Infor LN Enterprise Planning
User's Guide for Order Planning

Publication Information

Table of Contents

About this document

Index

About this document

This document describes the process used to manage planning data in the form of <u>planned orders</u>. The options, steps and conditions for the use of order planning are detailed.

Objectives

This guide addresses the general concepts and basic principles of order planning in Enterprise Planning. Technical details are left out. The document is intended for users of the Infor software and for internal use.

Document summary

Enterprise Planning supports two types of planning processes: order planning and master planning. The concepts of master planning are explained in a separate document. Some master planning concepts, such as the plan-bucket definition and bills of critical materials impact the order planning concept. This overlap will be addressed in this document.

Many of the discussed concepts are addressed in more detail in a separate topic document.

How to read this document

This document was assembled from online Help topics. As a result, references to other sections in the manual are presented as shown in the following example:

For details, refer to *Scenarios*. To locate the referred section, please refer to the Table of Contents or use the Index at the end of the document.

Underlined terms indicate a link to a glossary definition. If you view this document online, you can click the underlined term to go to the glossary definition at the end of the document.

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Chapter 1
Order Planning Concepts

1

General overview and basic concepts

The planning logic within LN provides a mechanism where supply and demand are balanced taking into account existing receipts, supply and inventory levels. The planning takes care of fulfilling unfulfilled demand by generating various sorts of supply orders, such as these:

- Planned production orders (an order to make the item)
- Planned distribution orders (an order to get the item from another site)
- Planned purchase orders (an order to buy the item)

You can set up the planning system by specifying this data:

- **Scenarios**
  Specify multiple scenarios, in order to compare various planning strategies.
- **General item data**
  Specify the various items.
- **Clusters and plan items**
  Differentiate the item planning characteristics for different warehouses, production sites, and suppliers.

Item data structure

You can further differentiate between items at various suppliers:

- Locations (warehouses)
- Purpose (planning, purchase)
- Origin (supplier, warehouse)

Example

An item is supplied by two different suppliers.

Supplier A ships in lots of 100 pieces because the packing of the item determines so.

Supplier B ships the goods in units of 60 pieces.

You can define specific parameters for each supplier.

You can use the following sessions to define these characteristics:

- Items - Planning (cprpd1100m000)
- Check Item Data by Warehouse (whwmd2210m000)
- Item Supplier Plan (cpvmi0530m000)

These sessions define entities that have an n-to-1 relationship with the general item data.
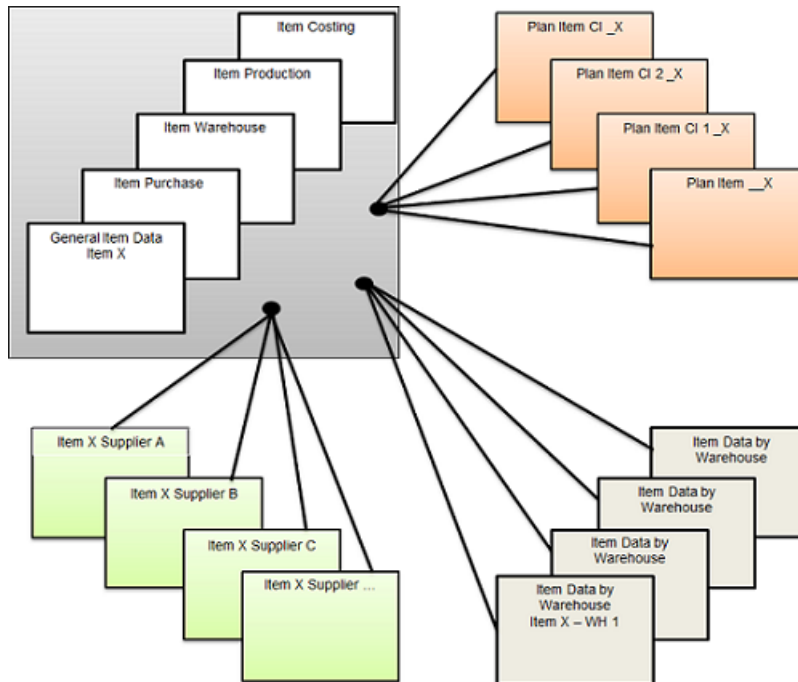
Item data structure

Scenarios

You can define several scenarios, each with its own set of planning parameters. A scenario is an umbrella for a set of planned orders that are planned according to scenario-dependent parameter settings. In this way, you can simulate several situations.

You can change the planning data manually after order generation. In this way, you can see the impact of his planning action compared to the generated plan.

The following settings are scenario dependent:

- **Plan Period Definition** for master planning
- Aggregation Relationships (cprpd3110m000)
- **Supply Strategies** and **Sourcing Strategies**

The scenario-dependent supply-chain strategies and sourcing strategies help planners to evaluate whether they should buy more and produce less or choose another way of fulfilling demand.

Planners can balance the sources of supply and investigate the consequences of their choices regarding capacity utilization, material requirements, and so on.

Example

You must specify which of the scenarios is defined as the **Actual Scenario**. The actual scenario is the scenario of which the plans and orders are to be actually executed.

You can transfer only orders from the actual scenario to the execution level. The ATP checks that you can perform in Sales Control are also based on the actual scenario.

To determine which scenario is the actual scenario, use the **Actual Scenario** field in the EP Parameters (cprpd0100m000) session.

Scenarios (cprpd4100m000)

To define scenarios, use the Scenarios (cprpd4100m000) session.

On the **Forecast** tab you can specify the settings for the demand forecast.

