Infor LN Enterprise Planning User Guide for Clusters

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About this document

This document describes the setup of warehouses, connected by supplying relationships into clusters. These clusters, are used in Enterprise Planning as one unit for planning purposes.

Document summary

This document describes how to use the cluster concept in the Enterprise Planning package of Infor LN. A cluster represents a geographical area.

Enterprise Planning plans the fulfillment of required items at a cluster through careful balance of three sources of supply:

1. Local production
2. Local purchasing
3. Transfer from other clusters (distribution)

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Chapter 1
Introduction

1

Clusters introduction

The internal network in companies is becoming increasingly complex. Forecasting, sales, inventory planning, order acceptance, and inventory replenishment can take place in and between every entity of that network. These entities can be the following:

- Production sites
- The head office
- Regional distribution center
- Decentralized sales offices

Enterprise Planning supports all of these business procedures for various entities, using the cluster concept. A cluster represents a geographical area. For each item, you can define several plan items, one for each cluster, and a nonclustered item that is not linked to any cluster, as shown in the following example:

- Clusters: `A`, `B`, `C`
- Item: `RAL END 1`
- Plan items:
  - **a.** `A/ RAL END 1`
  - **b.** `B/ RAL END 1`
  - **c.** `C/ RAL END 1`
  - **d.** `- / RAL END 1` (nonclustered item)

Functionally, a nonclustered plan item does not differ from a clustered plan item. The nonclustered plan item simply represents one of the geographical areas. If a logistical company has only one location, you need not define any clusters and can simply use nonclustered plan items for that location.

To support planning by location, the planning process takes the requirements and supply strategies for each plan item into account separately.

In addition, each clustered plan item, as well as the nonclustered plan item, has a unique item order plan view and (optionally) item master plan view that enables you to evaluate all requirements and supplies.

Note

The cluster concept is only used in Enterprise Planning. The other packages in LN, such as Warehousing, Procurement, and Manufacturing, do not use clusters.

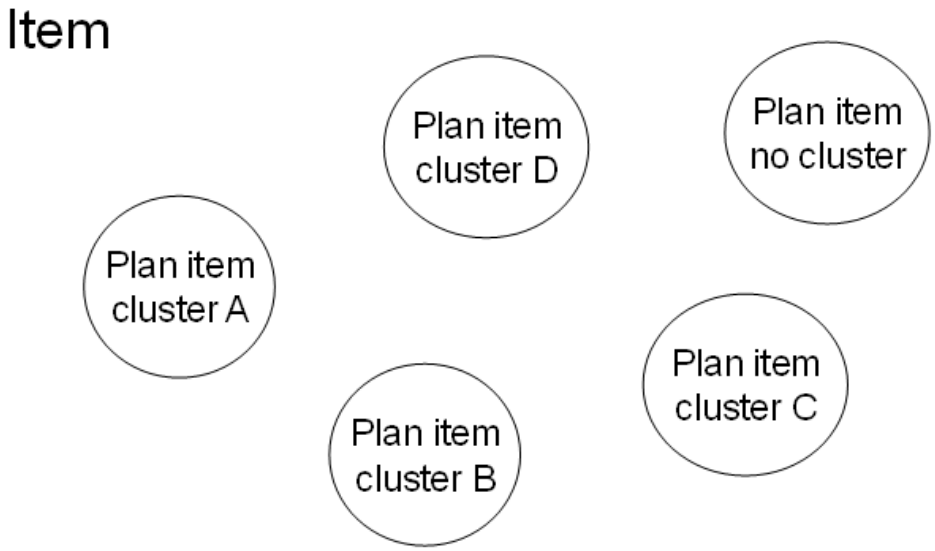
Chapter 2
Cluster Concept

2

To enable planning by item and warehouse

A cluster is a group of one or more warehouses in a particular geographical area. You can plan an item by cluster (geographical area).

To enable this, you can set up multiple plan items for one item. You always define one plan item without a cluster indication and multiple plan items with a cluster indication. From now on, a plan item with a cluster will be called a *clustered plan item*, and the plan item without cluster will be called the *nonclustered plan item*.

