Scheduling Discrete Jobs

Student Guide

Course Code	14498GC10
Edition	1.0
Month	July 2000
Part Number	M012462

ORACLE

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This book was published using:

Oracle® Tutor™

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Preface

Profile

Before You Begin This Course

Before you begin this course, you should have the following qualifications:

- Thorough knowledge of <*insert information specific to this course*>
- Working experience with <*insert information specific to this course*>

Prerequisites

- <*insert prerequisites from the course description, including any suggested preparation courses*>
- <*if there are no prerequisites, insert the following sentence:*> There are no prerequisites for this course.

How This Course Is Organized

<*Course Title*> is an instructor-led course featuring lecture and hands-on exercises. Online demonstrations and written practice sessions reinforce the concepts and skills introduced.

Related Publications

Oracle Publications

Title	Part Number
<*insert*>	*Axxxxxx*
<*insert*>	*Axxxxxx*
<*insert*>	*Axxxxxx*
<*insert*>	*Axxxxxx*

Additional Publications

- System release bulletins
- Installation and user's guides
- *read.me* files
- Oracle Applications User's Group (OAUG) articles
- *Oracle Magazine*

Typographic Conventions

Typographic Conventions in Text

Convention	Element	Example
Bold italic	Glossary term (if there is a glossary)	The ***algorithm*** inserts the new key.
Caps and lowercase	Buttons, check boxes, triggers, windows	Click the Executable button. Select the Can't Delete Card check box. Assign a When-Validate-Item trigger to the ORD block. Open the Master Schedule window.
Courier new, case sensitive (default is lowercase)	Code output, directory names, filenames, passwords, pathnames, URLs, user input, usernames	Code output: `debug.set ('I", 300);` Directory: `bin` (DOS), `$FMHOME` (UNIX) Filename: Locate the `init.ora` file. Password: User `tiger` as your password. Pathname: Open `c:\my_docs\projects` URL: Go to `http://www.oracle.com` User input: Enter `300` Username: Log on as `scott`
Initial cap	Graphics labels (unless the term is a proper noun)	Customer address (*but* Oracle Payables)
Italic	Emphasized words and phrases, titles of books and courses, variables	Do *not* save changes to the database. For further information, see *Oracle7 Server SQL Language Reference Manual.* Enter `user_id@us.oracle.com`, where *user_id* is the name of the user.
Quotation marks	Interface elements with long names that have only initial caps; lesson and chapter titles in cross-references	Select "Include a reusable module component" and click Finish. This subject is covered in Unit II, Lesson 3, "Working with Objects."
Uppercase	SQL column names, commands, functions, schemas, table names	Use the SELECT command to view information stored in the LAST_NAME column of the EMP table.

Convention	Element	Example
Arrow	Menu paths	Select File–> Save.
Brackets	Key names	Press [Enter].
Commas	Key sequences	Press and release keys one at a time: [Alternate], [F], [D]
Plus signs	Key combinations	Press and hold these keys simultaneously: [Ctrl]+[Alt]+[Del]

Typographic Conventions in Code

Convention	Element	Example
Caps and lowercase	Oracle Forms triggers	`When-Validate-Item`
Lowercase	Column names, table names	`SELECT last_name FROM s_emp;`
	Passwords	`DROP USER scott IDENTIFIED BY tiger;`
	PL/SQL objects	`OG_ACTIVATE_LAYER (OG_GET_LAYER ('prod_pie_layer'))`
Lowercase italic	Syntax variables	`CREATE ROLE role`
Uppercase	SQL commands and functions	`SELECT userid FROM emp;`

Typographic Conventions in Navigation Paths

This course uses simplified navigation paths, such as the following example, to direct you through Oracle Applications.

(N) Invoice > Entry > Invoice Batches Summary (M) Query > Find (B) Approve

This simplified path translates to the following:

1. (N) From the Navigator window, select Invoice > Entry > Invoice Batches Summary.

2. (M) From the menu, select Query > Find.

3. (B) Click the Approve button.

Notations :

(N) = Navigator

(M) = Menu

(T) = Tab

(I) = Icon

(H) = Hyperlink

(B) = Button

Typographical Conventions in Help System Paths

This course uses a “navigation path” convention to represent actions you perform to find pertinent information in the Oracle Applications Help System.

The following help navigation path, for example—

(Help) General Ledger > Journals > Enter Journals

—represents the following sequence of actions:

1. In the navigation frame of the help system window, expand the General Ledger entry.

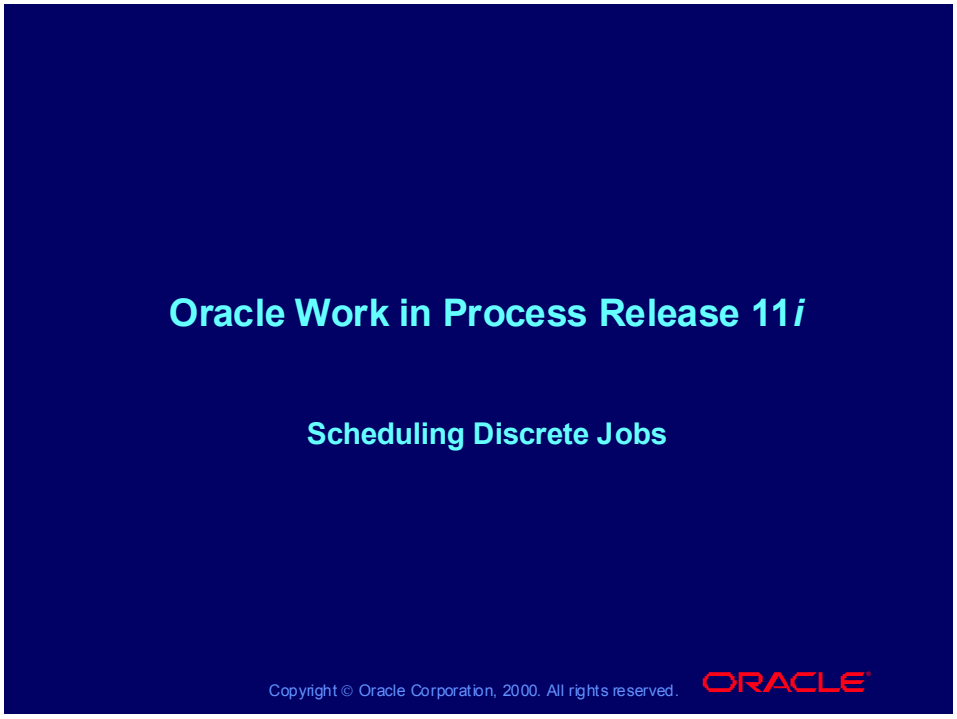
2. Under the General Ledger entry, expand Journals.

3. Under Journals, select Enter Journals.

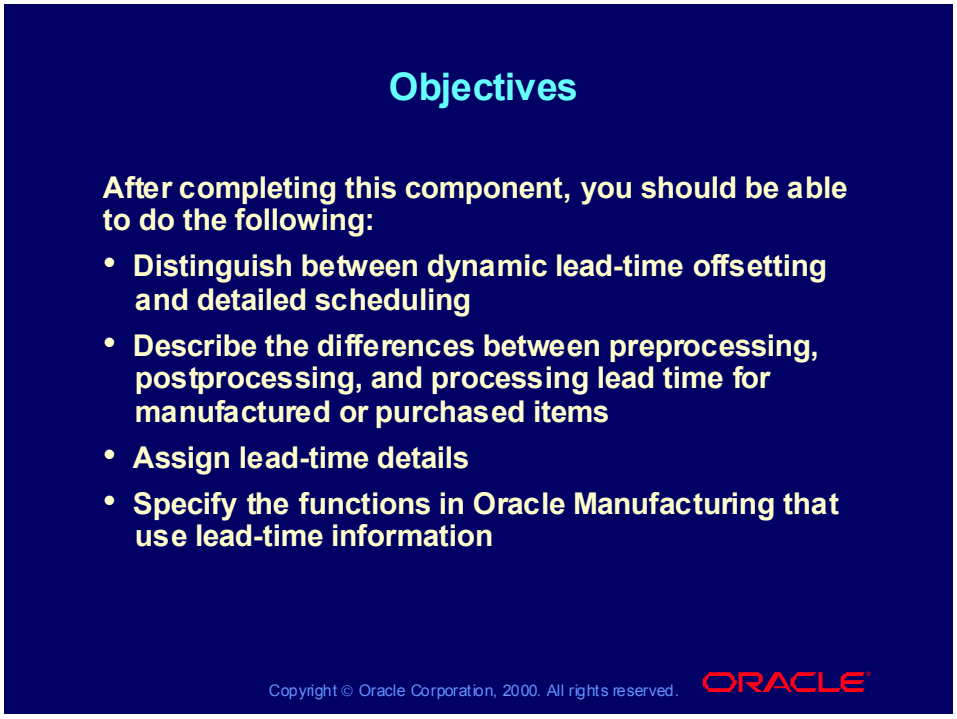
4. Review the Enter Journals topic that appears in the document frame of the help system window.

Scheduling Discrete Jobs

Chapter 1

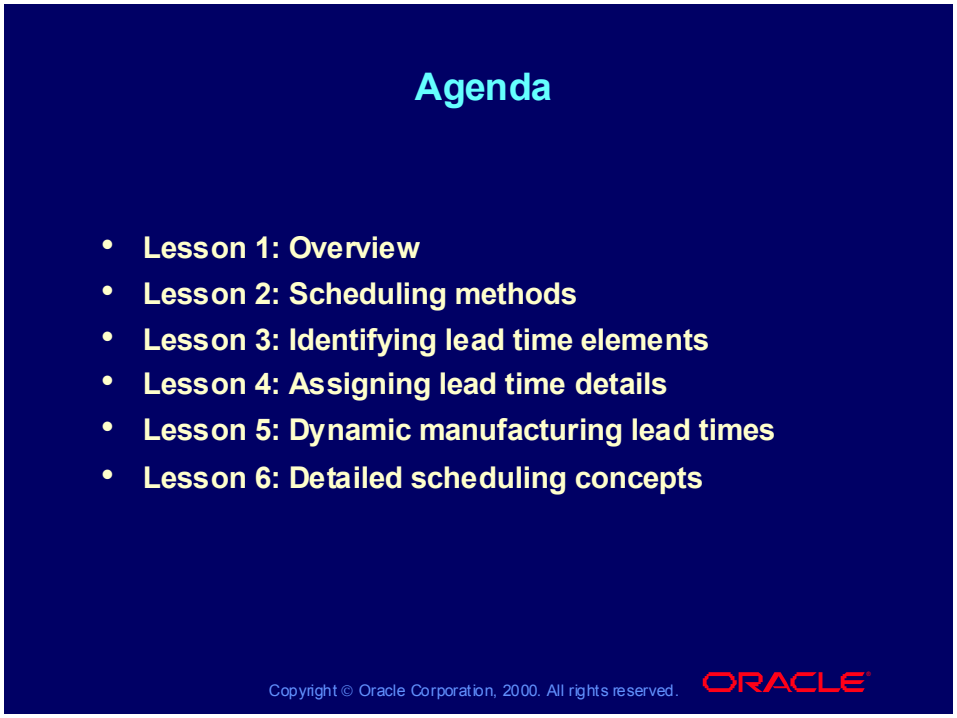


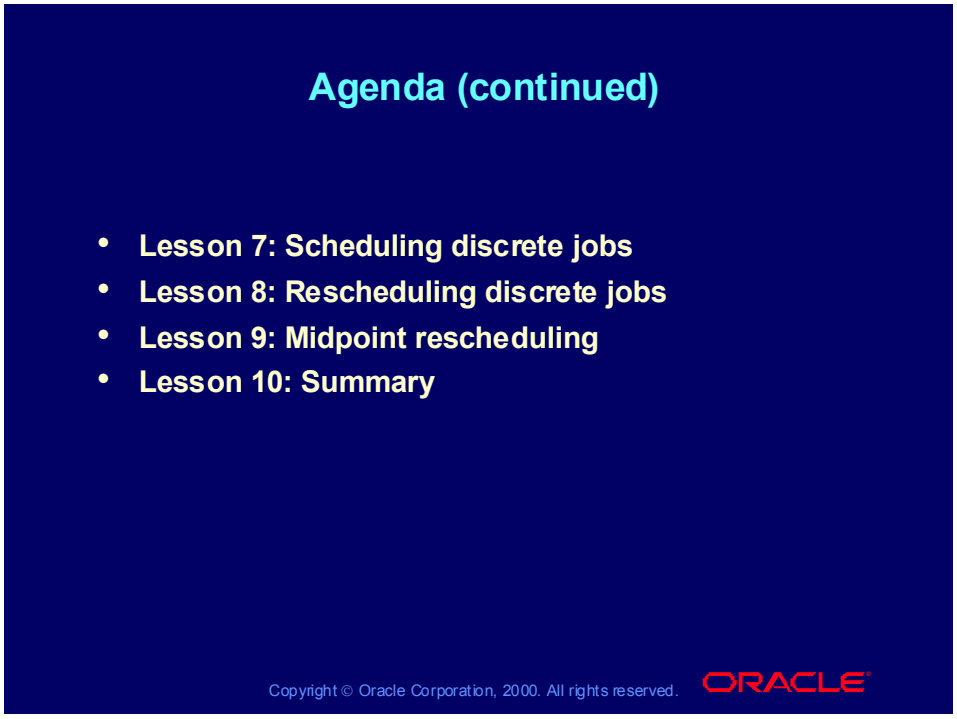
Notations:
N = Navigator
T = Tab
M = Menu
I = Icon
H = Hyperlink
B = Button
Help = Oracle Applications Help System

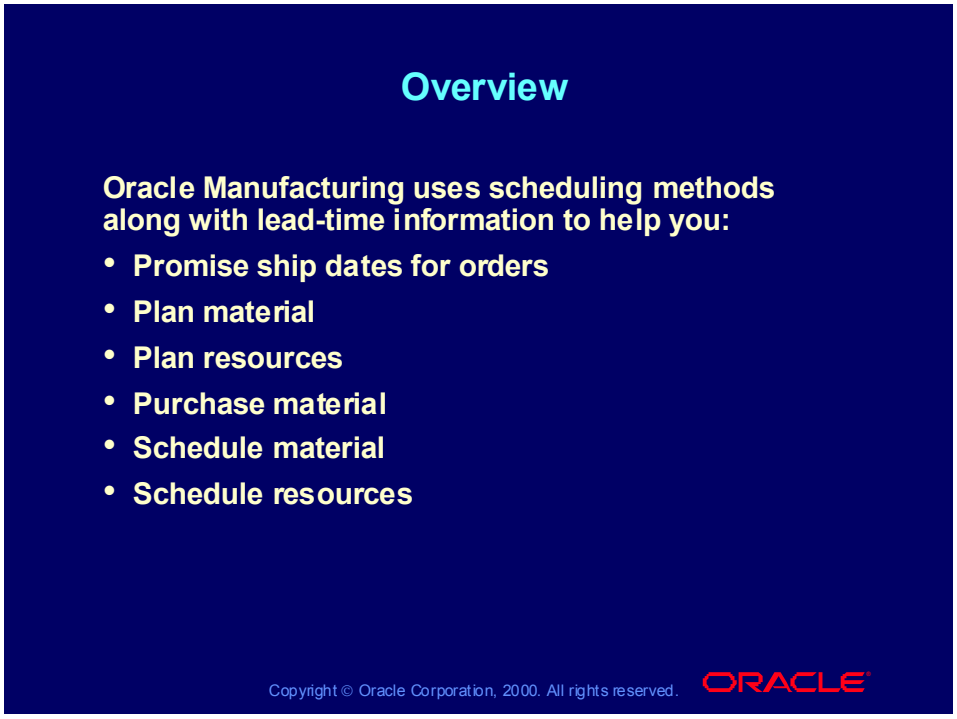


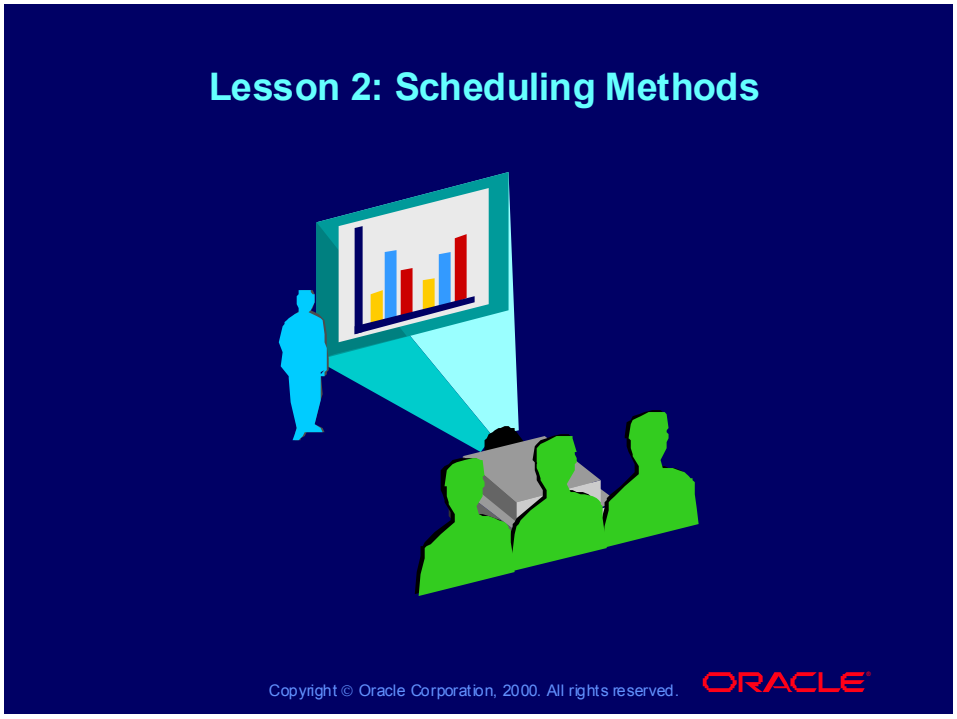
Objectives (continued)

- Calculate manufacturing lead times
- Describe detailed scheduling
- Schedule and reschedule discrete production in Oracle Work in Process