You must define the values of the following fields:

Scenario properties

Field	Description
Scenario Start Date	The start date of the time frame in which Enterprise Planning is capable of planning.
	The goods flow transactions *before* the scenario start date are also taken into account, but Enterprise Planning moves these transactions to the start date of the scenario.
	It is strongly recommended to define a start date in the past – preferably so far in the past that all open transactions (such as unfinished sales orders) are

	between the scenario start date and the scenario finish date.
Scenario Finish Date	The end of the range where Enterprise Planning is capable of planning.
	Enterprise Planning disregards all goods flow after the scenario finish date.
Rolling Scenario	If this check box is selected, the scenario is rolled. This means that Enterprise Planning moves the plan periods forward from time to time.
	To roll the scenario, use the Initialize, Roll, and Update Scenario (cprpd4200m000) session.

General item data

Enterprise Planning plans by plan item. Each plan item derives its general properties from the related general item definition.

Items - General (tcibd0501m000)

Item type

In the Item Data session, you can define an item's item type. The item type is **Items Manufactured** or **Items Purchased**.

Enterprise Planning uses the item type together with the default source in plan item data to determine the type of order to be generated during the order generation. You can make the item type date-dependent by using the Date-Effective Item Data (tcibd0510m000) session. In this way, you can specify that the item is purchased in one period, but manufactured in another period.

To start the Date-Effective Item Data (tcibd0510m000) session, click the button next to the **Item Type** field.

The other fields in the Items - General (tcibd0501m000) session are explained in the following table.

General item properties

Field	Description

(Actual) Item Type (display-only field)	If date-effective item data has been defined, this fields shows the currently effective item type.
Item Group	LN uses this field to retrieve the item defaults if you generate an item.
Derived-from Item (display-only field, Engineering tab)	Links a customized item to the related standard item or generic item.
Unit Effective End Item (Unit Effectivity tab)	If this check box is selected, sales orders for this item can specify an effectivity unit. An effectivity unit denotes a small configuration of the item. For more information, refer to the section on effectivity units.
Unit Effective Supply	If this check box is selected, effectivity units are taken into account for the supply order.
Effectivity Units are Interchangeable	If this check box is selected, demand for unit 5 can be supplied by unit 6. All units of an item can be interchanged, even if they have different configurations. If this check box is cleared, interchangeability can be specified on a more detailed level (between ranges of units) as well as at a global level (units are always interchangeable).

Items - Purchase (tdipu0101m000)

The following fields are important for the Enterprise Planning package.

Item purchase data

Field	Description

Buy-from Business Partner	This field serves as a default for creating the item supplier data. The field is not used for planning.
Supply Time	Enterprise Planning uses this field to determine the lead time. For more information, refer to the document on lead times.

Item - Ordering (tcibd2100s000)

Order System

Enterprise Planning only plans items of which the order system is **Planned**.

To specify the order system:

1. Start the Item - Ordering (tcibd2100s000) session.
2. Click the **Settings** tab.
3. Set the **Order System** field to **Planned**.

Lot sizing

A planned order's order quantity is the quantity that is manufactured, bought, or otherwise supplied by that planned order.

The value of the **Order Method** field determines which rules Enterprise Planning applies in the order quantity calculation.

General lot-sizing parameters:
- **Order Quantity Increment**
- **Minimum Order Quantity**
- **Maximum Order Quantity**

Parameters for specific order methods:
- **Fixed Order Quantity**
- **Economic Order Quantity**
- **Maximum Inventory**

To avoid orders for unusual quantities (for example, 32,142 iron bolts), set the **Order Quantity Increment** field to round numbers, such as 10, 50, or 100. Enterprise Planning plans the order quantity to a multiple of the **Order Quantity Increment** field.

To avoid orders for extremely small quantities (for example, 20 inch of metal wire), set the **Minimum Order Quantity** field to a reasonable value.

Very large orders reduce the planning flexibility for your production and handling facilities. For example, a production order that keeps a work center occupied for three weeks, prevents the system from scheduling small rush orders in between. To prevent these situations, use the **Maximum Order Quantity** field.

The **Order Method** field can have these values:

- **Lot-for-Lot**
- **Fixed Order Quantity**
- **Economic Order Quantity**
- **Replenish to Maximum Inventory**

Lot-for-Lot

The most simple order method is **Lot-for-Lot**. If the order method is **Lot-for-Lot**, Enterprise Planning calculates the order quantity as follows:

- First, sets the order quantity to the required quantity.
- Rounds the order quantity up to the next multiple of the **Order Quantity Increment** field.
- If the order quantity is less than the minimum order quantity, adjusts the order quantity accordingly.
- If the order quantity is greater than the maximum order quantity, generates multiple orders.

Note

If the maximum order quantity constraints the order quantity, the system optimizes the generated orders.

Example

- Minimum order quantity = 30
- Maximum order quantity = 50
- Demand = 70

Two orders are created of 35 pieces. The system does not generate an order of 50 and another order of 30, because this would result in 10 pieces too much.

Fixed order quantity

If the order method is **Fixed Order Quantity**, Enterprise Planning always makes the order quantity equal to the fixed order quantity, as follows:

- If the demand is less than or equal to the fixed order quantity, Enterprise Planning generates an order and sets the order quantity equal to the fixed order quantity.
- If the demand is greater than the fixed order quantity, Enterprise Planning generates multiple orders.

Economic order quantity

The economic order quantity is the lot size that will give you the lowest total cost, considering order costs and inventory handling costs.

To calculate the economic order quantity, click **Calculate EOQ**.

If the order method is **Economic Order Quantity** (EOQ), Enterprise Planning sets the order quantities to at least the economic order quantity.

Replenish to maximum inventory

If the order method is **Replenish to Maximum Inventory**, Enterprise Planning generates orders if the projected inventory drops below the inventory plan or the safety stock. If this happens, the order quantity is made large enough to bring the inventory back to the maximum inventory level. You can set the maximum inventory level in the **Maximum Inventory** field.

The **Replenish to Maximum Inventory** order method is particularly suitable if:

- The item has a relatively low cost price and low storage cost; in other words, you can keep a reserve quantity in storage without much cost.
- Demand for the item is difficult to predict or lead times are long.