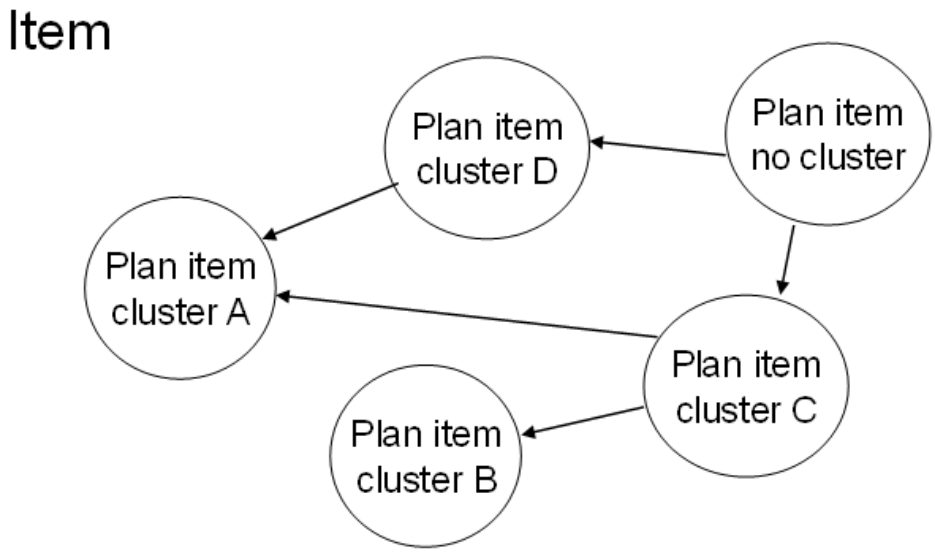


You can set up distribution relationships between the clustered and nonclustered plan items. This setup supports distribution requirements planning (DRP) in Enterprise Planning on individual warehouses as well as on a more aggregated level, such as a group of warehouses in one cluster.

To perform DRP on planning level, you must use clusters. You can define distribution relationships in all directions, even from a clustered item to the nonclustered item.

Support for Distribution Requirements Planning (DRP)

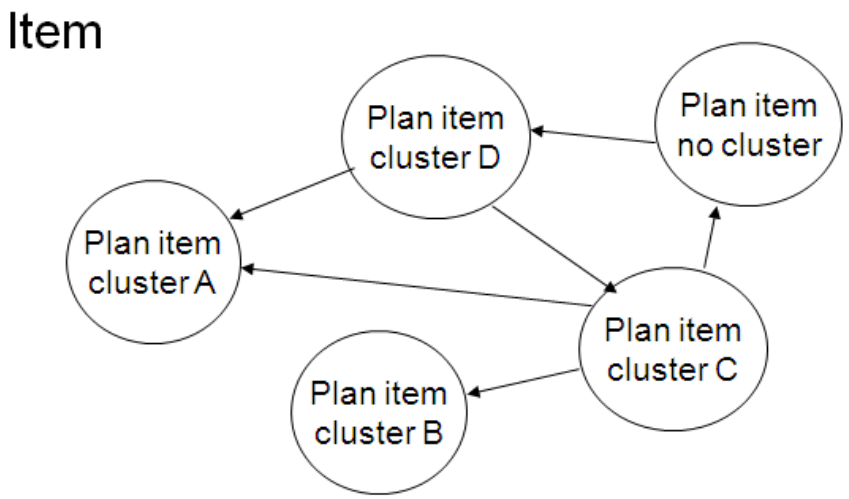
The following figure illustrates how the cluster concept supports Distribution Requirements Planning (DRP):



Cycles

You can also define distribution relationships from a clustered plan item to a nonclustered plan item. However, no cycles are permitted in these relationships. If you run the Compute Phase Numbers (cprpd6200m000) session, LN automatically checks the supplying relationships and detects and reports any loops (cycles) in the structure.

The following figure provides an example of a cycle in the supplying relationships:



The following relationships constitute a cycle, which continually generates dependent demand:

- The nonclustered plan item and cluster D
- Clusters D and C
- Cluster C and the nonclustered plan item

