Infor LN Service User Guide for Group Planning

Important Notices

Trademark Acknowledgements

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Table of Contents

About this document

This guide provides information about the various concepts and processes available in Group Planning.

Objectives

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

Understand the following concepts

- Group Planning
- Route-based Planning
- Resource Planning

To perform the following tasks

- Set up group planning data
- Implement route based planning
- Implement priority rule
- Allocate resources

Document summary

This guide explains the various concepts and processes available in the Group Planning.

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 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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Chapter 1
Introduction

1

This chapter provides a brief introduction of the Group Planning functionality available in Group Planning module.

You can use group planning as a grouping mechanism for service orders, work orders, and planned activities. You use the group planning module to prepare containers of work that can be assigned to a resource using group planning groups and group planning activity sets. LN plans forward sets of activities where grouping based on various service characteristics. For more information, refer to *Group planning process (p. 12)* and *Group planning data set-up (p. 9)*

Chapter 2
Group Planning

2

This chapter provides a brief description of the concepts available in Group Planning.

Group planning data set-up

The purpose of Group Planning functionality is to assign a service engineer to a service order or a service department to a work order/planned activity. Group planning prepares groups that are containers of work, that can be assigned to a resource. Within a group, service activities and activity sets level are present. For example:

- If group is the tray containing sheets of paper,
- the activity set is the paper clip grouping multiple sheets of paper and
- the activity is the sheet of paper

Group Planning can be time based and route based. Route calculation requires extended calculations since every 'to be planned 'activity has to be fitted into the correct node of the existing route. The prerequisite being, GPS coordinates are known for the installation address. Time based calculations are much faster, but these time based calculations do not result in travel times and therefore give a more optimistic view.

Overview

When activities are grouped into activity sets and groups, a service engineer or a service department can be assigned to a group.

Infor LN plans sets of activities where grouping is based on service characteristics. Grouping characteristics can be, for Example, service areas, skill, service type, project, item, contract, installation number, and so on.

Infor LN always plans the set of activities in a sequence. The sequence determines which activity is planned first and influences the fact whether time windows (time constraints) are exceeded. Therefore, the sorting configuration is important. Steps to generate plan:

- Group activities in Groups and Activity Set (depending on configuration)
- Sort the activities
- Plan forward of the sorted activities taking the time windows into account

The groups, groups and activities for group planning are created when a group planning is generated using the Generate Plan (tsspc3200m000) session. Activities can be added to existing groups or new groups. New orders can be added to the group plan using the service order and work order session. For a group, the activities can have the following Group Planning Activity Status.

Group Planning can be broadly classified into following three process steps:

1. Generate group planning (tsspc3200m000) : Service order activities, work order activities, or planned activities are read. These activities are used to generate the group planning groups, group planning activity sets and group planning activities . The generated entities are stored in the database. During the generation of the group planning, the start and end dates of the order activities are updated. For service orders, the travel start and end dates of the order activities are also be updated.
2. View and update group planning (tsspc3100m000, tsspc3110m000, tsspc3120m000) : The generated group planning can be viewed and modified. The date/time fields of the group planning activities can changed. For service orders, travelling can be taken into account. For work orders and planned activities, travel time calculations are not applicable.
3. Release group planning (tsspc3240m000) : When the group planning process is complete, the original service order activities, work order activities, and planned activities can be modified. The updated date/time fields of the group planning activities are copied to the original service order activities, work order activities, and planned activities. For service orders the updated travel date/time fields are also copied to the original service order activities.

Group planning concepts

The entities defined for the group planning functionality:

Service planning parameters

For the group planning functionality, the parameters are defined in the General Service Parameters (tsmdm0100m000) session and in the Service Planning Parameters (tsspc0100m000) session. The parameters can be classified into three groups: parameters for the planning of service order activities, parameters for the planning of work order activities, and parameters for the planning of planned activities.

Note

Route planning is only applicable for service orders and planned activities. Route planning cannot be applied to work orders.

Group sequence

Group sequence defines the sequence of a group attribute. The groups must be sequenced, because a number of group attributes can be used to group activities into groups and activity sets.

