

Oracle® Manufacturing Scheduling

User's Guide

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Oracle Manufacturing Scheduling User's Guide, Release 12.2

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Preface

Intended Audience

Welcome to Release 12.2 of the *Oracle Manufacturing Scheduling User's Guide*.

Casual User

See Related Information Sources on page x for more Oracle E-Business Suite product information.

Documentation Accessibility

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Structure

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Related Information Sources

This book is included on the Oracle E-Business Suite Documentation Library, which is supplied in the Release 12.1 Media Pack. You can download soft-copy documentation as PDF files from the Oracle Technology Network at <http://www.oracle.com/technology/documentation/>. The Oracle E-Business Suite Release 12.1 Documentation Library contains the latest information, including any documents that have changed significantly between releases. If substantial changes to this book are necessary, a revised version will be made available on the "virtual" documentation library on My Oracle Support (formerly Oracle*MetaLink*).

If this guide refers you to other Oracle E-Business Suite documentation, use only the latest Release 12.1 versions of those guides.

Integration Repository

The Oracle Integration Repository is a compilation of information about the service endpoints exposed by the Oracle E-Business Suite of applications. It provides a complete catalog of Oracle E-Business Suite's business service interfaces. The tool lets users easily discover and deploy the appropriate business service interface for integration with any system, application, or business partner.

The Oracle Integration Repository is shipped as part of the E-Business Suite. As your instance is patched, the repository is automatically updated with content appropriate for the precise revisions of interfaces in your environment.

You can navigate to the Oracle Integration Repository through Oracle E-Business Suite Integrated SOA Gateway.

Online Documentation

All Oracle E-Business Suite documentation is available online (HTML or PDF).

- **Online Help** - Online help patches (HTML) are available on My Oracle Support.
- **PDF Documentation** - See the Oracle E-Business Suite Documentation Library for current PDF documentation for your product with each release. The Oracle E-Business Suite Documentation Library is also available on My Oracle Support and is updated frequently.
- **Release Notes** - For information about changes in this release, including new features, known issues, and other details, see the release notes for the relevant product, available on My Oracle Support.
- **Oracle Integration Repository** - The Oracle Integration Repository contains database diagrams and a detailed description of database tables, forms, reports, and programs for each Oracle E-Business Suite product. This information helps you

convert data from your existing applications and integrate Oracle E-Business Suite data with non-Oracle applications, and write custom reports for Oracle E-Business Suite products.

Related Guides

You should have the following related books on hand. Depending on the requirements of your particular installation, you may also need additional manuals or guides.

Oracle E-Business Suite Installation Guide: Using Rapid Install

This book is intended for use by anyone who is responsible for installing or upgrading Oracle E-Business Suite. It provides instructions for running Rapid Install either to carry out a fresh installation of Oracle E-Business Suite Release 12, or as part of an upgrade from Release 11*i* to Release 12. The book also describes the steps needed to install the technology stack components only, for the special situations where this is applicable.

Maintaining Oracle E-Business Suite Documentation Set

This documentation set provides maintenance and patching information for the Oracle E-Business Suite DBA. *Oracle E-Business Suite Maintenance Procedures* provides a description of the strategies, related tasks, and troubleshooting activities that will help ensure the continued smooth running of an Oracle E-Business Suite system. *Oracle E-Business Suite Maintenance Utilities* describes the Oracle E-Business Suite utilities that are supplied with Oracle E-Business Suite and used to maintain the application file system and database. It also provides a detailed description of the numerous options available to meet specific operational requirements. *Oracle E-Business Suite Patching Procedures* explains how to patch an Oracle E-Business Suite system, covering the key concepts and strategies. Also included are recommendations for optimizing typical patching operations and reducing downtime.

Multiple Organizations in Oracle Applications

This guide describes how to set up and use Oracle Manufacturing Scheduling with Oracle Applications' Multiple Organization support feature, so you can define and support different organization structures when running a single installation of Oracle Manufacturing Scheduling.

Oracle Alert User's Guide

This guide explains how to define periodic and event alerts to monitor the status of your Oracle E-Business Suite data.

Oracle E-Business Suite Concepts

This book is intended for all those planning to deploy Oracle E-Business Suite Release 12, or contemplating significant changes to a configuration. After describing the Oracle E-Business Suite architecture and technology stack, it focuses on strategic topics, giving a broad outline of the actions needed to achieve a particular goal, plus the installation and configuration choices that may be available.

Oracle E-Business Suite Developer's Guide

This guide contains the coding standards followed by the Oracle E-Business Suite development staff. It describes the Oracle Application Object Library components needed to implement the Oracle E-Business Suite user interface described in the *Oracle E-Business Suite User Interface Standards for Forms-Based Products*. It provides information to help you build your custom Oracle Forms Developer forms so that they integrate with Oracle E-Business Suite. In addition, this guide has information for customizations in features such as concurrent programs, flexfields, messages, and logging.

Oracle E-Business Suite Flexfields Guide

This guide provides flexfields planning, setup, and reference information for the Oracle E-Business Suite implementation team, as well as for users responsible for the ongoing maintenance of Oracle E-Business Suite product data. This guide also provides information on creating custom reports on flexfields data.

Oracle E-Business Suite System Administrator's Guide Documentation Set

This documentation set provides planning and reference information for the Oracle E-Business Suite System Administrator. *Oracle E-Business Suite System Administrator's Guide - Configuration* contains information on system configuration steps, including defining concurrent programs and managers, enabling Oracle E-Business Suite Manager features, and setting up printers and online help. *Oracle E-Business Suite System Administrator's Guide - Maintenance* provides information for frequent tasks such as monitoring your system with Oracle Applications Manager, administering Oracle E-Business Suite Secure Enterprise Search, managing concurrent managers and reports, using diagnostic utilities including logging, managing profile options, and using alerts. *Oracle E-Business Suite System Administrator's Guide - Security* describes User Management, data security, function security, auditing, and security configurations.

Oracle E-Business Suite User Interface Standards for Forms-Based Products

This guide contains the user interface (UI) standards followed by the Oracle E-Business Suite development staff. It describes the UI for the Oracle E-Business Suite products and how to apply this UI to the design of an application built by using Oracle Forms.

Oracle Bills of Material User's Guide

This guide describes how to create various bills of materials to maximize efficiency, improve quality and lower cost for the most sophisticated manufacturing environments. By detailing integrated product structures and processes, flexible product and process definition, and configuration management, this guide enables you to manage product details within and across multiple manufacturing sites.

Oracle Capacity User's Guide

This guide describes how to validate a material plan by verifying that there are resources sufficient to perform the planned work for repetitive and discrete jobs. Using finite capacity planning techniques, you learn how to use rough-cut capacity planning to validate a master schedule and capacity planning to validate the material plan.

Oracle Inventory User's Guide

This guide describes how to define items and item information, perform receiving and inventory transactions, maintain cost control, plan items, perform cycle counting and physical inventories, and set up Oracle Inventory.

Oracle Manufacturing APIs and Open Interfaces Manual

This manual contains up-to-date information about integrating with other Oracle Manufacturing applications and with your other systems. This documentation includes API's and open interfaces found in Oracle Manufacturing.

Oracle MRP User's Guide

This guide describes how to anticipate and manage both supply and demand for your items. Using a variety of tools and techniques, you can create forecasts, load these forecasts into master production schedules, and plan your end-items and their component requirements. You can also execute the plan, releasing and rescheduling planning suggestions for discrete jobs, repetitive schedules, and flow schedules.

Oracle Order Management User's Guide

This guide describes how to enter sales orders and returns, copy existing sales orders, schedule orders, release orders, create price lists and discounts for orders, run processes, and create reports.

Oracle Quality User's Guide

This guide describes how Oracle Quality can be used to meet your quality data collection and analysis needs. This guide also explains how Oracle Quality interfaces

with other Oracle Manufacturing applications to provide a closed loop quality control system.

Oracle Work In Process User's Guide

This guide describes how Oracle Work in Process provides a complete production management system. Specifically this guide describes how discrete, repetitive, assemble-to-order, project, flow, and mixed manufacturing environments are supported.

Oracle Workflow Developer's Guide

This guide explains how to define new workflow business processes and customize existing Oracle E-Business Suite-embedded workflow processes. It also describes how to define and customize business events and event subscriptions.

Do Not Use Database Tools to Modify Oracle E-Business Suite Data

Oracle **STRONGLY RECOMMENDS** that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle E-Business Suite data unless otherwise instructed.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle E-Business Suite data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle E-Business Suite tables are interrelated, any change you make using an Oracle E-Business Suite form can update many tables at once. But when you modify Oracle E-Business Suite data using anything other than Oracle E-Business Suite, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle E-Business Suite.

When you use Oracle E-Business Suite to modify your data, Oracle E-Business Suite automatically checks that your changes are valid. Oracle E-Business Suite also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

Manufacturing Scheduling

This chapter covers the following topics:

- Overview of Manufacturing Scheduling
- Constraint-Based Scheduling
- Manufacturing Scheduler Workbench Navigation

Overview of Manufacturing Scheduling

This chapter introduces Oracle Manufacturing Scheduling and describes the constraint-based scheduling engine, the Scheduler Workbench, and the menus and toolbar associated with the workbench.

The Oracle Manufacturing Scheduling application is a Work in Process web-based shop floor scheduling solution. Oracle Manufacturing Scheduling consists of two major components:

- Constraint-based scheduling engine
- Scheduler Workbench

The constraint-based scheduling engine schedules jobs and operations based on user-predefined objectives, priorities, resources, and material constraints. You can reschedule single jobs and operations or the entire shop floor.

The Scheduler Workbench lets you graphically view and reschedule single jobs and operations based on constraints, such as resource or material shortages. It provides you with a visual display (Gantt chart) of jobs on the shop floor. You can interactively reschedule jobs, operations, and resources. You can manually control the rescheduling or let the system automatically optimize the schedule based on resource and material constraints. The Scheduler Workbench interfaces directly with Oracle Work in Process. See: Manufacturing Scheduling Workbench, page 1-4.

Oracle Enterprise Asset Management (eAM) utilizes the Oracle Manufacturing Scheduling application to schedule eAM work orders and operations. See: eAM

Scheduling, *Oracle Enterprise Asset management User's Guide*, and Enabling eAM Scheduling, *Oracle Enterprise Asset Management User's Guide*.

Oracle Process Manufacturing (OPM) is also integrated with Oracle Manufacturing Scheduling. Processing batches can be scheduled to equipment to avoid resource and component constraints. A scheduling workbench is provided that is specific to Process Manufacturing environments.

Features

The Manufacturing Scheduling product provides the following features:

- Graphically view shop floor jobs, operations, and resources
- User friendly drag and drop mechanism to reschedule jobs, operations, and resources
- Fully integrated with Oracle Work in Process
- Ability to select the primary objective of work in process scheduling
- Ability to schedule jobs based on available resources and material
- Ability to reschedule jobs due to resource and material shortages (machine breakdown, employee sickness, material availability)
- Ability to maintain schedules
- Adjustable bucket sizing that affects the Gantt chart and associated resource load versus capacity view
- Simultaneous and alternate resources invoked during high demand or when a resource is unavailable
- Ability to simulate capacity changes, or dragging and dropping to simulate load changes on the Scheduler Workbench
- Modeling features for creating a prototype for scheduling
- Minimum transfer quantities for operations to move a portion of some assemblies to a subsequent operation rather than waiting for the entire quantity to complete
- Resource batching to use resources across multiple jobs simultaneously, preventing a resource from being under utilized
- Ability to dispatch jobs to instances of machines
- Ability to group and sequence jobs based on setup changeovers

- View job related sales order and customer information on the workbench
- Oracle Shop Floor Management enabled so you can schedule discrete jobs on the Scheduler Workbench created in lot based organizations
- Integrated with Oracle Enterprise Asset Management for scheduling maintenance of assets

Constraint-Based Scheduling

The constraint-based scheduling engine factors resource and material availability when scheduling and rescheduling jobs and operations.

The constraint-based scheduling engine lets you:

- Schedule single discrete jobs and operations
- Reschedule all jobs on the entire shop floor

Scheduling Single Discrete Jobs

When each discrete job is created and saved, you receive a request ID. When the request has completed, you can view the updated start and completion dates of your job and operations.

If you enter a start date, the system calculates a completion date when the constraint-based scheduling engine runs. If you want a different completion date than the calculated completion date to drive the scheduling of your job, specify that date in the Requested Due Date field on the Scheduling tab of the Discrete Jobs window.

If the constraint-based scheduling engine cannot meet your requested start date or calculated start date (if you specify a completion date the system calculates the start date) due to resource and/or material availability, it schedules the job in the first available time slot where resource and/or material are available. Planned material receipts are calculated.

If resources and material are not available within the current scheduling horizon, your job will be scheduled at the end of the scheduling horizon and you might receive an exception message in the Oracle Application request log. If a job requires two resource instances, but only one is available, the operation resource starts beyond the end of the scheduling horizon.

See: Creating and Scheduling a New Job, page 4-1.