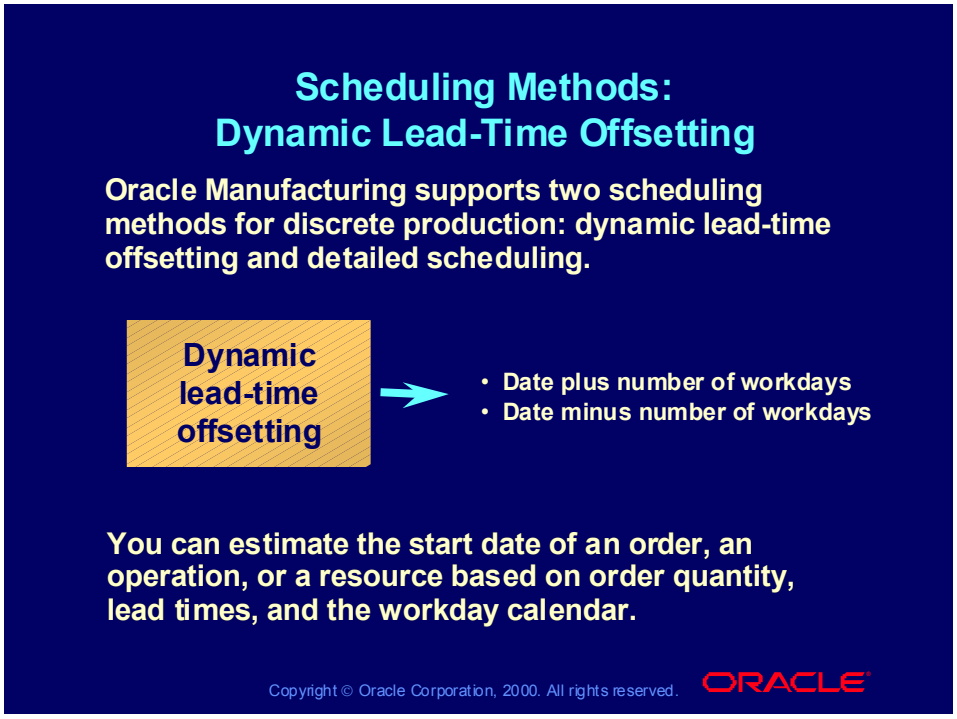


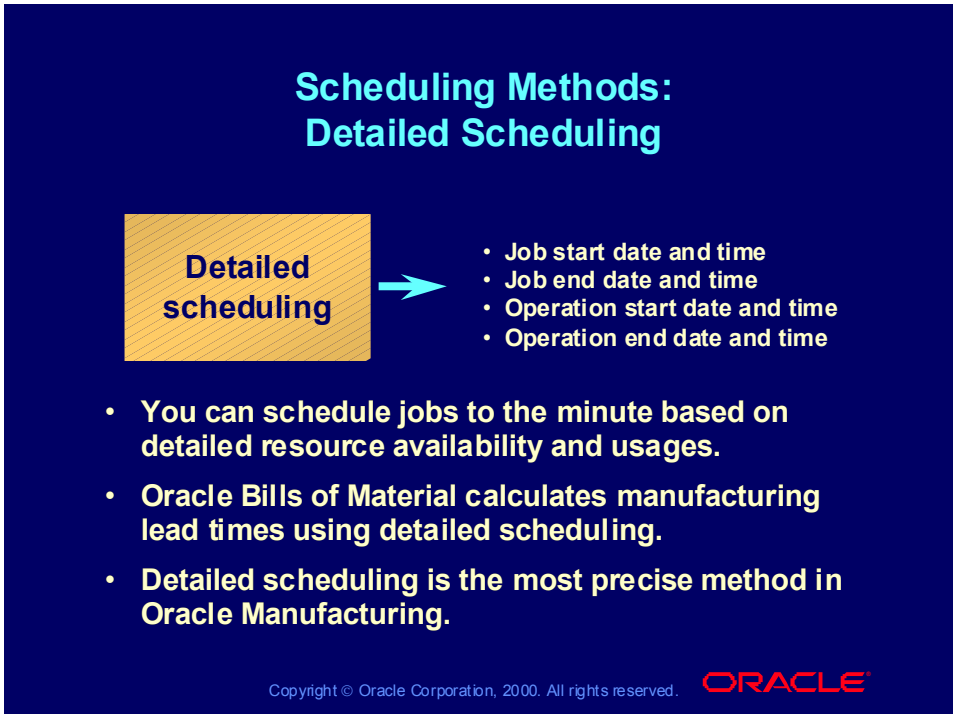


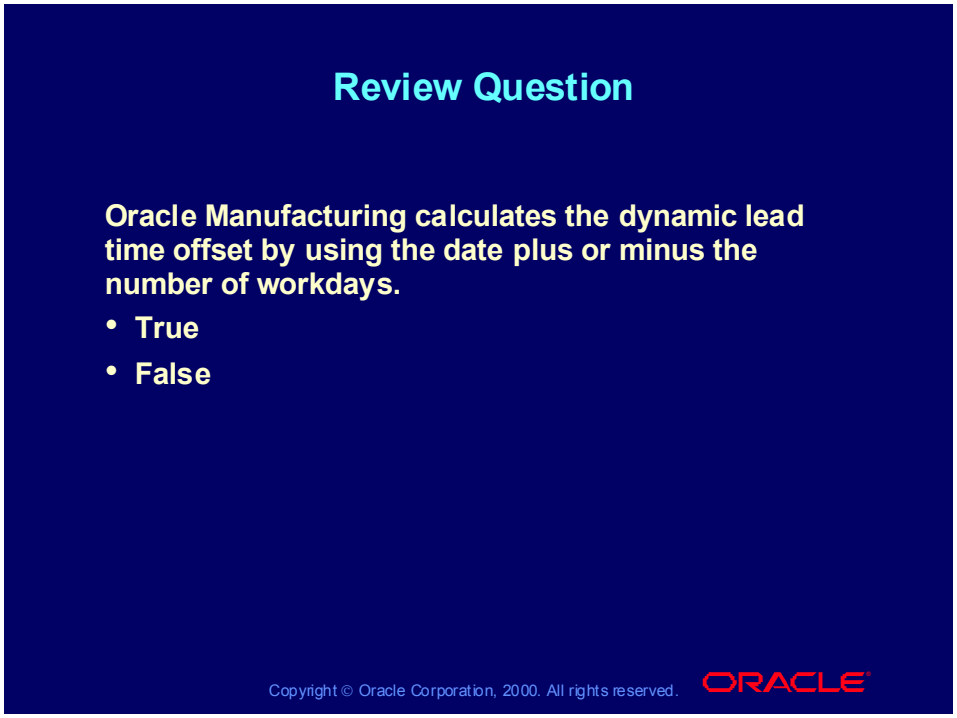


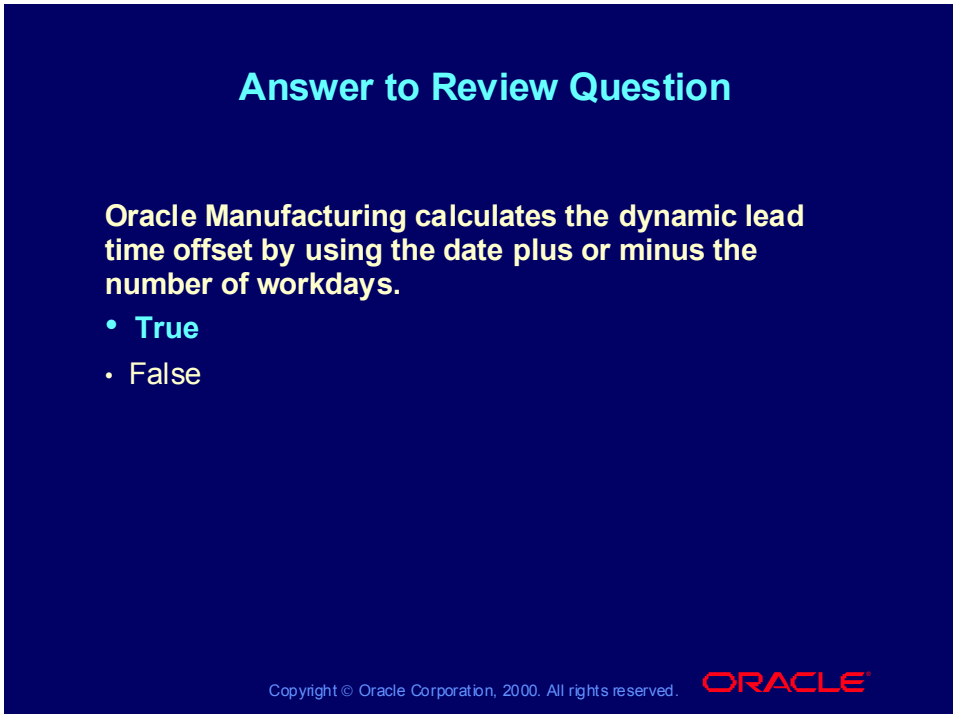


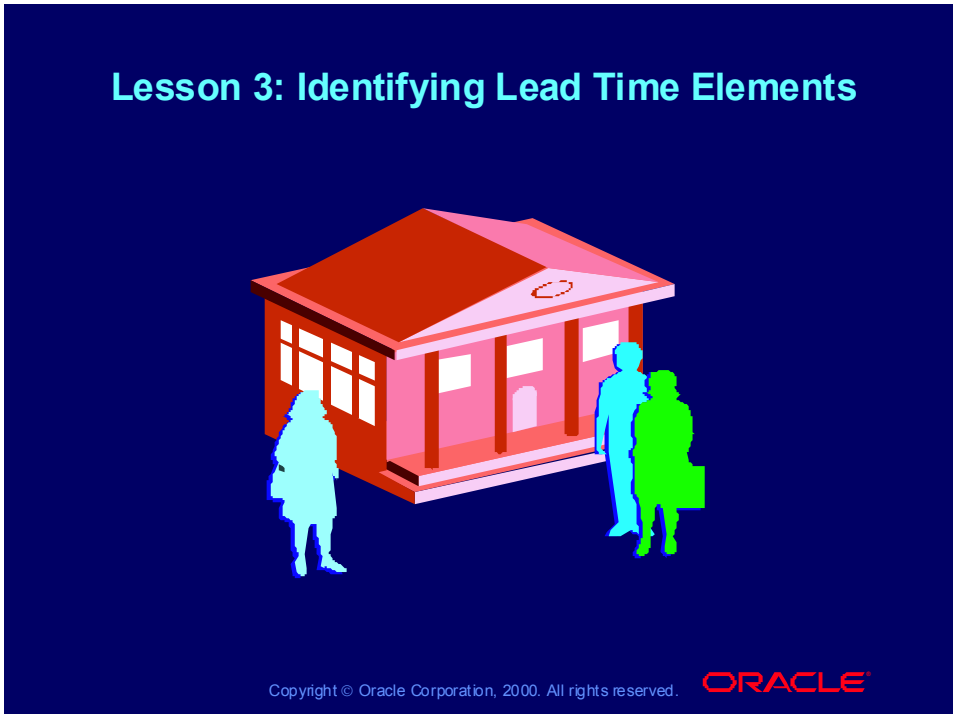
Scheduling Methods: Dynamic Lead-Time Offsetting