Group attribute

Group attribute defines the attribute of an activity or related order header or related master data (for example, item group). All activities with the same value for a given group attribute are grouped into the

same group or activity set. For Example when the service area is used as group attribute, all activities with the same service area are grouped into a group or activity set. Group attributes are defined in the Planning Attributes (tsspc0110m000) session. For each attribute, you can define the planning sequences.

Group method

Group method is used to indicate if the group attribute is used to group the service order activities into groups or activity sets. **Group Method Parallel** indicates that the service order activities are grouped into separate groups. Groups are created parallel in time and independent of other groups. Planning is for a group. Example the planning of the activities in group GRP000111 is independent from the planning of the activities in group GRP000112. **Group Method Sequential** indicates that the service order activities are grouped into separate activity sets within the same group (sequentially in time). Activity sets are created sequentially in the same group.

Activity set sequence

The sequence of the activity sets with the specified attribute values within a group.

Planning attribute values

Specific attribute values are defined for each planning attribute to be used to group the related service order activities, work order activities, or planned activities.

Reference point configuration

A reference point configuration determines which reference point(s) apply to which group of attributes / value pairs. Infor LN determines dynamically the reference point that is closest to the activity location address.

Activity - preferred resource

A preferred resource can be the preferred engineer for service orders or the preferred department for work orders or planned activities. Infor LN assigns these preferred resources to groups.

Group Planning Group

When a group planning is generated, group planning activities are created from service order activities, work order activities or planned activities. The group planning activities are grouped into group planning activity sets.

Attribute values for a group

The attribute values that are used when a Group Planning Group was created. Two or more attribute values can be linked to one group.

Resources for a group planning group

The resources are assigned to a group planning group. Resources cannot be assigned to an activity set or separate activities. Two kinds of resources can be used for group planning: engineers and departments. Two or more engineers can be assigned to one group planning group. Only one department can be assigned to one group planning group.

Note

A single service department can be assigned to a work order or a planned activity. Therefore a single service department can be assigned to a group planning activity that is derived from a work order or a planned activity. One or more service engineers can be assigned to a service order. Therefore, one or more service engineers can be assigned to a group planning activity that is derived from a service order. The limitations and restrictions of service orders, work orders, and planned activities are applicable to the group planning.

Groups for activity/activity sets

The group planning activities are created from service order activities, work order activities, or planned activities that are grouped into activity sets. The activity sets are grouped into group planning groups.

Attribute value for a group planning activity set

The attribute values that are used when a Group Planning Activity Set is created.

Group planning activities

When a group planning is generated, group planning activities are created from service order activities, work order activities or planned activities that are grouped into group planning activity sets. Two or more attribute values can be linked to one activity set.

Note

Groups for service orders, work orders, and planned activities are separate groups that are planned and released separately.

Group planning process

To generate the plan, LN does the following:

Step 1: LN populates the activities in the group planning based on the planning attributes

- The group planning populates the selected activities in the groups. Service activities are grouped into activity sets and groups, based on the planning attributes. Activity sets are always part of a group.

- Activity groups are planned in parallel with time and activity sets, within a group, are sequentially planned in time. Group sequences with **Group Method** set to **Parallel** are used to generate groups. Group sequences with **Group Method** set to **Sequential** are used to generate activity sets within a group.

Note: If the activity set is frozen, LN does not allow you to add orders to an existing activity, but new orders can be manually added to an activity set. LN allows you to manually add new service orders to an existing plan, even though the activity set is frozen.

Step 2: Sort the activities

LN sorts the activities in groups and activity sets. By default, sorting is based on the latest finish time. Each activity set contains one order with the earliest of the latest finish time, that is also the earliest time the activity set can start and be used for sorting.

Step 3: Plan forward against the calendar

LN plans the sorted activities considering the time windows into account. Planning is based on the **Plan Forward** parameter in the Generate Plan (tsspc3200m000) session.

Note: Planning can also be based on the route. You can use the **Plan Method** parameter in the Service Planning Parameters (tsspc0100m000) session.