Rescheduling All Jobs

When you reschedule all jobs, the constraint-based scheduling engine uses the requested due date and scheduling priority. The highest priority jobs are scheduled

first. Jobs with the same priority are scheduled based on the earliest requested due date. Firm jobs and any associated operations are not rescheduled. If a job requires two resource instances, but only one is available, the operation resource starts beyond the end of the scheduling horizon.

See: Rescheduling All Jobs, page 6-2.

Manufacturing Scheduler Workbench Navigation

The Scheduler Workbench enables you view all jobs on the shop floor. You can interactively reschedule jobs, operations, and resources. The workbench comprises four panes:

- Top left pane: Tree Hierarchy (default)
- Top right pane: Gantt Chart (default)
- Bottom left pane: Select Resource(s)
- Bottom right pane: Resource Load Versus Capacity

The Scheduler Workbench defaults to the Tree Hierarchy and Gantt Chart panes. The Select Resource(s) and Resource Load Versus Capacity panes appear when you choose Show/Hide Resource Load on the toolbar. A Status bar, that appears at the bottom of the window, indicates the current scheduling mode of operation and also displays message.

Tree Hierarchy Pane

This pane displays the contents of the workbench. There are three levels of information or branches in the hierarchy of the tree: job, operation, and resource. The Tree Hierarchy is dynamically created when you launch the workbench, which defaults to show only unreleased, released, and on hold jobs. You can update the display at any time by choosing Revert and Refresh on the toolbar. You can also choose the Filter button to display specific jobs in the Tree Hierarchy pane and corresponding Gantt Chart pane, used when issues such as machine breakdown, component shortage, or absent employees impact the schedule. See: Filtering Jobs, page 3-2.

Expanding and Collapsing Jobs or Operations

You can expand a job and its operation(s) in the Tree Hierarchy pane to view the associated resources. Likewise, you can collapse an operation or job in the Tree Hierarchy.

- To expand a job:

Point and click on the (+) symbol next to a job.

The job expands showing the respective operation(s). The symbol next to the

selected job changes to (-); the symbol next to the operation is (+).

- To expand an operation:

Point and click on the (+) symbol next to an operation.

The operation expands showing its associated resources(s). The symbol next to the selected operation changes to (-).

- To collapse an operation:

Point and click on the (-) symbol next to an operation.

The operation collapses. The symbol next to the selected operation changes to (+).

- To collapse a job:

Point and click on the (-) symbol next to a job.

The job collapses. The symbol next to the selected job changes to (+).

Gantt Chart Pane

This pane consists of a timeline, that appears at the top, and a horizontal bar chart. The timeline represents a time axis (bucket) for the horizontal bar chart. The Gantt chart directly reflects the tree hierarchy. Besides displaying jobs, operations, and resources, it can also display the setup resources. The left side of a horizontal bar represents the start date; the right side of a horizontal bar represents the end date. The magenta vertical line represents today's date, which is located at the left edge of the Gantt Chart pane by default.

This pane lets you:

- Manually reschedule jobs, operations, and resources, see: Manually Rescheduling Start and End Dates, page 3-9.
- Automatically reschedule jobs and operations, resources are adjusted according to the newly realized requirements, see: Automatically Rescheduling Jobs and Operations, page 3-10.
- View rescheduling activities in the Resource Load Versus Capacity pane by appropriately choosing Refresh Resource Load on the toolbar, both prior and after saving changes.
- View property windows for jobs, operations or resources are available in the Gantt Chart pane. These windows contain information about dates, quantities, and descriptions of the scheduling data. See: Job Properties Window, page 3-4, Operation Properties Window, page 3-4, and Resource Properties Window, page 3-4.

- View exception messages related to jobs and resources requiring attention. See: View All Exceptions Window, page 5-3.

Changing the Timeline

You should change the timeline in the Gantt Chart pane to view at least one complete operation.

To change the timeline

1. Right click on the timeline.

A drop-down menu appears which lets you increment the timeline in:

- Months
 - Weeks
 - Days
 - Hours
 - 30 Minutes
 - 15 Minutes
 - Horizontal Sliding Bar - Lets you fine tune the bucket width.
 - The left-most position shows the minimum bucket width
 - The right-most position shows the maximum bucket width
2. Choose the appropriate increment to resize the buckets so that at least one complete operation is viewable.

Select Resource(s) Pane

This pane consists of resources and resource instances selected through the Select Resource(s) window. When you choose the Select Resource(s) button, the Select Resource(s) window appears. This window lets you select the available resources and resource instances to display in the Resource Load Versus Capacity pane.

Resource Load Versus Capacity Pane

This pane shows the Required resource load versus the Available resource capacity for the selected resource(s) and resource instance(s) that appear in the Select Resource(s) pane. This pane shares the same timeline as the Gantt Chart pane and reflects the rescheduling activity in the Gantt Chart. You can immediately see the resulting changes

on resource loads before saving.

The Required resource load, Available resource capacity, and Overload resource capacity key indicators appear to the right of the graphic drop-down menu. The key indicators are:

- *Required*: Number of units required by the resource for all jobs in that time bucket.
- *Available*: The number of resource capacity units in that time bucket (all of which could already be assigned).
- *Overload*: Number of resource units that are required but already committed.

The graphic drop-down menu provides the following choices:

- *Table*: Shows in tabular form. The top number represents the Required resource load; the bottom number represents the Available resource capacity.
- *Continuous*: Shows a continuous graph. Non-bucketed lines representing Required, Available, and Overload resources accurate to the minute.
- *Bar*: Shows a bar graph. The number on the left represents the Required resource load; the number on the right represents the Available resource capacity.

When you select:

- Table or Bar, the Required and Available key indicators appear
- Continuous, the Required, Available, and Overload key indicators appear

When the Required resource load is greater than the resource capacity, the Required resource load number appears red.

After a job is completed, any open resource requirements for that job are excluded from the resource load calculations. This ensures that resource requirements are correct when scheduling resource capacity.

Note: Resource load includes all shop floor demand, not just demand displayed on the workbench.

Scrolling and Resizing the Panes

The vertical and horizontal scroll bars let you display all the contents of a pane. You can resize a pane by dragging the vertical or horizontal border line to the desired position.

When the job/operation bar is dragged off of the window, the horizontal scrollbar will automatically scroll left or right.

Workbench Menus and Toolbar

The menus provide you with these choices:

| Menu | Menu Item | Description |
|-------------|-----------------------|---|
| File | Revert and Refresh | Restores latest database view. |
| | Save and Refresh | Saves latest changes to database. |
| | Close | Closes Scheduler Workbench. |
| Edit | Cut | Removes selection and stores it in clipboard. |
| | Copy | Copies selection and stores it in clipboard. |
| | Paste | Copies selection from clipboard to selected location. |
| | Clear Selected | Clears selection without storing it in clipboard. |
| | Select All | Highlights all the information. |
| View | Bar Inspector | Displays Bar Inspector window that shows start and end dates of selected job, operation, or resource. |
| | Resource Load | Shows or hides Select Resource(s) and Resource Load Versus Capacity panes. |
| | Refresh Resource Load | Refreshes Resource Load Versus Capacity pane with latest changes. |

| Menu | Menu Item | Description |
|-----------------|-------------------------------|--|
| | Filter | Displays Filter window that lets you display specific jobs in the Tree Hierarchy pane and corresponding Gantt Chart pane by entering data in the respective fields and/or checking the respective check boxes. |
| Schedule | Manual/Automatic Scheduling | Displays dialog box to flag Manual or Automatic job scheduling. |
| | Take Shop Floor Snapshot | Takes snapshot of system information on the shop floor. |
| | Schedule Multiple Work Orders | Access the Scheduling Parameters window to schedule jobs on the shop floor. |
| | View all Exceptions | Displays the View All Exceptions inquiry window. |
| Tools | WIP Parameters | Accesses the Work in Process Parameters window from Oracle Work in Process |
| | Create/Modify Work Orders | Accesses Discrete Jobs window from Work in Process to create or modify jobs. |
| | View Item Supply/ Demand | Accesses the Supply/Demand Detail window from Oracle Inventory. |
| | Show Discrete Workstation | Access the Work in Process Discrete Workstation |

| Menu | Menu Item | Description |
|------|-----------|---|
| Help | | Displays Manufacturing Scheduling window information and Oracle Applications Library. |

Workbench Toolbar

The following icons on the toolbar reference the menu items of the same name:

- Save and Refresh.
- Revert and Refresh
- Take Shop Floor Snapshot.
- Automatic/Manual Scheduling
- Show/Hide Resource Load
- Refresh Resource Load

See Also

Defining a Department, *Oracle Bills of Material User's Guide*

Defining WIP Parameters, *Oracle Work in Process User's Guide*

Reviewing Exception Messages , page 5-1

Defining Discrete Jobs Manually, *Oracle Work in Process User's Guide*

Viewing Item Supply/Demand Information, *Oracle Inventory User's Guide*

Setting Up

This chapter covers the following topics:

- Overview of Setting Up
- Setup Steps
- Defining Work in Process Parameters
- Profile Options
- Defining WIP Resource Definition
- Defining Simultaneous and Alternate Resources
- Overview of Scheduling Objectives
- Defining WIP Scheduling Priority

Overview of Setting Up

This chapter provides information about setting up Oracle Manufacturing Scheduling as well as the necessary Oracle Work in Process application functionality.

This section contains an overview of each step you need to complete to set up Oracle Manufacturing Scheduling. For instructions on how to complete each task, see the setup sections indicated in each step below.

You may not need to perform some of the steps below if you've already performed a common-application setup (setting up multiple Oracle Applications products).

Related Product Setup Steps

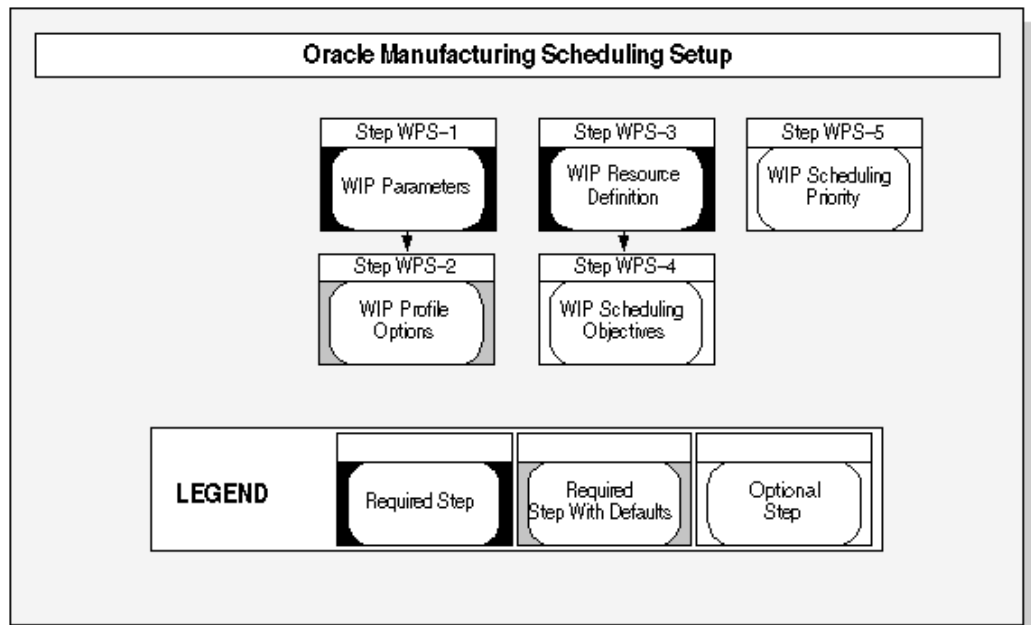
Oracle Manufacturing Scheduling requires that Oracle Work in Process Release 12 be set up for discrete jobs. See: *Overview of Setting Up, Oracle Work in Process User's Guide*.

Setup Flowchart and Checklist

Some of the steps outlined in this flowchart and setup checklist are:

- Required
- Required Step With Defaults
- Optional

Required Step With Defaults refers to setup functionality that comes with pre-seeded, default values in the database; however, you should review those defaults and decide whether to change them to suit your business needs. If you need to change them, you should perform that setup step. You need to perform Optional steps only if you plan to use the related feature or complete certain business functions.



Setup Checklist

The following table lists setup steps. After you log on to Oracle Applications, complete these steps to implement Oracle Manufacturing Scheduling.

| Step No. | Required | Step |
|----------|----------|-------------------------|
| Step 1 | Required | Defining WIP Parameters |

| Step No. | Required | Step |
|----------|----------|----------------------------------|
| Step 2 | Required | Defining WIP Profile Option |
| Step 3 | Required | Defining WIP Resource Definition |
| Step 4 | Optional | Setting Up Scheduling Objectives |
| Step 5 | Optional | Defining WIP Scheduling Priority |

Setup Steps

For each step, a Context section indicates whether you need to repeat the step.

Defining WIP Parameters

WIP parameters define modes of operation and default values that affect Work in Process.

