



Infor LN Service User Guide for Configuration Management

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About this Guide

This guide provides information about the various processes in Configuration Management and the procedure to create installation groups and generate the physical breakdown structure of the items.

Objectives

This document is designed to meet the objectives described below. It is assumed that you already have a general understanding of LN Service.

Understand the following concepts :

- Serialized items
- Clusters
- Cluster lines
- Physical breakdown structure
- Serialized item dashboard
- Functional element
- Owner vs User

To perform the following tasks:

- To use serialized item groups
- To maintain and create physical breakdowns
- To delete physical breakdowns
- To define a cluster
- To modify an item breakdown
- To create an item breakdown from a standard production BOM

Document summary

This guide explains the various processes in the Configuration Management module and the procedure to create clusters and generate physical breakdowns.

How to read this document

This document is 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 the LN Service Online Help.

Please refer to the Table of Contents to locate the referred section.

Underlined terms indicate a link to a glossary definition. If you view this document online and you click on underlined text, you jump to the glossary definition at the end of this document.

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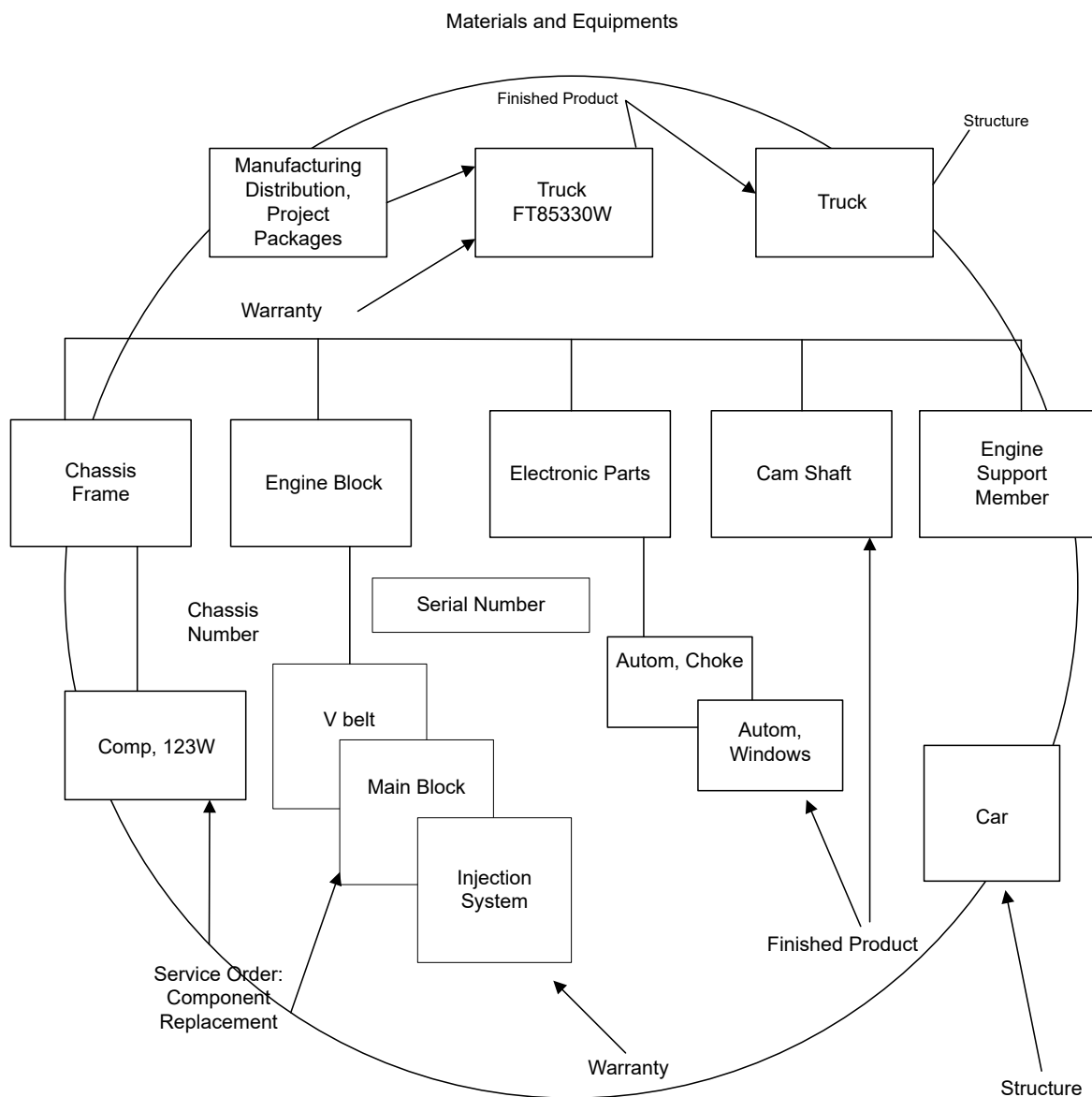
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Chapter 1: Introduction

This chapter provides a brief introduction of Configuration Management functionality.

Configuration Management (CFG)

Configuration Management provides the customer, production, or planning department with accurate information on the installed base and includes the details of the configuration of assets. The assets can be either serialized items or equipment owned by customers. The Configuration Management module offers a multilevel configuration structure definition and handling.



Use the Configuration Control module to define and maintain the following:

- *Serialized-item groups*: Serialized-item groups are used during the planning of service orders. The serialized items also act as the planning constraints when you select service engineers based on skills defined for a specific serialized item group.
- *Functional elements*: A grouping of exchangeable items with identical functions. You can use functional elements in item breakdowns, physical breakdowns, and reference activities. For example, if you define a maintenance activity for a configuration, you can specify a functional element. In this way, the activity applies to all items covered by that functional element, and multiple, identical reference activities for similar items are avoided.

- *installation group*: A set of serialized items that have the same location and are owned by the same business partner. Grouping serialized items into an Installation group enables you to maintain them collectively.
- *installation*: The list of items or serialized items that belong to an Installation group.
- *Item breakdowns*: Item breakdowns can be used to create physical breakdowns. In addition, you can look up where items or child items are used in an item breakdown, copy standard production BOMs to item breakdowns, and replace/delete items in item breakdowns.
- *Serialized items*. Serialized items can be used to create physical breakdowns.
- *Physical breakdowns*: Defined for an Installation group configuration, and enables you to view the *as-built structure* and as-maintained structure of the configuration and also the as-maintained structure.

Chapter 2: Configuration Management Concepts

This chapter provides a brief description of the concepts in Configuration Management module.

Installation Group Service

An installation group is set of serialized items that have the same location and are owned by the same business partner. Grouping serialized items into an installation group enables you to maintain them collectively. An installation group helps you to relate multiple objects for a particular customer, location, or contract.

You can also define an installation group as a location for a group of objects. The key data include the location details and service center details of an installation group. The other details serve only as defaults for the lower-level objects.

An installation group is at the highest level in the bill of objects and includes header information for all the objects that belong to the installation group, such as the business partner, location, and calendar. You can register the specific installation group (installed base) bought by the customers.