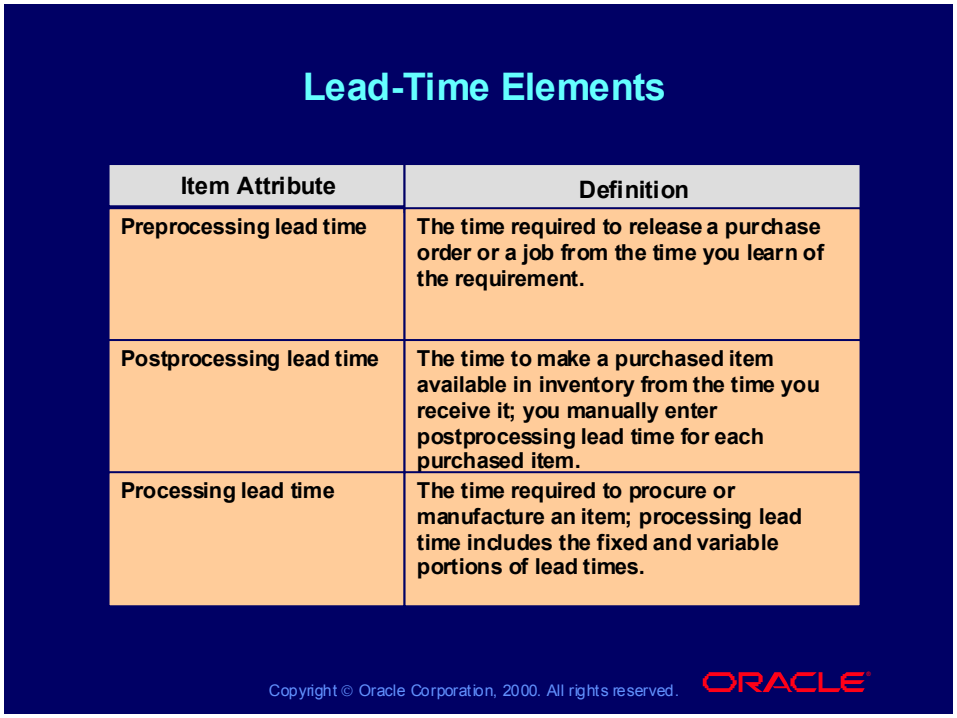


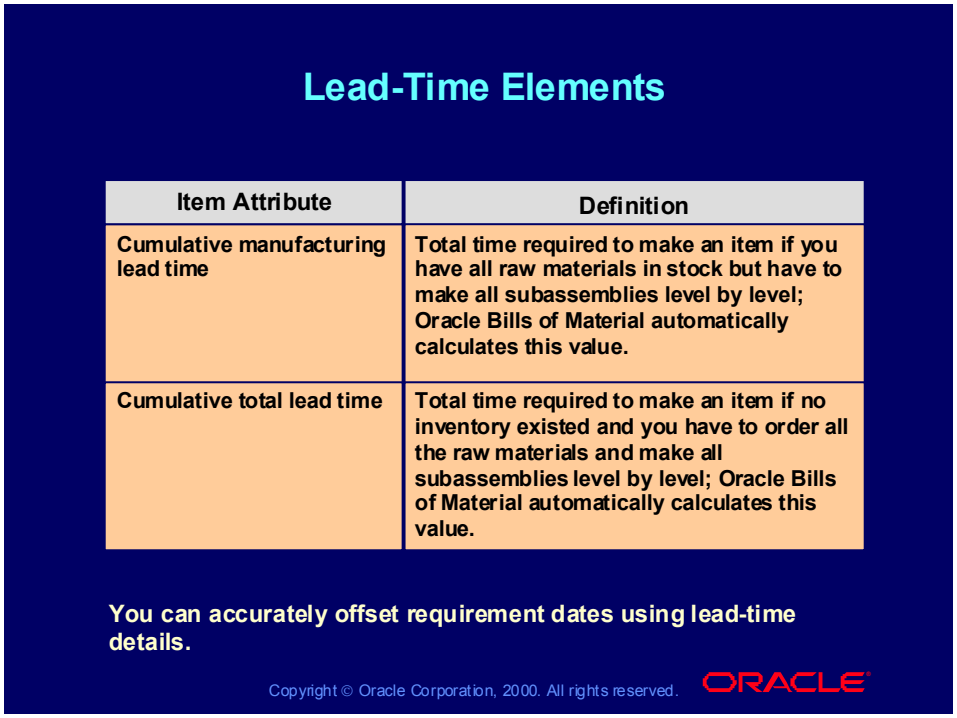




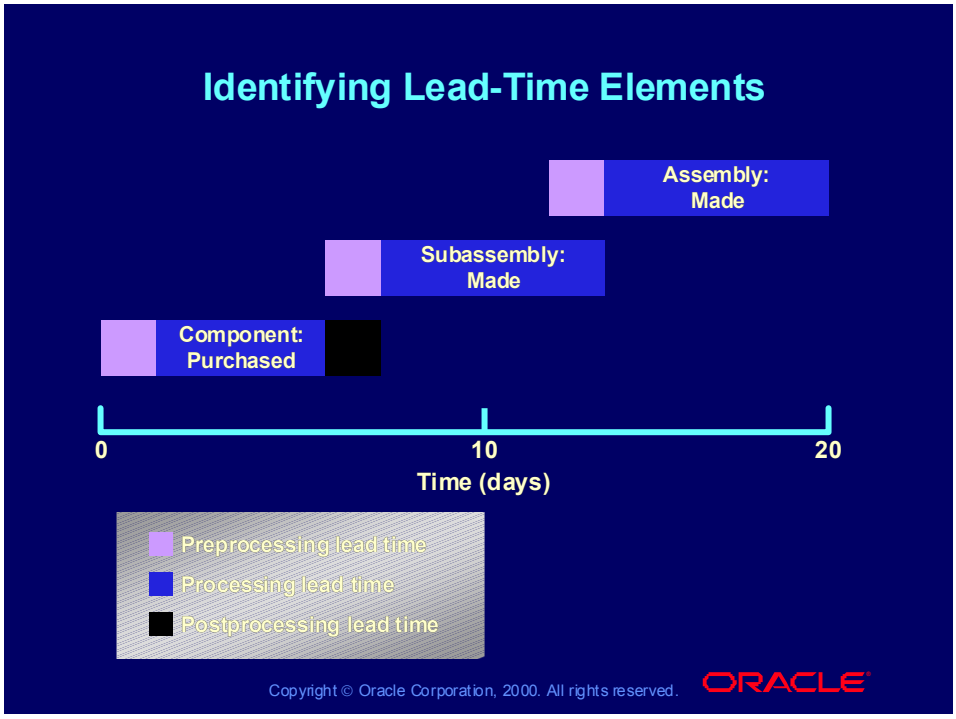


Lead-Time Elements





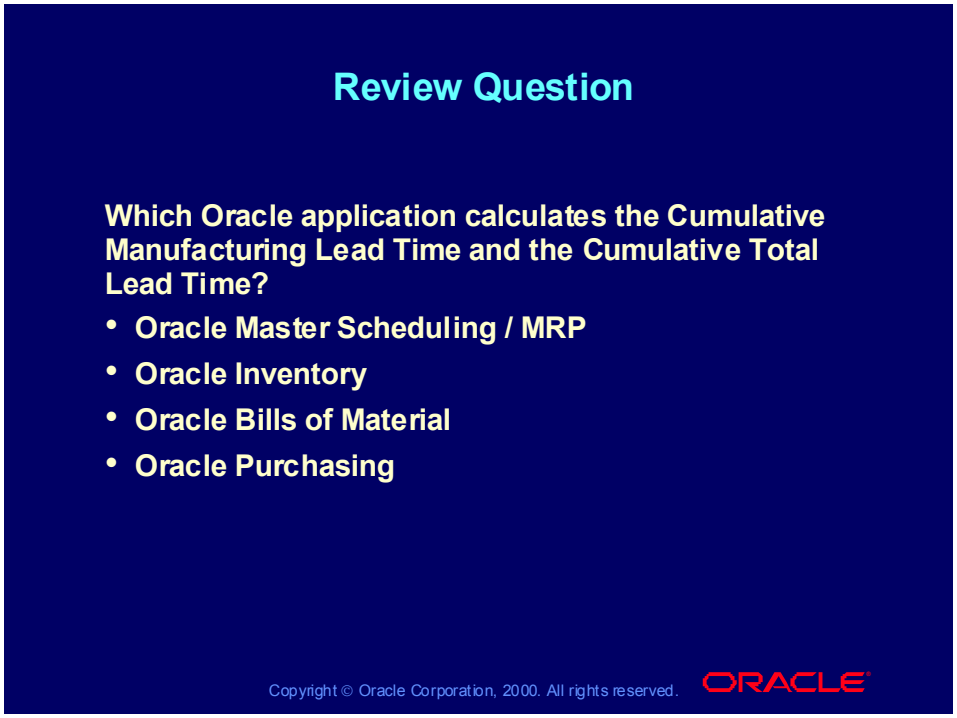
Identifying Lead-Time Elements

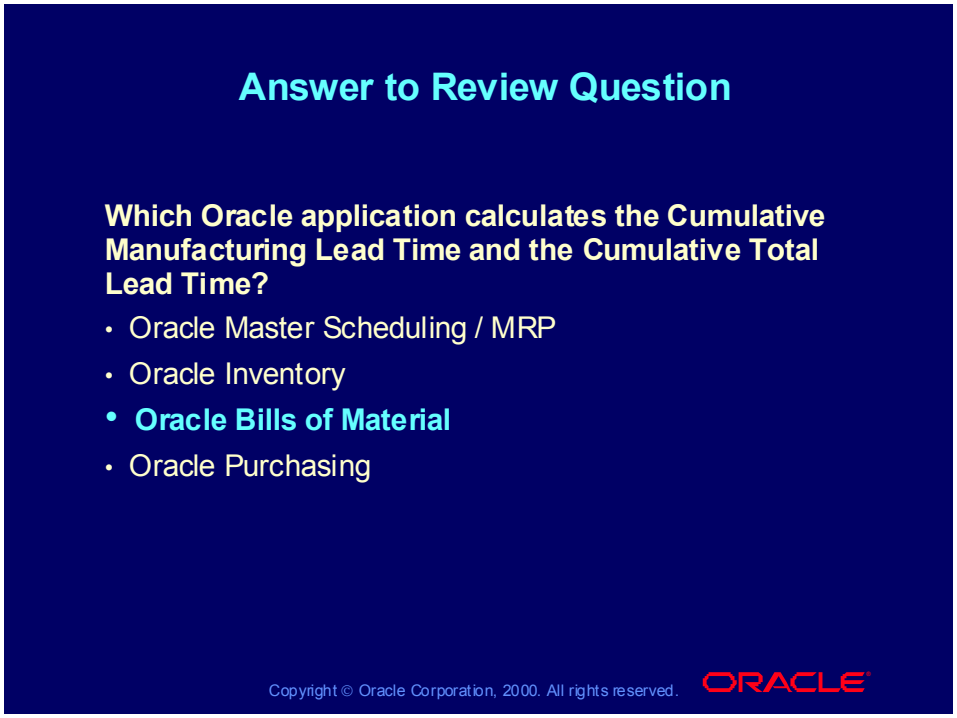


Technical Note

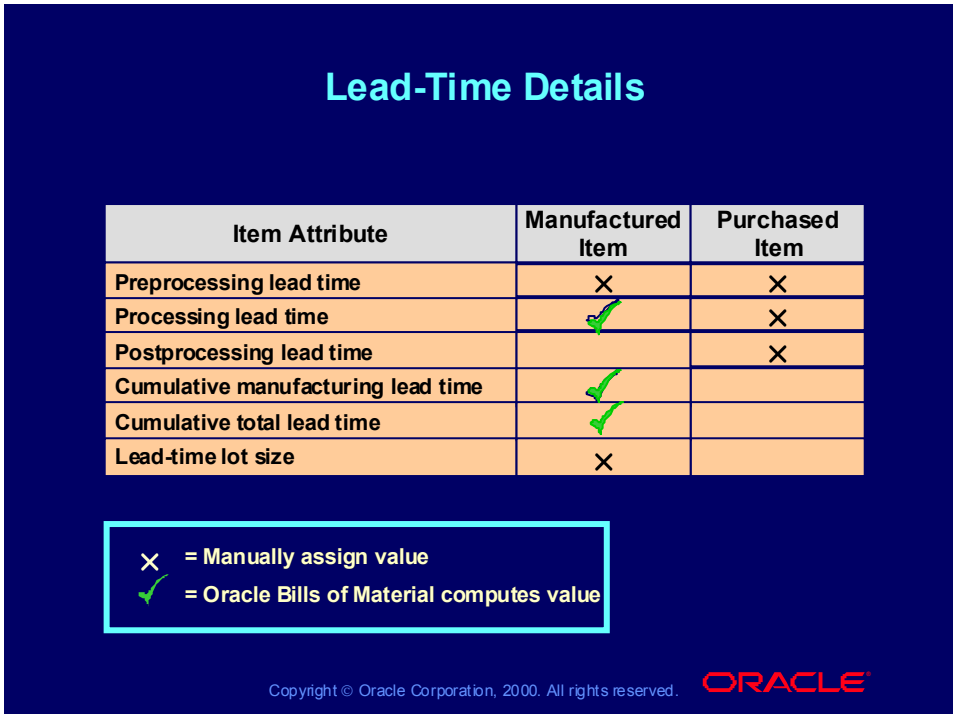
Oracle MRP/Master Scheduling considers preprocessing lead time when offsetting dates.

Oracle Bills of Material and Oracle Engineering do not consider preprocessing when computing manufacturing (processing) lead time.





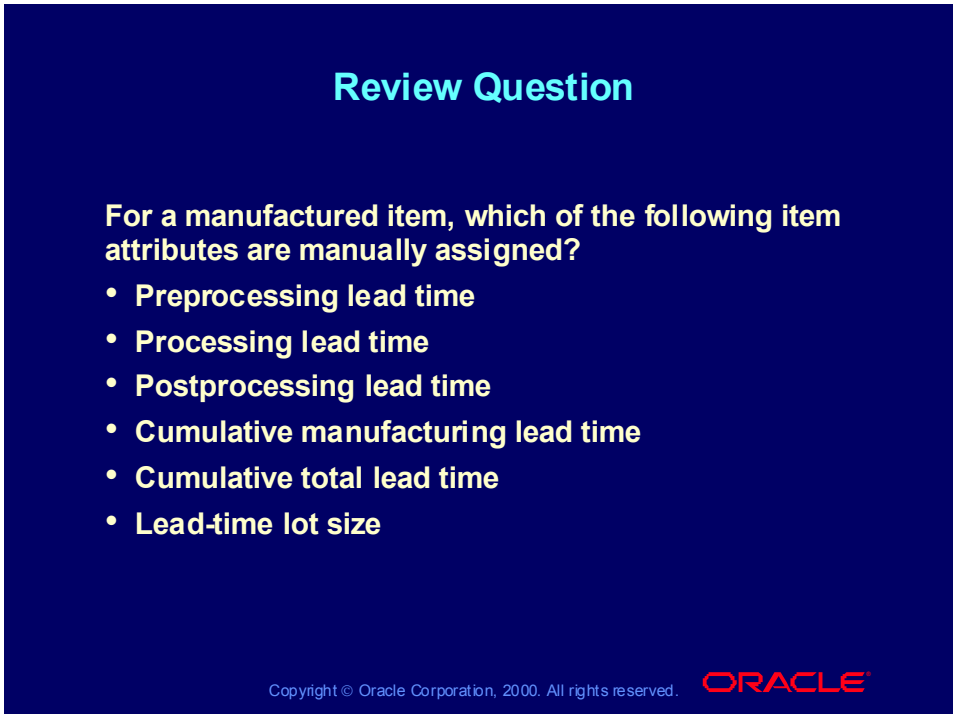
Lead-Time Details

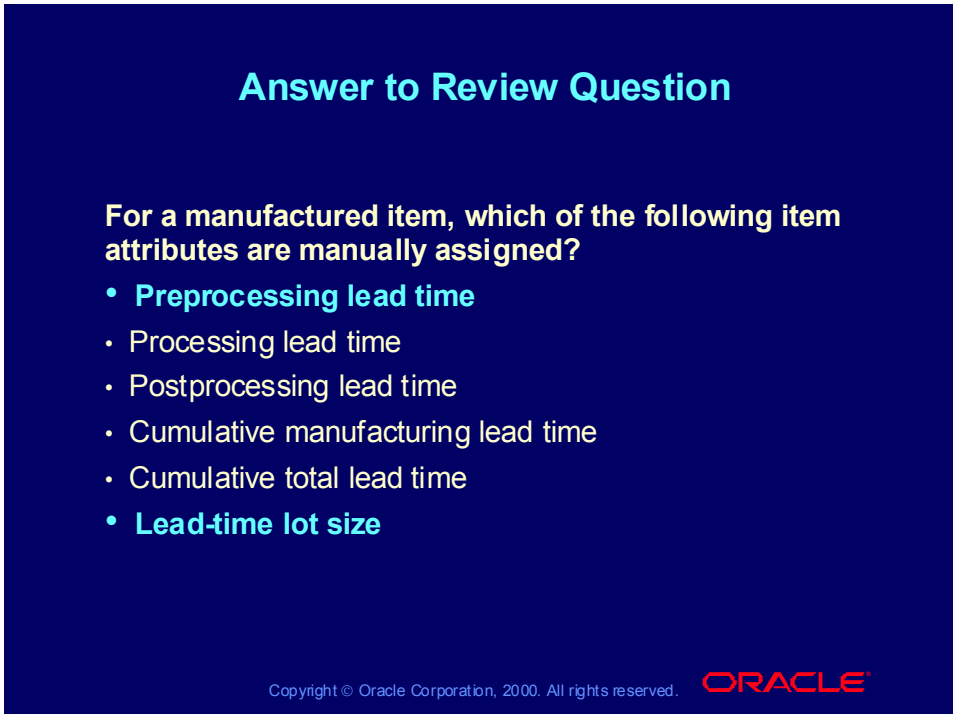


Technical Note

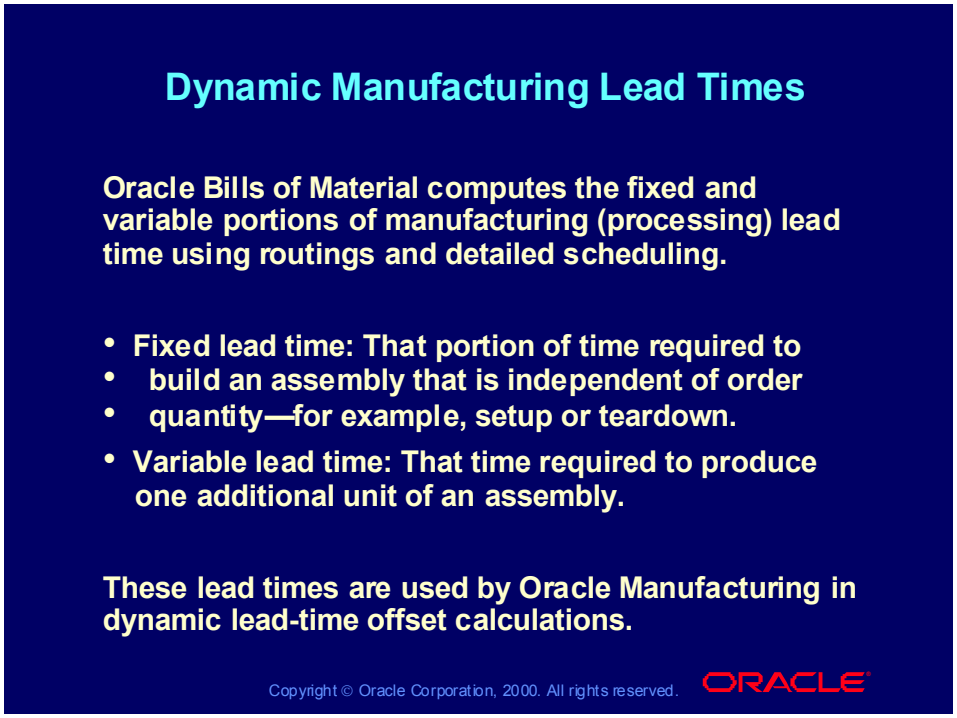
You can manually assign values for fixed lead time for a purchased item, instead of assigning the processing lead time.

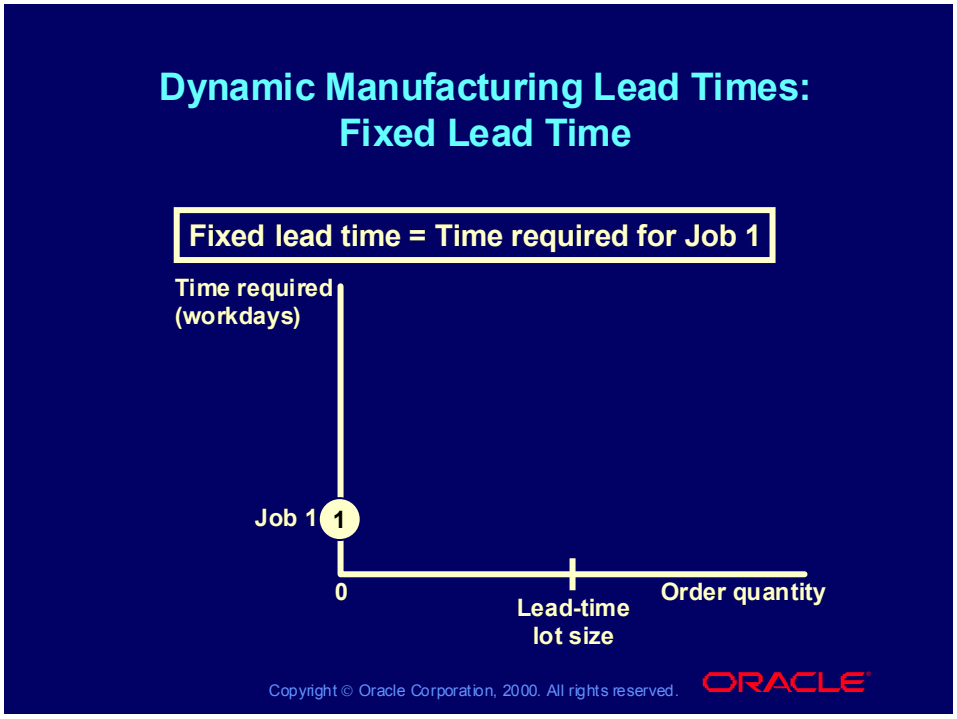
Oracle Master Scheduling/MRP uses the fixed lead time value if one is entered. You do not calculate lead times for purchased items even if they have a routing. You must manually assign all lead-time information for purchased items.





Lesson 5: Dynamic Manufacturing Lead Times





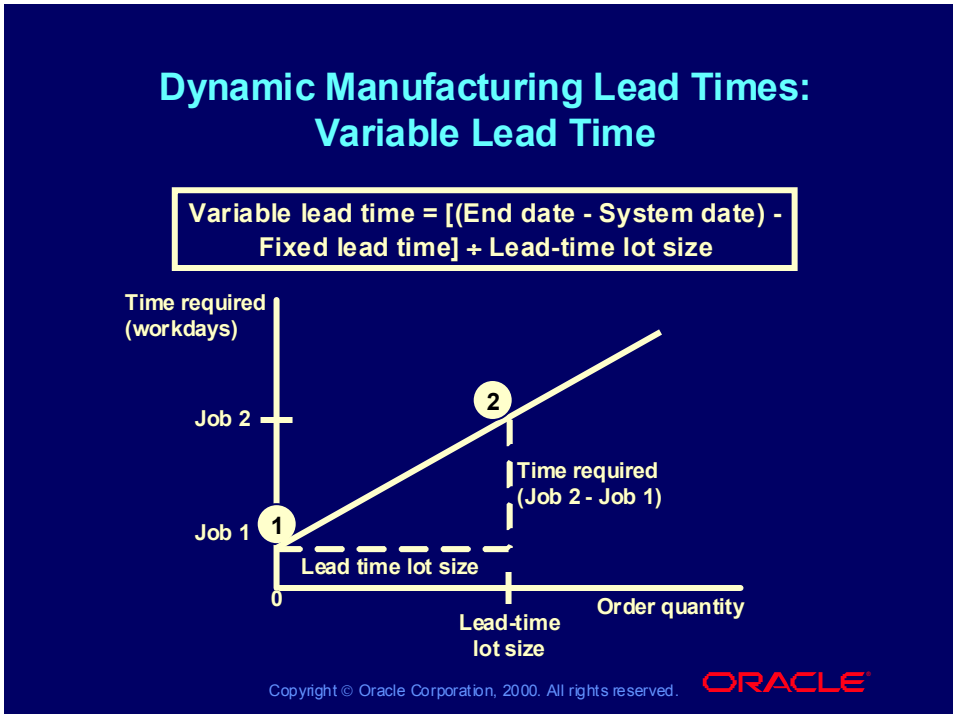
Fixed Lead Time

The fixed lead time is calculated by scheduling a job for a quantity of zero with the current date as the job start date.

Technical Note

Because all lead-time offsetting uses the fixed and variable lead time of an item, the processing lead time represents an estimated lead time. Processing lead time represents the typical time required to build a typical number of units.

Dynamic Manufacturing Lead Times: Variable Lead Time

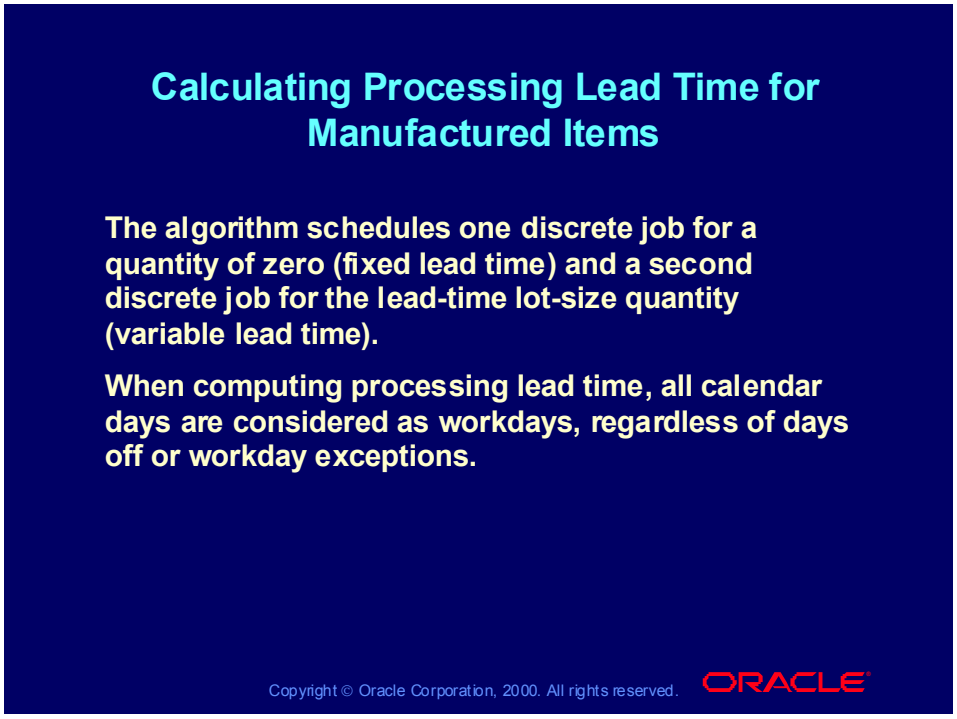


Variable Lead Time

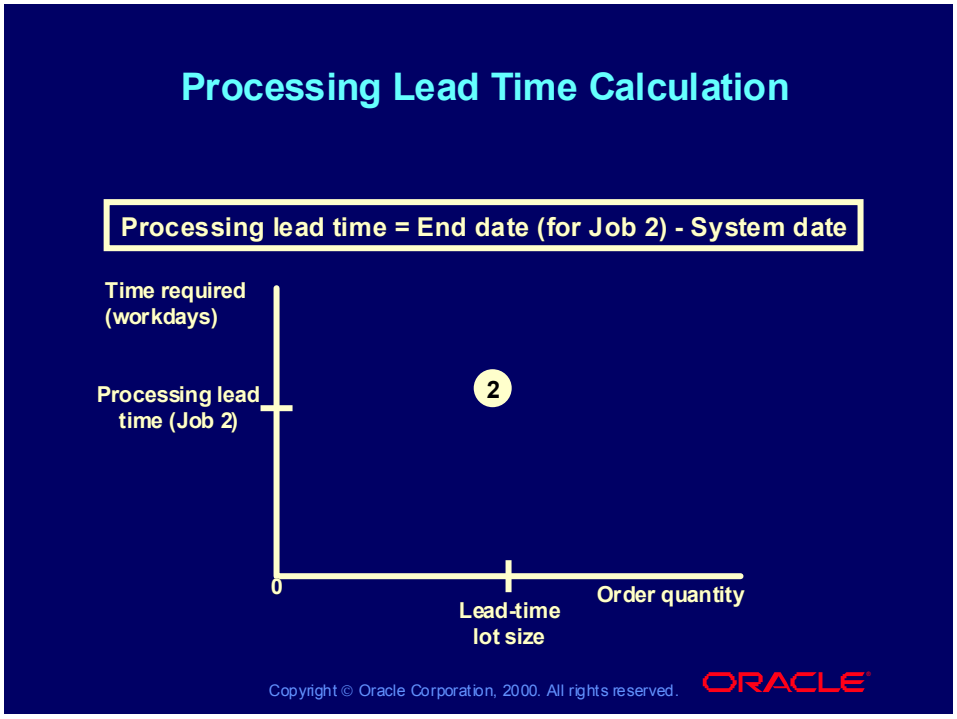
The variable lead time is calculated by scheduling a second job for the lead time lot size quantity, with the system date as the job start date.