Default: Defaults to unchecked *Use Constraint Based Scheduler* check box.

Default: Defaults to *Resource Only* in the Constraints drop-down menu.

Default: There is no default for the Horizon (days) field. You need to enter a value.

Context: You need to perform this step initially and as needed.

See: Defining Work in Process Parameters, page 2-4.

Defining WIP Profile Options

You can select either concurrent or interactive processing while defining jobs.

Default: If you skip this step, defaults to *Interactive definition* in User Value drop-down menu.

Context: You need to perform this step whenever you want to change the discrete job creation definition.

See: Profile Options, page 2-6.

Defining WIP Resource Definitions

You must schedule a resource as Yes, Prior, or Next to enable the constraint-based scheduling engine to properly calculate the capacity for the resource. You can define

simultaneous and alternate resources to use during high demand or when a resource is unavailable.

Default: If you skip this step, defaults to *No* in the Scheduled drop-down menu.

Context: You need to perform this step initially for each resource assigned to an operation sequence in a routing.

See: Defining WIP Resource Definition, page 2-7.

See: Defining Simultaneous and Alternate Resources, page 2-9.

Setting Up Scheduling Objectives

You select a primary scheduling objective. You can also define penalty factors, resource setups, and resource instances.

Context: You need to perform this step whenever you want to change your scheduling objective.

See: Setting Up Scheduling Objectives, page 2-12.

See: Penalty Factors, page 2-12.

See: Defining Resource Setup Information, page 2-13.

See: Resource Instances, page 2-15.

Defining WIP Scheduling Priority

You can select any priority number from 1 to 9999.

Default: If you skip this step, defaults to *10* in the Scheduling Priority field.

Context: If certain jobs have a higher priority, you need to perform this step every time a job is created from the Discrete Jobs window or prior to mass rescheduling of the shop floor.

See: Defining WIP Scheduling Priority, page 2-16.

Defining Work in Process Parameters

WIP parameters define modes of operation and default values that affect Work in Process.

To define work in process parameters

1. Navigate to the Work in Process Parameters window.
The Work in Process Parameters window appears.
1. Select the Scheduling tab.

1. Check the Use Constraint Based Scheduler check box.
2. From the Constraints drop-down menu select Resource Only or Resource and Material.
3. Select the primary goal, or objective, of work in process scheduling for your plant. From the Primary Objective drop-down menu select Maximize Ontime Completion, Minimize Setup, or Minimize Operation Slack.

The choice of objective determines which unique set of scheduling logic is used on the shop floor.

4. In the Horizon (days) field, enter a scheduling horizon adequate to calculate your resources and material.

Note: The scheduling horizon should be at least as long as your longest job. You should add additional time to take into consideration future material receipts.

Note: When using this application with an advanced planning product, you can select a shorter scheduling horizon (as short as one day is allowed) so as to not override all your planning.

5. Select a simulation set in the Simulation Set field to enable the adjust resource capacity capability.

Simulation sets are used to link resource changes to available resource capacity for scheduling and planning. They are defined on the Simulation Sets window. If the Use in Scheduling field on this window is checked for particular simulation sets, capacity modifications associated with that set are used when scheduling jobs in Oracle Work in Process.

When you assign resources to departments, you can use simulation sets for capacity modifications by defining them on the Capacity Changes window in Oracle Bills of Material. See: *Assigning Resources to a Department, Oracle Bills of Material User's Guide*.

The capacity of shop floor resources can be changed from the Scheduler Workbench, see: *Adjusting Resource Capacity, page 3-6*.

6. In the Maximum Penalty field, enter the maximum penalty factor that can be entered when assigning penalties for scheduling.
7. In the Penalty Per Day Late field, enter the default penalty factor that will be used in scheduling for jobs not completed by the scheduled due date.

Higher penalties generate attempts in the scheduling logic to circumvent such an

event.

8. In the Due Date Tolerance (days) field, enter the default number of days that specifies the drop dead date that a job can be delayed during scheduling.

For example, if a job has a requested due date of July 27, 2001 with a due date penalty of ten per day and a due date tolerance of five days, the maximum the job can be delayed is July 31, 2001 but the job still pays a penalty of fifty.

9. Save your work.

See Also

WIP Parameters, *Oracle Work in Process User's Guide*

Defining WIP Parameters, *Oracle Work in Process User's Guide*

Profile Options

During your implementation, you set a value for each Oracle Work in Process profile option used in Oracle Manufacturing Scheduling to specify how the application controls access and processes data.

Generally, your system administrator sets up and updates profile option values. The *Oracle Applications System Administration User's Guide* contains more information on profile options.

Only one profile option needs to be set for Oracle Manufacturing Scheduling, WIP:Define Discrete Jobs Form. This specifies the scheduling processing used when new jobs are created from the Discrete Jobs window.

You can select either concurrent or interactive processing while scheduling jobs.

- *Concurrent definition*: Best for scheduling multiple jobs. The system does not freeze while waiting for the execution of a transaction to complete. If you selected *Concurrent definition*, the following sequence occurs:
 - Bill of Material loads.
 - Routing loads.
 - Scheduling engine runs in the background. Status is Pending Bill Load unless an exception is realized.
 - If the scheduling engine can schedule the job without any exceptions, the job will be scheduled. The status may change to Pending Scheduling if an exception occurs during the scheduling process. You can read any exception messages in the request log file.

- *Interactive definition*: Best for scheduling only a few jobs. The system freezes while the transaction is executing. You can not open any other application. When the job is scheduled, control returns to you. If you selected *Interactive definition*, the following sequence occurs:
 - Application momentarily locks you out.
 - Bill of Material loads.
 - Routing loads.
 - Control returns to you while the scheduling engine is running in the background. The status is Pending Scheduling during this time.
 - If the scheduling engine can schedule the job without exceptions, the job is created in Pending Scheduling status and changed to Unreleased after the scheduler runs.

See Also

Overview of User Profiles, *Oracle Application User's Guide*

Setting Up Your Personal Profile, *Oracle Applications User's Guide*

Defining WIP Resource Definition

The Constraint-based Scheduling engine provides the ability to schedule jobs based on available resources and material. Manufacturing Scheduling resources are enabled on the Resources window in Oracle Bills of Material. You must schedule a resource as Yes, Prior, or Next to enable the constraint-based scheduling engine to consider the capacity for the resource.

After resources are defined, you can create other resource managing components including:

- Simultaneous resources
- Alternate resources
- Scheduling objectives using the components of penalty factors, machine and resource setups, and resource instances
- Resource batching

See Also

Defining Simultaneous and Alternate Resources, page 2-9.

Resource Usage, *Oracle Bills of Material User's Guide*.

Schedule Field, *Oracle Bills of Material User's Guide*.

Setting Up Scheduling Objectives, page 2-12.

Penalty Factors, page 2-12.

Defining Resource Setup Information, page 2-13.

Resource Instances, page 2-15.

Resource Batching, page 7-5.

To schedule a work in process resource:

1. Navigate to the Resources window in Oracle Bills of Material.

The Resources window appears.

2. Select the Scheduling tab.

3. In the Schedule field select a value for this resource:

Yes: Include this resources when scheduling an operation from a job and calculating manufacturing lead time for the assembly.

Note: Do not include scheduling the operation or calculating the lead time.

Prior: Include this resource when scheduling a job or schedule by backward scheduling the previous operation from the end of this resource. Use this option when setup resources can work in parallel with previous operations.

Next: Include this resource when scheduling a job or schedule by forward scheduling the next operation from the start of this resource. Use this option when the teardown of the current operation can overlap with the execution of the next operation.

Note: If you do not select Yes, Prior, orNext, the constraint-based scheduling engine will not consider the capacity for the resource.

Note: If you have a change in available resources, you can edit the Assigned Units field.

4. Save your work.

See Also

Assigning Operation Resources, *Oracle Bills of Material User's Guide*

Resource Usage, *Oracle Bills of Material User's Guide*

Defining Simultaneous and Alternate Resources

Simultaneous resources consist of two or more resources scheduled with the same start date within a job operation. Alternate resources consist of other resources, or groups of resources, used instead of the primary resource in the job operation.

In Oracle Bills of Material, you define resources, associate the resources with your departments, and assign them to routing operations. In Oracle Work in Process, you can also add and update resources associated with jobs.

Alternate resources are invoked in one of two ways:

- During backward scheduling, when the use of alternate resources is the only means for a job to complete by the Requested Due Date
- When a resource for an operation is unavailable

See: Scheduling Jobs with Simultaneous and Alternate Resources, page 4-3.

To define simultaneous resources in item routings:

1. Navigate to the Operation Resources window in Oracle Bills of Material.
2. Enter your resource information in the Main tabbed region. See: Assigning Operation Resources, *Bills of Material User's Guide*
3. In the Scheduling tabbed region, enter the same value in the Scheduled Seq field for all resources that are simultaneous for each sequence.

The schedule sequence number indicates the sequence the resource is to be used, simultaneous resources have identical values. For example, Resource1 and Resource2 are treated as a simultaneous resource group for sequence 10 in this table.

| Seq | Resource | Schedule Seq |
|-----|-----------|--------------|
| 10 | Resource1 | 10 |
| 20 | Resource2 | 10 |

In this next example, Resource2 and Resource3 are treated as a simultaneous resource group for sequence 20.

| Seq | Resource | Schedule Seq |
|-----|-----------|--------------|
| 10 | Resource1 | 10 |
| 20 | Resource2 | 20 |
| 30 | Resource3 | 20 |

4. In the Principle Flag check box, optionally designate the resource that is the primary resource in a group of simultaneous resources.
5. Save your work.

To define simultaneous resources for job routings:

1. Navigate to the Resource Requirements window in Oracle Work in Process.
2. Enter your resource information in the Main tabbed region. See: Adding and Updating Resource Requirements, *Oracle Work in Process User's Guide*.
3. In the Scheduling tabbed region, enter the same value in the Scheduled Seq field for all resources that are simultaneous for each sequence.

The schedule sequence number indicates the sequence the resource is to be used, simultaneous resources have identical values. For example, Resource1 and Resource2 are treated as a simultaneous resource group for sequence 10 in this table.

| Seq | Resource | Schedule Seq |
|-----|-----------|--------------|
| 10 | Resource1 | 10 |
| 20 | Resource2 | 10 |

In this next example, Resource2 and Resource3 are treated as a simultaneous resource group for sequence 20.

| Seq | Resource | Schedule Seq |
|-----|-----------|--------------|
| 10 | Resource1 | 10 |

| | | |
|----|-----------|----|
| 20 | Resource2 | 20 |
| 30 | Resource3 | 20 |

4. Select the Start Dates and times for the resources, these dates must be the same date for the resources to be considered simultaneous.

Simultaneous resources must begin at the same time, but they may complete at different times depending the Usage Rate or Amount.

5. Save your work.

To define alternate resources:

1. Navigate to the Alternate Resources window.

This window is accessed from the Operation Resources window in Oracle Bills of Material, and the Resource Requirements window in Oracle Work in Process when you choose Alternates.

Note: The Alternates button is active when a value is entered in the Scheduling Sequence field on the resource record. When adding a new resource, this field uses the Resource Sequence value as a default. The Resource Sequence value can be changed, but you can not use duplicate values.

2. In the Scheduling tabbed region, for each alternate resource, enter a Replacement Group value.

This is used in grouping several resources together as an alternate resource group. The primary resource defaults to Replacement Group value of 0.

3. In the Scheduled Sequence field, enter a value.

The schedule sequence number indicates the sequence the resource is to be used, this value defaults from the Resource Requirements window and is the same value as the resource it is replacing.

4. Choose Save.

See Also

Defining a Resource, *Oracle Bills of Material User's Guide*

Assigning Operation Resources, *Oracle Bills of Material User's Guide*

Resource Usage, *Oracle Bills of Material User's Guide*

Assigning Resources to a Department, *Oracle Bills of Material User's Guide*

Overview of Resource Management, *Oracle Work in Process User's Guide*

Adding and Updating Resource Requirements, *Oracle Work in Process User's Guide*

Overview of Scheduling Objectives

You can select the primary goal, or objective, of work in process scheduling in your plant. The choice of objective determines which unique set of scheduling logic is used on the shop floor, and can vary from plant to plant. You can define your primary objective to minimize slack time between job operations, decrease the number of changeovers, or maximize ontime completion. Scheduling objectives use the following in their calculations:

- Penalty factors
- Machine setup models
- Resource setup times

Setting up Scheduling Objectives

You can model your system in a way that reflects your primary scheduling objective and closely represents how you actually deploy your resources. This allows you to achieve your job scheduling goals through more effective management of your resource constraints. To set up your system you need to assign penalty factors, define resource setup information, and define resource instances.

Penalty Factors

A weighted value, or penalty, can be assigned to occurrences in scheduling. Higher penalties carried by an event, generate attempts in scheduling logic to circumvent such an event. For example, an event might be job completion (early or late) as compared to due date. The wait time between job operations can be assigned a penalty factor.