Example

- Order Method = Replenish to Maximum Inventory
- Maximum Inventory = 50 pieces
- Safety Stock = 0
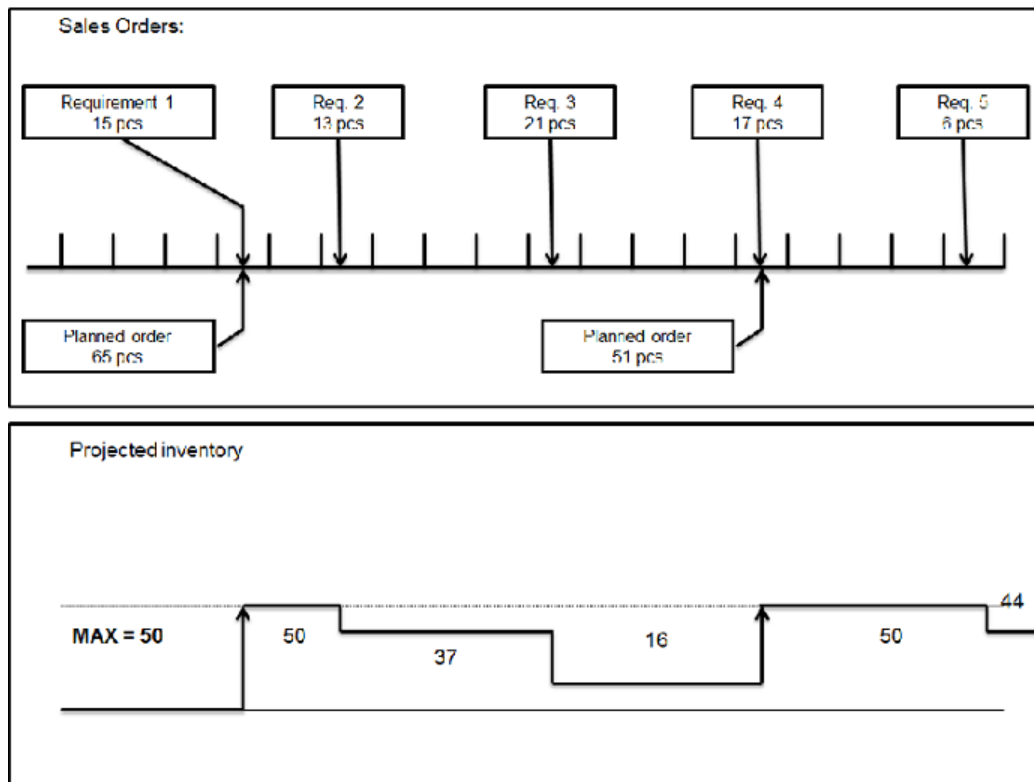
Replenish to maximum inventory

- Stock at starting point is 0
- At Requirement 1, you receive the first sales order (15 pcs). The projected inventory drops to a negative value (-15)
- Enterprise Planning generates an order for 65 pcs to bring the inventory back to 50
- At Req. 4, the time-phased inventory value drops below the safety stock or below 0, to -1.
- Enterprise Planning raises the next order for 51 pcs, and brings the projected inventory back to 50

In previous LN versions, this order method was implemented for SIC (Statistical Inventory Control) items). The functionality is available for planned items as well. You can apply the SIC logic during the order generation run.

Order interval

Order interval is the minimum time interval (in days or hours) between two successive planned orders.

The time interval is measured starting at the last generated order.

Example

If the order interval is a week and the first requirement falls on a Monday, the first order generation moment lies on that Monday.

The system will not generate the second planned order before the next Monday.

However, if there is no need to generate an order on that next Monday, then the next generated order determines the start of the new order interval.
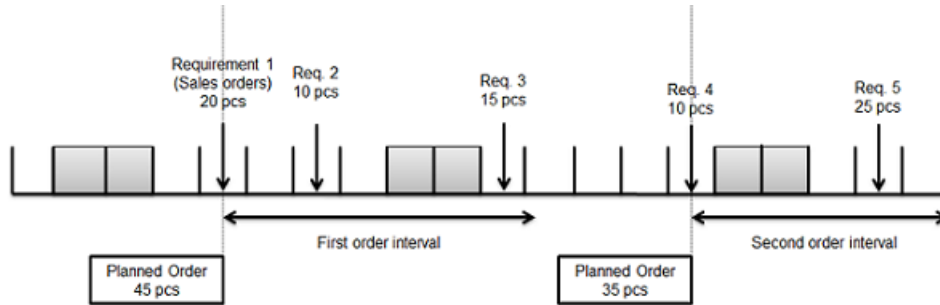
Order interval

Legend

▭	Weekend
Order Interval =	1 week

Some fields in the Item - Ordering (tcibd2100s000) session are explained in the following table.

Item ordering data

Field	Description
Order Policy	If this field is **Anonymous**, the item is made to stock (not ordered for a specific customer or project). If this field is **To Order**, the item is a project item (ordered for a specific customer or project).
	For more information, refer to the documents on **Engineer-to-Order**, Assemble-to-order, and Make-to-order order policies.
Critical in Planning	If this check box is selected, the item is critical in the production process. The item is by default part of the Bill of Critical Materials (BCM).

Warehouse	The default value for the warehouse for the plan items based on this item.
Reorder Point	This field is not used in Enterprise Planning.
Service Level [%]	This field is not used in Enterprise Planning.
Safety Stock	The quantity that is planned to remain available in inventory at times when the stock is low. The purpose of the safety stock is to avoid that the item becomes out-of-stock if the demand is higher than expected.
	In the master-planning process, Enterprise Planning uses the safety stock to generate the inventory plan. The inventory plan is subsequently used to generate the orders.
	In the order-planning process, Enterprise Planning uses the safety stock directly for the generation of orders.
Safety Time	A time period (expressed in hours or days) that is added to the lead time as part of the lead-time offset in Enterprise Planning. For more information, refer to the topic document on lead times.
First Allowed Order Date	This field is not used in Enterprise Planning.
Order Costs	This field is not used in Enterprise Planning.
Planner	This field is not used in Enterprise Planning. You can define a plan item's planner in Enterprise Planning.
Shop Floor Planner	This field is not used in Enterprise Planning.
Seasonal Pattern for Safety Stock	This field affects a plan item's inventory plan.
Seasonal Pattern for Forecast	The seasonal pattern for forecast affects the demand forecast calculation.
Number of Periods for Forecast	This field is not used in Enterprise Planning.

