the Gantt. See: Supported color values (Excel) Commitment | String Indicates the likelihood that the work will be executed. This value can be updated internally and protected from external changes that attempt to set the value "backward" (such as from Firm to Planned). This allows the planner to advance the Commitment level internally and not have the change undone by an external system that has not been updated. Accepted Values: Released Firm Planned Estimate CustomerEmail | String The e-mail address(es) of the customer(s). For informational purposes only. Description | String Additional text for describing the Job. (Inherited from BaseObject.) Destination | String Indicates the geographical region or address where the products will be sent for information only.

DoNotDelete | Boolean If True, then the Job will not be deleted by the system. This can be used to keep Jobs that will be used as templates for copying to new Jobs. This value can be set by the interface but cannot be updated. This is to preserve the manual changes made by the planner. DoNotSchedule | Boolean If True, then the Job will not be scheduled. This can be used to prevent quotes or other un-Firm Jobs from scheduling until a planner does. This value can be set by the interface but cannot be updated. This is to preserve the manual changes made by the planner. Hold | Boolean Whether the Job was placed On-Hold and work should not be done on it. HoldReason | String The reason the Job was placed On-Hold. Default accepted values (custom reasons can be accepted too if custom reasons are configured in System Settings): 1. Material Hold 2. Tooling Hold 3. Production Hold 4. Engineering Hold 5. Customer Hold 6. Quality Hold 7. Lack of Material 8. Design Change Pending HoldUntilDate | DateTime No Activities are scheduled before this date/time. This value is only set if the Job itself is placed On-Hold (Hold is set to 'True'), not if Operations or Activities only are placed On-Hold. Hot | Boolean This indicates that the Job is essential. The Balanced Composite Rule can use this. HotReason | String Specifies why the Job is set to Hot. Importance | Int32 This indicates the value of the Job relative to other Jobs. For example, the Balanced Composite Rule can use this. Invoiced | Boolean Whether an invoice has been sent for the Job. For information only.

LatePenaltyCost | Decimal Optional currency value that specifies the cost (either actual or estimated) per day of finishing late. For display only. MarkForDeletion | Boolean The Interface Customizer can use it to delete jobs that are batched together, etc. MaxEarlyDeliveryDays | Double The customer will accept the order this number of days before the Need Date. If Operations are scheduled with more than this amount of Slack, then they are considered Early. This does not impose a constraint on Optimizations or Moves as Jobs can still be scheduled earlier than this. If this value is zero, then E-mail Alerts are not sent to alert early Jobs since they cannot be accepted early.

NeedDateTime | DateTime The date and time when the job should be finished to be considered on time. Notes | String Comments or special considerations about the Job. (Inherited from BaseObject.) OldExternalId | String It can be used to change the ExternalId of a Job once it has been imported. During import, if a Job with the specified ExternalId does not exist, then a Job with OldExternalId is searched for and updated if it exists. If this doesn't exist either, a new Job is created with the ExternalId (not the OldExternalId). OrderNumber | String It can be used to specify the customer order number (the Sales Order(s) that the job is supplying). For display only. Printed | Boolean Whether the Job's Traveler Report has been Printed. Priority | Int32 Usually used to specify a combination of importance and urgency. The Balanced Composite Rule can use this. Lower numbers are more urgent/important. Revenue | Decimal The estimated amount paid for the parts produced by the Job. Reviewed | Boolean Tracks whether a planner has reviewed the Job. Only set during import for NEW Jobs and thereafter controlled internally. Shipped | Int32 Whether the job has been shipped to the recipient. For information only.

ShippingCost | Decimal The cost of shipping the parts produced by the Job. Template | Boolean This indicates that the Job is only used for copying to create new Jobs. Template Jobs are not scheduled. Type | String It can be used to specify a free-form type for grouping. For display only. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Jobs Board Import Mappings Board

## Manufacturing Order Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Manufacturing Order. \*JobExternalId | String The External identifier of the Job to which the Manufacturing Order belongs. \*Name | String Changeable text identifier for the Manufacturing Order. \*RequiredQty | Decimal The target quantity of Products to be made. AlternatePathSelection | String Controls how Alternate Paths are used. Accepts a AlternatePathID. AutoJoinGroup | String Manufacturing Orders with this same group are joined together during MRP when the "AutoJoinManufacturingOrders" option is set to 'True'. BatchDefinitionName | String The Definition Name of the Batch. BatchGroupName | String The Group Name of the Batch. CanSpanPlants | Boolean If True, then Operations of the M.O. can schedule in more than one Plant. Otherwise, all Operations must be scheduled in only one Plant. CopyRoutingFromTemplate | Boolean If True, then any Path (Routing) information is ignored. The Path information for an existing Template Job is copied and used instead. The Product Name specifies which Product to copy the Path from. If there is more than one Template for the same product, the first one found by the system will be used. Note: Setting this to true on an existing Manufacturing Order will cause any current routing information to be lost and copied in from a Template when the Manufacturing Order is saved.

DBRShippingBufferOverrideDays | Double This value is added to the Manufacturing Order's Need Date to set the Shipping Need Date. MOs should be completed before the Shipping Need Date to avoid Shipping Buffer Penetration. DefaultPathExternalId | String The initial Path to be used. A scheduler may still schedule the M.O. on a different Path. Description | String Additional text for describing the Manufacturing Order. ExpectedFinishQty | Double This is usually the same as the Required Qty, but production issues may result in more or fewer items than required. This is usually specified externally, but changing the quantities in the Job Dialog will update this value based on Operation Completion Quantities and whether "DeductScrapFromRequired" is set on the Resource Operation. Family | String For display only. Hold | Boolean Whether the Manufacturing Order was placed on Hold and work should not be done on it. HoldReason | String The reason the Manufacturing Order was placed On-Hold. HoldUntilDate | DateTime The Date and Time specified when the MO was placed on Hold. All Operations have their HoldUntilDate set to this value as well. Note: This has no effect unless the 'Hold' field is set to 'True' for the MO. IsReleased | Boolean Whether a Planner has approved the Manufacturing Order to go into production, setting this to 'True' will set the Release Date to the current time. LockedPlantExternalId | String The External identifier of the Plant where all work must be scheduled. LockToCurrentAlternatePath | Boolean If True, the Manufacturing Order will be locked to the current Alternate Path. MoNeedDate | Boolean If True, then the Need Date of the Manufacturing Order can be updated manually in PT, via an import, when creating a CTP Job, or by an optimize (if the Set sub-Job Need Dates feature is on). If False, the Need Date of the MO will be set to the Job Need Date. NeedDate | DateTime The Date and Time when the Manufacturing Order should be finished to be considered On Time. The NeedDate is a calculated field that can be affected by the MoNeedDate checkbox defined above. It cannot be set unless the MoNeedDate is set to True. Notes | String Comments or special considerations about the Manufacturing Order. PreserveRequiredQty | Boolean If True, then the Required Qty can only be set manually, not via ERP imports. This value is automatically set to 'True' when a planner manually changes the Required Qty in PlanetTogether to preserve the change. If true, TotalOutputQty on all products of all operations of the MO will not change when a new value is imported from the ERP/SQL. ProductColor | String It can be used to indicate the product being made visually. ProductDescription | String The description of the Product is made. ProductName | String The Name of the Product being made. ReleaseDateTime | DateTime No activities are scheduled before this date/time. This represents the date and time at which the activities can be Released to start. ResizeForStorage | Boolean If true, a single-operation Manufacturing Order can resize its Quantity to match the quantity that can fit in a Storage Area. SplitUpdateMode | String Determines how the Manufacturing Order Splits will be updated. The following values are accepted: UpdateSplitsIndividually: Hour and quantity reporting for the operation must specify the ExternalId of the MO to update, similar to when an MO has not been split.

ShareReportedValuesProportionallyDecimal: When hours or quantities are reported for the manufacturing order, they are allocated across all MOs and their activities in proportion to their Required Qty, allowing decimal values for quantities. ShareReportedValuesProportionallyInteger: When hours or quantities are reported for the MO, they are allocated across all MOs and their activities in proportion to their Required Qty, rounded into integer values for quantities. UOM | String Unit of measure. For display only. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Job Mappings Operation Mappings Alternate Path

## Material Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required \*\* = Required for standard stock material requirements; not required for buy-direct material requirements (RequirementType is 'BuyDirect') \*ExternalId | String The External identifier for the Material Requirement. \*JobExternalId | String The External identifier of the Job associated with the Material Requirement. \*MoExternalId | String The External identifier of the Manufacturing Order associated with the Material Requirement. \*OpExternalId | String The External identifier of the Operation that is associated with the Material Requirement. This is the Operation consuming the item as Material.

\*\*ItemExternalId | String The External identifier of the Item to be used as a Material for the Operation. Required for standard stock material requirements; not required for buy-direct material requirements (RequirementType is 'BuyDirect'). \*\*TotalRequiredQty | Double The Quantity of Material to be consumed by the Operation for this requirement. If materials constrain the Operation, schedulability of the operation will be determined by availability of the material in inventory according to the material requirement's MaterialUsedTiming setting. AllowedLotCodes | String This is used to specify which Material Lots are allowed to supply the Material Requirement. The Lot Code(s) of the item or lot must match this value. Multiple lots can be added, separated by a comma (avoid spaces after comma-separated lot codes). AllowExpiredSupply | Boolean If true, the requirement will be allowed to use material sources that have expired (Shelf Life Hours of the item has passed since the Lot Production Date). This can be enabled to ensure operations don't get pushed past the planning horizon and to allow for visibility into expired sources being consumed by scheduled operations. Disable this to allow Storage Areas/Tanks to dispose automatically when material expires, and also improve scheduling performance. AllowPartialSupply | Boolean If true, MRP will consider any partial supply to satisfy the demand if there is not enough to satisfy the demand in full. Available | Boolean Used by buy-direct materials only, otherwise the availability is calculated for standard stock material requirements. If true, the scheduling logic will assume the material is available as early as the start of the scheduling clock. ConstraintType | String Indicates whether the Material Requirement should prevent its Operation from starting before the material arrives. Accepted values: NonConstraint: The material requirement is not a scheduling constraint. Material availability has no impact on the operation's schedulability.

ConstrainedByEarlierOfLeadTimeOrAvailableDate: If there is no Item associated with the MaterialRequirement (Buy-Direct only), the Operation can't start until the earlier of the Material's AvailableDate and Clock+LeadTimeSpan. In the case where there is an Item associated with the MaterialRequirement. The AvailableDate is determined by Inventory levels, not the AvailableDate field within this class. So it's the earlier of what can be supplied through inventory or the lead-time. ConstrainedByAvailableDate: If there is no Item associated with the Material Requirement (Buy-Direct only): Operation can't start until the AvailableDate defined within this Material Requirement. In the case where there is an Item associated with the MaterialRequirement: The Operation is constrained to start until the Material is available in Inventory.

IgnoredConstrainedByEarlierOfLeadTimeOrAvailableDate: The material requirement is not constrained by default. A user may manually enable the constraint type according to the ConstrainedByEarlierOfLeadTimeOrAvailableDate setting by using the Actions tile or right-click action from the Gantt, Jobs board, or Activities board to Restore Constraints. Not compatible with buy-direct material requirements. IgnoredConstrainedByAvailableDate: The material requirement is not constrained by default. A user may manually enable the constraint type according to the ConstrainedByAvailableDate setting by using the Actions tile or right-click action from the Gantt, Jobs board, or Activities board to Restore Constraints. Not compatible with buy-direct material requirements. FixedQty | Boolean If True, this specifies that the Required Quantity is a fixed number that does not scale up or down when the MO or Operation Required Quantity are adjusted higher or lower. IssuedQty | Double The quantity of material that has been issued to the Operation by physically removing the material from storage and delivering it to the floor for production. LatestSourceDateTime | DateTime When there are multiple sources supplying the material requirement, this date and time is meant to reflect the date that the latest of all material sources becomes available. It can be imported for Buy-Direct materials, otherwise is a calculated field. LeadTimeHrs | Double The minimum number of hours needed to procure the material. Applies to Buy-Direct Material requirements only (RequirementType is 'BuyDirect'). The value is visualized in the "LeadTimeDays" property of the Buy-Direct

Materials grid of the Job Dialog. If the Constraint Type is ConstrainedByEarlierOfLeadTimeOrAvailableDate, then the minimum of Available Date and Now + Lead Time is used as the constraint date. If the Constraint Type is ConstrainedByAvailableDate, then the Available Date is used instead, and Lead Time is only used if there is no supply at the end of the scheduling process. MaterialAllocation | String This field specifies how material will be allocated according to the production or procurement date of the material source. If set, this property will overwrite the property of the same name that may be set on the required Inventory record. Accepted values: NotSet: No allocation rules are set. The material's allocation settings are defined at the Inventory level. UseNewestFirst: The material requirement will source material from the most recently produced or procured material source. UseOldestFirst: The material requirement will source material from the earliest/oldest produced or procured material source. MaterialDescription | String The Description of the Required Material. This is the item's description for stocked Items, and it can be set externally for Buy-Direct Material requirements. MaterialName | String The Name of the Required Material. This is the item's name for stocked Items, and it can be set externally for Buy-Direct Material requirements. MaterialSourcing | String NotSet: Exclusive: MaterialUsedTiming | String This field defines when material is needed. The options are; SetupStart: As soon as setup starts, all material is required to be available. If the operation does not incur setup, the materials are required at the start of the first production cycle. ProductionStart: All material is required at the start of production (processing). DuringSetup: Material is required evenly over the duration of the setup. The item's TransferQty will be used if set. If a Storage Area Connector is required, it will be used during the duration of setup. ByProductionCycle: A portion of the material is required at each production cycle start. The quantity is the ratio of the material requirement TotalRequiredQty and the Operation RequiredFinishQty. Issued material will be omitted from the initial cycle's requirements. If a Storage Area Connector is required, it will be used during the duration of production. LastProductionCycle: All material is required on the final operation cycle start. FirstAndLastProductionCycle: Confirms that the first cycle has enough material and that all remaining material is available for when the last cycle starts. This can be used when the material overlap doesn't need to check every cycle, but the consuming operation is delayed by the first production cycle material and delayed by the full required material at the end of the operation. PostProcessingStart: All material is required at the start of post-processing. PostProcessingEnd: All material is required at the end of post-processing. MaxEligibleWearAmount | Int32 Deprecated in software version 12.1.4 and newer. This specifies the maximum number of times that a material can be used. MaxSourceQty | Decimal MinAgeHrs | Double Specify how old (in number of hours) the lot of a lot controlled material must be before it is considered eligible to satisfy the material requirement. The age of material is determined by the difference between the simulation clock and the lot's production time. MinRemainingShelfLifeHrs | Double This is the minimum number of hours that must be remaining on the Material's ShelfLife to be used as a Material. If the remaining ShelfLifeHrs are less than this amount, the Material cannot be used as it is considered expired. MinSourceQty | Decimal MultipleStorageAreaSupplyAllowed | Boolean If True, the Materials required for the Operation can be supplied by multiple storage areas. If False, all required materials must be supplied from the same storage area. MultipleWarehouseSupplyAllowed | Boolean If True, the Materials required for the Operation can be supplied by multiple warehouses. If False, all required materials must be supplied from the same Warehouse. PlannedScrapQty | Decimal This is used to specify the Quantity of Scrap items that are expected to be consumed. ProductRelease | String RequireFirstTransferAtSetup | Boolean Used by material requirements whose MaterialUsedTiming is either ByProductionCycle or FirstAndLastProductionCycle. If true, the first transfer of material is needed at the start of setup if the operation has a scheduled setup. If no setup is scheduled, the first transfer is required according to the first production cycle calculation. This is useful, for example, if part of setup is priming the resource with some starter material. Item TransferQty is used, otherwise a quantity of 1 is required. RequirementType | String This is used to specify whether the Material is being directly purchased or taken from inventory to supply the requirement. Accepted values: FromStock: The Material is taken from Inventory. This is the default value if unset. BuyDirect: The Material does not affect Inventory, and Inventory has no effect when this Material Requirement is satisfied. Source | String This is used to describe where the Material is coming from. ('Purchase Order XYZ, 'from stock,' etc.). This is set automatically for stocked items and can be set externally and imported for Buy-Direct materials. StorageAreaExternalId | String Defines which storage area the material will be pulled from. TankStorageReleaseTiming | String Deprecated in software version 12.3.0 and newer. If the material is drawn from a Tank Resource, these values can indicate the timing of when the Tank is empty. Accepted values: NotTank: Not expected to be drawn from a tank. AtActivityStart: Release the Tank when the activity consuming the material starts. AtEndOfActivitySetup: Release the Tank when the activity consuming the material has finished Setup. AtEndOfProcessing: Release the Tank when the activity consuming the material has finished processing.

AtEndOfPostProcessing: Release the Tank when the activity consuming the material in the tanks has finished its post-processing. TotalCost | Decimal Used for buy-direct materials only. Used in KPIs and simulation rules to calculate WIP cost. Standard stock material requirement costs are calculated according to the item's Cost \* Required Quantity. UOM | String The unit of measure of the Quantity fields. For information only.

UsabilityRequirement | Int32 Deprecated in software version 12.1.4 and newer. UseOverlapActivities | Boolean Deprecated in software version 12.3.0 and newer. If True, the Material Requirement will be able to depend on Material from other Manufacturing Orders that are not yet Finished but whose material is projected to arrive in stock in time to satisfy the cycles of the Operation. Setting this may allow the operation and other operations to start earlier. If False, then this Material Requirement may wait until the expected completion of Manufacturing Orders supplying the Material. UseOverlapPurchases | Boolean If True, the Material Requirement will depend on Material Purchase Orders that have not arrived yet, but whose material is projected to arrive in stock in time to satisfy the cycles of the Operation. Setting this may allow the operation and other operations to start earlier. If False, then this Material Requirement may wait until the Expected Receipt Date of Purchase Orders supplying the Material. WarehouseExternalId | String The External identifier of the Warehouse that must supply this Material Requirement. If omitted, the Material Requirement can be satisfied by any Warehouse accessible by the Plant of the Primary Resource performing the work. For MRP and CTP functionality, the warehouse must be defined if there is more than one warehouse in the data model. See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Item Mappings Import Mappings Board Inventory Plan Board Materials Board

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## Operation Attribute Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*AttributeExternalId | String The unique external identifier of the Attribute. \*JobExternalId | String The external identifier of the parent job. \*MoExternalId | String The external identifier of the Manufacturing Order associated with the job. \*OpExternalId | String The external identifier of the job operation to which the Attribute will be assigned. Code | String A string value assigned to the Attribute. This can be used by sequence-dependent Clean or Setup time configurations. CodeManualUpdateOnly | Boolean Whether the Code field can be updated through import. ColorCode | Int32 A Color name or hexadecimal code that can be used to visually represent the Attribute in the Gantt. For example, if the Attribute represents paint colors, then the ColorCode can be the color of the paint. See: Supported color values (Excel). ColorOverride | Boolean If true, then the ColorCode property value defined here on the Operation Attribute mapping will override the ColorCode defined on the Attribute object. ColorCodeManualUpdateOnly | Boolean Whether the ColorCode field can be updated through import. Cost | Decimal The cost to perform the Setup or Clean triggered by this Attribute. This is only used if not using Lookup tables. CostOverride | Boolean If true, then the Cost property value defined here on the Operation Attribute mapping will override the DefaultCost defined on the Attribute object. CostManualUpdateOnly | Boolean Whether the Cost field can be updated through import. DurationHrs | Double The duration of the Setup or Clean triggered by this Attribute. This is only used if not using Lookup tables. DurationOverride | Boolean If true, then the DurationHrs property value defined here on the Operation Attribute mapping will override the DefaultDurationHrs defined on the Attribute object. DurationHrsManualUpdateOnly | Boolean Whether the DurationHrs field can be updated through import. Number | Double A numeric value assigned to the Attribute. This can be used by sequence-dependent Clean or Setup time configurations and constrain the Operation to Eligible resources. NumberManualUpdateOnly | Boolean Whether the Number field can be updated through import. ShowInGantt | Boolean Specifies whether to show this Attribute in the Gantt View when the 'Attribute(s)' segment is enabled on the labels. ShowInGanttOverride | Boolean If true, then the ShowInGantt property value defined here on the Operation Attribute mapping will override the ShowInGantt setting defined on the Attribute object. ShowInGanttManualUpdateOnly | Boolean Whether the ShowInGantt field can be updated through import. See Also Attribute Mappings Job Mappings Manufacturing Order Mappings Resource Operation Mappings Import Mappings Board

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## Product Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String An External identifier of the operation's Product entry. Must be unique per each Product per Operation. \*ItemExternalId | String The External identifier of the item being produced. \*JobExternalId | String The External identifier of the Job associated with this product. \*MoExternalId | String The External identifier of the Manufacturing Order associated with this product. \*OpExternalId | String The External identifier of the Operation associated with this product.

\*WarehouseExternalId | String The External identifier of the Warehouse where the produced Item(s) will be stored.

CompletedQty | Decimal Define a quantity of work which has already been completed and added to inventory. When the operation completes, only the RemainingFinishQty amount (TotalOutputQty minus CompletedQty) is added to inventory. FixedQty | Boolean This specifies whether the TotalOutputQty is a fixed number. If True, the TotalOutputQty will not change if the RequiredQty of the Manufacturing Order is changed for any reason. This is not supported on the primary product (MO Product) of template jobs which are used to generate production orders via MRP and CTP. This is typically used to add Tool type items back to inventory. InventoryAvailableTiming | String When the inventory (Product) is created, controls are considered available in stock for use by a consuming Material Requirement. Accepted values: AtOperationRunStart: All produced inventory is considered available at the scheduled start of the Operation's Run time. This can be used when operations consuming the material should be allowed to schedule overlapping the operation producing the material. If Material Post-Processing Time is defined, the release time is delayed by that time span. AtOperationRunEnd: All produced inventory is considered available at the end of the Operation's last run/cycle, plus any Resource Transfer time.

AtOperationResourcePostProcessingEnd: All produced inventory is considered available at the end of the Operation's post-processing step, plus any Resource Transfer time. ByProductionCycle: If TransferQty is set, material will be moved to storage based on that quantity. Otherwise, it will be moved at the end of each cycle. See also: Manufacturing Order Production Overlap This may cause scheduling performance to degrade, especially if Transfer Quantity is a very small value and the operation's TotalOutputQty is a large value.

DuringPostProcessing: Material is transferred evenly over the full duration of PostProcessing. This will occupy a StorageConnector if one is used to store material. If Item TransferQty is set, the material will be moved to storage based on that quantity. DuringStorage: Material is transferred evenly over the full duration of Storage. This will occupy a StorageConnector if one is used to store material. If Item TransferQty is set, the material will be moved to storage based on that quantity. AtStorageEnd: Material is transferred immediately at the end of Storage.

Deprecated value in software versions 12.3.0 and newer: BasedOnTransferQty: The material becomes available as it is produced in increments equal to its item's Transfer Quantity property value. LimitMatISrcToEligibleLots | Boolean If True, the lot produced by the Product output can only be consumed by Stock Material Requirements which specify the Product's Lot Code in the AllowedLotCodes property. This is the default behavior if unset. If False, the lot produced by the Product output can be consumed by any Stock Material Requirement.

UseLimitMatISrcToEligibleLots | Boolean This must be set to True when LimitMatISrcToEligibleLots is set to False in order to override the default behavior. LotCode | String The Lot Code to be assigned to the items being produced.

MaterialPostProcessingHrs | Double The amount of time after Processing that the Product must wait before another Operation can use it. For example, this can represent drying or cooling time. This time period does not consume capacity on Resources but is used to determine when the product is available.

RequireEmptyStorageArea| Boolean Used to identify whether a tank/silo needs to be empty before material can be stored. If true, the Storage Area that will be storing this product must be empty or else it cannot be stored.

MaterialRequirement | String Deprecated in software versions 12.3.0 and newer. The Material Requirement associated with this product. Predecessor | String Deprecated in software versions 12.3.0 and newer. The Predecessor Operation for this product. SetWarehouseDuringMRP | Boolean If True, then during MRP Warehouse is set to the Warehouse where the demand occurs, provided that the Item is stocked in the demand's warehouse.

StoreInTank | Boolean Deprecated in software versions 12.3.0 and newer. If True, and the Resource that the Product is processed on is defined as a Tank, then the material will be stored in the Tank Resource for no longer than the duration of the item's defined Shelf Life property. StorageAreaExternalId | String The Storage Area where the product will be stored. TotalOutputQty | Decimal The total amount of the specified Item to be made by the Operation. UnitVolumeOverride | Decimal Set a volume value directly on the operation to override the default calculated volume. Otherwise volume is defined by item.UnitVolume \* Product.RequiredQty. See Also Job

Mappings Manufacturing Order Mappings Resource Operation Mappings Item Mappings Warehouse Mappings  
 Import Mappings Board Inventory Plan Board

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## Required Capabilities Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*CapabilityExternalId | String The External identifier of the Capability to be assigned to the Resource Requirement for this Operation. \*JobExternalId | String The External identifier of the Job to which the Manufacturing Order belongs. \*MoExternalId | String The External identifier of the Manufacturing Order to which the Operation belongs. \*OpExternalId | String The External identifier of the Operation is associated with the Resource Requirement and Required Capability.

\*ResourceRequirementExternalId | String The External identifier of the Resource Requirement to which the Required Capability is assigned. See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Resource Requirement Mappings Capability Mappings Capability Assignment Mappings Import Mappings Board

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## Resource Operation Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*CycleHrs | Double The number of hours it takes for one cycle of the operation to complete. This is used with Qty Per Cycle to determine the length of the operation. \*ExternalId | String The External identifier of the Operation. Must be unique per each Operation of a Manufacturing Order. \*JobExternalId | String The External identifier of the job associated with the Operation.

\*MoExternalId | String The External identifier of the Manufacturing Order associated with the Operation. \*Name | String Unique, changeable text identifier for the Operation. \*RequiredFinishQty | Double The Quantity of good units that the Operation must produce. AutoCreatedCapabilityExternalId | String The External identifier of the capability associated with the Operation was automatically created. AutoCreateRequirements | String Whether requirements should be automatically created for this operation. AutoFinish | Boolean If True, the Operation will be Finished automatically when the Clock is advanced past its scheduled end date. See also: Automatic Activity Reporting and Finishing AutoReportProgress | Boolean If True, the Operation has its progress reported according to the schedule when the Clock is advanced past its scheduled start date. In addition, hours are automatically added to the fields for Reported Setup, Run, and Post-Processing based on the current Production Status of the activity. For example, if the activity's Production Status is Running, when the Clock is advanced, the Reported Run Hours is incremented by the difference in hours between the old clock and new clock values. Note that for the activities to have their scheduled lengths adjusted due to this auto reporting of progress, the Time Base Reporting value on the Operation must also be True. To preserve the auto-computed values for Reported Setup, Run, and Post-Processing, updates from imports are ignored. However, manual updates of these fields from the user interface may be applied. See also: Automatic Activity Reporting and Finishing AutoSplit | Boolean If the operation is scheduled after its JITStartTime, then it will be split evenly into N activities where N is the number of eligible Resources. The resulting split activities are scheduled independently of each other and may schedule on the same or different Resources. This also controls un-splitting. During optimizations, if an activity has been split unnecessarily, it will be unsplit. This applies both to automatically and manually split activities. AutoSplitType | String The type of AutoSplit that will be used when scheduling the operation. The default is None. Accepted values: None: Auto-split is disabled. Manual: Auto-split is disabled. Manual splitting is allowed.

PrimaryCapacityAvailability: Auto-split based on the capacity availability of the resource(s) chosen to schedule the primary resource requirement. PredecessorMaterials: Auto-split a successor operation into the same number of activities as the predecessor was split when the predecessor feeds the successor material.

PredecessorQuantityRatio: Auto-split successor operations into an equal number of parts as its predecessor is split into. ResourceQtyCapacity: Auto-split based on a resource's configured Maximum Quantity and/or Minimum

Quantity values. ResourceVolumeCapacity: Auto-split based on a resource's configured Maximum Volume and/or Minimum Volume values. BatchCode | String On Batch Resources, Operations with the same Batch Code are allowed to run in the same batch. CampaignCode | String A custom Campaign Code can be defined and used in conjunction with the Optimize Factor to prioritize scheduling operations of the same Campaign. CanPause | Boolean If True, then Activities of the Operation can be paused for offline capacity intervals (or gaps in online capacity). This allows the operation to start before an offline interval, span the duration of the offline interval with no progress made on the activity, then resume progress at the start of the next online interval. If False, then Activities of the Operation won't be scheduled to start until there is sufficient time to complete them in one continuous online capacity interval. CanResize | Boolean If True, then Activities of the Operation can be resized via click/drag in the Gantt. CanSubcontract | Boolean This indicates to the planner that this Operation can be subcontracted if necessary. For display only. CarryingCost | Decimal This is the cost per unit, per day after this Operation is finished. This is for costs related to shrinkage, spoilage, raw materials, engineering changes, and customer changes that may cause materials to be scrapped. For KPI calculations. CleanHrs | Double Defines the time required for cleaning out each Resource that was used to run the operation. CleanOutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule. CleanTimeManualUpdateOnly | Boolean Whether the CleanHrs field can be updated through import. CleanoutCost | Decimal The cost of Production Cleanout. Used if Operation Cleanout is incurred. CommitEndDate | DateTime The planned Operation End Date is to be used to measure schedule conformity. CommitStartDate | DateTime The planned Operation Start Date is to be used to measure schedule conformity. CompatibilityCode | String This is used to restrict Resources only to perform compatible work at simultaneous times. If specified, any scheduled Operation's CompatibilityCode must match the CompatibilityCode of the other operations scheduled on Resources with the same CompatibilityGroup. Resources that are part of the same Compatibility Group can only run Operations concurrently if they have the same Compatibility Code. So, for example, if the same material input pipe feeds two machines, they can only run products that use that same material at any point in time. The UseCompatibilityCode setting of the operation must also be set to True. UseCompatibilityCode | Boolean Whether to use the Operation's Compatibility Code when setting up Item/Resource Compatibility. ConstraintType | String Whether the Operation should prevent its successor(s) from starting before material from this Operation is finished. Accepted values: NonConstraint ConstrainedByLeadTime ConfirmedConstraint CycleSpanManualUpdateOnly | Boolean Whether the CycleSpan field can be updated through data import. Description | String Text for describing the Operation. IsRework | Boolean This indicates that this work is being performed to fix a problem encountered in another operation. For display only. JITStartDateBufferDays | Double This is the timespan that is subtracted from the JITStartDate to allow additional JIT slack on an Operation basis. MaterialsManualUpdateOnly | Boolean Whether the Operation's Material Requirements can be updated through the data import. If True, the Material Requirements can only be updated manually in PlanetTogether. MaxAutoSplitAmount | Double This is a maximum quantity or volume amount for any resulting activity of a split. MinAutoSplitQty | Double This property is removed from software versions 12.2.0.1 and newer. This is a minimum quantity for any resulting activity of a split. MinAutoSplitAmount | Double This is a minimum quantity or volume amount for any resulting activity of a split. Notes | String Comments or special considerations about this Operation. Omitted | String Omitted Operations are treated as if they take zero time. Accepted values: NotOmitted: The Operation will be included as normal. OmittedByUser: The Operation will be omitted per a user's preference/specification. OmittedAutomatically: The Operation will be omitted automatically by the system due to bad data. OnHold | Boolean Whether the Operation should not be worked on for some reason until the Hold Until Date. HoldReason | String The Reason why the Operation has been put on Hold. Hold Reasons may be customized via System Settings, but these are the standard accepted values: 1. Material Hold 2. Tooling Hold 3. Production Hold 4. Engineering Hold 5. Customer Hold 6. Quality Hold 7. Lack of Material 8. Design Change Pending HoldUntilDateTime | DateTime If the Operation is on Hold, then activities for this Operation are scheduled to start after the Hold Until Date. OperationSequence | Int64 The sequential order of the operation in relation to other operations of the same M.O. if not importing alternate path predecessor/successor mappings. OutputName | String The name of the Output Product produced by this Operation. This is useful when several predecessor operations producing the same type of material supply the same Successor Operation. The Successor will use this field to recognize quantities of identical materials available. If this field is not set, the Material will not be grouped with any other Predecessor Operations. Groups of material are used for things such as calculating the ExpectedFinishQuantity. OverlapTransferQty | Double The number of parts moved to the next Operation in each Transfer Batch. Smaller values can be used to shorten flow times by making Material available at Successor Operations more quickly. NOTE: A quantity of "1" or similar small increment combined with a large total quantity

produced by the operation (~100 or more) is known to impact scheduling performance and cause instance services to consume high amounts of RAM due to the number of calculations the simulation engine must perform in order to determine when the successor operation(s) can schedule. PlannedScrapQty | Decimal The quantity that is planned to be scrapped. This is a calculation of the RequiredQty x PlanningScrapPercent. PlanningScrapPercent | Decimal Percent of parts expected to be scrapped. Used to calculate ExpectedGoodQty and ExpectedScrapQty. Can be combined with DeductScrapFromRequired in order to have the system adjust the total production to equal RequiredQty plus PlannedScrapQty. DeductScrapFromRequired | Boolean Whether the ExpectedScrap should be deducted from the Required Finish Qty when determining the quantity to schedule. In some cases, more material is available, and additional products can be produced to make up for the scrap. In other cases, this is not possible, and the Operation will finish short. PostProcessingHrs | Double Specifies the number of hours that a resource may be occupied after Processing has been completed. This can be used to model cleanup time. The release of material is constrained by the Post Processing time, and no operations can schedule on the resource. Whether a resource will be occupied also depends on the Resource Requirement's UsageStart and UsageEnd settings. PostProcessManualUpdateOnly | Boolean Whether the PostProcessingHrs field can be updated through data import. PreventSplitsFromIncurringSetup | Boolean When True, split activities of this operation will not incur any Setup time. PreventSplitsFromIncurringClean | Boolean When True, split activities of this operation will not incur any Clean time. ProductCode | String The code to use for specific product rules that override the default product rule. ProductionSetupCost | Decimal The cost of Production Setup. Used if Operation Setup is incurred. ProductsManualUpdateOnly | Boolean Whether Operation's Products can be updated through the data import. QtyPerCycle | Double The quantity of product produced during each production cycle. QtyPerCycleManualUpdateOnly | Boolean Whether the QtyPerCycle field can be updated through data import. ResourceRequirementsManualUpdateOnly | Boolean Whether Operation's Resource Requirements can be updated through the data import. ScrapPercentManualUpdateOnly | Boolean Whether ScrapPercent field can be updated through data import. SetupCode | String This property is removed from software versions 12.3.0 and newer. The same behavior can be replicated using Attributes. It can be used to calculate sequence-dependent setup and/or reduce the frequency of setups during optimizations. Operations that have different Setup Codes typically require some time to be spent during the changeover to set up the equipment for the next run. (Inherited from InternalOperation.) SetupColor | String A Color name or hexadecimal code that can be used to visually represent the Setup process of the operation in the Gantt. See: Supported color values (Excel). SetupColorAlpha | Int32 The alpha color component is used to identify the type of setup on the Gantt visually. SetupColorBlue | Int32 The blue color component is used to identify the type of setup on the Gantt visually. SetupColorGreen | Int32 The green color component is used to identify the type of setup on the Gantt visually. SetupColorRed | Int32 The red color component is used to identify the type of setup on the Gantt visually. SetupHrs | Double The time required for setting up each Resource that is used during the Operation's Setup time. See also: Resource SetupHrs. (Inherited from InternalOperation.) SetupNumber | Double The SetupNumber of the Operation this block belongs to. This is used by the Attribute Number Range Tables to determine the required amount of setup and can be used as an eligibility constraint. SetupSplitType | String Determines how Setup should be allocated when an Operation is split. Accepted values: None: No override is required and the Setup is calculated normally. FirstActivity: Only the first activity is scheduled with normal Setup and the rest have none. SplitByQty: Each activity is scheduled with a proportional Setup duration according to the Activities split ratio. SetupTimeManualUpdateOnly | Boolean Whether the SetupHrs field can be updated through import. SplitUpdateMode | String Determines how the Operation Splits will be updated. StorageHrs | Double The time required for Operation Storage. This typically represents the amount of time it takes to transfer product to inventory from the resource where the operation runs. StorageManualUpdateOnly | Boolean Whether the StorageHrs field can be updated through import. SuccessorProcessing | String This is used to control whether Successor Operations should be scheduled on the same Resource as the current Operation. For example, 'KeepSuccessor' means that successor operations will try to schedule on the same resource as the predecessor, and 'KeepSuccessorNoInterrupt' will try to schedule it right after the predecessor operation. Use of this feature requires that the routing be linear within the predecessor and successor operation, that the operation only has 1 activity, and that the resource the predecessor ends up being scheduled on is eligible to perform the work required on the successor operation. Accepted values: NoPreference KeepSuccessor KeepSuccessorNoInterrupt KeepSuccessorsTimeLimitHrs | Double The length of time that the SuccessorProcessing setting remains valid for. After this length of time has passed without the Successor Operation finding capacity on the Resource after its Predecessor, it may be scheduled on another Resource. TankPostProcessingHrs | Double The amount of time a Tank Resource is unavailable after all of the material has

been removed. TankPostProcessingManualUpdateOnly | Boolean Whether the TankPostProcessingHrs field can be updated by import. TimeBasedReporting | Boolean Specifies whether the ReportedRunSpan is subtracted from the ScheduledRunSpan rather than calculating the ScheduledRunSpan based on the RemainingQty. (Inherited from InternalOperation.) UOM | String Indicates the meaning of one unit of this product. For display only. UseExpectedFinishQty | Boolean Whether the finish quantities of Predecessor Operations will influence the Expected Finish Qty of this Operation, in the event of multiple Predecessors, the most limiting one determines the Finish Qty. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). WholeNumberSplits | Boolean Whether activities must be split into quantities with whole numbers, this is only possible if the original quantity is a whole number. See Also Job Mappings Manufacturing Order Mappings Import Mappings Board

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## Resource Requirement Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String An External identifier for the Resource Requirement. Must be unique per each Resource Requirement per Operation. \*JobExternalId | String The External identifier of the Job associated with this Resource Requirement. \*MoExternalId | String The External identifier for the Manufacturing Order associated with this Resource Requirement. \*OpExternalId | String The External identifier of the Operation associated with the Resource Requirement. AttentionPercent | Int32 The percent of the Resource's attention consumed by this Resource Requirement. For example, two Operations with Attention Percents of 60% and 40% could schedule to run simultaneously. A maximum of 100% summed across all simultaneous Operations is enforced. For this to have an effect, the Resource's Capacity Type must be set to Multi-Tasking, and the Activity's PeopleUsage must be set to Use All Available. BlockFillImageFile | String If the BlockFillType is set to Image, this image is used to fill the Gantt block (or the Resource Image is used if this is left blank). This can be used to differentiate the types of operations or resources. The values specified are the full name of the file, such as myfile.png. These image files are in the ResourcelImages folder under the client executable (with the images displayed in the Resource grid). BlockFillPattern | String If the BlockFillType is set to Pattern, this pattern is used to fill the blocks in the Gantt. This can be used to differentiate the types of operations or resources. BlockFillType | String Specifies how the blocks in the Gantt should be filled. Accepted values: Default ImageAlignedCenter ImageAlignedLeft ImageAlignedRight Pattern CopyMaterialsToCapabilities | Boolean If True, for each MaterialRequirement on the Operation, a RequiredCapability will be created and assigned to this ResourceRequirement. The Capability ExternalId will be the same as MaterialRequirement's ExternalId. DefaultResourcePlantExternalId | String The External identifier of the Plant in which the Resource used to complete the ResourceRequirement is found. DefaultResourceDepartmentExternalId | String The External identifier of the Department in which the Resource used to complete the ResourceRequirement is found. DefaultResourceExternalId | String The External identifier of the Resource used to complete the ResourceRequirement. DefaultResourceJITLimitHrs | Double This represents the duration from the release on the default resource for which the operation can schedule on non-default resources when UseDefaultResourceJITLimitHrs is set to True. This provides flexibility during optimization to choose other Resources if the Default Resource cannot start the Activity on time. This minimizes the chances of it being late. A value of zero means the default resource is not a constraint, but otherwise, no effect. A value less than zero will allow the operation to schedule on non-default resources before the default resource. UseDefaultResourceJITLimitHrs | Boolean Whether to allow scheduling on non-default resources according to the DefaultResourceJITLimitHrs setting. Description | String Text that describes the purpose or the source of the Resource Requirement. NumberOfResourcesRequired | Int32 If greater than 1, create this many duplicates of this ResourceRequirement. PrimaryRequirement | Boolean If True, the Resource Requirement is defined as being the Primary Resource Requirement. If any operation requires 2 or more resources, one must be designated the Primary requirement. UsageStart | String Defines when the Operation starts using the Resource. Must be less than or equal to the UsageEnd value. A Primary Resource Requirement must always start at Setup. Accepted values: Setup: Start using from the start of the Operation Setup process. This is the required setting for all primary resource requirements. Run: Start using from the start of the Operation Run (Cycle) process. PostProcessing: Start using from the start of the Operation Post Processing process. Clean: Start using from the start of the Operation Clean process. Storage: Start using from the start of the Storage process. Option removed from software version