Note: Variable lead time is expressed as days per unit.

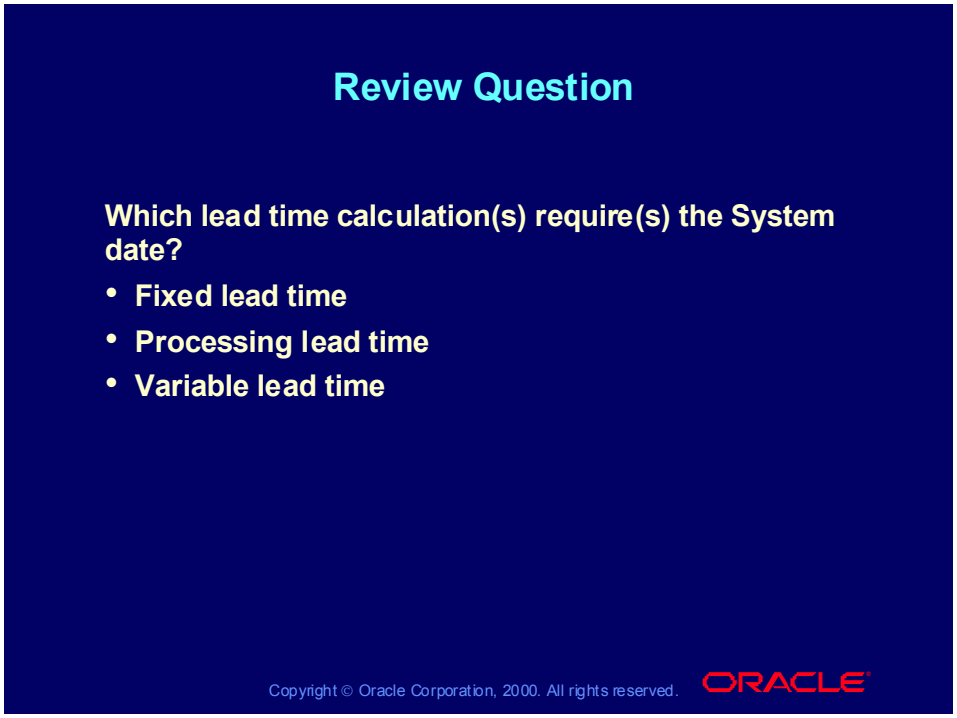
Calculating Processing Lead Time for Manufactured Items

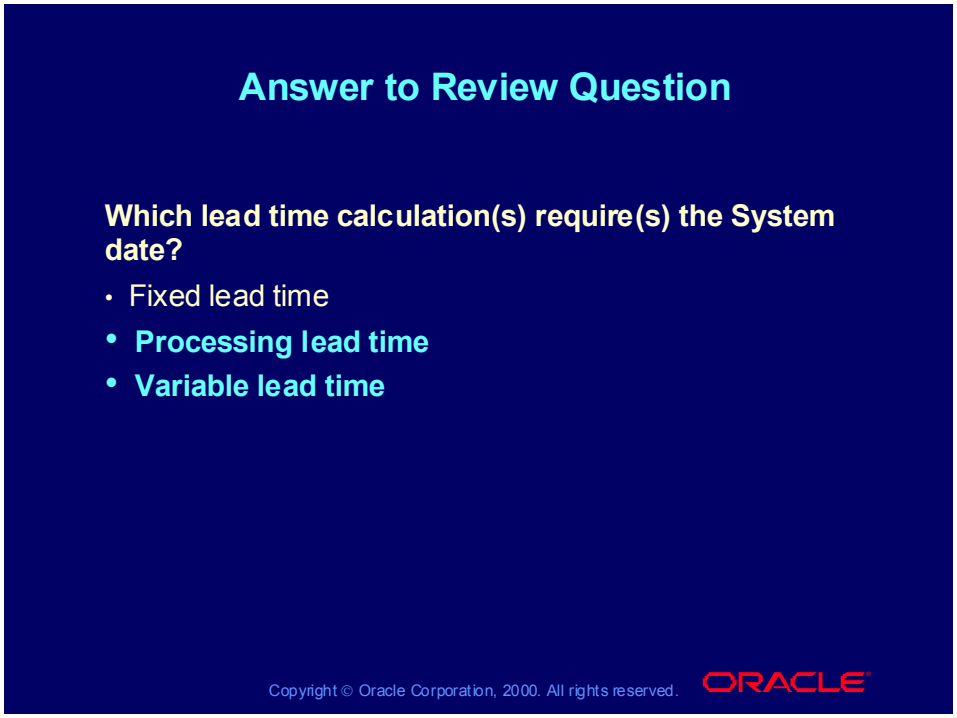


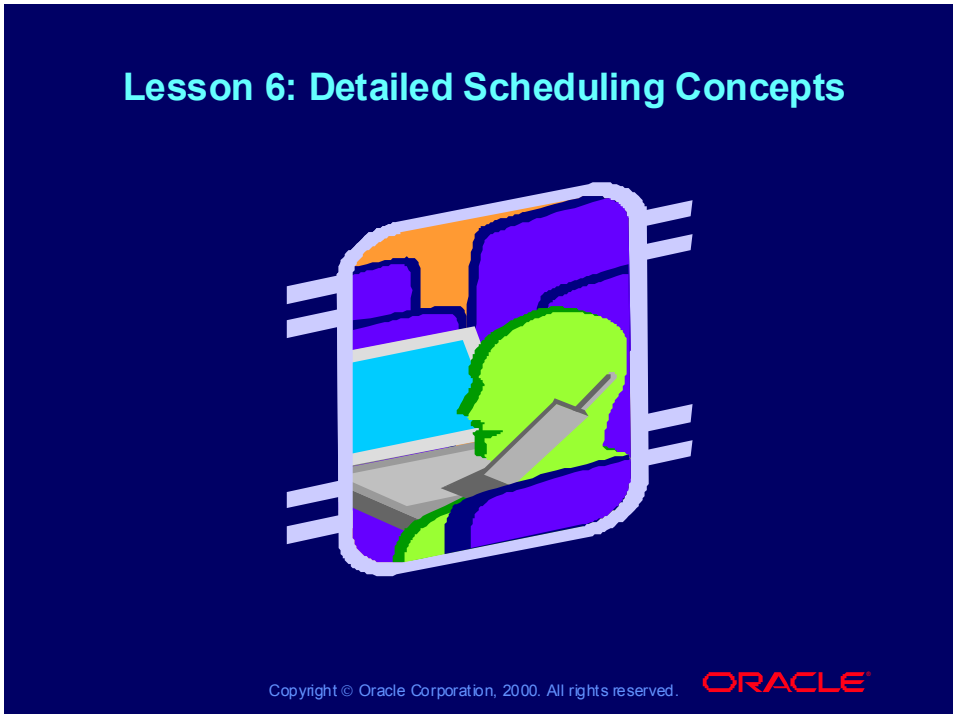
Processing Lead Time Calculation

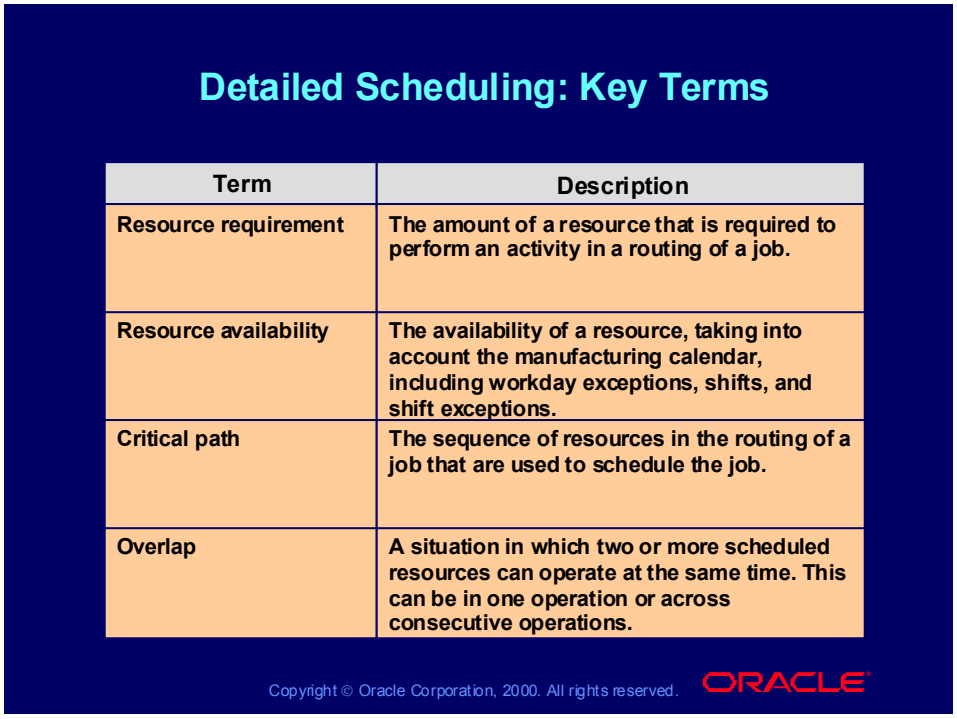


The processing (manufacturing) lead time is calculated as the time required to manufacture a job for the lead time lot size quantity.

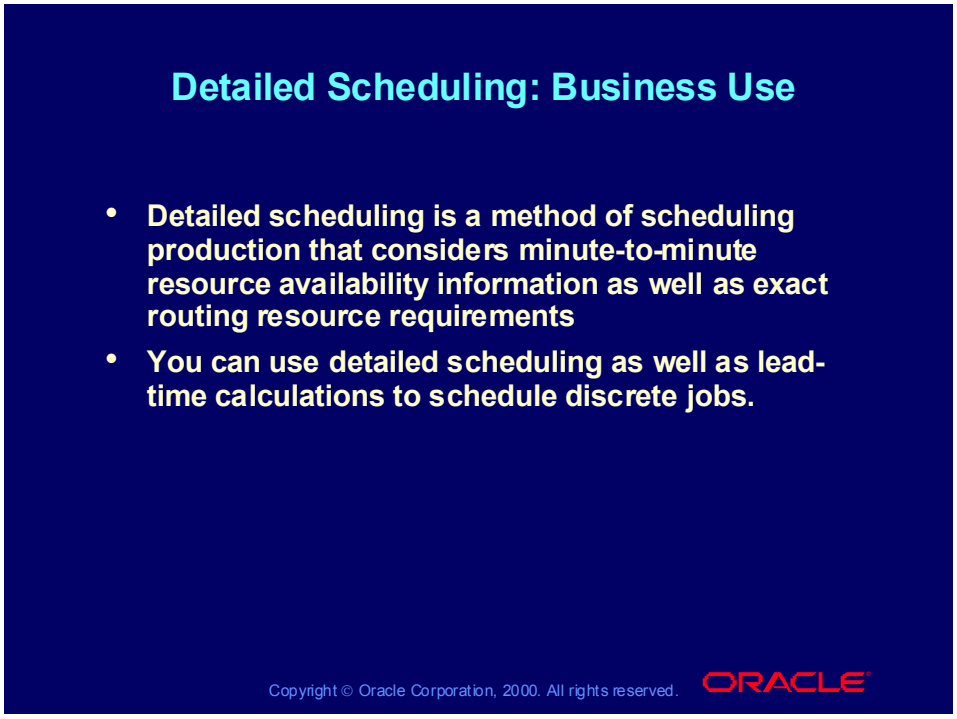


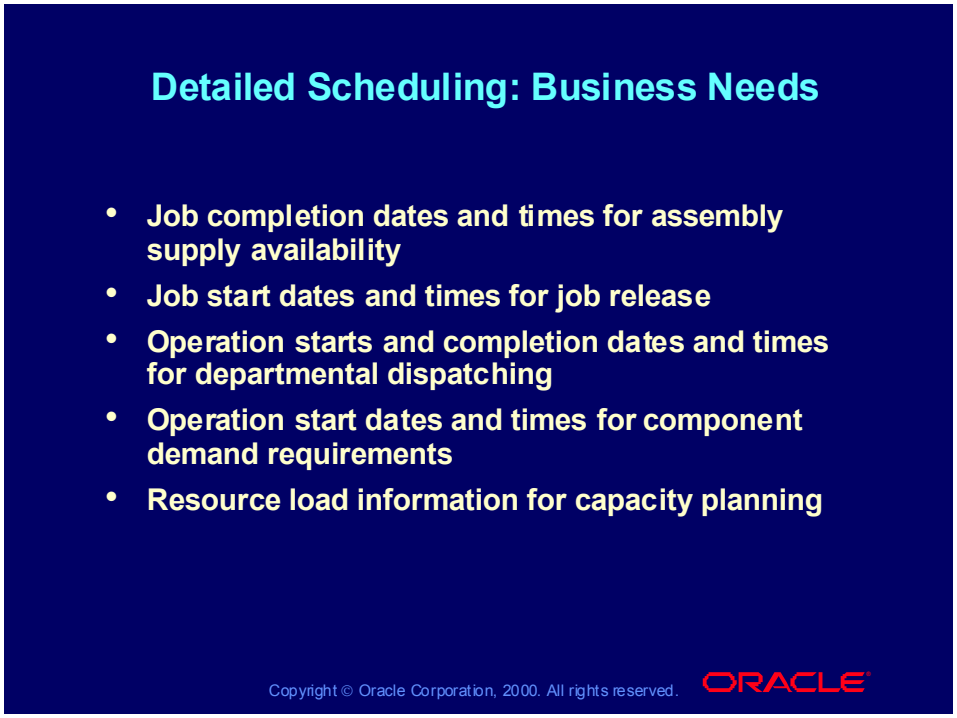




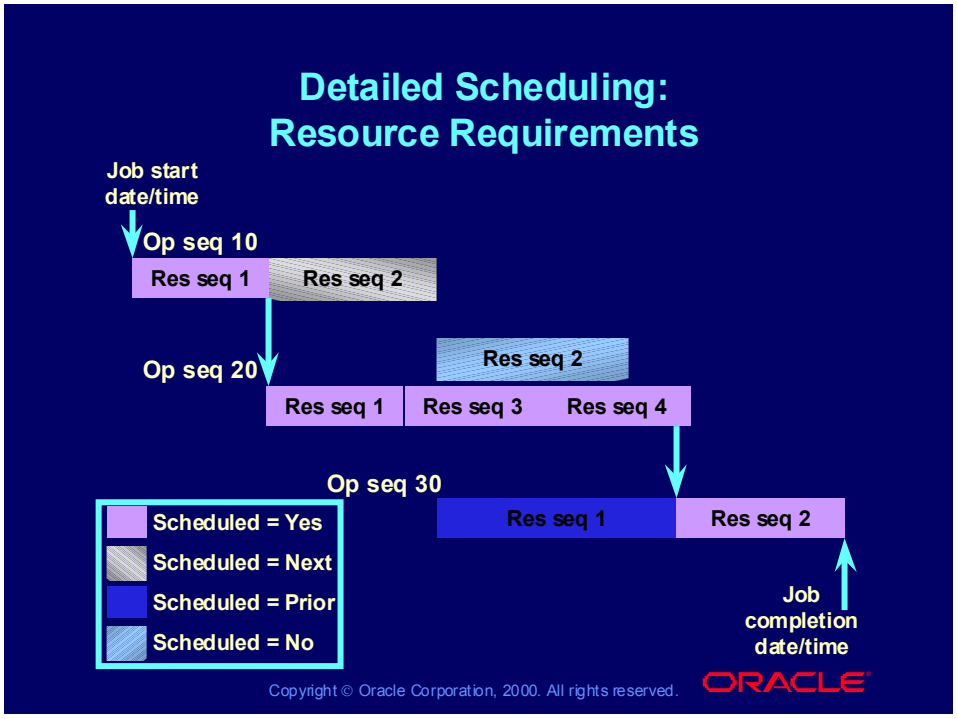


Note: The most common example of overlap is a machine and a machinist working simultaneously.