To include the serialized items or physical breakdown structures, you can include the item or top item in the installation group lines linked to the installation group.

Defining installation groups

You can define an installation group and its structure manually. Alternatively, you can generate the installation group from service bill of materials, purchase orders, sales orders, and project work breakdown structure or element structures.

Example

You can define the following installation groups:

- All computer hardware in a particular building
- An air-conditioning unit in a large building

Linking installation groups

You can link the installation group in one of these ways:

- Link the installation group to a business partner to designate the installation group as an external installation group

- Link the installation group to a work center or department to designate the installation group as an internal installation group.

Installations

Installation is the list of items or serialized items that belong to an Installation group. An Installation can be a unique object or a generic model. An Installation occupies the highest level in the Installation group structure.

Installation group structure

The Installation group structure is also referred to as the bill of serialized items. An Installation group structure is the list of serialized items that share the same location and customer as the Installation group. An installation group structure always consists of at least one Installation. Each physical breakdown structure or serialized item can be a part or member of the Installation group structure.

To create the structure, you must define serialized item relations. An Installation group structure can have up to 99 levels and can be viewed graphically.

Physical Breakdown Structure, Service

Physical breakdown enables you to display the relation between serialized items. Physical breakdown relates the serialized items with each other (through parent-child relations). You can explode the physical breakdown to display a (multi-level) breakdown structure that displays the complete structure of the serialized items within a configuration. The concept of physical breakdown is introduced in LN.

Create physical breakdown

You can set up a physical breakdown to manage product configurations (breakdown structures) during service and maintenance activities.

In Service Order Control, you can handle the service-order activities, to update active physical breakdowns.

Select the **Configuration Status Usage** check box in the **Configuration Management Parameters (tscfg0100m000)** session. You can maintain the physical breakdowns in the **Physical Breakdowns (tscfg2110m000)** session.

You can create a physical breakdown using any of the following options:

- As-built structure
- Item breakdown
- ASCII file
- Project-breakdown structure

Activate physical breakdown

Set the top-serialized item to **Active** to activate the physical breakdown. All the events and changes to the physical breakdown of an item are automatically logged.

Physical breakdown log

Physical breakdown log is used so that every change in physical breakdown structure is traceable and formally controlled. The initial physical breakdown and all the modifications identified with the action taken that have been executed on it are stored in the physical breakdown log.

Select the **Create Physical Breakdown Log** check box in the **Configuration Management Parameters (tscfg0100m000)** session to create a physical breakdown log.

Note:

The installations or removals are logged automatically, but only if both of the following conditions are met:

- The serialized item's status in the **Serialized Items (tscfg2100m000)** session is **Active**.
- In the Configuration Management Parameters (tscfg0100m000) session, either the Configuration Status Usage check box or the Create Physical Breakdown Log check box is selected.

The *graphical browser framework (GBF)* that you can start in the **Physical Breakdowns (tscfg2110m000)** session, also uses the data in this session.

Functional Element

Functional elements are a group of exchangeable items with identical functions and can be used in item breakdowns, physical breakdowns, and reference activities.

You can use functional elements:

- To define reference activities for groups of similar items at once, rather than define multiple, identical reference activities.
- To list several exchangeable items for a specific position in the item breakdown.

You can define a single reference activity that describes the removal of a fan rather than define the removal of item Fan-54576787. If the reference activity is linked to a work order, you can specify the actual item that is placed in the physical breakdown.

- Functional elements can only be defined if the **Functional Elements Active** check box in the **General Service Parameters (tsmdm0100m000)** session is selected.
- You cannot change the functional element in a physical breakdown.
- A parent item and child item combination can only belong to one functional element.

A serialized item is identified by the combination of the item code and the serial number. You can set up the *mask* used to generate the serial numbers in such a way that the serial number includes some fields of the item data, such as the item group and the manufacturer.

In a multicompany structure, the companies can share the serialized item data. All the service departments in the various companies can refer to the same serialized items.

The serialized item can originate from a sales order or from a project. The details of a serialized item indicate their origin, for example, by using specific sets of serial numbers for items that originate from sales orders and from projects. Serialized items can also originate from an *as-built structure* or directly from the production bill of material in Manufacturing.

In Service, serialized items can start their respective life cycles in As-Built mode or As-Maintained mode. Each serialized item, with or without its installation group, can be covered by a service contract or a warranty.

The serialized item status

Serialized items can be status controlled.

Each serialized item can have the following status:

- **Startup**
The serial number has been assigned, but the item is not yet included in a service order or contract. You can only change the status to Active.
- **Active**
The serialized item is part of a service order or contract. You can only change the status to Revision.
- **Revision**
You can only change the status to Active.

Serial numbers

A unique serial number is assigned to every manufactured item or purchased item. The serial number is assigned to track the item in its life cycle.

You can define a dummy serial number for an item. The dummy serial number is a temporary number and can be used to monitor the item until a permanent number is assigned.

For each serialized item, you can define an alternative serial number for customer reference. You can use the alternative serial number to search for items when you register calls, create service order activities, or register parts lines for a maintenance sales order.

Serialized item groups

You can group serialized items by *serialized item groups*. A serialized item group is a group of serialized items with similar features.

You can define the serialized item groups that you need, for example, to categorize the skills required for the maintenance of the items, or as a basis for enquiries and reporting.

For example, you can select service engineers on the basis of their skills for a specific serialized item group.

Serialized items in physical breakdown structures

Serialized items are the building blocks of *physical breakdown structures*. A physical breakdown structure is the relationship definition of a set of serialized items with their underlying parts and assemblies. Some serialized items, such as a photocopier, have a simple structure whereas other serialized items such as a ship or an aircraft have a complex structure.

A top serialized item occurs at the highest level in the physical breakdown structure, while the underlying structure consists of assemblies that are either effective or outdated. Use the Tree View option to display a graphic view of the structure.

Each serialized item in the breakdown can be linked to a *functional element*, with a common function across the entire structure, and can be used to group serialized items based on the functional importance.

Alternative Item

Alternative items serve as a substitute for the standard item when the standard item cannot be delivered or is being replaced. If several items can be substituted for a standard item, you can assign a priority code to each alternative item.

You can specify alternative items for the components in an item breakdown under different parent items. You can select the correct alternative item based on the parent item

When you delete an item breakdown relation then the corresponding alternative items are also deleted. When there is a change in the item breakdown then the corresponding item in the alternative items must be updated.

Serialized item dashboard

Use this session to, view the details of the serialized items, that are used across modules, in various active and history tables related to orders, calls, contract configuration lines, field change order lines, job quotations, inspection registrations, failure analysis, and subcontract agreement lines.

Use the **Serialized Item 360 (tscfg2100m100)** session to select serialized item from the serialized item list. The details of the serialized item , such as the *functional element*, *life cycle*, *service area*, warranty type and so on are displayed in the session.

To view the serialized item details, double-click the serialized item line in the list.

The selected check boxes under **Additional Information** indicate that specific data is available for the selected serialized item.