12.3.0: StoragePostProcessing: Start using from the start of the Storage Post-Processing process. StoragePostProcessing only occurs if the material is being stored in a tank. StorageClean: Start using from the start of the Storage Clean process. StorageClean only occurs if the material is being stored in a tank. UsageEnd | String Defines when the Operation is finished using the Resource. Must be greater than or equal to the UsageStart value. A Primary Resource Requirement must always end at PostProcessing, Clean, or Storage. Accepted values: Setup: Finish using at the end of the Operation Setup process. Run: Finish using at the end of the Operation Run (Cycle) process. PostProcessing: Finish using at the end of the Operation Post Processing process. Clean: Finish using at the end of the Operation Clean process. Storage: Finish using at the end of the Storage process. Option removed from software version 12.3.0: StoragePostProcessing: Finish using at the end of the Storage Post-Processing process. StoragePostProcessing only occurs if the material is being stored in a tank. StorageClean: Finish using at the end of the Storage Clean process. StorageClean only occurs if the material is being stored in a tank. See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Required Capabilities Mappings Import Mappings Board Helper Resources

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## Successor Manufacturing Order Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Successor Manufacturing Order. Must be unique per Manufacturing Order. \*JobExternalId | String The External identifier of the Job associated with this Successor Manufacturing Order. \*MoExternalId | String The External identifier of the Predecessor Manufacturing Order. \*SuccessorJobExternalId | String The External identifier of the Job associated with the Successor Manufacturing Order. \*SuccessorManufacturingOrderExternalId | String The External identifier of the Successor Manufacturing Order. SuccessorOperationExternalId | String The External identifier of the Successor Operation. SuccessorPathExternalId | String The External identifier of the Successor Path. TransferHrs | Double Specifies the number of hours it takes to transfer Items to supply the Successor Manufacturing Order after the Predecessor Operations are done. The Successor Manufacturing Order is constrained by the FinishDate of the Predecessor Manufacturing Order plus this number of hours. UsageQtyPerCycle | Double Specifies the quantity of the Predecessor Operation's Product that the Successor Operation consumes in each cycle of the Successor Operation. See Also Job Mappings Manufacturing Order Mappings Resource Operation Mappings Alternate Path & Node Mappings Import Mappings Board

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## User Field Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String A unique identifier of the User Field. \*Name | String The Name used to identify the User Field. This is the value displayed in grids, Gantt labels, and Tooltips. \*ObjectType | String Specifies the type of PlanetTogether object that the related User Field belongs to. I.e: Plants, Resources, Jobs, Operations, etc. Accepted values: Users Plants Departments Resources Cells CapacityIntervals ProductRules ResourceConnectors Items Warehouses SalesOrders Forecasts PurchasesToStock TransferOrders Jobs ManufacturingOrders ResourceOperations Customers \*UDFType | String Specifies the data type of the User Field. Accepted values: String Hyperlink Integer Double Long Decimal Boolean DateTime TimeSpan DefaultValue | String Allows for a Default Value to be set for the associated User Field. This value is imported as a String value but parsed into the defined type during the import process. Description | String Additional text for describing the User Field. DisplayInUI | Boolean Specifies whether the User Field is displayed in grids and the Gantt. Default is True if omitted. Notes | String Additional notes related to the User Field. Publish | Boolean Specifies whether the User Field should be published to external systems. Default is True if omitted. See Also User Defined Fields

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## Object Import Mappings > Resource Objects Mappings

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### Allowed Helper Resource Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required AllowedHelperDepartmentExternalId | String The ExternalId of the Department with which the Allowed Helper is associated.  
 AllowedHelperPlantExternalId | String The ExternalId of the Plant with which the Allowed Helper is associated.  
 AllowedHelperResourceExternalId | String The ExternalId of the Resource which is designated as an Allowed Helper to the Primary Resource. ResourceDepartmentExternalId | String The ExternalId of the Department with which the Resource to be granted an Allowed Helper is associated. ResourceExternalId | String The ExternalId of the Resource to be granted an Allowed Helper. ResourcePlantExternalId | String The ExternalId of the Plant with which the Resource to be granted an Allowed Helper is associated. See Also Allowed Helpers Resource Mappings Import Mappings Board Capacity Planning Board

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### Attribute Code Table Mappings

[Source](#)

Property Name | Data Type Description & accepted values \* = Required Attribute Code Table \*TableName | String Name of the Attribute Code Table. Description | String Description of the Attribute Code Table. PreviousPrecedence | Boolean This determines which wildcard match takes precedence when both non-exact match types are found. "The previous Precedence" means that the Code Table value that has the "Wildcard Code" in the "PreviousOpSetupCode" field will be used to calculate the setup. Wildcard | String This is a string or a character used to support pattern matching and is used to search within the "Table Values" data of the Code Table for occurrences within the "PreviousOpSetupCode" and "NextOpSetupCode" fields. Attribute Code Table Attribute Name \*TableName | String Name of the Attribute Code Table. \*AttributeName | String Name of the Attribute. This property is removed from software versions 12.2.0.1 and newer. \*AttributeExternalId | String The ExternalId of the Attribute. Must be unique to all Attribute ExternalId's per each Attribute Number Range Setup Table. Attribute Code Table Attribute Code \*AttributeName | String Name of the Attribute. This property is removed from software versions 12.2.0.1 and newer. \*AttributeExternalId | String The ExternalId of the Attribute. Must be unique to all Attribute ExternalId's per each Attribute Number Range Setup Table. \*TableName | String Name of the Attribute Code Table. \*PreviousOpAttributeCode | String The Attribute Code of the Previous Operation. \*NextOpAttributeCode | String The Attribute Code of the Next Operation. \*SetupTime | Double The time incurred for Setup. This property is removed from software versions 12.2.0.1 and newer. \*DurationHours | Double The time incurred for Setup or Clean when triggered by this table. CleanoutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule. Cost | Decimal The cost incurred for Setup or Clean when triggered by this table. SetupCost | Double The cost incurred for Setup. This property is removed from software versions 12.2.0.1 and newer. Attribute Code Table Assigned Resources \*PlantExternalId | String Identifier of the Plant to which the Resource is associated. \*DepartmentExternalId | String Identifier of the Department to which the Resource is associated. \*ResourceExternalId | String Identifier of the Resource that will be associated with the Attribute Code Table. \*TableName | String Name of the Attribute Code Table. See Also Setup Time Cleans Import Mappings Board Scenario Data Board

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## Attribute Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String A unique identifier of the Attribute. AttributeTrigger | String Specifies when Setup or Cleans (and costs associated with each) will be triggered to schedule for the Attribute. The AttributeType property defines whether the attribute will be used for Setup or Cleans. Accepted values: Always: This uses the DefaultDurationHours specified, no matter what. CodeChanges: This uses the DefaultDurationHours whenever this attribute's Code changes from one scheduled operation to the next on the same resource. NumberChanges: This uses the DefaultDurationHours whenever this attribute's Number changes from one scheduled operation to the next on the same resource. NumberHigher: This uses the DefaultDurationHours when this attribute's Number increases from one scheduled operation to the next on the same resource. NumberLower: This uses the DefaultDurationHours when this attribute's Number decreases from one scheduled operation to the next on the same resource. LookupByCode: Uses an Attribute Code Table to determine the setup or clean duration. This overrides the DefaultDurationHours value. LookupByRange: Used for Setup only. Uses an Attribute Range Table to determine setup duration. This overrides the DefaultDurationHours value. Never: The attribute is not used for Clean or Setup time calculations. Note Setup calculations are dependent on the scheduled resource having its SetupIncluded property set to the value UseOperationAttributes. Cleans calculations are dependent on the scheduled resource having its UseAttributeCleanouts property set to True. For more information, see: Setup Time Cleans AttributeType | String Define whether the attribute is used for Cleans or Setups. Null values are accepted if used only for informational purposes. Accepted values: Clean Setup CleanoutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule. When multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two cleanouts of the same grade are scheduled together, the longest duration is used. When a cleanout occurs, it resets all cleanout triggers that are the Cleanout Grade or lower. ColorCode | String A Color that can be used to represent the value of the Attribute in the Gantt. The ColorCode property mapped via the Operation Attributes Mapping can be used to override the default value. See: Supported color values (Excel). ConsecutiveSetup | Boolean This is used to model operations where multiple Setup activities must be completed in a sequence and cannot be performed concurrently. If True, the total Setup time for the Operation is calculated as the sum of the maximum non-consecutive Setup time and the various consecutive Setup times. DefaultCost | Decimal The cost to perform the Clean or Setup incurred by this Attribute. This is only used if not using lookup tables. The Cost property mapped via the Operation Attributes Mapping can be used to override the default value. DefaultDurationHrs | Double The number of Clean or Setup hours incurred by this Attribute when triggered. This is only used if not using Lookup tables. The DurationHrs property mapped via the Operation Attributes Mapping can be used to override the default value. Description | String Additional text for describing the Attribute. HideInGrids | Boolean If True, the Attribute cannot be displayed in the Activity Scheduling grids. The default value/behavior is False if unset. IncurResourceSetup | Boolean If True, the Sequenced Setup will be incurred even if the UseSequencedSetup field on the Resource is set to false. Name | String The Name used to identify the Attribute. ShowInGantt | Boolean Specifies whether to show this Attribute in the Gantt View when the 'Attribute(s)' segment is enabled on the labels by default. This can be overridden by specific operations via Operation Attribute Mappings. UseInSequencing | Boolean Specifies whether to include this Attribute to be available to use in sequencing plan optimization factors. See Also Attributes Operation Attribute Mappings Job Mappings Manufacturing Order Mappings Resource Operation Mappings Import Mappings Board

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## Attribute Range Table Mappings

### Source

Jump to section: Attribute Range Table Attribute Range Table Attribute Name Attribute Range Table From-Range Attribute Range Table To-Range Attribute Range Table Resource Property Name | Data Type Description & accepted values \* = Required Attribute Range Table Establish the presence of each Attribute Number Range Setup Table. Formerly labelled "Attribute Setup Table" \*Name | String Unique, changeable, text identifier for the Attribute Number Range Setup Table. \*TableId | Int64 A unique identifier of the Attribute Number Range Setup Table. Must be unique among all imported Setup Tables. Description | String Additional text for describing the Attribute Number Range Setup Table. Attribute Range Table Attribute Name Define each of the Attributes which will be mapped to each Attribute Number Range Setup Table. Formerly labelled "Attribute Setup Table Attribute Name" \*AttributeName | String The Name of the Attribute. Must be unique to all Attribute Names per each Attribute Number Range Setup Table. This property is removed from software versions 12.2.0.1 and newer.

\*AttributeExternalId | String The ExternalId of the Attribute. Must be unique to all Attribute ExternalId's per each Attribute Number Range Setup Table. \*TableId | Int64 The unique identifier of the Attribute Number Range Setup Table. Description | String Additional text for describing the Attribute. EligibilityConstraint | Boolean Defines whether the Attribute is a scheduling constraint. If True, operations will only be eligible to schedule on resources that can perform the work based on its attribute number value and the from/to range defined in this Attribute Number Range Setup Table. Attribute Range Table From-Range Each Attribute mapped to each Attribute Number Range Setup Table is required to have at least one defined From Range. The From Range is enough to establish resource eligibility constraints (no To Range is required). Formerly labelled "Attribute Setup Table From-Range" \*AttributeName | String The Name of the Attribute. Must match an Attribute Name that was mapped in the Attribute Setup Table Attribute Name mappings table. This property is removed from software versions 12.2.0.1 and newer. \*AttributeExternalId | String The ExternalId of the Attribute. Must be unique to all Attribute ExternalId's per each Attribute Number Range Setup Table. \*FromId | Int64 A unique identifier for the From Range. Must be unique per From Range per Attribute Name. \*FromRangeStart | Double The starting value of the From Range. \*FromRangeEnd | Double The ending value of the From Range. \*TableId | Int64 The unique identifier of the Attribute Number Range Setup Table. Attribute Range Table To-Range Define a To Range if using the Attribute Number Range Setup Table to calculate sequence-dependent setup times based on the From → To Range configurations. A To Range is not required to be defined. Formerly labelled "Attribute Setup Table To-Range" \*AttributeName | String The Name of the Attribute. Must match an Attribute Name that was mapped in the Attribute Setup Table Attribute Name mappings table. This property is removed from software versions 12.2.0.1 and newer. \*AttributeExternalId | String The ExternalId of the Attribute. Must be unique to all Attribute ExternalId's per each Attribute Number Range Setup Table. \*FromId | Int64 The unique identifier of the From Range associated with the To Range. \*TableId | Int64 The unique identifier of the Attribute Number Range Setup Table.

\*ToRangeStart | Double The starting value of the To Range. \*ToRangeEnd | Double The ending value of the To Range. SetupCost | Double The incurred cost of Setup for this From/To Range. SetupMinutes | Double The incurred Setup minutes for this From/To Range. Attribute Range Table Resource Associate any number of Resources to use each configured Attribute Number Range Setup Table. Formerly labelled "Attribute Setup Table Resource" \*PlantExternalId | String The External ID of the Plant to which the Resource is associated. \*DepartmentExternalId | String The External ID of the Department to which the Resource is associated. \*ResourceExternalId | String The External ID of the Resource that will be associated with the Attribute Number Range Setup Table. This must be unique per each Attribute Number Range Setup Table (the same resource cannot be associated twice to the same Table). \*TableId | Int64 The unique identifier of the Attribute Number Range Setup Table. See Also Setup Time Scenario Data Board Import Mappings Board

## Capability Assignment Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required \*CapabilityExternalId | String The ExternalId of the Capability to be assigned to a Resource. \*DepartmentExternalId | String The ExternalId of the Department to which the Resource belongs. \*PlantExternalId | String The ExternalId of the Plant to which the Department belongs. \*ResourceExternalId | String The ExternalId of the Resource to which the Capability will be Assigned. See Also Capability Mappings Resource Mappings Department Mappings Plant Mappings Import Mappings Board Capacity Planning Board Scenario Data Board

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## Capability Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Resource Capability. Must be unique per each Capability object. \*Name | String Unique, changeable, text identifier for the Resource Capability. Description | String Text for describing the Capability. Notes | String Comments or special considerations about the Capability. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Capacity Planning Board Scenario Data Board Import Mappings Board

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## Capacity Interval Mappings

### [Source](#)

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The external identifier of the capacity interval. Must be unique among all capacity intervals, including recurring intervals. \*Name | String A common name used to identify the capacity interval. \*StartTime | DateTime The date and time when the capacity interval starts. \*EndTime | DateTime The date and time when the capacity interval ends. CanBeDeleted | Boolean If True, the capacity interval is allowed to be deleted by users who have permission to maintain capacity intervals. When disabled, the capacity interval cannot be deleted by any user. CanBeDraggedOrResized | Boolean If True, the capacity interval is allowed to be dragged and resized in the Gantt by users who have permission to maintain capacity intervals, and who have the similar user settings enabled. When disabled, the capacity interval cannot be dragged and resized in the Gantt by any user. CanStartActivity | Boolean If True, then activities are allowed to start on this interval. Default value is True if no value is defined and no IntervalPreset is defined. CapacityCode | String A custom code to restrict scheduling resource requirements with different codes. Operation resource requirements must define the code in order for them to be considered eligible to run on this interval. CleanOutSetups | Boolean Deprecated in software versions 12.3.0 and newer. Replaced by ResetAttributeChangeovers. If True, then this interval resets sequence-dependent setup and cleanout trigger values. Color | String A Color that can be used to distinguish the Job from other Jobs in the Gantt. Accepts HTML hexadecimal color codes, or HTML color name strings. See: Supported color values (Excel) Description | String A text description of the capacity interval. IntervalPreset | String Use a preset capacity interval configuration to assign standard settings to common capacity interval types. Once a preset is defined, each option and setting may be manually changed, if desired. Each preset assigns a value to each of: IntervalType, Color, Overtime, CanStartActivity, PreventOperationsFromSpanning, CleanOutSetups (aka Reset Attribute Changeovers), UseOnlyWhenLate, UsedForSetup, UsedForRun, UsedForPostProcessing, UsedForStoragePostProcessing, and UsedForClean. Accepted values: Online Offline Maintenance Overtime PotentialOvertime Holiday Cleanout Details of each preset configuration can be found on the Capacity Intervals page. IntervalType | String Determines how the event will affect capacity. Accepted values: Online: The resource is available to perform some type of work. Offline: The resource is not available to perform work. Accepted values changed in software version 12.2.1.x. Older software versions accept the following values: NormalOnline: The resource is available to perform work.

Resource usage costs are calculated at the rate defined in the resource's Standard Hourly Cost property.

Overtime: The resource is available to perform work. Resource usage costs are calculated at the rate defined in the resource's Overtime Hourly Cost property. PotentialOvertime: The resource is available to perform work.

Resource usage costs are calculated at the rate defined in the resource's Overtime Hourly Cost property. Behaves the same as Overtime by default in terms of scheduling but the behavior can be manipulated using a custom extension.

Offline: The resource is not available to perform work. If an offline interval is placed at the same time on the same resource as an online or overtime interval then the resource is considered offline. Operations can be configured to span offline intervals (work may begin on the operation before an offline interval then pauses for the offline interval before resuming at the next online interval).

Cleanout: The resource is not available to perform work. No operations are allowed to be scheduled to span over this type of interval. If a cleanout interval is placed at the same time on the same resource as an online, overtime, or offline interval then the resource is considered offline and the cleanout interval behavior is enforced. This type is often used for resource maintenance when no operations should be started before the interval and placed on hold for the duration of the interval before resuming work at the next available online interval.

NbrOfPeople | Double The number of people available during the interval. The interval's total capacity hours is calculated as a multiple of this number by the duration of the interval. For example, if the interval duration is 8 hours and the NbrOfPeople is 2, then the interval equates to 16 hours of total capacity. If the Resource Type is set to Multi-tasking, this number will determine how many operations can run simultaneously during the interval. Not used if IntervalType is Offline or Cleanout.

Notes | String Comments or special considerations about this Capacity Interval.

Overtime | Boolean When True, cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. When false, cost calculations for performing work on the interval use the Standard Hourly Cost on the resource. Default is False if not imported and no IntervalPreset is defined.

PreventOperationsFromSpanning | Boolean If True, then operations are allowed to span this interval (pause) without performing any work. Interval type must be Offline.

ResetAttributeChangeovers | Boolean If True, then this interval resets sequence-dependent setup and cleanout trigger values incurred by attributes and attribute tables.

UsedForClean | Boolean When True, the capacity interval can be used to perform Clean processes.

UsedForPostProcessing | Boolean When True, the capacity interval can be used to perform Post-Processing processes.

UsedForRun | Boolean When True, the capacity interval can be used to perform Cycle/Run processes.

UsedForSetup | Boolean When True, the capacity interval can be used to perform Setup processes.

UsedForStoragePostProcessing | Boolean When True, the capacity interval can be used to perform Storage Post-Processing processes.

UseOnlyWhenLate | Boolean When True, activities will only schedule on the capacity interval if they are late (the schedule clock date time is later than the activity's JIT start date).

UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Resource Capacity Recurring Capacity Interval Mappings Capacity Interval Resource Mappings Import Mappings Board

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## Capacity Interval Resource Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*CapacityIntervalExternalId | String The external identifier of the Capacity Interval.

\*DepartmentExternalId | String The external identifier of the Department to which the Resource belongs.

\*PlantExternalId | String The external identifier of the Plant to which the Resource belongs.

\*ResourceExternalId | String The external identifier of the Resource to be assigned the Capacity Interval.

See Also Resource Capacity Resource Mappings Capacity Interval Mappings Recurring Capacity Interval Mappings Import Mappings Board

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## Cell Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External identifier of the Cell. Must be unique per each Cell object. Description | String Additional text for describing the Cell. Name | String The name of the Cell. Unique, changeable, text identifier. Notes | String Comments or special considerations about this Cell object. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Scenario Data Board Capacity Planning Board Resource Mappings Import Mappings Board

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## Cleanout Trigger Table Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required Jump to section: Cleanout Trigger Tables  
 Cleanout Trigger Tables Assigned Resources Operation Count Cleanout Trigger Tables Production Unit Cleanout  
 Trigger Tables Time Cleanout Trigger Tables Cleanout Trigger Tables \*TableName | String An unique identifier for  
 the Trigger Table. Description | String Additional text for describing the Trigger Table. Cleanout Trigger Tables  
 Assigned Resources \*DepartmentExternalId | String The external identifier of the Department to which the  
 Resource belongs. \*PlantExternalId | String The external identifier of the Plant to which the Resource belongs.  
 \*ResourceExternalId | String The external identifier of the Resource to be assigned the Trigger Table. \*TableName |  
 String The name of the Trigger Table being assigned to the resource. Must match the TableName property  
 mapped to a table from the Cleanout Trigger Tables mappings. Operation Count Cleanout Trigger Tables  
 \*DurationHours | Double The number of Clean process hours incurred by this table when triggered. \*TableName |  
 String The name of the associated Trigger Table. Must match the TableName property mapped to a table from the  
 Cleanout Trigger Tables mappings. \*TriggerValue | Int32 The number of operations to run on the assigned  
 resource before a cleanout is triggered. CleanCost | Decimal The cost to perform the Clean incurred by this table  
 when triggered. CleanoutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule. When  
 multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two cleanouts of the  
 same grade are scheduled together, the longest duration is used. When a cleanout occurs, it resets all cleanout  
 triggers that are the Cleanout Grade or lower. Production Unit Cleanout Trigger Tables \*DurationHours | Double  
 The number of Clean process hours incurred by this table when triggered. \*ProductionUnit | String Define which  
 production unit type to use for tracking and triggering cleans at various intervals. Accepted values: Cycles: In this  
 case, the TriggerValue specifies the total number of operation cycles scheduled on a resource since the last  
 cleanout was scheduled. ProductUnits: In this case, the TriggerValue specifies the total output production units  
 (product Total Output Quantity \* UnitVolume) of primary products produced by operations scheduled on a  
 resource since the last cleanout was scheduled. Quantity: In this case, the TriggerValue specifies the total output  
 quantity of primary products produced by operations scheduled on a resource since the last cleanout was  
 scheduled. \*TableName | String The name of the associated Trigger Table. Must match the TableName property  
 mapped to a table from the Cleanout Trigger Tables mappings. \*TriggerValue | Decimal The number of production  
 units which must be produced on the assigned resource before a cleanout is triggered. Uses the ProductionUnit  
 property to determine which unit type is tracked. CleanCost | Decimal The cost to perform the Clean incurred by  
 this table when triggered. CleanoutGrade | Int32 Define a Grade value to prioritize which Clean signal to schedule.  
 When multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two cleanouts  
 of the same grade are scheduled together, the longest duration is used. When a cleanout occurs, it resets all  
 cleanout triggers that are the Cleanout Grade or lower. Time Cleanout Trigger Tables \*DurationHours | Double The  
 number of Clean process hours incurred by this table when triggered. \*TableName | String The name of the  
 associated Trigger Table. Must match the TableName property mapped to a table from the Cleanout Trigger  
 Tables mappings. \*TriggerValueHours | Double The number of hours of production or calendar time that must pass  
 before a cleanout is triggered. Uses the UseProcessingTime and UsePostProcessingTime property values to  
 determine whether to use production or calendar time. CleanCost | Decimal The cost to perform the Clean incurred  
 by this table when triggered. CleanoutGrade | Int32 Define a Grade value to prioritize which Clean signal to  
 schedule. When multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two  
 cleanouts of the same grade are scheduled together, the longest duration is used. When a cleanout occurs, it  
 resets all cleanout triggers that are the Cleanout Grade or lower. TriggerAtEnd | Boolean When True, the clean is  
 scheduled at the end of the operation which triggers the clean. When False, the clean is scheduled at the end of  
 the operation which is scheduled just prior to the operation which triggers the clean. UsePostProcessingTime |  
 Boolean When True, operation post-processing time will be used to calculate when cleans needs to be scheduled  
 according to the TriggerValueHours setting. This can be combined with UseProcessingTime. UseProcessingTime |  
 Boolean When True, operation run/cycle time will be used to calculate when cleans needs to be scheduled  
 according to the TriggerValueHours setting. See Also Cleans

## Compatibility Code Table Mappings

### Source

Jump to section: Compatibility Code Tables Compatibility Code Tables Assigned Resources Compatibility Code Table Codes Property Name | Data Type Description & accepted values \* = Required Compatibility Code Tables Establish the presence of each Compatibility Code Table. \*AllowedList | Boolean When True, the table is used to list allowed or compatible codes which are allowed to schedule simultaneously. When False, the table is used to list disallowed or incompatible codes which are never allowed to schedule simultaneously. \*TableName | String A unique identifier of the Compatibility Code Table. Must be unique among all imported Compatibility Code Tables. Description | String Additional text for describing the Compatibility Code Table. Compatibility Code Tables Assigned Resources Associate any number of Resources to use each configured Compatibility Code Table. \*PlantExternalId | String The External ID of the Plant to which the assigned Resource is associated. \*DepartmentExternalId | String The External ID of the Department to which the assigned Resource is associated. \*ResourceExternalId | String The External ID of the Resource that will be associated with the Compatibility Code Table. This must be unique per each Compatibility Code Table (the same resource cannot be associated twice to the same Table). \*TableName | String The unique identifier of the Compatibility Code Table. This must match the property of the same name imported from the Compatibility Code Tables mapping. Compatibility Code Table Codes Define each of the Codes which will be mapped to each Compatibility Code Table. \*CompatibilityCode | String A Code associated with the Compatibility Code Table. Each code must be associated with the Table one entry at a time. \*TableName | String The unique identifier of the Compatibility Code Table. This must match the property of the same name imported from the Compatibility Code Tables mapping. See Also Compatibility Codes Resource Mappings

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## Department Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String An External identifier for the Department. Must be unique per each Department per Plant. \*PlantExternalId | String The External identifier of the Plant to which the Department belongs. DepartmentFrozenSpanHrs | Double The Frozen Span Hours for the department. If not defined, a default value of 8 hours will be assigned. For more information, see: Plant Stability. Description | String Text that describes the purpose or the source of the Department. Name | String Unique, changeable, text identifier for the Department. Notes | String Comments or special considerations about the Department. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). See Also Import Mappings Board Capacity Planning Board Plant Stability

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## Plant Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The external identifier of the Plant. Must be unique per each Plant object. AnnualPercentageRate | Decimal The annual percentage rate on current interest-bearing liabilities. This is used when calculating an operation's Carrying Cost. BottleneckThreshold | Decimal If more than this percentage of Activities on a Resource's schedule are Capacity Bottlenecked, the Resource is flagged as a bottleneck. All resources in the plant share the same threshold value. DailyOperatingExpense | Decimal Monetary costs of operating the plant for a day. Note that Resource hourly costs are also added to the KPIs' OE value, so they should either be included here or in the Resource Cost but not both. Description | String Text for describing the plant. HeavyLoadThreshold | Decimal If a Resource has more than this percentage of its capacity allocated in the short term, it is considered 'Heavy Loaded' and is flagged as such. InvestedCapital | Decimal Monetary value encapsulating all monies invested in the plant. (Total Assets — Non-Interest-Bearing Current Liabilities — Excess Cash) Name | String Unique, changeable, text identifier. Notes | String Comments or special considerations about the plant. StableSpanHrs | Double The plant stable span hours. For more information, see: Plant Stability. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Capacity Planning Board Import Mappings Board

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## Product Rules Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*DepartmentExternalId | String The External identifier of the Department to which the Resource belongs. \*PlantExternalId | String The External identifier of the Plant to which the Resource belongs. \*ProductItemExternalId | String The External identifier of the Item to which the Rule will be applied. \*ResourceExternalId | String The External identifier of Resource to which the Rule will be applied. CleanoutCost | Double The cost of Production Cleanout. UseCleanoutCost | Boolean If true, it overrides the operation's Clean Cost with the CleanoutCost defined in the Product Rule. CleanHrs | Double The number of hours required for the Clean process when the Item specified is produced on the specified Resource. UseCleanHrs | Boolean If true, it overrides the operation's Clean Hours with the CleanHrs defined in the Product Rule. CleanoutUnitsRatio | Decimal Overrides Units Produced when calculating resource cleanout. UseCleanoutUnits | Boolean If true, it overrides the operation's Units Produced with regards to calculating resource cleanout with the CleanoutUnitsRatio defined in the Product Rule. CycleHrs | Double The number of hours required for one production Cycle of the Item specified on the Resource. UseCycleHrs | Boolean If true, it overrides the operation's Cycle Hours with the CycleHrs defined in the Product Rule. HeadStartHrs | Double The number of hours that the operation can start before its JIT start date. Higher values will assign operations to this resource earlier than resources with lower headstart values. UseHeadStartSpan | Boolean If true, it overrides the operation's HeadStart span with the HeadStartHrs defined in the Product Rule. MaterialPostProcessingHrs | Double The number of hours required for Material Post-Processing for the specified Item and Resource. UseMaterialPostProcessingSpan | Boolean If true, overrides the operation's Material Post-Processing span with the MaterialPostProcessingHrs defined in the Product Rule. MinQty | Decimal The minimum quantity that must be produced of the specified Item when it's scheduled to be produced on the specified Resource. UseMinQty | Boolean If true, overrides the minimum quantity allowed to be produced on the Resource according to the MinQty defined in the Product Rule. MaxQty | Decimal The maximum quantity that must be produced of the specified Item when it's scheduled to be produced on the specified Resource. UseMaxQty | Boolean If true, overrides the maximum quantity allowed to be produced on the Resource according to the MaxQty defined in the Product Rule. OperationName | String This property is removed from software versions 12.2.0.1 and newer. If specified, then the rule only applies to Operations with this Operation Name. Otherwise, the rule applies to all Operations of any Manufacturing Order making this Product. OperationCode | String This property is removed from software versions 12.3.0 and newer. It's replaced by ProductCode for consistency. If specified, then the rule only applies to Operations which have this code value defined in the Operation Product Code. Otherwise, the rule applies to all Operations of any Manufacturing Order making this Product. PlanningScrapPercent | Double The Planning Scrap

Percent for the specified Item and Resource. UsePlanningScrapPercent | Boolean If true, it overrides the operation's Planning Scrap Percent with the PlanningScrapPercent defined in the Product Rule. PostProcessingHrs | Double The number of hours required for Post-Processing for the Item and Resource specified. UsePostProcessingHrs | Boolean If true, it overrides the operation's Post-Processing span with the PostProcessingHrs defined in the Product Rule. Priority | Int32 A numerical Priority value to assign to the resource. Used for resource prioritization sequencing. UsePriority | Boolean If true, it overrides the resource's assigned Priority value with the one defined in the Product Rule. ProductCode | String If specified, then the rule only applies to Operations which have this code value defined in the Operation Product Code. Otherwise, the rule applies to all Operations of any Manufacturing Order making this Product. ProductionSetupCost | Decimal The cost of operation setup when running the operation on the specified resource. UseProductionSetupCost | Boolean If true, it overrides Operation Production Setup cost with the one defined in the Product Rule. QtyPerCycle | Double Quantity per Cycle. The number of items produced per cycle on the specified Resource. UseQtyPerCycle | Boolean If true, it overrides the operation's Qty Per Cycle with the QtyPerCycle defined in the Product Rule. SetupHrs | Double The number of hours required for Setup for the specified Item and Resource. UseSetupHrs | Boolean If true, it overrides the operation's Setup Hours with the SetupHrs defined in the Product Rule. StorageHrs | Double The number of hours required for Storage for the specified Item and Resource. UseStorageHrs | Boolean If true, it overrides the operation's Storage Hours with the StorageHrs defined in the Product Rule. TransferQty | Decimal The Item Transfer Quantity when the specified Item is produced on the specified Resource. UseTransferQty | Boolean If true, it overrides the item's Transfer Quantity with the TransferQty defined in the Product Rule. UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). See Also Product Rules Resource Mappings Item Mappings Import Mappings Board Scenario Data Board

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## Recurring Capacity Interval Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The External Identifier of the recurring capacity interval. Must be unique among all capacity intervals, including non-recurring intervals.

\*Name | String A common name used to identify the capacity interval. \*StartTime | DateTime The date and time when the capacity interval starts. \*EndTime | DateTime The date and time when the capacity interval ends. \*Recurrence | String The recurrence frequency type of the capacity interval. Accepted values: NotRecurring: The interval does not recur. Daily: The interval recurs once daily, every day of the week. The days of the week boolean properties are ignored (as if all are set to True). Weekly: The interval recurs weekly on specific days of the week. Used in conjunction with the days of the week boolean properties (Sunday, Monday, etc.).

MonthlyByDayNumber: The interval recurs once per month on the same numerical day of the month. Used in conjunction with the MonthlyDayNumber property. YearlyByMonthDay: The interval recurs once per year on the same date defined in the StartDateTime property. \*RecurrenceEndType | String Represents how the recurring capacity interval will end. Accepted values: NoEndDate: The capacity interval recurs for the duration of the planning horizon. AfterMaxNbrRecurrences: The capacity interval recurs a specific number of times, or until it reaches the end of the planning horizon, whichever occurs first. The maximum number of recurrences is defined in the MaxNbrRecurrences property. AfterRecurrenceEndDateTime: The capacity interval recurs until a specific date and time, or until it reaches the end of the planning horizon, whichever occurs first. The end date is specified in the RecurrenceEndDateTime property. CanBeDeleted | Boolean If True, the capacity interval is allowed to be deleted by users who have permission to maintain capacity intervals. When disabled, the capacity interval cannot be deleted by any user. CanBeDraggedOrResized | Boolean If True, the capacity interval is allowed to be dragged and resized in the Gantt by users who have permission to maintain capacity intervals, and who have the similar user settings enabled. When disabled, the capacity interval cannot be dragged and resized in the Gantt by any user. CanStartActivity | Boolean If True, then activities are allowed to start on this interval. Default value is True if no value is defined and no IntervalPreset is defined. CapacityCode | String A custom code to restrict scheduling resource requirements with different codes. Operation resource requirements must define the code in order for them to be considered eligible to run on this interval. CleanOutSetups | Boolean Deprecated in software versions 12.3.0 and newer. Replaced by ResetAttributeChangeovers. If True, then this interval resets sequence-dependent

setup and cleanout trigger values. Default value is False if no value is defined and no IntervalPreset is defined.

Color | String A Color that can be used to distinguish the Job from other Jobs in the Gantt. Accepts HTML hexadecimal color codes, or HTML color name strings. See: Supported color values (Excel) Description | String A text description of the capacity interval. IntervalPreset | String Use a preset capacity interval configuration to assign standard settings to common capacity interval types. Once a preset is defined, each option and setting may be manually changed, if desired. Each preset assigns a value to each of: IntervalType, Color, Overtime, CanStartActivity, PreventOperationsFromSpanning, CleanOutSetups (aka Reset Attribute Changeovers), UsedOnlyWhenLate, UsedForSetup, UsedForRun, UsedForPostProcessing, UsedForStoragePostProcessing, and UsedForClean. Accepted values: Online Offline Maintenance Overtime PotentialOvertime Holiday Cleanout Details of each preset configuration can be found on the Capacity Intervals page. IntervalType | String Determines how the event will affect capacity. Accepted values: Online: The resource is available to perform some type of work. Offline: The resource is not available to perform work. Accepted values changed in software version 12.2.1.x. Older software versions accept the following values: NormalOnline: The resource is available to perform work. Resource usage costs are calculated at the rate defined in the resource's Standard Hourly Cost property. Overtime: The resource is available to perform work. Resource usage costs are calculated at the rate defined in the resource's Overtime Hourly Cost property. PotentialOvertime: The resource is available to perform work. Resource usage costs are calculated at the rate defined in the resource's Overtime Hourly Cost property. Behaves the same as Overtime by default in terms of scheduling but the behavior can be manipulated using a custom extension. Offline: The resource is not available to perform work. If an offline interval is placed at the same time on the same resource as an online or overtime interval then the resource is considered offline. Operations can be configured to span offline intervals (work may begin on the operation before an offline interval then pauses for the offline interval before resuming at the next online interval). Cleanout: The resource is not available to perform work. No operations are allowed to be scheduled to span over this type of interval. If a cleanout interval is placed at the same time on the same resource as an online, overtime, or offline interval then the resource is considered offline and the cleanout interval behavior is enforced. This type is often used for resource maintenance when no operations should be started before the interval and placed on hold for the duration of the interval before resuming work at the next available online interval. Sunday | Boolean Whether the capacity interval recurs each Sunday. Monday | Boolean Whether the capacity interval recurs each Monday. Tuesday | Boolean Whether the capacity interval recurs each Tuesday. Wednesday | Boolean Whether the capacity interval recurs each Wednesday. Thursday | Boolean Whether the capacity interval recurs each Thursday. Friday | Boolean Whether the capacity interval recurs each Friday. Saturday | Boolean Whether the capacity interval recurs each Saturday.