You have the ability to assign varying penalty values to different changeovers, in order to sequence production in any order you desire. Doing so results in not only minimizing changeovers but also reducing the occurrences of the most costly changeovers.

When you define your items in the Item Master window in Oracle Inventory, two item attributes can be used to specify the penalty value.

- Inventory Carry, specifies, in units per day, a penalty for jobs that are completed before they are scheduled to be finished.

- Operation Slack, specifies, in units per day, the penalty for items having lag time between operations.

To define penalty factors for manufacturing scheduling items:

1. Navigate to the Master Items window in Oracle Inventory.
2. Enter the item master information if this is a new item number. Or select the item you want to assign a penalty factor if it exists in your item master file.
See: Defining Items, *Oracle Inventory User's Guide*.
3. Select the Work in Process tab on the Master items window.
4. In the Scheduling Per Day region, enter values for Inventory Carry and Operation Slack penalties.
 - In the Inventory Carry field, enter the units per day signifying the penalty for jobs completed before they are scheduled to be finished. For example, the Inventory Carry penalty for a job that is completed early for an item might be 10 per day.
 - In the Operation Slack field, enter the units per day signifying the penalty for items having lag time between operations.
See: Work in Process Attribute Group, *Oracle Inventory User's Guide*.
5. Save your work.

Defining Resource Setup Information

You can create a performance model for machine and resource setups to include time from one setup to another, including the time required to perform the work. If one of your scheduling objectives is to sequence or group jobs based on their required setup, you can also include a penalty factor, or weighted value, in the scheduling calculation.

Resources defined in the Operation Resources window can have multiple setup types. You can define these setup types with an identifying user code or a numerical value.

Any two setup types within a resource can have a transition time and a transition penalty, which means that the scheduler needs the specified time to transition from the former setup to the latter. Also in doing so a certain transition penalty is incurred. This penalty is used to weigh the relative merits of doing the setup versus delaying the job versus cycle time.

The setups for a resource are independent of the department that the resource belongs to.

The setup type for a particular operation resource is defined in the Operation Resources window. This data displays in the Resource Requirements window during routing

explosion. Setup resources and resource instances are only exploded during scheduling. Machine and resource setup information is defined in several setup definition windows in Oracle Bills of Material.

To define machine and resource setup types:

1. Navigate to the Setup types window in Oracle Bills of Material.
2. In the Code field, enter a unique value for this setup type. Optionally you can enter descriptive information in the Description field.

For example, you may have different codes for setting up and tear down of paint color changes.

3. Save your work.

The Setup Standard Operations window is used to assign the setup information to the operation code of a routing

To define machine and resource setup standard operations:

1. Navigate to the Setup Standard Operations window in Oracle Bills of Material.
2. Select a standard operation code where the setup is performed.
3. Select the department where the operation is performed.
4. Enter the minimum transfer quantity of assemblies to move from this operation to the next.
5. For operations in ATO model or option class routings only, indicate whether the operation is option dependant. That is, whether the operation is dependant on the choice of an optional component. See: Overview of Configure to Order, Oracle Bills of Material Use's Guide.
6. Select your Count Point and Autocharge options. See: Count Point and Autocharge, Oracle Bills of Material Use's Guide.
7. Indicate whether to backflush components on shop floor moves at this operation in the Backfulsh check box.
8. Choose the Operation Resources to assign resources to the standard operation. See: Assigning Operation Resources, Oracle Bills of Material Use's Guide.
9. Save your work

To assign setup times to resources:

1. Navigate to the Resources window in Oracle Bills of Material.

2. Select your resource.
3. Choose Setups.
The Setups window displays.
4. In the Setup Type field, select a value. Enter all the setup types applicable to this resource.
The descriptions for each type displays in the Description field.
5. Save your work.
6. Choose Changeovers to access the Changeovers window.
7. In the From field enter the setup type to change from.
8. The To field defaults in from the setup type you selected on the Setups window.
9. Enter the time it will take to perform the changeover in the Duration field and enter the unit of measure for the duration in the UOM field.
10. Assign a penalty to the changeover if there is one.
11. Select a Standard Operation (optional).
12. Save your work.

Resource Instances

This feature gives you the ability to define specific machines to any of your machine type resources. You can also define specific employees to any of your labor type resources. When a resource has instances defined, the system can schedule at that level and later view the results on the Manufacturing Scheduling Workbench.

For example, you can define all the individual machines belonging to the resource GRINDERS. An individual grinder machine can then be called out specifically as a resource requirement and scheduled, and can have its own unique capacity definition.

Resource instances are specified on the Resource Instance window. You can see all instances for one resource in the Resource Property window, including setup start date, setup end date, assigned units, effective start date, effective end date, and serial number.

To enter resource instances:

1. Navigate to the Resources window.
2. For each resource that you want to schedule at the instance level check the Schedule

by Instance checkbox.

When adding machine resources to the department, the Schedule by Instance checkbox is selected as the default.

3. Choose Instances to navigate to the Instances window.
4. Enter the number(s) for the employee(s) or equipment and serial number(s) depending on which type of resource it is.
5. Save your work.

See Also

Defining a Department, *Oracle Bills of Material User's Guide*

Defining a Resource, *Oracle Bills of Material User's Guide*

Assigning Resources to a Department, *Oracle Bills of Material User's Guide*

Defining WIP Scheduling Priority

You can select a specific job and enter a requested due date that is different than the completion date. The system may recalculate the completion date. The requested due date is user-defined and will never be recalculated by the system. You can also assign a scheduling priority number for this job. The prerequisite for this functionality is that the Use Constraint Based Scheduler check box is checked

See: Defining WIP Parameters, page 2-4.

When scheduling multiple jobs the following criteria is used:

- Schedules the highest priority job first, regardless of the date of the Requested Due Date field. Insures that resources and material are allocated to the highest priority jobs.
- Prioritizes jobs with the same user-defined priority based on the various penalty factors defined.

To select the scheduling priority

1. Navigate to the Discrete Jobs window.
2. Select the Scheduling tab.
3. Optionally, you can enter a date in either the Requested Start Date or Requested Due Date fields.

The scheduling engine uses the Requested Start Date value to schedule the job from that starting point for forward scheduling.

The scheduling engine uses the Requested Due Date value to schedule the job from that ending point for backward scheduling.

4. In the Scheduling Priority field, enter a number ranging from 1 to 9999, with 1 being the highest priority.

The default priority is 10.

5. Save your work.

Using the Scheduler Workbench

This chapter covers the following topics:

- Overview of Workbench
- Launching the Workbench
- Filtering Jobs
- Viewing a Property Window
- Showing Select Resources and Resource Load Versus Capacity Panes
- Adjusting Resource Capacity
- Rescheduling Jobs, Operations, and Resources in the Gantt Chart

Overview of Workbench

This chapter explains how to launch the Manufacturing Scheduler Workbench, filter jobs, change the timeline, and select resources. It also explains how to manually or automatically reschedule jobs, operations, and resources.

The Manufacturing Scheduling Workbench enables you to select specific jobs, expand and collapse jobs and operations in the Tree Hierarchy. You can display resources in the Select Resources pane, and view its capacity and load in the Resource Load Versus Capacity pane. You can also select a job in the Gantt Chart pane and manually or automatically reschedule the job and its associated operations or resources.

Launching the Workbench

You launch the workbench by navigating to the Scheduler Workbench window from the Scheduling Workbench menu item in Oracle Manufacturing Scheduling. The workbench appears and shows all the jobs in the Tree Hierarchy and Gantt Chart panes.

Filtering Jobs

You can filter jobs when issues such as machine breakdown, component shortage, or absent employees impact the schedule. You can view a graph or table representing resource load versus capacity in both bucketed and continuous form. Filter criteria are used to find jobs that are affected and filter out the jobs that do not meet the criteria.

To filter job:

1. Choose Filter from the tree pane, or the View menu. You can select one or any combination of values on this window for filtering.

2. You can select a department and resource.

Note: Only departments with jobs defined display in this field.

3. If you select a department or resource, you can choose dispatch information, the values are:

Immediate Dispatch: Includes all of the job operations that are ready to be worked on in the department or by the resource (there is a quantity of assemblies in its queue).

Upstream Dispatch: Includes all of the job operations that are to be worked on in the department or by the resource in the near future (there is a quantity of assemblies ready to be moved in the previous operation).

4. Optionally select a customer or sales order.

Customer and sales order information is visible on the Scheduler Workbench for all jobs with sales order references.

5. Optionally, select Work Orders, Assembly, Component Used, Project, and Task field information.

6. In the Work Order Status region, you can check a value for filtering:

Released: The work has begun and the discrete job is transactable.

Unreleased: The job is planned but not released for work to begin and not yet transactable.

On Hold: The job is prevented from progressing through the order cycle.

Complete Charges: The job is complete and charges are allowed.

Complete No Charges: The job is complete but charges are not allowed.

7. Use the Filter By Time region if you want to filter by using date criteria. You can filter by either date or offset days. Check the Enable Date check box to enable these

fields.

If you choose Date, select a starting date in the Start field, and ending date in the End field. Only jobs that fall within this time period, and other criteria selected, display. However, jobs that overlap this time period window also display, a job displays if part of the job is in the selected time window.

If you choose Offset days from today, enter values, in days, to create the time period window around your system date. For example, if you enter 3 in the Start field, and 2 in the End field, the jobs will be filtered using a time period window of 5 days. That is 3 days before today's date added to 2 days after today's date.

8. Check the Show jobs with no operations or resources checkbox if you would like to see those jobs in the Scheduler Workbench.
9. Choose Apply.

The Scheduler Workbench refreshes and shows the selected jobs associated with the information entered.

Customer and Sales Order Information

If a job is linked to a sales order, you can use sales order and customer numbers as filter criteria. And you can view job related sales order and customer information on the workbench. The information is displayed in two areas, on the Job Properties window and in a tool tip window.

The Sales Order Lines tab of the Job Properties window displays the job and assembly number; and all sales order information including customers, lines, and due dates. See: Job Properties Window, page 3-4

When you select a job bar on the workbench with a referenced sales order, a tool tip window displays:

- The work order, priority, and the job progress information displays in the upper region
- Date information displays in the middle region
- Customer and sales order displays in the lower region. If this work order is used for several customers, or sales orders, that information is represented by an ellipsis after the name or order number. You can view the other customers or sales orders in the Job Properties window.

See Also

Linking Sales Orders and Discrete Jobs, *Oracle Work in Process User's Guide*

Viewing a Property Window

Property windows for jobs, operations or resources are available in the Gantt Chart pane. These windows contain information about dates, quantities, descriptions of the scheduling data, and sales order and customer information. See: Job Properties Window, page 3-4, Operation Properties Window, page 3-4, and Resource Properties Window, page 3-4

To view a property window

- Left double-click on a job, operation, or resource in the Tree Hierarchy or Gantt Chart pane
- Right click on a job, operation, or resource.

A drop-down menu appears.

Choose Properties. The property window for the respective job, operation, or resource appears.

Job Properties Window

The information on the General tab of the Job Properties window originates from the Discrete Jobs window when you create the job, or derives through job transactions such as status and revision changes. *Defining Discrete Jobs Manually, Oracle Work in Process User's Guide.*

The progress bar displays a value that is calculated by the percent completed of all operations based on the time of each operation.

The Sales Order Lines tab displays information about all sales order lines linked to this job. This includes customer, status, and due date information.

Operation Properties Window

The information in the Operation Properties window originates from the Operations window in Oracle Work in Process, schedule information when you release the job, or quantity information derived through job transactions. see *Adding and Updating Operations, Oracle Work in Process User's Guide.*

The progress bar displays a value that is calculated by the percent completed of the Scheduled Quantity. Scrap quantity is included with completed quantity in the progress calculation.

Resource Properties Window

You can display resource information for resources assigned to specific job operations, or general resource information for resources defined in Oracle Bills of Material.

The information on the Resource Properties window displays resources assigned to a particular job operation. The data on the General tab originates from the Resource Requirements window when you assign a resource to an operation. See: Adding and Updating Resource Requirements, *Oracle Work in Process User's Guide*.

The Instances tab displays the resource name, the type of instance, the instance names, and the number of assigned instances. See: Resource Instances, page 2-15.

When you are in the Resource Load view of the Scheduler Workbench, you can display the resource properties that are defined in Oracle Bills of Material.

To view the Bill of Material resource definition:

1. Select Resource Load from the View menu or toolbar to display the Resource Load versus Capacity pane. See: Showing Select Resources and Resource Load Versus Capacity Pane, page 3-5.
2. Choose Resources in the Select Resource(s) pane. See: Selecting a Resource, page 3-6.
3. When the resources display on the workbench, right click on a resource.
A drop-down menu appears.
4. Choose Properties. The property window for the resource appears.
5. Choose OK to close this window.

Showing Select Resources and Resource Load Versus Capacity Panes

The Scheduler Workbench lets you show or hide job operations from the resources listed, and the resources in relationship to the capacity available. You can identify problems for analysis so that tasks can be modified, for example, the order in which the resource performs these tasks or the shifting the tasks across the other resources.