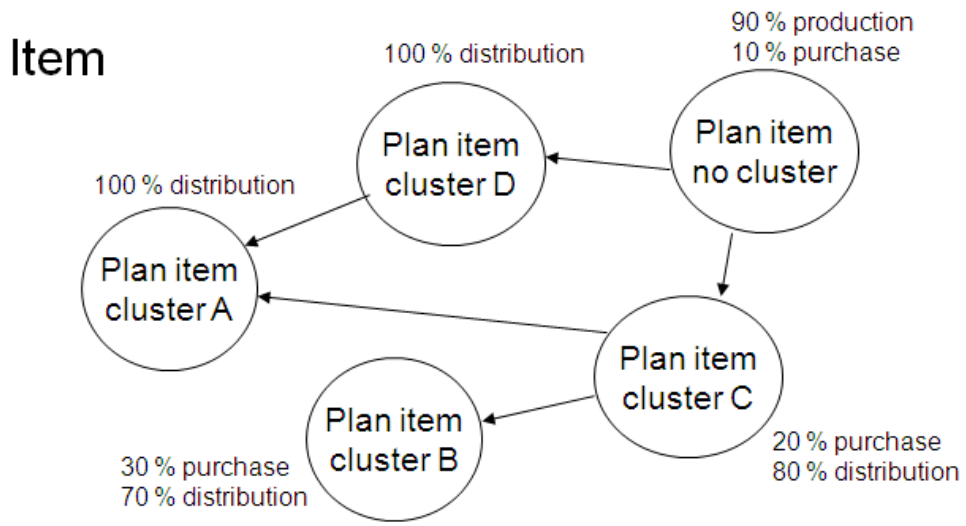
Local production and purchasing

The plan items in the clusters can be supplied not only by distribution, but also through purchase and production. In this way, you can, for example, plan local purchasing in a cluster (geographical area). You can also plan supply from multiple sources.

Example

Eighty percent of an item's required quantity is supplied by distribution from the central warehouse to the cluster (regional distribution center), and twenty percent of the item's required quantity is purchased locally by the cluster.

The following figure shows the sourcing possibilities for clustered plan items:



You cannot use the source production for more than one of the clustered and nonclustered items, because only one bill of material and routing for each item is available.

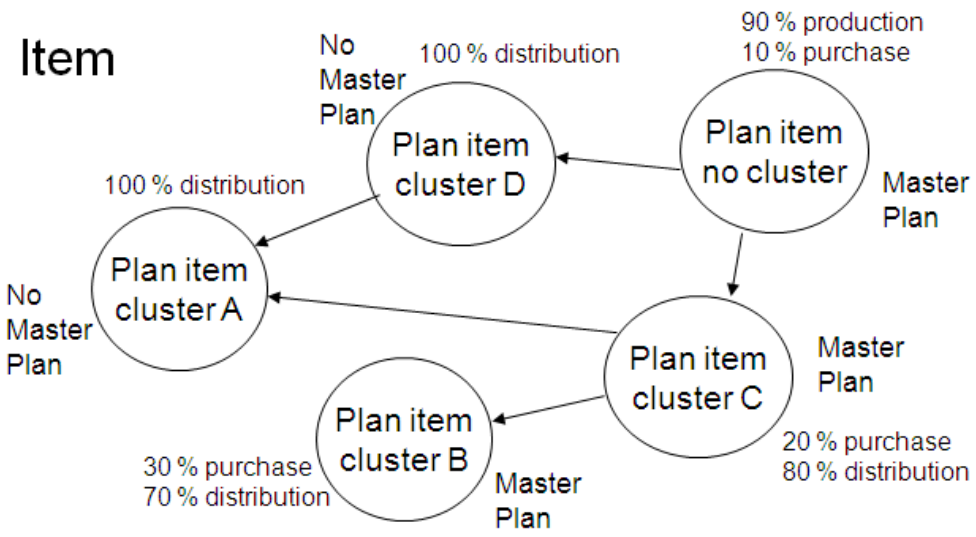
Local master-plan functionality

Master-plan functionality enables you to perform forecasting and inventory planning. To perform these activities not only on the central level, on nonclustered items, but also decentralized, on clustered items, LN provides master-plan functionality for clustered items. Aggregation and disaggregation of forecasts, plans, and orders between the central office and the regional distribution centers and sales offices is also enabled through the use of master plans.

Of course, master plan maintenance is not mandatory for clustered items. Available-to-promise information (ATP), in that case, is still available for clustered plan items, because you can obtain ATP information without a master plan.

The use of a master plan, which supports forecasting and inventory planning on clustered items, is depicted below:

The following figure shows the sourcing possibilities for clustered plan items:



Note

You can maintain a master plan for an item without using master-based planning. Master-based planning is based on the bill of critical materials and the bill of critical capacities. You can use order-based planning instead of master-based planning.

Chapter 3
Master Data

3

Cluster of warehouses

A cluster represents a geographical area that contains one or more warehouses or a company entity, such as a production site, regional distribution center, or sales office.

You can define clusters in the Clusters (tcemm1135m000) session. The cluster is connected to the warehouses that are part of the cluster.

To link a warehouse to a cluster, use the Warehouses (tcemm1112m000) session. A cluster can also include warehouses for which the **Include in Enterprise Planning** check box is cleared. During the order planning and master planning, LN ignores the stock transactions of these warehouses. You can use this, for example, to designate warehouses for rejected goods.

Cluster plan item

The cluster is one of the segments in the plan item code. Therefore, every clustered plan item has its own planning parameters. You define a plan item's planning parameters in the Items - Planning (cprpd1100m000) session.