MaxNbrRecurrences | Int32 The maximum number of times the capacity interval may recur when the RecurrenceEndType is set to AfterMaxNbrRecurrences. MonthlyDayNumber | Int32 Represents the day where the recurring capacity interval with a Recurrence set to MonthlyByDayNumber will recur. NbrIntervalsToOverride | Int32 Specifies the number of intervals to override during the short-term capacity. NbrOfPeople | Decimal The number of people available during the interval. The interval's total capacity hours is calculated as a multiple of this number by the duration of the interval. For example, if the interval duration is 8 hours and the NbrOfPeople is 2, then the interval equates to 16 hours of total capacity. If the Resource Type is set to Multi-tasking, this number will determine how many operations can run simultaneously during the interval. Not used if IntervalType is Offline. NbrOfPeopleOverride | Decimal Specifies the number of people to override during the short-term capacity. Notes | String Additional notes and comments. Overtime | Boolean When True, cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. When false, cost calculations for performing work on the interval use the Standard Hourly Cost on the resource. Default is False if not imported and no IntervalPreset is defined. PreventOperationsFromSpanning | Boolean If True, then operations are allowed to span this interval (pause) without performing any work. Interval type must be Offline. RecurrenceEndDateTime | DateTime The date and time when the recurrence of the capacity interval should end. Applies to whose RecurrenceEndType is after RecurrenceEndDateTime. ResetAttributeChangeovers | Boolean If True, then this interval resets sequence-dependent setup and cleanout trigger values incurred by attributes and attribute tables. SkipFrequency | Int32 This will skip several intervals based on the Recurrence set. For example, if the SkipFrequency is set to 2 and the Recurrence is set to Weekly, the recurring capacity interval will skip two weeks before recurring. UsedForClean | Boolean When True, the capacity interval can be used to perform Clean processes. UsedForPostProcessing | Boolean When True, the capacity interval can be used to perform Post-Processing processes. UsedForRun | Boolean When True, the capacity interval can be used to perform Cycle/Run processes. UsedForSetup | Boolean When True, the capacity interval can be used to perform Setup processes. UsedForStoragePostProcessing |

Boolean When True, the capacity interval can be used to perform Storage Post-Processing processes.  
UseOnlyWhenLate | Boolean When True, activities will only schedule on the capacity interval if they are late (the schedule clock date time is later than the activity's JIT start date). See Also Resource Capacity Capacity Interval Mappings Capacity Interval Resource Mappings Import Mappings Board

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## Resource Attribute Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*DepartmentExternalId | String The external identifier of the Department in which the Resource is found. \*Name | String Unique, changeable, text identifier of the Attribute. \*PlantExternalId | String The external identifier of the Plant in which the Resource is found. \*ResourceExternalId | String The external identifier of the Resource to be assigned the Attribute. Code | String The Attribute Code value. This can be used for sequence-dependent setup calculations, or optimization prioritization, or for informational purposes. ColorCode | String A Color name or hexdecimal code that can be used to visually represent the Attribute in the Gantt. See: Supported color values (Excel). ConsecutiveSetup | Boolean This is used to model operations where multiple Setup activities must be completed in a sequence and cannot be performed concurrently. If True, the setup time incurred by this Attribute will be added to any other setup time incurred on the operation (assuming attributes are configured to be considered when calculating Operation Setup time). See also: Setup Time. Description | String Text for describing the Attribute. IncurSetupWhen | String Specifies when to include a Setup time and cost for the Attribute. Accepted values: Always: The Attribute's setup time and/or cost is always considered during simulation Setup calculations. CodeChanges: Consider incurring setup when the Attribute Code value changes from the previously scheduled operation on the same Resource. NumberChanges: Consider incurring setup when the Attribute Number value changes from the previously scheduled operation on the same Resource. NumberHigher: Consider incurring setup when the Attribute Number value is higher compared to the previously scheduled operation on the same Resource. NumberLower: Consider incurring setup when the Attribute Number value is lower compared to the previously scheduled operation on the same Resource. LookupByCode: Consider incurring setup based on any applicable Attribute Code Table logic. Never: Never incur setup based on this Attribute. LookupByRange: Consider incurring setup based on any applicable Attribute Number Range Table logic. See also: Setup Time. ManualUpdateOnly | Boolean Specifies whether this Attribute can be updated during data imports. This is usually set to 'True' once an Attribute has been modified manually to prevent an import from overriding those modifications. Number | Decimal The Attribute Number value. This can be used by Attribute Number Range Tables for sequence-dependent setup calculations and/or constrain the operation to eligible resources, or optimization prioritization, or for informational purposes. SetupCost | Decimal The cost to perform Setup incurred by this Attribute. This value is not considered if using Lookup tables. SetupHrs | Decimal The Setup hours incurred by this Attribute. This value is not considered if using Lookup tables. ShowInGantt | Boolean Specifies whether to show this Attribute in the Gantt View when the 'Attribute(s)' segment is enabled. See Also Resource Mappings Department Mappings Plant Mappings Import Mappings Board Setup Time

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## Resource Connector Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required Jump to section: Resource Connector Mappings Resource Connection Mappings Version 12.1.4 and Older Mappings Resource Connector Mappings  
 \*ExternalId | String A unique identifier of the Resource Connector. This value must be unique per each Resource Connector.  
 \*Name | String A common name used to identify the Resource Connector. Description | String A text description of the Resource Connector. LinkMaterials | Boolean This property is deprecated in software version 12.3.0 and newer. Material connectors are now configured via Storage Area Connectors. If True, then the Connector will be used to constrain Material supply based on linked Resources. LinkSuccessors | Boolean This property is deprecated in software version 12.3.0 and newer. All Resource Connectors are now used to link successor activities. If True, then the Connector will be used to constrain successor activities based on linked Resources. Notes | String Comments or special considerations about this Resource Connector. TransitHours | Double The number of hours which need to pass between the end of a predecessor operation and its successor operation on a connected downstream resource. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). Resource Connection Mappings  
 \*ConnectionDirection | String This field determines the directional connection for a Resource Connector. Accepted values: FromResource: Establishes the resource as the predecessor in the connection sequence. ToResource: Establishes the resource as the successor in the connection sequence.  
 \*PlantExternalId | String Identifier of the Plant to which the Resource is associated.  
 \*DepartmentExternalId | String Identifier of the Department to which the Resource is associated.  
 \*ResourceExternalId | String Identifier of the Resource that will be associated with the Resource Connection.  
 \*ResourceConnectorExternalId | String Identifier of the Resource Connector. Version 12.1.4 and Older Mappings These mappings are deprecated in software versions 12.2.0.1 and newer.  
 DownstreamResourceDepartmentExternalId | String The ExternalId of the Department to which the downstream Resource belongs. DownstreamResourceExternalId | String The ExternalId of the downstream Resource.  
 DownstreamResourcePlantExternalId | String The ExternalId of the Plant to which the downstream Resource belongs. FixedTransitHrs | Double The number of hours which need to pass between the end of a predecessor operation and its successor operation on a connected downstream resource. ResourceDepartmentExternalId | String The ExternalId of the Department to which the primary connected Resource belongs. ResourceExternalId | String The ExternalId of the primary connected Resource. ResourcePlantExternalId | String The ExternalId of the Plant to which the primary connected Resource belongs. See Also Resource Connectors Resource Mappings Import Mappings Board Tank Resources

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## Resource Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The identifier of the Resource for external system references. This value must be unique per each Resource per each Department.  
 \*Name | String A common name used to identify the Resource. \*DepartmentExternalId | String The External identifier for the Department in which the Resource is in. \*PlantExternalId | String The External identifier for the Plant in which the Resource is found. Active | Boolean Specifies whether the resource is active (in use). If False then no operations will be allowed to schedule on the resource until it is active again.  
 ActivitySetupEfficiencyMultiplier | Decimal This is used as a rate multiplier for activity setup values. It will be overridden if setup is used in a ProductRule. Multiplies the setup time to adjust for slower/faster setups. Larger numbers mean the resource is faster at performing setups. For example, specifying 3 means it can complete a setup process 3x faster than the time standards indicate. AutoJoinHrs | Double This is the number of hours from the PlanetTogether clock within which resources can be processed to auto-join. AutoSplitHrs | Double This is the number of hours from the PlanetTogether clock within which resources can be processed to auto-split. BatchType | String Specifies whether a percentage or a volume defines the batching. Accepted values: None Percent Volume BatchVolume | Decimal Specifies the number of jobs that can be batched together on the resource. If an activity's Required Quantity is larger than this value, the job will fail to schedule. BufferSpanHrs | Double The hour span of

the Buffer when using Drum-Buffer-Rope Release rules. Buffer spans are used to prevent starving this resource to keep its utilization high. CapacityType | String Specifies whether the resource may be capable of running multiple operations simultaneously. Accepted values: SingleTasking: Only one operation may be performed at any point in time. MultiTasking: A finite number of operations can be performed at the same time. Infinite: Any number of activities can be performed at the same time (no constraint). CellExternalId | String The External Identifier of the Cell assigned to the Resource. Cells represent a physical grouping of Resources in an autonomous production line. When one operation of a job which has multiple operations schedules on a resource in a designated Cell, all successor operations will attempt to schedule on Resources within the same Cell.

ChangeoverSetupEfficiencyMultiplier | Decimal A rate multiplier for activity changeover values. This is applied to setups incurred by attribute logic. Values larger than 1 will run setup faster. CompatibilityGroup | String This property is removed from software versions 12.2.0.1 and newer. A Compatibility Group string identifier. Resources that are part of the same Compatibility Group can only run Operations concurrently if they have the same Compatibility Code. So, for example, if the same material input pipe feeds two machines, they can only run products that use that same material at any point in time. ConsecutiveSetupTimes | Boolean Whether Resource and Operation setups are done consecutively or in parallel. True: the Total Setup is the sum of the Resource and Operation setups. False: the Total Setup is the maximum of the two. This setting has no effect if UseOperationSetupTime is set to False. CurrentProductSetup | String This property is removed from software versions 12.2.0.1 and newer. The Product for which the Resource is currently or was most recently set up. This is used to calculate the Setup time for the first scheduled activity on the Resource. CurrentSetupCode | String This property is removed from software versions 12.2.0.1 and newer. The Operation Setup Code for which the Resource is currently or was most recently set up. This is used to calculate the setup time for the first scheduled activity on the Resource. CurrentSetupNumber | Decimal This property is removed from software versions 12.2.0.1 and newer. The Operation Setup Number for which the Resource is currently or was more recently set up.

Optimization can use this to sequence operations with Setup Numbers that are near each other or are in an increasing/decreasing sequence. CycleEfficiencyMultiplier | Decimal In software versions 12.2.0.x and older, these worked in reverse so that values greater than 1 resulted in activities running slower while values less than 1 ran them faster. Multiplies run time to adjust for slower/faster Resources. Values greater than "1" represent a resource running faster than usual, while values less than "1" represent a resource running slower than usual. Description | String A text description of the Resource. DisallowDragAndDrops | Boolean If True, then drag and drop of activities on the Resource are not allowed. DiscontinueSameCellScheduling | Boolean If True, then same-cell scheduling for predecessor operations is discontinued. But if this resource is part of a cell, then the behavior is as usual and this resource's cell will become the new cell that the optimizer attempts to schedule successor operations in. Drum | Boolean Whether to treat this Resource as a Drum when using the Drum-Buffer-Rope Release rule.

ExcludeFromGantts | Boolean Whether the Resource should be excluded from Gantt charts. This is often set to True for inactive resources. ExperimentalSequencingPlan | String The name of the first experimental sequencing plan assigned to the resource. ExperimentalSequencingPlanTwo | String The name of the second experimental sequencing plan assigned to the resource. ExperimentalSequencingPlanThree | String The name of the third experimental sequencing plan assigned to the resource. ExperimentalSequencingPlanFour | String The name of the fourth experimental sequencing plan assigned to the resource. GanttRowHeightFactor | Int32 Controls how tall the row is relative to other rows. Valid ranges are from 1 (shortest) to 10 (tallest). For example, a value of 5 will make that resource row 5 times taller than another on the Gantt whose value is 1. HeadStartHrs | Double Specifies the number of hours that a job or operation can be released to schedule on the resource ahead of its calculated Just In Time (JIT) date when using the release rule JIT with Resource Headstart in Optimize Settings. When this value is reduced, it may help to prevent inventory buildup. Conversely, when the value is increased then operations may be released to schedule earlier which may create excess inventory. ImageFileName | String Filename (with file extension but not a full path) of which image to use in the Gantt to represent this Resource. Accepted values are available in this downloadable .txt file: ImageFileNames.txt IsTank | Boolean Specifies whether the Resource is a Tank Resource. LimitAutoJoinToSameShift | Boolean This property is removed from software versions 12.2.0.1 and newer. If True, then AutoJoining will be limited to operations and activities starting in the same shift. ManualAssignmentOnly | Boolean If True, then operations and activities can only be assigned to the Resource manually. Jobs will not be automatically scheduled on this resource. MaxQty | Decimal For the Resource to be considered eligible for an Activity, the Activity's Required Finish Quantity must be less than or equal to this amount. MaxQtyPerCycle | Decimal For the Resource to be considered eligible for an Activity, the Activity's QtyPerCycle must be less than or equal to this amount. This is often used for batch processes where a

Resource can hold a certain volume, which cannot be exceeded. MaxSameSetupHrs | Double This property is removed from software versions 12.3.0 and newer. When using Same Setup Code optimization factor, a setup code change is forced after this specified number of hours of setup time has been scheduled consecutively without a code change between operations. This option can be used to force periodic rotation between groups of products (setup codes). MaxVolume | Decimal For the Resource to be considered eligible for an Activity, the Activity's Required Finish Quantity multiplied by the associated MO Product's assigned Unit Volume must be less than or equal to this amount. MinNbrOfPeople | Decimal The minimum number of people that are required for the resource. MinQty | Decimal For the Resource to be considered eligible for an Activity, the Activity's Required Finish Quantity must be at least this amount. MinQtyPerCycle | Decimal For the Resource to be considered eligible for an Activity, the Activity's Quantity Per Cycle must be at least this amount. This is often used for batch processes where a Resource can hold a certain volume, and there is a desire to use smaller Resources for smaller orders to avoid wasting capacity. MinVolume | Decimal For the Resource to be considered eligible for an Activity, the Activity's Required Finish Quantity multiplied by the associated MO Product's assigned Unit Volume must be at least this amount. NoDefaultRecurringCapacityInterval | Boolean If True, the First Shift default capacity interval will not be automatically assigning to this Resource. This is to prevent jobs from scheduling on a newly-imported Resource. NormalSequencingPlan | String The name of the Normal (standard) sequencing plan used by this resource. Notes | String Comments or special considerations about this Resource. NumberOfResources | Int32 This property is removed from software versions 12.2.0.1 and newer. Used to speed up importing multiple identical Resources. Create a single resource record and specify the number of resources in this field and the system will create the additional resources and add "-1", "-2", etc., to the Resource Name and ExternalId.

OmitSetupOnFirstActivity | Boolean If True, then the Setup Time on the first Activity scheduled on the Resource is always zero. OmitSetupOnFirstActivityInShift | Boolean If True, then the Setup Time on the first Activity scheduled on a Capacity Interval on the Resource is always zero. OvertimeHourlyCost | Decimal The hourly cost for running the resource during overtime capacity intervals. Priority | Int32 A numerical priority value assigned to the resource. This can be used during optimization when the applied sequencing plan is configured to factor in the Resource Priority factor. This allows for specific ranking of resource priorities when two or more resources are capable of performing the same work and each are available to schedule an eligible activity at the same time. ResourceCleanoutCost | Decimal Specify cost of incurred Resource Cleanout Cost. ResourceSetupCost | Decimal Specify cost of incurred Resource Setup Cost. ResourceType | String The type of physical entity represented by the Resource. Used for custom reports and other display groupings. Accepted values: Machine Operator Supervisor Engineer Inspector Team Labor Equipment Tool Subcontractor Cell work area WorkCenter Bay Transport Container Special Technician Fixture Employee Tank Inbox SameSetupHeadstartMultiplier | Decimal This property is removed from software versions 12.2.0.1 and newer. Used in the calculation of how far an operation can be scheduled before its JIT Start Date. Larger values result in activities with longer setups being allowed to start earlier to save a setup. During Optimizations, activities are not permitted to start earlier than JITstartDate-(SameSetupHeadstartMultiplier\*currentSetupSpan+headStartSpan). It can be used to prevent excessive inventory buildup and aid in grouping same-setup code activities. ScheduledRunSpanAlgorithm | String Name of the script used to calculate ScheduledRunSpan in activities on this resource. If specified, this gives the absolute final value for ScheduledRunSpan. The result must be a non-negative double, or 1 will be substituted, and an error will be logged. ScheduledSetupSpanAlgorithm | String Name of the script used to calculate ScheduledSetupSpan in Activities on this resource. If specified, this gives the absolute final value for ScheduledSetupSpan. The result must be non-negative double, or zero will be substituted, and an error will be logged. ScheduledTransferSpanAlgorithm | String Name of the script used to calculate ScheduledTransferSpan in Activities on this resource. If specified, this gives the absolute final value for ScheduledTransferSpan. The result must be non-negative double, or zero will be substituted, and an error will be logged. Sequential | Boolean This property only applies to infinite resources. It ensures that every activity that gets scheduled finishes on or after the last scheduled block time. If the activity being scheduled would have been scheduled to complete before the last block that was scheduled, the scheduled finish time is adjusted so that the block is scheduled to finish at the same time as the last scheduled block. This property was added to help model conveyors. First, model the minimum length of time an activity must stay on the conveyor (transfer time) using an Infinite sequential resource, then model the unloading of the conveyor as a finite resource. You may also need to place the two resources used to model the conveyor and predecessor resource in the same cell. Setup the unloading resource and operation so that the unload's length matches the load's length. SetupEfficiencyMultiplier | Decimal This property is removed from software version 12.2.1 and newer. It is replaced by ActivitySetupEfficiencyMultiplier. Multiplies the setup time to adjust for slower/faster

setups. Larger numbers mean the resource is slower at performing setups. For example, specifying 3 means it takes 3x longer to perform a setup than the standards indicate. SetupHrs | Double The number of hours which must be spent to set up this resource whenever the preceding operation did not use this resource. SetupIncluded | String This property is removed from software version 12.3.0 and newer. It's replaced by boolean fields UseResourceSetupTime, UseOperationSetupTime, and UseSequencedSetupTime Indicates when to add setup time to an operation scheduled on this resource. Accepted values: WhenProductChanges: Setup is incurred when the M.O. product of the operation's associated M.O. is different from the previously scheduled operation's M.O. product on the resource. WhenSetupCodeChanges: Setup is incurred when the operation's Setup Code is different from the previously scheduled operation's Setup Code on the resource. WhenEitherChanges: Setup is incurred when either the M.O. product or the Setup Code of the operation is different from that of the previously scheduled operation on the resource. Always: Always incur setup according to all configured possible sources of Setup time. Never: Setup time is never incurred on the resource by any operation. WhenSetupNumberChanges: Setup is incurred when the operation's Setup Number is different from the previously scheduled operation's Setup Number on the resource. WhenSetupNumberIncreases: Setup is incurred when the operation's Setup Number is higher/larger than the previously scheduled operation's Setup Number on the resource. WhenSetupNumberDecreases: Setup is incurred when the operation's Setup Number is lower/smaller than the previously scheduled operation's Setup Number on the resource. UseSetupCodeTable: Lookup operation Setup Code changes in an associated Setup Code Table to determine how much setup to incur based on Setup Code changes between scheduled operations. UseOperationAttributes: Setup is incurred according to operation attribute settings. See also: Setup Time Stage | Int32 Used for multi-stage scheduling to allow scheduling of groups of resources stage by stage. Staging comes with the following restrictions: Jobs can only have one Manufacturing Order. This is because the job release event only occurs once in simulation. Each operation can only have one predecessor operation and one successor operation. An operation can only have one resource requirement to help prevent requiring resources that have different stages. Resources with the same capabilities must have the same stage number. Otherwise, the operation would be eligible in multiple stages, only one of the stages would be selected, and the resources from the other stages would become ineligible. If any of these restrictions are violated, then the simulation might fail. StandardCleanHours | Double The number of hours which must be spent to clean this resource whenever the preceding operation did not use this resource. StandardCleanoutGrade | Int32 The Cleanout Grade value to use for the resource StandardCleanHours. For more information, see: Cleans. StandardHourlyCost | Decimal The hourly cost for running the resource during non-overtime online capacity intervals. TransferHrs | Double The time it takes for the items produced to be transferred to the next resource or inventory. Successor operations cannot start before this time passes after finishing the operation. However, the resource is not consumed during this time. UseAttributeCleanouts | Boolean Whether to consider operation attributes when calculating and scheduling Cleans. UseOperationCleanout | Boolean Whether to consider the Clean Time of the Operation when calculating and scheduling Cleans. UseOperationSetupTime | Boolean If true, the specified Operation Setup (Operation.SetupHrs) of operations scheduled on the resource will be factored in when calculating the scheduled setup. UseResourceSetupTime | Boolean If true, the specified Resource Setup (Resource.SetupHrs) will be factored in when calculating the scheduled setup of each operation that schedules on the resource. UseResourceCleanout | Boolean If true, the specified Resource Cleanout (Resource.StandardCleanHours) of operations scheduled on the resource will be factored in when calculating the scheduled cleanout. UseSequencedSetupTime | Boolean If true, Operation Attributes of operations scheduled on the resource will be factored in when calculating the scheduled setup. UserFields | String An optional list of user-defined fields. For more information, see: User Defined Fields (UDFs). Workcenter | String The name of the work center in the ERP system (or Department Name if not set). For display only. WorkcenterExternalId | String The External identifier of the Work Center in the ERP system. See Also Capacity Planning Board Import Mappings Board Helper Resources Allowed Helpers Allowed Helper Resource Mappings Setup Time Cleans

## Setup Code Table Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required Setup Code Table \*TableName | String Name of the Setup Code Table. Description | String Description of the Setup Code Table. PreviousPrecedence | Boolean This determines which wildcard match takes precedence when both non-exact match types are found. "The previous Precedence" means that the SetupCode Table value that has the "Wildcard Code" in the "PreviousOpSetupCode" field will be used to calculate the setup. Wildcard | String This is a string or a character used to support pattern matching and is used to search within the "Table Values" data of the SetupTable for occurrences within the "PreviousOpSetupCode" and "NextOpSetupCode" fields. Setup Code Table Setup Code \*TableName | String Name of the Setup Code Table. \*PreviousOpSetupCode | String The Setup Code of the Previous Operation. \*NextOpSetupCode | String The Setup Code of the Next Operation. \*SetupHrs | Double The time incurred for Setup, in hours. \*SetupCost | Double The cost incurred for Setup. Setup Code Table Assigned Resources \*PlantExternalId | String Identifier of the Plant to which the Resource is associated. \*DepartmentExternalId | String Identifier of the Department to which the Resource is associated. \*ResourceExternalId | String Identifier of the Resource that will be associated with the Setup Code Table. \*TableName | String Name of the Setup Code Table. See Also Setup Time Import Mappings Board

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## User Mappings

### Source

Property Name | Data Type Description & accepted values \* = Required \*ExternalId | String The external identifier of the User. Must be unique per each User object. \*Login | String The username of the user. Active | Boolean Whether the user is active or not. If FALSE, the user will not be able to log in. Description | String Additional text for describing the user. DisplayLanguage | String Specifies which language to use in the user interface for this user. Accepted values: English\_US English\_GB Note that English\_GB uses the same text as English\_US but with en-GB date and number formats. Chinese\_PRC Dutch French German Italian Japanese Polish Spanish FirstName | String The user's first name. LastName | String The user's last name. Notes | String Comments or special considerations about the user. Password | String The user's password. PlantPermissionGroup | String The Name of the Plant Permission Group to assign to the user. RequirePasswordResetAtNextLogin | Boolean If TRUE, the user will be prompted to reset their password at the next login. TimeZone | String By default, this field will be set to the configured time zone of the user's machine. However, a TimeZone value can be imported to forcefully set the user's time zone. Accepted values: Dateline Standard Time UTC-11 Samoa Standard Time Hawaiian Standard Time Alaskan Standard Time Pacific Standard Time (Mexico) Pacific Standard Time US Mountain Standard Time Mountain Standard Time (Mexico) Mountain Standard Time Central America Standard Time Central Standard Time Central Standard Time (Mexico) Canada Central Standard Time SA Pacific Standard Time Eastern Standard Time US Eastern Standard Time Venezuela Standard Time Paraguay Standard Time Atlantic Standard Time Central Brazilian Standard Time SA Western Standard Time Pacific SA Standard Time Newfoundland Standard Time E. South America Standard Time Argentina Standard Time SA Eastern Standard Time Greenland Standard Time Montevideo Standard Time UTC-02 Mid-Atlantic Standard Time Azores Standard Time Cape Verde Standard Time Morocco Standard Time UTC GMT Standard Time Greenwich Standard Time W. Europe Standard Time Central Europe Standard Time Romance Standard Time Central European Standard Time W. Central Africa Standard Time Namibia Standard Time Jordan Standard Time GTB Standard Time Middle East Standard Time Egypt Standard Time Syria Standard Time South Africa Standard Time FLE Standard Time Israel Standard Time E. Europe Standard Time Arabic Standard Time Arab Standard Time Russian Standard Time E. Africa Standard Time Iran Standard Time Arabian Standard Time Azerbaijan Standard Time Mauritius Standard Time Georgian Standard Time Caucasus Standard Time Afghanistan Standard Time Ekaterinburg Standard Time Pakistan Standard Time West Asia Standard Time India Standard Time Sri Lanka Standard Time Nepal Standard Time Central Asia Standard Time Bangladesh Standard Time N. Central Asia Standard Time Myanmar Standard Time SE Asia Standard Time North Asia Standard Time China Standard Time North Asia East Standard Time Singapore Standard Time W. Australia Standard Time Taipei Standard Time Ulaanbaatar Standard Time Tokyo Standard Time Korea Standard Time Yakutsk Standard Time Cen. Australia Standard Time AUS Central Standard Time E. Australia Standard Time AUS Eastern Standard Time West Pacific Standard Time Tasmania Standard Time Vladivostok Standard Time Central Pacific Standard Time New Zealand Standard Time UTC+12 Fiji Standard Time Kamchatka Standard Time Tonga Standard Time UserFields | String A list of user-defined fields. See: User Defined Fields (UDFs). UserPermissionGroup | String The Name of the User Permission Group to assign to the user. See Also User Management Import Mappings Board

## Packages & Extensions > Custom Package Development

## Create a Custom Software Package

### Source

Key Concept A package is a software bundle that can be dynamically loaded into an instance of PlanetTogether to affect the behavior of the software. A package may include software views, interactions, fields, UI components, scheduling logic, and/or server processes. Each package is its own C# project, and will implement three kinds of PlanetTogether structures: packages, modules, and elements. Packages are the main object the system loads. There are many package interfaces, and each represents a general kind of application functionality. Each package project implements one or more package interfaces. Modules are used to configure the methods of creating Elements. Elements are the content that get loaded into the program. Creating a Package Tip Find a sample package offered in the PlanetTogether SDK. Follow these steps to create a new Package Project: Right-click the PackageProjects folder and select New Project Select Windows Forms Class Library (search box can be used to find this option) Select .NET 6.0 or .NET 8.0 as the target Framework .NET 6.0 should be chosen for PlanetTogether version 12.2.1.61 or lower .NET 8.0 should be chosen for PlanetTogether version 12.2.1.62 or higher When choosing a name, be sure to end the name with Package, e.g., SdkPackage Also, set the directory to be the PackageProjects folder within the repository Right-click on the created project and select Properties to change the output name and namespace The output name, which can be chosen under Assembly Name, must start with PT for the system to recognize it, e.g.: PT.SdkPackage Copy the value chosen for Assembly Name into the Default Namespace project property The Windows Form project template may comes with extra files that are not needed. Delete everything except for the dependencies and a class file. Rename the file to PackageInfo.cs. This is a standard file that all PT packages must have. Rename the class inside of PackageInfo.cs to match the package name Example: SdkPackage Add the following to the .csproj file of the C# project: The props file contains information regarding the various references/dependencies that all PT packages have Many of the .dll references can be removed from ProjectSharedTargets.props if the SDK developer deems them to be unnecessary for their package The .csproj file will likely have some properties that were auto-generated, but are also in the .props file. These duplicate references should be removed. Create a public constructor with no parameters Have the class implement IPackage or one of the interfaces that derive from IPackage. Create an AssemblyInfo.cs file for the package project This file has information the system uses to determine whether or not a .dll is a package and whether or not said .dll should be loaded The following five fields are necessary to include in AssemblyInfo.cs:

```
[assembly: AssemblyTitle("SdkPackage")] [assembly: PT.Common.Attributes.Assembly.AssemblyPackageld(4021)]
[assembly: PT.Common.Attributes.Assembly.RequiresLicense(false)] [assembly:
PT.Common.Attributes.Assembly.TargetPackageFrameworkVersion("12.2.0")]
[assembly: PT.Common.Attributes.Assembly.PackageFrameworkVersion("12.2.0")]
```

The five fields above should be adjusted to suit the package being created AssemblyTitle should match the name of the package being created AssemblyPackageld must be unique within the system. Non-SDK PlanetTogether Packages will not have any Packagelds above 4000. RequiresLicense should be false for SDK packages TargetPackageFrameWorkVersion and PackageFrameworkVersion should match the version of the PT software that is installed on the SDK developer's computer. Example: If the user has software version 12.2.1.21 installed, then these values should be 12.2.1.

Loading a Package When the system starts, it will look for available packages in a folder on the server (default location is {Instance's base directory}\System\Data\Packages). There should be a set of compiled .dll files located in this folder or its subfolders, and after the system determines that each .dll implements the necessary package interfaces (described in the Creating a Package section), it will load the package into memory. If any of the Package content is used by the PlanetTogether Client application, the server will send the content over to the client upon startup. For more information about loading and unloading packages, see: Software Package Management. Note The sample project also has a postbuild event that copies the .dll over to the folder specified in the .props file. This postbuild event can be copied into any package if desired. See Also Software Package Management PlanetTogether SDK: Getting Started

## PlanetTogether SDK: Getting Started

### Source

**Key Concept** This guide is meant to assist software developers who are ambitious enough to create their own custom software packages that can be loaded into an instance of PlanetTogether in order to alter default functionality or add new functionality. Note: An SDK license is required to use the SDK client. Please contact PlanetTogether Support to obtain an SDK license or to modify an existing license to allow for SDK development. Please provide your existing serial code if you already have a PlanetTogether license. Jump to section:

**Prerequisites** Configure the Solution Prerequisites Install Visual Studio 2022 Download and install Visual Studio from Microsoft: Visual Studio 2022. Use the Individual Components tab to select any .NET 6.0 components. Install ASP.NET Install version 6.0 or newer from Microsoft: APS.NET. Install DevExpress Packages Run DevExpress's Unified Component Installer to install various DevExpress packages. Install PlanetTogether Server Software Follow the Server Software Installation Guide to install software version 12.2.0.25 or newer. Create a new Instance Use the Instance Manager to create a new software instance, but ensure the service remains stopped (existing instances can be used, but this means operations done through SDK will effect the instance's scenario data). Configure the Solution Download the SDK: PlanetTogetherSDK\_12.2.1.zip Unzip the SDK zip file into a new folder location Run Visual Studio with administrator permissions Open the VS solution that is provided in the SDK zip (aps-sdk.sln) Add the following to the PlanetTogetherClient debug properties: The Debug Properties dialog can be accessed by clicking the downward triangle on the Start button near the top of the screen next to the startup project name PlanetTogetherClient. \ServerManagerUri:https://localhost:7980 \SystemServiceURI:https://localhost: {LocalInstancePort} \InstanceName:{LocalInstanceName} \SoftwareVersion:{VersionNumber} \UserName:admin \Password: \EndQuickly: \CreateInstanceOfServer:Internal \CertificateThumbprint:{CertificateThumbprint} \InstanceConnectionString:"Server=localhost;Database={DBName};TrustServerCertificate=True;User ID={Username};Password={Password};" Replace the following with values from the local environment: {LocalInstancePort}: The System service port used by the SDK instance {LocalInstanceName}: The Name of the SDK instance {VersionNumber}: The PlanetTogether software version number used by the SDK instance {CertificateThumbprint}: The certificate thumbprint of the local PlanetTogether server's SSL certificate (this can be found in the Server Manager Settings of the Instance Manager) InstanceConnectionString: The parameters values in the connection string should be replaced with appropriate SQL server credentials to connect to the PlanetTogether server instance configuration database An example of a well-formed set of arguments: \ServerManagerUri:https://localhost:7980 \SystemServiceURI:https://localhost:4051 \InstanceName:SDK \SoftwareVersion:12.2.0.25 \UserName:admin \Password: \EndQuickly: \CreateInstanceOfServer:Internal \CertificateThumbprint:4A0E559FA28DA4428C696812FD624A42AB81C5E2 \InstanceConnectionString:"Server=localhost;Database=PTInstances;TrustServerCertificate=True;User ID=InstanceManagerUser;Password=P@\$\$w0rd;" Next, locate the path to the Client.zip file of the PlanetTogether Client application and unzip it to a new folder location. The default installation location is: C:\ProgramData\PlanetTogether\Software\{VersionNumber}\Client.zip Replace {VersionNumber} with the SDK instance software version From the Visual Studio project, open the ProjectSharedTargets.props file from the Misc folder. Paste the path to the unzipped/extracted Client application into the ClientDependenciesPath property. Locate the path to the SDK instance's Packages folder and paste the path into the PackageProjectPath property in the same ProjectSharedTargets.props file. The default location of the instance Packages folder is: C:\ProgramData\PlanetTogether\Software\{InstanceId} \SoftwareVersion\System\Data\Packages\ Replace {InstanceId} and {SoftwareVersion} with the name and version of the SDK instance Locate the PT.BrandingPackage.dll file from the BrandingPackage folder from the SDK instance Packages folder (found in the previous step). Copy this file into the folder of the ClientDependenciesPath property. The solution should now build and start! Important Visual studio must be run with administrator permissions, or enough permissions to be able to start a service and use a port. Important The SDK instance service should always remain stopped while using the SDK method to connect to it. See Also Create a Custom Software Package Software Package Management Instance Manager

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## Partner Resources > Sales Enablement

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## Partners Resource Hub

### Source

Getting Started Partner Onboarding Presentation A brief history of PlanetTogether Partner Webinar PlanetTogether v12.3: Solution Updates & Demo Best Practices session! { % video\_player "embed\_player" overrideable=False, type='hsvideo2', hide\_playlist=True, viral\_sharing=False, embed\_button=False, autoplay=False, hidden\_controls=False, loop=False, muted=False, full\_width=False, width='688', height='387', player\_id='198488810092', style="" %} Demo { % video\_player "embed\_player" overrideable=False, type='hsvideo2', hide\_playlist=True, viral\_sharing=False, embed\_button=False, autoplay=False, hidden\_controls=False, loop=False, muted=False, full\_width=False, width='688', height='387', player\_id='198477475920', style="" %} General Resources 2026 Global List Prices Knowledge Base Cloud Data Discovery EQPA POC/Evaluation Agreement Register a Lead PlanetTogether Payments Options Marketing and Sales PlanetTogether Sales Deck What is PlanetTogether What is PlanetTogether - Spanish Competitive Advantages brochure PlanetTogether Use Cases: Industry Packages PlanetTogether Feature Listing FAQ - Frequently Asked Questions FAQ - Frequently Asked Questions (Video) Just the Facts Brochure Why ERP alone is not the answer Requirements Gathering Tools D365/Dynamics Brochure Optimize Manufacturing Distribution SAP ByD Brochure SLA/EULA Clickwrap SLA/EULA Signature Keyword Planning - Global How Advanced Planning and Scheduling Optimizes the CPG Supply Chain Resilient Chemical Supply Chains3 Building a Resilient CPG Supply Chain with Advanced Planning and Scheduling (Video) Pharmaceutical Industry Pharmaceutical Supply Chains: Challenges and Solutions Life Sciences Supply Chain with APS Version 12 V12 General (short version) Product Video: (Highlights key features) V12 Features (long version) V12 Web Application Reporting: Your Key to Smarter Decisions and Lower Risk Version 12 Presentation Announcement Version 12 Partners Anuncio Spanish AI Bot Library Case Studies Advanced production scheduling drove efficiency and growth for a leading flexible packaging manufacturer How Digital Planning Elevated Genealogy Operations Transforming Production Scheduling in the Medical Devices and Industrial Equipment Industry Transforming Truck Equipment Production with Advanced Scheduling Solutions A Digital Journey with Integrated Planning for Coffee Producers Streamlining Production with AI Planning and Digital Supply Chain Solutions How a Top Communications Network Manufacturer Grew with AI-Powered Planning and Scheduling How a Whole Food Nutrient Solutions Leader Transformed Production with Advanced Planning Production Scheduling in Brewing: Achieving 30% Faster Setups with Digital Optimization Transforming Coffee Production: How Digital Solutions Enhanced Scheduling Efficiency by 50% Graphic International Packaging's Success with AI Planning and Digital Transformation Driving Innovation: How One Mobility Manufacturer Embraced Digital Solutions to Optimize Operations SnakKing - Spanish Case Study Graphic Packaging - Spanish Case Study Industry Packages (Chemical, CPG, Life Sciences and Mobility) Complete Deck in here - All Industries To make your presentations impactful, we've tailored slide decks per industry—Chemicals, CPG, Mobility, and more. Use these decks to engage with clients, highlighting industry-specific benefits and solutions that resonate. Whether you're presenting to leaders in Chemicals or the CPG sector, these slides are designed to showcase how PlanetTogether addresses unique challenges in each field. Review, customize, and use them as you see fit! Social Media Channels Youtube Channel LinkedIn Facebook X (formerly Twitter) Instagram Newsletter Web - Newsletter/Mailing list (Request) Web - LinkedIn Newsletter

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## Sample Data Models

### Source

Key Concept PlanetTogether has created and maintains sample data models which enable users to train or demo the software using industry-based models that each offer unique features and functionalities of the software. They can be used without the integration by simply loading the provided scenario file, or fully integrated into the software instance with the provided Excel sheet as the master data source. Jump to section: Excel Integration Overview Sample Data Models Excel Integration Overview Each of the provided sample data models can be integrated using our Full Excel Integration Package integration strategy. Some preparation of the SQL environment and the instance is necessary in order to use the provided Excel sheets as the master data source. This is optional though -- each data model can be loaded into any software instance by simply loading the provided scenarios.dat file. Sample Data Models [ More information about each model coming soon... Each download includes a "readme.txt" with more information about the model and how to load it. ] Click the links to download the data model .zip files according to the software version you'll be running them in. It is recommended to upgrade to the latest version though for any training or demos. Versions 12.2.0 and 12.2.1 Version 12.3.0 Job Shop Job Shop 12.3.0 Brewery Brewery 12.3.0 Pharma Tablets Pharma Tablets 12.3.0 Complex Reactor Complex Reactor 12.3.0 Consumer Packaged Goods (CPG) Consumer Packaged Goods (CPG) 12.3.0 Bakery Bakery 12.3.0 Steel Mill Steel Mill 12.3.0 See Also Microsoft Excel Integration Full Excel Integration Package Load a Scenario File Standard Import Database Standard Publish Database Server Software Installation Guide Instance Manager

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## Version 12 Availability & Adoption

[Source](#)

Overview PlanetTogether has made our new product, Version 12, available for new and existing customers. It is available for on-premises hosted solutions as well as PlanetTogether Cloud Hosted solutions. At initial launch, all features and functionalities will be available to both on-premises hosted and PT Cloud hosted environments, though some of our future development roadmap items may only be offered to PT Cloud hosted customers, so we are encouraging all early adopting customers to also allow us to host their instances. Early Adopters:

Considerations Version 12 is becoming more stable with each release since the first customers began adopting it in November 2023. One year later, we have a handful of customers actively using it in their production environments and a dozen or so more in the implementation phase. We are confident in the stability of our General Availability releases and encourage customers to upgrade, especially if they are interested in any of the newly developed features and functionality. While each General Availability software release is meticulously tested with various data models, users may still find ways to use the system and its features in ways that are not thoroughly tested so they may reveal instabilities that our testers did not uncover. Rest assured, however, that PlanetTogether developers are treating all customer-reported issues with utmost urgency in order to ensure the smoothest possible integration and implementation onboarding or adaptation. We strive to release fixes for reported issues within 1-2 weeks or less depending on their severity. Existing Customer Upgrades: Considerations While available for existing customers, please note that this is not just an upgrade of an existing Version 11 (or older) installation. This product is priced only as a SaaS subscription which requires a new license agreement and represents a full migration from one product offering to another. Any existing Version 11 license may continue to be used by the customer which purchased it until it expires. Perpetual Version 11 licenses will remain active/valid indefinitely. Migration to the new platform may not always be simple and will require partner involvement throughout the process to train users on the new system, update the integration, reconfigure data points that don't copy over like Workspaces, Optimize Rules and Settings, User Permissions, User and System Settings, etc. Ideally, this is an opportunity for integrators to charge for services/solutions involvement. We estimate it will take about 10-25% of the effort of an initial implementation project depending on the size and complexity of the data model and integrated software features. For more detailed information about the migration process and effort, see: Upgrading from Version 11 Version 12 Licensing This product is priced as a SaaS subscription which requires a new license agreement. All Version 12 project deals should flow through our partner as if it is a new sale with that partner detailing the solution to the customer. To get started, request a POC license from PlanetTogether via our License Request Form. If interested, feel free to note in the form submission that you'd prefer that we host the POC instance in our cloud environment (or follow up with PlanetTogether Support after the license has been issued to request the same) and we'll work closely with you to configure the data model and integration as needed. Each partner will be responsible for configuring the POC data model, providing product demonstrations, training, etc. through to the eventual closure of the new sale. Our Support and Enablement teams are available to answer any questions our partners may have throughout the POC and sales cycle so you can have informed conversations with interested customers. Once the sale is finalized, PlanetTogether Support and Enablement teams will also make themselves available to the customer for additional support and training, as needed (in addition to giving them access to LMS and Knowledge Base resources). Pricing information is available in the 2026 Global List Prices asset. See Also New Functions & Features Upgrading from Version 11 Limited Release Functional Limitations Product Feature Roadmap LMS Course: Version 12 Introduction

## Partner Resources > Software Licensing

### License Request Form

[Source](#)

## PlanetTogether Employee Resources > Software Licenses

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### Software Licensing Overview

#### Source

This document is internal to PlanetTogether employees. Do not share its contents externally. Key Concept Software licenses allow users to run instances of PlanetTogether. Various license types may have unique capabilities and those will be covered here at a high level. License Subscriptions PlanetTogether offers two primary license models: subscription licenses and perpetual licenses. Each comes with distinct payment structures, access rights, and implications: Feature Subscription License Perpetual License Payment Structure Recurring (monthly/annual) payments One-time, upfront payment Software Usage/Access Only while subscription is active, otherwise software enters Read Only mode Indefinite (unless terminated by other means) Maintenance Updates & Support Included for the duration of subscription 12 months from initial purchase; may optionally be renewed annually Software Upgrades Always entitled to upgrade to the latest version Fixed version unless maintenance and support subscription is renewed Maintenance & Support Customers who have purchased a perpetual software license may optionally pay for Maintenance and Support. If they choose to subscribe to maintenance and support then they are entitled to the following: Product support from our internal support teams Software upgrades to the latest software version of their current product For Version 11 customers and licenses, they may only upgrade to the latest Version 11 release Software bug fixes from our development team When maintenance and support expires, the software license will no longer allow the user to download newer software releases or run instances of the newer software release versions. Otherwise, the expiration of maintenance has no impact on a perpetual software license or if there are rare cases where a subscription license is renewed without maintenance and support -- the license will allow the software to work normally as long as it's running a software version that was released prior to the maintenance expiration date. System ID Type The System ID Type determines whether the software license can run services of a single instance at a time, or as many instances as the server/PC will allow. License Service The License Service type entitles the license to run services of a single instance at a time. It can be transferred between users and servers as needed with no engagement with PlanetTogether Support as long as it's only ever running a single instance. If more than one instance is running with a software license of this type, then the first instance that was started will work normally but subsequent instances will start in Read Only mode. CPU ID The CPU ID type entitles the license to run services of any number of instances simultaneously, but it is limited to functioning only on the server or PC with the assigned System ID. If the license is used on any server or PC whose System ID does not match that of the one configured on the license server, then the instances will start in Read Only mode. Windows Product ID The Windows Product ID type is a legacy type that is tied to a server or PC's Windows product ID. It works similarly to the CPU ID type. No new licenses should be issued with this type.