Net change date (display-only field)	The last time on which production orders, demand data, BOMs, routings, bills of critical materials, or bills of critical capacities have changed.
	Enterprise Planning uses the value of this field if you execute a net-change planning run.
Net change flag (display-only field)	If this check box is selected, a change occurred in the static data or in the goods flow. In the next planning run, Enterprise Planning must take these changes into account.
	The net change date tells you from where the planning should be run. Before the net change date, the system does not have to re-execute the planning calculations, because no changes occurred there. If you execute a planning run, Enterprise Planning clears the check box.
Update Inventory/Order Data	This field is not used in Enterprise Planning.
PCS Project (Recommended OQ, OQ)	This field is not used in Enterprise Planning.

Clusters and Planned items

The cluster concept allows you to perform integrated planning over multiple sites. A cluster represents one or more warehouses located near each other – typically, the warehouses at a particular site or in a particular country.

You can define a plan item for each combination of cluster and item code.

The plan item code includes these segments:
- The cluster segment prefixes
- The item code segment

Therefore, the plan item represents the combination of item definition and location.

Clustered items and nonclustered items

You can also define a plan item with an empty cluster segment. The empty cluster is used to model the production environment; the other clusters are used for modeling the supply chain structure for Distribution Requirements Planning (DRP).

For plan items, we use the following terms:

- **Clustered item**
  Plan item with the cluster filled
- **Nonclustered plan item**
  Plan items with empty cluster segment

If it is not relevant if the cluster is filled, we will speak just of *plan items*.

The clustered item groups all inventory and planned inventory transactions of all warehouses that are assigned to the cluster.

The nonclustered plan item groups all inventory and transactions of all warehouses not linked to any cluster.

To view the planned inventory transactions, use the Planned Inventory Transactions (whinp1500m000) session.

Note

The planning system ignores inventory and planned inventory transactions of warehouses that are explicitly excluded from the planning process, such as a warehouse for rejected items or spare parts.

To exclude a warehouse from the planning process, clear the **Include in Enterprise Planning** check box in the Warehouses (whwmd2500m000) session.

Example of clusters

Suppose you defined item S-3501.

You also defined the following clusters:

- EUR (Europe)
- NA (North-America)
- JAP (Japan)

Now, you can define four plan items all representing the same physical item:

- EUR S-3501
- NA S-3501
- JAP S-3501
- S-3501

The planning engine treats these four plan items as four different items. For each plan item, the system maintains the anticipated receipts and issues, expected inventory levels, and forecast demand separately.

The plan item concept supports the following functionality:

- MRP (Material Requirements Planning)
- MPS (Master Planning Schedule)
- PRP (Project Requirements Planning)
- DRP (Distribution Requirements Planning)

Similarly, you can specify plan items for project items. In that case, the plan item code has three segments: cluster, project, and item code.

Items - Planning (cprpd1100m000)

To define plan items, use the Items - Planning (cprpd1100m000) session.

The following fields in the Items - Planning (cprpd1100m000) session are relevant for the order planning.

Item planning data

Field	Description
Plan Item	The plan item code consists of first, the cluster code, then the project code, then the item code
Description	The description of the plan item is defined in the general item data.
Plan Item Type	The plan item type can be item or family. This type indicates the role the item plays in planning. For more information, refer to the next field.
Plan Level	This level is intended for the planning of product families. *Example:* a manufacturer of bicycles has a family 'bicycles' on level 1, on level 2 he models the sub-families Woman's bikes, Men's bikes and Children's bikes. On level 3 the real items are defined. Enterprise Planning cannot handle BOM explosion for items that are defined on different levels. You are advised to model the plan items of plan item type Item on the lowest plan level.
Default Supply Source	Extends the item type as defined in the Items - General (tcibd0501m000)) session. The item type just distinguishes manufactured and purchased parts, while this source adds distribution to the scope of sources.

Actual Supply Source (display-only field)	This field determines the kind of supply order to be generated – planned purchase, planned production or planned distribution orders.
	If the default supply source is 'Production/Purchase', the item type from the General Item Data or the date-effective item type determines whether the source is Production or Purchase. The sourcing strategy can overrule the value of this field.
Default Warehouse	The warehouse where the planned orders are generated for. The default value for this field is re-trieved from the general item data.
	You can specify one of the warehouses that belong to the same cluster as the item. You can find a warehouse's cluster under Cluster Details in the Warehouses (tcemm1112m000) session.
Calendar of Default EU (display-only field)	If no specific work center calendar is found, LN uses the calendar of the warehouse's enterprise unit to determine the correct calendar for the lead time calculations and determination of start and finish date of the order. This is only needed when no cal-endar can be found.