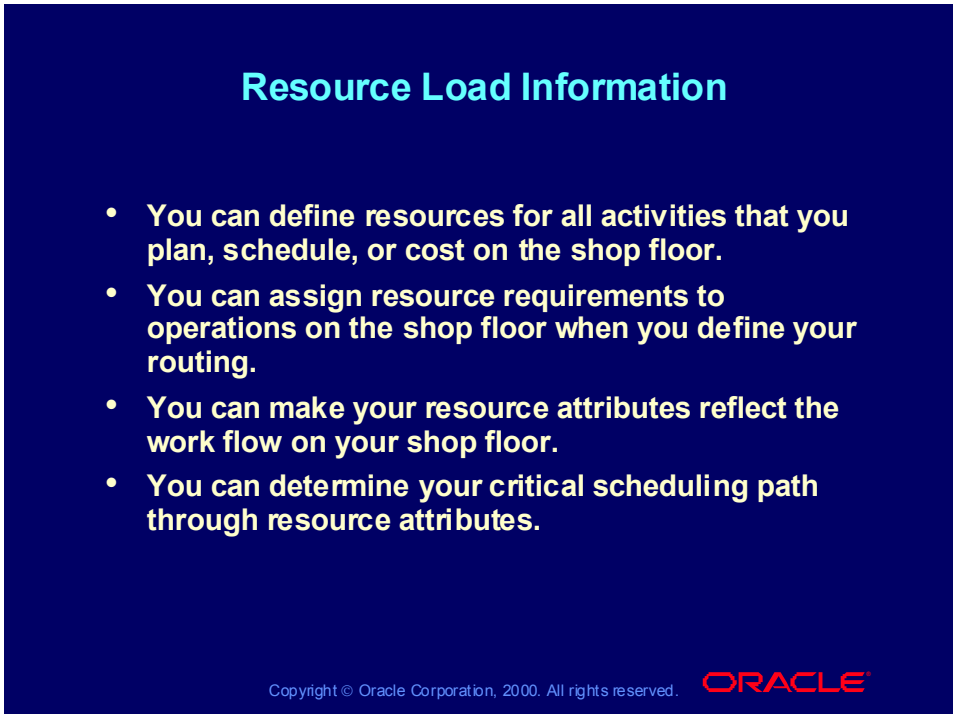




Detailed Scheduling: Resource Requirements



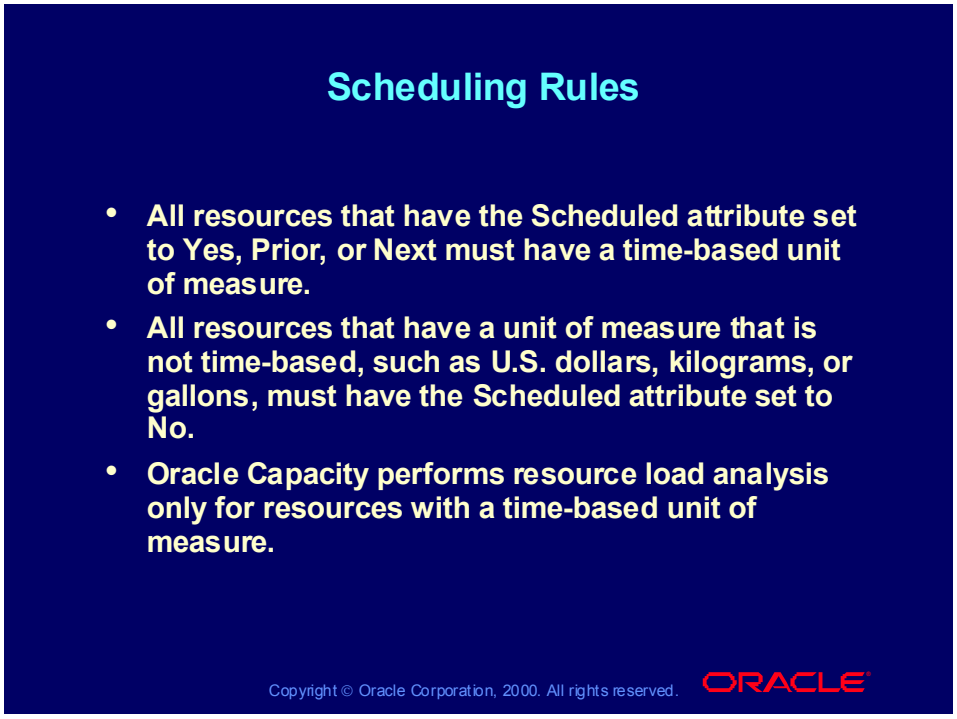
Resource Load Information



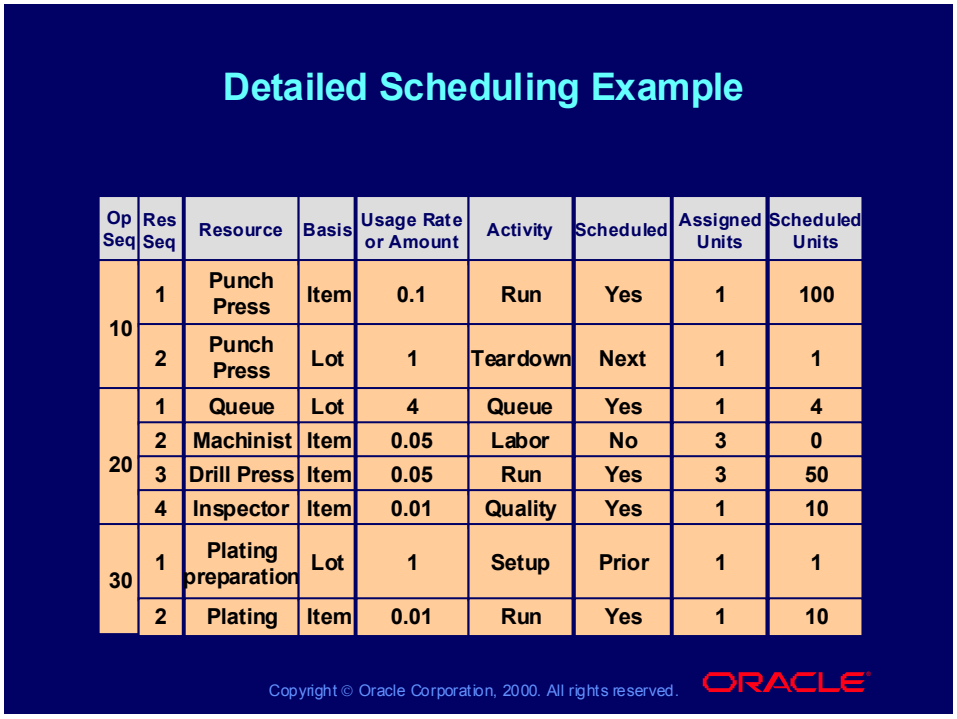
(N) Bills of Materials > Routings > Standard Operations >

(B) Operation Resources > Resources

(Help) Oracle Manufacturing Applications > Oracle Bills of Material > Routings > Resource Usage



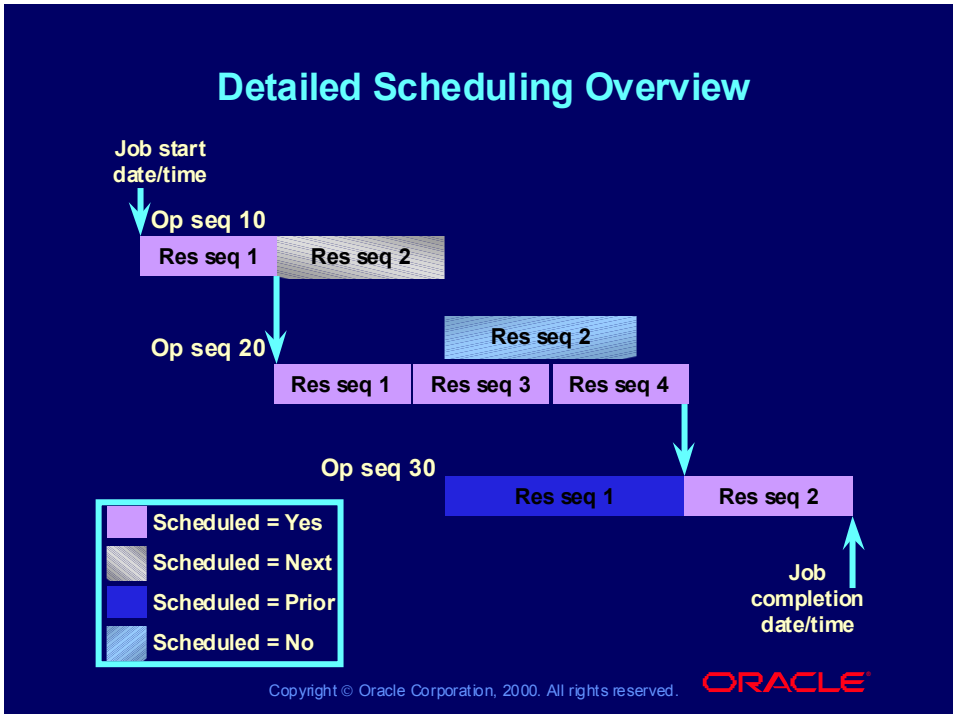
Detailed Scheduling Example



Example

- Suppose that the operations and resources shown in the slide make up the routing for one of your assemblies, and you want to build 1,000 of these assemblies. The unit of measure for all of the resources is hours.
- All the resources where the Scheduled attribute is set to Yes are on the critical path.
- The teardown activity at the Punch Press resource at resource sequence 2, operation 10 can be performed at the same time as the Queue activity at the next operation.
- The machinist at operation 20 is not on the critical path, since the Scheduled attribute for this resource is set to No. This means he works concurrently with the Drill Press resource at the same operation.
- The lead time rollup calculates the resource offset for the machinist resource to be the same as that of the next resource with Scheduled attribute Yes—that is, the Drill Press.
- The machinist resource, although not scheduled, is still charged to the job (assuming it is a costed resource) exactly as it would be if the resource were scheduled, and the load is still calculated.

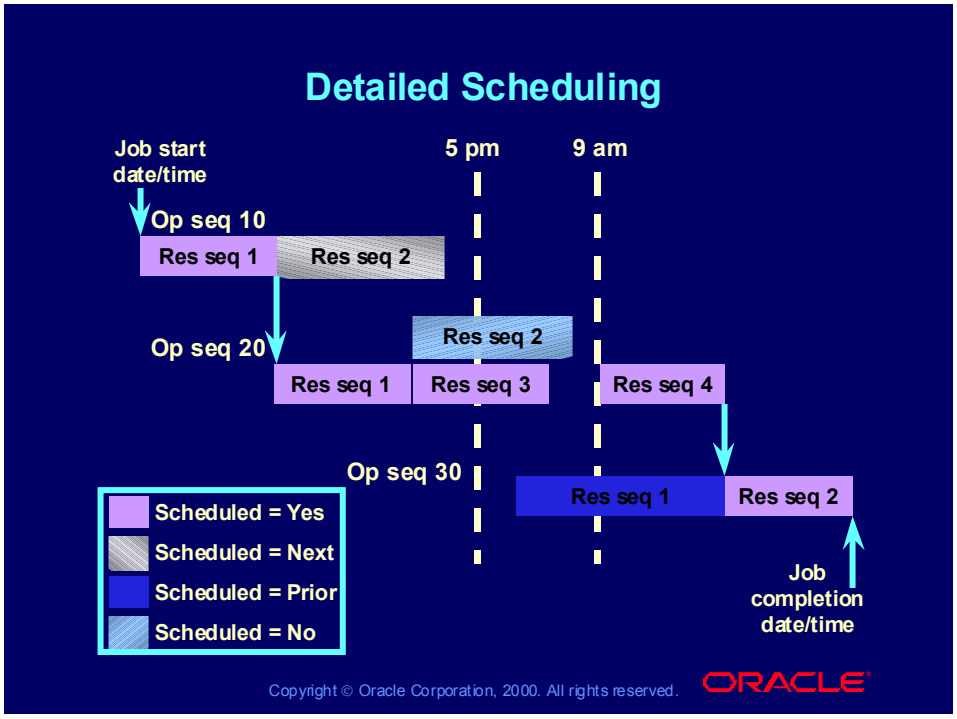
Detailed Scheduling Overview



Notes

- The diagram in the slide assumes 24-hour availability of all resources.
- The diagram shows the machinist resource (res seq 2 at op seq 20) as taking some amount of time for illustrative purposes only. Actually, the amount of time it takes is irrelevant to the detailed scheduling algorithm.
- Capacity calculations assume that a nonscheduled resource requirement begins at the same time as the closest following scheduled resource, as the diagram indicates.

Detailed Scheduling



You can schedule your resource use through resource shifts.

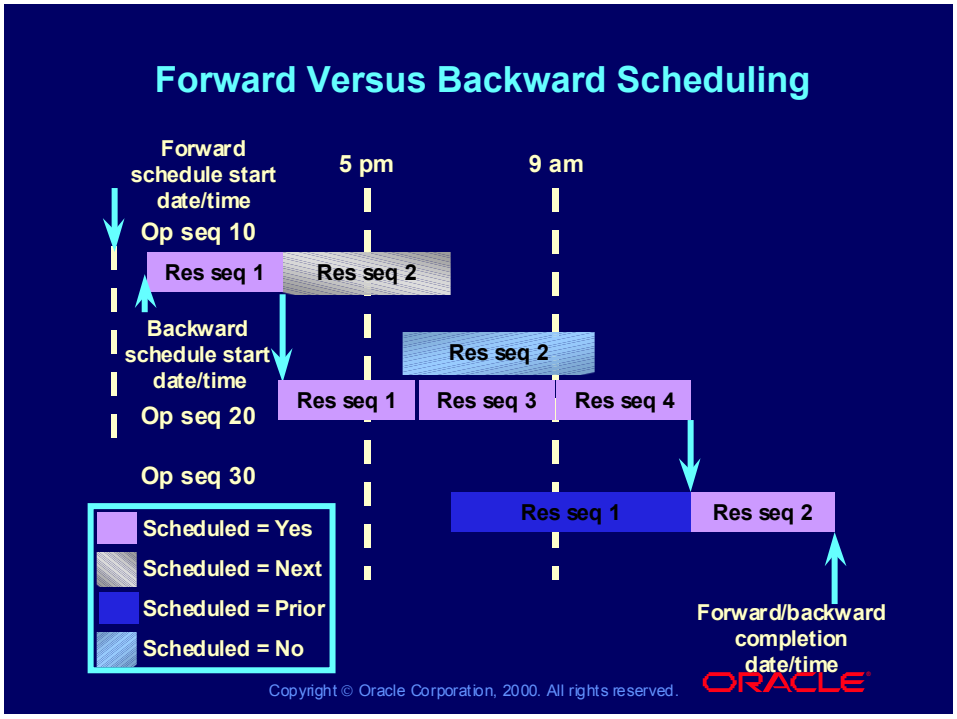
Using Resource Shifts

- You can ensure that production is scheduled only at times when the resource is available.
- You can assign the resource to your predefined shifts, or indicate that it is available 24 hours.

Example

- Using the routing shown in the diagram, suppose now that the Inspector resource (res seq 4 at op seq 20) is only available from 9 a.m. to 5 p.m. each day. All other resources are available 24 hours.
- Assume that resource 3 at op seq 20 starts sometime in the afternoon and runs past 5 p.m.
- Use forward scheduling in this example.

Forward Versus Backward Scheduling



Definition

- You can use forward scheduling if you know what date you want to begin production and you want to derive the completion date.
- You can use backward scheduling if you know what date you want to complete production and you want to derive the start date.

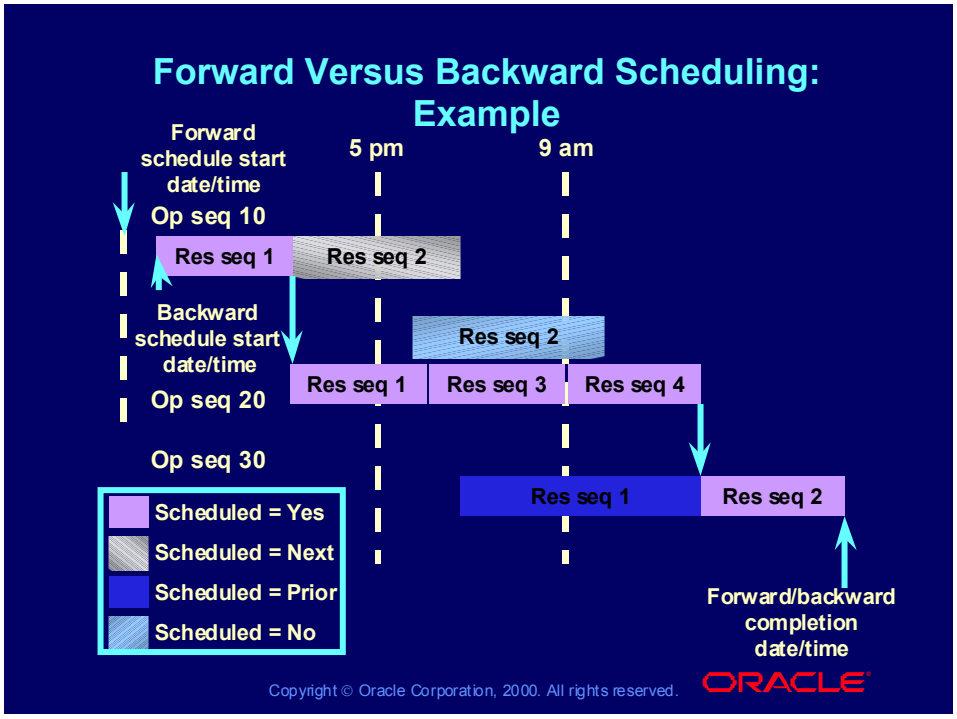
Scheduling Resources Using Resource Shifts

- You can ensure that production is scheduled only at times when the resource is available.
- You can assign the resource to your predefined shifts, or that the resource is available 24 hours.

Note

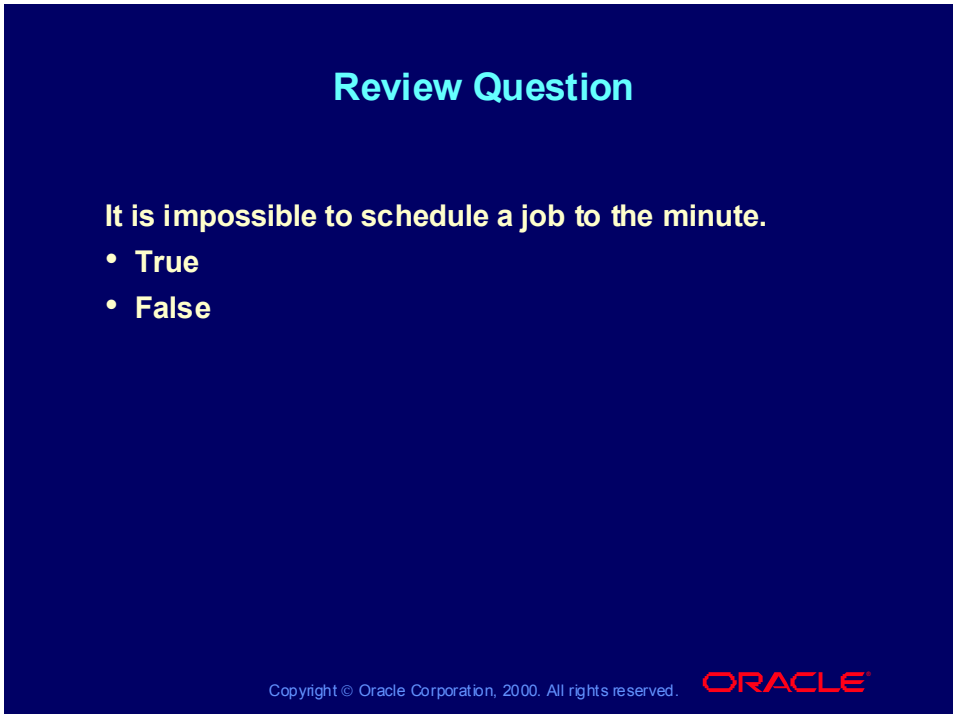
The two methods may yield different results because the lead times calculated in either case may be different due to your resource shifts.

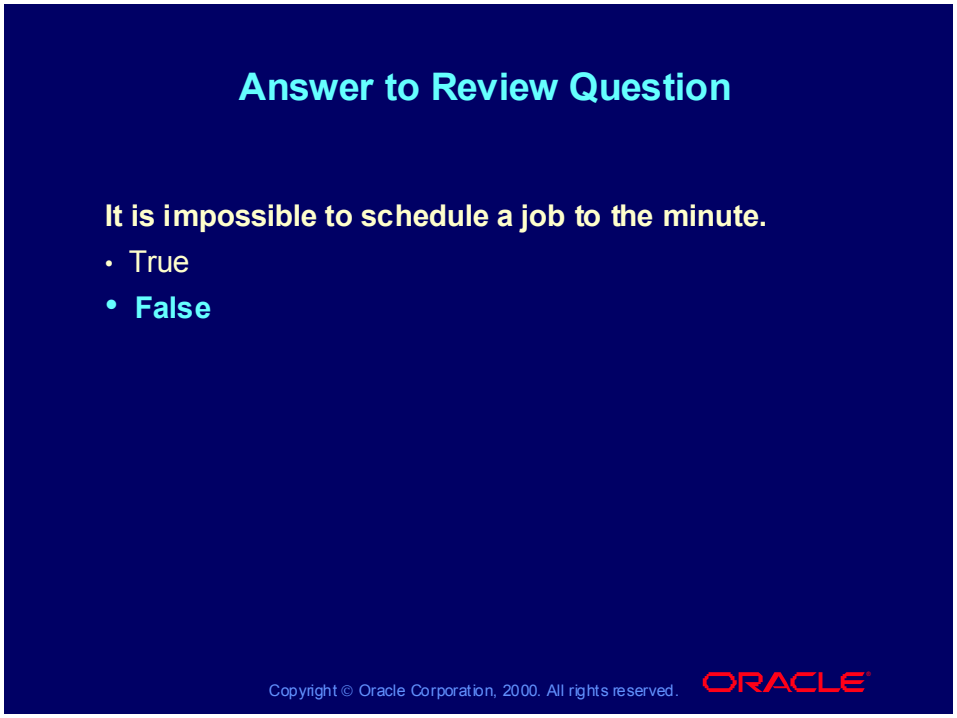
Forward Versus Backward Scheduling: Example

