Introduction
This document is intended for use by new Superusers of the Oracle Manufacturing Applications, or by others wishing to learn how the various lead-times and lot sizes in the application interact. It should be particularly useful towards the end of training and prior to go-live.

Oracle uses seven different lead times and five different lot sizes or order modifiers. Failure to understand the differences or the interaction among them can have serious negative consequences if inappropriate values are entered and used after go-live.

I recommend that readers re-create the exercises using test data on their own system rather than just reading the document.
Definitions

Pre-processing Lead-Time
The administrative time it takes to place an order or release a job after demand is recognized (MRP has run).

Processing Lead-Time
The time it takes a supplier to deliver an order to the dock (purchased items) or the time it takes to complete a job for the Lead-Time Lot Size (manufactured items).

Post-processing Lead-Time
Only applicable to purchased items. It is the time it takes to process a receipt from dock to stock. This normally includes receiving and inspection time.

Fixed Lead Time
That portion of the Processing Lead-Time that is independent of the job quantity. This normally includes set-up, teardown and Queue/Move times.

Variable Lead Time
That portion of the Processing Lead-Time that depends on the job quantity. Typically, this is the run time per assembly.

Cumulative Manufacturing Lead Time
The time taken to produce the Lead-Time Lot Size of an assembly if all the purchased components were available, but all subassemblies had to be built.

Cumulative Total Lead Time
The time it would take to produce the Lead-Time Lot Size of an assembly if all components had to be bought and all subassemblies had to be built.

Lead Time Lot Size
The lot size that is used to calculate Processing Lead-Times and the two Cumulative Lead-Times. If no value is entered, the system defaults to the Lot Size for Standard Costing (see below). If this attribute has no value entered, the system defaults to a Lead-Time Lot Size of 1.

Lot Size for Standard Costing
The lot size that is used to develop the Standard Cost of an assembly.

Fixed Order Quantity
A quantity for which every job or PO is opened.

Fixed Lot Multiplier
A quantity of which every job or PO opened is a multiple.

The above two attributes are mutually exclusive. An assembly either has a Fixed Order Quantity or a Fixed Lot Multiplier. It cannot have both.
Fixed Days Supply
The period that the planning system goes out into the future and combines demand, taking into account the FOQ and FLM.

Practical Exercise

Setting up Items
INV > Items > Master Items
Enter 3 items, TESTFDS, TESTFLM and TESTFOQ. Apply a Finished Goods template if available. Assign the three items to a child organization.

INV>Items> Organization Items
For item TESTFDS, enter a Fixed Days Supply of 40. For TESTFLM, enter a Fixed Lot Multiplier of 20. For TESTFOQ, enter a Fixed Order Quantity of 20. Except for these values, all attributes for the three items should be the same.

Setting up BOM’s
BOM > Bills > Bills
Enter a Bill of Material for TESTFDS. Choose 4 components that have costs entered. Supply type is not important.

Special > Copy Bill From
Enter a BOM for TESTFLM by copying the BOM for TESTFDS.
Enter a BOM for TESTFOQ by copying the BOM from TESTFDS.
The BOM should look similar to the one below, but as long as the three BOM’s are the same, any one will do.
Setting up Routings

Set up a routing for TESTFDS as shown below.

- Be sure to use resources that have a cost associated with them.
- The actual departments and resource names you use are not important for this exercise, but make sure that the basis and usage rates are as below.
- Be sure that your resources are all set to Scheduled = Yes. Any resource with a Scheduled = No would be ignored in the lead-time roll-up calculation.

Other alternatives for the Scheduled flag are “Prior” and “Next”. If you choose these options, these resource sequences will be scheduled to run concurrently with the prior or next resource sequence. For a more complete discussion of this option, please refer to the online help or to the Oracle BOM User Guide.
Tools > Copy Routing

From

Build routings for the TESTFLM and TESTFOQ by copying the routing for the TESTFDS.
Lot Size for Standard Costing

Enter lot sizes for standard costing as below:

TESTFDS: 10
TESTFLM: 50
TESTFOQ: 500

Assembly Cost Roll-up

Roll up the assembly costs for the three items using the parameters shown below:
Once the Assembly Cost Roll Up is complete, go to the Item Costs screen and view the results.
Note that, even though the BOM and the Routing for each of these assemblies is identical, the unit costs are very different. This is because a different Lot Size is used in each case for costing. In the case of the TESTFDS, the cost of the lot-based resources (Set-up, Queue/Move time, Teardown etc.) is spread across only 10 pieces. For the TESTFOQ, this fixed cost is spread across 500 pieces, resulting in a significantly lower cost per unit ($127 vs $121).

It is obvious from the above example that it is very important that you choose appropriate lot sizes for your assemblies. Failure to do so will result in inaccurate costs for your organization.
Lead Time Lot Size

Navigate to the Lead-Time Tab for each of the three assemblies. Note that the following values appear:

- TESTFDS: 10
- TESTFLM: 50
- TESTFOQ: 500

These values have defaulted from the Lot Size for standard Costing, which were entered earlier.

Lead Time Roll-up

Roll up the Manufacturing Lead Times for the three assemblies using the parameters shown below:
Once the Manufacturing Lead Time Roll Up is complete, run the Cumulative Lead Time Rollup for the three assemblies:

Once the roll-ups are complete, Go to the Organization Items Lead-Time Tab and review the lead-times generated:
Note that there are significant differences in the lead times for the three assemblies. The Lead-Time Lot Size drives these differences.