To show the Select Resources and Resource Load Versus Capacity Panes

Choose Show/Hide Resource Load from the View menu or toolbar. The Select Resources and Resource Load Versus Capacity panes appear.

To hide the Select Resources and Resource Load Versus Capacity Panes

Show/Hide Resource again from the View menu or toolbar. The Select Resources and Resource Load Versus Capacity panes do not appear.

Note: The Resource Load Versus Capacity will not change if you filter jobs in the Gantt chart because the total demand placed on those resources by all jobs on the shop floor has not changed.

Selecting a Resource

You can select a specific resource. If you are uncertain of the resource name, expand a job and an operation and view the specific resource of interest. Select a resource bar with your mouse pointer (yellow text bubble appears which indicates the name of the resource). The name of the resource is also available on the Resource Properties window.

To select a resource

1. In the Select Resource(s) pane choose the Select Resources button.
2. The Select Resource(s) window appears.
3. In the Available Resources pane select a resource or an instance.
4. Choose the right arrow button.

The resource appears in the Selected Resources pane.

5. Choose OK.

The name and description of the resource appears in the Select Resources pane and its corresponding graphic display for the resource appears in the Resource Load Versus Capacity pane. This represents the resource load for all jobs on the shop floor requiring this resource. The default graphic view is Table. The Required and Available key indicators appear.

6. From the graphic drop-down menu choose Continuous.

A continuous line graph appears. The Required, Available, and Overload key indicators appear.

7. From the graphic drop-down menu choose Bar.

A bar graph appears. The Required and Available key indicators appear.

Adjusting Resource Capacity

You can adjust resource capacity to respond to machine or personnel availability. This includes:

- Delete or add a day of capacity, adjusting for overtime shifts or shop closures
- Add or delete resource units when either extra resources are obtainable or resources are unavailable
- Adjust Assigned Units or Usage Rate for the resource on the job routing

Simulation sets are used to link resource changes for scheduling. Simulation sets are defined, associated to resources in Oracle Bills of Material, and linked to Work in Process scheduling in Work in Process Parameters window. See: Defining Work in Process Parameters, page 2-4. There are two methods for adjusting resource capacity:

- Navigate to the Departments window in Oracle Bills of Material, and from there access the Resources, Shifts, and Capacity Changes windows
- Access the Capacity Changes window directly from the Scheduler Workbench

To adjust resource capacity through Bill of Materials:

1. Navigate to the Departments window from Oracle Bills of Materials. See: Defining a Department, *Oracle Bills of Material User's Guide*.
2. Choose Resources to navigate to the Resources window.
3. Select a resource, then choose Shifts.
The Shifts window displays. This window is used to assign shifts to the resource from those assigned to the workday calendar.
4. Select a shift and choose Capacity Changes to define capacity changes for a shift.
The Capacity Changes window displays. Capacity modifications include adding or deleting days.
5. Select the designated simulation set defined on the Work in Process Parameters window. See: Defining Work in Process Parameters, page 2-4.
6. Save your work.
7. In the Scheduler Workbench, select Refresh Resource Load to display your changes.
8. Select Schedule Multiple Work Orders to apply these capacity adjustments to the shop floor schedule.

To adjust directly from the Scheduler Workbench:

1. Select Resource Load from the View menu or toolbar to display the Resource Load versus Capacity pane. See: Showing Select Resources and Resource Load Versus Capacity Pane, page 3-5.
2. Choose Resources in the Select Resource(s) pane. See: Selecting a Resource, page 3-6.
If the resource is scheduled by instance, and you want to adjust capacity, select the instance in the Available Resource(s) pane. If you select the resource and not the instance, the only action you can perform is deleting a day.

3. When the resources display on the workbench, select and right-click on the resource you want to adjust.

A drop-down menu appears.

4. Choose Change Capacity. The Capacity Changes window displays.

Note: a resource must be assigned to a department and a shift to display this window.

5. The Resource and Department fields display the resource name and the department it is assigned. The Simulation Set field displays the simulation set used to link resource changes to available resource capacity.

The Schedule by Instance field displays Yes or No depending on whether the resource has specified instances (machine or labor type). This is set on the Resources window, the Schedule by Instance checkbox. See: Resource Instances, page 2-15.

6. In the Capacity Changes region of the window, you can change or add information depending on the resource definition.

If you selected a resource scheduled by instance, the only available value in the Action field is Delete a Day. For these resources, access the instance to adjust capacity.

7. In the Shift field, select available shifts from the list of values.

Shifts are defined on the Shifts window when you are assigning a resource to a department. See Assigning Resources to a Department, *Oracle Bills of Material User's Guide*.

8. Select the action you want to perform. The choices are Add Capacity, Delete a Day, Reduce Capacity, or Add a Day.

You can only delete work days, and only add non-work days.

9. If you are adding or reducing capacity, select the capacity units you want to change.

The value in the Units field is defaulted from the assigned units of the resource to this department, and can be changed.

10. In the Date fields, From and To, select the dates for this capacity action to occur.

11. In the Time fields, From and To, the values default from the shift information, but can be changed.

12. Save your work.

13. Select Refresh Resource Load to display your changes.
14. Select Schedule Multiple Work Orders to apply these capacity adjustments to the shop floor schedule.

See Also

Assigning Operation Resources, *Oracle Bills of Material User's Guide*

Assigning Resources to a Department, *Oracle Bills of Material User's Guide*

Resource Usage, *Oracle Bills of Material User's Guide*

Rescheduling Jobs, Operations, and Resources in the Gantt Chart

You can manually or automatically reschedule the start and end dates of a job, operation, or resource.

For Manual Mode (Manual rescheduling is the default mode):

1. Grab and drag the start or end of a bar
2. Use the Edit Schedule window
3. You can invoke the Bar Inspector window that shows the start and end dates of a selected job, operation, or resource.

For Automatic Mode:

1. Grab and drag the start or end of a bar
2. Invoke the Automatic Rescheduling window

Manually Rescheduling Start and End Dates

You can manually reschedule any job, operation, or resource without regard for constraints or scheduling rules.

To manually forward or backward reschedule using the pointer

1. Point at the start or end of a job, operation, or resource bar.
2. Grab and drag to the right (forward) or left (backward).
The beginning or end of the bar moves to the right or left, respectively.
3. Save your work.

To manually forward or backward reschedule using the editor

1. Right click on any bar.
A drop-down menu appears.
2. Choose Edit Schedule.
The Edit Schedule window appears.
3. In the Start Date and/or End Date fields, enter the new start and/or end date for the required job or operation.
4. Choose Apply.
The bar moves to the new start and/or end date.
5. Save your work.

Automatically Rescheduling Jobs and Operations

You can automatically reschedule any job or operation. The required resource and material are used as the determining factor. The automatic scheduler enables you to specify the start and end dates, forward or backward schedule a job, and schedule an operation using the midpoint or midpoint forward scheduling method. You can initiate automatic rescheduling by moving jobs and operations with the mouse pointer or through the Automatic Reschedule window.

The constraint-based scheduling engine uses your date if constraints allow, or it moves the job and/or operation forward to the first available time slot as resources and material are available.

The following is recommended:

- Take a snapshot before rescheduling
- Periodically take a snapshot to ensure the capacities used by the constraint-based scheduling engine are correct

Note: In automatic mode, you cannot schedule a job or operation if it is beyond the end of the horizon. See: Scheduling Horizon, page 6-3

To automatically forward or backward reschedule a job using the pointer

1. Toggle or select Automatic/Manual Scheduling from the menu or toolbar.
You can also right click on a job or operation in the Gantt Chart pane, choose Automatically Reschedule from the drop-down menu, and specify the date and

direction you want the scheduler to use

2. Point at the beginning or end of a job.
3. Grab and drag to the right (forward) or left (backward). The Automatic Reschedule window appears.
4. Verify date and scheduling direction.
5. Choose Schedule.

The constraint-based scheduling engine uses the selected date or searches for the first available time slot as resources and material are available.

6. Choose Refresh Resource Load to view changes prior to saving.
7. Save your work.

To automatically forward or backward reschedule a job using the rescheduler

1. Place your cursor on the start (forward scheduling) or end (backward scheduling) portion of a job, left click on the light blue portion of the job, and drag the job right (forward) or left (backward).

The Automatic Reschedule window appears.

2. In the Scheduling Direction field select Forward or Backward.
3. Select the start or end date.
4. Choose Schedule.

The job attempts to start on the date requested as constraints allow, or moves forward until the next available time slot is found. The job's operations and resources move with the job.

5. Choose Refresh Resource Load on the toolbar to view changes prior to saving.
6. Save your work.

To automatically forward or backward reschedule an operation using the rescheduler

1. Place your cursor on the start or end portion of an operation, left click on the light blue portion of the operation, and drag the operation right (forward) or left (backward).

The Automatic Reschedule window appears.

2. In the Scheduling Direction field select Forward or Backward.

3. In the Scheduling Method field select the appropriate method.

Both directions from operation (Midpoint): Reschedules all prior and next operations when a time slot is found for this selected operation. Prior operations are backward scheduled, m=next operations are forward scheduled. The constraint-based scheduling engine looks for sufficient resources to allow the operation to be placed at its newly desired time slot while finding a time slot for all prior and next operations, keeping all operations in their original sequence.

Forward from operation (Midpoint Forward): Moves only the selected and next operations, keeping them in sequence, when a time slot is located to move this specified operation. Prior operations will not be rescheduled.

Note: Use Midpoint Forward when you have already started a job and have activity in any operation.

4. Select the start or end date.
5. Choose Schedule.
6. Save your work.

Creating, Scheduling, and Importing Jobs

This chapter covers the following topics:

- Overview of Creating, Scheduling, and Importing Jobs
- Creating and Scheduling a New Job
- Creating Final Assembly Orders
- Importing Jobs and Schedules

Overview of Creating, Scheduling, and Importing Jobs

This chapter explains how to create and schedule jobs, and how Oracle Manufacturing Scheduling accepts all jobs and schedules from Oracle Work in Process, including ATO (Assemble to Order) jobs.

Oracle Manufacturing Scheduling enables you to maintain the scheduling of discrete jobs based on resource and material constraints. You use the Work in Process windows and load program to perform these tasks including the Discrete Jobs window, the AutoCreate Final Assembly Orders window, and the Import Jobs and Schedules window.

Note: Oracle Shop Floor Management is enabled so you can schedule discrete jobs on the Scheduler Workbench created in lot based organizations.

Creating and Scheduling a New Job

Refer to the Oracle Work in Process task for creating and scheduling discrete jobs. See: *Defining Discrete Jobs Manually, Oracle Work in Process User's Guide* and *Discrete Scheduling, Oracle Work in Process User's Guide*.

Note: To use the constraint-based scheduling engine to schedule your jobs, you must check the Constraint Based Scheduling check box on the Scheduling tab of the WIP Parameters window. You also must complete all other setup requirements as specified in Setup Steps, page 2-3.

To create and schedule a new job

1. Navigate to the Discrete Jobs window in Oracle Work in Process.
2. Choose New
The Discrete Jobs window appears.
3. Enter the name of a job.
4. In the Type field select Standard.
5. In the Assembly field select an assembly from the List of Values.
6. Enter a class.
7. With the constraint-based scheduling engine active, the Status field is automatically set to Pending Scheduling. See: Profile Options, page 2-6.
8. Ensure that the Firm check box is not checked.
If the Firm check box is checked the job will not be automatically rescheduled.
9. In the Quantities region enter a quantity in the Start field.
10. In the Dates region enter a date in the Start or Completion field.
11. Select the Scheduling tab.
12. Optionally, you can enter a date in either the Requested Start Date or Requested Due Date fields.
These values are used by the scheduling engine to schedule as close to this date as possible. The scheduling engine uses the Requested Start Date value to schedule the job from that starting point for forward scheduling. Or uses the Requested Due Date value to schedule the job from that ending point for backward scheduling.
13. Optionally, enter a scheduling priority.
14. Optionally, assign a penalty factor in the Penalty Per Day Late field.
15. Optionally, in the Due Date Tolerance (days) field, enter the number of days that a

job can be delayed in scheduling without penalty.

16. Select the other tabs to ensure that there are no other specific user requirements.
17. Save your work.

Resource Instances

If resource instances were defined for a resource used in the job, you can override the resource instance(s) assigned to the job. Navigate to the Resource Instances window, select either the Person or Equipment tab, and change the resource instance name.

Note: If a job requires two resource instances, but only one is available, the operation resource starts beyond the end of the scheduling horizon.

Scheduling Jobs with Simultaneous and Alternate Resources

Simultaneous resources consist of two or more resources scheduled with the same start date. Alternate resources consist of other resources, or groups of resources, used instead of the primary resource in the job operation. Simultaneous and alternate resources in Oracle Manufacturing Scheduling include the following features:

- Two or more resources can be scheduled with the same start date within the job operation, subject to shift assignments of the individual resource
- You can define more than one group of simultaneous resources in an operation, in sequential groups
- Simultaneous and standard resources can be combined in an operation
- Simultaneous resources can have different usage rates or amounts, the scheduling engine restricts all the resources in a set to start at the same time
- You can define multiple resource groups as alternates in a prioritized order, the scheduling engine tries the first set of alternates, then the second set, and so on

See: Defining Simultaneous and Alternate Resources, page 2-9.