Installation group layout example

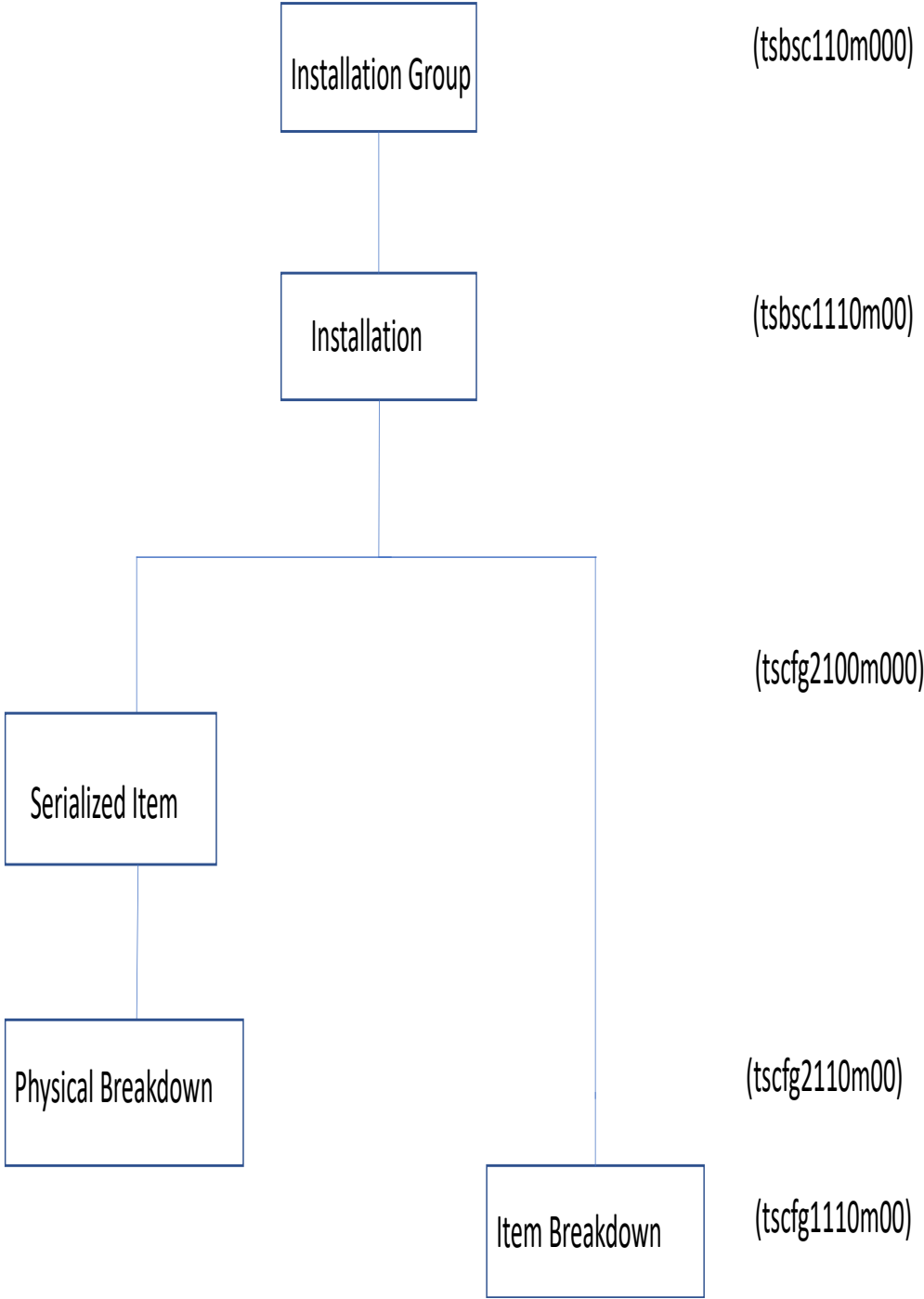
This example shows how the components of an *installation group* can be structured. Dependent on the complexity of the structure, an installation group can include:

- *Installation*
- *Serialized items*
- *Physical breakdown*
- *Item breakdown*

To display the structure trees, select View Tree from the *appropriate* menu in these sessions:

- **Installation Group** To display the Installation group structure tree, the top level structure tree.
- **Physical Breakdowns (tscfg2110m000)** To display the physical breakdown structure tree.
- **Item Breakdowns (tscfg1110m000)** To display the item breakdown structure tree.

The structure of an installation group can look as follows:



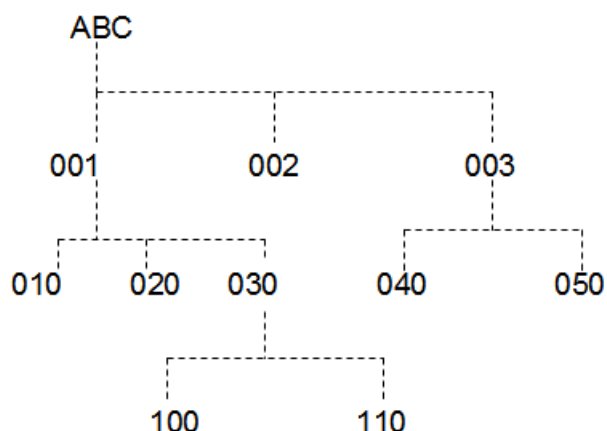
Sample ASCII file

The positions of the arguments in the ASCII file are as follows:

ABC	SN515	10	001	SN217
ABC	SN515	20	002	SN317
ABC	SN515	30	003	SN017
001	SN217	10	010	SN0027
001	SN217	20	020	SN0037
001	SN217	30	030	SN0117
003	SN017	10	040	SN0217
003	SN017	20	050	SN0217
030	SN0117	10	100	SN00047
030	SN0117	20	110	SN00147

Separator | (pipeline)

The physical breakdown that you create from this ASCII file looks like the following:



Owner vs User

When you execute the service activities for calls, *service order*, *maintenance sales order* and customer claims, the invoice is received by the owner (the sold-to business partner) of the serialized item. However, It must be possible to invoice one of these parties involved in the service activities such as the owner, the user, and the dealer instead of invoicing the owner of the serialized item.

Configuration Management

- Installation Groups and Serialized Items

To implement this functionality, the following fields are added to the **Installation Group** session and the **Serialized Items (tscfg2100m000)** session:

- **Owner**
- **Dealer**
- **In Use-by**
- **Supplier**

The **Default Business Partner for Order** field is added to define the business partner role used as the default Sold-to BP for the order, at the time of generating the call, customer claim, service or maintenance sales order.

The business partners specified in the **Installation Group** or **Serialized Items (tscfg2100m000)** can only be used as the sold-to business partner for an order if the Sold-to role is defined for the business partner.

The role, **Owner** and **Dealer** are of type Sold-to BP. The role, **In Use-by** is of type **Business Partner** and the **Supplier** role is of type Buy-from **Buy-from Business Partner**. If the value of the **Default Business Partner for Order** is set to **In Use-by** or **Supplier**, LN checks whether the related business partners have the sold-to role defined.