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### Server Administration > Installation and Updates

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## Deploy Integration Files to Server

### Source

Key Concept Each PlanetTogether instance is required to load a set of integration files. During the server software installation process, the standard PlanetTogether integration files can be downloaded and usually those are fine to use as a starting point for any newly created instance. When creating a new instance which will use a particular master data source (ERP, MES, or Excel) for which PlanetTogether offers a standard integration as a starting point, those integration files can be downloaded and deployed to the IntegrationFiles folder of the server software installation location so that they may be selected during new instance creation. Download Integration Files Integration files are offered in the knowledge base documentation associated with PlanetTogether's available integrations. Deploy Integration Files To deploy the integration file package so that it may be used during software instance creation, extract the downloaded folder of files into the IntegrationFiles folder of the PlanetTogether software installation location, typically: C:\ProgramData\PlanetTogether\IntegrationFiles The integration files offered may vary from one integration data set to the next, but typically include: APSInterfaceSettings.xml: The Import Mappings configuration. PT\_Import.sql: A SQL script which can be used to create the necessary tables and stored procedures for the import database. PT\_Publish.sql: A SQL script which can be used to create a standard publish database. Integration.json: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance. PtDbDataSet.xsd: The PlanetTogether Server Manager uses this file when creating and operating instances which use this integration. It is required to remain in the IntegrationFiles folder of the instance. When manually extracted correctly, each of the files listed above will reside in their own contained folder in the IntegrationFiles folder. For example: C:\ProgramData\PlanetTogether\IntegrationFiles\Integration\_Name\APSInterfaceSettings.xml  
C:\ProgramData\PlanetTogether\IntegrationFiles\Integration\_Name\Integration.json  
C:\ProgramData\PlanetTogether\IntegrationFiles\Integration\_Name\PT\_Import.sql  
C:\ProgramData\PlanetTogether\IntegrationFiles\Integration\_Name\PT\_Publish.sql  
C:\ProgramData\PlanetTogether\IntegrationFiles\Integration\_Name\PtDbDataSet.xsd See Also Integrations: Overview

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## Installer Downloads

### Source

Download Details Version 12 Server Installer The full Version 12 PlanetTogether Server and Client applications. Use this link when configuring a new server or upgrading an existing one. Requires Microsoft .NET 8.0.4 or newer Windows Hosting Bundle. Version 12 Client Installer The Version 12 PlanetTogether Desktop Client application. Use this link to install only the Desktop Client application which allows users to connect to PlanetTogether Workspaces to create schedules. Requires Microsoft .NET 6.0.4 or newer Windows Hosting Bundle. Compatible with all Version 12 instance workspace software versions. Version 12 Client Installer without .NET validation The Version 12 PlanetTogether Desktop Client application. For use with software instance workspaces running version 12.2.1.62 or newer which have .NET 8 bundled into them and thus do not require users to install .NET as a separate component. See also: Server Installation Guide Desktop Client Installation Guide

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## Offline Software Installation and Manual Deployment

### [Source](#)

Key Concept Software versions may be installed or deployed offline without using an installer executable. The software packages may be obtained from PlanetTogether's PT Builds SharePoint site, or shared and downloaded by any other means. This guide will step through how to deploy software versions manually. PlanetTogether Employee SharePoint: PT Builds PT Builds Offline Installation If the software package includes a PlanetTogetherFull12.exe installer and a PTLocalInstallationFiles collection of software package files, then run the PlanetTogetherFull12.exe and opt to Install from local files when prompted rather than entering a license serial code. Choose which software components you wish to install as if it were the standard web installer (see: Server Installation Guide). Manual Deployment If the software package does not contain an installer executable, then make sure that you have downloaded and installed the latest version of Server Manager and Instance Manager, then locate the software version .zip file from the downloaded package and extract its contents into a new folder named the same as the software version in the PlanetTogether server software installation folder. The standard/default installation location is: C:\ProgramData\PlanetTogether\Software If done correctly, the software version folder will reside in the PlanetTogether\Software folder in a new folder of its own and will contain 4 folders/files: C:\ProgramData\PlanetTogether\Software\N1.N2.N3\ Packages ProgramFiles UpdateFiles Client.zip Once the software version folder is correctly deployed, the new software version will be select-able from the New Instance creation dialog from the Instance Manager. Example In this example, the 12.1.4.6.zip file from PT Builds contains 2 files and 1 folder: PTLocalInstallationFiles PlanetTogetherClient12.exe PlanetTogetherFull12.exe Inside of the PTLocalInstallationFiles\Software folder is a compressed file called 12.1.4.6.zip. This .zip file contains the actual software components. Cut or copy the .zip file and paste it to the server software installation folder. Once the .zip file is saved in the Software installation folder, extract its contents to a new folder named that of the software version (12.1.4.6 in this case). If successful, software version 12.1.4.6 will now be an available option to select when creating a new instance.

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## Server Installation Guide

### [Source](#)

Key Concept Follow this guide to install PlanetTogether Version 12 Server Manager software on a server or test machine. The article linked at the bottom of the page will direct you to the next step of the process to create an Instance. Don't worry about any existing Version 11 Installation on the same server or test machine – Version 12 will install separately from it so that both versions can run simultaneously. Jump to section: Installation Procedure Software Upgrade Procedure Instance Manager Installation Procedure Step 1: .NET 8.0.x PlanetTogether APS Version12 requires the .NET 8.0 Core Runtime Hosting Bundle framework package. Begin by downloading and installing it from Microsoft. ASP.NET Core Runtime 8.0.20 Hosting Bundle NOTE: Some servers may require that you restart the server after installing .NET before it can be used by other applications. Step 2: Configure a SQL Database All PlanetTogether servers require a connection to a SQL database in order to store server and instance configurations. SQL Server or SQL EXPRESS may be installed on the same server as the PlanetTogether instance host, or any other SQL server may work as long as the PlanetTogether instance host server has access to it. To install SQL Server, see: Microsoft SQL Server downloads It's recommended to create a new empty database which will act as the PlanetTogether Instance Configuration database, though any existing database may also be used. The software will require 3 tables to exist in the database, but if they don't exist then it will create them during the installation process. The tables that get created are: Configuration InstanceSettings ServerSettings The PlanetTogether Server Manager service will read and write to the database. The service will be created during the server software installation process. It may be configured to use Windows authentication (Integrated Security) or SQL authentication. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well. SQL Authentication Mode If using SQL user authentication rather than Windows Integrated Security, the SQL server must be configured to allow SQL authentication. This can be enabled from the Security tab of the

server Properties dialog. Access server properties from the right-click menu of the object explorer in SSMS: From the Properties dialog, select Security from the left navigation and select the Server authentication option SQL Server and Windows Authentication mode. In order to apply this setting change, the SQL Server Windows service must be restarted. Step 3: PlanetTogether Installer With the appropriate .NET framework packages installed and a SQL database is prepared, download the PlanetTogether Version 12 installer: PlanetTogether Version 12 installer Once complete, run the downloaded PlanetTogetherFull12.exe installer to start the installation wizard. NOTE: If not all .NET packages were installed correctly, a popup may appear to prompt the user to download and install the appropriate .NET package(s). Click Yes to download the missing package(s) from Microsoft. Once installed, re-run the PlanetTogetherFull12.exe installer. Step 3: Installation Wizard Server Software Installation Server software installation using the web installer requires access to the subdomains and the Licensing URLs below.

<https://www.planettogether.com> <https://download.planettogether.com> <https://deployment.planettogether.com>  
<https://ptwebhost.table.core.windows.net> Licensing The installer and server application requires an active internet connection and access to: <https://licenseserver.planettogether.net:45455>

<https://licenseserver2.planettogether.net:45455> An active internet connection means continuous internet access while the instance is running. However, intermittent connection losses will not affect licensing if the server has connection issues; consult with a PlanetTogether support to determine any potential licensing problems. Enter a valid PlanetTogether Version 12 license serial code Select a software version to install. Choose an installation location, if desired (if installing for the first time), then proceed to Install Server Manager. Choose an existing SSL certificate or generate a new one if necessary. Be sure to choose a certificate with the DNS association "PlanetTogether.local" or one that validates the Server Name where the software is being installed by using the Find Certificate button before you Accept and proceed. Follow this documented process to generate a certificate if you need to create one. Enter Instance Database Connection String information Use the connection string builder in the Build tab of the interface to simplify the connection string configuration process. Alternatively, use the Custom tab to build the connection string manually. Once the credentials are provided, use the Test button to confirm that the connection to the server and database can be established. If successful, proceed by clicking the Accept button. Integrated Security When disabled, authentication to the specified SQL server and database is established via the Username and Password fields of this database connection string builder which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the PlanetTogether Server Manager Windows service which may not exist yet. By default, the Windows user is the standard Local System user (NT AUTHORITY\SYSTEM) which typically does not have access to SQL databases. Unless the Local System NT AUTHORITY\SYSTEM user has been given database access and rights, the initial installation may not fully succeed. After the installation completes (which creates the PlanetTogether Server Manager service), Integrated Security logon credentials can be modified from the Windows Services application via Properties → Log On → This account. Once the integrated security user is configured in Windows Services, restart the service so that the newly configured user may populate the Instance Settings database with necessary configurations using the defined Windows user's credentials. Click the Install Server Files button to include the software version files. Select the desired integration from the dropdown (PlanetTogether is recommended unless installing for a specific supported ERP system) and click the Install Integration button. Choose an installation location, if desired (if installing for the first time), then click the Install Client button to include the Client Sign-In Manager application (recommended). The installation should validate as shown in the image below. Choose the button to Review Terms and Conditions. Scroll down to the bottom of the Terms and Conditions dialog. Select the checkbox stating that "I have read and agreed to the terms and conditions." Then choose the Close button. Click the Install Software button. The installation will then begin. Software Upgrade Procedure Upgrading to new software versions is very similar to new installations, except certain steps may optionally be skipped. It's typically recommended, however, to download and re-install all components of the installation in order to ensure the Server Manager component is compatible with newer core software versions. Be sure to review the latest Release Notes to get an idea of what to expect for the upgrade. The installer should create a backup of the existing Server Manager installation so that the upgrade may be reverted if deemed necessary. It might be a good idea though to still create a manual backup of the Server Manager folder in case the installer fails. The Server Manager files are typically installed at this location:

%ProgramData%\PlanetTogether\Software\ServerManager Download the latest PlanetTogether Version 12 installer: PlanetTogether Version 12 installer Once complete, run the downloaded PlanetTogetherFull12.exe installer to start the installation wizard. Installation Wizard Enter a valid PlanetTogether Version 12 license serial code Select a software version to install. It's recommended to opt to Re-Install Server Manager when prompted to

install the latest version. Accept the detected existing SSL certificate and proceed. Accept the detected Instance Database Connection String information and proceed. Click the Install Server Files button to include the core software version files. Select the desired integration from the dropdown (PlanetTogether is recommended unless installing for a specific supported ERP system) and click the Install Integration button. Choose an installation location for the client sign-in application, if desired (if installing for the first time), then click the Install Client button to include the Client Sign-In Manager application (recommended). The installation should validate as shown in the image below. Choose the button to Review Terms and Conditions. Scroll down to the bottom of the Terms and Conditions dialog. Select the checkbox stating that "I have read and agreed to the terms and conditions." Then choose the Close button. Click the Install Software button. The installation will then begin. Instance Manager Version 12 introduces a new web-based application Instance Manager. Once the server software installation completes, use the Instance Manager guide to create an Instance on the server to start setting up a data model.

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## Single Sign On (SSO) Integration

### [Source](#)

**Key Concept** PlanetTogether Instances can be configured to allow users to log in with their Single Sign On (SSO) network credentials. Note that SSO is only available to organizations with a "Pro" PlanetTogether license key. Jump to section: Collaboration with PlanetTogether Support Instance Manager Settings User Management Sign in to a Workspace Collaboration with PlanetTogether Support The PlanetTogether team will need to configure our 3rd party authorization platform (Auth0) to enable the server that hosts the PlanetTogether instance(s) to allowing SSO connections from the customer organization's email domain(s). To initiate this process, email support@planettogether.com or complete this form to submit a request to the Support team to enable the organization's domains for SSO connections. The Support team will need to know the name of the organization's SSO identity provider and each domain which requires access. Depending on which provider is being used, different instructions/requirements may be sent to complete the process.

**Instance Manager Settings** This section only pertains to local or on-premises installations. For PlanetTogether Cloud Hosted instances, the PlanetTogether cloud team will manage this step. Once the authorization platform configuration is updated, PlanetTogether will deliver an SSL certificate for local server installations. A server administrator will need to make the following changes to the PlanetTogether instance settings via the Instance Manager: From the Instance Manager, open the instance settings dialog for the instance you wish to enable SSO for. Navigate to the Client Connections tab and check the box to [x] Allow Single Sign-On. Click the Search icon and find and select the appropriate SSO certificate to use for SSO validation. Once configured, click Apply or Save & Close. After saving the changes, the instance service must be restarted before users may login using SSO.

**User Management** Once SSO is configured in the instance, some additional user administration is required before users may login using their SSO credentials.

**Create User Accounts** A user administrator of the Instance Workspace must sign in to the Workspace and create a user account for each SSO user. For each user, the User Name field must match the email address that the individual uses to sign in to their SSO account. If users are expected to use SSO exclusively, then a password can be entered into the Password field which is not meant to be shared with the user. When SSO successfully authenticates, this Password field is not considered; it's only considered when logging in as a local Workspace user, so it can be set to anything random and not shared. Be sure to also toggle OFF the setting Require password reset at next login or else the user will be prompted to set a password, even if they connect via SSO. For more information about user creation and management, see: User Management.

**System Settings** It is recommended to disable the user options in System Settings to Require passwords to be changed periodically so that SSO users won't be prompted to change their password. This feature is meant for non-SSO users.

**Sign In to a Workspace** Once their user account is created in the Workspace, a user may launch the PlanetTogether Sign-In Manager application and choose the SSO Login option from the Welcome screen. A popup dialog will appear for the user to login to their company's SSO account. Upon successful SSO login, the user may connect to an existing mapped workspace if they've already connected to one before, or they may connect to a server and add new workspaces to their Sign-In application for future connections. For more information, see: Client Sign-In Manager Application

**See Also** Contact Support Instance Manager User Management Client Sign-In Manager Application

## Software Package Management

### Source

Key Concept Each instance loads many software packages which determine what features and functionality are loaded into the instance workspace for end users. Each Package includes specific features and functionality which can be included or excluded by loading or choosing not to load the particular package. Custom packages may be developed in order to add or alter UI features, or alter scheduling or other system behaviors. These custom packages can be added to instances to customize the workspace users' experience. Alternatively, it may be desirable to remove packages if they were not purchased and licensed, or if schedulers and users simply don't use the features contained within the package and they want to reduce clutter in the UI and improve system performance. Jump to section: Add a Package Remove a Package Add a Package A package can be added to an installed software build so that it gets installed automatically on all instances created in that particular software version on the server, or it can be added to a specific instance after it's been created. In either case, a Package Folder must be created which contains a Version folder within it, then the compiled package .dll file contained within the version folder. All PlanetTogether compiled packages are required to start with the prefix "PT." in the file name. The Version folder name must only use numbers and decimals. Example MyCustomPackage → 1.0 → PT.MyCustomPackage.dll Once the Package Folder is created, it can be copied to the installed software build location where it will be included in all instances created in the associated software version moving forward (but will not be included in any existing instance that was created before the package was added here):

[INSTALL\_LOCATION]\Software\[VERSION]\Packages Example:

C:\ProgramData\PlanetTogether\Software\12.1.3.9\Packages Or, it can be copied to a specific instance folder where it will only be included for that specific instance: [INSTALL\_LOCATION]\[INSTANCE\_NAME]

[SOFTWARE\_VERSION]\System\Data\Packages Example: C:\ProgramData\PlanetTogether\TestInstance

12.1.3.9\System\Data\Packages If adding the package directly to an instance, then the instance service must be restarted before the package is loaded into the workspace for all users. Remove a Package Any number of packages may be removed from a specific instance so that the associated functions and features are removed for all users in that specific workspace, or packages can be removed from an installed software build so that any instance created on the server in that software version will not load the package(s). To remove a package from the software installation folder, remove the entire associated package folder from the installation location:

[INSTALL\_LOCATION]\Software\[VERSION]\Packages Example:

C:\ProgramData\PlanetTogether\Software\12.1.3.9\Packages To remove a package from a specific instance, remove the entire associated package folder from the specific instance folder: [INSTALL\_LOCATION]\[INSTANCE\_NAME]

[SOFTWARE\_VERSION]\System\Data\Packages Example:

C:\ProgramData\PlanetTogether\TestInstance 12.1.3.9\System\Data\Packages

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## Uninstall PlanetTogether

### Source

Key Concept Use this as a guide to uninstall the PlanetTogether Server software and/or Client and Client Sign-In Manager applications. Jump to section: Uninstall PlanetTogether Server Software Uninstall PlanetTogether Client Application Troubleshoot: Manual Uninstallation Uninstall PlanetTogether Server Software PlanetTogether can be uninstalled from Windows using an uninstaller application. This will automatically uninstall the PlanetTogether Services and delete the PlanetTogether installation folder, including all instance folders and data. Backup all data now before proceeding, if desired. Follow these steps to ensure the cleanest and most seamless uninstallation procedure: Stop services of all running instances Open the Instance Manager and ensure that all instance services are stopped. Run the uninstaller From Windows Control Panel, navigate to the Uninstall a Program section, or from System Settings navigate to the Apps & features section. Search for PlanetTogether. Select the application from the search result and click Uninstall. Optionally, the uninstaller.exe may also be found in the installation folder; typically: C:\ProgramData\PlanetTogether\Software\ServerManager The uninstaller will prompt the user to confirm y/n to proceed with the uninstallation. Type the letter y to confirm and press enter as prompted to proceed. Once the uninstallation completes, all Windows Services associated with the Server Manager and all instances are removed. All server software files and all instance data files are also removed. Instance data which was stored in the server manager settings database are also purged from the database tables, though the database itself will remain intact. Uninstall PlanetTogether Client Application The client application isn't a formal Windows application that gets installed and embedded into the Windows registry, so removing it is quite simple. All it takes is to remove or delete the entire folder of files where it was installed. The standard installation folder location is: %AppData%\PlanetTogether By simply deleting the PlanetTogether folder and all of its contents, the application is effectively uninstalled. Troubleshoot: Manual Uninstallation If the installation process fails for any reason, a user may need to uninstall each component manually. The process includes removing files and folders, as well as deleting associated Windows services. Software files and folders Open the Instance Manager and ensure that all instance services are stopped. Close all Windows applications which may be using files from the software installation location. In order to prevent additional Windows services deletion efforts later, it's recommended to use the Instance Manager interface to delete as many instances as possible. If one or more instances are returning errors or cannot be deleted though, then proceed with the manual deletion steps. Open Windows Services and stop the service called PlanetTogether Server Manager if it's currently running. Navigate to the installation location and delete the entire installation folder. The standard installation location is: C:\ProgramData\PlanetTogether In this case, delete the entire PlanetTogether folder. Windows Services Windows Services can be uninstalled by running an elevated command prompt or PowerShell (run as administrator). The command sc delete "Service Name" will remove the associated service. Collect a list of each Windows service that still exists and execute the sc delete command for each one individually. Each service's name will start with the text PlanetTogether. Example sc delete "PlanetTogether Server Manager"

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## Server Administration > Licensing

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## Manually Install License Key Files

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Key Concept If a server running the PlanetTogether server software is unable to download License Key files from the PlanetTogether license server (<https://licenseserver.planettogether.net:45455>) then the files may be downloaded and installed manually. Jump to section: Download License Key Files Install License Key Files Download License Key Files First, retrieve the appropriate license key files by navigating to <https://licenses.planettogether.com/> and entering the 12-character license key into the form input. Press Continue when ready. If the license key is valid, the next screen will contain a link to Download the license key files. Click it to download a .zip file containing the key files. Install License Key Files From the Instance Manager, stop the instance service if it's currently running. Navigate to the license key folder of the instance. From the software installation location, the license key files are located in the INSTANCE\_FOLDER\System\Data\Key directory. Optionally, backup any existing files in the folder by selecting them all then right-clicking any of the selected files and choosing Send to → Compressed (zipped) folder Finally, extract contents of zipped key files that were downloaded from the license server. If prompted, opt to overwrite all files of the same name. The instance service can now be started from the Instance Manager. Submit a Support Request If you are still experiencing issues, you will need to submit a support request to PlanetTogether's support team. Please fill out all of the required fields, and be sure to include: The license key(s) in question Details of the problem, along with any recent changes to the server or data model See Also Instance Manager

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## Server Administration > System & Network Requirements

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### IT Reference Guide

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Table of Contents: Hardware Selection Minimum Server Requirements Minimum User Workstation Requirements On-Premises Server Management Server Demands and Benchmarks Performance with many users Operating System Compatibility Cloud Installation Network Requirements Server Software Installation Licensing Data Sources Fail-over and Recovery Load Balancing Network Latency Secure Connections Service & Support Overview This guide will help IT personnel determine how their existing hardware and network infrastructure can be used or expanded to support PlanetTogether software. This guide will cover hardware requirements for a server and end user's computers, failover and recovery, and possible impact on users from limited networks. Content provided is for planning and informative purposes only. This guide does not contain step-by-step instructions for implementing or configuring PlanetTogether software features. References to the phrase 'PlanetTogether' in this document refers to the Advanced Planning and Scheduling software provided by PlanetTogether Inc. Note that this is not the PlanetTogether installation guide. Installation instructions can be found in the Getting Started section of this knowledge base. Hardware Selection The recommended hardware depends on if PlanetTogether will be running on a dedicated machine or sharing resources with other demanding applications. If running PlanetTogether on a dedicated machine, the Workstation recommendation is ideal. The server recommendation will provide better results if the engine runs other applications such as SQL Server, ERP software, or PlanetTogether clients (even on other isolated virtual machines). PlanetTogether may be run on virtual environments with no additional hardware requirements. Tip: CPU speed is the most impactful component on PlanetTogether performance. Therefore, faster CPU speeds will result in noticeable speed improvements. Investment in faster desktop hardware for the client application will be more valuable in user-perceived performance. The only noticeable impact of having a server slower than the client will be when publishing the schedule, as the server will have to catch up before the publish is started. This is especially important in cloud server environments since cloud servers with high-speed processors can be expensive. Minimum Server Requirements The minimum recommendation is a CPU with a speed of 2.3 GHz. PlanetTogether must be running on an environment with at least four dedicated CPU cores. In addition, the server should have at least 10 GB of free disk space per instance for transactional data files. Recommended Server Specifications Server CPU: Latest Intel Xeon 3.8 GHz or faster At least 4 cores should be

dedicated to the PlanetTogether environment At least 2 cores should be devoted to each instance of PlanetTogether running concurrently. OR Workstation CPU: Latest Intel i7, i9, or AMD Ryzen. 4.0 GHz or faster Workstations can help run PlanetTogether instances if performance is a top priority. Non-server CPUs often have faster speeds and better CPU cooling available. A high-end i9 can complete CPU-limited actions such as optimization at up to 5GHz, resulting in a significant performance gain over a higher core count server CPU. Memory Dedicated 32 GB if under 20,000 job operations across all active instances Dedicated 64 GB if over 20,000 job operations or using End User method 2 (below) Hard Drive A Solid State Drive is recommended Dedicated 50 GB of disk space if under 20,000 job operations across all active instances Dedicated 100 GB of disk space if over 20,000 job operations across all active instances Note: Actual memory requirements will depend on the data model and the number of instances running and other applications on the same server, such as SQL Server. Minimum User Workstation Requirements Minimum: 8 GB RAM, 2 Cores Recommended: 16 GB RAM, 4 Cores Scenarios with > 20k operations may require 32 GB RAM or more Tip: The client performs substantial calculations in processing a schedule optimization and will utilize parallel processing. Still, faster processors will always be better. More than four cores will allow the client to more quickly display additional data views at the same time but is not required. On-Premises Server Management PlanetTogether Data Volume Performance PlanetTogether's architecture is designed to provide the fastest possible responsiveness to users in data-intensive applications. All data is loaded into computer memory for processing that is much faster than disk-based operations that are common in traditional databases. The memory-resident data objects also have direct links to each other designed to allow for immediate access to needed information without relying on time-consuming lookups that are also common in many other traditional database systems. The software also utilizes multi-threading extensively. The result is that in most businesses, small or large, PlanetTogether will provide schedule optimizations and adjustments in minutes or even seconds, resulting in a system that is easier and more enjoyable to use. The most important factors affecting performance are: (1) the number of operations in the schedule, (2) the features in use, and (3) the computer hardware. Forwarding Proxy Configurations The PlanetTogether host server must have an open internet connection to the PlanetTogether License Server or else instances won't be able to start properly and will run in Read Only mode. The PlanetTogether Server Manager supports WinHTTP proxy configurations. If the host server is required to forward outbound traffic from installed applications through a proxy server, then the PlanetTogether host server's WinHTTP proxy must be configured to route outbound traffic to the PlanetTogether License Server domains through the forwarding proxy. This can be achieved by executing this command (with the appropriate proxy host name or IP and port) from an elevated command prompt: netsh winhttp set proxy proxy-server=":" bypass-list="licenseserver.planettogether.net;licenseserver2.planettogether.net" Server Demands and Benchmarks The hardware used to perform the following tests matched the Workstation Recommended Specifications above (both server and client components were installed on the Workstation). This first table shows your estimated optimize times based on data volume with minimal constraints. The model contained 100 resources with random need dates and minimal restrictions. The only way to be sure of actual performance and memory requirements is to build a representative model of the particular factory with the required features and substantial data volumes running on the computers to be used. This article provides tips for performance tuning. Example model data volumes from realistic models The following diagram shows realistic models containing multiple constraints. PlanetTogether End Users There are three common ways to run the PlanetTogether client application. In each case, the client computer needs access to the PlanetTogether server on the standard installation TCP ports. No other internet access is required. Allowing user access to planettogether.com may be helpful for online help and support resources. End users typically run a PlanetTogether sign-in application that automatically retrieves the latest client updates. This allows for upgrades to PlanetTogether without additional configuration or updates to the end user's computer. The sign-in application is not required, and users may also run the complete client application to connect to PlanetTogether. Users run PlanetTogether client on their computers Each user's computer should meet the minimum hardware requirements for PlanetTogether and the memory recommendation for workstations Users run PlanetTogether on the server machine In this setup, the Server hardware selection is recommended Each end-user should be using a separate windows user Users run PlanetTogether in a virtual desktop environment. Virtual desktops are supported; however, the client sign-in application stores information in the user's roaming AppData folders. As an alternative, users can run the complete client application to log in. This full client does not require information stored in user profiles but must be installed and accessible for each user. A note about ports: PlanetTogether uses TCP connections to communicate between clients, the server, data sources, and configuration programs. Port 7981 is the secure port to allow clients to connect to a PlanetTogether server. Ports 7980 is used on the PlanetTogether server only, and

no access outside of the server is required to it. Each instance of PlanetTogether runs on a single port. By default, the ports start in the low 4000's range, though this can be configured in the Instance Settings. Each instance port will need to allow incoming and outgoing communication to connecting clients. Performance with many users User scheduling actions are processed synchronously. If one user's activity is being processed, other users' scheduling actions will be queued and processed in sequence. PlanetTogether clients will remain responsive while scheduling actions are being processed. Users may continue to view and analyze certain data, run reports, and queue additional actions while other users' actions are in process, but certain data may not be visible until all queued scheduling actions have completed (for example, job details dialogs, the Materials view, and inventory plots may not be visible since the scheduling actions have a direct impact on the data that gets presented). Login speed may be impacted if many users attempt to log in to PlanetTogether simultaneously due to network bandwidth limitations. This is because each client will be retrieving the required application data from the server. If clients take too long to log in due to low bandwidth, consider staggering user logins or leave clients connected continuously to avoid the login process. Operating System Compatibility PlanetTogether server, clients, and associated programs run on the Microsoft .NET Framework (.NET 6.0 for older PT versions, and .NET 8.0 for software versions newer than 12.2.1.71). It is compatible with all Microsoft Windows operating systems that support this framework. However, a 64-bit operating system is recommended for better performance and future support. Cloud Installation Any virtual machine that meets the minimum hardware requirements and runs a compatible operating system is sufficient to handle PlanetTogether. The standard approach to installing PlanetTogether in the cloud is to use a Windows virtual machine on any cloud platform. Note that there is significant variability in the performance of cloud virtual machines. However, as CPU performance is an essential factor for the speed of PlanetTogether, cloud machines with fast computing performance are recommended.

Network Requirements PlanetTogether uses TCP connections to communicate between clients, the server, data sources, and configuration programs. The TCP ports used by PlanetTogether are configurable for each of these connections. Typical data volumes include: between 10 MB to 200 MB during startup of the client, 1 MB to 5 MB between the server and the import data source during queries of the data source, and minimal network during regular operation of a client. Server Software Installation Server software installation using our web installer requires access to the subdomains and the Licensing URLs below. An offline installer is also available if internet access is unavailable. <https://www.planettogether.com> <https://download.planettogether.com>

<https://deployment.planettogether.com> <https://ptwebhost.table.core.windows.net> Licensing The server application requires an active internet connection and access to: <https://licenseserver.planettogether.net:45455>

<https://licenseserver2.planettogether.net:45455> An active internet connection means continuous internet access while the instance is running. However, intermittent connection losses will not affect licensing if the server has connection issues; consult with a PlanetTogether engineer to determine any potential licensing problems.

Data Sources The primary data import and export source for PlanetTogether is Microsoft SQL Server. Version 2014 and newer are supported. A SQL Server installation is most likely required. Integrations to or from other data sources can be achieved through PlanetTogether integrations that use SQL Server as a staging database. Data can also be imported directly from Excel files. For Excel import, a data adapter that matches the Excel version is required. PlanetTogether can also export to an XML formatted data file for custom export processes. Integration services and methods vary; please consult with a PlanetTogether engineer to determine the ideal setup for your environment.

Fail-over and Recovery To assist in server failure, a standby PlanetTogether instance can be prepared for fast recovery. Backing Up PlanetTogether PlanetTogether automatically provides transactional data backups. These files reside on the PlanetTogether server. Transactional files should be backed up to a secondary location for recovery in case of a server failure.

Recovering PlanetTogether A second PlanetTogether installation is required in case of a server failure. The second instance can be pre-installed with the same configuration as the primary instance. However, it cannot be active while the primary instance is active. The latest transactional backup can be restored for recovery by taking the newest snapshot (scenario.dat file and/or transaction files) and applying it to the secondary instance. The secondary instance can then be started. Once started, the instance will become active automatically if the primary instance is offline. Clients connect to the instance by a server connection string. The connection string must be pointed to the new instance, or clients must use a unique connection string to access the secondary instance.

Load Balancing PlanetTogether does not support load balancing. Only a single server instance is running at once. PlanetTogether is a high-performance, memory-resident program capable of optimizing large amounts of data due to its in-memory objects. To allow for this capability, scheduling operations cannot be distributed among multiple services, and data is not stored in a shared database or store. In most situations, the high performance of PlanetTogether alleviates the need for load

balancing to achieve fast performance. If your application has a high volume of scheduled operations (more than 25,000, for example), testing the application in a Proof-of-Concept configuration is recommended. Network Latency Most user actions are not affected by latency or slow connections. However, users may experience a slight delay between attempting to act and when the action begins under inferior connections. A slow connection will more heavily impact the following steps: Client login: Slow connections may result in long login times for end-users. This action is the most heavily impacted. Depending on the connection limits, it may be preferred to stay logged in to the system. Data refresh: Depending on the amount and frequency of data brought into the system, import actions may take longer for users on a slower connection. Data export: This action is only affected by the server's network performance. Slow connections will result in longer publish durations. Unstable connections where network connections may be disrupted have varying effects. The server must have, at a minimum, a few-minute connection each day to the internet for licensing communication. Client's whose connection with the server is disrupted will not be able to perform actions. If the client's connection is disrupted for a long duration (configurable but generally 1-3 minutes), it will be disconnected from the server and need to log into the system again when the network connection is restored. Secure Connections PlanetTogether uses SSL (TLS) for all of its connections. PlanetTogether does not handle the transfer or the storage of files, but everything that PlanetTogether transfers is done via TLS connections. All customers are partitioned, and data is segregated. An SSL certificate is required during server software installation. To manage SSL connections and PlanetTogether's certificate, see the following setup instructions: Server Manager settings. Enforce TLS 1.2 PlanetTogether server will use TLS 1.2 by default; however, if a Client is running an older version of windows, it may request to use an older version of TLS. Older versions of TLS can be restricted by altering the CHANNEL registry keys in windows. Here is a reference: <https://docs.microsoft.com/en-us/windows-server/security/tls/tls-registry-settings#tls-dtls-and-ssl-protocol-version-settings> Go to the following section of the registry: HKLM SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols. You may have to create the TLS 1.0 and TLS 1.1 subkeys. Create them if they don't exist. Under each of those subkeys, create a Server subkey (if it doesn't already exist). In each Server subkey, create a DWORD called "Enabled" and set it to 0. This will disable the specific protocols referenced. HKLM SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\TLS 1.0\Server Enabled DWORD 0 HKLM SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\TLS 1.1\Server Enabled DWORD 0 A reboot may be required to take effect. Note that this will disable TLS 1.0 and 1.1 for all applications using CHANNEL on this server. Service & Support For ease of service and support during integration, implementation, and support/maintenance activities, VPN remote access to PlanetTogether application server and SQL Server is recommended. This typically is configured the following way: Windows Remote Desktop access with Administrator privileges Windows users must have administrator privileges on the server SQL Server authentication login/user read/write/owner access to PlanetTogether Staging Databases Ability to execute stored procedures, update, select, drop, insert, etc. Read access to linked servers and other data sources containing scheduling data. See Also System Performance SSL Certificate Management Server Software Installation Guide

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## SSL Certificate Management

### Source

Key Concept Any server or test machine that hosts PlanetTogether instances is required to be configured with an SSL certificate for increased security. The most secure option is to procure and install a signed and trusted certificate from an internal or external certificate authority which matches the server name and/or network address that users will use to connect to the PlanetTogether instances. Alternatively, a self-signed certificate can be generated and used which will require each user to configure an SSL thumbprint in their sign-in application in order to establish an SSL handshake with the server before they will be able to connect. Jump to section: Generate a Self-Signed Certificate Server Configuration Client Connections Generate a Self-Signed Certificate Disclaimer: This method is recommended for test machines only. It's advisable to purchase and install a valid SSL certificate from a trusted Certificate Authority in any production environment to ensure the highest security standards are maintained. This manual process requires local administrator rights on the device where the certificate is being generated and installed. Generate the certificate by following these steps: Begin by opening the Windows PowerShell application as an administrator From the PowerShell command prompt, enter the following: New-SelfSignedCertificate -DnsName PlanetTogether.local -FriendlyName PlanetTogether -CertStoreLocation cert:\LocalMachine\My This requires PowerShell v3.0 or higher. If the above command produces an error then try upgrading to the latest compatible version of PowerShell, then try again. Upon successful execution of the command, the certificate information will be presented. For example: The new certificate is now ready to be used with the PlanetTogether server configuration. Server Configuration During the server software installation, if the appropriate certificate information is not found and automatically populated in the installer at the Select Certificate screen then click the Find Certificate button. If necessary, choose the More choices link from the dialog and find the desired certificate. A prompt to install the certificate may appear. Proceed through the installation wizard, ensuring to opt to store the certificate for the Local Machine if prompted: Let the installer Automatically select the certificate store based on the type of certificate if prompted: Upon successful installation of the certificate, the information will be displayed in the PlanetTogether installer and software installation may resume. If PlanetTogether is already installed, a server administrator may associate a certificate with the existing server manager installation. Navigate to the Server Settings page of the Instance Manager (<https://localhost:7980/#/server-settings>) and click the Choose Certificate button under the Certificate Settings section. Select the desired certificate from the list and click Accept. After updating the certificate settings, be sure to Save the change from the Server Manager Settings. For trusted certificates, the certificate name must match the Instances Host Name value from the Server Settings. This value can be edited as needed; it does not need to match the Server Name exactly. Be sure to Save the change from the Server Manager Settings page if any edits are made. Manual Service Restart Any changes made to the Server Manager Settings will require you to restart the PlanetTogether Server Manager Windows service before the changes are applied. Client Connections The value of the Instances Host Name must be the same value used in the Server field from the Sign-In Manager Application when users connect externally to instance workspaces hosted on the server. When running the Sign-In Client Application on the server directly, the Server field may optionally be set to "localhost". If using a trusted certificate then the SSL handshake should be established without any additional configuration. If using a self-signed certificate then users will be required to enter the Certificate Thumbprint into their client application in order to establish an SSL handshake between the client and server. The thumbprint is exposed in the Server Manager settings screen in the Instance Manager and must be shared with each user so that they can paste it into the Options section of the Sign-In Manager Application. See Also Server Installation Guide Instance Manager Server Administration Client Sign-In Manager Application

## System Performance

### Source

Key Concept This article describes which factors contribute to software performance as well as some guidelines to configure the settings in a way to optimize performance for all users. Jump to section: Computer Hardware System Settings Computer Hardware Please pay special attention to the processor speed and memory (RAM) requirements, as these tend to have the greatest impact on the performance of the software. In particular, be aware of the following: Most CPUs now have on-die memory controllers; whether or not that memory controller is a dual channel or triple channel will affect the amount of RAM to get. For example, a dual-channel controller will typically support 2-stick or 4-stick configurations (2x4, 2x8, 4x2, etc.). A triple channel controller will typically be in 3-stick or 6-stick configurations (3x2, 3x4, etc.). If you use more than 3GB of RAM, you will need a 64-bit operating system to take advantage of the memory. Software Settings The following features and data have a significant impact on performance: A high volume of Jobs and Operations Custom software packages (extensions) Overlap by Transfer Quantity (Job Production Overlap) Max Delay MRP Optimization Scheduling on multi-tasking resources Having many boards and tiles open which require continuous refreshing as the schedule changes Gantt Labels that are calculation-intensive The following are ways to improve performance: Use shorter Optimize release limits Use the Simplify Gantt Options Shorten the Planning Horizon or MRP Cutoff Date Hide columns in grids; or manual refresh of grids Reduce the number of undo-sets or the number of actions to store per undo set to slightly speed up the system and undo/redo at the cost of less history Model single-tasking resources instead of multitasking resources In KPI visibility settings, KPIs can be set not to calculate. That will help reduce the processing. Fewer scenario copies will reduce data Refresh time Simplify the constraints used as much as possible If many manual changes are needed, unschedule jobs outside the time period of focus during the manual changes and then add them back to the schedule when done. Split off independent Resources/Job/Items into a separate Instance Analyze your need for manual changes and try to automate them Use computers with faster processors (and more memory and cores if memory is an issue) See Also IT Reference Guide System Settings User Settings User Management Software Package Management

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## Server Administration > Workspace Instance Management

### Audit Log

#### Source

Key Concept Each PlanetTogether instance workspace can be configured to log user activity and errors to an Audit Log database. This can be helpful to understand user actions, behaviors, and trends over time, or to analyze errors of the system that users may experience. Database Configuration A server administrator may create or designate an existing SQL database to act as the Audit Log destination for the PlanetTogether instance workspace(s) to log data to. One Audit Log database can be used for multiple instance workspaces, if desired. The data that gets logged is labeled to easily query and filter on specific instance workspaces and software versions, as needed. No tables, views, or stored procedures need to be created. All that the PlanetTogether instance workspace needs is an existing SQL database destination and it will create tables and the appropriate schema within the configured database as needed. If one does not exist, create a new empty database with any configuration. When the instance workspace inserts records into the database tables, it will insert them into the following tables:

InstanceLogs: This table contains all error log entries from errors encountered by connected clients.

