Thru-Put 7.0 Release Blue Print

Thru-Put Advanced Planning and Scheduling

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Style Conventions

The following is the list of conventions used throughout this document:

[ ]   Square brackets are used around text to indicate optional items, except in languages in which brackets are part of the syntax. You should type only the information within the brackets, not the brackets.

Italics   Italics are used to specify a variable name or other information the user must provide – for example, a path and file name. We also use them to denote parameters, placeholders, new terms, emphasis, and book titles.

Bold   Bolded text is used to indicate commands; text that must be entered exactly as it appears in this document; and buttons, checkboxes, menu commands, tabs, and option buttons that must be clicked.

Intended Readers

- Technology Managers

- Systems Engineers

- Web/Network/database Administrators

Overview

Thru-Put 7.0 represents first in the series of new generation 64 Bit versions of the Thru-Put Advanced Planning and Scheduling software. Currently, Thru-Put 7.0 is available in 64 Bit plat form only and 32 Bit version of Thru-Put is not available and there is no immediate plan. While using Thru-Put 7.0(64 Bit) Advanced Planning and Scheduling software, we recommend user to use Microsoft SQL Server 2005 or above version of database. Both 32 Bit and 64 Bit versions are supported. Microsoft Access 64 Bit drivers are not available and hence Thru-Put 7.0 is not available to work with Microsoft Access. This document represents brief summary of functionalities those have been currently added to Thru-Put 7.0. With Thru-Put 7.0, SQL Server native database connection is no longer used. So while using Thru-Put, active database connection needs to be set to ODBC. We have noted that using SQL Server Native Client 10.0 or above as ODBC driver performs better than other SQL Server ODBC drivers.

64 Bit OS Memory Architecture to help scheduling Plants with Huge data

When you run Thru-Put on a Windows 32 Operating system, maximum memory that could be allotted to Thru-Put application is less than 2GB with standard windows setting and less than 3GB with upper memory bit turned on (/3GB settings). If you are running Thru-Put scheduling for large plants with complex bill of materials and long range demand with lot of demands, it is very common to exceed this memory limit.

In order to handle scheduling large data, Thru-Put has been made compatible with 64 Bit version of Windows Operating With this, 16TB of data could be handled in memory. This will help to schedule large plants for long range demands. Currently, the software has been tested with Windows 2008 R2, Windows 2008 (64 Bit) version and Windows 7 (64 Bit) versions of the Operating System. At this time, only 64 bit version of Thru-Put is made available for general release. There is no plan to add 32 bit version at this time.

Support for calendar times instead of 0 to 24 hour calendar

In Thru-Put 6.1, times specified are in 0 to 24 hour time with 0 representing the start time of the shift. But in practice the shift start times do not coincide with 12AM and normally start later. For issuing the actual schedule to the shop floor, customers need to map into the shift start and end times. If there are multiple shifts within a day, this mapping becomes difficult especially when time gap exists between first and second shifts.

With the new release, user can specify the shift start times for each of the calendar the work centers are following. Thru-put will schedule tasks on each work center based upon the calendar times. The inputs are given to Thru-Put by means of two tables:

CALPOLY_SHIFT and CAL_SHIFT tables. CALPOLY_SHIFT represent the shift policy over a week starting from Sunday (1) thru Saturday (7). Thru-Put allows you to provide up to a maximum of three shifts per day. If on any day the work center does not work, then you don't need to provide the data or you can also give 0 values for all the fields in that case.

LOCATION_ID	CALENDAR_ID	WEEK_DAY	SHIFT1_START (In Minutes)	SHIFT1_LENGTH (In Minutes)	SHIFT1_UNITS	SHIFT2_START (In Minutes)	SHIFT2_LENGTH (In Minutes)	SHIFT2_UNITS	SHIFT3_
WareHouse1	ASSY_DEPT	1	0	0	Not Used	0	0	0	
WareHouse1	ASSY_DEPT	2	420	480	Not Used	960	480	1	
WareHouse1	ASSY_DEPT	3	420	480	Not Used	960	480	1	
WareHouse1	ASSY_DEPT	4	420	480	Not Used	960	480	1	
WareHouse1	ASSY_DEPT	5	420	480	Not Used	960	480	1	
WareHouse1	ASSY_DEPT	6	420	480	Not Used	960	480	1	
WareHouse1	ASSY_DEPT	7	420	480	Not Used	0	0	0	

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WEEK_DAY represents days of the week: 1(Sunday), 2(Monday), ..., 7(Saturday)

CALPOLY_SHIFT represents the general weekly policy of the shifts. On any given day range, these shifts could be overridden by specifying the timing in the CAL_SHIFT table. If a calendar does not have a shift data in this table, then the shift start time is assumed to be 12:00AM midnight. Sales, forecast, safety stock, Work order, Purchase orders due times follow the DEFAULT calendar. Except for Purchase orders in the above list, all other due times in the above list are end of the last shift for the day unless overridden in the configuration. For purchase order, the due time is start time of the first shift unless overridden in the configuration. The way to specify other than the shift start or end is to change the configuration parameter EnableMidDayArrivalsAndShipments=1 in the config.ini file. In that case, Thru-Put reads the due time of the order.