- Synchronizing BP roles in Physical Breakdown Structures

The owner of all the serialized items in a PBS and the owner linked to an installation group, is the same, and if the **Owner** is changed, all the serialized items in the PBS are also updated. The **Owner** can only be changed at the highest level, of the PBS.

The **In Use-by** related fields are updated to all serialized items on a lower level in the PBS. You can modify the **In Use-by** at all the levels in the PBS.

The **In Use-by**, **Dealer** and **Supplier** related fields have to be synchronized manually. When you manually change the **Dealer**, **Supplier** and **In Use-by** related fields, LN prompts you to confirm that the serialized item lower in the structure must be updated with these values.

If the **Owner** is not specified, all the **Owner** and **In Use-by** related fields in the PBS, are cleared.

- Service Order Parameter 'Ship Materials To'

The material required to perform the service order activity is normally shipped to the ship-to address of the ship-to BP or to the location address of the order/activity (The location address is defaulted from the Installation Group or Serialized Item).

The service order material is shipped to the ship-to address of the order or to the location address of the order/activity based on the value specified in the **Ship Materials To** field in the **Service Order Parameters (tssoc0100m000)** session.

The sold-to BP specified for the order can be different from the Owner (sold-to BP) specified on the Installation Group or Serialized Item. So, it must be possible to ship the material by default, to one of the addresses linked to the roles defined for the Installation Group or the Serialized Item.

The **Ship Materials To** domain is extended with the following values:

- **Ship-to BP Address**
- **Location Address**
- **Owner Address**
- **In-Use-by BP Address**
- **Dealer Address**

- Handling of customer owned items

When an installation that is not owned by the Sold-to BP of that installation is serviced, you are allowed to use the sold-to business partner or installation owner for the warehouse receipt or issue if the following check boxes are selected in the SO, MSO or WO parameter sessions:

- **Allow to use Installation Owner instead of Sold-to BP on issue**
- **Allow to use Sold-to BP instead of Installation Owner on receipt**

- Receipt of customer owned serialized items

During the receipt of a customer owned serialized item, the owner of the serialized item is updated.

If the item is received as company owned, the Owner field is cleared. If the item is received as customer owned, the Owner of the item in the inventory can be different from the Owner of the serialized item.

A new parameter **Keep existing Installation Owner on Receipt** is added to the SO, MSO or WO parameter sessions. If this check box is selected, Owner of the serialized item and the Owner in inventory are same.

Chapter 3: Master Data Setup

This chapter describes the steps you must follow to set up the master data for the Configuration Management module.

Configuration Data Setup

Before you can define service items, Service BOMs, objects and configurations, you must enter the data that can be used for creating the service items. Because configuration data is used throughout LN, all data must be entered as completely as possible.

Functions of the other LN modules in relationship with Configuration Control:

- Master Data Management (MDM) is used for and consists of service item groups and service items, which help define item breakdowns, serialized items and Installation groups.
- Item-Based Data (IBD) contains data about each item that must exist before you can create service items.
- Routing (ROU), which is used to maintain machines and work centers, can also be used when you define objects and configurations.
- Service Planning and Concepts (SPC) enables you to predict activities for each model, as well as generate maintenance plans for each configuration and the objects in the configuration.
- Call Management (CLM) tracks service calls on objects and configurations.
- Contract Management (CTM) keeps track of the contracts linked to objects and configurations.
- Service Order Control (SOC) creates service orders for objects and configurations.
- History and Statistics (HST) records historical and statistical information for objects and configurations.

Configuration setup sessions

Enter the configuration data in the following sessions:

- 1 Set configuration management parameters in the **Configuration Management Parameters (tscfg0100m000)** session.
- 2 Define Serialized item groups in the **Serialized Item Groups (tscfg0110m000)** session.
- 3 Define usage classes in the **Usage Classes (tsspc0130m000)** session.
- 4 Define service item groups in the **Service Item Groups (tsmdm2110m000)** session.

Configuration management parameters (tscfg0100m000)

The settings in the **Configuration Management Parameters (tscfg0100m000)** session affect the way the Configuration Control module operates.

Serialized item groups (tscfg0110m000)

Use the **Serialized Item Groups (tscfg0110m000)** session to define serialized item groups. A serialized item group is a group of objects with similar features. Serialized item groups can be used when you plan a service order. For example, you can select a service engineer on the basis of skill that the service engineer has for an serialized item group. The creation of the serialized item group is user defined, but generally relates to a group of similar objects.

Usage classes (tsspc0130m000)

The usage class is a categorization of usage based on environmental factors. Usage classes are attached to the models, configuration or objects. You can use usage classes to define more than one maintenance concept for an object or a model.

Example

Depending on the usage of a truck and the resulting specific maintenance requirements, the truck's usage class can be either National or International.

Service-item groups (tsmdm2110m000)

Service item groups are groups of items with common characteristics. The benefit of grouping service items is that grouping enables easier assignment of multiple items to a contract, quote, or warranty. For example, if you want to cover all your gaskets in a contract, assign the gaskets to the same service item group, then just include that item group in the contract. Before you can enter the data, you must define service item groups.

Chapter 4: Configuration management procedures

This chapter explains the configuration management procedures.

To use serialized item groups

A serialized item group is a group of serialized items with similar features. Use the **Serialized Item Groups (tscfg0110m000)** session to define *serialized item group*.

You can use serialized-item groups when you generate service order planning. The skills and serialized item group of a *service employee* can be used as planning constraints when LN selects a *service engineer* to carry out a service order. Example: You can use serialized item groups to select a service engineer on the basis of skill that the service engineer has for a specific serialized item group. The creation of the serialized item group is user defined, but generally relates to a group of similar objects.

To maintain physical breakdowns

You can set up a *physical breakdown* to manage product configurations (breakdown structures) during service and maintenance activities. The physical breakdown is used to display the relation between *serialized items*

In the Service Order Control module, you can handle service-order activities, which you can use to update active physical breakdowns.

If, in the Configuration Management Parameters (tscfg0100m000) session, the Configuration Status Usage check box is selected, a physical breakdown becomes active when the top-serialized item is set to Active. This event, as well as subsequent changes to an item's physical breakdown, are automatically logged.

How to maintain physical breakdowns

Use the **Physical Breakdowns (tscfg2110m000)** session to maintain the physical breakdowns.

Use the commands on the *appropriate* menu in the session to create a physical breakdown from one of the following:

- *As-built structure*
- *Item breakdown*
- *ASCII file*

- *Project-breakdown structure*

Note: You can set up breakdown structures for non-customized items in an item breakdown.

To create a physical breakdown from an as-built structure

You can use the **Create Physical Breakdown Structure (tscfg2210m000)** session to create the physical breakdown from an *as-built structure*.

If you create a physical breakdown from an as-built structure, this results in a direct copy of serialized items present in the **Serial End Item - As-Built Headers (timfc0110m000)** session of Manufacturing to the **Serialized Items (tscfg2100m000)** session of Service. The physical breakdown is created with the same structure as the as-built structure.