InstanceServiceLogs: This table contains entries of users signing in and out of the instance, and the instance service starting and stopping.

TransmissionLog: This table contains all user transmissions (actions) as they perform actions from their connected client machines. Instance Workspace Configuration A server administrator may enable audit logging from the Other tab of the Instance Settings dialog, as shown here: Enter SQL database information via the Logs Database Settings dialog. Build Server Name: Enter the computer name of the server that hosts the SQL data, or use "(local)" or "localhost" if the SQL data is hosted on the same server as the PlanetTogether instance. If the SQL server uses SQL Express, then the Server Name will need "SQLEXPRESS"

appended to the end. For example: "localhost\SQLEXPRESS" Database Name: Enter the name of the database. Integrated Security: When disabled, authentication to the specified SQL server and database is established via the User Name and Password fields of this database settings dialog which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the System service of the instance. By default, the Windows user is the standard Local System user which typically does not have access to SQL databases. Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well. Encrypt: Choose whether to encrypt the connection to the SQL server. This can usually be disabled, but some SQL server security settings may require it to be enabled. User Name: With Integrated Security disabled, enter the user name of the SQL user with appropriate permissions to access the specified database on the server. Password: With Integrated Security disabled, enter the password of the SQL user with appropriate permissions to access the specified database on the server. Custom Use Custom Connection String: Check this box to allow the instance to use the custom connection string input rather than the connection string builder. Text input: Enter a custom connection string to use to establish a connection to the data source. Test: Click the Test button to test the database configuration to ensure a connection can be established successfully. Note that this does not test that the user has all appropriate SQL permissions, only that the connection can be established to the database using the credentials provided. Note that the Test button may not be active/available when using Integrated Security if the instance System service is not started since SQL authentication is established by the Windows service itself rather than a SQL user. Audit Log Database Schema Table: [dbo].[InstanceLogs] Field Name Data Type Description InstanceName nvarchar(MAX) Name of the instance workspace SoftwareVersion nvarchar(MAX) Software version of the instance workspace TypeName nvarchar(MAX) Log entry type Message nvarchar(MAX) Log entry message StackTrace nvarchar(MAX) Log entry stack trace Source nvarchar(MAX) Source of the log entry InnerExceptionMessage nvarchar(MAX) Log entry exception message (for exception type errors) InnerExceptionStackTrace nvarchar(MAX) Log entry exception stack trace (for exception type errors) LogType nvarchar(MAX) Log entry log type category HeaderMessage nvarchar(MAX) Log entry header message Timestamp datetime Log entry timestamp Table: [dbo].[InstanceServiceLogs] Field Name Data Type Description InstanceName nvarchar(MAX) Name of the instance workspace SoftwareVersion nvarchar(MAX) Software version of the instance workspace Message nvarchar(MAX) Log entry message EventType nvarchar(MAX) Log entry event type category Reason nvarchar(MAX) Log entry reason description TimeOfEvent nvarchar(MAX) Timestamp of the event occurrence DurationSinceStart nvarchar(MAX) Duration since the start of the associated user session Timestamp datetime Log entry timestamp Table: [dbo].[InstanceServiceLogs] Field Name Data Type Description InstanceName nvarchar(MAX) Name of the instance workspace InstanceVersion nvarchar(MAX) Software version of the instance workspace ScenarioName nvarchar(MAX) Name of the instance workspace scenario where the transmission was sent from Username nvarchar(MAX) Username of the user who triggered the transmission Description nvarchar(MAX) Description of the transmission ScenarioType nvarchar(MAX) Scenario type indicator (Production or not) TransmissionType nvarchar(MAX) Transmission type indicator Details nvarchar(MAX) Details of data modifications impacted by the transmission Timestamp datetime Log entry timestamp TransmissionNumber bigint Sequential transmission number reference See Also Instance Manager

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## Instance Manager

### Source

Key Concept The Instance Manager is used to create and configure Instances of the PlanetTogether software application on a server or test machine. An "Instance" in this context is a single copy or iteration of the PlanetTogether software running on a physical or virtual server or computer. Jump to section: Accessing the Instance Manager Dashboard Instance Management Instance Actions Menu Create a New Instance Copy an Instance Upgrade an Instance Instance Settings Log Viewer License Manager Bulk Update Settings Server Manager Settings Accessing the Instance Manager The instance manager can only be accessed from the same server or

test machine where the PlanetTogether Server Manager application has been installed. It is accessed in any web browser at the following URL: <https://localhost:7980> Users may be prompted that the connection is not private. Depending on the browser used to access the Instance Manager, a slightly different message may appear but it can safely be ignored. In Chrome, click the Advanced button and choose the link to Proceed to localhost (unsafe). The Instance Manager will open. These warnings can be avoided in various browsers by enabling an advanced setting: Chrome Go to chrome://flags/#unsafely-treat-insecure-origin-as-secure and enable the option to Treat given (insecure) origins as secure origins and enter <https://localhost> as a domain to treat as secure. Edge Go to edge://flags/#unsafely-treat-insecure-origin-as-secure and enable the option to Treat given (insecure) origins as secure origins and enter <https://localhost> as a domain to treat as secure. Dashboard The Dashboard acts as the 'home' page of the Instance Manager. This can always be accessed by clicking the Home button on the left main navigation menu. The dashboard pie charts show each started, stopped, and erroneous Production and Test instance for a quick overview of the number of active and inactive instances configured on the server. The lower half of the dashboard displays an overview of the number of users that are actively connected to each instance. Instance Management Access the Instances page where instances can be created, edited, and deleted by clicking the folder icon from the left navigation menu to be taken to <https://localhost:7980/#/instances>. Instance Actions Menu From the list of instances, click once on any instance to select it to reveal a menu of action buttons. Stop Stop the instance service to effectively shut it down. Users will not be able to connect to the instance until it is started again. Start Start the instance service to allow users to connect to it. Edit Open the Instance Settings dialog box to configure various aspects of the instance. Logs Open the Log Viewer dialog box to view warning and error messaged logged by the selected instance. Copy Create a copy of the selected instance for the purpose of testing or upgrading to a new software version. See: Copy an Instance Upgrade Upgrade the selected instance to a new software version. See: Upgrade an Instance Delete Delete the selected instance. Once confirmed, the deletion cannot be undone nor can the data be retrieved if it was not backed up somewhere prior to the deletion. Create a New Instance To create a new instance, navigate to the Instances page from the left navigation and click the New Instance button. A dialog will pop up with configuration options. Version: Select the desired version from the dropdown of installed versions Instance Name: Name the Instance to identify it among others Integration Code: Select the desired integration from the dropdown of installed integrations (typically "PlanetTogether") Scenario File: Select New Scenario to start from a blank scenario, or select Browse Disk to use the file picker to choose an existing .dat file to load into the instance Environment Type: Choose whether the instance will represent a Production, Development, or QA environment. This is for informational purposes only and has no effect on the functionality of the instance. Workspace Profiles: Select from available standard user Workspace Profiles to pre-load for all new users of the Instance Serial Code: Enter a valid license serial code Start Instance Service: Indicate whether or not to start the instance service immediately upon its creation Once the options are defined, click the Create button. The new instance will be added to the grid list. Copy an Instance New instances can be created as copies of existing instances, typically for testing purposes where a server administrator might adjust some of the settings in the instance to see how a change might behave. To Copy an existing Instance, navigate to the Instances page and click once on any Instance from the grid to select it, then click the Copy button from the actions toolbar. Note: It's advisable to Stop the instance service before proceeding to ensure all current data gets copied to the new instance. A dialog similar to that of the New Instance dialog will appear to configure the new instance. One notable difference is that the Scenario to Load dropdown will now contain a Keep Scenario option which will effectively copy the latest scenario file from the existing instance. Otherwise everything is the same and can be configured independently of the original Instance as needed. Instances which are created as copies of other instances in this manner will run on their own unique port so they can be run on the same server at the same time (license restrictions permitting). Upgrade an Instance New instances can be created by upgrading existing instances, typically used when upgrading a production instance to a more recent software version of PlanetTogether. In fact, the Upgrade option only works if a new software version has already been downloaded and installed, otherwise just use the Copy button for other testing and more flexibility in what can be configured with the newly created instance. To Upgrade an existing Instance, navigate to the Instances page and click once on any Instance from the grid to select it, then click the Upgrade button from the actions toolbar. Note: The instance service is required to be stopped before proceeding since the new instance will be created to use the same port as the existing instance that is being upgraded. A simple Upgrade Instance dialog will appear to select the software version of the new instance. No other options or settings can be configured. After selecting the software version, click the Upgrade button to proceed to create the new instance. Instances which are upgraded in this manner will be configured to run on the same port as the instance that was selected to be upgraded so only

one can possibly run at a time unless the port assignment is manually changed. If it was previously enabled, the instance setting to [ ] Automatically start service after server reboots will be disabled on the original instance which was upgraded, but will remain enabled on the newly created instance. Instance Settings There are many options and settings to configure for a PlanetTogether Instance. No changes are required from the default settings in order to run the instance and have users connect to it, though their ability to utilize all functions and features of the software will be limited without updating some of the options in the Instance Settings dialog. The most important settings are those connecting to the SQL data source to fetch data from an integrated ERP system, and to connect to a SQL Publish database where completed schedules can be published to so that they can be fetched by ERP systems and/or shared with shop floor workers. Jump to Instance Settings section: Data Import Data Publish Service Configuration Client Connections Diagnostics Audit Log Backup Start-Up Other To modify the settings of an instance, navigate to the Instances page and double-click on any Instance row from the grid, or click once to select it and click the Edit button from the actions toolbar. Data Import Configure Import database connections to link the instance to a master data source. Data Source Enter SQL database information via the Import Database Settings dialog to act as the data source for the instance. This database connection is used during the Refresh process to pull data from a SQL database into PlanetTogether. Program to run before import: An optional input to run a program or batch file from the server prior to each data Refresh/Import operation. This input accepts a fully qualified path to the .exe, .bat, or similar program executable file. Program arguments: Optional arguments that can be passed to the program which gets run before each data Refresh/Import. Run SQL before import: When enabled, a SQL command can be executed before each data Refresh/Import operation as defined in the next SQL to run before import input field. SQL to run before import: A SQL statement that will be executed by the SQL server before each data Refresh/Import operation. Note that if both a program and a SQL statement are configured to run prior to each data Refresh/Import then the program gets run first, followed by the SQL statement. Import URLs Pre-Import URL: The API URL to call prior to each data Refresh/Import. Post-Import URL: The API URL to call after to each data Refresh/Import. Data Publish Configure the Publish database connection to link the instance to a publish destination. Optionally, configure an Analytics database as a secondary publish destination. Data Export Enter SQL database information via the Publish Database Settings dialog to act as the data publish destination for the instance. This database connection is used during the Publish to SQL process to push data from within PlanetTogether out to a SQL database. Export URLs Pre-Export URL: The API URL to call prior to each data Publish. Post-Export URL: The API URL to call after to each data Publish. Analytics Export The data published to the standard Publish database is the same data that gets published to the Analytics database. Analytics may be published to more or less often depending on how organizations prefer to generate analytical reports from the data. Enter SQL database information via the Analytics Database Settings dialog to act as the analytics publish destination for the instance. This database connection is used during the Publish Analytics operation where schedules and other data may be published to a separate database that is connected to external analytical tools for additional insights and analysis. SQL Command to Run after Publish: A SQL statement that will be executed by the SQL server before after each publish to the analytics database. Analytics URL: Timeout seconds per table: Define the number of seconds that the Publish process may wait to complete before timing out and moving on to the next table. Auto-Publish Every: Define a number of hours and/or minutes to automatically publish data to the analytics database. If both values are 0 zero then auto-publish will be disabled. If either value is greater than 0 zero then auto-publish will be enabled. Database Settings Dialog There are a handful of Database Settings dialogs throughout the Instance Settings window that are each used for various purposes, but each use the same configuration logic. A connection string builder form is offered for simple connection configurations, or a custom connection string entry is also offered. Build Server Name: Enter the computer name of the server that hosts the SQL data, or use "(local)" or "localhost" if the SQL data is hosted on the same server as the PlanetTogether instance. If the SQL server uses SQL Express, then the Server Name will need "SQLEXPRESS" appended to the end. For example: "localhost\SQLEXPRESS" Database Name: Enter the name of the database. Integrated Security: When disabled, authentication to the specified SQL server and database is established via the User Name and Password fields of this database settings dialog which accept a SQL user's login credentials. When enabled, authentication to the specified SQL server and database is established via the Windows user credentials that are used to start and run the System service of the instance. By default, the Windows user is the standard Local System user which typically does not have access to SQL databases. Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. Whichever method is chosen, the user whose credentials are used will need to be able to read and write to the database, including the ability to create tables. At minimum, the

user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well. Encrypt: Choose whether to encrypt the connection to the SQL server. This can usually be disabled, but some SQL server security settings may require it to be enabled. User Name: With Integrated Security disabled, enter the user name of the SQL user with appropriate permissions to access the specified database on the server. Password: With Integrated Security disabled, enter the password of the SQL user with appropriate permissions to access the specified database on the server. Custom Use Custom Connection String: Check this box to allow the instance to use the custom connection string input rather than the connection string builder. Text input: Enter a custom connection string to use to establish a connection to the data source. Test: Click the Test button to test the database configuration to ensure a connection can be established successfully. Note that this does not test that the user has all appropriate SQL permissions, only that the connection can be established to the database using the credentials provided. Note that the Test button may not be active/available when using Integrated Security if the instance System service is not started since SQL authentication is established by the Windows service itself rather than a SQL user. Service Configuration This section allows adjustments to the instance "System" Windows service settings. Server Port System Service: The port on the server or test machine that is used to run the instance System service. Logs Status: A flag icon indicator that shows whether or not there are any warning or error messages in the instance service log files. Hover over the icon to view the number of logged messages. A gray icon indicates no messages are logged, while yellow indicates one or more message is logged. Service Status: A visual indicator of the service status (Active, Started, Stopped, Starting, Stopping). Actions Start/Stop: Start or Stop the instance service (Start will be available if the service is currently stopped, while Stop will be available if the service is currently running). Logs: Open the Logs dialog to view warning and error messages in the instance service log files. Start Service Automatically Start Service after Server Reboots: When enabled, the System service of the instance will automatically start when the server or PC reboots, or when the PlanetTogether Server Manager service is started/restarted. Start Service Timeout (in seconds): Define a number of seconds to wait before attempts to start the instance Service timeout. A value of 0 zero indicates that attempts will never timeout. Serial Code: The license key serial code used to run the instance. Environment Type: Choose whether the instance will represent a Production, Development, or QA environment. This is for informational purposes only and has no effect on the functionality of the instance. System Service Logon As Used for Integrated Security SQL authentication. Username: The username of a Windows user to run the System service as. Password: The password of the Windows user to run the System service as. Client Connections Adjust how users are allowed to connect to the instance. Credentials Update Admin Credentials: The instance service must be running for this option to be active. Use this to reset any administrative user's password as a means to either quickly change the password for security reasons, or to gain access where maybe it has been lost. Add App User: Web App users cannot login or access the Client application like a scheduler can. They can only be used to perform API calls to web-based integration applications. Server administrators may use this button to quickly add App users as needed without having to connect to the instance and create the user(s) from the client application directly. Timeouts Client Timeout (in seconds): The number of seconds to wait before users' attempts to connect to the instance time out. Web API Timeout (in seconds): The number of seconds to wait for API connection requests to this instance to respond back with the requested data. User Login Allow Single Sign-On: When enabled, SSO can be used to connect to the instance. Requires a valid SSO certificate to be installed. Single Sign-On Certificate: Displays the thumbprint of the SSL certificate used to validate SSO connection requests. Use the search icon to browse existing installed certificates and select an appropriate one for SSO validation. For more information, see: Single Sign-On (SSO) Integration Diagnostics Enable additional logging to better track user activity and/or automatically submit errors and usage statistics to the PlanetTogether development team. Diagnostics Service Enable Diagnostics: When enab

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## Migrating from Version 11

### Source

Key Concept Generally speaking, all Version 11 data from versions 11.50.20 and newer with the exception of Extensions is compatible with Version 12. This includes scenario data as well as the integration mappings file (APSInterfaceSettings.xml) and import and publish databases. Use this guide to upgrade an instance from Version 11 to be used in Version 12. Jump to section: Server and Client .NET Upgrade Requirement Scenario Compatibility

Requirements Integration Changes Instance Services Instance Start-Up Type Folder Structure File Names and File Types Known Exceptions Unavailable Features .NET Upgrade Requirement Version 12 requires an upgrade to .NET from version 4.8 to 6.0.4 (or newer) for both the Server Manager and the Client applications. For more information, see: Desktop Client Installation Guide Server Installation Guide Scenario Compatibility Requirements Version 12 only supports scenarios that were created in version 11.52.28 or newer. When attempting to upgrade from an older version, the scenario must first be loaded in an instance running 11.52.28 or newer, then saved from Version 11. All Version 11 and older scenarios can be loaded in 11.52.28 or newer, and it's just a matter of loading the data in the new version then stopping the instance services so that a new scenarios.dat file is written using the new version's serialization logic. Process steps to Serialize a Version 11 Scenario for Version 12 If necessary, use the Version 11 web installer to download and install a compatible version (11.52.28 or newer) If necessary, create a new Version 11 instance running a compatible version Locate a scenarios.dat file from the existing non-compatible version, then load it into the compatible Version 11 instance Start and stop the instance services The resulting scenarios.dat file that gets written to the INSTANCE\_NAME\System\Data\Scenario folder is now compatible to use in a Version 12 instance. See the Instance Start-Up Type section below for additional considerations when loading a Version 12 instance from a scenarios.dat file. Integration Changes The Import Mappings configuration file APSInterfaceSettings.xml from the INSTANCE\_NAME\IntegrationFiles\ folder of the Version 11 instance can act as a good starting point for the migration to Version 12. The instance folder structure between versions is the same, so the file location will be the same in both versions. Much of the property mappings have not changed, but some modifications may be required in order to allow data refreshes from SQL to function properly. These are each of the integration changes that may need accounted for: Colors. In Version 11, colors were identified by their RGB values. In Version 12 they are identified by their hexadecimal code values. Color names like "White", "Blue", "Red", etc. are still supported, or colors may be imported as hexadecimal codes with transparency (e.g. '#FFFFFF' for White with no transparency, or '#FFDC143C' for Red with no transparency). Click here to download an Excel sheet that contains ~140 hexadecimal code mappings to color names. Customers. In Version 11, customers, vendors, and suppliers were represented as strings of text associated with jobs, sales orders, CTPs, and purchase orders. In Version 12 we've introduced Customer Objects which can be imported from a SQL data source mapped via the Customer Mappings sections of the Import Mappings Board, and/or managed via the Customers Board. Customers, Vendors, and Suppliers are now associated with their object names and unique IDs. Associate one or more Customers to each Job via the Customer Connections Mappings section of the Import Mappings Board, or manually choose customers to associate with jobs via the Job Details dialog. Associate one Customer to each Sales Order via the Sales Order Mappings section of the Import Mappings Board, or manually define a customer from the Sales Order Details tile of the Sales Orders Board. Associate one Vendor or Supplier via the VendorExternalId property of the Purchases to Stock Mappings section of the Import Mappings Board, or manually define a vendor from the Purchase Orders Board. Associate one Customer to each Forecast via the Forecast Mappings section of the Import Mappings Board, or manually define a customer from the Forecast Manager tile of the Inventory Plan Board. Attributes. In Version 11 and early releases of Version 12, Attributes could be assigned to Resources and Operations. In the latest Version 12 release, Attributes are first imported as stand-alone objects in the data model, then those Attribute objects can be assigned to Operations. Resource Attributes have been deprecated (User Defined Fields can still be assigned to Resources). Resource Capacity / Capacity Intervals. In the latest Version 12 release, capacity intervals have been redesigned to be more configurable and flexible so that they can be assigned specific types of work. Capacity Interval Presets can be assigned to quickly define the type of work that each interval can do, or each new option may be configured individually. Resource Connectors. Resource connectors specify a flow relationship between two or more resources. A resource can have connections to one or more downstream resources which can enforce the following scheduling constraints: Which resource(s) successor operations of the same manufacturing order can be scheduled Which resource(s) may consume material from a producing tank resource The number of simultaneous material allocation connections which can be made from a tank resource to consuming operations Compatibility Codes. Compatibility Code Tables define lists of Operation Compatibility Codes which are either allowed or disallowed to schedule concurrently within a group of resources. Resources may be assigned one or more Compatibility Code Tables, and each table may be assigned to any number of resources. Frozen Span / Stable Span. The Frozen Span system setting is removed in Version 12 in favor of mapping department-specific frozen spans for each department. The optional Plant Stable Span is still an option. Setup Efficiency Multipliers. Setup time efficiency multipliers on resources is diverged into two settings: ActivitySetupEfficiencyMultiplier and ChangeoverSetupEfficiencyMultiplier. Additions, removals, and updates to all imported and published fields can be

reviewed in these standard integration change reports: Import Mappings Comparison Report: 11.52 vs. 12.2.1 Publish Database Comparison Report: 11.52 vs. 12.2.1 Instance Services Where all Version 11 instances used 5 services (Interface, Extra Services, Client Updater, Scheduling Agent, and System) Version 12 only uses 1 - a System service. Where Version 11 instance services used ports in the 8000-8999 range, Version 12 instance services use ports in the 4000-4999 range. Where Version 11 instance services started with the text APS (e.g. "APS Instance Name 11.50.20 Extra Services") Version 12 instance services begin with PlanetTogether. Instance Start-Up Type Version 11 would always default to start up by loading the scenarios.dat file in the "Scenario" folder. This file would only ever be updated with a new version when the instance services were stopped gracefully. This caused problems when a power outage or other unexpected server disruption caused the instance services to shut down without giving the system a chance to save the latest data in a new scenarios.dat file. This in turn would force a server administrator to intervene and manually restore the data from a Recordings folder backup. Version 12 now starts up from the latest Recordings folder by default if a folder of files exists. If no folders of recordings exist then it loads from the Scenario folder. If neither exist then it loads a blank scenario. By loading from Recordings, if ever the instance service or server shut down unexpectedly, no manual intervention is necessary to restore the scenario data to its most current/recent state -- the system will automatically load from the latest recorded scenario file and play back any user actions which may have been performed since the last saved backup. Considering the new default start-up mode for Version 12 loads data from Recordings, in order to load a Version 11 scenarios.dat file from the Scenario folder of the Version 12 instance, the contents of the Recordings folder will need to be removed if the instance was ever started from a blank or demo scenario. A new feature of the Version 12 Instance Manager is that administrators may now choose to browse the local disk to pick a scenario file that should be used as a starting point when creating new instances. Steps to manually load a scenarios.dat file: Stop the instance service Copy the scenarios.dat file to the Scenario folder of the Instance installation (typically %ProgramData%\PlanetTogether\INSTANCE\_NAME\System\Data\Scenario) Delete all folders of files inside of the Recordings folder of the instance (typically

%ProgramData%\PlanetTogether\INSTANCE\_NAME\System\Data\Recordings) Start the instance service Alternatively, the instance can be configured to use the old start-up method by changing the start-up type to Scenario from the instance settings dialog. Folder Structure The folder structure of Version 12 instances is the same as Version 11 instances, though Version 12 does reduce the number of files and folders necessary since there are fewer instance services that need files stored. Where Version 11 instances were stored on the hard drive under a PlanetTogether APS folder, Version 12 instances are stored on the hard drive in a folder named simply PlanetTogether. File Names and File Types All file names and types of files within each instance folder are the same in Version 12 as they were in Version 11. Known Exceptions Some data from Version 11 scenarios will not be available when you load the scenario file in Version 12. These will need to be reconfigured manually in Version 12 to ensure the same experience between versions. This data includes: Instance settings Workspaces (now considered "Workspace Profiles") Layouts and Alerts Gantt Labels and Tooltips Optimization Rules (now considered "Optimize Factors" of "Sequencing Plans") Permissions, settings, and options User permissions User settings System options System settings User Optimize settings (including MPS/MRP Optimize and Compress settings) Publish options Operation attributes (see: Attributes) Unavailable Features Some Version 11 features are not made available in Version 12. Some may be added back later, while others are not planned to be included. In-app reports: Reports which were developed using DevExpress Report Designer and offered in Version 11 from the application interface are not currently supported. Those include: Job Travelers Report, Production by Product report, Changeover Schedule, and Late Job report. Many similar report tiles exist in Version 12, and with the Version 12 web application, any report can be designed using Microsoft's Power BI with the published schedule data as the data source. Job Eligibility Dialog: Version 11 had an "Eligibility" dialog in the Jobs View which helped to visualize where a selected job was eligible to schedule. We plan to construct a more useful tool to help to visualize the same data and more in a future release of Version 12. Sheets View: Version 11 offered a "Sheets" view to allow for very simple Plant, Department, Resource, Template, Item, and Job imports via a spreadsheet view built into the PlanetTogether Client application. Version 12 will soon allow for much more robust/complex imports from an Excel spreadsheet without a SQL component required. This is estimated to be released by the end of Q3 2023. Shop Views: The Shop Views application that was available for Version 11 is not planned to be released for Version 12. A web-accessible schedule is planned to be developed which will first roll out with read-only capabilities but will eventually allow for shop floor progress reporting. Visual Factory: Visual Factory mode cycled through various views and screens on a timer. This was handy to run on a shared monitor on the shop floor so that it would cycle through various views of the schedule for various departments. It was not a widely used

feature, and we'll be offering a web application view of the schedule for PT Cloud hosted customers, so it was removed. Scenario History: In V11, the "Scenario History" board listed user interactions over time. The same data can be tracked in SQL in V12 by configuring a Diagnostics Logs database in the Instance Manager. Standard Gantt flags: Custom Gantt flags can still be created via extensions. Schedule "Commit": An option to "Commit Schedule" was available in the Scenario dropdown of Version 11 which set a "CommitStart" and "CommitEnd" date on all scheduled activities. These dates could then be used to realize "Commit Drift" when schedule changes occurred that impacted the timing from the originally committed scheduled points in time. Eventually we want to reintroduce this feature along with some ways to visualize commit date drifting via Gantt highlighting and a schedule adherence report and/or KPI. User Collaboration/Chat: Version 11 offered an in-app chat feature but this has since been removed as most organizations already use their own third party applications for company chat and communication. Auto-Generate Forecasts: Version 11 supported integration with a 3rd party software called "R" in order to analyze sales orders in the data model and generate forecasts based on trends/patterns it found in the quantities required per item in the sales orders objects. This will not be supported in Version 12 since it requires the 3rd party integration, though auto-forecasting can be developed as a custom package/extension of the core product to suit a customer's specific needs. Active Directory Authentication: Active Directory authentication has been removed. The only supported authentication methods are Single Sign On and PlanetTogether users (created and maintained manually in each instance).

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## Restore a Scenario from a Recording Backup

### [Source](#)

Key Concept PlanetTogether instances are typically configured to save automatic backups of Scenario files in case of emergency. Backup frequency and other settings are configured in the Backup/Diagnostic Recordings section of the Instance Settings screen. Note that the instance Start-Up Mode ("Normal" or "Scenario") will also play a factor in how to restore the instance from a backup file. Jump to section: "Scenario" Start-up Type "Normal" Start-up Type Process Steps The strategy to restore an instance back to a recorded point in time may differ depending on the System Start-up Type setting on the instance. If the Start-up Type is Scenario then it's as straightforward as copying an old scenario file from a folder of recordings and pasting it into the appropriate Scenario file to overwrite the existing one. If the Start-up Type is Normal though then recordings files and folders may need to be moved or deleted so that when the system starts up again it will start from an older point in time. It might be easier to temporarily set the Start-Up Type to Scenario during the backup procedure if it's currently set to Normal, then change it back to Normal once the scenario has been successfully restored. For more information about the Start-Up Type, see: Instance Manager: Instance Settings - Start-Up "Scenario" Start-Up Type Stop the instance service in the Instance Manager (beware of any connected users): Locate a TIMESTAMP.scenarios.dat file from the instance Recordings folder on the server. The location can vary depending on which disk drive the software has been installed on, but can generally be found under C:\ProgramData\PlanetTogether\[Instance Name]\System\Data\Recordings Locate the Recordings folder and select the desired file based on the Date modified and the date and time that the desired version may have been saved. Copy the TIMESTAMP.scenarios.dat file from the Recordings folder and paste it into the Scenario folder (back two folders into Data and then into Scenario). Rename (to back up) or delete the existing scenarios.dat file, then rename the copied TIMESTAMP.scenarios.dat file to be named scenarios.dat. Restart the instance service from the Instance Manager: "Normal" Start-Up Type Stop the instance service in the Instance Manager (beware of any connected users): Locate a TIMESTAMP.scenarios.dat file from the instance Recordings folder on the server. The location can vary depending on which disk drive the software has been installed on, but can generally be found under C:\ProgramData\PlanetTogether\[Instance Name]\System\Data\Recordings Locate the Recordings folder and select the desired file based on the Date modified and the date and time that the desired version may have been saved. Move or delete all files from the folder which were created after the selected TIMESTAMP.scenarios.dat file so that it becomes the last/most recently created file in the folder. Restart the instance service from the Instance Manager: See Also Instance Manager Server Administration

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## Software Releases & Roadmap > Product Roadmap

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### Early Access Program

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**Key Concept** The PlanetTogether Early Access Program is designed for PlanetTogether customer and partners users interested in experiencing new features and software updates before they are released for general availability. To facilitate this, special Early Access versions of PlanetTogether will be made available to members of the program. Early Access versions will be updated periodically as significant changes are introduced. **Goals:** Provide a preview of new features so partners and users can become familiar with the software before the next official version is released. Allow for initial feedback on changes. **Early Access Version** An Early Access version is a pre-release of the next version of PlanetTogether that may be in one of several stages of development. As such, it's not recommended for production environments without very careful testing and consideration. Each version may have a specific purpose related to a new feature or change. Key changes will be identified in the email sent out to members when a new version is available for download. A complete list of changes is made available in the associated software version **Release Notes** page. **Requirements & Registration** To use the Early Access Version in a local environment, you must be a current PlanetTogether Customer or Partner with a PlanetTogether software license with the appropriate Early Access entitlement. Any PlanetTogether cloud-hosted customer may request that any of their environments be upgraded to an Early Access version by requesting it from our Cloud Operations Support team. If you'd like to opt in to receiving an Early Access Program software license and/or release communications, please submit the registration form: **Installation** The Early Access Version can be downloaded and installed from our standard web installer. When selecting the software version in the web installer, check the **Include PreRelease Versions** checkbox to be able to select from the standard or Early Access versions. For detailed instructions on the installation process, see: **Server Installation Guide**. **Provide Feedback** Please submit general feedback, enhancement requests, or bugs via the **Product Feedback** form. This will go to the PlanetTogether Product team to debug and triage for development as needed. **Need Support?** If you encounter errors or need assistance installing or using an Early Access version, submit requests to PlanetTogether Support via email at support@planettogether.com or by completing the **Contact Support** webform.

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### Product Roadmap

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**Key Concept** The PlanetTogether development team tries to adhere to quarterly feature releases while bug fixing and maintenance is still supported on the most recent major feature release version. This article provides insights into the features and functionality currently being developed for the next major release, as well as a rough plan for the next release or two. Plans are subject to change, especially for releases further out than the next one upcoming. The quarterly timelines in this article suggest that each of the features of each version will be released at or near the end of each quarter. If you'd like access to early release versions, consider signing up for our Early Access Program! **Disclaimer** This document, and any linked product roadmap materials, serve to provide a high-level overview of our anticipated product direction. These are purely informational and should not be incorporated into contracts. PlanetTogether makes no commitment to deliver specific features, code, or functionality based on these documents, and they should not be the sole basis of purchasing decisions. The development, release, and timing of product features or functionality are at PlanetTogether's discretion and subject to change. Please remember these documents reflect our current understanding of future development and are subject to change without notice. **Roadmap Download** the latest 6-quarter outlook (PDF). See Also **Migrating from Version 11 to Version 12** **Early Access Program Release Notes**

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## Software Release Announcements Opt-In/Out

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Enter your information and choose whether to Opt in or Opt out of receiving email announcements whenever a new Version 12 General Availability software release is made available.