Step 4: Modify the plan manually

LN allows you to modify the plan at two levels:

- At group level: Moves activity sets from one group to another
- Within a group:
  - Changes the sequence of the activity sets
  - Reschedules from specific activity set from user determined start/end time
  - Splits the activity sets
  - Adds (rush) orders to the activity set
  - Changes the sequence of the orders in a group

For example, for a day, when the work load within a group is satisfactory, the user can merge all activity sets in a group, resulting in a single group-activity set combination that contains many service orders. These service orders can be sequenced again before the plan is frozen. **Note** Merging of activity sets results in re-sorting and re-planning

Step 5: Assign resources

You can assign engineers to the activity:

- Manually
- Automatically

You can define up to 20 skills for an activity. The required activity skills must meet the employee assigned for the activity between the planned start and finish time of the activity.

Using the Group planning module, you can create a group of activities or buckets of work to be executed, that can be assigned to an employee/resource.

LN allows you to assign the resources at these levels:

- At group level (based on characteristic): Groups are created for activities with similar characteristics or attributes. For Example, all the washers, dishwashers, and air conditioners are classified in 3 groups. Washers: Marc, John and, Hank; Dishwasher: Peter, Dave; Airco: Marco. LN assigns the resource if the characteristics of the group and the employee are similar. If multiple resources are similar, LN displays the list of employees and the planner can manually select one of the engineers. If a single resource is similar, LN assigns the resource. Alternately, resources can be assigned based on the priority rule. For more information, refer to *Priority Rule (p. 18)*.
- At activity set level. The resource of the group level is the assigned resource. Individual activity sets cannot be assigned to employees. When an activity set is assigned to another employee, the activity set can be moved to another group that is assigned to another resource. The assignment can also be changed on the service order.

Note LN allows you to generate a default assignment. You can assign an engineer to a service order activity directly, based on the service type. However, the assignment generated by group planning is considered before the default assignment.

Step 6: Recalculate planned start and finish time

LN calculates the new start and finish times. When the new planned start and finish times are known, including travel durations, the slack or shortage of time can be displayed to the user (planner) for every group assigned to a resource.

Step 7: Release group planning

The group planning activity data is copied to the corresponding service order activities, work order activities and planned activities using update activities from the Group Planning session. For service orders, the updated travel date/time fields are also copied. Use the Release Plan (tsspc3240m000) session to release the group plan.

Note LN allows you to delete the groups from group planning when the resources and the planned start and finish time, are updated.

Route-based planning process

Group planning can be time based and route based. When a route is planned for group planning activities, LN calculates travel distances and travel times for the activities. The route execution sequence of the activities is based on the route.

The route planning data is copied from group planning to the original service order activity, when the plan is released from group planning.

Note

Route planning is applicable only for service order activity.

A route can be planned based on the set of orders assigned to the engineers of a group. **Note** When different characteristics must be planned in a route, the characteristics are merged into one activity set. The travel times based on distances can also be calculated using the activity set. The addresses contain GPS co-ordinates that are required to calculate distances and also to locate the current location of the service engineer. The travel time is combined with the duration of the various activities that must be executed on location, that results in the new planned start and planned finish times. The new planned start and planned finish times data is transferred to the standard service orders.

A route can be planned for every activity set of a group, that may or may not be assigned to an engineer. When various activity sets must be planned for a route, the activity sets must be merged before a multi-characteristic route is planned. With the activity set, the travel times based on distances can also be calculated for every location in the activity set. The addresses contain GPS co-ordinates that are required to calculate distances. You can also plan the home address of an engineer as a part of the route. These distances can be calculated based on various methods such as a crow flies or web service based. The travel time is combined with the duration of the various activities that must be executed on location that results in the updated planned start and planned finish times. The new data are transferred to the standard service orders.

The methods to calculate the route:

- You can calculate the distance using 'As a crow flies' or a true distance can be calculated using a dedicated web service. When no distance is found for two locations the distance is calculated using a simple formula. For example, the calculation for 'As a crow flies':
- - Given are two points (dlat1,dlong1) and (dlat2,dlong2) in degrees
  - Convert (lat1,long1) and (lat2,long2) to radians using
    angle_radians = angle_degrees × π/ 180
  - R = 6371010 (mean Earth radius in meters)
    Δlat = lat2- lat1
    Δlong = long2- long1
    $a = \sin^2(\Delta lat/2) + \cos(lat1) \times \cos(lat2) \times \sin^2(\Delta long/2)$
    distance = 2 × R × atan2(va, v(1- a))
- You can plan the route based on a Bing map. An internet connection is required where LN sends a request to the bing maps web service to calculate the distance.
- You can perform a route calculation or a distance calculation based on sorted data. For a set of sorted orders, you must enter the group sequence. LN calculates the distance between the various addresses of the activities. Based on the average speed and initial start up time, LN estimates, based on the distance.

```
time(distance) =  distance(km) * speed (km/hr) + initial time (hr)
```