Note:

- Manufacturing must be implemented to create a physical breakdown from an as-built structure. Refer to the Manufacturing (ti) check box in the **Implemented Software Components (tccom0500m000)** session.
- *Anonymous items* cannot have serialized items as child items.

To create a physical breakdown from an as-built structure

- 1 Start the **Create Physical Breakdown Structure (tscfg2210m000)** session.
- 2 In the Source field, select As-built Structure.
- 3 Under As-built Structure, enter or select the as-built (top) item and serial number to copy from. The as-built (top) item cannot be *lot* controlled. Make sure that as-built component data is present in the **Serial End Item - As-Built Components (timfc0111m000)** session for the as-built (top) item. The non-serialized items in the as-built component data must be present in the **Items (tcibd0501m000)** session. Otherwise, no physical breakdown is created.
- 4 On the Source tab, in the Link To section, select one of the following in the Target field:
 - **Installation Group**
The top item in the item breakdown is set as the top-serialized item in the physical breakdown. The components in all levels in the item breakdown are exactly copied to the serialized items. The serial number of the serialized item is created according to a *mask*.
 - **Breakdown**
The top item of the item breakdown must exist as a child item in the physical breakdown you enter. The components in all levels in the item breakdown are exactly copied to serialized items. The serial number of the serialized item is created according to a mask.
 - **New Breakdown**
LN creates a new physical breakdown.
- 5 Under Defaults, enter or select the following:
 - The serialized item group to which the newly created serialized items belongs.
 - Service department (optional).
 - Delivery time (optional).
- 6 Select the Process Report check box and the Error Report check box as required.

7 Click **Process**.

As-built structure copied to an Installation group

- A new Installation group configuration is created.
- The top item in the as-built structure is set as the top-serialized item in the physical breakdown.
- The child items (as-built component data) on all levels in the as-built structure are copied exactly to the physical breakdown.
- The serialized as-built components are copied to the **Serialized Items (tscfg2100m000)** session. The non-serialized as-built components are copied to the **Items - Service (tsmdm2100m000)** session.

As-built structure copied to a breakdown

- The top item of the as-built structure must exist as a child item in the physical breakdown you enter.
- The child items (as-built component data) on all levels in the as-built structure are copied exactly to the physical breakdown.
- The serialized as-built components are copied to the **Serialized Items (tscfg2100m000)** session. The non-serialized as-built components are copied to the **Items - Service (tsmdm2100m000)** session.

As-built structure copied to a new breakdown

- The child items (as-built component data) on all levels in the as-built structure are copied exactly to the physical breakdown.
- The serialized as-built components are copied to the **Serialized Items (tscfg2100m000)** session. The non-serialized as-built components are copied to the **Items - Service (tsmdm2100m000)** session.

To create a physical breakdown from an item breakdown

You can use the **Create Physical Breakdown Structure (tscfg2210m000)** session to create the physical breakdown from an *item breakdown*.

Note: The item breakdown can be copied from a standard *production BOM*.

To create a physical breakdown from an item breakdown, take the following steps:

- 1 Start the **Create Physical Breakdown Structure (tscfg2210m000)** session.
- 2 In the **Source** field, select Item Breakdown.
- 3 Under Item Breakdown, enter the top item of the item breakdown.
- 4 In the **Target** field, select one of the following:
 - **Installation Group**
The top item in the item breakdown is set as the top-serialized item in the physical breakdown. The components on all levels in the item breakdown are exactly copied to serialized items. The serial number of the serialized item is created according to a *mask*.
 - **Breakdown**

The top item of the item breakdown must exist as a child item in the physical breakdown you enter. The components on all levels in the item breakdown are exactly copied to serialized items. The serial number of the serialized item is created according to a mask.

- **New Breakdown**

LN creates a new physical breakdown.

- 5 Under Defaults, enter or select the following:
 - The serialized item group to which the newly created serialized items will belong.
 - Service department (optional).
 - Delivery time (optional).
- 6 Under Item Effectiveness, select the Check Effectivity check box to enter a date that LN uses to check the validity of the item-breakdown components. LN only copies the components that are valid on the entered date. If you want to copy all components, leave the Check Effectivity check box cleared.
- 7 Under **Options**, select the Generate Dummy Serial Numbers check box, and any of the other check boxes, as required.
- 8 Click **Process**.

Create a physical breakdown from a sales order (line)

You can use the **Create Physical Breakdown Structure (tscfg2210m000)** session to create the physical breakdown from a *sales order* (line).

Note:

- Sales must be implemented to create the physical breakdown from a sales order or sales order line. Refer to the **Order Management (TD)** check box in the **Implemented Software Components (tccom0500m000)** session.
- If you read "order" in the text hereafter, sales order is intended.

The customized BOM is used when the items in the order lines are customized to create a new physical breakdown structure. Customized BOMs are identified by the item's project *segment* in the **Bill of Material (tibom1110m000)** session.

Before you can create a physical breakdown from a sales order line, you must perform three preliminary steps:

- Link the sales order lines to an Installation group.
- Release the sales order to warehousing.
- Perform the outbound procedure of the warehouse issue.

Linking sales order lines to an installation group

- Start the **Sales Order Lines (tdsls4101m000)** session.
- On the *appropriate* menu, point to After Sales, and click Link Installation group to Sales Order Lines.

- In the **Link Installation Group to Sales Order Lines (tscfg2201m000)** session, under Selection Range, enter or select the sales order and, if applicable, the sales order line.
- Enter or select the Installation group to which the sales order (line) must be linked.
- Click **Link**.

Releasing sales order to warehousing

- Start the **Sales Orders (tdsls4100m000)** session.
- Select the appropriate sales order and, on the *appropriate* menu, click **Release to Warehousing**.
- In the **Release Sales Orders to Warehousing (tdsls4246m000)** session, enter any other required data.
- Click **Release**.

Performing outbound procedure of warehouse issue

- In the **Warehousing Orders (whinh2100m000)** session, check whether the warehouse order is created.
- Use the appropriate options on the *appropriate* menu to generate and release the outbound advice.
- On the *appropriate* menu in the **Warehousing Orders (whinh2100m000)** session, click **Shipment Lines**.
- In the **Shipment Lines (whinh4131m000)** session, select the outbound line and, on the *appropriate* menu, click **Freeze/Confirm Shipments/Loads**.

Creating a physical breakdown from a sales order line

- 1 Start the **Create Physical Breakdown Structure (tscfg2210m000)** session.
- 2 Set **Source** to **Item Breakdown**.
- 3 Select the **Deliveries** check box.
- 4 Under **Selection Range**, enter or select the appropriate Installation group, item, or serialized item data.
- 5 On the **Target** tab, under **Defaults**, enter or select the serialized item group to which the newly created serialized items can belong.
- 6 Specify a service department and a delivery date as required.
- 7 Under **Item Effectiveness**, select the **Check Effectivity** check box to enter a date that LN uses to check the validity of the item-breakdown components. LN only copies the components that are valid on the entered date. If you want to copy all components, leave the **Check Effectivity** check box cleared.
- 8 Under **Options**, select the **Generate Dummy Serial Numbers** check box, and any of the other check boxes, as required.
- 9 Click **Process**.