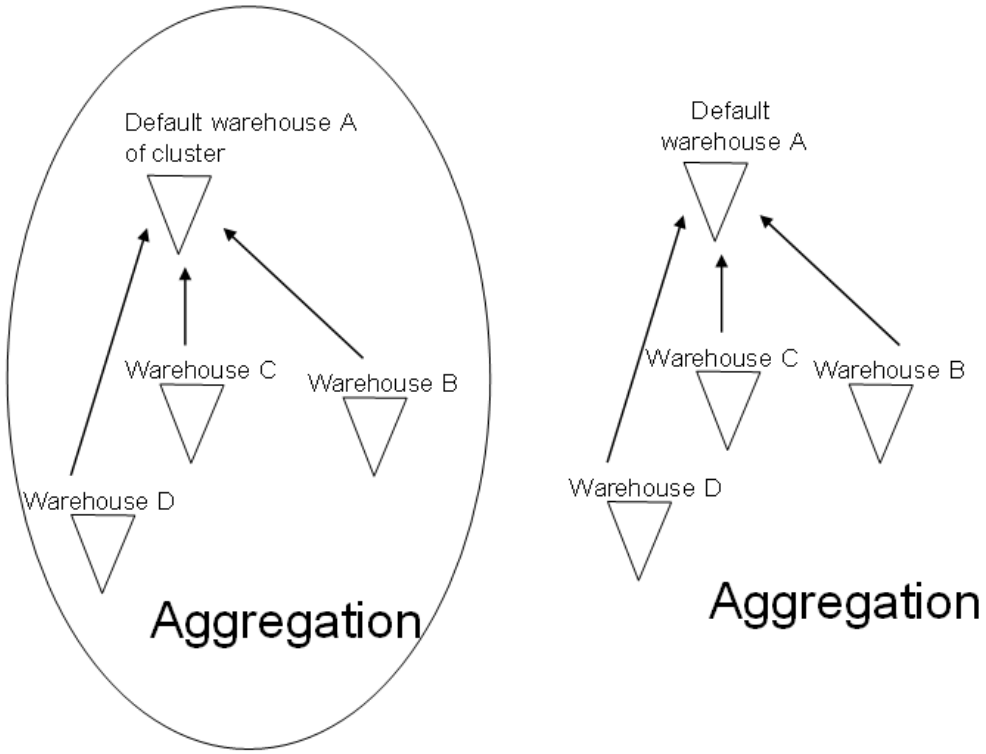
Example

- Cluster: USA
- Plan Item: USA RAL END1
- Default Warehouse: NY

Default warehouses for plan items

If a single cluster contains multiple warehouses, the planning is always aggregated to one default warehouse for a plan item.

The following figure provides an illustration of this type of aggregation:



The default warehouse for both clustered and nonclustered plan items is defined in the Items - Planning (cprpd1100m000) session. The inventory and requirements (demand) are automatically aggregated to the default warehouse. The planning always supplies to this default warehouse, based on the aggregated quantities.

Supply source for clustered items

A clustered plan item can be supplied by distribution, purchase, or production. You can also define multisourcing strategies.

Distribution

If the default supply source is **Distribution**, the plan item is replenished from warehouses in other plan clusters. To set up distribution planning (DRP), you must define supplying relationships between the planning clusters (warehouses) in the Supplying Relationships (cprpd7130m000) session. The DRP functionality uses these relationships to generate planned distribution orders to supply the planning cluster.

Note

You must define warehouse supplying relations on planning cluster level. You do not need supplying relationships on warehouse level, because Enterprise Planning always plans on the same default warehouse per planning cluster.

Purchase

If the actual supply source is **Purchase**, external suppliers supply the plan item. This setup is called local purchasing.

To set up purchase planning, use these sessions:

- Items - Purchase (tdipu0101m000)
- Item - Purchase Business Partner (tdipu0110m000)
- Supply Strategy (cprpd7120m000)

The planned cluster segment is only applicable in Enterprise Planning. Therefore, all the plan items use the same purchase data and item purchase business partner information.

The supply strategy is optional and you can define a supply strategy for each cluster. This strategy determines the priority rules for the selection of suppliers during the planning run.

Production

If you set the default supply source to **Job Shop**, production orders supply the clustered plan item. To set up production planning, the following sessions are the most important sessions:

1. Bill of Material (tibom1110m000)
2. Routing Operations (tirou1102m000)
3. Bill of Critical Materials (cprpd3120m000)
4. Bill of Critical Capacities (cprpd3130m000)

The cluster segment is only used in Enterprise Planning. As a result, the clustered plan items use the nonclustered manufactured item's BOM, routing, bill of critical material (BCM) and bill of critical capacities (BCC). In the order horizon, the planning routines use BOMs and routings to explode material requirements and operations. In the planning horizon, the planning routines use BCMs and BCCs to explode material requirements and operations.