Planner	In many sessions, you can use the planner ID to make selections of items, orders, and sig-nals. In many business cases, the planners are responsible for specific items or groups of items.
	The Planner field makes this responsibility visible to all the users. Planners can run the planning run (order generation) for their own items, view their own signals (exception mes-sages and warnings) and set the tolerances. The Planner field is not used for authorization, it is just a selection mechanism.
Fixed De-livery Type	
Maintain Master Plan	If this check box is selected, you can maintain a master plan for the item. An item's master plan is central to the master-based planning method. However, a master plan is also useful for the order-based planning method, although not required.
	The following functionality is available if you select the Maintain Master Plan check box:
	■ Aggregation and disaggregation of data

- Inventory plan – to differentiate the required inventory level by plan period
- Forecast generation based on historic demand
- Record extra demand by plan period

Safety Stock (display-only field)	This field displays the sum of the item's safety stock for all warehouses in the cluster. You define the safety stock for each warehouse in the Warehouse - Item (whwmd2510m000) session.
	If the Use Item Ordering Data check box is selected in the Warehouse - Item (whwmd2510m000) session, LN retrieves the safety stock value from the ordering data in the Items - Ordering (tcibd2500m000) session. If multiple warehouses refer to ordering data, LN adds this central safety stock only once to the safety stock of the cluster.
Time fence (on the Horizons tab)	The time fence defines the horizon where Enterprise Planning is not allowed to generate new supply orders. The time fence is meant to freeze the planning on the short term to prevent from creating nervousness in the planning schedule and the production schedule on the shop floor. It is recommended to make the time fence equal to the lead time of the item.
	Usually, orders that are due in the near future – *before* the time fence – have already been released to the execution level, because the start date for processing has been reached.
	The released orders are probably also scheduled already on the shop floor, so stability of the plan within this time fence is important. You can express the time fence in working days or working hours. The time fence is calculated from the current date. Note that a value of 0 also has effect. That time fence will prevent Enterprise Planning to plan orders in the past.
Use Time Fence	
Forecast Time Fence	
Order Horizon	Determines the time frame in which planned orders are generated. The order horizon is expressed in working days and calculated from the current date.
Planning Horizon	Determines how far Enterprise Planning looks forward in time when planning supply and demand. The planning horizon applies to both order planning and master planning.
	Master planning can only be executed after the order planning horizon.

	Therefore, when the planning horizon is equal to the order planning, no plan but only orders can be generated. After the planning horizon, nothing exists from a planning perspective. No transactions are considered and no plans or orders are generated.
Safety Time (display-only field)	A buffer between finish date of the planned order and the requirement date (for example, date of sales order). Either the plan item's default warehouse in combination with the plan item or the plan item itself determines the safety time.
Order Lead Time (display-only field)	The time between the order's start time and finish time. LN uses the order lead time for order generation in order to determine the planned order start date outside the fixed lead time horizon. If the order's source is purchase, Enterprise Planning retrieves the lead time for purchase orders. The purchase order lead time is the supply time defined in item purchase data. If the order's source is production, Enterprise Planning retrieves the lead time for production orders. The order lead time of orders for distribution plan items is zero. The production order lead time is retrieved from the item production data.
Extra Lead Time	Models a processing step outside the normal processing time (thus on purpose not between the start and finish date of the planned order). Time unit is working days.

Start of Fixed Lead Time Horizon	
Cumulative Order Lead Time (display-only field)	
Non-Critical COLT (display-only field)	
Online ATP Update (CTP tab)	Together with the **Online ATP Update in EP** check box in the Planning Parameters (cprpd0100m000)

session, this field determines whether changes in goods flow (inventory, planned transactions) directly update the item master plan.

Items - Purchase Business Partner (tdipu0110m000)

Item-supplier information becomes relevant to Enterprise Planning, if you generate planned purchase orders. Enterprise Planning always searches for item-supplier information. If the item-supplier information is not available, Enterprise Planning generates the order without business partner.

The following table explains some of the parameter settings in the Items - Purchase Business Partner (tdipu0110m000) session.

Item – Purchase Business Partner

Field	Description
Item	The item segment of the plan items to which this record applies. All plan items with the same item code as the item code in the item supplier information, can use this record. In this way, there can be a one-to-many relation between plan item and item-supplier information.
Item Group	You can leave the item code empty and fill this field. In this way, you can define the item-supplier information on two levels: item and item group. Enterprise Planning always searches for the item level first and then for the item-group level.
Ship-from Business Partner	The business partner from where the ordered item is shipped.
	Note: if the warehouse in the Ship-from Business Partners (tccom4521m000) session is not equal to the warehouse on plan item data, this supplier is ignored. An empty warehouse for the ship-from business partner means the business partner can deliver to any warehouse.

Effective date and expiry date	The dates between which the record is effective. If the supplier is not effective, LN does not consider the supplier during simulation.
Preferred	The preferred supplier among a group of alternative suppliers. At any single time, only one item supplier can be the preferred supplier.
Status	This field indicates whether the supplier is blocked.
Priority (Sourcing tab)	LN uses the priority of the item-supplier record for the supplier choice during the order generation process. Zero is the highest priority, 999 is lowest priority.
Sourcing Percentage (Sourcing tab)	LN uses the sourcing percentage of the item-supplier record for the supplier choice during the order generation process. The sourcing percentage is always used as a relative percentage compared to the other item supplier records with the same priority
Order Quantities (Ordering tab)	Each item-supplier record has its own order-quantity settings. Enterprise Planning applies the rules of the most detailed level. The order-quantity settings fulfil the same role as the order-quantity settings on Item Ordering level.
Carrier (Receiving tab)	Determines the transportation time that is used for the lead time calculation of the planned order.
Lead Time Horizon	Determines the date from where the planning of the order lead time is done. Planning is done only on the calculated lead time and not the individual lead-time components. The use of a lead-time horizon saves system performance of the order generation process. This horizon fulfills the same role as the fixed-lead-time horizon in Enterprise Planning for planned production orders.
Calculated Lead Time (display only)	The calculated lead time that represents the lead time components. The calculated lead time is a combination of internal processing time, safety time, supply time, transportation time and warehouse in-

	bound time. The calculated lead time fulfills the same role for planned purchase orders as the order lead time on plan item data for planned production orders
Supplier Capacity (Shipments tab)	Reflects what the supplier can ship during a predefined span of time. The supplier capacity is a constraint for order generation. When the total supply of all the orders that were generated for this item-supplier combination within the capacity time unit exceeds the capacity, Enterprise Planning generates no more orders. The constraint is not only determined by the supplier capacity, but also by the maximum capacity tolerance.
Maximum Capacity Tolerance	Tolerance that indicates how far the supplier capacity can be exceeded for order generation. The constraint for order generation is thus determined by the following formula: `(order quantities of all supply orders) per capacity time unit ] <= [ Supplier capacity * (1 + Maximum Capacity Tolerance/100)`
Capacity Time Unit	Defines the bucket length for supplier capacity. LN calculates the bucket start dates starting from the scenario start date