LN processes as follows:

- Creates a serialized item for the item on every order line. The serial number of the serialized item is created according to a *mask*.
- Creates serialized items for the item-breakdown components also, if the item on an order line has an item breakdown.
- Uses these serial numbers to create the top-serialized items, if sales items are shipped from Warehousing and serial numbers are created for these sales items in Warehousing.

To create a physical breakdown from an ASCII file

You can create a physical breakdown from an ASCII file in the **Create Physical Breakdown Structure from ASCII-File (tscfg2210m100)** session.

Note:

- The service items do not have to exist in the **Items - Service (tsmdm2100m000)** session. LN creates the service items.
- The serialized items do not have to exist in the **Serialized Items (tscfg2100m000)** session. LN creates the serialized items.
- Before you create the physical breakdown from an ASCII file, make sure that the item data is available in the **Items (tcibd0501m000)** session.

To create a physical breakdown from an ASCII file

- 1 Start the **Create Physical Breakdown Structure from ASCII-File (tscfg2210m100)** session.
- 2 In the **Target** section, under **Link To** field, select one of the following:
 - **Installation Group**
Select the Installation group to which the physical breakdown must be linked.
 - **Breakdown**
Select the serialized item to which the physical breakdown must be linked.
 - **New Breakdown**
LN creates a new physical breakdown.
- 3 Under Defaults, enter or select the following:
 - The serialized item group to which the newly created serialized items belongs.
 - **Delivery Time** (optional).
- 4 Select the Process Report check box and the Error Report check box as required.
- 5 Click **Process**.

Creating a physical breakdown from a project-breakdown structure

You can create a physical breakdown structure by copying from a Project structure with the underlying Element or Activity structure and the material lines of the specific structure. In this process, you can also copy the material lines that underlie any of the elements or activities that are copied. You can create a physical breakdown from a *project-breakdown structure* in the **Copy Project Breakdown Structure (tscfg2210m200)** session.

In this session, you can create the physical breakdown from:

- An *element structure*.
- An *activity structure*.

Note

You can only use this session if Project is implemented.

1 Project field

Enter or select the *project*. For the entered project, the value of the Project Package Link field in the **General Projects (tcmcs0552m000)** session, must be Project (Project). If you use free projects, note that the changes made to the project after you have copied the project, are not processed to Service.

2 Origin Structure field

Select from:

- **Activity Structure**

The leading plan is used (refer to the Planning tab in the **Projects (tppdm6100m000)** session). The *activity structure*, as displayed in the **Activities (tpss2100m000)** session, is used as input for the physical breakdown. LN creates a serialized item for each activity. The top element is used as the top-serialized item in the physical breakdown. The serial number of the serialized item is created according to the *mask*.

- **Element Structure**

The budget top element is used (refer to the Budget tab in the **Projects (tppdm6100m000)** session). The element structure as displayed in the **Element Budget Structure (tpptc1509m000)** session is used as input for the physical breakdown. LN creates a serialized item for each element. The top element is used as the top-serialized item in the physical breakdown. The serial number of the serialized item is created according to the *mask*.

3 Installation Group field

Enter the code of the Installation group that the newly-created physical breakdown belongs to. LN creates an Installation in the **Installation** session that specifies the newly-created top-serialized item. You can specify the default installation group in the Project and in that scenario, this value is automatically defaulted from the project.

To create a physical breakdown from a Bill of Materials

You can use the **Create Physical Breakdown Structure (tscfg2210m000)** session to create the physical breakdown from a *Bill of Material (BOM)*.

If you create a *physical breakdown* from a bill of material, this results in a direct copy of effective items present in the Bill of Material (tibom1110m000) session of LN Manufacturing to the **Serialized Items (tscfg2100m000)** session of LN Service. If no item service data is present, LN uses the item service defaults maintained for item type and item group to create items in Service.

To create a physical breakdown from a Bill of Materials

- 1 Start the **Create Physical Breakdown Structure (tscfg2210m000)** session.
- 2 In the **Source** field, select **Bill of Material**.
- 3 Use the **Deliveries** option to create a physical breakdown from Sales (after sales). The end item of the sales order, the *production BOM* is copied to a physical breakdown. If you select this check box, you can use the fields in the **Selection Range** group box to create a physical breakdown from a range of *installation group*, *items*, or *serialized items*. For this selection range, a physical breakdown is created.
- 4 If you select the **Check Effectivity** check box, the items' validity is checked before the items are copied to *physical breakdown*.

LN validates the following:

If the item is revision controlled and derived from sales deliveries, LN checks for revision from the sales order line. LN checks for the effective date from engineering items for the given item and revision.

If the item is not revision controlled and derived from sales deliveries, LN checks for the effective date from sales based on the Configuration Date in Sales field.

If the item is not from sales deliveries then, LN takes the effective date given as input.

- Unit Effectivity: When LN creates the physical breakdown structure from a *Bill of Material (BOM)*, LN considers unit effectivity as a validation. The items that belong to the unit effectivity are only created in service. Unit effectivity is checked from the *serialized item*. If unit effectivity is not present in the serialized item, LN checks the unit effectivity from a sales order line if the item originates from sales.
- Fall back on Bill Of Material if source is not found: If you select this check box when you create the *physical breakdown* structure from an *as-built structure* or *item breakdown* and no source item is found, LN copies the bill of material of that item to the physical breakdown structure.
- Consistency checks: If the physical breakdown is generated directly from a *production BOM*, LN performs a consistency check, both at LN Manufacturing and LN Service, to ensure the structure is defined without any mismatch. The items in such a structure must be defined in LN Service with appropriate *service-item data* with related configuration control, and checked for consistency.

LN performs the following consistency checks:

To distinguish between the items relevant and not relevant to service, LN copies the configuration-controlled items, namely serialized or anonymous items, into *physical breakdown*. If no *service-item data* is available for an *item*, based on service defaults, the item data will be created in items service and copied to physical breakdown.

Note: You must create service item data for all the items copied from a production bill of material to the physical breakdown structure.

LN checks for consistency with respect to the structure formation. A serialized item must always be situated above an anonymous item to ensure that the structure remains consistent with the item definition. LN begins to copy when inconsistency is detected in the structure formation and an error report is generated.

LN prints an error report if a serialized item is present under an anonymous item, as illustrated in the following example:

Example

Level	Item	Conf. Control	Item Service Data Present
0	X	Serialized	Yes
1	Y	Anonymous	Yes
2	A	Serialized	Yes ----- Problem 1
2	B	None	No
1	Z	Anonymous	Yes
2	A	Serialized	Yes ----- Problem 2
3	B	None	No
4	C	Anonymous	Yes ----- Problem 3

All three problems are caused by serialized items present under anonymous items.

LN prints the following error report:

No PBD was generated for item X for the following reasons:

- Parent item (Y-anonymous) has a lower configuration control setup than Child item (A-serialized).
- Parent item (Z-anonymous) has a lower configuration control setup than Child item (A-serialized).
- Parent item (B-none) has a lower configuration control setup than Child item (C-anonymous).