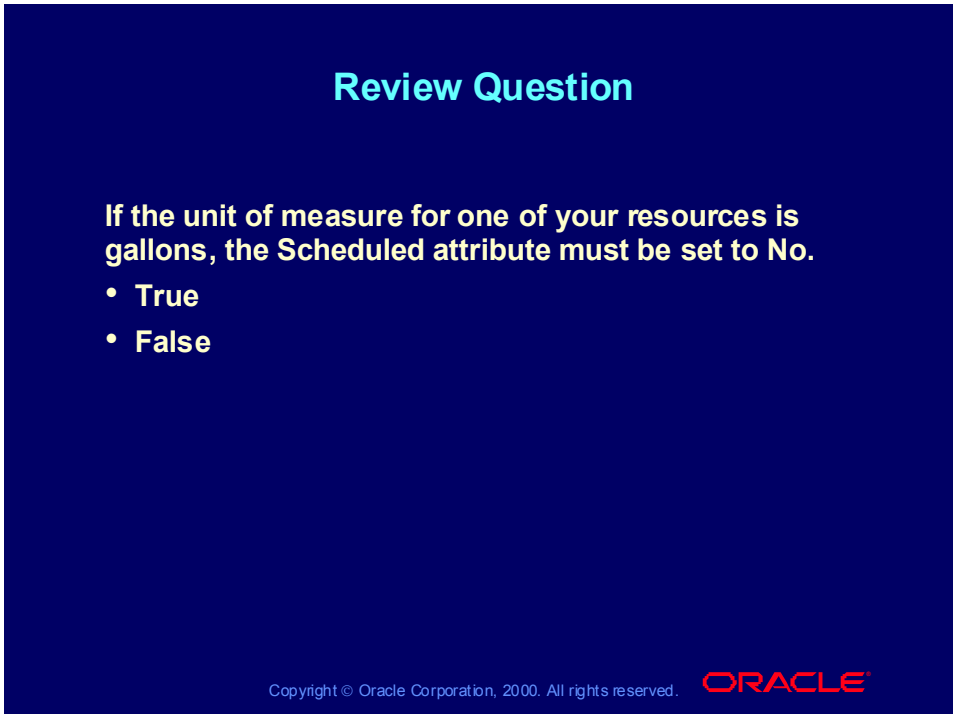


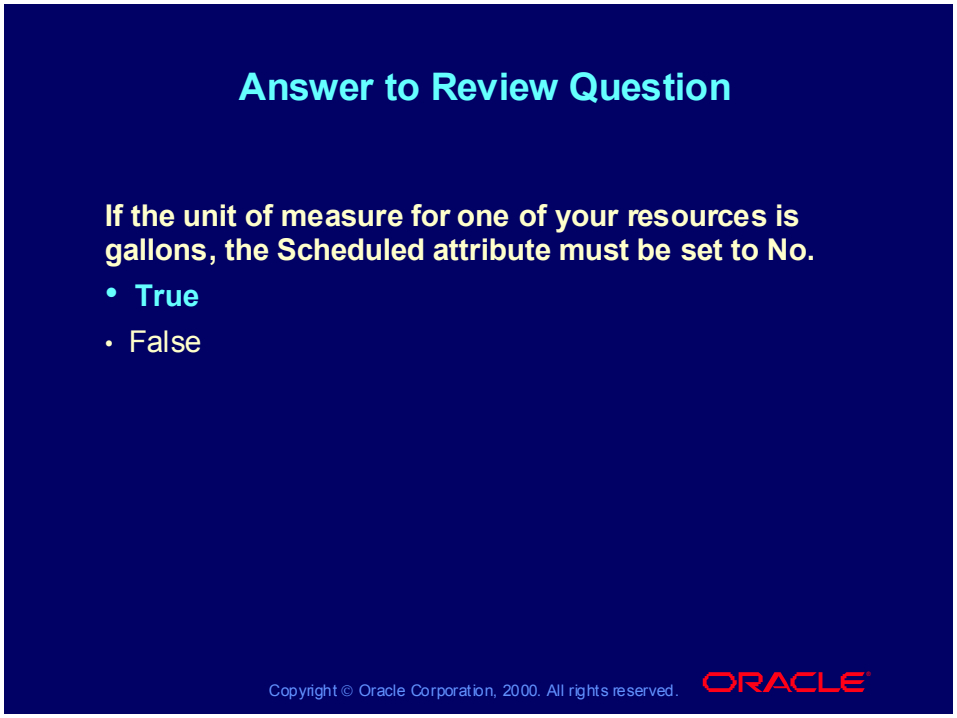
Forward Versus Backward Scheduling Example

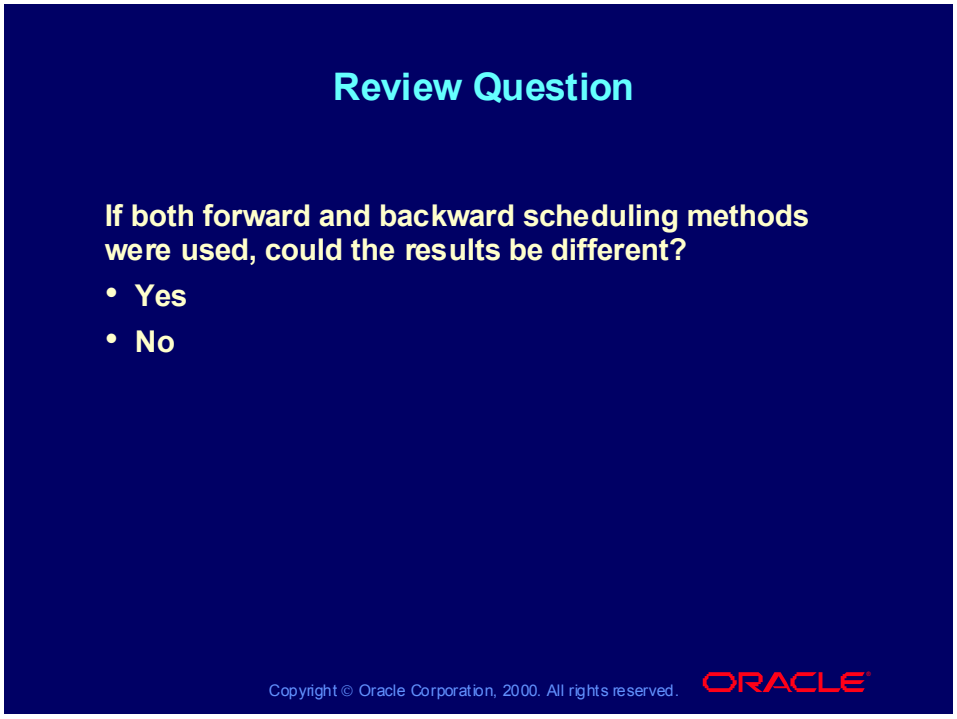
- Assume, as before, that the Inspector resource, resource 4 at operation 20, is only available from 9 a.m. to 5 p.m.
- Now backward schedule from the date and time on which the last resource of op seq 30 ended.
- The new job start date/time is moved back compared to the previous example.
- The time during which the assembly was held up due to the unavailability of the inspector resource has been eliminated.
- The total lead time for the job is decreased.

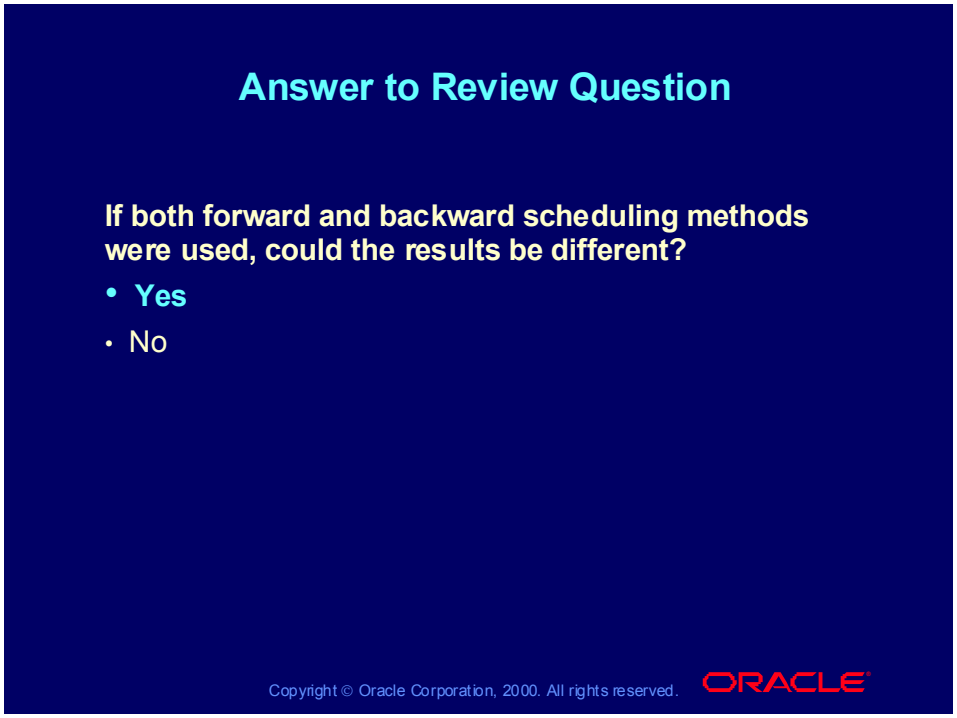




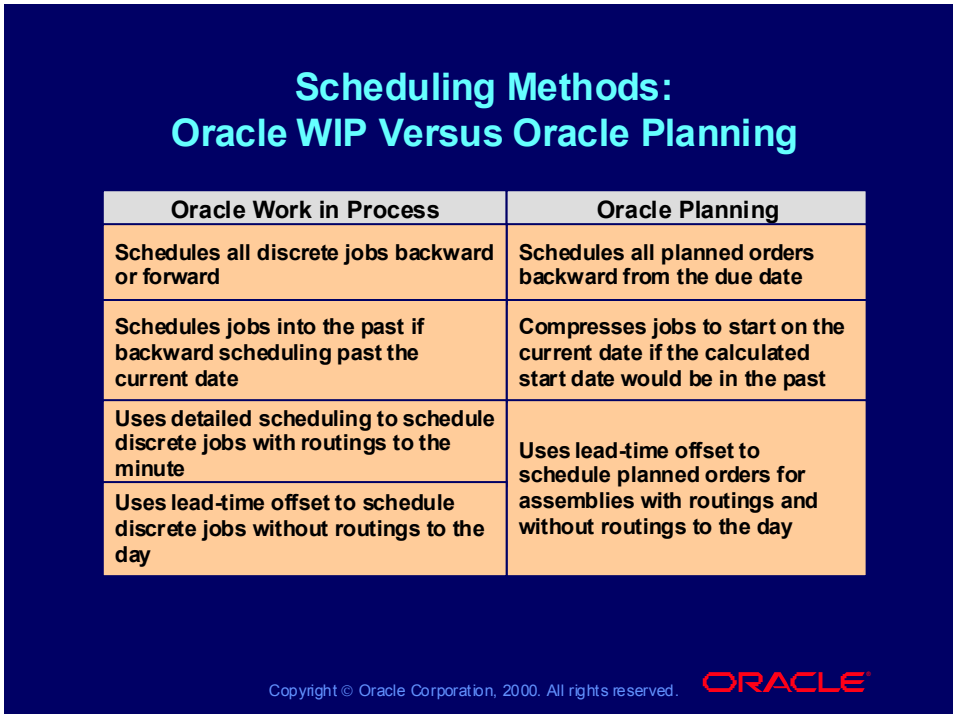






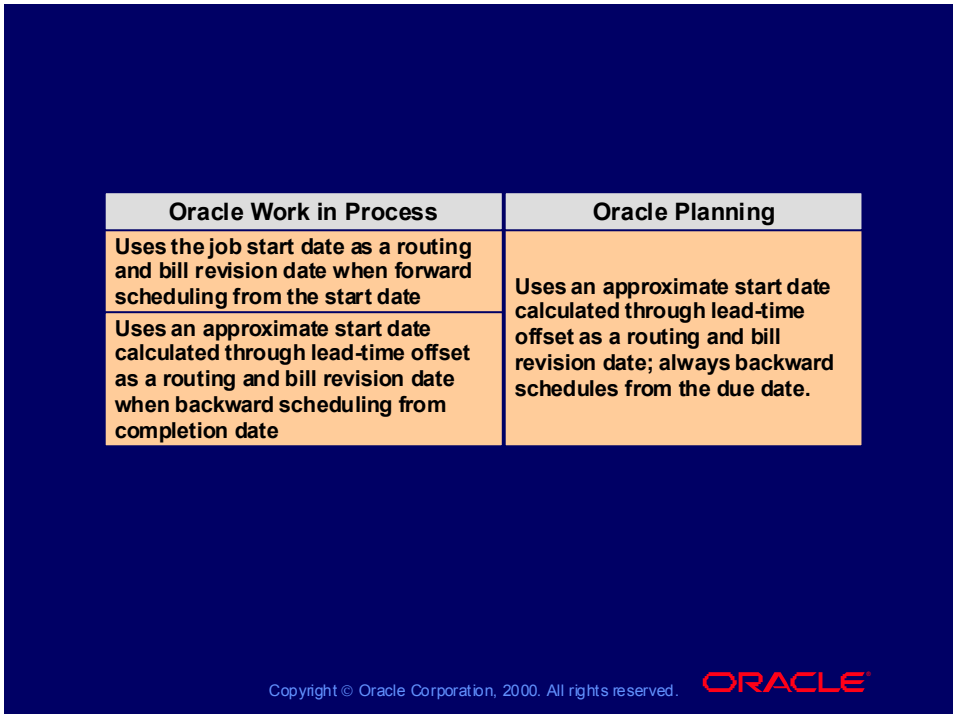


Scheduling Methods: Oracle WIP Versus Oracle Planning



Options for Defining Jobs

- You can use detailed scheduling to schedule discrete jobs to the minute.
- You can use the Discrete Jobs window to define individual discrete jobs.
- You can use the Planner Workbench in Oracle Planning to load suggested discrete jobs into Oracle Work in Process.
- You can use the Import Jobs and Schedules window to load discrete jobs from any outside source.
- For jobs with routings, you can schedule the requirements based on operation dates.
- You must use lead-time offset for jobs without routings. You end the start date and time or the completion date and time, and the other date is automatically calculated using lead-time offset.
- Lead time = (job quantity * variable lead time) + fixed lead time



Note

- Planned orders in Oracle Planning become discrete jobs in Oracle Work in Process when you mass load them from the Planner Workbench.
- The fixed and variable lead times that the lead time offset uses are calculated by scheduling two discrete jobs when you run the lead time rollup process in Oracle Bills of Material.
- Discrete jobs that are mass loaded into Oracle Work in Process from Oracle Planning are rescheduled using detailed scheduling and scheduled backward in the mass load process to recalculate a more exact start date.

Differences in Scheduling Results

Scheduling discrete jobs with routings in Oracle Work in Process and Oracle Planning can result in different total lead times.

The lead-time offset algorithm that Oracle Planning uses considers workday and workday exception information but does not consider shift and shift exception information.

If you have made routing changes since the last time you ran the lead-time rollup process, the fixed and variable lead times that the lead-time offset uses become less accurate.

Oracle Planning is date based and Oracle Work in Process is date and time based. This could result in differences because of rounding up to a day between the start

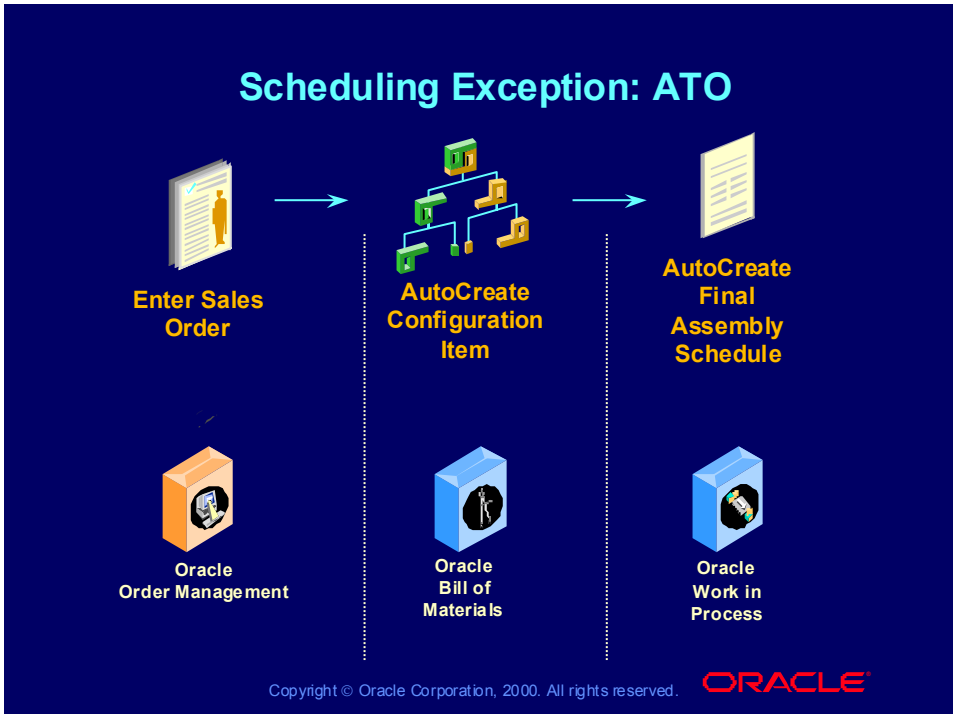
date calculated in Oracle Work in Process and the start date suggested by Oracle Planning.

If the Use in Scheduling checkbox is selected for the simulation set, Oracle Work in Process considers capacity modifications. Oracle Planning does not consider capacity modifications.

Oracle Planning does not schedule into the past. When the calculated start date precedes the system date, Oracle Planning uses the system date for the start date. Oracle Work in Process schedules into the past in these cases.

Scheduling discrete jobs without routings and planned orders yields the same results in Oracle Work in Process as in Oracle Planning, because both products use lead-time offset rounded up to the next day to schedule in this case.