Alternate resources are invoked when there is high demand for the original resource, or when a resource is unavailable. Oracle Manufacturing Scheduling also provides the ability to adjust resource capacity. See: Adjusting Resource Capacity, page 3-6.

Creating Final Assembly Orders

You can automatically create final assembly orders for ATO (Assemble to Order) items entered in Oracle Order Management. You can also associate sales orders to discrete

jobs for ATO items, thereby allocating production to specific customers.

After running AutoCreating Final Assembly Orders, discrete jobs are automatically scheduled using the constraint-based scheduling engine.

See Also

AutoCreating Final Assembly Orders, *Oracle Work in Process User's Guide*

Final Assembly Orders, *Oracle Work in Process User's Guide*

Importing Jobs and Schedules

When importing jobs and schedules you can perform the following tasks:

- Load information into the Work Order Interface.
- Import data from the Work Order Interface.

Note: Jobs are automatically scheduled when they are imported, unless you set the Scheduling Method to Manual or set Allow-Explosion to No in the import table before importing the jobs.

Oracle Manufacturing Scheduling is integrated with Oracle Advanced Supply Chain Planning. If you have this application installed, Manufacturing Scheduling accepts all jobs imported by Advanced Supply Chain Planning and does not automatically reschedule those jobs when they are imported. See: Importing Jobs and Schedules, *Oracle Work in Process User's Guide*

Exception Messages

This chapter covers the following topics:

- Reviewing Exception Messages

Reviewing Exception Messages

A range of exception messages are provided in Oracle Manufacturing Scheduling so you can manage your scheduling by displaying jobs and resources requiring attention. Exception messages may be created after drop and drag scheduling on the Scheduler Workbench, after creating or scheduling discrete jobs, and after scheduling the entire shop floor.

For each exception that occurs, you can view the message, where the problem occurred and the severity, and details of the job. Messages can be one of three types: error, exception, or warning.

- An error message indicates that the job was not scheduled as shown in this example:

```
Oracle Manufacturing Scheduling could not schedule job due to
activity on this job while schedule was running. Please
re-launch the scheduler.
```

- An exception message informs you about a problem that should be corrected, but lets you know that the job is not cancelled as shown in this example:

```
Oracle Manufacturing Scheduling delayed the job because the
requested start date is before today's date.
```

- A warning message indicates an inconsistency, however the job is still scheduled:

```
The discrete job completes earlier than the requested due
date.
```

There are several ways to view exception messages in Oracle Manufacturing Scheduling:

Navigate to the Scheduling Exceptions window

You can view exception messages for jobs or resources from the Scheduling Exceptions window. You can view the full text of the exception messages, delete messages, and mark messages to show that they have been read.

Right click on a job or resource in the Scheduler Workbench

You can view exception messages for a single job or resource by accessing the View Exceptions window. Right click on any bar, a drop-down menu appears and choose View exceptions. This window displays in inquiry mode only.

Access the View All Exceptions window from the Schedule menu

This window displays information for all jobs and resources in inquiry mode only.

Scheduling Exceptions Window

To view and process exception messages:

1. Navigate to the Scheduling Exceptions window.
2. Exceptions window, choose Find to show all exception messages. Or limit the number of records by selecting criteria. See: *Using Query Find, Oracle Application's User's Guide*.

You can limit records displayed by selecting values for job, assembly, scheduling priority, job status, requested due date, scheduling request identification, or error message severity type.

3. Choose Find to display the Scheduling Exceptions window.
4. Select a job from the Tree Hierarchy pane to view exceptions.
You can view exception messages by either exception or properties.
5. Choose the Exceptions tab to view jobs by exception message.
In addition to the full text of the message, information is displayed in which operation sequence the exception occurred and the severity.
6. Optionally, you can mark a message to indicate that it has been read. Check the Marked box if you want to flag the message as read.
7. Choose the Properties tab to view the properties for the job that the exception message is flagging.

Note: In addition to the Scheduling Workbench, you can access the

Scheduling Exceptions window directly from the Manufacturing Scheduling menu.

View All Exceptions Window

In the Schedule menu you can also access the View All Exceptions window. This window displays the same information as shown in both tabs of the Scheduling Exceptions window, in inquiry mode only.

Rescheduling Discrete Jobs

This chapter covers the following topics:

- Overview of Rescheduling Discrete Jobs
- Rescheduling All Jobs
- Backward and Forward Scheduling
- Scheduling Dates on the Discrete Jobs Window
- Rescheduling the Entire Shop Floor
- Rescheduling a Single Job or Operation
- Alternate Resources

Overview of Rescheduling Discrete Jobs

When rescheduling jobs you can perform the following tasks:

- Reschedule all jobs using forward or backward scheduling.
- Reschedule jobs with or without a routing reference. For detailed information, see *Rescheduling Discrete Jobs, Oracle Work in Process User's Guide*.
- Add, update, delete, reschedule, and view operations. For detailed information, see *Adding and Updating Operations, Oracle Work in Process User's Guide*.
- Use midpoint rescheduling to reschedule around a bottleneck job operation. For detailed information, see *Midpoint Rescheduling, Oracle Work in Process User's Guide*.
- Modify discrete job operations, import modified jobs and schedules, and replan planned orders. For detailed information, see *Discrete Rescheduling, Oracle Work in Process User's Guide*.

Some updates and changes made to jobs automatically launch the reschedule process.

This includes changes to:

- Start job quantity
- Start date
- Completion date
- Requested Start Date
- Requested Due Date
- Bill of Material Revision
- Routing Revision

All other changes such as updates to the job heading, routing, bill of material, require that you manually launch the reschedule process. Refresh the Gantt chart to view these changes.

Note: When Scheduling All or Pending jobs, the scheduling engine does not schedule jobs with past due dates, or jobs outside of the scheduling horizon.

Rescheduling All Jobs

You can access the concurrent program to reschedule all jobs on the shop floor in two ways. You can navigate to the Schedule Discrete Jobs window, or access the Scheduling Parameters window directly from the Workbench. When accessed from the workbench, the workbench passes organization and discrete job information, and you only need to provide two other fields.

To reschedule all jobs:

1. Navigate to the Schedule Discrete Jobs window.

The Parameters window appears.

2. Select an organization.
3. In the Work Orders field select All Jobs.

The scheduling engine selects jobs with a status of Released, Unreleased, On Hold that are within the scheduling horizon.

4. In the Scheduling Mode field, select either Forwards from start date or Backwards from completion date.

5. In the Use Alternate Resources field select either Yes or No. The default is Yes.
6. In the Work Order Type field, select either Discrete job or Maintenance job.
This field defaults to the type of the organization specified in the Organization field.
7. Choose OK. The Schedule Discrete Jobs window appears.
See: Submitting a Request, *Oracle Applications User's Guide*.
8. Choose Submit.
A Decision window appears which indicates the request identification number. You can record this number for future reference.

To reschedule all jobs directly from the workbench:

1. Select Schedule Multiple Work Orders from the Schedule menu.
The Scheduling Parameters window displays.
2. Select scheduling method in the Scheduling Direction field.
Your choices are Forward from start date, or Backwards from completion date.
3. In the Use Alternate Resources field, select Yes if you want to consider alternates in the scheduling run, or No if you want current required resources to be used regardless of constraint.
4. Choose Submit to start the concurrent program.
A Request identifications number displays at the bottom of the Scheduler Workbench. When the program is complete, a confirmation window displays.

Scheduling Horizon

When scheduling all jobs, the scheduling engine does not schedule jobs with past due dates, or jobs outside of the scheduling horizon.

In automatic mode, if you grab and drag to the right (forward) or left (backward) beyond the end of the horizon, you will not be able to schedule the job. An error message displays when you choose Schedule on the Automatic Reschedule window, stating that you must either change the schedule date or cancel the transaction.

See Also

Defining Work in Process Parameters, page 2-4

Automatically Rescheduling Jobs and Operations, page 3-10

Backward and Forward Scheduling

Manufacturing Scheduling supports multiple scheduling methods including backward and forward scheduling at the job level, and midpoint forward scheduling at the operation level.

The Scheduling tab of the Resources window is where you define resource scheduling. The values are Yes, Prior, or Next. If you select Prior, you are including this resource when scheduling the previous operation. If you select Next, you are including this resource when scheduling the next operation. Finite scheduling also considers prior and next operation resources, for example, with fixed setups and teardowns. See: *Defining WIP Resource Definition*, page 2-7.

Backward and forward scheduling parameters differ depending on whether you are:

- Entering scheduling data on the Discrete Jobs window
- Rescheduling a single job by dragging and dropping on the Gantt chart
- Employing Alternate Resources

Scheduling Dates on the Discrete Jobs Window

The Discrete Jobs window has two areas holding scheduling date information: the Dates region on the main region of the window, and the date fields on the Scheduling tab. These date fields are employed in different ways.

Dates Region

When you initially create a job, you select production dates in the Dates region.

You can forward schedule by specifying a Start date. The constraint-based scheduling engine begins when the record is saved and moves the job forward to the first available time slot as resources and material are available.

You can backward schedule by specifying a Completion date. The constraint-based scheduling engine begins when the record is saved and schedules the job to complete as close as possible to that date. It calculates a production start date, according to resource and material availability.

The values in the Date region may change when the record is saved and scheduling dates are calculated. When the record is saved, these date values and other parameters (such as whether the job has an assembly routing or not, and is standard or non-standard) are used for the date calculation. See: *Defining Discrete Jobs Manually*, *Oracle Work in Process User's Guide*. If you are using manufacturing scheduling, the resource and material constraints are used in the date calculations.

Scheduling Tab Date fields

The dates on the Scheduling tab are the desired, or target, dates you want for scheduling. When you first create a job, the requested date defaults to date entered in the Date Region. After you select a Requested Start Date or Requested Due Date, the scheduling engine uses that date and scheduling constraints, and attempts to meet the request.

The constraint-based scheduling engine uses the Requested Start Date value to schedule the job from that starting point for forward scheduling, or the Requested Due Date value to schedule the job from that ending point for backward scheduling.

The dates in the Date region may change when the record is saved and scheduling dates are calculated. But the requested dates only change when you manually enter new values.

Rescheduling the Entire Shop Floor

When you reschedule all jobs on the shop floor from the Scheduler Workbench, the constraint-based scheduling engine considers:

- Resources and material
- Requested start or due date targets
- Job scheduling priority
- Scheduling objectives

Note: Firm jobs and any associated operations are not rescheduled.

See Also

Scheduling Dates on the Discrete Jobs Window, page 2-4

Defining WIP Scheduling Priority, page 2-16

Scheduling Objectives

You can select the primary goal of scheduling. The choice of objective determines the scheduling algorithm used and is used to maximize ontime completion, decrease the number of changeovers, or minimize slack time between job operations. Scheduling algorithms use penalty factors and machine and resource setup models. The scheduling objective is defined in the WIP Parameters window. See: Defining Work in Process Parameters, page 2-4, and Setting Up Scheduling Objectives, page 2-12.

Note: When jobs on the shop floor have varying scheduling priorities, scheduling logic looks at jobs having the same priority when determining the order operations selected for scheduling. The group of jobs with the highest priority is scheduled first, then the next highest priority group is scheduled next, until all jobs are scheduled.

- Maximize Ontime Completion

This scheduling objective employs only backward scheduling and incorporates penalty calculations including due date, inventory carrying, setup, and operation slack. See: Penalty Factors, page 2-12. When this objective is used, the algorithm uses the following logic:

- The last operation of every job on the shop floor, having the same priority level, is evaluated for penalty factor time totals.
- The cumulative penalty factor of all the jobs is calculated. The job operation with the highest penalty is scheduled first and allocated resources.
- Then, the last operation, or next to last operation in the job already scheduled, is evaluated again for penalty factor times.
- The cumulative penalty factor for this next set of last job operations is calculated. The job operation with the highest penalty is scheduled next and allocated resources.
- The system evaluates all the job operation sets until the last operation is scheduled on the shop floor.

- Minimize Setup

This scheduling objective employs both backward and forward scheduling. Machine and resource setup changeovers, and transition penalty factors are used in the scheduling calculations. See: Defining Resource Setup Information, page 2-13. When this objective is used, the algorithm uses the following logic:

- The system evaluates all resources used for jobs on the shop floor with setups and changeovers, and calculates the transition penalties.
- It then reviews all the operations using this resource, totals all penalty factors, and selects the operation with the highest penalty aggregate.
- The operation selected is scheduled first.
- Then system again evaluates all resources used for jobs with setups and changeovers, and calculates the transition penalties.