Preprocessing: This is constant for the three assemblies.

Processing: This value is derived by multiplying the Variable by the Lot Size, adding the Fixed, then rounding to the next highest whole number.

Post-processing: Not used for manufactured items.

Fixed: This is derived in WIP by scheduling a job for zero quantity.

Variable: This is derived in WIP by scheduling a job for the Lead-Time Lot Size, subtracting the time for the zero quantity job, then dividing by the Lead-Time Lot Size.

Cum Mfg: This is derived by adding the time taken to produce the longest lead-time subassembly to the Processing Lead-Time. Because our BOM has no subassemblies, this lead-time is the same as the Processing Lead-Time.

Cum Total: This adds the lead-time for the longest lead-time component to the prior value. Because the components used in our example had no processing lead-time entered, the only difference between this and the prior value is the standard 5 days of pre-processing time entered for all components.

There is no documentation that I could find, either online in the User Guides, that explains what each of these lead-times is used for. I have yet to speak to anyone at Oracle Support (including developers) who can fully explain their use either. What follows, therefore, are my deductions based on experience and experimentation. Divergent opinions are eagerly solicited!

Oracle uses the Cumulative Lead-Times only for calculating Planning Time Fences for items, and only then if that is specified when the item is defined.
Oracle Planning uses the Fixed and Variable Lead-Times to calculate the Start Date for a planned order from the Due Date. It multiplies the Variable Lead-Time by the Planned Order Quantity, then adds the Fixed Lead-Time, to do so. It subtracts the Pre-processing Lead-Time from the Start Date to calculate the Order date.

Processing Lead-Time is Lot Size-specific and, for manufactured items, is used only to calculate Cumulative Lead-Times.

It is important to note that the Variable Lead-Time is not a constant, but that it changes as the Lead-Time Lot Size changes. There are considerable practical implications to this. If you fail to enter a Lead-Time Lot Size (defaults to one), or enter an inappropriate value, the system will calculate a Variable Lead-Time that is also inappropriate. MRP will then use this inappropriate value to calculate Start Dates for Planned Orders. Once the Planned Orders are implemented and Discrete Jobs are created, WIP will calculate their Start Dates correctly, as it doesn’t use lead-times, but all material requirements will be procured for the incorrect MRP-generated date. You must enter good Lead-Time Lot Sizes for Oracle Planning to work effectively.
Enter Demand

Enter demand for the three assemblies as shown below:

TESTFDS: 50 on 1st of one month, 50 on 1st of following
TESTFLM: 50 on 1st of one month, 50 on 1st of following
TESTFOQ: 50 on 1st of one month, 50 on 1st of following

Each should look similar to the example below:

Run MRP

Update the Master Demand Schedule using the Forecast you modified. Once the MDS run is complete, Launch MRP using this MDS as the input.
Print Planning Detail Report

Print the Planning Detail Report for the three assemblies. Use the parameters shown below:

Note the suggested order date for the Planned Order for TESTFDS on the report extract shown below.
We will now implement the planned order from the Planners’ Workbench, track it through to the WIP module and compare results.

## Implement Planned Orders as Discrete Jobs

Go to the Planners’ Workbench and review the suggestions for the three items:

---
**Planned Orders**
<table>
<thead>
<tr>
<th>Order Date</th>
<th>Start Date</th>
<th>Due Date</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-FEB-99</td>
<td>15-FEB-99</td>
<td>01-MAR-99</td>
<td>100.0</td>
</tr>
</tbody>
</table>
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**Engineering Changes For This**

**BOM Changes For This Component**

**Substitute Item Detail**

**Reservation Detail**

**By-Product Supply**

Note the suggestions in relation to the Order Modifiers that we entered for the assemblies.

TESTFDS, which had a Fixed Days Supply of 40, shows only one order for 100. This is because MRP combined any demand 40 (working) days into the future and suggested one job to cover it.

TESTFLM, which had a Fixed Lot Multiplier of 20, shows two orders, one for 60 and one for 40. MRP suggests supply to balance demand, but in multiples of 20.

TESTFOQ, which had a Fixed Order Quantity of 20, shows five orders of
twenty each. MRP suggests supply to balance demand, but in discrete jobs of 20 at a time.

If you define a Fixed Order Quantity for an assembly, it follows that the Lead-Time Lot Size, and the Lot Size for Standard Costing, should equal the Fixed Order Quantity. If you define a Fixed Lot Multiplier, the Lead-Time Lot Size, obviously, should be a multiple of that value and should equal your normal run size.

Implement the suggestions, creating Discrete Jobs for the assemblies.

View the jobs created in the Discrete Jobs summary screen.
Note that the Start Date for the TESTFDS job is 17th February, compared to 15th February on the Planning Detail Report. This discrepancy is caused by the two different scheduling methods that Oracle uses. The discrepancy seems to be most pronounced when you have a very low Lead-Time Lot Size and a high job quantity. When you do encounter this phenomenon, WIP, which uses a more rigorous calculation method, should always be relied upon.

**Key Points**

- It is important to specify correct Lot Sizes for Standard Costing so that good Standard Costs can be derived.
- It is important to specify correct Lead-Time Lot Sizes so that good lead-times are calculated.
- Oracle Planning and WIP use different scheduling methods to calculate Start Dates. These different methods can produce different results. There is more likely to be divergence when Lead-Time Lot Sizes are low and job quantities are high. The negative business consequence of the divergence is that components will be procured too early and high inventory values will result.