Warehouse - Item (whwmd2510m000)

In many cases, the items are stored in several warehouses. For each warehouse, Enterprise Planning can use different characteristics for order generation, order processing, valuation method and so on. You can achieve this by defining the item data by warehouse in the Warehouse - Item (whwmd2510m000) session. Most of these parameters are also defined in the Items - Ordering (tcibd2500m000) session. If Enterprise Planning finds no parameters for the specific item-warehouse combination, the parameters in the Items - Ordering (tcibd2500m000) session are used.

The following parameter is available in this session.

Warehouse – Item

Field	Description
Use Item Ordering Data	If this check box is selected, Enterprise Planning uses the ordering data from the Items - Ordering (tcibd2500m000) session. If this check box is cleared, Enterprise Planning uses the ordering data that you defined in the Warehouse - Item (wh-wmd2510m000) session, based on the default warehouse of the plan item.

Item structures

Bill of Material (tibom1110m000)

For production planning, Enterprise Planning and Shop Floor Control make use of the item structure and the routing for these items. The item structure, also called the Bill of Materials (BOM), describes the relationships between items in a production environment. Items that are related to each other have a parent-child relation:

A is parent of B and C
B and C are child of A

C is parent of D
D is child of C
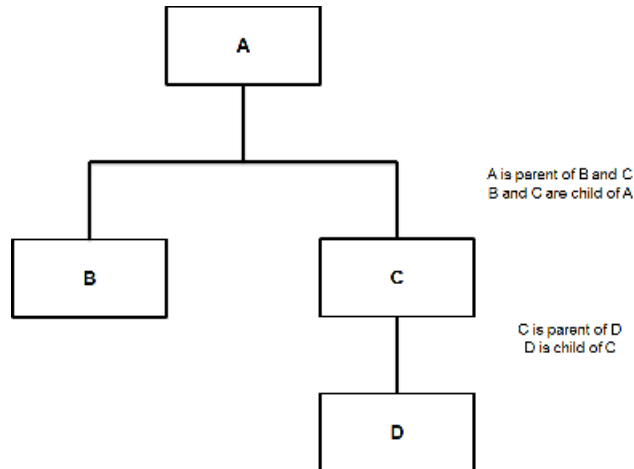
Each parent-child relation has specific characteristics that are defined on the BOM line, such as scrap percentage, scrap quantity, and net quantity.

Enterprise Planning uses the bill of material for several purposes:

- Material explosion for order planning
- BOM generation for customized items (customized item derived from a standard item) (Make to Order (MTO).

■ The BOM is the basis for the Bill of Critical Materials (BCM) generation. Enterprise Planning uses the BCM for material explosion for master planning and for available to promise (ATP) checks across the whole planning horizon.

Item - Routings (tirou1101m000)

An item can have a routing and a routing can have one or more routing operations. Each operation describes a process step on a specific work center.
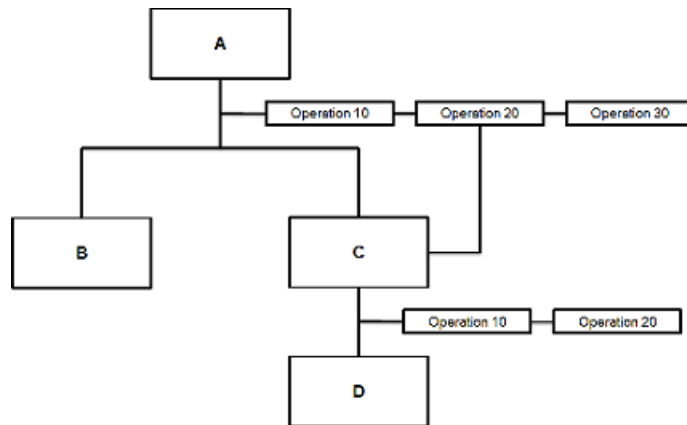
The operation defines the processing and waiting times and things such as scrap and yield. Enterprise Planning uses the routing to perform the following:

■ Generate the operations of the planned production orders. All operations together determine the planned start and finish date of the order.
■ Generate the project routing.
■ As the basis for the Bill of Critical Capacities (BCC). The BCC is used for master planning and Capable to Promise (CTP) checks of the resources. BCC is also used for CTP checking in the order planning horizon.

In the example above item A has a routing with 3 operations.

Operation 10 is the first operation and 30 the last operation.

Item C has two operations.

> **Note**
>
> The materials are always planned at the beginning of the routing except when on the BOM line it is defined that the material should be available at a specific routing operation (like C) that is linked to operation 20.
>
> This link is defined on the **Operation** field of the BOM line.
>
> When the **Operation** field is empty, the material is planned at the start of the routing which is at the start of operation 10.

BOM Line - Material-Routing Relationships (tibom0140m000)

The material-routing relationship is an extension of the Operation-on-BOM-line concept. The link between material and operation is dependent on the selection of the (quantity dependent) routing.

The screen dump below shows the material-routing relationship for a BOM line. The header defines the item and position of the BOM line in the BOM. Each line (record) defines a relation of this BOM-line item (component) to an operation for each specific routing.