- It then reviews the remaining operations, not scheduled, using this resource; totals all penalty factors, and selects the operation with the highest penalty aggregate.
 - The operation selected is scheduled next.
 - The evaluation and scheduling continues until all operations are scheduled.
- **Minimize Operation Slack**
This scheduling objective employs both backward and forward scheduling. It incorporates calculations including due date, inventory carrying, setup, and operation slack. See: Penalty Factors, page 2-12. When this objective is used, the algorithm uses the following logic:
 - The penalty factor time for each job on the shop floor, having the same priority level, is calculated.
 - The job with the highest penalty aggregate is scheduled first and allocated resources. If it is backward scheduled, the scheduling begins at the last operation of the job. If forward scheduled, the scheduling begins at the first operation of the job. All the operations in the job selected are scheduled.
 - Next, the penalty factors for the remaining jobs on the shop floor are calculated.
 - The next job with the highest penalty aggregate is scheduled first and allocated resources. All the operations in the job selected are scheduled.
 - The system evaluates all the jobs on the shop floor until the last job is scheduled.

Rescheduling a Single Job or Operation

Rescheduling a single job or operation on the Gantt chart using constraint-based scheduling uses the same scheduling logic as finite scheduling. The scheduling attempts to meet the due date of the job or operation, setups are sequenced, and slack is minimized. The difference in rescheduling a single job or operation is that no other jobs or operations are moved, this can effect your objectives. Start or end dates can be rescheduled both manually and automatically. You can:

- Midpoint and midpoint forward schedule at a selected operation
- Backward schedule from a previous operation
- Schedule an operation using the midpoint or midpoint forward scheduling method

Automatically Rescheduling Jobs and Operations

The Automatic Reschedule window enables you to specify the start and end dates, forward or backward schedule a job, and schedule an operation using the midpoint or midpoint forward scheduling method. The required resource and material are used as the determining factor.

Select Automatic Scheduling from the menu or toolbar, and use the pointer to automatically forward or backward reschedule a job. You can forward schedule by selecting the right of the job or operation bar. Or backward schedule by selecting the left of the job or operation bar.

The constraint-based scheduling engine uses the selected date or searches for the first available time slot as resources and material are available. The job's operations and resources move with the job.

See: Automatically Rescheduling Jobs and Operations, page 3-10

Manually Rescheduling Jobs, Operation, and Resources

You can forward or backward schedule using the pointer or the Edit Schedule window, enabling you to manually reschedule any job, operation, or resource without regard for constraints or scheduling rules.

You can forward schedule by selecting the right of the job, operation, or resource. Or backward schedule by o the left of the job, operation, or resource.

Or you can use the Edit Schedule window to enter new start or end dates for the required job or operation. The required resource and material are used as the determining factor.

See: Manually Rescheduling Start and End Dates, page 3-9

Alternate Resources

Alternate resource functionality only employs backward scheduling, because alternate resources do not use start dates:

- When rescheduling single jobs, the alternate resource is invoked if the primary resource does not enable the job to complete by the Requested Due Date. It will revert back to the primary resource if neither the primary or alternate resource can complete by the date.
- When rescheduling multiple jobs, the scheduling logic looks at the Job Priority, Requested Due Date, and Completion Date values. The alternate resource is invoked if the primary cannot complete by the due date. If neither primary or alternate resource can meet the date, the primary resource is used.

Shop Floor Modeling

This chapter covers the following topics:

- Overview of Shop Floor Modeling
- Minimum Transfer Quantity
- Resource Batching

Overview of Shop Floor Modeling

Oracle Manufacturing Scheduling provides features to model the work on your shop floor for creating a prototype for scheduling. This enables you to improve responsiveness and optimize scheduling with material and resource information. You set up parameters for modeling, and then use the Scheduler Workbench for a graphical view and to reschedule on the shop floor. The features available for shop floor modeling are:

- Scheduling Priorities
- Alternate Resources
- Simultaneous Resources
- Scheduling Objectives
- Setups and Changeovers
- Penalty Factors
- Resource Instances
- Capacity Adjustments
- Minimum Transfer Quantities

- Resource Batching

Scheduling Priorities

You can assign a scheduling priority number for jobs. The priority value determines the order resources and material are allocated to jobs. Priority is not considered when a single job is scheduled or rescheduled. See: Defining WIP Scheduling Priority, page 2-16

Alternate Resources

Alternate resources consist of other resources, or groups of resources, used instead of the primary resource in the job operation. Alternate resources are invoked when scheduling dates are not feasible due to resource unavailability. See: Defining Simultaneous and Alternate Resources, page 2-9 Alternate Resources, and Scheduling Jobs with Simultaneous and Alternate Resources, page 4-3.

Simultaneous Resources

Simultaneous resources consist of two or more resources working concurrently within a job operation, subject to shift assignments of the individual resource. See: Defining Simultaneous and Alternate Resources, page 2-9 and Scheduling Jobs with Simultaneous and Alternate Resources, page 4-3.

Scheduling Objectives

You can select the primary goal, or objective, of scheduling and model your system to this application of resources. The choice of objective determines the scheduling logic. See: Setting Up Scheduling Objectives, page 2-12. Scheduling objectives use penalty factors. machine and resource setups, and resource instances.

- Penalties for Late or Early Completion and Wait Time

A weighted value, or penalty, can be assigned to scheduling events. Higher penalties induce the scheduling logic to circumvent such an events. For example, different changeovers can be assigned various penalties to sequence production in a particular order. See: Penalty Factors, page 2-12.

- Machine and Resource Setups

You can create a performance model for machine and resource setups to include changeover time from one setup to another, including the time required to perform the work. Resources can have multiple setup types. Any two setup types within a resource can have a penalty assigned to weigh one changeover setup versus the other. See: Defining Resource Setup Information, page 2-13.

Resource Instances

You can define specific machines to machine resources, and specific employees to labor

resources. The resource instance data is viewable in the Resource Property window, including setup start date, setup end date, assigned units, effective start date, effective end date, and serial number. See: Resource Instances, page 2-15.

Capacity Adjustments

Resource capacity can be adjusted to respond to machine or personnel availability. You can add, delete, or adjust capacity and resource units. Simulation sets are used and linked to scheduling. They are defined and associated to resources.

See Also

Defining Work in Process Parameters, page 2-4

Assigning Resources to a Department, *Oracle Bills of Material User's Guide*

Adjusting Resource Capacity, page 3-6

Minimum Transfer Quantity

Minimum transfer quantities on routings enable you to move a portion of assemblies. This allows you to complete jobs more efficiently than waiting for the entire quantity to be completed. See: Minimum Transfer Quantity, page 7-3,.

Resource Batching

Resource batching enables you to use a single resource to process multiple jobs simultaneously, preventing a resource from being underutilized. See: Resource Batching, page 7-5.

Minimum Transfer Quantity

You can define a minimum transfer quantity for operations on a routing, enabling you to move a portion of some assemblies to the subsequent operation. Scheduling with transfers provides the ability to complete jobs more efficiently than waiting for the entire quantity to move to the next operation. Scheduling algorithms use the minimum transfer quantity values; and processing begins before all assemblies are completed at the current operation.

Setting Up

Minimum transfer quantity functionality is enabled when you enter this value on either the Standard Operations or Routings windows in Oracle Bills of Material. If the job uses a standard operation, the value defaults from the Standard Operations window. If the job uses a routing, either bill of material or work in process routing type, the value defaults from the Routings window.

See Also

Creating a Routing, *Oracle Bills of Material User's Guide*

Creating a Standard Operation, *Oracle Bills of Material User's Guide*

Processing Features

Manufacturing begins when a sufficient quantity of the assembly is at the operation resource. When the quantity is complete, it moves to the next operation resource.

- If this functionality is enabled, the scheduling engine always transfers completions in batches, and the minimum transfer quantity amount applies to all resources in the operation.
- This processing does not allow overlapping transfers in the same operation. If a minimum transfer quantity arrives at an operation resource before the previous quantity is completed, work does not begin until the first amount is completed.
- The batch amount matches the minimum transfer quantity value. However, the transfer quantities can differ across transfers in order for the completion to equal to the sum of the batches. For example:
 - If the job quantity is 100,
 - And the minimum transfer quantity is 30,
 - You can have transfers of quantities 30, 30 and 40 in order to equal the total of 100.
- Transfers are only within operations of a routing.

Note: Network routings do not use minimum transfer quantity functionality.

- Resource Settings

Prior and Next Operation Resources: If an operation resource is flagged as Prior on the Resources window, then it can overlap with the previous operation. If it is flagged as Next, then it can overlap with the succeeding operation. However, minimum transfer quantity processing does not allow overlapping batches in the same operation. If you are using minimum transfer quantity batches and they overlap, the quantities skip the Next or Prior resource, and move to subsequent or preceding resource in the routing.

Sequential Operation Resources: In sequential operation resources, the transfer amount determines the schedule of the operation resources. If one of those resources does not have minimum transfer quantity, the schedule is determined by

the end time of one and the start time of the other.

Simultaneous Resources: Within any simultaneous set, all transfers in an operation resource coincide.

Resource Batching

Resource batching enables you to use resources across multiple jobs. This prevents a resource from being underutilized. Work scheduled using resource batching is equivalent work performed with the same manufacturing processes.

Resource batching creates processing batches which consist of a job/resource combination, and standard operation code if applicable. For each batchable resource, a time window is defined when the system should look for operations to include in the batch.

Note: If using standard operation codes, they must be the same for all the operations in a batch.

Batching Different Assemblies

You can create a batch that includes jobs of different assembly numbers. The scheduling engine creates batches across multiple jobs and schedules them as a one group when they use the same:

- Standard operation code in their routings
- Resource setup
- Time period duration of the resource

They must also fall within the same batching window.

Batch Definition

The resource batching information is defined in the Resources window in Oracle Bills of Material. See: *Creating a Routing, Oracle Bills of Material User's Guide*. Check the Batchable check box to enable a resource for batching, and enter values for the following fields:

- *Maximum Batch Capacity:* The largest number of units to group in a batch. If there are jobs containing units exceeding this value, the system creates multiple batches.
- *Batch Capacity UOM:* Unit of measure used for the resource batch such as units, area, volume, or weight.
- *Batching Window:* The time frame in which this resource is used when batching. For

example, if the batching window value is 3 hours, the resource is available to the processing batch in this 3 hour window.

- *Batching Window UOM*: The unit of measure, expressed in time, used for the Batching Window field.

Windows and Navigator Paths

This appendix covers the following topics:

- Windows and Navigator Paths

Windows and Navigator Paths

The following table shows how to find detailed information described in other manuals.

| See... | Refer to this manual for a complete form description |
|--------|--|
| BOM | Refer to the Oracle Bill of Materials User's Guide |
| WIP | Refer to the Oracle Work in Process User's Guide |

The following table shows windows and navigation paths for Oracle Manufacturing Scheduling.

| Window Name | Navigation Path |
|------------------|---|
| Capacity Changes | Manufacturing Scheduling > Scheduling Workbench > View > Resource Load > right click on a resource > Capacity Changes |
| Changeovers | BOM > Routings > Resources > Setups > Changeovers |

| Window Name | Navigation Path |
|---------------------------|---|
| Discrete Jobs | WIP > Discrete > Discrete Jobs |
| Filter | Manufacturing Scheduling > Scheduling Workbench > Filter |
| Instances | BOM > Routings > Departments > Resources > Instances |
| Job Properties | Manufacturing Scheduling > Scheduling Workbench > right click on a job |
| Operation Properties | Manufacturing Scheduling > Scheduling Workbench > right click on an operation |
| Resource Properties | Manufacturing Scheduling > Scheduling Workbench > right click on a resource |
| Schedule Discrete Jobs | Manufacturing Scheduling > Scheduling Workbench > Schedule Discrete Jobs |
| Scheduler Workbench | Manufacturing Scheduling > Scheduling Workbench |
| Scheduling Exceptions | Manufacturing Scheduling > Scheduling Exceptions |
| Scheduling Parameters | Manufacturing Scheduling > Scheduling Workbench > Schedule menu > Schedule Multiple Work Orders |
| Standard Operations | BOM > Routings > Standard Operations |
| Setup Types | BOM > Routings > Setup Types |
| Setup Standard Operations | BOM > Routings > Setup Standard Operations |
| Setups | BOM > Routings > Resources > (B) Setups |
| View All Exceptions | Manufacturing Scheduling > Schedule menu > View All Exceptions |

| Window Name | Navigation Path |
|----------------------------|--|
| Work in Process Parameters | WIP > Setup > WIP Parameters > (T) Scheduling |

Glossary

active schedule

A schedule currently running on a production line. A schedule can be active past its scheduled completion date or before its scheduled start date.

alternate bill of material

An alternate list of component items you can use to produce an assembly.

alternate routing

An alternate manufacturing process you can use to produce an assembly.

assemble-to-order (ATO)

An environment where you open a final assembly order to assemble items that customers order. Assemble-to-order is also an item attribute that you can apply to standard, model, and option class items.

assembly

An item that has a bill of material. You can purchase or manufacture an assembly item. For more information, see **assemble-to-order (ATO)bill of material**.

assembly completion pull transaction

A material transaction where you backflush components from inventory to work in process as you complete the operation where the component is consumed. See **operation completion pull transaction**.

assembly completion transaction

A material transaction where you receive assemblies into inventory from a job or schedule upon completion of the manufacture of the assembly.

assembly move completion transaction

A move transaction that completes assemblies into inventory.

assembly scrap transaction

A move transaction where you charge a scrap account as you move assemblies into a Scrap intraoperation step. This reduces the value of your discrete job.

assembly UOM item

A purchasing item associated with an outside resource that you purchase using the assembly's unit of measure. The assembly's unit of measure should be the same as the purchasing item's unit of measure.

asset subinventory

Subdivision of an organization, representing either a physical area or a logical grouping of items, such as a storeroom where quantity balances are maintained for all items and values are maintained for asset items.

assigned units

The number of resource units assigned to work at an operation in a routing. For example, if you have 10 units of machine resource available at a department, you can assign up to 10 of these units to an operation in a routing. The more units you assign, the less elapsed time Work in Process schedules for the operation.

available capacity

The amount of capacity available for a resource or production line.

available-to-promise (ATP)

Ability to promise product for customer orders based on uncommitted inventory, planned production, and material.