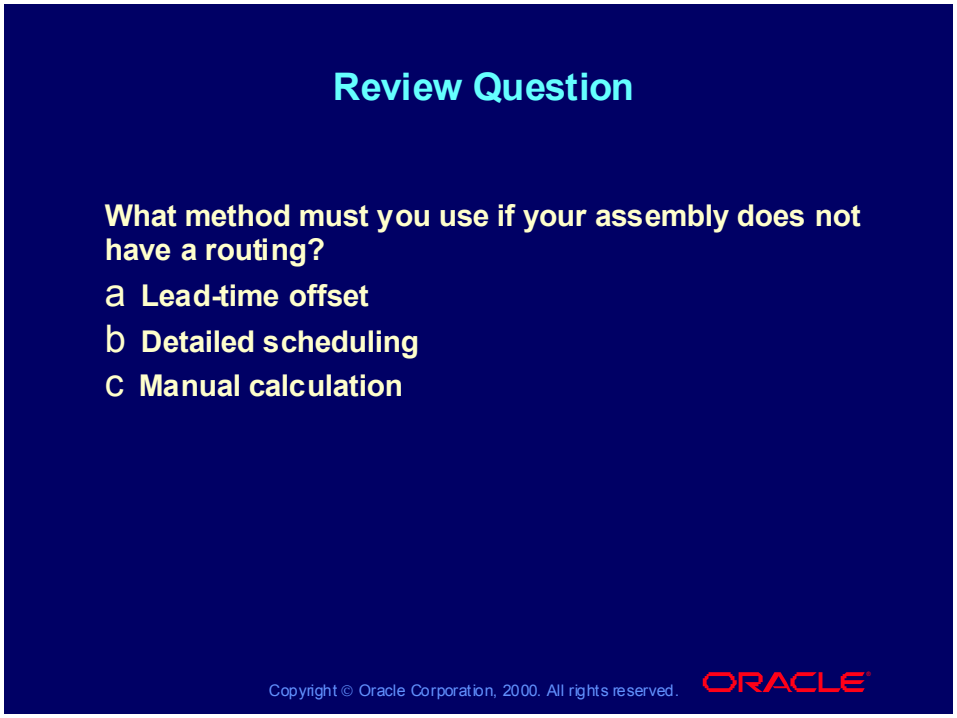
Scheduling Exception: ATO

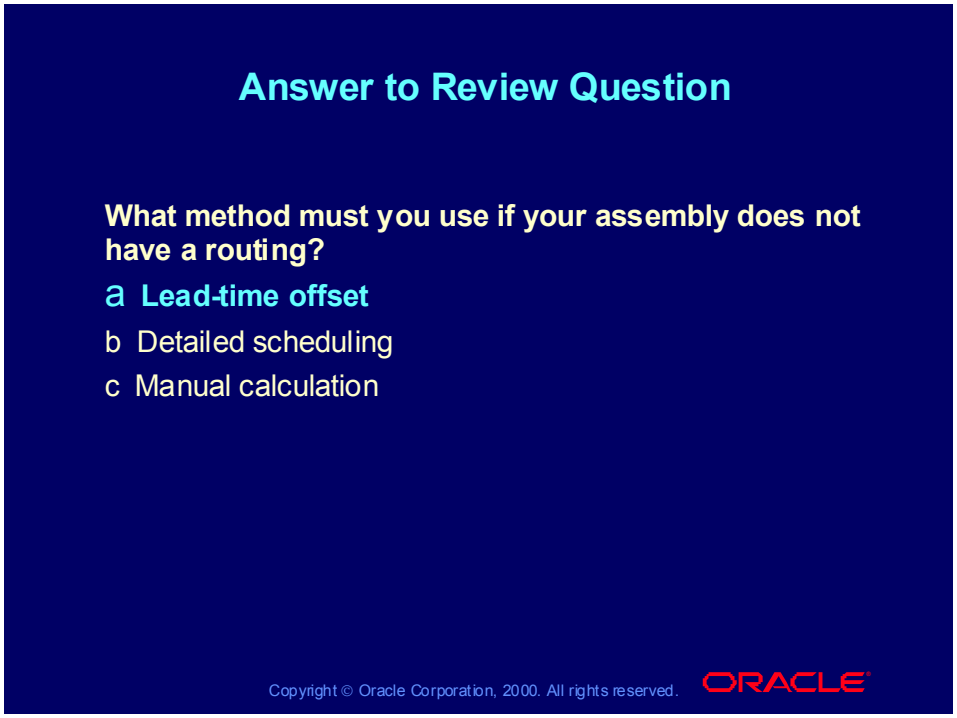


The Exception

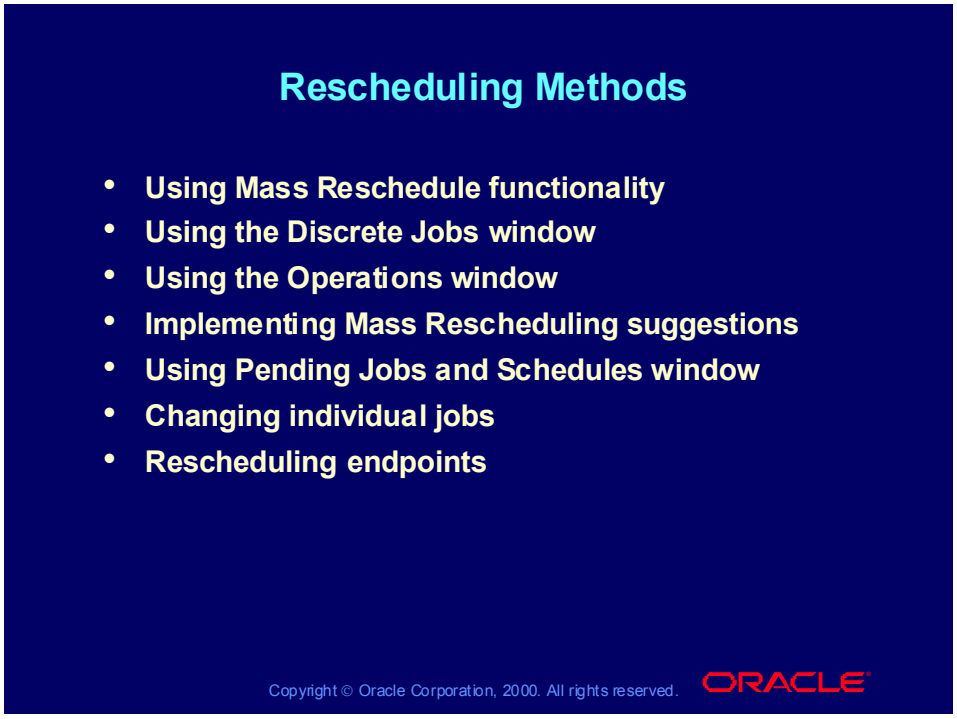
When the line item on the sales order is for a configuration, the configured assembly is structured with the selected options, a bill of material, routings, and a discrete job is autocreated in the ATO process. The job is then scheduled with a completion date set to the delivery date on the sales order. With the completion date, Oracle Work in Process automatically creates the job start date by using the backward scheduling routine.

The schedule release process links final assembly schedule to sales order.





Rescheduling Methods



Using the Mass Reschedule Functionality

Use this rescheduling method if you:

- Use Oracle Planning or if you run MRP relatively frequently and have a high volume of changes.
- Have another planning or scheduling system integrated with Oracle Work in Process

Using Discrete Jobs Window

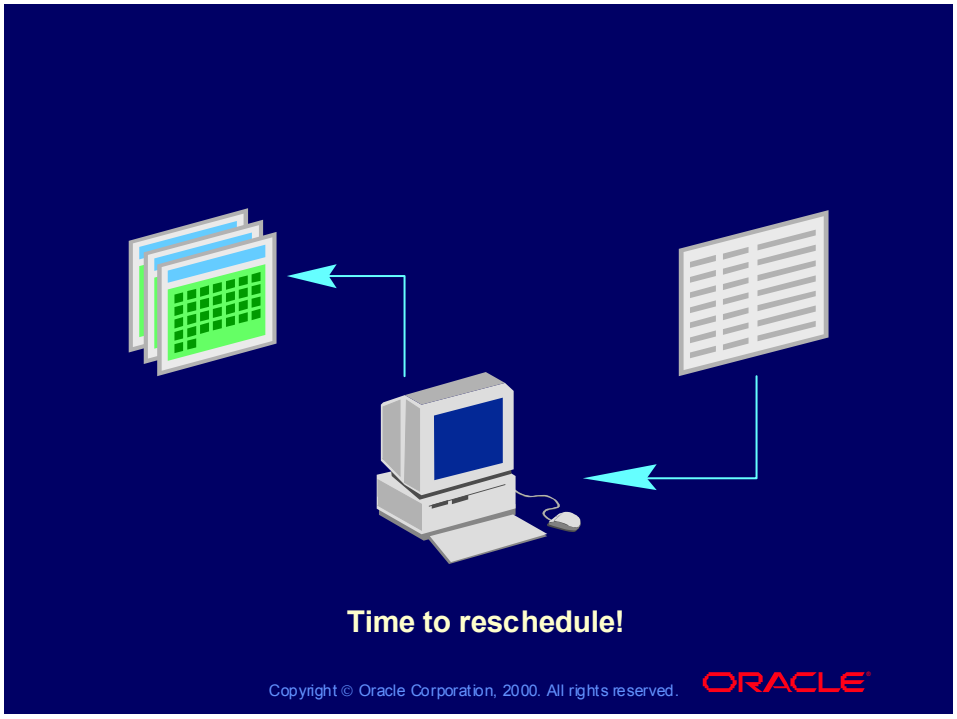
Use this rescheduling method if you want to make date or quantity changes to a specific job.

Using the Operations Window

Use this rescheduling method if you:

- Want to make changes to specific operations on a job
- Monitor your jobs closely and adjust them manually
- Do not use Oracle Planning or do not run MRP frequently enough to affect jobs that are already in production

Note: Use this method if there are changes on the shop floor such as capacity modifications and shift exceptions. These are changes that Oracle Planning is not aware of.



Implementing Mass Rescheduling Suggestions

You can reschedule discrete jobs according to rescheduling recommendations from Oracle Planning or from another planning or rescheduling system.

Load the interface table with your rescheduling suggestions from the Planner Workbench in Oracle Planning. With the Planner Workbench you can update quantities, dates, and statuses for jobs to be rescheduled.

Use the Import Jobs and Schedules window to automatically reschedule your jobs according to rescheduling suggestions from from any other source.

(N) Material Planning > MPS or MRP > Workbench

(Help) Oracle Manufacturing Applications > Oracle Master Scheduling/MRP >

Planner Workbench > Implementing Planning Recommendations >

Implementing Planned Orders

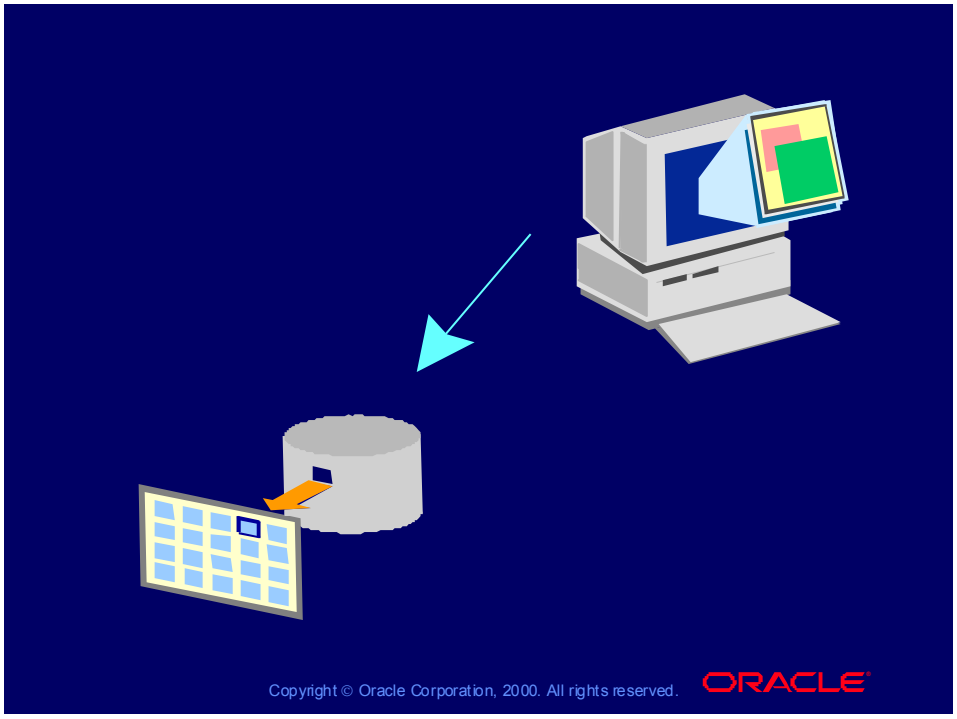
Using Pending Jobs and Schedules Window

You can use the Pending Jobs and Schedules window to view, update, delete, or resubmit job records that have failed validation and remain in the Open Job and Schedule Interface table.

(N) WIP > Discrete > Pending Jobs and Schedules

(Help) Oracle Manufacturing Applications > Oracle Work in Process >

View Pending Job Transactions



Changing Individual Jobs

Using the Discrete Jobs window, you can:

- Reschedule individual jobs by modifying their quantities and dates directly
- Update the start or completion date and time
- Update the job quantity to increase or decrease your output (The job is automatically rescheduled to build the new quantity.)
- Update the routing revision of an unreleased job and reschedule it accordingly

•Rescheduling Endpoints

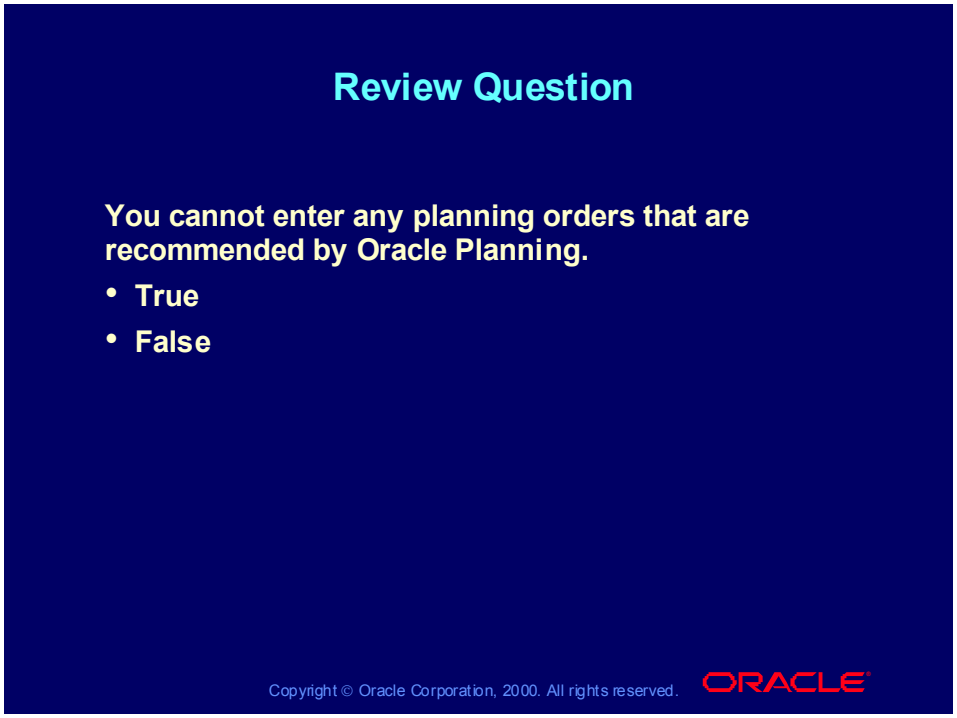
You can use endpoint rescheduling to reschedule forward or backward by changing the start or completion date and time in the Discrete Jobs window.

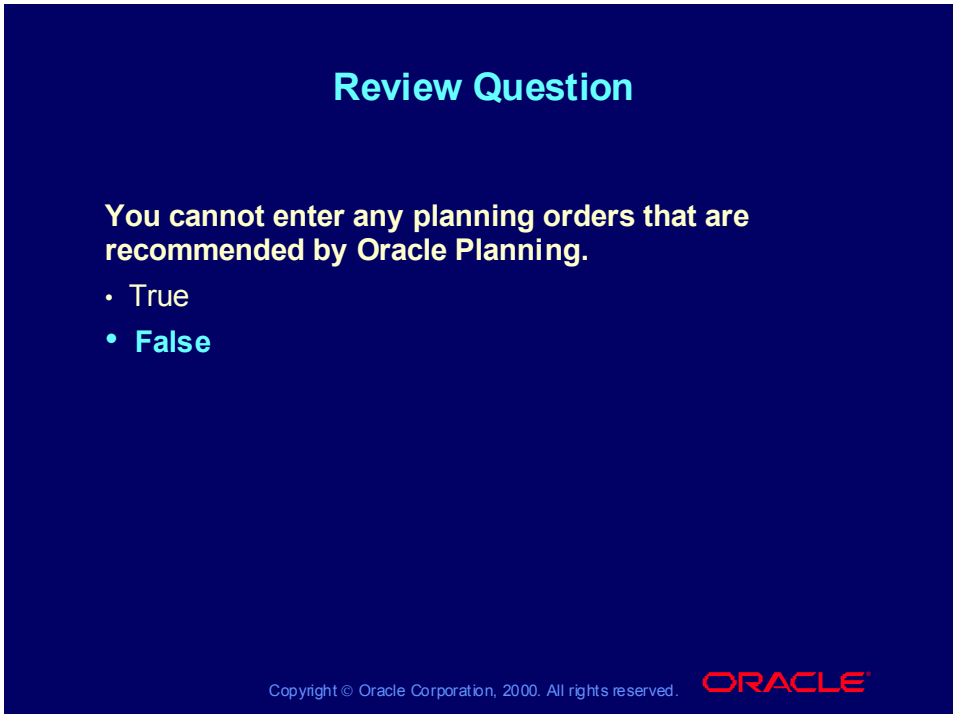
(N) WIP > Discrete > Discrete Jobs

(Help) Oracle Manufacturing Applications > Oracle Work in Process > Discrete Manufacturing > Rescheduling Discrete Jobs

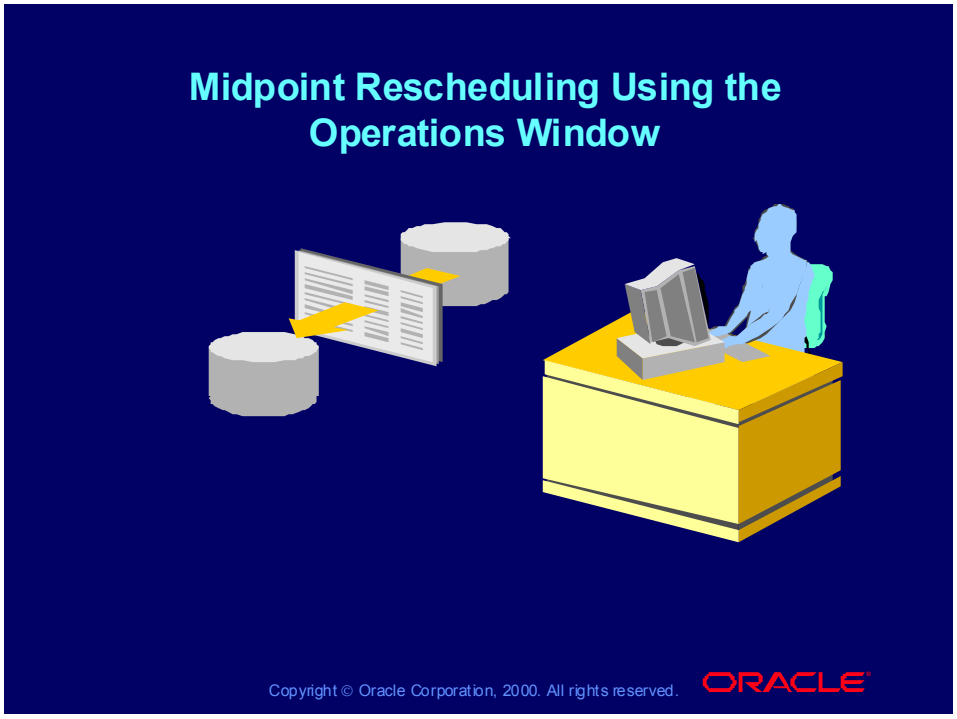
Note: To help you with your rescheduling decisions, you can view all jobs defined for a department prioritized by completion date in the Discrete Job Dispatch Report.

Note: The job start date and time and the completion date and time are affected only when you move earliest operation up or your latest operation back. That is, all operations must take place between the start and completion date and time.