LN checks for consistency with respect to the loops in the *bill of material (BOM)*. If two anonymous items occur in an opposite fashion, with respect to an existing structure definition, the anonymous items can subsequently end up in a loop.

LN detects a loop in a bill of material, LN prints an error report, as illustrated in the following example:

Example

Level	Item	Conf. Control	Item Service Data Present
0	X	Serialized	Yes
1	Y	Serialized	Yes
2	A	Serialized	Yes
2	B	Serialized	Yes

1	Z	Serialized	Yes
2	A	Serialized	Yes
3	B	Serialized	Yes
4	X	Serialized	Yes ----- Problem 1

LN prints the following error report:

For item X, no PBD could be generated for the following reasons:

- Cycle detected in BOM.

To delete physical breakdowns

Use the **Delete Physical Breakdown (tscfg2210m600)** session to delete the *physical breakdowns*, the related top-serialized items and all related child serialized items.

Use the session to delete the physical breakdown, the related top-serialized items and all related child serialized items simultaneously.

Enter the item and the serial number of the item to delete the item and all its child items from the physical breakdown

To generate an error report in case of errors that occur when you delete the physical breakdown, select the Generate Error Report check box .

Note: You cannot delete serialized items that have the status Active or that are linked to an Installation group.

To define an Installation group

You can define an Installation group, and the Installation group's structure, manually, or you can generate the Installation groups from the following:

- Service BOMs
- Purchase orders
- Sales orders
- Project work breakdown structure
- Element structures

You can define an Installation group as a location for a group of serialized items. The key data include the location details and service center details of an Installation group. The other details serve only as defaults for the lower-level serialized items.

Installation groups can be created in the following ways:

- Manually, in the **Installation Group** session.

- Automatically generated by LN

To create an Installation group manually

Use the **Installation Group** session to create an Installation group.

Note the following points:

- **Ownership**
You must indicate who owns the Installation group. If the Installation group belongs to a business partner, select the business partner in the **Owner** field. If your company owns the Installation group, leave the **Owner** field empty and in the **Department** field, select the department that owns the Installation group. For example, this can be the work center that uses the production machine.
- LN derives the sold-to business partner or the department that owns the Installation group from the **Sold-to Business Partners (tccom4510m000)**
- If the **Use Service Areas** check box is selected in the **General Service Parameters (tsmdm0100m000)** session, you must enter the service area.

To create an Installation

For a list of serialized items that belong to Installation group, you must define an Installation.

To create Installations for the Installation group, take the following steps:

- 1 On the *appropriate* menu of the **Installation Group** session, click **Line**. The **Installation** session starts.
- 2 In the **Installation** session, click New.
- 3 Enter the Installation details.

To modify an item breakdown

You can modify an *item breakdown* in the **Replace Item in Item Breakdowns (tscfg1210m000)** session.

Note:

- You can select to replace or delete the item (component) from the item breakdown.
- You can select to print a process report and an error report.
- The old item and new item can only be the same if you enter a different item revision for the new item.
- You can also modify the item breakdown with a *change request*.
- If an existing item breakdown component is related to a *change order*, you cannot replace or delete this component with the **Replace Item in Item Breakdowns (tscfg1210m000)** session.

To replace an item in an item breakdown

- 1 Enter the old item under Replace.
- 2 Enter the new item under Replace With.
- 3 Enter the date on which the new item becomes valid.

- 4 Select the **Retain Old Item** check box if you want to keep the old item as an expired item in the item breakdown.
- 5 Enter the range of item breakdowns for which the item must be replaced.
- 6 Click **Replace**.

To delete an item from an item breakdown

- 1 Enter the item that must be deleted under Replace.
- 2 Leave the Item field under Replace With empty.
- 3 Enter the date when the item expires in LN.
- 4 If you want to keep the deleted item as an expired item, select the Retain Old Item check box.
- 5 Enter the range of item breakdowns for which the item must be replaced.
- 6 Click Replace.

To create an item breakdown from a standard production BOM

You can use the **Create Item Breakdown from Standard Production BOM (tscfg1210m200)** session to copy a *production BOM* to an *item breakdown*. This functionality can help you create Installation groups.

Note

- You must implement Manufacturing to use this session. Select the **Manufacturing (TI)** check box in the **Implemented Software Components (tccom0500m000)** session.
 - The item breakdown can contain less items than the production BOM.
- 1 Start the **Item Breakdowns (tscfg1110m000)** session.
 - 2 On the *appropriate* menu, click Create from Standard Production BOM to start the **Create Item Breakdown from Standard Production BOM (tscfg1210m200)** session.
 - 3 Enter or select the top item to copy from in the Production BOM field.
 - 4 Under Settings, select the Check Effectivity check box to enter a date that LN uses to check the validity of the production-BOM item. LN only copies the items that are valid on the entered date. To copy all the items, clear the Check Effectivity check box .
 - 5 Click Create.

Note:

- If the item breakdown already exists for the top item in the production BOM, the question "Item Breakdown Already Exists. Overwrite?" appears. If you click Yes, the existing item breakdown is completely replaced.
- Make sure that the default item data is present in the **Item Defaults (tcibd0102m000)** session for the combination of item type and item group of the production-BOM items.
- The BOMs of *customized items* cannot be copied. You can copy the customized BOM to a standard production BOM with the **Copy Customized Product Structure to Standard Structure (tipcs2232m000)** session and proceed as described in this topic.

- LN always creates the item breakdown for one (1) parent item. Therefore, if the BOM quantity of the top item in the production BOM is greater than one (1), LN converts the quantity of the BOM items to a top-item quantity of one (1).
- If you create an item breakdown for manufactured items with a BOM quantity greater than one (1), this can result in a decimal quantity of the item-breakdown components.
- LN copies production-BOM (P-BOM) items listed in the **Items - Service (tsmdm2100m000)** session or the **Item Service Defaults (tsmdm2105m000)** session to the new item breakdown. **Note** P-BOM Items that are only listed in the **Item Service Defaults (tsmdm2105m000)** session are copied (based on the defaults) to the **Items - Service (tsmdm2100m000)** session, by LN, when you create the new item breakdown.
- LN copies the production-BOM items with a quantity greater than zero (0).
- LN copies the production-BOM items that are serial-number controlled. Make sure that the Serialized check box in the **Items (tcibd0501m000)** session is selected for the BOM items.
- You can create a *physical breakdown* from the item breakdown with the **Create Physical Breakdown Structure (tscfg2210m000)** session.

Service inspections and preventive maintenance scenarios

Measurements are used to determine the value of an item's variable (measuring quantity) in a specific situation. Example Tire treads depth. When measurements are registered for serialized items during inspections, maintenance notifications are generated, based on pre-defined maintenance trigger.

The type of the measurement determines whether a trend (estimated behavior) and a measurement unit are used. For alphanumeric measurement types, used for measuring conditions instead of absolute values, trend and measurement unit cannot be defined.