With this relationship, you can link BOM lines to an operation of a specified routing.
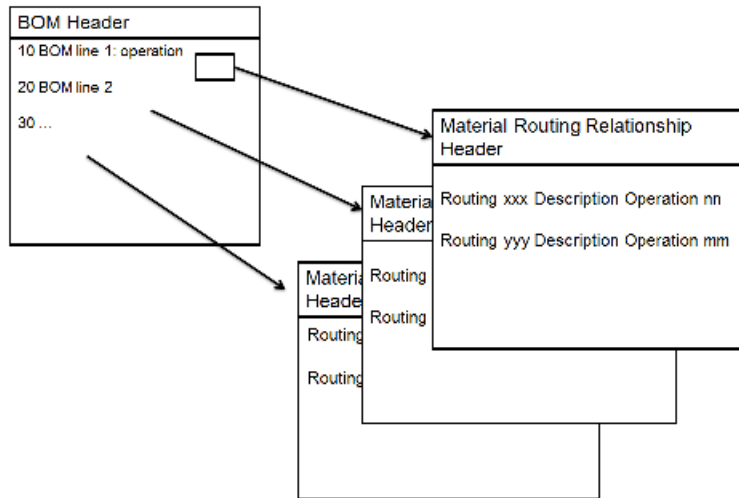
Example

With this relationship you can say: this BOM line is required at the beginning of operation 20 when an order is planned with routing 001 and at the beginning of operation 40 when the order is planned via routing 002.

This concept is supported by Shop Floor Control, but not by Enterprise Planning. Therefore, the functionality is not working for planned orders. The functionality is only available for manually entered production orders.

In these situations, this will not lead to problems:

- The material-routing relationships are not defined.
- The material-routing relationships are defined but an operation is specified on the BOM-line, which means the material-routing relationship is overruled.
- The material-routing relationships are defined but you accept your materials to arrive earlier than necessary. The materials will never be too late, they only can be too early.

Supply chain modeling

Supplying Relationships (cprpd7130m000)

The supplying relationships model the distribution structure for Distribution Requirements Planning (DRP). Supplying relationships model a plan item relation and not a location-to-location relation. The plan item itself defines the location by the cluster code and the default warehouse of the plan item.

You can define supplying relationships on these levels:

- Plan item
- Cluster
- Item group

Enterprise Planning searches for supplying relationships on each level (first on plan item level, then on cluster level, and so on) until an applicable supplying relationship is found.

Capable-to-Promise (CTP) checks are also performed by using supplying relations but never more than only one level deep.

The following table explains some of the parameter settings in this session.

Supplying relationships

| Field	Description
Supplying Site	Defines the site were the supplying item is defined. You can define a supplying relationship over multiple sites.
Effective Date and Expiry Date	Determine if the supplying relation can be selected for order generation.
Supply Costs	Enterprise Planning uses the supply costs for the supplier choice when a supply strategy is defined for an item. The supply source can be determined at least costs.
Percentage	This field is used as a relative percentage in the supply allocation
Priority	This field is used to order the supplying sources based on the priority rules as defined in the supply strategies.

Supply Resource, Supply Lead Time and Carrier	These fields are used for lead-time calculations.
Supply Lead Time	The transportation time from supplying warehouse to the receiving warehouse.
Carrier	The carrier responsible for moving the goods between the supplying and the receiving warehouse.
Minimum Volume	This field is used in the process of assigning planned supply to this supply source.
Maximum Volume	The maximum is a hard constraint. When the total amount of supply that is generated for this supplying relation meets the maximum volume, no further supply can be generated.
	Note that this constraint is not bound to a time unit, but is valid for the whole time between effective and expiry date (total amount of supply = planned orders, interplant planned distribution orders, adjustment orders (cycle counting), transfer orders, assembly orders)
Maximum Days Overdue	The number of days that a supplying relation can be selected before or after the planned finish date.

Supply chain strategies

The supply chain strategies consist of two layers:

- **Sourcing Strategies**
  The sourcing strategy defines how Enterprise Planning must choose between the sources of supply, which are manufacture, purchase or distribution. The sourcing strategy determines how demand is fulfilled by what kind of supply.

- **Supply Strategies**
  The supply strategy defines per source the supplier choice within that source. For example: when Enterprise Planning decides on the basis of the sourcing strategy that a planned purchase order should be generated, the supply strategy determines which supplier will be selected.

Therefore, the process of sourcing and supplier choice is a two-step approach.
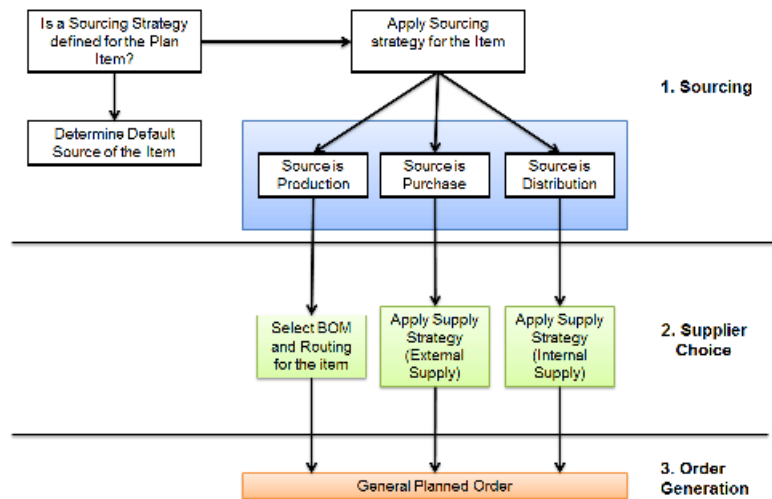
Sourcing Strategy

Enterprise Planning can generate orders for different types (production, purchase, and distribution) for the same plan item. The a plan item's sourcing strategy determines how the supply is distributed over these sources.

You can define sourcing strategies on these levels:

- **Cluster**
- **Item Group** (within a cluster)
- **Plan Level**

Supply Strategy

In the order generation process, Enterprise Planning first determines the source (purchase, or distribution) and then the supplier.