Midpoint Rescheduling Using the Operations Window



(N) WIP > Job/Schedule Details > Operations > (T) Dates > (B) Reschedule

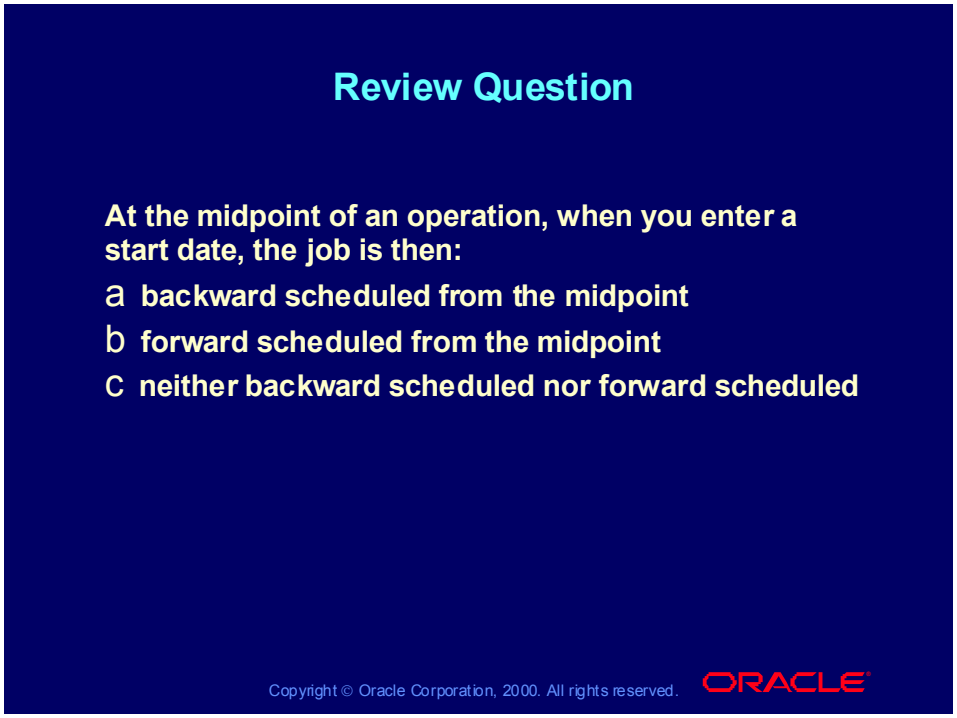
(Help) Oracle Manufacturing Applications > Oracle Work in Process > Discrete Manufacturing > Rescheduling Discrete Jobs > (H) Midpoint Rescheduling

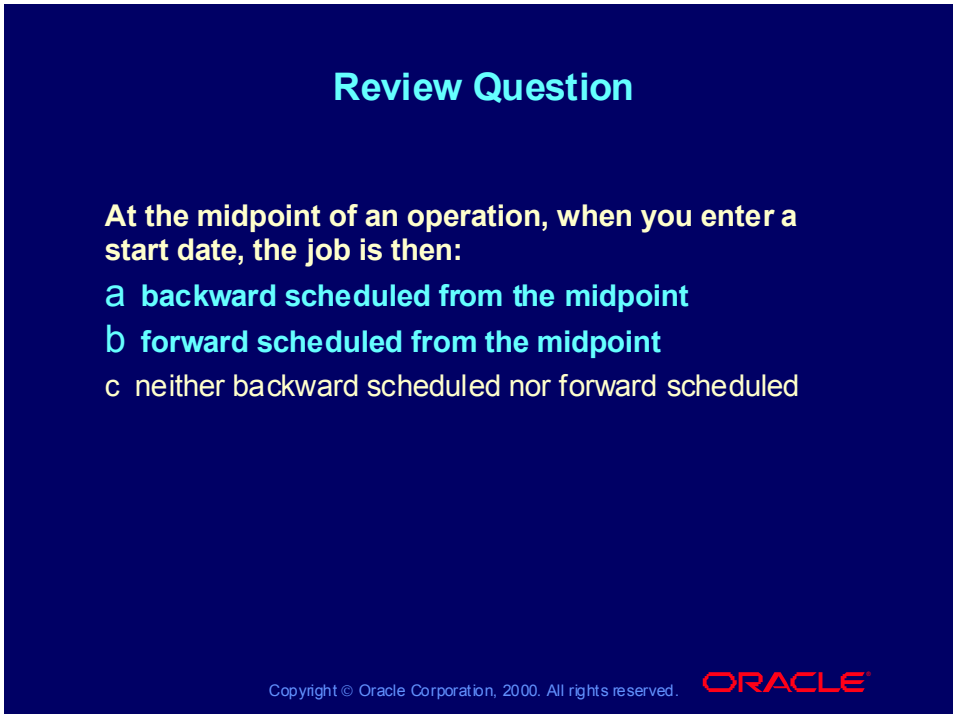
Midpoint Rescheduling

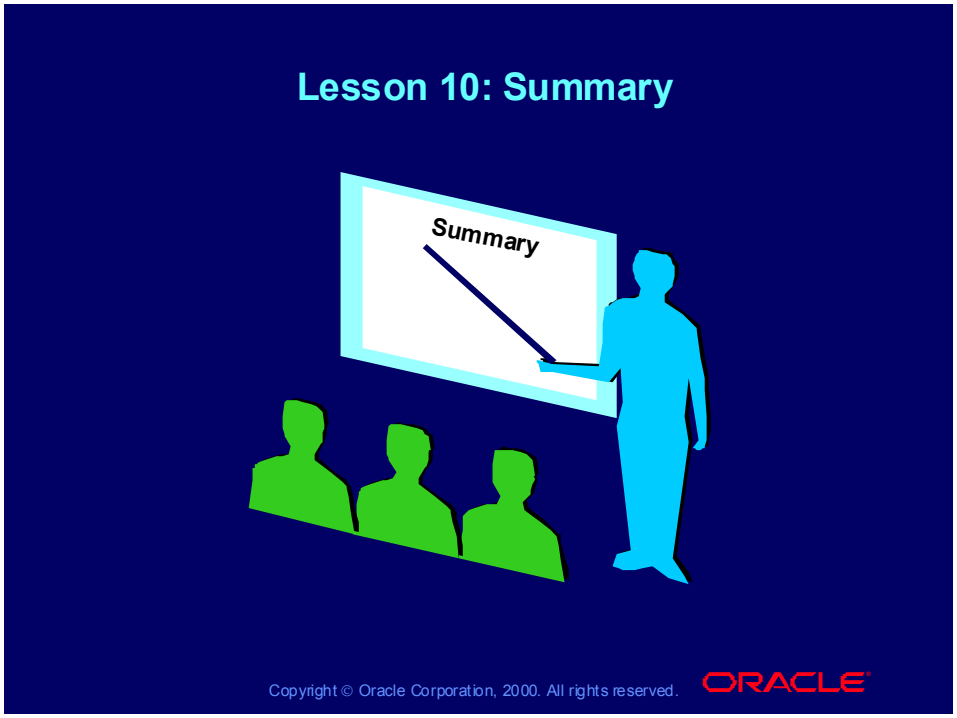
You can use the Reschedule window to reschedule individual jobs based on the midpoint of an operation. This allows you to schedule around bottleneck operations in your job.

If you have a capacity-constrained machine where you manually sequence jobs, you can set the operation start or complete date and time for this midpoint operation to match your manual sequence.

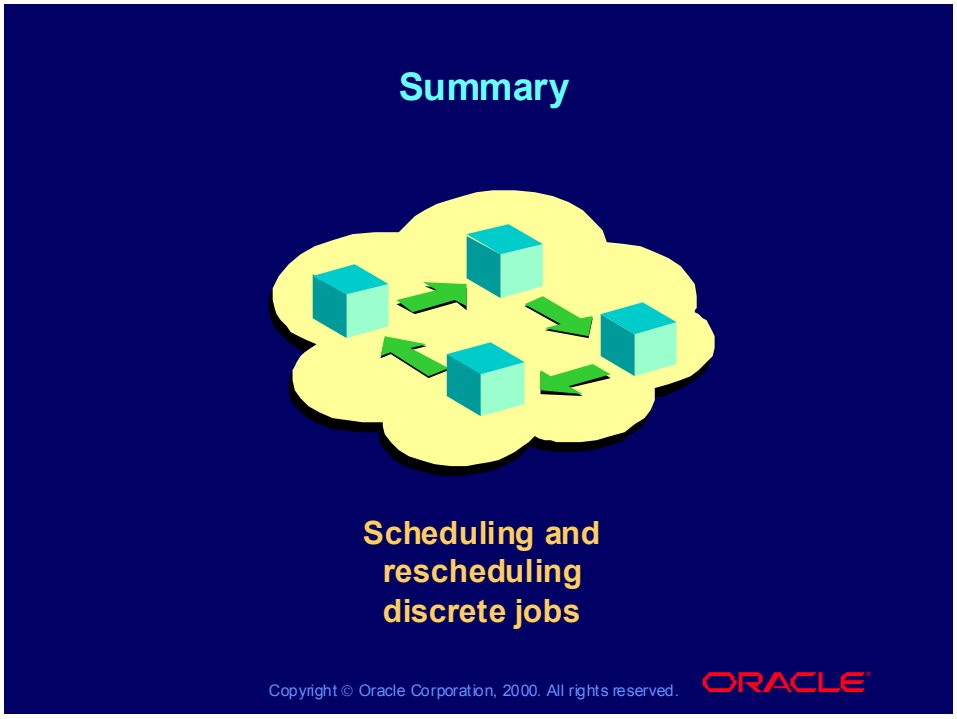
The job is then backward scheduled from the midpoint to set the start date and time, and forward scheduled from the midpoint to set the completion date and time.







Summary



You can plan material and resource requirements and determine requirement dates for available-to-promise calculations using dynamic lead times.

Oracle Work in Process detailed scheduling is more accurate than lead-time offset scheduling since it takes into account current resource requirement and availability information.

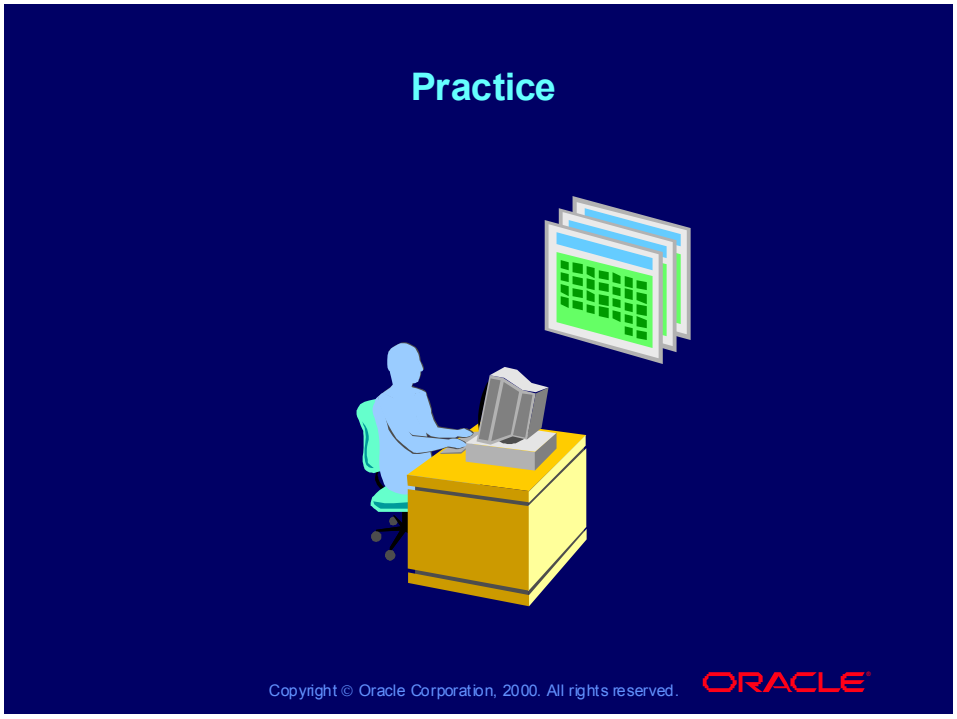
You can use resource attributes to model your resource requirements on the shop floor and schedule accordingly.

Oracle Work in Process uses detailed scheduling to schedule to the minute discrete jobs with routings. Jobs without routings are scheduled using lead-time offset.

You can use the Mass Reschedule functionality to reschedule discrete jobs based on recommendations from Oracle Planning or another source.

You can use the Reschedule window from the Operations window or the Discrete Jobs window to reschedule individual jobs.

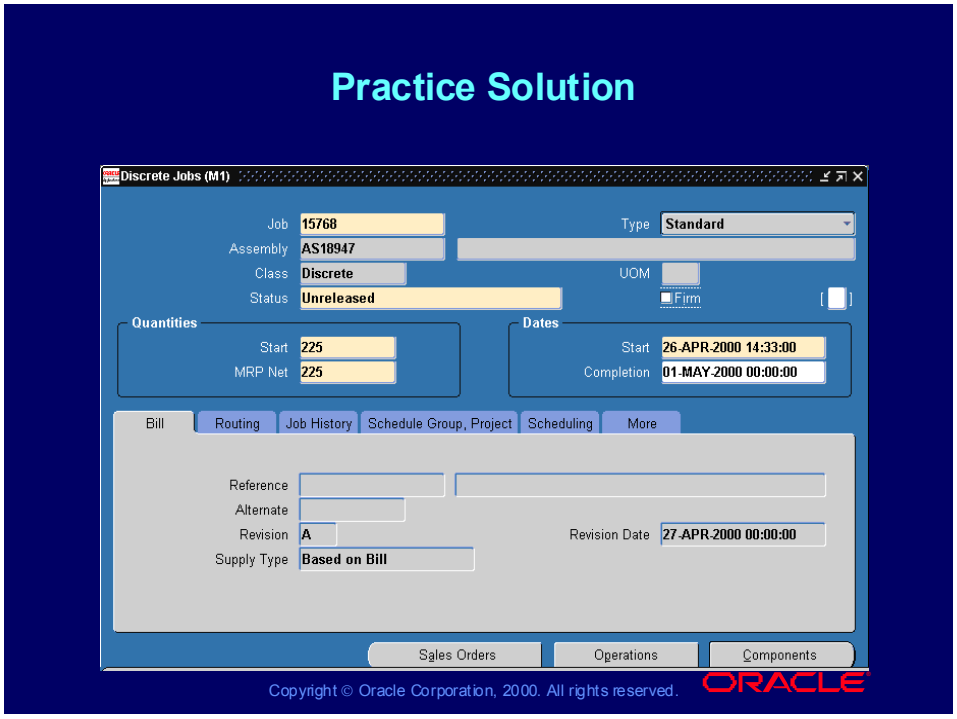
Practice



Your manager wants you to specify a quantity of 100 units to satisfy the demand for Sentinel Standards on the rush order. You should start the job using today's date.

1. Define a discrete job to build the Sentinel Standard in the Boston organization. Specify a quantity and a date.
2. View the job operations and resources in the View Operations window.
3. Reschedule the first operation of your discrete job using the reschedule window from the Operations window. Observe how the operation dates change.

Practice Solution



(N) WIP > Discrete > Discrete Jobs

(Help) Oracle Manufacturing Applications > Oracle Work in Process > Discrete Manufacturing > Creating Discrete Jobs > Defining Discrete Jobs Manually

Defining a Discrete Job

1 Navigate to the Discrete Jobs window.

2 Enter a job name that is unique and alphanumeric.

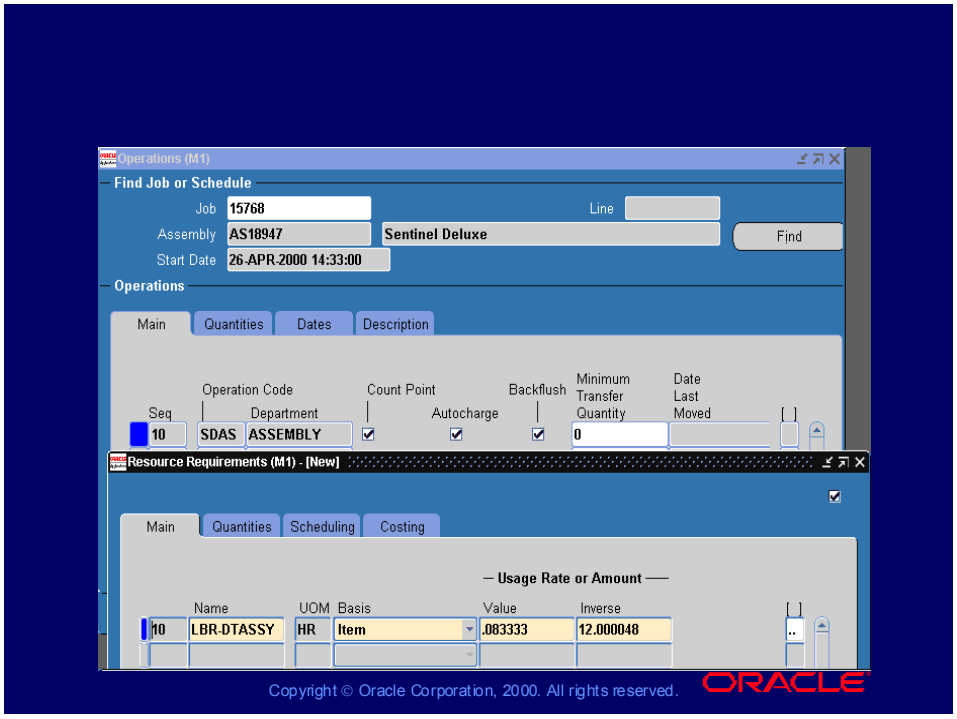
3 Select the Job Type of Standard.

4 Select an accounting class, or use the default if found.

5 Select the job status.

6 Specify the start quantity, the MRP net quantity, and the start date.

7 Save your work.



(N) WIP > Job/Schedule Details > Operations > (B) Resources

(Help) Oracle Manufacturing Applications > Oracle Work in Process > Discrete Manufacturing > Viewing Discrete Jobs > Viewing Job and Schedule Operations

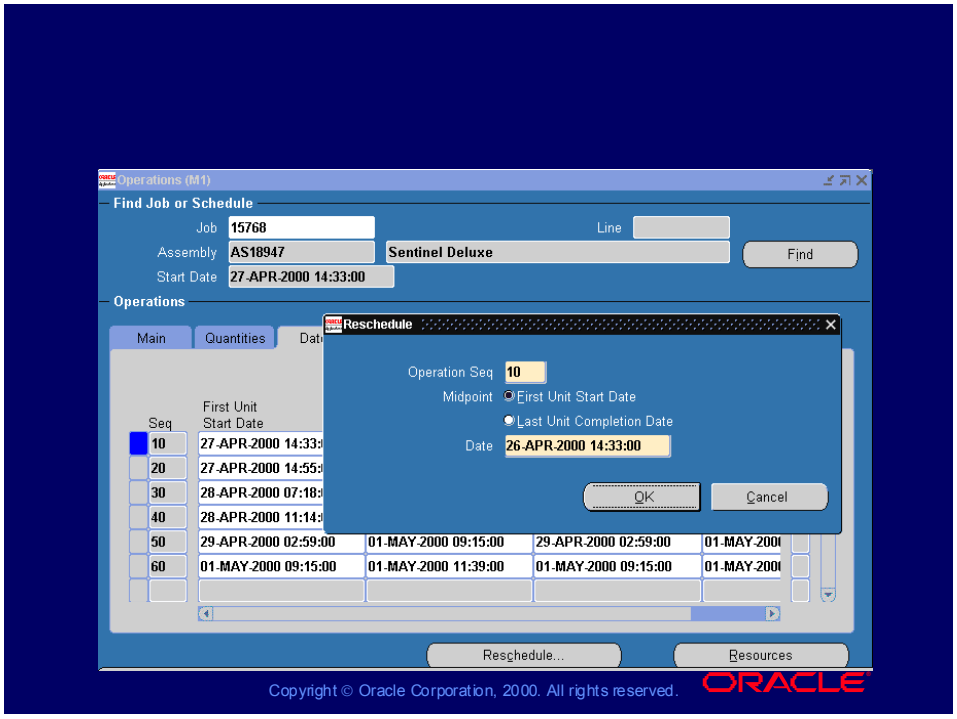
Reviewing Job Operations and Resources:

1 Navigate to the Operations window after finding your job.

2 Select an operation.

3 Click the Resources button.

4 If any resources are required at the selected operation, they are displayed.



(N) WIP > Job/Schedule Details > Operations > (B) Reschedule

(Help) Oracle Manufacturing Applications > Oracle Work in Process > Discrete Manufacturing > Creating Discrete Jobs > Defining Discrete Jobs Manually

Rescheduling the Job:

1 Navigate to the Operations window after finding your job.

2 Click on the Reschedule button.

3 Reschedule the discrete job using the Reschedule window.

4 Observe how the the operation dates change.