Note: When you are using the shift functionality, it is mandatory to set the following configuration parameter to 1 or 2. (This parameter is available in config.ini file under [System] section)

NewIntTimeCalc=1

Vendor Daily Call Offs based upon Part Planning Profile

Currently, in Thru-Put6.1, purchase requisitions are for the full quantity of the requirement due on the first day when the entire demand is due. If the consumption happens many days, then a better supply delivery process could be implemented with suggested daily delivery schedules (Vendor Daily call-offs).

In order to facilitate vendor managed inventory, a new functionality is added to Thru-Put to schedule the purchase order receipts spread over multiple days based upon the material plan profile. Instead of receiving the material at the beginning of the assembly work order, a daily call offs (or the receiving days) quantity is published to the suppliers. Input is determined from XA through Plan Profile data which is a new file added to the XA download. Plan profile determines the frequency of the individual receipts, quantity breakdowns and any other rule associated in determining the scheduled receipts dates and quantities.

Suppose following is the assembly schedule for two channels that require common buy material and we need to determine the daily call offs. There are two assembly work orders on channel 1, one for 400 starting on day 1 and ending on day 4; another one starting on day 7 and ending on day 8.

On channel 2, there are two work orders, one for 100 starting on day 2 and ending on day 3; another one starting on day 6 and ending on day 7.

Days->	1	2	3	4	5	6	7	8
Channel1	400			→			200	→
Channel2		100	→			100	→	

If we apply the daily call off logic from the previous section, Purchase Delivery Requirement for buy item assuming 1 per assembly required will be as shown in the following table:

Days->	1	2	3	4	5	6	7	8
Daily Req (receiving daily)	100	150	150	100		50	150	100
Daily Req (receiving daily with 10% set up)	110 (110+0)	152 (97+55)	142 (97+45)	96 (96+0)		55 (0+55)	155 (110+45)	90 (90+0)
Daily Req (receiving daily with 10% set	150	150	150	50		100	150	50

up, Multiple 50)								
Daily Req (receiving daily with 10% set up, Multiple 50, Min Lot 100)	200	100	200	0		100	200	0
Receiving Calendar 1,3,7	250	0	300	0		0	250	
Receiving Calendar 1,3,7 with 10% set up	?		?				?	

At this time, Planning Profile data is not available in APSI for download from XA. A new interface to create a mapping file in DBUtil and reading, validating and storing the data into Thru-Put database has been added. A hard coded file called "PlanProfile.dat" needs to be created.

Supplier Capacity Modelling

In earlier version of Thru-Put, it was assumed that infinite quantity of buy items are available at the MRP lead time. Although this is true for normal materials, there are cases where priority materials are supplied by key vendors who have limited capacity in delivering the full quantity of the buy items. With the current version, user can define a fixed quantity available for each plan fence. Thru-Put will automatically schedule the assembly work based upon how much quantity will be available at the plan fence and push out the schedule accordingly if the buy item quantity needed is greater than the available at the fence. You can define the number of plan fences after which the capacity restrictions are removed. The defealut value for number of fences is three.

Support for Flow Production (Variable delivery rate)

In the current version of Thru-Put, all the customer order requirements are due at the end of the day and there is no visibility into the partial completion of the order. In many customer environments, finished items are passed on to stock as they are produced on the assembly lines and so user needs to know the delivery rate throughout the progress of the assembly line schedule. New enhancement is added to bring visibility into delivery start, delivery rate and delivery end to the user.

Support for External Assembly line Scheduling Systems

In the current version of Thru-Put 6.1, all the customer order requirements are due at the end of the day and completion of the last operation is rounded off to meet the end of the customer due date minus the shipping buffer. But in many cases, Thru-Put scheduling needs to support the assembly line scheduling system from a third party. In such cases, order due date can occur any time during the day and rounding off to the end of the day should be skipped. With the new functionality added to Thru-Put, user will be able to accomplish that task.

Support for SQL Server Bulk Copy

In the current release of Thru-Put, one of the concerns expressed by customers is that Thru-Put does not make effective use of SQL Server capabilities to transfer bulk packets of data to SQL Server when SQL Server is hosted on a separate from Thru-Put server. This concern has been now addressed in the software. Software now uses latest Microsoft SQL Server Client drivers to bulk copy multiple records at the same improving the overall data throughput in a networked environment. The way to enable the bulk copy is to modify the config.ini entry

[ODBC]

MaxBatchedRows=0

Currently, when you set the above value to 0, hundred records at a time are bulk inserted. This value cannot be changed for now.

Enhanced Table views for Sorting and Filtering

All the tabular views in Thru-Put Scheduling now have been revamped to have a new enhanced look with additional option for selective hiding of columns, column sorting and filtering.

DBMaint feature for Work center Maintenance

In the current release of Thru-Put6.1, work center maintenance data needs to be directly entered into the database tables. In order to facilitate user interaction, a new tabular view has been added to Thru-Put where user can enter, update and delete work center maintenance records.