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## Software Releases & Roadmap > Release Notes

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### Release Notes: 12.1.3

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Latest version: 12.1.3.15 | April 4, 2024 Jump to section: New features & functionality Improved functionality Critical bug fixes Integration changes Deprecated functionality General Availability Releases Release Version Release Date 12.1.3.5 January 10, 2024 12.1.3.12 February 26, 2024 12.1.3.14 March 14, 2024 12.1.3.15 April 4, 2024 NEW FEATURES & FUNCTIONALITY Update the ProductRules table in the Publish DataSet | 12.1.3.15 The ProductRules table in the Publish data is updated so that the OperationName field is a primary key field. This enables multiple rules with the same Item and Resource pair with unique Operation Names to publish. New Plant Tile In Scenario Data Board | 12.1.3.12 Plants and Plant Settings can be configured and maintained manually in a new Plants tile in the Scenario Data board. New Department Tile In Scenario Data Board | 12.1.3.12 Departments and Department Settings can be configured and maintained manually in a new Departments tile in the Scenario Data board. Material Allocation enforced by all Optimizations | 12.1.3.5 The MaterialAllocation property which can be set on an operation's Stock Material requirement or at the Inventory record level is now enforced by all Optimization logic. It was previously only used by MRP planning logic. The MaterialAllocation property value defined at the Inventory level will be used by default, but the property of the same name can be set at the Stock Material Requirement level on an individual operation to override the Inventory level setting. Material Allocation property values: Use Oldest First: Materials will be allocated to consuming operations based on the material's earliest eligible produced source, starting with on-hand inventory. Use Newest First: Materials will be allocated to consuming operations based on the material's newest/most recently produced or purchased eligible source. Existing on-hand inventory will be considered last if no job production or purchase order can supply the requirement. Not Set: Defaults to the behavior of Use Oldest First. User-Specific Optimize and Compress Settings Presets | 12.1.3.5 If a user chooses to not use shared optimize and/or compress settings in their user preferences, they will have the option to select from their Optimize or Compress settings preset configurations. For more information, see: User Preferences. Customers Board Tiles | 12.1.3.5 Added new Tiles to the Customers board to display charts for: Sales Orders by Customer Jobs by Customer Job Watch Gantt by Customer A new Max Delay Gantt block segment is added | 12.1.3.5 A Max Delay Gantt block segment can be enabled along with an optional custom text label to help visualize when Max Delay is violated based on the position of the scheduled operation in relation to its successors or predecessors. For more information, see: User Settings. Add button to quickly regenerate system-generated Gantt Layout configurations | 12.1.3.5 A new Generate Plant Layouts button is added to the Plant View Settings screen which generates or regenerates all Plant and Department Gantt layouts. Use it after adding new plants, departments, or resources. Add sort buttons to Gantt Layout sorting controls | 12.1.3.5 Buttons to Sort Alphabetically or Sort by Workcenter are added to the Gantt layout configuration settings in the user's Plant View Settings for quick sorting of the selected resources. Add grid layouts and grid search to all bound grids | 12.1.3.5 Added the PT Toolbar and the Grid Layout Module to all Bound Grids to allow users to create new layouts in all tile and dialog grids. Previously, these were only enabled in each board's main grid tile. Update grids in Scenario Data to support multi-select actions | 12.1.3.5 Added multi-row deletion for Cells, Capacity Intervals, and Capabilities tiles in the Scenario Data board. Implement Optimize Progress bar which can be controlled via the Progress Frequency setting | 12.1.3.5 Optimize progress percentage is shown on the progress bar and Progress Frequency setting alters the % precision accordingly. Visualize move in Activity Move tile | 12.1.3.5 Added Move Result and Move Result Reason columns to activities grid on Activity Move tile. Add current scenario name to Metric board slides in compare mode | 12.1.3.5 Added current scenario name to Metric slides in

the Metrics Board when they compare two or more scenarios' data. Add Conditional Formatting to Optimize Factors tile grid | 12.1.3.5 Enabled Conditional Formatting for bound grids such as the one used by the Optimize Factors tile. Schedules Table Add: Instance ID, Instance Name, Instance Version | 12.1.3.5 The Schedules table of the Publish database now includes InstanceId, InstanceName, InstanceVersion fields. InstanceId: A system-generated ID associated with the instance/workspace whose data was published. InstanceName: The name of the instance/workspace whose data was published. InstanceVersion: The software version of the instance/workspace whose data was published. New Resource Properties | 12.1.3.5 Added Setup Code Table Name and Attribute Code Table Name columns to the Resources grid for visibility. Add permissions group visibility on the User Preferences dialog | 12.1.3.5 A user's current assigned permission group name is made visible in the User Preferences dialog. Rename "AvailableDate" field in Materials Grid to "Latest Source Date" | 12.1.3.5 AvailableDateTime field on an operation's Material Requirement has been renamed to LatestSourceDateTime. The date represents the latest date and time of all material sources supplying the requirement. The field can be imported for Buy-Direct materials. An integration change will be required for Import. Enhance Lot Eligibility to support Job Products LimitMatISrcToEligibleLots | 12.1.3.5 Two new fields on an operation's Product allow the use of pegged lot remainder: UseLimistMatISrcToElibleLots should be enabled to override the default behavior LimitMatISrcToEligibleLots can be set to false to change the default behavior of true. This will set the same named field on the Lot when produced by an activity. If false, when a pegged lot has been sourced for all pegged materials and demands, any remaining material will become available to non-pegged materials and demands. Add new Capacity Tools tile | 12.1.3.5 Moved the Capacity Tools from below the Gantt into a new Tile on the Gantt board. Enable Gantt Printing / Exporting The Resource Gantt and the Job Watch Gantt can now be printed using two new buttons from the Gantt toolbar. Add back "Earliest Job Need Date" optimize factor | 12.1.3.5 Added Job Need Date sequencing factor. Enhance MRP to handle demand pegging when the job is split | 12.1.3.5 MRP will now split the total demand for a created job among all of its MOs. This will now more accurately calculate original demands for each MO. IMPROVED Automated Job Notes Should Reset After Optimizing | 12.1.3.15 Job Notes are no longer populated with the text "FailedToSchedule" if a job fails to schedule. This information is available in the Job Analysis as well as the Job Scheduled Status properties already. General Performance and Stability Improvements | 12.1.3.12 A few performance-related issues were resolved related to loading data on initial sign-in; the client interface freezing when many boards and tiles were open at the same time; slow load times of certain boards in larger data models (Activities, Inventory Plan, Materials); "Filter Gantt Selection" in Activities grids can be toggled independently | 12.1.3.12 The option to Filter Gantt Selection in the Activities board Activity Scheduling (Primary) and Activity Scheduling (Secondary) tiles can be toggled independently of one another. Sort Activity Scheduling resource list in Resource Filter alphabetically | 12.1.3.12 Departments and Resources in the Resource Filter of the Activity Scheduling tile grids are now sorted alphabetically. Metrics UI Performance update | 12.1.3.5 Resolved an issue where search for a metric layout control was not found causing issues when removing a metric to be still drawn and also caused a new metric control to be added on data change. Also, made further enhancement to minimize the number of instances a metric group's contents are refreshed on data change. Investigate drag/drop performance | 12.1.3.5 Greatly improved UI performance when performing manual schedule move adjustments in the Gantt and Activity Scheduling grids. Gantt Grid Enhancements & Simplification | 12.1.3.5 Inactive resource row has a distinctive background color on the Gantt The Gantt grid is updated to have the following column changes: New Plant name column Removed Sort Column Disabled Sorting on the Gantt Grid columns Renamed 'Message' column to Eligibility Renamed Resources column to Resource Expose Plant Configuration resource sorting by default | 12.1.3.5 Advanced Sorting toggle is visible by default so that Resource sorting is displayed in Plant Configuration User Settings without needing to enable Show Advanced User Settings in a user's preferences. Auto-add resources, only add the resource if the parent department/plant is enabled | 12.1.3.5 Gantt layouts with the 'Auto Add Resources' flag enabled will only add new resources if the parent department/plant is selected/enabled. Hide "Advance All Scenarios" and "Refresh All Scenarios" from isolated scenarios | 12.1.3.5 Scenarios which are isolated from Clock Advance only have an option to Advance Active Scenario from the main toolbar. Scenarios which are isolated from Import only have an option to Refresh Active Scenario from the main toolbar. Update User Mappings | 12.1.3.5 Administrator, InitialAccessLevel and InitialWorkspace have been removed from User Mappings. UserPermissionGroup and PlantPermissionGroup have been added as string Mappings to import a User Permission Group and/or a Plant Permission Group by name. Reduce white space in Activity Scheduling Resource Filter | 12.1.3.5 In order to save space, Plant node is removed from Resource Filter tree in Activity Scheduling tiles if there is only one Plant in the data model. Bulk edit tile type-ahead search shows incomplete and evolving property name results | 12.1.3.5 Bulk edit tile type-ahead search accurately matches and displays all possible

results. Allow editing of "Image" property in Resources grid | 12.1.3.5 The Image property can be edited in Grid Edit mode from the Capacity Planning board's main Resources grid. Format numerical grid property values with thousands separators | 12.1.3.5 All numeric properties in all grids are displayed with thousands separators every 3rd digit (commas in English, or decimals or spaces in other languages as appropriate). CRITICAL BUG FIXES Simple Sequencing Plans produce inaccurate Optimization results | 12.1.3.14 If a Sequencing Plan is used during optimization and its only weighted factors are "Constant" factors, then the system was previously defaulting to an incorrect scoring mechanism which resulted in inaccurate schedule optimization results. This is now fixed so that even simple Sequencing Plans use the correct scoring mechanism. Daylight Savings Time causes many adverse side effects | 12.1.3.14 As daylight savings time rolled out across much of the world, it was discovered that the new Time Zone functionality in PlanetTogether was overly aggressively compensating for the time adjustment which resulted in manual scheduling moving jobs +1 hour; manual edits to jobs increasing the job need date by +1 hour; certain date time UI components displaying dates +1 hour later than the actual objects were configured with; etc. This build fixes all of the known issues that users encountered and reported related to daylight savings time. Client became unresponsive when too many boards and tiles were opened | 12.1.3.12 Resolved an issue which was prompting the system to open thousands of error message dialogs in the user's session which would freeze the interface for several hours before becoming responsive again. Poor performance when various boards are open (Inventory Plan, Materials, Activities) | 12.1.3.12 Fixed an issue with an object property updating incorrectly which negatively impacted performance. Created a new helper object to improve grid loading performance. Job "Late" property boolean value is reversed | 12.1.3.12 Fixed an issue where the Job Late property was returning the value in reverse (Late=False if the job was actually scheduled to finish late). Instance Unresponsive on User Logoff | 12.1.3.12 Fixed an issue where instance services may become unresponsive to Stop and Start signals occasionally after users logged off, so the services had to be forcibly killed from the Windows Task Manager. INTEGRATION CHANGES Import Mappings Capacity Interval Resource Mappings: DeptExternalId is updated to DepartmentExternalId for consistency. Job Mappings: The TravelerReport property is removed User Mappings: Administrator, InitialAccessLevel and InitialWorkspace are removed UserPermissionGroup and PlantPermissionGroup are added as string properties Cell Mappings: ConWipMoLimit and EnforceConWipMoLimit are removed. Resource Mappings: Role property is removed. Forecast Mappings: The Customer property is updated to CustomerExternalId. Its value is validated against the External ID of Customer objects that are imported or which exist in the data model. Material Mappings: LatestSourceDateTime can be imported for Buy-Direct materials. Product Mappings: Two new fields are added to allow the use of pegged lot remainder: UseLimistMatISrcToEligibleLots should be enabled to override the default behavior LimitMatISrcToEligibleLots can be set to false to change the default behavior of true. Publish Data InstanceId (varchar, primary key), InstanceName, and InstanceVersion are added to the published Schedules table. InstanceId (varchar, primary key) is added to all publish database tables DEPRECATIONS Gantt Grid Functionality & Resource "Sort" Property | 12.1.3.5 The Gantt grid Sort column and sorting functionality on grid columns are removed. Resources can be custom-sorted via Gantt layout configurations in the user's Plant View Settings. Plant, Department, and Resource Sort properties are removed from the UI and associated object import mappings. Remove Cell and Capability Attributes | 12.1.3.5 Removed Attributes tab from the Edit Cell and Edit Capability popup dialogs since attributes are not supported on these objects. User Defined Fields are still supported. Remove Analytics Board | 12.1.3.5 Analytics board is removed from the UI. A new web-accessible analytics view is coming soon to replace it. Feedback & Support We strive to make scheduling software that supports modelling of as many manufacturing processes as possible. We encourage all users to please send us your feedback if there is something we can do better -- a new feature; a bug fix; a UI enhancement; -- you name it and we'll do our best to accommodate. To request assistance to upgrade an environment, please contact support and we'd be happy to help!

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## Release Notes: 12.1.4

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Latest version: 12.1.4.24 Jump to section: New features & functionality Improved functionality Server Manager updates Critical bug fixes Integration changes Deprecated functionality General Availability Releases Release Version Release Date 12.1.4.17 June 24, 2024 12.1.4.20 July 10, 2024 12.1.4.21 August 8, 2024 12.1.4.22 August 28, 2024 12.1.4.24 September 23, 2024 NEW FEATURES & FUNCTIONALITY Enhanced Summary Metrics: Data

summations, averages, minimums, and maximums | 12.1.4.17 New Metrics may now be configured to track quantity summations, averages, minimums, or maximums of any numerical property on any board grid which supports Metrics. Consider these possible use cases: Track a sum quantity of production of a specific item Track a sum quantity of Profit or Revenue from certain jobs (either from a particular customer, or during a particular time frame) With visibility of these data in the Metrics board, they may be easily compared between scenarios to better track the impact of schedule and/or data changes. For more information, see: Layouts, Metrics, and Targets.

Compress for a specific timeframe and resource(s) | 12.1.4.17 The Compress functionality is enhanced to allow users to define the specific time to start and end compressing the schedule, and to allow users to select which specific resources should be impacted by the Compress action. For more information, see: Compress the Schedule.

Gantt Printing Options | 12.1.4.17 A new Print Gantt button is added to the Gantt toolbar. The button opens a dialog with options to either print the Gantt on a connected printer, or export the Gantt to PDF format. The dialog gives users the option to select one custom Gantt layout to print, or offers a Print All button to print or export two or more select Gantt layouts (or all layouts, if desired). For more information, see: Gantt Board: Toolbar.

Scenario Permissions tile added to Users Board | 12.1.4.17 A new Scenario Permissions tile is added to the Users Board to allow for administrators to view and manage all scenario permissions for all scenarios which exist in the Workspace in one place. For more information, see: User Management.

Transfer Orders tile added to Inventory Plan Board | 12.1.4.17 A new Transfer Orders tile is added to the Inventory Plan board to allow users to manage Transfer Orders and give better visibility into Transfer Order details. For more information, see: Inventory Plan Board.

Job Eligibility Properties added to Jobs Board Grid | 12.1.4.17 A new Eligibility property is added to the Jobs board grid. It offers insights into reasons why a job may not be eligible to schedule.

"Assigned Resources" button added to Capabilities tile | 12.1.4.17 A new Assigned Resources button is added to the Capabilities tile of the Scenario Data board to help with quickly assigning capabilities to resources. This is mostly used for demonstration and experimentation purposes, as this data is typically imported rather than manually maintained.

Include "Last Publish Date" in the User Interface | 12.1.4.17 The date and time of the last successful publish of the currently active scenario is made visible in the Publish dropdown. Load Interface log errors from server when user logs in | 12.1.4.17 When users first login to the Workspace, their Message Log will now display "Interface" log errors that exist on the server via a new tab labelled Interface From Server. The Interface log documents data-related errors that occur during a data refresh. This enhancement can help give visibility into whether or not the last data refresh was entirely successful, regardless if the user was connected to the Workspace at the time of the last data refresh or not. Each time the Message Log dialog is closed and re-opened, or when the Refresh All button is clicked, the data from the server is fetched again and displayed in the dialog. By default, the Interface From Server data is sourced from the server's Interface.log file, located on the server here:

PlanetTogether\\_INSTANCE\\_System\Alerts If the instance is configured to write logs to the Audit Log database, then the Message Log dialog will fetch the Interface log data from the Audit Log database rather than the Interface.log file.

Insert Jobs Scheduling Feature | 12.1.4.17 A new function of the CoPilot feature is added to assist with inserting one or more jobs into the existing schedule without impacting the current order of scheduled jobs/operations. Any job which is not currently scheduled is eligible to be scheduled via one of the Insert Jobs functions. To use one of the functions, select one or more unscheduled jobs from the Jobs board grid, then right-click one of the selected rows or use the Job Actions tile and choose one of the Insert Jobs functions:

- Insert Jobs Individually: Each of the selected jobs will be inserted into the existing schedule according to the configured System Settings.
- Insert Jobs as a group: The system will attempt to insert all of the selected jobs into the existing schedule. If any one of them is unable to be scheduled, then all of them will fail to schedule. In either case, the resulting schedule will be available in a new scenario copy. If the schedule result is desirable, the new scenario copy can be updated to become the new production scenario.

For more information, see: CoPilot Settings and Job Actions Tile.

Operation Transfer and Overlap Enhancement | 12.1.4.17 Transfer between operations can now be configured using different transfer start and end usages. For example, Transfer can be enforced between predecessor run end and the successor run start. This allows the successor operation to overlap some of the transfer based on the new usage settings TransferStart and TransferEnd. This is compatible with Operation Overlap, so the successor can also overlap the predecessor while still enforcing the transfer span. See also:

Alternate Paths Alternate Path & Node Mappings Additional Experimental sequencing plan mappings | 12.1.4.17 Previously, each resource was allowed to be configured with one Normal and one Experimental sequencing plan to determine optimization scoring. This enhancement adds three additional Experimental settings so that each resource may now be mapped to one Normal and up to 4 Experimental sequencing plans. The additional sequencing plan mappings may also be imported via Resource Mappings.

IMPROVED Sign-in to server should

respect max number of failed login attempts settings | 12.1.4.22 Previously, the Sign-in to server section of the sign-in application allowed unlimited login attempts. This enhancement counts each failed login attempt from the Sign-in to a server screen against each of the server's online instance's Maximum number of failed login attempts setting. Client Application Performance Enhancements | 12.1.4.17 Various performance enhancements have been made to the client application: The Import Mappings board has been reworked in order to improve the amount of internal memory required to view it. The Metrics board has been reworked and now refreshes much faster as changes are made to the schedule. Internal memory management has been improved when loading the Job Details dialog to ensure that making many manual edits to many jobs won't slow down the application. Refactor Gantt Layouts | 12.1.4.17 Gantt layout configuration logic has been reworked to better support multiple scenarios in the same Workspace. Automatic Actions: Improved scheduling flexibility | 12.1.4.17 Scheduling of Automatic Actions is improved to be much more customizable using CRON expressions. These can be made to be very specific to run actions on a more predictable and practical cadence. CRON expression syntax looks a bit odd to the untrained eye. It's recommended to use this CRON expression generator to assist with curating the Automatic Actions schedule: CRON Expression Generator - Quartz For more information, see: System Settings: Automatic Actions. Move Job Watch to a new tile in the Gantt | 12.1.4.17 The Job Watch Gantt in the Gantt board is a bit more agile now as it has been decoupled from the Resources Gantt and converted to a separate tile. Add jobs to the Job Watch Gantt by right-clicking them in the Gantt and choosing Analysis → Watch Job on any scheduled activity block. Preserve scroll location and row selections when grids refresh | 12.1.4.17 As multiple users interact in the same Workspace, one user may perform some action which causes other user's visible grids to refresh. This enhancement ensures that after the grid refreshes that the scroll location hasn't jumped around from where the user was previously viewing. Prevent User From Deleting Last "Production" Scenario | 12.1.4.17 Users can no longer delete the last scenario from the workspace which is flagged as a "Production" scenario. Make activity move selections visible in Activity Move tile | 12.1.4.17 Activities which are selected from the Activity Scheduling grid to be moved via the Activity Move tile are also selected and highlighted in the Activity Move tile for better visibility when the two grids may not be docked side by side. Add Confirm button to Activity move | 12.1.4.17 A Confirm Resource and Time button is added to the Activity Move tile of the Activities board. The button displays a dialog which indicates whether the selected activities can be moved to the specified time or point in the schedule. This gives the user more confidence that the manual move will be successful, or provides them with a warning if one or more of the selected activities cannot be moved. Resource Utilization Chart design update | 12.1.4.17 The Resource Utilization Chart in the Capacity Planning and Gantt boards is made a bit more flexible by separating the usage metric selection from additional categorization and chart grouping options. Enable Product Rules to support User Defined Fields | 12.1.4.17 User Defined Fields (UDFs) can be imported for Product Rules. UDFs are made visible in the Product Rules tile grid of the Scenario Data board. "Create Job" tile updates | 12.1.4.17 The Create Job tile is updated on both the Jobs board and the Routing Templates board. The tile text makes it more clear that the tile can be used to create copies of existing jobs, or create jobs from routing templates. A new button is also added to create new blank jobs or templates from scratch. Add back removed KPIs | 12.1.4.17 Two KPIs which were previously removed from the KPIs board are added back: Late Jobs Total Setup Calendar Hours Resize notifications to be larger and consistent | 12.1.4.17 Notification slides which appear across the bottom of the client interface are made a bit wider and formatted more consistently. New settings to delay tooltip window refresh | 12.1.4.17 The Gantt tooltip window is enhanced by some new settings which allow users to customize how quickly the tooltip window refreshes as the user moves their mouse around the Gantt. Remove extra space from the start of Gantt Label text | 12.1.4.17 Custom Gantt label text was previously starting each new line with a blank space. This extra space is now removed. Scheduling enhancement to consider Cleanout intervals on Helper Resources | 12.1.4.17 Scheduling activities which require a helper resource is enhanced to consider cases when the helper resource has a Cleanout interval where the primary resource does not. Previously, the software was erroneously allowing operations to schedule on helper resources where there was a cleanout interval. Now the scheduling logic treats the cleanout interval appropriately and ensures that helper capacity is not available during the scheduled cleanout time. Add back "POSSIBLE" supply activity links in Gantt | 12.1.4.17 When Gantt scheduling hints are enabled in the Gantt, a new "Possible" supply link may be drawn between two scheduled operations if an operation producing some material is scheduled to start later than a scheduled operation which has that material set as a non-constraining material requirement. The downstream supplying operation becomes a possible source of material for the earlier scheduled operation that otherwise has no known source of the required material. This appears as a dark yellow/brown colored link with the arrow drawn to point from the downstream operation to the upstream one: Activity progress AutoComplete enhancements | 12.1.4.17 Auto-reported activity progress via clock

advance will now update production statuses and will accurately report setup time. Auto-reported start date will now be the scheduled start before a clock advance instead of the clock date for better accuracy. Auto-reported finish date will be set to the scheduled finish date from before the clock advance. Add Gantt Background indicators for "Manual schedule resources" | 12.1.4.17 A blue bar will be drawn across the top of the Gantt row of any resource which is flagged to only allow for manual drag/drop scheduling. User Permissions: Update, verify, enforce | 12.1.4.17 User permissions were revisited to ensure that each permission does what it is meant to do to grant or deny users access to various interfaces or actions. Restore Desync handling | 12.1.4.17 Client desynchronization handling has been restored to help users restart the client application in the event that their local session has become desynchronized with the server. Include more data points in Audit Log database | 12.1.4.17 Breaking Change Servers and instances which utilize the Audit Log Database from an earlier software version will need to delete the InstanceLogs and InstanceServiceLogs tables for these changes to take effect. The tables will be re-created automatically with the updated schema when the instance starts up again. The InstanceLogs and InstanceServiceLogs tables now accurately capture error data, and also provide an always-populated TIMESTAMP column to track the time of logging. SERVER MANAGER UPDATES Install PlanetTogether Server software on non-English systems | 12.1.4.17 The PlanetTogether Server software is now compatible to be installed on non-English servers/PCs. Save/Load Instance Configuration Data from an Instance Database | 12.1.4.17 A database is now required for standard software installation and instance creation. Instance settings are to be stored in a SQL database rather than stored in the PlanetTogether\_ServerSettings.json file on the server. For this release, the settings will be backed up to the JSON file on the server, but the Instance Manager and Server Manager will read and write to the configured database. Instance configuration data may be stored in any SQL database. It's recommended to create a new database specifically for storing instance settings, but a dedicated database is not necessarily required. No database tables need to exist; the necessary tables will be created by the installer application during the installation process. The software installer will now require the user to provide database connection information. If using Integrated Security, then the application will use the Windows User credentials that are configured to run the PlanetTogether Server Manager service to read from and write to the SQL database. If the service is configured to run using the default Local System user, then in SQL the NT AUTHORITY\SYSTEM user will need read/write access to the specified database. Otherwise, it might be more practical to configure a SQL user with read/write access to the database. Enhanced "admin" user password reset dialog | 12.1.4.17 An Admin User dropdown selection is added to the Client Connections tab of the instance settings. This allows a server administrator to select which administrative user's password to reset. The list of users is populated with all user accounts in the current Workspace scenario who are part of an administrative group (one which allows for administrating users). Changing Analytics Post-Publish command does not prompt the need for instance restart | 12.1.4.17 Modifying the SQL Command to RUN after Publish setting from the Analytics tab of the Instance Settings dialog will now prompt the user to restart the instance service to apply the change. Log client/user errors on the server | 12.1.4.17 Errors which are experienced by client application users will now be logged on the PlanetTogether server. If Audit Logging is enabled in the instance settings, then the errors will be logged to the Audit Log database in the InstanceLogs table. If Audit Logging is disabled, then the errors will be logged in the instance folder on the server in the System\Data\Alerts folder. CRITICAL BUG FIXES System Out of Memory / Application Freezing | 12.1.4.17 Many users reported the client application would freeze and/or they would receive "Out of memory" errors. We were able to improve internal application memory allocation in a few areas of the code (Metrics, Import Mappings, and the Job Details dialog). ScenarioType field in Publish data accurately reflects "Production" scenario types | 12.1.4.17 The ScenarioType field in the Schedules table of the publish database is updated to correctly identify scenarios with are flagged as Production scenarios in the instance workspace. Unable to unlock a locked user account | 12.1.4.17 A user's account may now be unlocked after it gets locked due to too many failed login attempts. Inventory adjustments are inaccurate for partially completed operations | 12.1.4.20 An issue was fixed so that activity production will now account for operation product completed quantity. If an operation was partially completed and its product was imported with a CompletedQty value, it is expected that the total inventory output at the scheduled end of the operation would equal its total required quantity minus the completed quantity. This was not functioning correctly though and the entire original required quantity was being added to inventory instead. User permissions are not always enforced | 12.1.4.20 Two issues were fixed related to user permissions which were not being enforced: Users without permission to advance the clock and/or refresh data were still able to advance the clock and/or refresh data. Users without permission to create scenarios were still able to create scenario copies. Resource utilization chart tile issues | 12.1.4.20 The Resource Utilization Chart tile in the Capacity Plan board and the Gantt board are fixed so that the user can switch between scheduled usage

% and scheduled usage hours, and so that users may scroll forward and backward in time in the Gantt without altering the plotted data values. Client application does not always shut down when closed | 12.1.4.21 A fix is released which addresses an issue where the client application Windows process would remain active in the background after being closed if the user had made one or more drag/drop moves during their active session. Over time, this could lead to too many sessions remaining open to a point where the user could experience "out of memory exception" errors. INTEGRATION CHANGES Import Mappings Resource Mappings Properties are added to support additional Experimental Sequencing Plan mappings: ExperimentalSequencingPlanTwo | String ExperimentalSequencingPlanThree | String ExperimentalSequencingPlanFour | String Each of these accepts values equal to the Names of existing Sequencing Plans in the Workspace, similar to the previously existing properties NormalSequencingPlan and ExperimentalSequencingPlan. Additionally, properties are added which have no functional purpose yet but will be functional with a future release (12.2.x) once our Freeze Dryer solution is fully developed: MinVolume | Decimal MaxVolume | Decimal Product Rules Mapping New properties are added, but they don't serve a functional purpose yet. They will have functional implications in a future software version release (12.2.0.x) related to some new freeze dryer functionality that is currently under development. MinVolume | Decimal UseMinVolume | Boolean MaxVolume | Decimal UseMaxVolume | Boolean Alternate Path Node Mappings Two new properties are added to Alternate Path Node Mappings in order to support the new TransferStart and TransferEnd properties: TransferStart | String: The point in time when the transfer from this operation to its successor should start. TransferEnd | String: The point in time when the transfer from this operation to its successor should end. Choose StartOfOperation for a standard calculation from the TransferStart. Accepted values for each of these fields: StartOfOperation: At the start of the operation. EndOfOperation: At the end of the operation. EndOfPostProcess: At the end of the operation's post-processing. EndOfStorage: At the end of the operation's Tank Storage. EndOfRun: At the end of all cycles/run. EndOfSetup: At the end of the operation's setup. Publish Data Inventories Properties associated with auto-generating forecasts are removed: AutoGenerateForecasts ForecastInterval NumberOfIntervalsToForecast JobOperationAttributes This table was found to be the one of a few without an InstanceId field. It has been added. InstanceId | varchar(38) JobPathNodes Alternate path node properties are added to this table: TransferStart | varchar(MAX) TransferEnd | varchar(MAX) JobResources This table was found to be the one of a few without an InstanceId field. It has been added. InstanceId | varchar(38) ProductRules The OperationName property is updated internally from having a character limit of 48 to a limit of 254. ReportBlocks The Duration property data type is updated from datetime to bigint. Duration | bigint Run this SQL query against the Publish database to drop then re-add the Duration property as a bigint data type: ALTER TABLE ReportBlocks DROP COLUMN Duration; ALTER TABLE ReportBlocks ADD Duration bigint; Resources One property is removed (it's been renamed): ExperimentalDispatcher Seven properties are added related to the work done to allow for more experimental sequencing plan mappings: ExperimentalDispatcherOne | bigint ExperimentalDispatcherTwo | bigint ExperimentalDispatcherThree | bigint ExperimentalDispatcherFour | bigint ExperimentalOptimizeRuleTwo | varchar ExperimentalOptimizeRuleThree | varchar ExperimentalOptimizeRuleFour | varchar ProductRules In order to allow multiple Item-to-Resource rules where the Item and Resource are identical but the Operation Name is unique, the OperationName property is now designated as a Primary Key of the ProductRules table. In order for this change to propagate to an existing publish database, the entire ProductRules table should be dropped, then it will be recreated with the next Publish cycle. Schedules Since Version 12 has two scenario types (Production and What-If), two properties are renamed and two others related to scenario types are removed. Some code changes to the way that time zones are managed resulted in a renamed time zone property. Removed: LastLiveSchedulePublished LastPublishedSchedulePublished LastNetChangeLiveSchedulePublished LastNetChangePublishedSchedulePublished UtcOffsetHrs

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## Release Notes: 12.2.0

### [Source](#)

Latest version: 12.2.0.27 Jump to section: New features & functionality Improved functionality Server Manager updates Critical bug fixes Integration changes Deprecated functionality General Availability Releases Release Version Release Date 12.2.0.27 October 7, 2024 NEW FEATURES & FUNCTIONALITY Optimization Enhancement: Schedule Highest Scoring Resource First An enhancement has been made to the standard optimization logic whereby all resources with capacity at any point in time during optimization will be considered eligible to schedule

the next operation. All operations which are released to schedule on all resources with capacity will be scored per each of the available resources. The operation with the highest optimization score will be scheduled on whichever resource it scores highest on. This behavior will help to improve resource selection during optimization. A practical example: If two or more resources are capable of scheduling the same operation at the same point in time, then the resource with the higher optimization score will be selected to schedule the operation. In previous software versions, the optimization engine would choose a specific resource and force something to schedule on that resource, even if there is only one eligible operation and if that eligible operation would score better and schedule better on another available resource. For more information, see: Optimization. New operation process: Clean Operations may now be configured with a Clean process. Cleans are scheduled to run after operation post-processing and may be configured to be sequence-dependent, much like operation Setup. Cleanout Triggers Cleanouts can be triggered to schedule after a certain number of operations are scheduled on a resource, some number of Production Units are scheduled to be produced by a resource, or after a combined total run/cycle time of one or more operations scheduled on a resource, or after a certain duration of calendar time. Cleanout Grade Cleanout grade is a new field related to the new Clean process. When multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two cleanouts of the same grade are scheduled together, the longest duration is used. When a cleanout occurs, it resets all cleanout triggers that are the Cleanout Grade or lower. For example this can be modeled with a Minor cleanout of 0 and Major cleanout of 1. For more information, see: Cleans. Attributes redesign for more robust functionality This is a breaking change. Operation Attributes are not backward compatible with previous versions. All attributes will need to be re-imported to accommodate the new structure. Attributes have been redesigned to accommodate both dynamic operation Setup and dynamic operation Clean processes. Attribute definitions are now imported in a new Attribute Mappings table as stand-alone objects OperationAttributes must reference an Attribute definition when imported Attribute definitions contain default durations, colors, and costs that can be overridden in each operation to support operation specific changeovers Attributes have a new AttributeType field to indicate whether the changeover values are for setup or for clean Resource Attributes are removed. Custom resource properties can be added as User Defined Fields (UDFs), and resource attributes will no longer be used for tracking sequence and setups. A new LastRunActivity mappings is created to import details of the last run activity on the resource. The attributes for that activity's operation will be used for sequence dependent setup and clean calculations. For more information, see: Attributes. Auto-Split Operations Operations may be split into two or more activities automatically during optimization based on many configurable factors. Splitting operations allows the work to be spread across multiple resources in order to complete the work faster (as each split part may be run in parallel), or can be used to split the work across gaps in resource capacity. Splitting can also be used to break larger operations down into smaller parts so that each part may comply with maximum quantity or volume constraints across capable resources. Auto-split can be configured to split based on many factors: Resource Quantity or Volume constraints Capacity of the Primary resource when an operation requires one or more helpers Predecessor material quantity and availability For more information, see: Auto-Split Operations. Resource Connectors redesign This is a breaking change. Resource Connectors are not backward compatible with previous versions. All connections will need to be re-imported to accommodate the new structure. Resource connectors specify a flow relationship between two or more resources. A resource can have connections to one or more downstream resources which can enforce the following scheduling constraints: Which resource(s) successor operations of the same manufacturing order can be scheduled Which resource(s) may consume material from a producing tank resource The number of simultaneous material allocation connections which can be made from a tank resource to consuming operations See: Resource Connectors. Compatibility Codes redesign This is a breaking change. Compatibility Code logic is not backward compatible with previous versions. All compatibility logic will need to be re-imported to accommodate the new structure. Compatibility Code Tables define lists of Operation Compatibility Codes which are either allowed or disallowed to schedule simultaneously within a group of resources. Resources may be assigned one or more Compatibility Code Tables, and each table may be assigned to any number of resources. This is an enhancement from previous software versions which only supported scheduling a single allowed code at a time. See: Compatibility Codes. New Product Rules functionality Cleanout grades and durations can be configured per Product -to- Resource mapping via new Product Rules properties. Min/Max Quantity and Volume can be configured per Product -to- Resource mapping OperationName property is replaced with a new OperationCode property in order to support multiple iterations of the same Product+Resource+OperationName combination where the rules may need to be different. Each operation can be assigned an OperationCode to differentiate it from other operations of the same name producing the same product. See: Product Rules. Allow specific quantities to be

allocated from specific lots Lot controlled planning is enhanced to allow users to define specific quantities to be allocated from specific lots in the event that one operation needs to source the same material from multiple lots. This is achieved by configuring two or more material requirements for the same item on the operation, each with specific required quantities and allowed lot codes. See: Lot Controlled Planning. New Gantt Settings for Scheduling Hints The following updates were made to the Gantt Scheduling Hints: A toggle switch to show individual Gantt Lines was added to the new Scheduling hints settings category A toggle switch to show individual Gantt Region was added to the new Scheduling hints settings category Removed the 'Clear Activity Links' Option from the Gantt Viewer Moved Activities Gantt to the Options dropdown on the Gantt Toolbar and renamed it "View As Daily Activities" See: User Settings New Sequencing Factors New sequencing factors meant to help prioritize resources under certain conditions are added: Closest Fit Quantity Closest Fit Volume Largest Quantity Fit Largest Volume Fit Least Waste Quantity Fit Least Waste VolumeFit Smallest Quantity Fit Smallest Volume Fit Others are added to help prioritize based on Clean cost, duration, and grade: Clean Duration Higher Cleanout Grade Lower Cleanout Grade Same Cleanout Grade Clean Cost Finally, a new factor Attribute Number is added to allow for prioritization based on a numerical value assigned to one or more attributes. See: Sequence Planning Board. New MRP options: MRP Start Type and Start Date New MRP options are added so that users may define when MRP processing should begin to consider demand signals. See: MRP OptionsMPS/MRP Optimize Plan Settings. Capacity Interval Configuration Options Both recurring and non-recurring capacity intervals are given more configuration options. A new Holiday type is added, and new options allow users to customize the interval Color and opt to enable options to reset setup and clean calculations, and/or prevent operations from spanning the interval. See: Resource Capacity. New InventoryAvailableTiming for product: AtOperationRunEnd A new Product InventoryAvailableTiming value AtOperationRunEnd allows for releasing product at the end of run for cases where resource post processing does not affect material availability. MRP Source from Firm Orders A new Source From Firm Orders MRP option allows sourcing from Firm and Released orders even if the material may not be available on time. Add Gantt Background visibility for transfer span Added a new module to draw a transfer span region when an operation is selected on the Gantt. Expedite options are added to Activities and Jobs boards Expedite options which were previously only available from the Gantt right-click menu are added to the Activities and Jobs board grid actions and right-click menus. Do ASAP Preserve the Frozen Span Preserve the Stable Span To specific date and time IMPROVED Gantt Layout Enhancements Fixed sorting issue not reflecting in the Gantt Fixed issue on Plant Gantt Layouts Settings control where user is prompted to save pending changes after they've just saved them Removed the Advanced Sort Mode Toggle switch to ensure Resource List is always sortable Disabled customization of system-generated Gantt layouts (selecting, sorting) A default layout "All Plants" is generated at start-up if no such layout exist. Users are prompted at start-up to regenerate Plant Layouts if invalid ones are detected. Criteria for prompting are: If a plant layout exists with the plant not found in the current scenario If a department layout exists with the department not found in the current scenario Job Flow Layouts are not serialized and are purged when: A new layout is selected Shutting down with a job flow layout set as the active layout All layouts with the Auto-Enable new resources setting enabled will have newly added resources added to them. Workspace Profile Auto-Save Auto-save / backup of workspace profiles now saves to the user's computer. Users may choose where the backups are stored. If a backup has a more recent timestamp than the one that is loaded on startup, then it will automatically be loaded. Desynchronization Logging Additional logging is added to help diagnose server-to-client desynchronization errors. Renamed "Attribute Setup Table" in mappings to "Attribute Range Table" To avoid confusion, the "Attribute Setup Table" mappings pages are renamed to "Attribute Range Table" mappings in Import Mappings. SERVER MANAGER UPDATES Server Manager Version: 12.2.0.7 Nothing significant to note. Some minor bug fixes are released. CRITICAL BUG FIXES Limit the number of rows from audit log DB to message logs The Interface from Server logs in Message Log is limited to 1,000 entries to prevent the dialog from taking several minutes to load when many thousands of entries exist in the interface log on the server. User is allowed to toggle off [x] Production flag from all scenarios Created a warning to appear if the user toggles off the production toggle for the last production scenario. This change is not allowed to save. Users in a group which does not have Import Data permissions are allowed to import data Fixed an issue with user permissions which allowed users without permission to import data to still have the option to import data. Recurring Capacity Intervals created after Daylight savings start date are different than those created before Recurring Capacity Intervals recurrences are calculated by using a StartDate that is closer to the clock date instead of using the import date to calculate, which can be far in the past, thus causing a daylight saving shift. Editing MO Required Quantity from Activities grid does not scale other operation quantities Editing a Manufacturing Order's Required Quantity from the Activities now properly triggers calculation of the related fields. Activity Move tile goes into "Edit Mode" which prevents certain

functionality from working Activity Move Tile will now never enter edit mode. INTEGRATION CHANGES Import Mappings Resource Mappings Removed: CompatibilityGroup CurrentProductSetup CurrentSetupCode CurrentSetupNumber Added: StandardCleanHours StandardCleanoutGrade UseOperationCleanout UseAttributeCleanouts Resource Attribute Mappings The entire mappings table is removed. User Defined Fields can be used in place of Resource Attributes. Resource Connector Mappings Resource Connectors have been redesigned. What was a single import mappings table is expanded to two to accommodate the new connector table structure. Resource Connectors Removed: ResourcePlantExternalId ResourceDepartmentExternalId ResourceExternalId DownstreamResourcePlantExternalId DownstreamResourceDepartmentExternalId DownstreamResourceExternalId FixedTransitHrs Added: ExternalId Name Description Notes UserFields TransitHours LinkSuccessors LinkMaterials Resource Connections Added: PlantExternalId DepartmentExternalId ResourceExternalId ResourceConnectorExternalId ConnectionDirection Capacity Interval Mappings Added: Notes Color CleanOutSetups PreventOperationsFromSpanning Recurring Capacity Interval Mappings Added: Color CleanOutSetups PreventOperationsFromSpanning Product Rules Mappings Removed: OperationName Added: OperationCode CleanHrs UseCleanHrs MinQty UseMinQty MaxQty UseMaxQty CleanoutUnitsRatio UseCleanoutUnits Attribute Mappings Attributes are now imported as objects before being associated with Operations or other objects. This is an entirely new mappings table: ExternalId Name Description ColorCode DefaultCost DefaultDurationHrs AttributeTrigger AttributeType CleanoutGrade ShowInGantt HideInGrids ConsecutiveSetup UseInSequencing Attribute Range Table Mappings (formerly "Attribute Setup Table Mappings") Each of the mapping tables Attribute Range Table, Attribute Range Table Attribute Name, Attribute Range Table From-Range, and Attribute Range Table To-Range were updated to accommodate the change from AttributeName to AttributeExternalId. Removed: AttributeName Added: AttributeExternalId Compatibility Code Table Mappings Item Compatibility (old) is replaced by a more robust Compatibility Code concept whereby many codes can be listed as allowed or disallowed to be scheduled together across an assigned resource group. These are all new mappings tables: Compatibility Code Tables AllowedList TableName Description Compatibility Code Table CompatibilityCode TableName Compatibility Code Tables Assigned Resources PlantExternalId DepartmentExternalId ResourceExternalId TableName Attribute Code Table Mappings Each of the mapping tables Attribute Code Table, Attribute Code Table Attribute Name, and Attribute Code Table Attribute Code, were updated to accommodate the change from AttributeName to AttributeExternalId. Removed: AttributeName Added: AttributeExternalId Additional changes to the Attribute Code Table Attribute Code mappings: Removed: SetupTime SetupCost Added: DurationHours Cost CleanoutGrade Lots Mappings Removed: WearAmount Resource Operation Mappings Removed: MinAutoSplitQty Added: CleanHrs CleanTimeManualUpdateOnly CleanOutGrade ProductCode AutoSplitType MinAutoSplitAmount MaxAutoSplitAmount SetupSplitType Internal Activity Mappings Added: CleanHrs CleanTimeManualUpdateOnly CleanOutGrade Product Mappings Removed: VolumeOverride Added: UnitVolumeOverride Operation Attribute Mappings Removed: Name Description SetupHrs SetupCost IncurSetupWhen ConsecutiveSetup ShowInGantt ManualUpdateOnly HideInGrids Added: AttributeExternalId CodeManualUpdateOnly NumberManualUpdateOnly DurationHrs DurationOverride DurationHrsManualUpdateOnly Cost CostOverride CostManualUpdateOnly ColorOverride ColorCodeManualUpdateOnly Cleanout Trigger Table Mappings Cleanout Trigger Tables are all new to this version. These are all new mapping tables: Cleanout Trigger Tables TableName Description Operation Count Cleanout Trigger Table TableName DurationHours CleanoutGrade CleanCost TriggerValue Production Unit Cleanout Trigger Table TableName DurationHours CleanoutGrade CleanCost TriggerValue ProductionUnit Time Cleanout Trigger Table TableName DurationHours CleanoutGrade CleanCost TriggerValueHours UseProcessingTime UsePostProcessingTime TriggerAtEnd Cleanout Trigger Tables Assigned Resources PlantExternalId DepartmentExternalId ResourceExternalId TableName Last Run Activities Mappings This new table maps activities to a resource for tracking sequence dependent values. This will be set on the resource automatically as operations finish, but can be overridden with an imported value. The finished activity must exist in the system. This table is already deprecated in the next software release. It's recommended to not use this solution to track sequence-dependent setup and clean at the start of the schedule. Instead, enable Track Actuals and import any number of finished operations. The scheduled resource can be specified in the ActualResourceUsed property of the internal activity. PlantExternalId DepartmentExternalId ResourceExternalId JobExternalId MoExternalId OperationExternalId ActivityExternalId Publish Data Breaking Change A Primary Key change in the ProductRules table requires rebuilding the table, or at least dropping it. Once it's been dropped, the next successful Publish from the PlanetTogether desktop application will recreate the table with the new schema as long as the ValidateDB property of the [dbo].[SystemData] table in the publish database is set to True. drop table [dbo].[ProductRules] Database Schema File Download the database schema file here:

StandardPublishDBSchema\_12.2.0.27.sql Customers Added: ExternalId | [nvarchar](max) Departments Removed: AttributesSummary Inventories Added: PreventSharedBatchOverflow | [bit] Items Removed: AttributesSummary JobActivities Added: CleanHrs | [float] CleanOutGrade | [int] CleanManualUpdateOnly | [bit] JobOperationAttributes Removed: Name Description ColorCodeColorName ConsecutiveSetup SetupHrs SetupCost IncurSetupWhen ShowInGantt ManualUpdateOnly HideInGrids Added: AttributeExternalId | [nvarchar](max) Cost | [float] DurationHrs | [float] ColorCode | [nvarchar](max) JobOperations Removed: MinAutoSplitQty Attributes Added: AutoSplitType | [nvarchar](max) MinAutoSplitAmount | [float] MaxAutoSplitAmount | [float] SetupSplitType | [nvarchar](max) Jobs Removed: AttributesSummary Lots Removed: WearAmount ManufacturingOrders Removed: AttributesSummary Plants Removed: AttributesSummary ProductRules Updated data type: OperationName from [nvarchar](254) to [nvarchar](max) Added: CleanHrs UseCleanHrs CleanoutUnitsRatio UseCleanoutUnits Primary Key Field Removed: OperationName PTAttributes This is a newly added table. PublishDate | [datetime] InstanceId | [nvarchar](38) Name | [nvarchar](max) Description | [nvarchar](max) ExternalId | [nvarchar](max) ColorCode | [nvarchar](max) ConsecutiveSetup | [bit] DefaultCost | [float] DefaultDurationHrs | [float] AttributeTrigger | [nvarchar](max) AttributeType | [nvarchar](max) CleanoutGrade | [int] ShowInGantt | [bit] HideInGrids | [bit] PurchasesToStock Removed: AttributesSummary Resources Removed: CompatibilityGroup CurrentProductSetup CurrentSetupCode CurrentSetupNumber AttributesSummary Added: StandardCleanHours | [float] StandardCleanoutGrade | [int] UseOperationCleanout | [bit] UseAttributeCleanouts | [bit] OperationCountCleanoutTriggerTableName | [nvarchar](max) ProductionUnitCleanoutTriggerTableName | [nvarchar](max) TimeCleanoutTriggerTableName | [nvarchar](max) TransferOrders Removed: AttributesSummary Warehouses Removed: AttributesSummary DEPRECATIONS Sequence Factors Lowest and Highest Attribute Number are removed The Highest Attribute Number and Lowest Attribute Number sequencing factors are replaced by a new Attribute Number factor. See: Sequence Planning Board. Resource Attributes Attributes are removed from Resource objects.