Multisourcing

Clustered plan items can also have multiple sources of supply, such as a combination of distribution, purchase, and production. To define multisourcing, you can use the sourcing strategy. You can set up a separate sourcing strategy for each clustered plan item.

To set up the sourcing strategy, use the Sourcing Strategy (cprpd7110m000) session:

For distribution sourcing only, you can set up cluster-specific distribution relationships. This option is not available for purchase and production. Therefore, the planning process always uses the same item purchase business partner information and same BOMs and routings to plan both the nonclustered item and the clustered items. You can set up the high level sourcing strategy by cluster.

Chapter 4
To Plan Clustered Items

4

Netting

LN nets a clustered plan item in the exact same way as a nonclustered plan item. Enterprise Planning calculates the net requirements on the basis of the gross requirements, the on-hand stock, and the firm supply. Next, Enterprise Planning generates supply for the net requirements.

You can leave a warehouse in a cluster out of the order planning and the master planning. To exclude a warehouse from the order planning and the master planning, clear the **Include in Enterprise Planning** check box in the Warehouses (tcmcs0503m000) session.

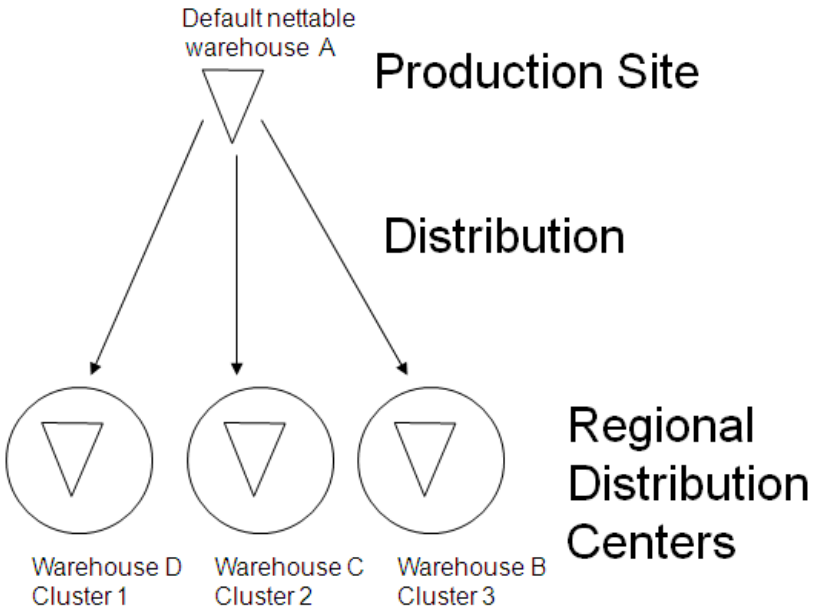
Distribution planning

Distribution Requirements Planning (DRP) balances the requirements in the distribution channels with supply by using planned distribution orders. You can plan distribution in these directions:

- From nonclustered plan item to clustered plan item
- From clustered plan item to nonclustered plan item
- Between clustered plan items

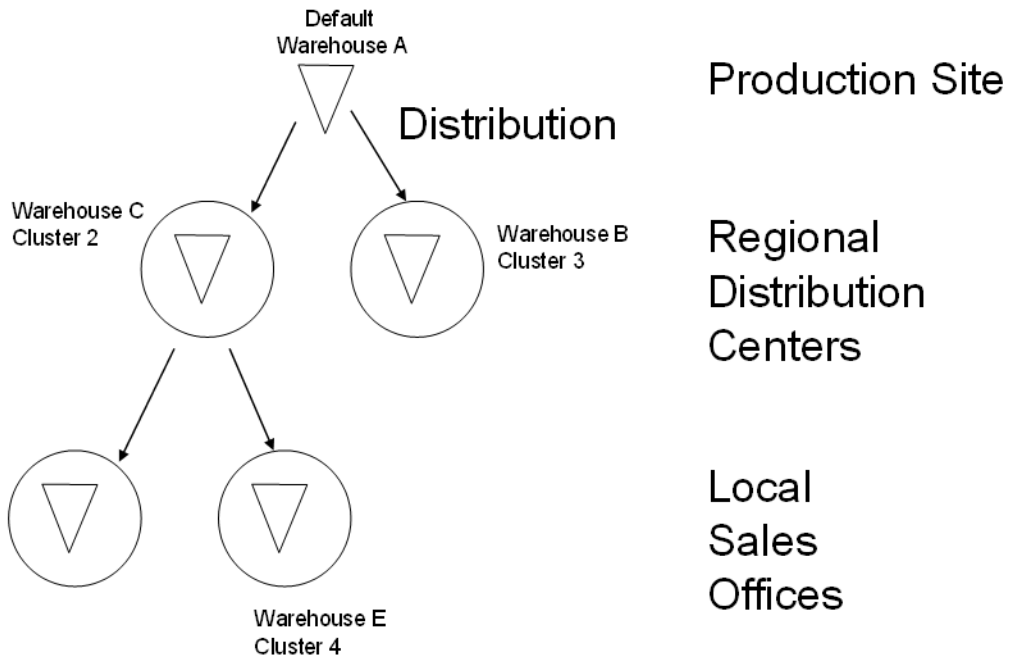
You set up the distribution relationships in the Supplying Relationships (cprpd7130m000) session. Various business cases are supported.