Measurement types are used for:

- Inspections on work orders for serialized items
- Inspections on service orders for serialized items
- Inspections on serialized items only
- Expected measurements on planned activities for preventive maintenance
- Counter value on serialized items that can be used in service contracts on the contract coverage lines

Maintenance triggers sets

Maintenance Trigger Set is a set of maintenance triggers that is used to trigger maintenance notifications when performing measurements. A maintenance trigger set is linked to a measurement type. A maintenance triggers set can be linked to a counter reading that is linked to a serialized item.

Maintenance triggers

Maintenance Trigger is a trigger that determines when maintenance must be performed for an item. A maintenance trigger is linked to a measurement type and consists of 1 or more maintenance triggers. The relation between the measurement type and a maintenance trigger set is 1 to many. When a measurement is performed (using a measurement type), LN checks whether a maintenance trigger is defined for a measurement. If a maintenance trigger is defined and triggered, a maintenance notification is generated. It

is possible to assign the maintenance notification to a person responsible for the follow up actions of the notification.

Maintenance trigger assignments are used to determine which trigger set is applicable for which item, item group, etc when performing a measurement for a specific position. Maintenance trigger set is a rule book with an effective/expiry dates. The order in which trigger set are selected is as follows:

- Maintenance trigger set specified on counter reading of serialized item.
- Maintenance trigger assignment rule book.
- Maintenance trigger on reference activity measurement type.
- Measurement type.

The Simulate Maintenance Trigger Set Rules (tsmdm0276m000) session is used to determine which trigger set is used.

Inspections

Inspections can be created manually (directly for an item) or generated using web services or reference activities when planning service orders/work orders.

Inspections (measurement types) can be defined in **Reference Activity - Measurement Types (tsacm3160m000)** session for Item – Reference Activity combinations. When defining a reference activity, with inspections on a service order activity or work order activity, inspections are generated in **Inspections (tscfg3100m000)** session.

Inspections can be:

- Generated from a Measurement, meaning, it is an inspection that must be executed.
- Retrieved from the physical breakdown structure.
- Retrieved from another serialized item.
- Retrieved from other counter reading.

Note: For advance inspections, besides setting up measurement types and maintenance trigger sets, counter reading must also be defined.

Counter groups

Counter groups can be used to support advanced measurement scenarios. Counter groups are used for numeric measurement types only. You can use counter groups to:

- Calculate trends for maintenance to be performed in future
- Retrieve measurements from other items or other measurements
- Define multiple trigger sets for one measurement

The counter group is used to default the counter readings when a serialized item is created. On a counter reading, it is possible to determine where the inspections are sourced from.

Trend information can also be defined on the counter reading. *Trend* calculation can be used to predict when maintenance is necessary. Trend calculation is :

- Based on a manually entered trend
- Retrieved from physical breakdown (only applicable if the counter is retrieved from the physical breakdown structure).

- Retrieved from specific item (only applicable if the counter is retrieved from another serialized item).
- Retrieved from another measurement type of type counter (especially if the wear is based on the usage)

When a serialized item is created, a default counter reading is created for the serialized item. LN defaults the measurement type from the service item data. The counter value can be updated manually or the counter value can be reset. You can define reset rules to indicate how counter values can be reset.

Maintenance notifications

Maintenance notifications are generated based on maintenance triggers that are applicable when registering measurements for serialized items during inspection. Based on the measurement type and *position* of the measurement, the applicable maintenance trigger set is determined. LN uses the following search logic:

- 1** From the counter readings defined for serialized items
- 2** From maintenance trigger set assignments
- 3** From reference activity
- 4** From the measurement type

Maintenance notifications follow-up

Based on the maintenance notification, you can decide the follow-up required for the maintenance. When a maintenance notification is generated it must be possible to set the maintenance notification to:

- Ignore for Now
- Always ignore
- Transfer to a planned activity, service order/work order and so on

Transfer maintenance notifications

Maintenance Notifications can have a follow-up activity defined indicating the next maintenance task that must be performed on the specific serialized item. These maintenance notifications can be transferred to various objects, such as, service orders, internal work orders, service order quotations and maintenance sales quotations.

Preventive maintenance scenarios

Preventive maintenance scenarios are used as the basis to generate planned activities. A maintenance scenario has scenario lines based on which planned activities can be generated; based on time (example 12 times a year), based on time according to a predefined pattern (example after 2 months small maintenance, after 3 months big maintenance, after 5 months small maintenance), and based on usage (example after 10000 km, execute maintenance or after profile of tire is below 3 mm).

Preventive maintenance scenario lines

Based on the preventive maintenance scenario lines, a maintenance plan is generated for the serialized item. You can define the following types of scenarios:

- Usage-based scenario
For a usage-based maintenance scenario line, the scenario line is defined for a specific child item that matches with the item of the serialized item for which the plan is generated. The measurement type,

maintenance trigger and counter readings are also defined. The counter reading must include trend information in order to calculate the planned activities. A maintenance trigger set is defined, and the applicable trend information is retrieved. For the defined counter value and start date, based on the trend data and maintenance trigger set, the first expected maintenance moment is determined. When this planned date is within the defined time fence, a planned activity is generated for the follow-up activity defined for the applicable maintenance trigger. This process is repeated, using the new planned date as the counter start date for the next iteration. When counter reset rules are defined for a default start value, the counter value used to calculate the next maintenance moment, is reset. This type can only be used for advanced inspection scenarios.

- Time-based scenario

A time-based scenario is used to define the reference activity that must be planned and how many times within the time frame (example: inspection to be done 12 times per year). For a time-based maintenance scenario line, the process to generate a plan based on master routing is different from that of generating the plan for a reference activity. When generating the plan based on master routing, the default routing option is defined, in case multiple routing options exist. Otherwise, an error report is generated in LN. The new start date is determined, based on the value the **Start Maintenance Cycle** field is set to, in the Generate Maintenance Plan (tsspc2200m000) session. If the start date is within the time fence, the routing operations are read from the master routing, in descending order, and planned in time. When the plan is generated for reference activities, the planned activity start date is determined using the same logic.

- Time-based with pattern scenario

This scenario is used to define the pattern using the relative moments when a reference activity must be performed and a planned activity must be planned for it. When generating a maintenance plan based on a time-based pattern line, the process to generate a plan based on master routing is different from that of generating the plan for a reference activity. When generating the plan based on master routing, the default routing option is defined, in case multiple routing options exist. Else, LN generates an error report. To determine the start date of the planned activity, the defined calendar moments in the activity pattern line are used. This process is repeated for each pattern line as long as the planned date is within the time fence.

Preventive maintenance scenario line patterns

Preventive maintenance can also be sometimes performed on an irregular basis. In such cases, a time-based pattern can be set up with relative moments defining when maintenance must be performed.

Generate maintenance plan

Use the Generate Maintenance Plan (tsspc2200m000) session to generate maintenance plans for serialized items for which a preventive maintenance scenario applies. The rule book for maintenance scenarios defines the applicable scenarios.

Note: A maintenance plan can be generated only if maintenance scenario is defined for the serialized item.

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