Available To Transact (ATT)

Quantity on hand less all reservations for the item which may be transferred within or out of inventory.

backflush transaction

A material transaction that automatically issues component items into work in process from inventory when you move or complete the assembly. Also known as **post-deduct** or **pull**.

backward scheduling

A scheduling technique where you specify a production end date and Oracle Manufacturing calculates a production start date based on detailed scheduling or repetitive line scheduling.

bill of material

A list of component items associated with a parent item and information about how each item relates to the parent item. Oracle Manufacturing supports standard, model, option class, and planning bills. The item information on a bill depends on the item type and bill type. The most common type of bill is a standard bill of material. A standard bill of material lists the components associated with a product or subassembly. It specifies the required quantity for each component plus other information to control work in process, material planning, and other Oracle Manufacturing functions. Also known as product structures.

cancelled job

A discrete job you no longer want to work on. You cannot make transactions, move assemblies, or apply or update costs.

closed job

A discrete job that is unavailable for charges or any type of transaction. Closing a job calculates final costs and variances and creates history for the job.

complete charges

The job is complete and charges are allowed.

complete no charges

The job is complete but charges are not allowed.

completed assembly

An assembly you built on a discrete job or repetitive schedule and received into inventory.

completed job

A discrete job whose quantity planned equals the number of assemblies actually completed.

completion date

The date you plan to complete production of the assemblies in a discrete job.

completion subinventory

An inventory location at the end of your production line where you receive completed assemblies from work in process. Often this is the supply subinventory for subassemblies or finished goods inventories for final assemblies.

component demand

Demand passed down from a parent assembly to a component.

component item

An item associated with a parent item on a bill of material.

component yield

The percent of the amount of a component you want to issue to build an assembly that actually becomes part of that assembly. Or, the amount of a component you require to build plus the amount of the component you lose or waste while building an assembly. For example, a yield factor of 0.90 means that only 90% of the usage quantity of the component on a bill actually becomes part of the finished assembly.

current on-hand quantity

Total quantity of the item on-hand before a transaction is processed.

demand class

A classification of demand to allow the master scheduler to track and consume different types of demand. A demand class may represent a particular grouping of customers, such as government and commercial customers. Demand classes may also represent different sources of demand, such as retail, mail order, and wholesale.

department

An area within your organization that consists of one or more people, machines, or suppliers. You can also assign and update resources to a department.

detailed scheduling

A method of scheduling production that considers minute to minute resource availability information as well as exact resource requirements from routings.

discrete job

A production order for the manufacture of a specific (discrete) quantity of an assembly, using specific materials and resources, in a limited time. A discrete job collects the costs of production and allows you to report those costs including variances by job. Also known as **work order** or **assembly order**.

discrete manufacturing

A manufacturing environment where you build assemblies in discrete jobs or batches. Different from a repetitive production environment where you build assemblies on production or assembly lines at a daily rate.

efficiency

A productivity measure that focuses on actual performance against a standard. Expressed in a percentage figure, it is calculated by dividing actual resource time charged to a task by the standard resource requirements for the same task.

final assembly order

A discrete job created from a configuration or an assemble to order item and linked to a sales order. Also known as final assembly schedule.

firm flag

Denotes a job that cannot be modified by the planning or rescheduling process. See *MRP User's Guide* and *Oracle Supply Chain Planning Implementation and User's Guide*.

first unit completion date

The date and time you plan to complete production of the first assembly on a repetitive schedule. This date equals the first unit start date plus the lead time.

first unit start date

The date and time you plan to begin production of the first assembly on a repetitive schedule. This date equates to the start of your lead time.

forward scheduling

A scheduling technique where you specify a production start date and Oracle Manufacturing calculates a production end date using either detailed scheduling or repetitive line scheduling.

immediate dispatch

Used in conjunction with department or resource job filter criteria. Includes jobs where there is quantity in an operation assigned to the selected department or resource.

intraoperation steps

The particular phases within an operation. There are five intraoperation steps in Work in Process: Queue, Run, To Move, Reject, and Scrap.

issue transaction

A material transaction to issue component items from inventory to work in process.

item-based resource

A resource whose usage quantity is the amount required per assembly unit you make.

job status

An Oracle Manufacturing function that lets you describe various stages in the life cycle of a discrete job and control activities that you can perform on the job.

last unit completion date

The date and time you plan to complete production of the last assembly on a repetitive schedule. This date equates to the first unit completion date plus processing days.

last unit start date

The date and time you plan to begin production of the last assembly on a repetitive schedule. This date is the first unit start date plus processing days.

lot based resource

A resource whose usage quantity is the amount required per job or schedule.

manual resource

A resource manually charged to a discrete job or repetitive schedule.

mass loading

An Oracle Manufacturing function to create one or more discrete jobs or repetitive schedules based on planned orders or schedules in your MRP or master production schedule.

mass rescheduling

An Oracle Manufacturing function where you can reschedule or change the status of one or more discrete jobs based on your planned reschedule recommendations in your MRP or MPS.

material requirement

An inventory item and quantity needed to build an assembly on a job or repetitive schedule. Discrete job and repetitive schedule material requirements are created based on the component items defined on the assembly's bill of materials. Issue transactions fulfill material requirements.

material transaction

Transfer between, issue from, receipt to, or adjustment to an inventory organization, subinventory, or locator. Receipt of completed assemblies into inventory from a job or repetitive schedule. Issue of component items from inventory to work in process.

midpoint scheduling

A scheduling technique where you specify an operation start or end date and Oracle Manufacturing automatically calculates production start and end dates.

move transaction

A transaction to move assemblies from operation to operation or within an operation on a discrete job or repetitive schedule.

MRP net quantity

The quantity planning views as supply coming from a discrete job on the scheduled completion date.

on hold job/schedule

A job or repetitive schedule not accepting further activity and is therefore untransactable.

operation

A step in a manufacturing process where you perform work on, add value to, and consume department resources for an assembly.

operation code

A label that identifies a standard operation.

operation completion pull transaction

A material transaction where you backflush components from inventory to work in process as you complete the operation where the component is consumed. For more information, see **backflush transaction**.

operation completion transaction

A move transaction from one operation to the next where you have completed building the assembly at that operation. In this process, you can also charge resources and overheads and backflush component items.

operation overlap scheduling

A scheduling technique that allows you to schedule resource activities in the prior and next operations to overlap with the current operation.

operation sequence

A number that orders operations in a routing relative to each other.

organization

A business unit such as a plant, warehouse, division, department, and so on. Order Entry refers to organizations as warehouses on all Order Entry windows and reports.

outside operation

An operation that contains outside resources and possibly internal resources as well.

outside processing

Performing work on a discrete job or repetitive schedule using resources provided by a supplier.

outside processing operation

Any operation that has an outside processing resource. See **outside resource**.

outside resource

A resource provided by a supplier you include in your routings, such as supplier sourced labor or services. This includes both **PO move** and **PO receipt** resources.

overload capacity

Number of resource units that are required but already committed.

pending

A status where a process or transaction is waiting to be completed.

planned order

A suggested quantity, release date, and due date that satisfies net item requirements. MRP owns planned orders, and may change or delete the orders during subsequent MRP processing if conditions change. MRP explodes planned orders at one level into gross requirements for components at the next lower level (dependent demand). Planned orders along with existing discrete jobs also serve as input to capacity requirements planning, describing the total capacity requirements throughout the planning horizon.

quantity completed

For an operation on a discrete job or repetitive schedule, the quantity of the assembly that you transacted beyond the Run intraoperation step. For a discrete job or repetitive schedule, the quantity of the assembly that you received into inventory.

quantity in operation

The quantity of an assembly in an operation on a discrete job or repetitive schedule. This includes the quantities in each of the intraoperation steps.

quantity on hand

Current quantity of an item in inventory.

quantity remaining

The quantity of an assembly remaining to be completed at an operation in a discrete job or repetitive schedule. This is the sum of the quantities in all intraoperation steps at all operations before the current operation, plus the quantities in the Queue and Run intraoperation steps at the current operation.

quantity required

The total quantity of a component item required to produce all the assemblies in a discrete job or repetitive schedule as determined by the usage quantity on the bill of materials, the production quantity, and the component yield.

queue

An intraoperation step in an operation where assemblies are waiting to be worked on. The default intraoperation step for every operation in a routing.

release date

The date when you release a discrete job or repetitive schedule to the shop floor signifying that work can begin and the discrete job or repetitive schedule becomes transactable.

released job/schedule

A discrete job or repetitive schedule that you have signified available to be worked on and transactable.

requested due date

The job due date. In Manufacturing Scheduling, you assign the requested due date in conjunction with the scheduling priority. The rescheduling engine uses this information to prioritize and reschedule all jobs or pending scheduling jobs.

required capacity

The amount of capacity required for a resource or production line.

reschedule

To modify the schedule of a discrete job. You can reschedule a discrete job by changing the start date, completion date, job quantity or any operation date on the routing. Planning can automatically reschedule jobs that are not firm based on planning requirement changes.

resource

Anything of value, except material and cash, required to manufacture, cost, and schedule products. Resources include people, tools, machines, labor purchased from a supplier, and physical space.

resource basis

The basis for resource usage quantity that indicates whether that quantity is required per item or per lot.

resource requirement

A resource and quantity needed to build an assembly on a job or repetitive schedule. Discrete job and repetitive schedule resource requirements are created based on the resource requirements specified on the assembly's routing. Resource transactions fulfill resource requirements.

resource sequence

The number that indicates the order of a resource in an operation relative to other resources.

run

An intraoperation step where you move assemblies that you are working on at an operation.

schedule group

An identifier used to group jobs for scheduling and releasing purposes. For example, you might group together all jobs that must be completed on a specific date and are being built on the same production line. Jobs within a schedule group can be sequenced .

scheduled resource

A resource on a routing that is scheduled by Work in Process.

scrap

An intraoperation step where you move assemblies that cannot be reworked or completed.

shift

A scheduled period of work for a department within an organization.

shop floor status

An Oracle Manufacturing function that lets you restrict movement of assemblies at an operation and intraoperation step within a discrete job or repetitive schedule.

standard operation

A commonly used operation you can define as a template for use in defining future routing operations.

start date

The date you plan to begin production of assemblies in a discrete job.

subassembly

An assembly used as a component in a higher level assembly.

subinventory

Subdivision of an organization, representing either a physical area or a logical grouping of items, such as a storeroom or receiving dock.

supplier

Provider of goods or services.

supply subinventory

The subinventory you use as a primary source of supply to meet a specific material requirement in a discrete job or repetitive schedule. In Release 9, this is the backflush subinventory for pull material or the primary issue subinventory for push material.

to move

An intraoperation step where assemblies can either be completed to a subinventory or wait to be moved to another operation.

transaction date

The date you enter and Oracle Manufacturing maintains for any manufacturing transaction. The date must fall within an open accounting period and be greater than the release date for transactions on a discrete job or repetitive schedule.

unit of measure

The unit that the quantity of an item is expressed.

unreleased job/schedule

A discrete job or repetitive schedule planned but not released for work to begin and not yet transactable.

UOM

See **unit of measure**

upstream dispatch

Used in conjunction with department or resource job filter criteria. Includes upstream jobs where there is quantity in an operation assigned to the selected department or resource.

usage rate

The amount of a resource consumed at an operation.

WIP accounting class

A set of accounts that you use to charge the production of an assembly. You assign accounting classes to discrete jobs and repetitive schedules. Each accounting class includes distribution accounts and variance accounts. Also used in cost reporting.

WIP move resource

A resource automatically charged to a discrete job or repetitive schedule by a move

transaction. Resources are automatically charged when a forward move occurs, or uncharged when a backward move occurs.

work in process

An item in various phases of production in a manufacturing plant. This includes raw material awaiting processing up to final assemblies ready to be received into inventory.

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