Example 1: DRP from central to decentralized warehouses



The regional distribution centers perform the sales order acceptance. The netted requirements that originate from these sales orders are aggregated to the central production site. The production site then replenishes the regional distribution centers. Although clusters are not used in sales orders, the item/warehouse combination of the sales order line is traced to the correct cluster in Enterprise Planning.

Example 2: Multilevel DRP from central to decentralized warehouses



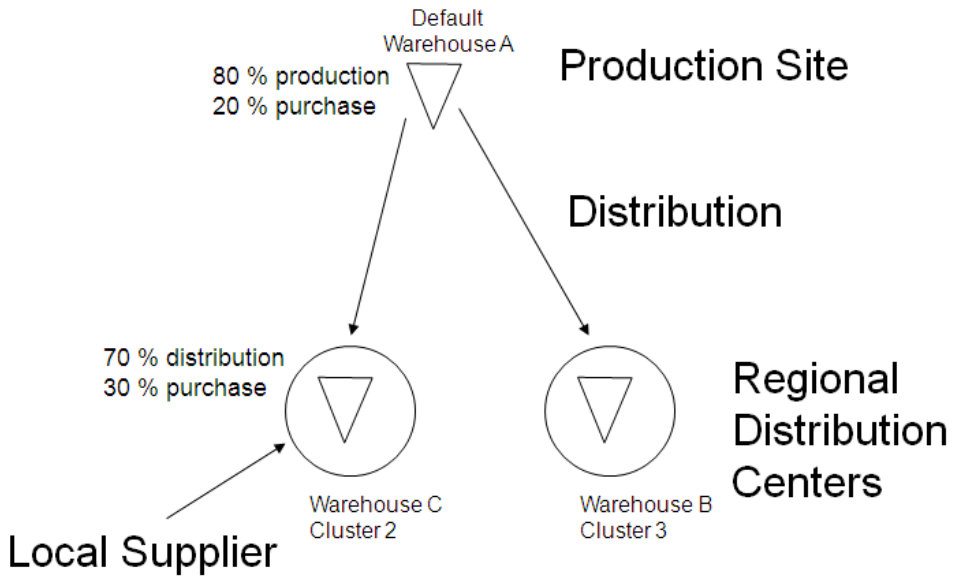
The local sales offices perform the sales order acceptance. The planning process aggregates the requirements through the distribution channel to the central production site. If necessary, the production site replenishes the regional distribution centers. Subsequently, these regional distribution centers replenish the local sales offices.

Purchase planning

The purchase planning process for clustered items is identical to that of the nonclustered items, because these items share item purchase business partner information. Only the supply strategy can be defined separately for a clustered item. However, to select suppliers based on the cluster (local purchasing), you can use the warehouse on the Ship-from role of the business partner.

If you entered a particular warehouse cluster for a supplier, that supplier can only deliver goods to this warehouse. As a result, the purchase planning process takes that supplier into account only when a plan item passes to a cluster for which the default warehouse equals the warehouse on the Ship-from role.

Example



The item is for 70 percent supplied to cluster 2 by means of distribution from the central production site. However, the cluster also purchases the same item locally (30 percent of supply). A sourcing strategy is defined for this item. You can also purchase the item centrally from another supplier. You can model this with the following setup:

In the Items - Planning (cprpd1100m000) session, specify the following fields:

Setup for local purchasing (Plan items)

Field	Nonclustered item	Clustered item
Plan Item	JOSCOM	USA JOSCOM
Cluster	(None)	USA
Default Supply Source	Production/Purchase	Distribution
Default Warehouse	DUB (Dublin)	NY (New York)

In the Ship-from Business Partner (tccom4121s000) session, which you can access from the Business Partners (tccom4500m000) session, specify the following fields:

Setup for local purchasing (Suppliers)

Field	Supplier for USA	Supplier for nonclustered warehouse
Supplier	SUP000002	SUP000003
Warehouse	NY (New York)	DUB (Dublin)

According to these settings, supplier SUP000002 can only deliver to the cluster and warehouse in New York.