The supply strategy defines how Enterprise Planning selects the supplier.You can define two kinds of supply strategies. The supply type can be either **Purchase** (external) or **Distribution** (internal).

Appendix A
Glossary

COLT

See: *cumulative order lead time (p. 33)*

cumulative order lead time

The total value of the item purchase lead time and the cumulative production lead time of all components.

Enterprise Planning uses the cumulative order lead time to determine the minimum value of the planning horizon.

Acronym: COLT

economic order quantity

The amount of an item to be purchased or manufactured at one time. This amount is the quantity for which the combined costs of acquiring and carrying inventory are the lowest. This is also referred to as the minimum cost order quantity.

enterprise unit

A financially independent part of your organization that consists of entities such as departments, work centers, warehouses, and projects. The enterprise unit's entities must all belong to the same logistic company, but a logistic company can contain multiple enterprise units. An enterprise unit is linked to a single financial company.

When you carry out logistic transactions between enterprise units, these are posted in the financial companies to which each enterprise unit is linked. You can define the relationships between the enterprise units, and thus the goods transfer that can take place between the enterprise units. To use invoicing and pricing between enterprise units, you must link the enterprise units to internal business partners.

You can use enterprise units to do separate financial accounting for parts of your business. For example, you can define enterprise units for separate parts of your organization that belong to one logistic company, but that are located in different countries. The accounting of each enterprise unit is performed in each country's national currency, and in the financial company linked to the enterprise unit.

execution level

Within Enterprise Planning, the designation of the LN packages that control the execution of orders and the actual goods flow, such as:

- Manufacturing
- Order Management
- Warehousing

Enterprise Planning uses planning algorithms to carry out simulations and optimizations. The other packages control the execution of orders, and the goods flow.

fixed delivery code

A code that identifies a collection of fixed dates and times on which external suppliers and internal suppliers are expected to make their deliveries to your address.

For each plan item you can select the appropriate fixed delivery code.

fixed lead-time horizon

The time period for which Enterprise Planning uses a fixed lead time to plan orders.

Planning with a fixed lead time is faster than planning on the basis of routing data, but the results are less precise.

The start date of the fixed lead-time horizon is defined in the plan-item settings. The end date coincides with the end of the order horizon.

Before the fixed lead-time horizon, Enterprise Planning plans on the basis of routing data. Within the fixed lead-time horizon, Enterprise Planning plans using a fixed lead time.

master-based planning

A planning concept in which all planning data is accumulated into time buckets with predefined lengths.

In master planning, all demand, supply, and inventory data is handled in terms of these time buckets, and is stored in master plans.

In master planning, supply is planned in the form of a supply plan. This supply plan is calculated on the basis of demand forecasts, actual orders, and other information. For production planning, this planning method only considers critical requirements, as recorded in an item's bill of critical materials and bill of critical capacities.

Note
In Enterprise Planning, you can maintain a master plan for an item, even if you plan all supply with order planning.

noncritical COLT

See: *noncritical cumulative order lead time (p. 35)*

noncritical cumulative order lead time

The total value of the item purchase lead time and the cumulative production lead time of all noncritical components.

Enterprise Planning uses the noncritical cumulative order lead time to determine the minimum value of the order horizon.

Acronym: noncritical COLT

order-based planning

A planning concept in which planning data is handled in the form of orders.

In order planning, supply is planned in the form of planned orders. LN takes into account the start and finish dates of individual planned orders. For production planning, this method considers all material and capacity requirements, as recorded in an item's BOM and routing.

> **Note**
> In Enterprise Planning, you can maintain a master plan for an item, even if you plan all supply with order planning.

order horizon

The time period for which Enterprise Planning uses order-based planning to plan supply.

The order horizon is expressed as a number of working days from the date you carry out the simulation.

If the order horizon is zero, Enterprise Planning does not use order-based planning for the item involved.

To calculate the order horizon, LN uses the calendar that you specified for the enterprise unit of the default warehouse to which the plan item belongs.

If you did not specify an enterprise unit for the default warehouse of the plan item, Enterprise Planning uses the company calendar to calculate the order horizon.

> **Note**
> LN moves the order horizon towards the end of the plan period) in which it falls, because Enterprise Planning must know whether a plan period falls within the order horizon.

pattern

A scheme on which you can define the day of the week, day of the month, or day of the year, and the time of the day you want an activity, such as a release or a delivery, to be carried out.

planned order

A supply order in Enterprise Planning that is created for planning purposes, but which is not an actual order yet.

Enterprise Planning works with planned orders of the following types:
- planned production order
- planned purchase order
- planned distribution order

Planned orders are generated in the context of a particular scenario. The planned orders of the actual scenario can be transferred to the execution level, where they become actual supply orders.

plan period

One of a series of time buckets into which all planning data in a master plan is accumulated.

Plan periods are defined in the context of a scenario.

Plan periods are identified by a period number, and are defined in days, weeks, or months.

special demand

An extra item quantity that is expected to be sold in a plan period, on top of the forecast demand, and for a specific reason. For example, a special sales action.

You can view and maintain special demand in the Special Demand by Item (cpdsp2100m000) session. Here you can also record a reason for each instance of special demand.

The assembly-part demand forecast from Configurator is also stored as special demand.

The special demand is part of the demand plan for a plan item or channel.

time fence

The date until which an item's supply plan and planned orders are frozen.

The time fence is expressed as a number of working days or working hours from the date you carry out the simulation.

As a rule, Enterprise Planning does not regenerate the supply plan or the planned orders within the time fence. However, you can overrule this behavior when you run a master-plan simulation or order simulation.

The time fence is meant to prevent:
- Disturbance of orders that have already started (at the shop-floor level).
- Generation of planned orders with start dates in the past (that is, orders that are late).

Usually, the lead time of an item's production process is a reasonable value for the time fence.

Index