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## Release Notes: 12.2.1

### [Source](#)

Latest version: 12.2.1.138 Jump to section: New features & functionality Improved functionality Server Manager updates Critical bug fixes Integration changes Deprecated functionality Maintenance Release Fixes General Availability Releases Release Version Release Date 12.2.1.58 December 23, 2024 12.2.1.60 December 30, 2024 12.2.1.71 February 18, 2025 12.2.1.77 March 21, 2025 12.2.1.87 April 14, 2025 12.2.1.97 May 19, 2025 12.2.1.111 July 11, 2025 12.2.1.116 July 25, 2025 12.2.1.129 September 9, 2025 12.2.1.138 November 10, 2025 Major Feature Release: 12.2.1.58 NEW FEATURES & FUNCTIONALITY Capacity Interval Enhancements Alert This is a breaking change. Imported capacity intervals are not backward compatible with previous versions. All imported capacity intervals will need to be re-imported to accommodate the new structure. Capacity intervals are simplified in some ways, but also given more flexibility and options to define precisely what type of work can be performed on each. Interval types are reduced to only 2: Online Offline Each interval can be given a custom color of the user's choosing. New boolean options are provided which determine various functionality of each interval: Overtime: When enabled, the resource is available to perform work. Cost calculations for performing work on the interval use the Overtime Hourly Cost on the resource. When disabled, cost calculations for performing work on the interval use the Standard Hourly Cost on the resource. Can Start Activity: When enabled, the interval can be used to start the first process of an activity (either Setup, if applicable, or Cycle). Prevent Operations from Spanning: When enabled, the resource is not available to perform work, and no idle work is allowed to pause to span across this interval. This is typically a good option for resource maintenance or cleaning where schedulers don't want to start progress on an operation or activity, then pause for its offline maintenance, then pick back up the activity after the offline interval. Reset Attributes Changeovers: When enabled, calculations which dictate sequence-dependent setups and cleans will be reset to 0. Use Only when Late: When enabled, activities will only schedule on the capacity interval if they are late (the schedule clock date time is later than the activity's JIT start date). Used for Setup: When enabled, the capacity interval can be used to perform Setup processes. Used for Run: When enabled, the capacity interval can be used to perform Cycle processes. Used for Post Processing: When enabled, the capacity interval can be used to perform Post-Processing processes. Used for Storage Post Processing: When enabled, the capacity interval can be used to perform Storage Post-Processing processes. Used

for Clean: When enabled, the capacity interval can be used to perform Clean processes. Interval preset templates are made available to quickly preset an interval with recommended settings for various common interval types. Each preset can also be imported via a new IntervalPreset property: Online Online CanStartActivity UsedForSetup UsedForRun UsedForPostProcessing UsedForStoragePostProcessing UsedForClean Overtime Online CanStartActivity UsedForSetup UsedForRun UsedForPostProcessing UsedForStoragePostProcessing UsedForClean Overtime PotentialOvertime Online CanStartActivity UsedForSetup UsedForRun UsedForPostProcessing UsedForStoragePostProcessing UsedForClean Overtime UseOnlyWhenLate Cleanout Online UsedForClean Holiday Offline PreventOperationsFromSpanning Offline Maintenance Offline PreventOperationsFromSpanning ResetAttributeChangeovers See also: Resource Capacity Scenario Data Board Gantt Board Capacity Interval Mappings Recurring Capacity Interval Mappings Scenario Management Enhancements The following enhancements are made to Scenario Management: Only one scenario may be designated a "Production" scenario. It cannot be deleted until replaced by another scenario (the workspace must have one Production scenario at all times). A new Scenario Swap button is added which enables users to swap a non-production scenario with the current production scenario. See also: Scenario Management Resource Prioritization Each resource may be given a Priority numerical value which can be considered during optimization when the associated optimize factor is scored so that if multiple resources are eligible to schedule an operation and each has available capacity, the Priority designation can force the scheduler to score the operation higher on the preferred resource. Product rules can override the Resource Priority order depending on the Product that the job is producing. See also: Resource Mappings Sequence Planning Board Product Rule Mappings New Product Rule: Item Transfer Quantity Per Product / Resource New product rules are created to override Item Transfer Quantity for a Product depending on which Resource it is made on. See also: Product Rules Product Rule Mappings New Gantt Segments: Job Color, Product Color Two new Gantt segments are added: Job Color and Product Color. Job Color: The segment is drawn with a background color equal to the defined Color property of the associated Job. Product Color: The segment is drawn with a background color equal to the defined Product Color property of the associated Manufacturing Order. See also: User Settings New User Control: Cancel Simulation A new option is available to users to cancel a long-running or stuck simulation process. See also: Main Toolbar New Message Log Control: Auto-Clear Import Logs A new option is available in the Message Log Viewer to automatically purge old import (Interface) logs so that only the errors logged from the most recent data refresh are visible. See also: Main Toolbar Create a visible queue of waiting actions When many manual schedule moves or similar actions are made in quick succession, each action may be added to a queue and processed in the order in which it was queued. The number of currently queued actions is made visible in a notification slide across the bottom of the screen. Add a means for a user to change their password A new Reset Password button is added to the User Preferences dialog to allow users to change their password. See also: User Management Activity Setup, Cycle, Quantity per Cycle, Post-Processing, and Clean can override Operation values Activities are updated to allow for different time standards to be configured per Activity rather than inheriting them from the associated Operation. This is particularly helpful if splitting an operation into multiple activities might have an impact on time standards like Setup, Cycle, Clean, etc. See also: Job Details Dialog Internal Activity Mappings New Gantt Hint Line: Product Consumed A new Gantt hint is added which draws a vertical line where the selected operation's product is consumed by another scheduled operation. See also: User Settings New Optimize Factor: MO is Scheduled A new optimize factor is added which prioritizes operations when one or more of its predecessors of the same MO are currently scheduled. See also: Sequence Planning Board Allow for Wildcard Characters in Attribute Code Tables Wildcard characters which were previously only available to use in configuring Setup Code tables can now be used in Attribute Code tables. See also: Scenario Data Board [ 12.2.1.71 ] New Optimize Factor: Shelf Life Added a new optimize factor prioritize operations if they consume materials which are close to expiring to help with scheduling shelf-life controlled lots to reduce waste. [ 12.2.1.87 ] Add setting to disable Import while Publish is running Adds a new setting and settings control to disable importing while a Publish is in progress. [ 12.2.1.87 ] Show Connected Jobs flow Added a new action element to the Gantt Right-click menu to show all related/ connected jobs flow of a selected job. [ 12.2.1.87 ] Add way for users who can't publish to see last publish date in core product The last publish date is presented in the top right corner for those users who do not have permission to see the Publish menu where the last publish date was previously displayed. [ 12.2.1.87 ] Audit Logging: Add FromDepartmentName and ToDepartmentName fields to dbo.TransmissionLog Request Added two new fields to the TransmissionLog Details column for Move Actions: FromDepartmentName (string) ToDepartmentName (string) Instances from this version onward will begin provided this information for each moved logged. [ 12.2.1.87 ] Add Grid Layout management to Inventory Details and KPIs board grids Grid Layouts are now enabled for the Inventory Details Grid in the Inventory Plan board's Inventory

Plot Report tile, as well as for the KPIs board grid. [ 12.2.1.87 ] Expedite: Add way to Expedite Jobs without Predecessors and Supplies A new Expedite option is added to the Gantt and Activities board Expedite Job and Supplies menus from the right-click actions menu. This option will only expedite the selected job without also expediting its supplying jobs. [ 12.2.1.87 ] Grid is refreshing while editing when schedule changes occur A User Preference is added to prevent grids from refreshing while in Edit Mode when other users are performing actions which typically trigger all grids to refresh. [ 12.2.1.97 ] Offer a "Minimum optimize score" feature A new Minimum Optimize Score feature is added which prevents scheduling an operation if its score does not meet or exceed a minimum value. Added Global Min Score for Sequencing Plans. This score prevents Activities from scheduling on a Resource if its calculated Sequencing Factors score does not meet or exceed the configured Global Min Score value. Added a column to the Sequence Plan Grid to display the Global Min Score Added an editor to the Optimize Factor Settings Control to allow editing the Global Min Score (this interface will be improved with the next major 12.3.0 software release) For more information, see: Sequence Planning Board. [ 12.2.1.97 ] New optimize factor: Max Delay A new optimize factor is added which scores operations according to how close they are from reaching or violating their predecessor's assigned Max Delay Hours. This is meant to be used without the Max Delay system setting enabled as a means to prioritize operations which are nearing or have exceeded their Max Delay Hours. For more information, see: Sequence Planning Board. [ 12.2.1.97 ] New optimize factor: MO time scheduled A new optimize factor is added which scores operations according to how far away in time they are from the scheduled end date of their predecessor. This helps to keep operations of the same MO scheduled closer together. For more information, see: Sequence Planning Board. [ 12.2.1.97 ] New System Setting which allows breaking a resource's sequence on manual move of dependent predecessor operations Added System Setting to Allow Change of Material Successor Sequence On Move. When enabled, the Material Successors related to the moving Activity are allowed to break the currently scheduled operation sequence on the resource they are scheduled on. For more information, see: System Settings. [ 12.2.1.97 ] New User Setting Move Options are added for Compress Predecessors behavior Compress Predecessors Move Settings toggle setting has been replaced with a dropdown setting with the following options: Predecessors Do Not Move: Predecessor Activities don't move which causes the moving Activity to be constrained by the End Date of the latest Predecessor. Predecessors Compress: Predecessors will "Compress" meaning they can move back as far as possible without changing Operation sequence on the Resource they're scheduled on. The moving Activity will be constrained by the End Date of the latest Predecessor after the Compress. Predecessors Move: Predecessor will be able to move and change the sequence on the Resource they are scheduled on. If the move date intersects a scheduled block, the Predecessor will move to the End Date of the Scheduled Block, which may cause the moving Activity to not be able to move to the desired Move Date. For more information, see: User Settings. [ 12.2.1.97 ] Set sub-job need dates enhancement: Account for production overlap A new Set Sub-Job Need Dates option is added: Production Overlap. It calculates the sub-job need dates to be the start date of the parent job minus the amount of time required for the sub-job to make its first transfer of product to inventory. For more information, see: System Settings MPS/MRP Optimize Plan Settings IMPROVED Inventory Plot: Consolidate rows when material supply comes from the same job and is distributed at the same time Multiple grid rows are consolidated into one row when one operation consumes material from another single operation where the producing operation's product was added to inventory in batches from Item Transfer Quantity logic. Inventory Management Tile: Allow for multi-row selections & deletions Multiple grid rows can now be selected for deletion from the Inventory Management tile in the Scenario Data Board. Last Refresh Timestamp is updated to be Scenario Specific Each scenario may be refreshed at different times. The Last Refresh timestamp in the top right corner of the main toolbar will now reflect the date and time of the last refresh performed in the currently active scenario. Limit the number of rows from the Audit Log to Message Logs The number of data import errors logged on the server which get displayed in the Message Log dialog to end users from the Interface From Server tab are limited to only the last 1,000 records. This was done to improve performance of the message log. Move Details are added to Audit Log Database Logging Manual drag/drop moves will now have more details of each move recorded in the TransmissionLog table of the Audit Log database. Additional details include: The Activity ID The operation Name The MO Name The Job Name The date and time the operation was previously scheduled The date and time that the operation was moved to The resource that the operation was previously scheduled on The resource that the operation was moved to Undo Details are added to Audit Log Database Logging Undo actions will now have more details of each action which is undone logged in the TransmissionLog table of the Audit Log database. Additional details includes a description and a transmission number of each action which is undone. Add Additional Fields to ChecksumValues for Desync Logging Additional fields have been added to ChecksumValues to be logged during client desynchronizations. Data

Refresh Progress Bar Enhancement The progress bar that is displayed in the Notifications slide during a data refresh is improved to show each specific step of the process and give users a rough idea of how far along it is and how close it is to completing. Data validation is added to prevent recurring capacity intervals which run for longer than 24 hours Recurring capacity intervals which run for longer than 24 hours can cause issues with intervals overlapping one another. New logic is added to prevent the creation of recurring intervals with a duration longer than 24 hours. Non-recurring intervals are still allowed to run longer than 24 hours. Reduce file size of downloaded scenarios New options are presented to users who opt to download a copy of the scenarios.dat file. When initiated, the user will be prompted to select which of the available scenarios in the Workspace should be downloaded, and whether or not to Clear Undo Sets. By clearing undo sets and selecting specific scenarios, the file size of the resulting download can be greatly reduced. See also: Main Toolbar Prevent Moves in the Job Watch Gantt Drag/drop moves could previously be performed in the Job Watch and Connected Jobs Gantts, even though the moves did not actually impact the schedule. Moves are now blocked in these Gantts to prevent confusion. Update PlanetTogether Integration Files Updates were made to the standard "PlanetTogether" integration files that get downloaded during the server installation process. The import database schema and a publish database script are updated according to the latest integration standards. Enabled users to freely modify the Commitment property from Bulk Edit tiles Previously, the Commitment property of a job could be progressed forward but not backward by a Bulk Edit tile modification. This change allows the Commitment to be set to any value at any time via the Bulk Edit tiles in Jobs and Activities boards. Capacity Planning Charts Improvements The Resource Utilization Chart and Scheduled Capacity Usage chart have been improved to show more accurate data. SERVER MANAGER UPDATES Server Manager Version: 12.2.0.17 Instance Settings Reorganization A minor reorganization of Instance Settings is rolled out which more clearly defines Import and Publish database settings See also: Instance Manager CRITICAL BUG FIXES Client process doesn't shut down Fixed an issue where the client application Windows process would remain active after the application was closed. Activity Move details are not always logged in Transmission Log database table Fixed a bug where the Audit Log would not consistently log data when the system was busy or related data no longer existed at the time of logging. Certain job quantity columns are rounding to nearest whole number Non-editable numeric grid columns now have their precision set to 2 instead of 0 digits. INTEGRATION CHANGES Import Mappings Resource Mappings Removed: SetupEfficiencyMultiplier Added: ActivitySetupEfficiencyMultiplier ChangeoverSetupEfficiencyMultiplier Priority Capacity Interval Mappings Added: CanStartActivity UsedForSetup UsedForRun UsedForPostProcessing UsedForClean UsedForStoragePostProcessing Overtime UseOnlyWhenLate CapacityCode IntervalPreset Recurring Capacity Interval Mappings Added: CanStartActivity UsedForSetup UsedForRun UsedForPostProcessing UsedForClean UsedForStoragePostProcessing Overtime UseOnlyWhenLate CapacityCode IntervalPreset

## Release Notes: 12.3.0

### Source

Latest version: 12.3.0.97 Jump to section: Migration Guide from 12.2 to 12.3 New features & functionality Improved functionality Server Manager updates Critical bug fixes Integration changes Deprecated functionality Maintenance Release Fixes General Availability Releases Release Version Release Date 12.3.0.94 November 10, 2025 12.3.0.97 December 10, 2025 □ Release Highlights □ ✓ Storage Areas are added to enhance tank scheduling capabilities ✓ The desktop client application runs "lighter" as it requires less RAM by allowing users to load or unload what-if scenarios, and no longer storing Undo data in memory ✓ New job-specific optimization options are available on one or more selected jobs, or for one or more selected resources ✓ Alternate Paths can be assigned Validity Dates which allows path schedule eligibility dates to be explicitly defined ✓ New production overlap enhancements are added for more accurate and flexible scheduling of overlapping production MIGRATION GUIDE FROM 12.2 TO 12.3 A curated guide has been created to assist in the upgrade process when upgrading from older Version 12 releases to 12.3.0: Upgrading from 12.1.x or 12.2.x to 12.3.x NEW FEATURES & FUNCTIONALITY □ New Inventory Storage Solution: Storage Areas ▲ Alert This introduces several breaking changes. All data models are required to be updated so that: Each Warehouse is assigned at least one Storage Area via Storage Area Mappings Each Inventory is assigned to at least one Storage Area via Item Storage Mappings On-Hand Inventory Quantity is imported as a Lot (one Lot per inventory record) via Lots Mappings and Item Storage Lots Mappings Purchase Orders are required to specify which Storage Area the inventory will be stored in If using MO Production Overlap, Job Operation Product and Material Requirement settings will need updated to use new properties and/or values. Storage Areas are introduced as a new required data object. They

represent an area within a Warehouse where material is stored. Each Warehouse must now have at least one assigned Storage Area. Storage Areas use Item Storage mappings to define properties for which items can be stored in each Storage Area and how they can be stored. These are meant to replace Tank Resource objects and come packaged with many optional constraints that enable more accurate modeling of how storage tanks and silos are scheduled in PlanetTogether. A high-level overview of the impact of the changes: Storage Areas can constrain how material is stored in a warehouse. This can be general unconstrained floorspace, storage bins, tanks, silos, etc. All scheduled and planned material must be stored in a Storage Area A new Storage Areas board shows inventory levels per item per storage area over the course of the schedule. This is different than the inventory plan as it will not show Forecast demands or shortages which remain at the inventory (warehouse) level. Storage Areas can constrain the flow of material by the number of simultaneous sources. Limits can be defined for simultaneous withdrawal, storage, and the combination of both. Storage Areas can be constrained to store a single material at a time to model single-item storage bins or tanks A new Item Storage object is added which extends inventory properties for each Storage Area. An item stored in a storage area is considered Item Storage. Similar to how Inventory contains properties for items within a specific warehouse, Item Storage contains properties for items stored in a specific Storage Area. An item storage must exist for every item that can be stored in the storage area An item storage may optionally define a maximum quantity of the item that can be stored in the storage area at any time An item storage may optionally define a minimum limit to maintain material in the Storage Area. If the quantity ever goes below this quantity, the remainder will be disposed. An item storage may optionally indicate whether the material will be disposed of immediately upon meeting the disposal requirement (time or quantity), or if the material should only be disposed if needed to make room for other storage. Storage Area Connectors: A new data object that links resources to storage areas. These act as constraints on when, how, and if the material can be transferred between resources and storage areas. Replaces material-based resource connector functionality Each connector has mappings for material flow from Resources In -> Storage Area In -> Storage Area Out -> Resources out Each connector is a 'plan' of how material can be transferred between resources and storage areas. When storing material from an operation product, all available connectors in the Resources In mappings will be considered. Only one connector will be used to store the material. The 'best' connector will be determined by Product Storage rules. For example largest storage, closest fit, empty, not empty, etc. If multiple resources can use a connector, it will be constrained by storage flow limits. StorageFlowIn and StorageFlowOut constrain how many storage areas can be used by the connector simultaneously. CounterFlow limits whether the connector can be used to move material in and out of storage simultaneously, constrained by the CounterFlowLimit. See: Storage Area Connectors. Storage Area impact on the Inventory Plan Board While a new Storage Areas Board has been added, some storage area details are made visible in the Inventory Plan Board as well. In particular, the Inventory Plot Report tile now includes the following details: Storage Area: The storage area impacted by the adjustment. Storage Area Level: The current total amount of inventory stored in the storage area. Storage Area Available Level: The current amount of inventory stored in the storage area which is available to be used by consuming operations. Storage Area impact on MRP The impact of storage areas on MRP is minimal. The only new requirement to preserve old functionality is to define a Storage Area ExternalId at the inventory level via the PurchaseOrderSupplyStorageAreaExternalId property for any inventory that is configured to allow MRP to generate purchase orders to satisfy demands (MrpProcessing is set to GeneratePurchaseOrders). Storage Area impact on Tanks: **⚠ Warning** All previous notions and conceptions of Tanks modeled as Resources has been completely redesigned. Tanks are now modeled as Storage Areas and may be connected to Resources via Storage Area Connectors. Storage tank functionality has been changed in the following ways: Storage Post Processing stage and statuses have been removed. Clean now most aligns with this status/process. Storage has been added as a standard production stage that comes after Post-Processing. Product material availability can now be made available during Post Processing, During Storage, or at the end of storage. Storage is meant to represent the time it takes to move material from the resource to a storage area, but it can be used and modeled as an extra production stage if needed, even if there is no material to move. Most features that worked with Storage Post Processing have been updated to work with Storage. For example capacity interval used during storage post processing field. Reported Storage can be imported similar to other Reported fields for the other production stages. Storage Clean has been removed and Clean now always comes after Storage. Product StoreInTank and other tank related fields have been removed Where tanks previously disposed of its material only after being completely consumed/depleted by other operations, or after expiring, now Item Storage can be configured with a Disposal Quantity which defines a minimum threshold that allows the storage area to automatically dispose of the material if the level drops too low. Review notes mentioned above and the newly documented Storage Areas

functionality for more information about how to model tanks in this software release and beyond. Storage Area impact on Lots and On-Hand Inventory: All inventory is now stored and sourced from Lots. A single on-hand lot may be imported to keep modeling simpler. All scheduled production and POs will create new lots in the system. Lot pegging with lot codes is unchanged and is still optional. Lot Quantity must be imported at the Item Storage level via Item Storage Lots Mappings which requires importing Lot objects via Lots Mappings. A single Lot can optionally be stored across multiple Storage Areas. Storage Area impact on Operation Material Requirements: MaterialUsedTiming - A new field is added to configure when the material is required: At start of setup, start of production, or based on production cycles. This replaces OverlapProduction fields. StorageArea - A new optional field that may be specified to indicate material may only be sourced from a particular storage area within a warehouse. If unspecified, the material will be sourced from any available Storage Area. MultipleStorageAreaSupplyAllowed - A new field similar to Allow Partial Supply and Multiple Warehouse Supply that specifies if the material can be sourced from multiple storage areas. Storage Area impact on Operation Product: StorageArea - A new optional field that may be specified to indicate the product must be stored in a specific storage area. If unspecified, the product will be stored in any available storage area. RequireEmptyStorageArea - A new field that specifies whether the product must be stored in an empty storage area. This field works with the StorageArea field SingleItemStorage. If both are set to True, then a storage area must be emptied or disposed before the product can be stored in the storage area. See also: Storage Areas Storage Area Connectors Storage Areas Board □ User Defined Fields have been Refactored △ Alert This is a breaking change to integrations that use User Defined Fields. This is the first step in moving toward fully integrating custom fields into the integration and field mappings interface. In this version, the following changes will impact the integration and import of UDFs: All UDFs must be defined as independent objects via User Field Mappings. For example, if a "UPC Code" UDF should be applied to both Jobs and Operations, there will need to be two definitions: one with the Job type and one with the ResourceOperation type. The External Id's need to be unique between them, but the Name can be the same. When importing the user field on an associated object, only the field ExternalId and Value should be imported rather than name, value, data type, and display in UI boolean field\_externalid~value. User Field properties are now defined in a separate object called a UserFieldDefinition. Properties of each definition include: External Id, Name, UDF Type, Object Type, Default Value, and various flags. Having the User Fields defined in a central table will allow the integration to only import the External Id

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## Software Releases & Roadmap > Software Installation

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### Software Installation and Upgrades

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## Software Releases & Roadmap > Upgrade Guides

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### Upgrading from 12.1.x or 12.2.x to 12.3.x

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Key Concept Software release version 12.3.0 introduces a significant new data structure in Storage Areas that impact all users and companies upgrading their data models from older Version 12 versions to 12.3.0 and newer. Use this guide to consider how your implementation and integration may be impacted by the changes. Jump to section: Import Database Updates Storage Areas & Item Storage Basic Storage Area and Item Storage Tank Resources On-Hand Inventory Purchase Orders & MRP Lot Controlled Planning & Shelf Life Resource Setup Capacity Intervals Operations and Activities Setup Codes Tank Post Processing Resource Requirements Material Requirements Products Resource Connectors Product Rules User Defined Fields Publish Database Updates Import Database Updates A best practice of any integration is to have the import database match 1:1 with

PlanetTogether's import mappings tables. This isn't always practical and is not required and is a more involved process to organize the data into the latest table structure, but if your project has the time and flexibility to adopt the latest import database schema, use the provided schema and comparison files to fill in the gaps and/or update your existing import database: Database Schema File Download the database schema file here: Version File Download 12.3.0.94 StandardImportDBSchema\_12.3.0.94.sql Database Schema Comparison Compare import database schemas between versions to clearly see what fields and tables have been added, removed, or updated: Versions File Download 12.2.1.129 vs. 12.3.0.94 ImportDBSchemaCompare\_12.2.1\_vs\_12.3.0.xlsx Storage Areas & Item Storage Storage Areas represent areas within a Warehouse where items can be stored. They are primarily introduced to improve PlanetTogether's tank modeling and scheduling solution since they can optionally be configured with constraints that are enforced during scheduling. Even if Tank resources are not part of an existing data model, Storage Areas are required new objects. Every Warehouse in the data model must contain at least one Storage Area, and Items must be configured to be stored in at least one Storage Area. Notably, none of the operation stock material or product data points need a storage area defined, so those objects do not need updated with storage area data. Basic Storage Area and Item Storage To upgrade with the minimum amount of effort, recycle existing Warehouse and Inventory data and map it to the new Storage Areas and Item Storage mappings. □ Example My data model gets Warehouse data from the import table called "Warehouses". It gets Inventory data from the import table called "Inventories". I can map each Warehouse as a Storage Area by configuring Storage Area import mappings to fetch data from the Warehouses table and mapping appropriate fields. I can then map Inventory records as Item Storage records to store all Warehouse inventories in the Storage Area. Be sure to include Storage Areas and Item Storage in the Inventory Objects to Include section of the import mappings configuration: Tank Resources Tank resources complicate things a bit. In order to get the same behavior from old versions in the new version, each tank resource must be modeled as both a Resource and a Storage Area, and a Storage Area Connector should establish an in-flow connection between the two. Additionally, any items that get stored in the tank storage area must be mapped via Item Storage Mappings. The path of least resistance here is to create a standard Table or View for each of Storage Areas, Item Storages, Storage Area Connectors, Storage Area Connector In, and Resource Storage Area Connector In data. The idea is to link a Resource to a Storage Area via a Storage Area Connector to allow that resource (and only that resource) to supply the Storage Area with material. This enables storage tracking and visibility from the Gantt and Storage Areas board. Each Storage Area should also be configured for Single Item Storage in order to emulate old storage tank behavior where only a single item was allowed to be stored in the tank at any given time. □Example A brewery model with 16 Tank resources has them imported as both Resources and Storage Areas. Each of the Storage Areas reside in the same Warehouse, though this is not a requirement. Each Tank Storage Area is configured for Single Item Storage. Create one Storage Area Connecter per Storage Area, then map StorageAreaConnectorIn and ResourceStorageConnectorIn logic to each connector where the Resource and Storage Areas share the same ExternalId's. Finally, for each Item or Inventory that can be stored in each Tank, map an Item Storage association. Note that it may require mapping the same items to multiple Storage Areas if an item might be eligible to be stored in more than one tank. Be sure to toggle on each of the appropriate Storage Area objects to import in the mapping wizard. On-Hand Inventory All inventory production, including on-hand inventory, are stored as Lots within Storage Areas. Lot codes are not required. With this in mind, in order to import on-hand inventory it must come into the system as a lot. This currently requires two separate sets of mappings: Lots Mappings: Create the on-hand lot object here. If your model does not already utilize a Lots table, consider importing on-hand lots from the Inventories table where the OnHandQty field used to exist. In these cases, you might also consider filtering to only import lots when the OnHandQty is greater than 0 since it is not valid to import a lot with 0 quantity. A simple way to set the Lot ExternalId is to use the ItemExternalId. Item Storage Lots Mappings: Assign each on-hand lot a quantity and a storage area here. Again, if Lots were not previously being imported then these Lot fields can be imported from the Inventories data where OnHandQty is greater than 0. Purchase Orders & MRP Purchase Orders (Purchases to Stock) now require a Storage Area ExternalId to be defined. If Purchase Orders are being imported, be sure to update the Purchases to Stock Mappings table with the Storage Area ExternalId data. If your data model uses PlanetTogether's MRP functionality and specifically its option to Generate Purchase Orders to Satisfy Demand and Material Requirements, then each purchased Item will need a new property assigned from the Inventory Mappings: PurchaseOrderSupplyStorageAreaExternalId. Set its value to the appropriate Storage Area ExternalId where the generated Purchase Orders should be stored. Lot Controlled Planning & Shelf Life If any of your items or inventories were previously lot controlled, note that the LotUsability property has been removed. In this software version, all inventory is stored in Lots, so technically all inventories are now lot controlled. Lot codes and pegging

is still optional. The system now tracks shelf life of all items as well. If the ShelfLifeHrs property of the Item is greater than 0, then production of the item will expire after the number of shelf life hours has passed since the lot was produced. In order to mimic the old LotUsability setting of ShelfLifeNonConstraint which allows expired material to be consumed, you must now set the AllowExpiredSupply property on the Operation Material Requirement to True. This will prevent those inventory lots from expiring and will give visibility into scheduled expired material consumption in the Materials board grid. For more information, see: Lot Controlled Planning.

Resources Setup Resource configurations have been modified to accommodate changes made to simplify how Operation Setup can be configured. The most notable change is the removal of the SetupIncluded property in favor now of boolean values: UseResourceSetupTime: If true, the specified Resource Setup (Resource.SetupHrs) will be factored in when calculating the scheduled setup of each operation that schedules on the resource. UseSequencedSetupTime: If true, Operation Attributes of operations scheduled on the resource will be factored in when calculating the scheduled setup. Notably, the UseOperationSetupTime property still functions as it did before. If true, the specified Operation Setup (Operation.SetupHrs) of operations scheduled on the resource will be factored in when calculating the scheduled setup. Be sure to set any of these to True if the resource needs to factor in these variables to schedule setup time on its scheduled operations. Capacity Intervals A small change is made to Capacity Intervals that may impact your implementation. The CleanOutSetups property is renamed to ResetAttributeChangeovers but serves the same purpose. If you were previously setting this to True on any of your recurring or non-recurring capacity intervals, be sure to set the new property name to True instead.

Operations and Activities Setup Codes Operation Setup has been slightly simplified/consolidated. The SetupCode property is removed (as are the accompanying Setup Code Tables) in favor of using Attributes to achieve sequence-dependent setup. Tank Post Processing With Tank Resources removed or refactored, the Operation TankPostProcessingHrs field and its associated Tank Post Processing production process are removed. Cleans most accurately represent what was Tank Post Processing, but for added flexibility a new Storage process has also been added. Resource Requirements Job operation Resource Requirements are updated to accommodate the removal of the Tank Post-Processing process noted above. Specifically, the UsageStart and UsageEnd properties no longer support the StoragePostProcessing or StorageClean options. To accommodate this, replace the StoragePostProcessing and StorageClean requirement usage start and end settings with either Clean or Storage depending on your strategy to adapt your tank modeling solution. Material Requirements If using MO Production Overlap, the former UseOverlapActivities property has been removed and a new MaterialUsedTiming property is added. These are the new options to model overlap using MaterialUsedTiming: DuringSetup: Material is required evenly over the duration of the setup. The item's TransferQty will be used if set. If a Storage Area Connector is required, it will be used during the duration of setup. ByProductionCycle: A portion of the material is required at each production cycle start. The quantity is the ratio of the material requirement TotalRequiredQty and the Operation RequiredFinishQty. Issued material will be omitted from the initial cycle's requirements. If a Storage Area Connector is required, it will be used during the duration of production. LastProductionCycle: All material is required on the final operation cycle start. FirstAndLastProductionCycle: Confirms that the first cycle has enough material and that all remaining material is available for when the last cycle starts. This can be used when the material overlap doesn't need to check every cycle, but the consuming operation is delayed by the first production cycle material and delayed by the full required material at the end of the operation. The one that most closely mimics the old software behavior is the ByProductionCycle property, although you may get similar (often identical) scheduling results and improved optimize performance by using the new FirstAndLastProductionCycle option.