Supplier SUP000003 only delivers to the warehouse in Dublin.

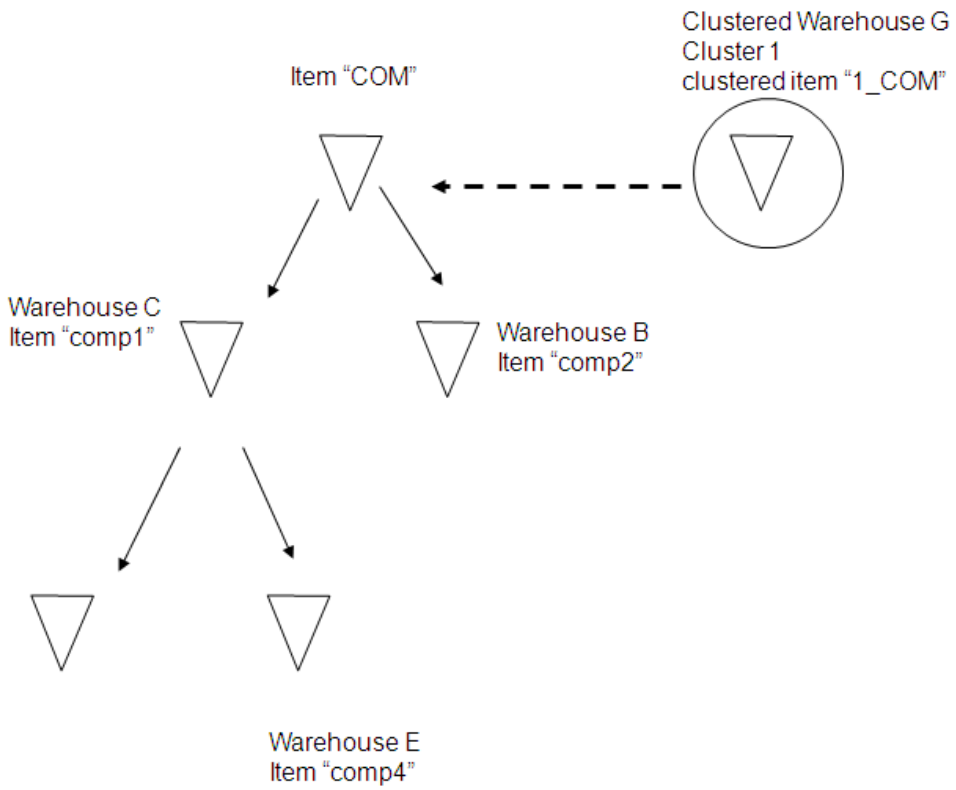
If a sales order is accepted in the New York sales office, the planning run automatically includes only the suppliers that have the New York warehouse connected, and suppliers that do not have any warehouse connected.

In this case, the planning run takes only SUP000002 into account to plan the clustered item USA_JOSCOM. The planning run selects clustered warehouse NY for the planned purchase order. You can transfer the planned purchase orders to the purchase department.

The goods are then received on the clustered warehouse.

Production planning

If the default supply source of a clustered item is **Job Shop**, the planning run creates planned production orders for the clustered item and the clustered warehouse. However, the explosion of materials and operations proceeds according to the general bill of material and routing. For master planning, the planning process uses the general bill of critical material and bill of critical capacities to explode dependent demand to critical materials and capacities.



A clustered item does not have a unique (critical) bill of material or (critical) routing. LN creates the planned production order for the clustered item and the clustered warehouse. You can transfer this planned production order to Job Shop Control. The clustered warehouse receives the finished product. LN aggregates all the inventory transactions to the clustered item.

Clustered components in the bill of material

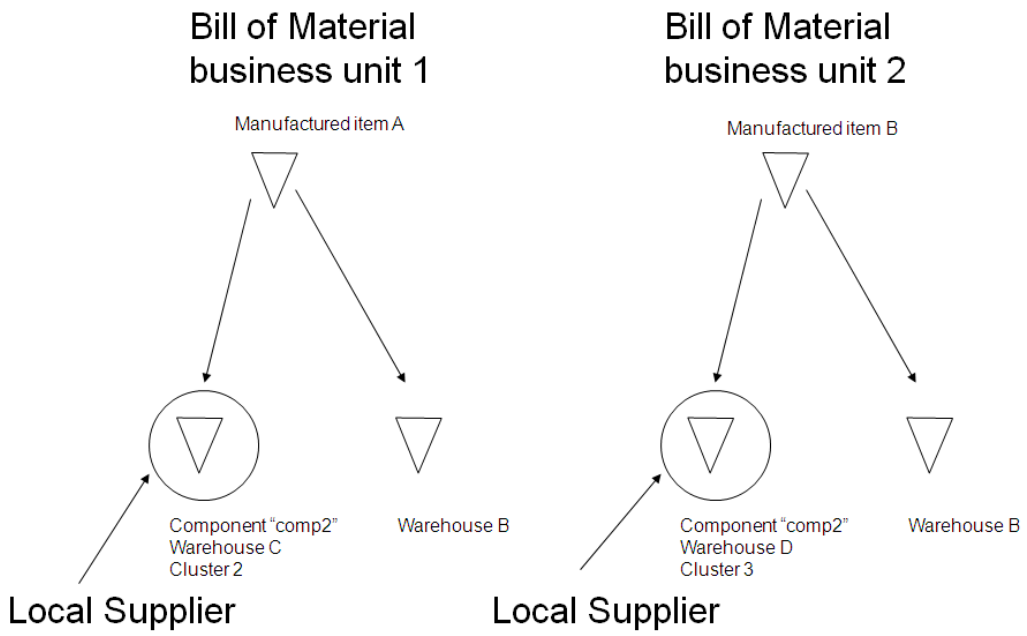
The bills of material of two items that are manufactured in two different production sites can contain the same component item and you might want to purchase that component from different suppliers, depending on the manufactured item for which you use the component.

To model that situation, you can use the following setup:

- Define a cluster for each production site.
- Define the component as clustered plan item in the Items - Planning (cprpd1100m000) session: one clustered plan item for each cluster. You specify one of the warehouses linked to the cluster as the clustered item's default warehouse.
- In the Bill of Material (tibom1110m000) session, on the BOM line for the component, enter the same warehouse as the default warehouse of the clustered plan item.

- In the Ship-from Business Partner (tccom4121s000) session, link the component's local supplier to the same warehouse.

If you run the planning process, LN automatically selects the correct supplier for each clustered plan item.



A single mechanism supports several similar business cases.

Chapter 5
Distribution within a cluster

5

Distribution within a cluster

Enterprise Planning always plans the demand and supply on a clustered plan item's default warehouse. As a result, even if you enter one of the other clustered warehouses on a sales order line, LN generates the planned order for the default warehouse, which is the level on which Enterprise Planning operates.

For movement of goods inside a cluster, from one warehouse to another, you must use Warehousing. That package's supply systems generate warehouse transfers directly on execution level.

The available supply systems for replenishing the shop floor in Job Shop Control are:

- Time Phased Order Point (TPOP)
- Order Controlled/Single
- KANBAN

Chapter 6
Available to Promise for Clustered Items

6

Available to promise for clustered items

For clustered items, you can use these types of available-to-promise functionality:

- Standard ATP
- Channel ATP
- Family ATP

You must set up a plan item's available-to-promise functionality in the Items - Planning (cprpd1100m000) session, on the Horizon tab.

For clustered items, the use of component and capacity CTP is restricted. Only one of the clustered plan items and nonclustered plan items can be supplied by means of the source production. If multiple clusters have the source production, the capable-to-promise functionality produces erroneous results, because the system promises the same capacity and components to multiple orders: once for each cluster. This happens because a clustered item cannot have a unique bill of material, bill of critical material, routing operations, or bill of critical operations.

If Enterprise Planning reserves and checks capacity CTP on a clustered item, the same capacity can be promised to multiple orders: once for the clustered item, and once for the nonclustered item.

No functionality for disaggregating distribution orders to a clustered item is available. Therefore, LN does not calculate the channel ATP automatically, if the clustered item has the source Distribution. For these clustered items, you must manually enter a quantity in the **Allowed Demand** field to maintain the channel ATP in the channel master plan.

Chapter 7
Summary

7

Clusters summary

Clusters represent one or more warehouses in a particular geographical area. Therefore, you can think of cluster as separate entities in a company, such as a production site, a regional distribution center, or a local sales office.

You can set up plan items for each cluster, called clustered plan items. These plan items allow you to plan per item-cluster combination. The clustered plan item can be supplied via distribution, purchase, and production. However, for purchase and production the functionality is limited.

The planning process is always performed on the aggregated level of the default warehouse of the cluster. You must use the available supply systems in Infor LN Warehousing to control the replenishment of the other warehouses in the cluster.

For order acceptance of clustered items, you can apply standard ATP, component and capacity CTP, family CTP, and channel CTP. However, the use of component and capacity CTP is limited, because a clustered item does not have a unique bill of (critical) materials and capacities.

Appendix A
Glossary

A

capacity CTP

The capacity of a resource that is available in a plan period for additional production of a plan item in connection with a customer order.

The capacity CTP is used in capable-to-promise calculations.

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