Products Since tank resources are refactored, the StoreInTank property of the Operation Product has been removed. New StorageAreaExternalId and RequireEmptyStorageArea properties should be used to mimic former tank material production and storage using the new tank storage areas. Resource Connectors Resource Connectors are simplified to only support connections between predecessor and successor operations of the same manufacturing order and the resource(s) that the successor is eligible to schedule on. It can no longer be used to constrain which resources are eligible to consume material from other resources since that was a functionality of tank resources. In order to model material-linked connections, Storage Area Connectors must be used instead. Similar to material-linked resource connectors, each Storage Area Connector represents a single pipe flow from a storage area to a consuming operation. If more than one operation are eligible to schedule to consume material from a storage area simultaneously, then two or more connectors are required (however many simultaneous connections are allowed). To configure a material link between a storage area and a resource, first create or define the Storage Area Connector, then configure or map each of the Storage Area Connector Out and Resource Storage Area Connector Out settings where the Storage Area Connector Out defines which storage area(s) the

material is stored in and the Resource Storage Area Connector Out defines the resource(s) which are eligible to consume material from the listed storage area(s).  $\triangle$  Note Unlike previous connectors which reserve capacity across all resources for the duration of an operation's scheduled work, Storage Area Connectors are only considered in use while an operation is actively consuming material from it. With this in mind in regard to material-linked connectors, it's required to set the new MaterialUsedTiming field on the stock material requirement to some value that results in the material being consumed from the storage area for the duration of the running operation. For example, the setting to consume material ByProductionCycle will force the connector to be used for the duration of each production cycle of the operation so that no other operation can schedule at the same time to use the same connector.  $\square$  Example My tank resource only has two connected pipes, so its contents may only be consumed by two operations simultaneously. Here is the storage area connector configuration (each connection configured identically): I have one production job which stores material in the tank resource. I have three packaging jobs which each must source required material from the tank, and I have three packaging resources capable of packaging the material. Each of the job operations' stock material requirement are configured to consume material by production cycle (MaterialUsedTiming = ByProductionCycle). When the work schedules, only two of the packaging jobs are allowed to run simultaneously. The third must wait for the pipe connection to be available before it is allowed to schedule to consume material from the tank resource, even though it has capacity to schedule earlier. Product Rules A small change to product rules was made to rename the OperationCode property to ProductCode so that it matches the Operation property of the same name. Be sure to update your mappings if you were previously using the OperationCode property. User Defined Fields Two major breaking changes are introduced in how User Defined Fields are modeled: All UDFs must be defined as independent objects via User Field Mappings For example, if a "UPC Code" UDF should be applied to both Jobs and Operations, there will need to be two definitions: one with the Job type and one with the ResourceOperation type. The External Id's need to be unique between them, but the Name can be the same. When importing the user field on an associated object, only the field ExternalId and Value should be imported rather than name, value, data type, and display in UI boolean field\_externalid~value Notably, User Fields are published as columns now using the User Field ExternalId instead of Name + UDF. If "U

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## Software Releases & Roadmap > Version 12 Introduction

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### New Functions & Features

#### Source

Jump to section: Desktop Application Enhancements Schedule Optimization Enhancements Server Management Enhancements Desktop Application Enhancements Complete User Interface Redesign Dock-able Boards with tiles; smart tabular navigation; sidebars navigation; status panels and more bring a sleek, modern look to the Client User Interface. For details and screenshots, see: Modern User Interface User Permissions Management Create permission groups and assign users to those groups for easier permissions management. See also: User Management Grid Enhancements More advanced filtering and sorting tools are now available, and grid columns and cells can have conditional formatting applied to them. Grids now load dynamically so there is never a need to manually refresh or reload a grid to see updated data. See also: Grid Personalization Editable Grids Most object properties are now editable directly in the main grids of each board that displays data object properties (Customers, Jobs, Inventory, Sales Orders, Purchase Orders, etc.). Simply toggle a new Edit Mode on and any editable fields which are visible in the currently selected layout will be available for editing. Non-editable fields will be grayed out. See also: Grid Edit Mode Metrics and Targets Formerly called "grid alerts", defining Metrics allows users to quickly see if jobs, materials, or inventory items match filtering criteria to provide a quick analysis of schedule changes and their impact. Metrics can be created based on any grid property filter criteria defined. Each metric can optionally be given targets (goals) which allows for quick assessment of whether or not your targets are being met for each metric. See also: Layouts, Metrics, and Targets Configurable Gantt Views Create and save as many custom Gantt views as make sense for your users and your organization. Configurable Gantt views allow you to choose which resources get displayed in the Gantt and in which order, and quickly switch from one saved view to another. See also: Plant View Settings Bulk Property Editors Many boards have an object Bulk Edit tile which allows users to make changes to any editable property and apply the changes to one or more objects at the

same time. See also: Object Bulk Edit Tiles Predictive KPIs Create your own KPIs to keep track of what matters most to you and your organization. You may now create up to 10 KPIs per Board (formerly "Views") for any number of factors based on your data within the planning horizon as presented in each of the Board grids. See also: Predictive KPI Tiles Sales Orders: Late Analysis Properties in the Sales Orders Grid Gather insights into how many Sales Orders are being delivered late with all new "Late" analysis properties offered in the Sales Orders grid. See also: Sales Orders Board Capacity Planning Analytics Tools and analytics to help plan capacity. Both Machine capacity and Worker schedules. Plan daily worker capacity, holidays, breaks, and planned maintenance. See also: Capacity Planning Board Scenario Management Manage and share multiple scenarios with new scenario options and sharing permissions. Switching between scenarios is now faster, and there are more tools available for comparing scenarios within existing views to allow you to easily see differences in Metrics, Predictive KPIs, KPIs, and more. Load and unload scenarios from memory to improve the desktop application performance. See also: Scenario Management Workspace Profile Management Managing and sharing user Workspace Profiles has been redesigned to allow full or partial Profile sharing (think: only import Metrics and Layouts from another user's Workspace Profile). Auto-save options are now available to save Workspace Profiles to user's local machines or to the server where they can be shared with others. Server administrators will also be able to choose a standard default workspace for all users of an instance at the time the instance is created. See also: Workspace Profiles Dashboard Notification Slides Users are prompted with success and failure messages of their actions via Notification Slides which appear at the bottom of the screen. Settings can be configured to preserve or automatically hide these messages after a specified duration depending on their severity. See also: User Settings Auto-save settings & configuration changes Users can opt to auto-save their changes to most settings and configurations to help save time trying to find a Save button. See also: User Preferences Sign-In Manager Application The new Sign-In Manager application offers simple integration with various SSO providers and offers statistics and visual aids related to each of the instances that users frequently connect to. See also: Client Sign-In Manager Application Configurable Time Zone Settings Configure the time zone at the Instance and/or User level to ensure all schedulers around the globe are scheduling using the appropriate time zone. See also: User Preferences Schedule Optimization Enhancements Optimization Enhancement: Schedule Highest Scoring Resource First An enhancement has been made to the standard optimization logic whereby all resources with capacity at any point in time during optimization will be considered eligible to schedule the next operation. All operations which are released to schedule on all resources with capacity will be scored per each of the available resources. The operation with the highest optimization score will be scheduled on whichever resource it scores highest on. This behavior will help to improve resource selection during optimization. A practical example: If two or more resources are capable of scheduling the same operation at the same point in time, then the resource with the higher optimization score will be selected to schedule the operation. In previous software versions, the optimization engine would choose a specific resource and force something to schedule on that resource, even if there is only one eligible operation and if that eligible operation would score better and schedule better on another available resource. See also: Optimization Optimization Rule Enhancements Optimize rules/factors can be more easily weighted against each other with a new simple scoring system. New analytics offer insight into how the scores impact scheduling. Certain factors can be given negative weight to count against a score. See also: Sequence Planning Board New Item Storage Options for Tank Modeling and Scheduling Storage Areas are introduced as a new required data object. They represent an area within a Warehouse where material is stored. Each Warehouse must now have at least one assigned Storage Area. Storage Areas use Item Storage mappings to define properties for which items can be stored in each Storage Area and how they can be stored. These are meant to replace Tank Resource objects and come packaged with many optional constraints that enable more accurate modeling of how storage tanks and silos are scheduled in PlanetTogether. Storage Areas can constrain how material is stored in a warehouse. This can be general unconstrained floorspace, storage bins, tanks, silos, etc. All scheduled and planned material must be stored in a Storage Area A new Storage Areas board shows inventory levels per item per storage area over the course of the schedule. This is different than the inventory plan as it will not show Forecast demands or shortages which remain at the inventory (warehouse) level. Storage Areas can constrain the flow of material by the number of simultaneous sources. Limits can be defined for simultaneous withdrawal, storage, and the combination of both. Storage Areas can be constrained to store a single material at a time to model single-item storage bins or tanks A new Item Storage object is added which extends inventory properties for each Storage Area. An item stored in a storage area is considered Item Storage. Similar to how Inventory contains properties for items within a specific warehouse, Item Storage contains properties for items stored in a specific Storage Area. An item storage must exist for every item that can be stored in the storage area An item storage

may optionally define a maximum quantity of the item that can be stored in the storage area at any time An item storage may optionally define a minimum limit to maintain material in the Storage Area. If the quantity ever goes below this quantity, the remainder will be disposed. An item storage may optionally indicate whether the material will be disposed of immediately upon meeting the disposal requirement (time or quantity), or if the material should only be disposed if needed to make room for other storage. See also: Storage Areas Storage Area Connectors Storage Areas Board New operation process: Clean Operations may now be configured with a Clean process. Cleans are scheduled to run after operation post-processing and may be configured to be sequence-dependent, much like operation Setup. Cleanout Triggers Cleanouts can be triggered to schedule after a certain number of operations are scheduled on a resource, some number of Production Units are scheduled to be produced by a resource, or after a combined total run/cycle time of one or more operations scheduled on a resource, or after a certain duration of calendar time. Cleanout Grade Cleanout grade is a new field related to the new Clean process. When multiple cleans need to be scheduled simultaneously, the highest grade takes precedence. If two cleanouts of the same grade are scheduled together, the longest duration is used. When a cleanout occurs, it resets all cleanout triggers that are the Cleanout Grade or lower. For example this can be modeled with a Minor cleanout of 0 and Major cleanout of 1. For more information, see: Cleans. Attributes redesign for more robust functionality Attributes have been redesigned to accommodate both dynamic operation Setup and dynamic operation Clean processes. Attribute definitions are now imported in a new Attribute Mappings table as stand-alone objects OperationAttributes must reference an Attribute definition when imported Attribute definitions contain default durations, colors, and costs that can be overridden in each operation to support operation specific changeovers Attributes have a new AttributeType field to indicate whether the changeover values are for setup or for clean Resource Attributes are removed. Custom resource properties can be added as User Defined Fields (UDFs), and resource attributes will no longer be used for tracking sequence and setups. A new LastRunActivity mappings is created to import details of the last run activity on the resource. The attributes for that activity's operation will be used for sequence dependent setup and clean calculations. For more information, see: Attributes. Options to Optimize Selected Jobs or Resources Actions tile and right-click menu options are added to the Jobs, Gantt, Capacity Planning, and Activities boards to: Optimize Selected Jobs: Optimize only the selected jobs. All other scheduled jobs are locked and anchored and unscheduled jobs are flagged with Do Not Schedule temporarily while the selected jobs get optimized. After optimization, all previously unlocked and unanchored jobs are reverted to unlocked and unanchored again, and the Do Not Schedule flag is removed from previously unscheduled jobs. Optimize Selected Jobs and Supplying Jobs: Optimize the selected jobs as well as the currently scheduled jobs which are supplying the selected jobs with one or more materials. All other scheduled jobs are locked and anchored and unscheduled jobs are flagged with Do Not Schedule temporarily while the selected jobs get optimized. After optimization, all previously unlocked and unanchored jobs are reverted to unlocked and unanchored again, and the Do Not Schedule flag is removed from previously unscheduled jobs. Reschedule Resource: Optimize all jobs scheduled on the selected resource. To include multiple resources in the optimization, select multiple grid rows from the Capacity Planning tile and use the Actions tile or right-click menu from this board to optimize jobs scheduled on the selected resources. All other scheduled jobs are locked and anchored and unscheduled jobs are flagged with Do Not Schedule temporarily while the jobs on the selected resource(s) get optimized. After optimization, all previously unlocked and unanchored jobs are reverted to unlocked and unanchored again, and the Do Not Schedule flag is removed from previously unscheduled jobs. Auto-Split Operations Operations may be split into two or more activities automatically during optimization based on many configurable factors. Splitting operations allows the work to be spread across multiple resources in order to complete the work faster (as each split part may be run in parallel), or can be used to split the work across gaps in resource capacity. Splitting can also be used to break larger operations down into smaller parts so that each part may comply with maximum quantity or volume constraints across capable resources. Auto-split can be configured to split based on many factors: Resource Quantity or Volume constraints Capacity of the Primary resource when an operation requires one or more helpers Predecessor material quantity and availability For more information, see: Auto-Split Operations. Compatibility Codes redesign Compatibility Code Tables define lists of Operation Compatibility Codes which are either allowed or disallowed to schedule simultaneously within a group of resources. Resources may be assigned one or more Compatibility Code Tables, and each table may be assigned to any number of resources. This is an enhancement from previous software versions which only supported scheduling a single allowed code at a time. See: Compatibility Codes. Alternate Path Validity Dates New properties

ValidityStartDate and ValidityEndDate are added to [Troubleshooting](#)

## **Delivering Files to PlanetTogether Support**

### Source

Key Concept PlanetTogether Support Agents may request files to be delivered in order to help them troubleshoot issues reported to them. All of the file deliverables mentioned in this guide require access to the files on the PlanetTogether server. Note: PlanetTogether's HighTail file upload portal is located here:

<https://spaces.hightail.com/uplink/planettogether> Jump to section: Scenario file (scenarios.dat) Recordings folder Alerts folder Instance Error Logs Windows Event Viewer Logs Customizations Database backup Scenario File (scenarios.dat) Overview In PlanetTogether, Scenarios contain all the data for the factory model, including plants, departments, resources, items, inventories, operations, and financial information. The Support team may request the scenario file if they are unable to replicate the reported issue in a simple data model. Steps to deliver From the Client Application Users with appropriate user permissions may see an option from the client interface to download the latest scenario file. Login to the client and click the PlanetTogether logo in the top right corner to expand a dropdown, then choose the Download Scenario option. Select a disk location to save the file and click Save. Upload the resulting scenario file to the PlanetTogether HighTail portal which automatically gets submitted to the Support team: <https://spaces.hightail.com/uplink/planettogether> From the Server Navigate to the instance installation folder on the server. From the Instance Manager, edit the instance settings and view the "Backup" tab for a quick Copy Path option. Copy the path and paste it into a Windows File Explorer address bar. From the instance System folder, navigate to Data → Recordings then into the Recordings folder that was most recently modified. Locate the TIMESTAMP.scenarios.dat file with the most recent Date Modified date and right-click the file and choose Send to → Compressed (zip) folder (or if 7-Zip is installed, use 7-Zip → Add to TIMESTAMP.scenarios.7z for better compression). Attach the resulting compressed file to an email to support@planettogether.com, or for larger files upload them directly to the PlanetTogether HighTail portal which automatically gets submitted to the Support team: <https://spaces.hightail.com/uplink/planettogether> Recordings Folder Overview Recordings folders provide vital debugging information as to what may have contributed to a system issue by "Recording" each step that each user takes when interacting with the software. Those steps can then be replayed later to replicate or re-run the steps taken to produce the error or issue. Recordings can also serve as backup scenario files. Follow the steps described in this document to restore the current scenario from one of the scenarios that are saved in a Recordings folder: Restore a Scenario from a Recording Backup. Steps to deliver 1) Navigate to the instance installation folder on the server. From the Instance Manager, edit the instance settings and view the "Backup" tab for a quick Copy Path option. Copy the path and paste it into a Windows File Explorer address bar. 2) From the instance "System" folder, navigate to "Data" -> "Recordings" 3) Locate the Recordings folder with the appropriate date and timestamp around the time that the steps were taken in the software. Right-click the folder and choose "Send to" -> "Compressed (zipped) folder" (or if 7-Zip is installed, use "7-Zip" -> "Add to FOLDER\_NAME.7z" for better compression). 4) Attach the resulting compressed file to an email to support@planettogether.com, or for larger files upload them directly to the PlanetTogether HighTail portal which automatically gets submitted to the Support team: <https://spaces.hightail.com/uplink/planettogether> Alerts Folder Overview Alerts folders contain log files which log user activity and details of errors that users may encounter as they use the software. The message logs can help the PlanetTogether Support and/or Development team to quickly diagnose a problem that users may be experiencing. Steps to deliver 1) Navigate to the instance installation folder on the server. From the Instance Manager, edit the instance settings and view the "Backup" tab for a quick Copy Path option. Copy the path and paste it into a Windows File Explorer address bar. 2) From the instance "System" folder, navigate to "Data" -> "Alerts" 3) Select all files from within the Alerts folder ("Ctrl+A" is a quick keyboard shortcut). Right-click on any of the highlighted files and choose "Send to" -> "Compressed (zipped) folder" 4) Attach the resulting .zip file to an email to support@planettogether.com, or for larger files upload them directly to the PlanetTogether HighTail portal which automatically gets submitted to the Support team:

<https://spaces.hightail.com/uplink/planettogether> Instance Error Logs Overview The instance error logs contain error messages that get logged during instance management (starting and stopping services, editing settings, etc.). The error messages can help the PlanetTogether Support and/or Development team to quickly diagnose a problem that a server administrator may be experiencing. Steps to deliver 1) Navigate to the Instance Manager 2) Click once to select the instance whose logs need analyzed, then click the LOGS action button 3) From the Logs dialog, click the Download Logs button and choose a place to save the resulting .zip archive 4) Attach the resulting .zip archive to an email to support@planettogether.com, or for larger files upload them directly to the

PlanetTogether HighTail portal which automatically gets submitted to the Support team:

<https://spaces.hightail.com/uplink/planettogether> Windows Event Viewer logs Overview Windows Event Viewer logs provide insights from Windows as to why applications may crash or produce other critical errors or warning messages. These can be helpful in diagnosing PlanetTogether services or applications crashing unexpectedly. Follow the Steps to Deliver below to isolate, zip, and deliver the appropriate Windows Event Viewer log entries. Steps to deliver 1) Open the Windows Event Viewer The easiest way to find the Event Viewer is to use the Windows search function in the main toolbar. Search for "Event Viewer" and it should appear as the top result. Alternatively it may be found as a shortcut somewhere in your start menu. Otherwise it's found in the "system32" folder of the hard drive where Windows is installed on the server/PC. 2) Navigate the Event Viewer to find Warning and Error messages from around the time of the crash or failure From the Event Viewer interface, expand the "Windows Logs" folder from the left menu and select "Application". You may choose to filter the results to only show Warning or Error messages using the "Filter Current Log..." dialog from the menu on the right side, but this is not necessary (only reduces the amount of scrolling). Scroll through the logs until you see entries from around the date and time of the incident in question and focus on any Warning or Error log entries. If none are found in the "Application" logs, try the "System" logs from the "Windows Logs" dropdown in the left pane and repeat. 3) Select each relevant warning and/or error message and save to a file Click to highlight each warning or error message that you suspect may be relevant to the error or incident in question. Press and hold Shift or Ctrl while you click in order to select multiple entries. Once all are selected, right-click on any of the selected items and choose the option to "Save Selected Events...". Choose the file location and name and click "Save" when prompted. 4) Attach the resulting .evtx file to an email to support@planettogether.com, or for larger files upload them directly to the PlanetTogether HighTail portal which automatically gets submitted to the Support team:

<https://spaces.hightail.com/uplink/planettogether> Custom Package Files Overview Custom package or "extension" files may be requested if they are suspected to be at fault for causing an issue on your system. The most common reason that a PlanetTogether Support agent might need your custom package file(s) is so that the PlanetTogether Development team can diagnose and fix any outdated or malfunctioning logic from within the custom coded file(s). Steps to deliver TBD... N) Attach the resulting .zip file to an email to support@planettogether.com, or for larger files upload them directly to the PlanetTogether HighTail portal which automatically gets submitted to the Support team: <https://spaces.hightail.com/uplink/planettogether> Database Backup Files Overview A

PlanetTogether Support agent may request SQL database backup files from you if your issue seems to be related to your specific data, or if they think it might be easier diagnosed if they had access to your data. If you don't feel comfortable sharing the SQL backup for any reason, please try to be available for a Support agent to meet with you in a Zoom or similar screen-share meeting where we might be able to run various SQL queries and tests on your system directly with your supervision. We may need either a backup of your Publish database or your Import database depending on the type of issue you're experiencing. In both cases we will also need your scenarios.dat file, and in the case that we need your Import database we will also need an additional file that contains the Import Mappings data. Continue reading for specific steps to deliver the requested files: Steps to deliver 1) Create a full database backup from the Microsoft SQL Server Management Studio application in .bak format according to the steps provided by Microsoft in this document: <https://docs.microsoft.com/en-us/sql/relational-databases/backup-restore/create-a-full-database-backup-sql-server> 2) Follow steps above to locate and retrieve a copy of your scenarios.dat file. 3) If you're preparing to deliver your Import database to the PlanetTogether Support team then please also include the file named "APSInterfaceSettings.xml" from the same Instance folder as you found the scenarios.dat file: PlanetTogether\INSTANCE\_NAME\IntegrationFiles\APSInterfaceSettings.xml 4) Compress the db.bak, scenarios.dat, and APSInterfaceSettings.xml files into a single .zip file and upload it to the PlanetTogether HighTail portal which automatically gets submitted to the Support team:

<https://spaces.hightail.com/uplink/planettogether>

## Software Assembly Version Detector

[Source](#)

Key Concept In old software versions (12.2.1.x Neptune and older), if users open a scenarios.dat file in Notepad, the last line of text would indicate which software version the scenario file was written in. This is helpful for QA and Support to understand what software version issues are reported in. This functionality is lost with all Hydrogen 12.3.0.x builds. In response, the PlanetTogether development team has created a simple application that can read a file property that determines the software version that the file was created in. Installation and Usage Download the application .exe and store it anywhere on your local drive: PTAssemblyVersionReader.exe (147 MB) Just open/run the .exe executable whenever you need to scan a scenarios.dat file to determine which version it was run in. To use the application, drag and drop the scenarios.dat file into the white area at the top of the application interface and its meta data will appear in the gray area below. Use the Reset button to clear the inputs and results from the application, if desired.

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## Troubleshooting > Common Issues

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### Troubleshoot: Client Sign-In Manager Application

[Source](#)

**Case Study: Unable to Connect to a Server** If users are unable to establish a connection to the server then they won't be able to connect to the workspaces hosted there. Causes & Troubleshooting 1. Incorrect server name or connection string This issue may be accompanied by a simple error message: Failed to connect to server. From the Add Workspaces section of the Sign-In Manager, the server name or connection string should be entered without a protocol or port number. Simply "localhost" from the server itself or the server name by itself will suffice. 2. Invalid or expired SSL certificate This issue may be accompanied by this error message: Certificate is expired. If you are an IT administrator click here for more information. In these cases, it's most likely the case the user has not properly configured the SSL thumbprint in the Client Sign-In Manager application. Navigate to the Options section of the Sign-In Manager and ensure a valid certificate thumbprint is entered. It's also possible that the server doesn't have a valid SSL certificate installed and/or associated with the PlanetTogether software. A server administrator may access the "Server" section of the Instance Manager and select an appropriate certificate if one is already installed on the server that can be used. If one is not yet available, one can be purchased from a trusted authority or an insecure self-signed certificate can be generated. See Generate a PlanetTogether Self-Signed Certificate for more information. If a purchased certificate signed by a trusted authority is installed on the server then users that connect to it do not need to configure the SSL thumbprint in their Client Sign-In Manager application. Otherwise, if the certificate is not secure and was self-signed and/or self-generated then users will need to store the certificate thumbprint in their Client Sign-In Manager application before they can connect to it.

**Case Study: Unable to login to a Workspace** If users try to change the login credentials from the Workspaces section of the Sign-In application then they may receive "Invalid Credentials" messages if the login credentials are not correct. If entered incorrectly too many times, the user account may get locked and a user administrator must unlock it. Causes & Troubleshooting 1. Invalid login credentials This issue will be accompanied by a simple error message: ERROR 2454: Invalid login Credentials. A user administrator may reset the user's password as needed from the Users section of the client interface (see: User Management). Alternatively, a server administrator may reset the user's credentials from the Instance Manager. 2. The user's account is locked This issue will be accompanied by the following error message: Unknown Error: 2459 In this case, a user administrator must toggle the [x] Unlock Account option in the User Management section of the client interface. It might also be a good idea to reset the password from the same tile at the same time.

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## Troubleshoot: Desktop Client User Interface Display

[Source](#)

Summary Monitor display settings can cause layout issues in the PlanetTogether desktop client application. Jump to section: Monitor Scaling Ease of Access Settings Monitor Scaling The monitor scaling factor of user's primary monitor is the greatest contributor to the display of the application. Unfortunately, due to the heavy integration with 3rd party developer DevExpress, the application only fully supports 100% scaled monitors. New monitors and especially 4K resolution monitors recommend and default to scaling around 150-250%, so users may have to reduce the scaling settings in order to view the application correctly. From Windows Settings, navigate to System → Display. Select the primary monitor in the monitor selection section, then locate the Scale and layout setting. Ensure the setting is set to 100%, even if it is not the recommended scale setting. It may be necessary to repeat this step for each connected monitor. Finally, restart the client application (logout and login again). Ease of Access Display Settings If the monitors are scaled to 100% but there are still display issues, other Ease of Use Windows display settings may be to blame. From Windows Settings, navigate to Ease of Access → Display. Locate the Make text bigger setting and ensure that it's set to the smallest 100% value. Next, locate the Make everything bigger setting and ensure that this is also set to 100%, even if it is not the recommended setting. Contact Support If these steps have not helped to resolve the issue, or the issue that you are facing is not described here, please contact PlanetTogether Support to request assistance.

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## Troubleshoot: Instance Manager

[Source](#)

Jump to case study: Unable to connect to the Instance Manager Unable to start an instance service Case Study: Unable to Connect to the Instance Manager A connection to the server cannot be established. This is often accompanied by a browser message similar to this one: Causes & Troubleshooting 1. The PlanetTogether Server Manager service is not running Navigate to Windows Services dialog and ensure the PlanetTogether Server Manager service status is Running. If not, try to start it from the Services window. If it fails to start, check the Windows Event Viewer logs in Windows Logs → Application for related error messages to help troubleshoot further. The most common reason why the PlanetTogether Server Manager service won't start or won't remain running is due to an invalid or incompatible SSL certificate selected during software installation. In order to remedy this in a test environment, it's easiest to generate a self-signed PlanetTogether certificate by running the following command from Windows PowerShell run as an administrator: New-SelfSignedCertificate -DnsName PlanetTogether.local -FriendlyName PlanetTogether -CertStoreLocation cert:\LocalMachine\My Once the certificate is successfully created, run the PlanetTogether Version 12 installer again, and be sure to click the Find Certificate button: From the resulting dialog, choose More Choices and select the newly generated PlanetTogether certificate before accepting and proceeding to re-install all software components. After re-installation completes, the PlanetTogether Server Manager service should be able to start and run. Case Study: Unable to start an instance service Instance services could fail to start for any number of reasons, and it's possible that no errors will be logged in the specific instance log folder. Typically, errors are likely to be logged in Windows Event Viewer with more details of why the service could not be started. Attempts to start the instance service from Windows Services directly will often produce the same result. One common error is a timeout message. If an attempt to start an instance takes more than 30 seconds for the instance service to communicate back that it is at least still trying to start, an error message may popup in the instance manager: The service did not respond to the start or control request in a timely fashion. Another common error is that the "Port is already occupied". Each PlanetTogether instance occupies a single TCP port while its service is running. An instance service may fail to start if another instance or any other application on the server is using the same TCP port. An error message will appear in the top right corner when this issue is encountered when trying to start an instance: It's also possible that the Server Manager version is not compatible to run an instance of the software version of the instance that is producing the error, or that the scenarios.dat file was created in a newer or older software version which is not compatible with the software version of the instance. Causes & Troubleshooting 1. Another PlanetTogether instance is already running on the configured port Check the System Service Port column in the Instances list and confirm that no

other Started or Active instance is already running on the same port as the instance being started. If an instance is already running on the same port, either stop the instance service or edit the stopped instance to use a different port (one that is not already occupied by another instance). 2. The Instance Database Connection is not configured correctly It has been observed (especially for new server installations) that the Instance Database configuration is not setup correctly which results in the Instance Manager and Server Manager not being able to properly communicate with the Instance services and as a result, the instance service(s) may be Running when observed from Windows Services, but Stopped when observed from the Instance Manager table of instances. In these cases, it's advised to double-check the database connection settings and ensure that the defined SQL user or integrated security user has appropriate permissions to read and write to the database, including the ability to add or drop tables. From the Instance Manager, navigate to the Server tab and click the button to Update Instance Database: From the Instance Database Settings dialog, click Test to ensure the database connection is established successfully. If unsuccessful, update each setting or parameter until the Test returns a success message. When the Test button succeeds, click Save and then Confirm if prompted to restart. Scroll down to the bottom of the Server Settings page and click the Save button there as well. Finally, open Windows Services and manually restart the PlanetTogether Server Manager service. Upon successful restart, it should write out data to the instance database. The instance database consists of 3 tables: Configuration InstanceSettings ServerSettings Query each of these tables by selecting all rows from each. It's expected that the Configuration table has one row and only one cell of data (whose value is the current Server Manager version). The ServerSettings table should have one row of data which includes the server name, path to the server manager software installation location, SSL certificate thumbprint ID, and two SSO fields. Finally, the InstanceSettings should return one row of data per each instance that currently exists on the server. If any of these tables are missing data or if any of these tables do not exist, then it's likely that the SQL user or integrated security Windows User configured in the Instance Database Settings does not have proper read/write permissions. Per the Server Installation Guide, at minimum the user must have db\_datareader, db\_datawriter, and db\_ddladmin permissions, though if deemed safe and appropriate, the db\_owner designation works as well. 3. The SSL certificate was not installed correctly If the server's SSL certificate was not installed correctly during the PlanetTogether server software installation process, it's possible that the certificate did not get bound properly to the PlanetTogether Server Manager port, so it can't read the instance service statuses. This would result in the instance service Running according to Windows Services, but Stopped according to the Instance Manager table of instances. In these cases, it's recommended to force the Server Manager to apply or re-apply the SSL certificate configuration by following these steps: Navigate to the Server section of the Instance Manager and scroll down and click the Choose Certificate button Even if there is only one option, select the radio option next to the appropriate certificate and click Accept Scroll down to the bottom of the Server Settings page and click Save to apply the certificate change Open Windows Services and manually restart the PlanetTogether Server Manager service Once the service restart successfully, check the Instances page again to see if the instance statuses are accurately reflected in the grid. 4. Server Manager is configured to use Integrated Security, but the instance is not When Server Manager is configured to use integrated security to communicate with the instance configuration database, each instance will also default to using integrated security for starting and stopping the service. In later 12.2.0.x releases, this is resolved by using the PlanetTogether Server Managers Windows service Logon As credentials for starting and stopping all instances, but in versions 12.1.4.x and early releases of 12.2.0.x each instance must also be configured to use a Windows user to run the instance service and the Windows user must have read/write access to the Instance Settings database. Integrated security logon credentials can be modified in the Service Configuration section of the Instance Settings dialog, or from the Windows Services application via Properties → Log On → This account. 5. The instance version is not supported by the currently installed version of Server Manager This is typically seen after server software upgrades when the user installing the updated software elects to Skip the installation/re-installation of Server Manager. It's always advisable to always upgrade Server Manager whenever installing a new version of the core software. New versions of Server Manager are always backward compatible with old core software versions, so upgrading should not have any negative impact. As a quick step to rule out the possibility that the Server Manager version is incompatible, run the server software installer and choose to re-install Server Manager when prompted. 6. The scenarios.dat file was created in an incompatible software version If attempting to start an instance from an existing scenarios.dat file, the scenario file must have been written in a compatible software version or else the instance service will fail to start. If the scenario file originated from a Version 11 instance, it must have been created in version 11.52.20 or newer. If the scenario file originated from a Version 12 instance, it must have been created in the same software version or an older software version than the version of the instance that it's trying to be loaded in to. Contact

Support If these steps have not helped to resolve the issue, or the issue that you are facing is not described here, please contact PlanetTogether Support to request assistance.

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## Troubleshoot: Instance Starting in Read-Only Mode

### [Source](#)

Description Certain license violations may cause an instance to load in read-only mode which will not allow the user to make any data or schedule modifications. Note that most of these troubleshooting steps require a server administrator with access to the PlanetTogether server. For PlanetTogether Cloud hosted environments, please contact support for assistance. A good place to start to diagnose these issues is the Logs dialog from the Instance Manager. Check for errors logged at the time the instance service was started to reveal clues of the underlying issue. Jump to a Case Study: License Cannot be Locked Server is not automatically fetching new key files from PlanetTogether Server Cannot Connect to PlanetTogether License Server Multiple Running Instances Using the Same License Key The License has Expired Case Study: License Cannot be Locked Overview This is a fairly generic message which essentially means that the license is already in use. \*\*\* Message \*\*\* License could not be locked. A license key may only be used to run a single instance of PlanetTogether, so if other instances are running or try to start while another instance is running using the same license key, then this error may be logged. There have been cases where there are no other running instances, but stopping the instance service doesn't properly unlock or release the license from the PlanetTogether License Service, so the license server thinks that the license is still in use when in reality it is not. Troubleshooting First and foremost, ensure that the license key is only in use by a single running instance. If the license key is used across multiple servers, be sure to stop all instance services from all servers, then proceed to only start the services of a single instance. For more tips in dealing with multiple instances, scroll down to the Multiple Running Instances Using the Same License Key section of this article. If there are no other instances running, it's possible that the communication between the PlanetTogether host server and the PlanetTogether License Server was disrupted in some way. Often times, stopping all instance services for ~15 minutes will force the PlanetTogether License Server to release its lock on the license so that it may be used again. Case Study: Server is not automatically fetching new key files from PlanetTogether Overview This case has no known cause and no errors are logged anywhere, but the fix is fairly simple. Instances that go into read only mode due to a supposed "expired license" even though the license is in fact not expired are prime candidates to try this quick fix to resolve the issue. Typically a PlanetTogether server will fetch a new set of license key files from the PlanetTogether license server automatically at frequent intervals (at minimum each time the instance services are restarted). Occasionally the server either can't or simply doesn't try to fetch new files from the PlanetTogether server so it retains old files which contain outdated information (like an expiration date). In these cases, a forceful refresh may be necessary. Troubleshooting Force the server to fetch new license key files from the PlanetTogether license server by removing the existing key files from the current location, then start the instance services. When the services attempt to start the system will realize that no files are present and will fetch the latest files from the PlanetTogether license server. Stop the instance service from the Instance Manager Navigate to the license key folder for the instance From the software installation location, the license key files are located in the INSTANCE\_FOLDER\System\Data\Key directory Backup the files in the folder by selecting them all then right-clicking any of the selected files and choosing Send to ➔ Compressed (zipped) folder Delete all of the files except for the newly created .zip backup Start the instance services from the Instance Manager The next time a user connects to the instance it should load normally if the license key files were downloaded properly (and the license isn't expired or in use elsewhere). If the above process fails, try following the steps documented here to manually download and deploy a new set of license key files to the instance Key folder: Manually Install License Key Files Case Study: Server Cannot Connect to PlanetTogether License Server Overview If the server that hosts the PlanetTogether instance(s) is unable to reach the PlanetTogether license server to validate the license, then the instance will start in Read-Only Mode. Troubleshooting The server's connectivity to the PlanetTogether license server can be tested by navigating to the Licenses section of the Instance Manager: If the Licenses table loads valid license data on this screen, then the connection can be established successfully and there are no firewall or proxy or other connectivity issues and this is not the reason that the instance is starting in read-only mode. Otherwise, an IT administrator must check to make sure that the server is connected to the internet and that any firewall or anti-virus or proxy configuration is not blocking outgoing requests to either of these addresses and

ports: https://licenseserver.planettogether.net:45455 https://licenseserver2.planettogether.net:45455 For forwarding proxy configurations, note that the PlanetTogether Server Manager supports WinHTTP proxy configurations. If the host server is required to forward outbound traffic from installed applications through a proxy server, then the PlanetTogether host server's WinHTTP proxy must be configured to route outbound traffic to the PlanetTogether License Server domains through the forwarding proxy. This can be achieved by executing this command (with the appropriate proxy host name or IP and port) from an elevated command prompt: netsh winhttp set proxy proxy-server=":" bypass-list="licenseserver.planettogether.net;licenseserver2.planettogether.net" Manually Install a License Key If it's expected that the server cannot and does not connect to the license server, then the license key files may be downloaded manually from the PlanetTogether License server, then extracted to the appropriate location on the server. This process is documented here: Manually Install a License Key Note that there is a chance that the PlanetTogether license server goes down temporarily. If the local server is connected to the internet and no firewall or anti-virus rules are blocking connectivity to the addresses and ports mentioned above, please contact PlanetTogether Support to investigate any potential issues with the license server itself. Case Study: Multiple Running Instances Using the Same License Key Overview Each PlanetTogether license is only allowed for single use, so if one license key is used to run the service of multiple instances then those which were not started first will start in read only mode. This may occur unexpectedly if a new instance was created using the same license key as a previous instance, or if multiple instances which share a license key are configured to [x] Automatically Start Services after Server Reboot in the Instance Settings and there was a recent server reboot, or perhaps during or after a migration to a new server if the old server was not properly updated to prevent the old instance from starting. Troubleshooting Stop all running instances across all servers which are using the license key, then start the service of only one instance. If multiple instances are needed to run simultaneously for testing or other purposes, additional licenses will be needed (one per instance). Contact the PlanetTogether Licensing team for assistance to provide additional test licenses. Note that there may be costs associated with the request which the Licensing team will be able to assess once the request is submitted. No requests will be fulfilled until all parties are in agreement on how best to proceed. Case Study: The License has Expired Overview If the PlanetTogether license has expired then the instance will start in read-only mode. Troubleshooting Contact the PlanetTogether Licensing team for assistance in extending the expiration date of the license key. Submit a Support Request If the instance remains in read-only mode after following these troubleshooting steps, contact the PlanetTogether Support team for assistance. Please fill out all of the required fields, in addition to: Details: Provide details of any changes which have been made to the model that could have caused the instance to go into read-only Mode. This can include changes made to the number of plants, resources, jobs, routings, items, etc. Category: Select "License issue or Software is read-only." File Upload: Please upload the latest scenario file. See Delivering Files to PlanetTogether Support for step-by-step instructions. See Also Instance Manager Manually Install License Key Files

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## Troubleshooting > Error Codes

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### Error Codes

#### Source

Jump to section: 2000-2050 2451-2500 2901-3000 2051-2100 2501-2550 3001-3999 2101-2150 2551-2600 4000-4050 2151-2200 2601-2650 4051-4100 2201-2250 2651-2700 4101-4150 2251-2300 2701-2750 4401-4450 2301-2350 2751-2800 7000-7050 2351-2400 2801-2850 2401-2450 2851-2900 Error Codes 2000 - 2050 Error Code Description Solution 0002 Error while updating the shop\_ops DataSet for the CustomInterface. 2000 Multiple files are containing a PostSimulationCustomization in a specific folder. Only one can be specified. 2002 Failed to load PostSimulationCustomizer from a specific file. 2003 There is no Job in the Scenario with that specific External Id, so the status will not be updated in Shop Ops. 2004 There is no Manufacturing Order with that specific External Id, so Shop Ops will not update the status. 2005 There is no Operation with that specific External Id in for that Job and MO, so the status will not be updated in Shop Ops. 2006 The Operation is not an Internal Operation, so the status will not be updated in Shop Ops. 2007 The Activity with that specific External Id was not found in that Job, MO, and Op, so the status will not be updated in Shop Ops. 2008 Not set up to handle this type of block in status

segments. 2009 Invalid Drag-Drop text. No valid DragDropType specified. 2010 Not set up to handle the linking of blocks from non-resource Operations. 2011 The Gantt has no Un-hidden hours! 2012 This should not happen because the top grid node should be visible. 2013 No Job was selected. Please select a Job for the Change Order. 2014 The Options to specify a specific Planner are selected, but no Planner is chosen. Instead, please select a Planner or choose the option for Any Planner. 2015 Invalid BreakOff Qty of the product was specified for the MO. 2017 Invalid ValueOption specified. 2018 The 'From Resource' and 'To Resource' must be different Resources. When setting up the resource connectors, you need to specify 2 different resources: 'From Resource' and one for the 'To Resource.' 2019 The Select Column is not the right Type. It must be bool. 2020 Cannot use non-positive BucketDuration. 2021 Must have at least one row and one column. 2022 The specific Warehouse is not found on the Dock board but should be. 2023 It should not be set to null. 2024 Desynchronization occurred for the specific User on the Connection. 2025 The resource is not a Tank. 2026 This is not a recognized report file. Therefore, it must have a {0} suffix for Crystal Reports or a {1} suffix for Microsoft Reports. 2027 There is no longer a Job with this Id. 2028 There is no longer an Operation with this Id. 2029 There is no longer a Manufacturing Order with this Id. 2030 Expedite based on the Plant Stable Span can only be performed from the Gantt View. 2031 Only InternalOperations can be split. 2032 Only activities that have their primary resource requirement clock scheduled can be split. 2033 The PT Interface settings file could not be found, so a blank one was created. If an Instance doesn't have an Interface Settings file loaded, PlanetTogether will start with a blank one. Any change required will need to be made through the import mappings. 2034 Problem reading the PT Interface settings file. You can edit the file to fix its format or rename or delete it so that the Interface can create a blank file of the correct format. 2035 At least one Job Alert must be stored for each Job to determine whether a new one needs to be sent. 2036 Data Validation Error: The UsedDuring field of the Primary Resource Requirement must be greater than or equal to the Helper Resource Requirements. The Primary Resource Requirement is used to calculate the length of different stages of production, so the primary resource requirement's UsedDuring must be greater than or equal to all the UsedDuring values of all the helper resources, so the length of different phases of an operation can be calculated correctly. 2037 A cycle appears to exist in this Path for the Manufacturing Order. 2038 This is not a valid old UDF Type Name. Valid data types are String, Int, Long, Double, Decimal, DateTime, and Bool. 2039 The user field data value does not match the specified type. When adding a UDF, the value must have the data type specified. 2040 The specified value is not the correct type. Instead, it must be one of the following: string, int, long, double, decimal, bool, or DateTime. UDFs only accept the data type mentioned in error; please verify that the value matches one of them. 2041 Input string contains more than the maximum of two space-separated values. 2042 Input string contains one value that is not a time or day. This means that the field requires DateTime data type values. First, check to see that all values have the correct format. 2043 GanttRowHeightFactor must be between 1 and 10, inclusive. 2044 Must specify at least 1 for the Number of Resources. 2045 Transmission error. {0} has been specified more than once. 2046 Invalid DbCommand object type. 2048 The Required Property in the table for the Transmission is null. 2049 InternalActivityUpdateT contains no ActivityStatusUpdate objects. It must contain at least one. 2050 Invalid value. NbrOfPeople must be greater than zero. In the Job Dialog Operation | Status tab, the Nbr of People field must be greater than zero. Error Codes 2051 - 2100 Error Code Description Solution 2051 An Item's transfer quantity cannot be less than 0. The Transfer Quantity value of the item must be equal to t or greater than 0. 2052 An item with ExternalId '{0}' has a non-positive BatchSize. The Batch Size value of the item must be equal to or greater than 0. 2053 An item with ExternalId '{0}' has negative MinNbrBatches. The Min Batch Size value of the item must be equal to or greater than 0. 2054 An item with ExternalId '{0}' has non-positive MaxNbrBatches. The Max Batch Size value of the item must be equal to or greater than 0. 2055 An item with ExternalId '{0}' has a non-positive BatchWindow. The Batch Window value of the item must be equal to or greater than zero. 2056 MaxNbrBatches."}>Item with ExternalId '{0}' has MinNbrBatches > MaxNbrBatches. The MinNbrBatches value cannot be greater than the MaxNbrBatches value. 2057 An item with ExternalId '{0}' has a JobAutoSplitQty that's less than the MinOrderQty. 2058 You cannot add an operation more than once to an alternate path. Path {0} already contains Operation {1}. 2059 Operation {0} already contains a Material Requirement with ExternalId '{1}' and ItemExternalId '{2}'. 2060 Operation {0} already contains a Product with ExternalId '{1}'. This error indicates that a product is being duplicated in the job. 2061 Operation {0} already has Operation {1} as its predecessor. It can't be added again. When establishing predecessor and successor operations, the same operation cannot be added twice. 2062 Operation '{0}' Required Finish Quantity is {1}. It must be greater than z

## PlanetTogether Knowledge Base

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