- Take time constraints into account yes or no : The shortest route taken into account. Otherwise the earliest start and latest finish of the activities is considered. These time constraints can be configured using the Respect Earliest Start Time and Respect Latest Finish Time parameters in the Service Planning Parameters (tsspc0100m000) session. If these check boxes are selected, and if the specified locations are not part of the route, Infor LN does not allow you

to release the activity; the activity remains in the group plan and the status of the activity is set to Not Planned.

- Take the home address of the service engineer into account yes or no: The time period between departure and arrival. When the service engineer departs from home and arrives at home in the evening, the tour is closed, otherwise it is open ended
- The planner can also manually define the sequence of the route. To do so:
  - Modify the sequence numbers
  - Select the Keep Sequence check box
  - Re-plan the route

  Consequentially, Infor LN updates the travel times in a pre-defined sequence. However, this sequence is not optimal and can lead to more travel time and a higher mileage.

Chapter 3
Resource Planning

3

This chapter provides a brief description of the Resource Available concepts in Group Planning.

Check Resource Availability

LN checks the resource availability if the **Check Resources for Availability** check box is selected in Groups for Service Orders (tsspc3100m000) or Groups for Work Orders (tsspc3100m100) sessions. By default, this field is checked, if the **Check Availability** check box is selected in the Service Planning Parameters (tsspc0100m000) session.

A resource is available for the Planning Group only if the resource is not allocated to another planning group with an overlapping time period (planned start time and planned finish time) that is smaller than the defined availability percentage. LN populates a list of resources that have matching attributes or matching skills, displayed in the Group - Proposed Resources (tsspc3104m000) session. LN allocates the resource with the highest ranking. Select the **Allocate Resource to Planning Group** check box to allocate the resource to the group.

When a resource is allocated to Group Planning, you can view the resource in the Group - Resources (tsspc3102m000) session. You can also view the list of proposed resources in the Groups for Service Orders - Resource Requirements (tsspc3604m000) session. The session also displays the attributes and skills defined for a group. In this session, the planner can select or clear the required attributes, or skills, or both, to check if more resources with a less rigid criteria can be made available for the group. The planner can also use the Groups for Service Orders - Proposed Resources (tsspc3604m400) session to check if the proposed resources' attributes and skills match the requirements of the group.

If the resource is not fully available in the time period of the specific group, the percentage of availability is calculated.

Example

The specific group starts at 8/28/2011 9:00 and ends at 8/28/2011 13:00.

Proposed resource EMPL-1 is allocated to another group from 8/28/2011 9:00 to 8/28/2011 10:00. Therefore, EMPL-1 is occupied for one hour. The availability percentage is (4-1)/4 * 100% = 75%.

```
The formula used to calculate Availability Percentage (AP):

AP = Available hours * 100% / Required hours

Available hours = number of working hours (based on resource calendar) between
 Planned Start Time and Planned Finish Time of the Planning Group -  ( working
 hours (based on resource calendar) between Planned Start Time and Planned
Finish Time of overlapping Groups where resource has been allocated to).
```

It is possible that the available hours exceed the required hours, the Availability Percentage is > 100%. Therefore, the Availability Percentage is set to 100%.

As soon as a resource is allocated to a planning group, LN recalculates the availability for the resource.

When the resource's availability is less than the **Minimum Availability Percentage** defined in the Service Planning Parameters (tsspc0100m000) session, LN moves the resource from the proposed resource list.

In case the check availability check box is not selected, LN does not check the availability of the resource. The Availability Percentage is not determined, and is set to 0.0.

Priority Rule

If more than one resource is identified for a planning group, the resources are prioritized based on priority rules. Set the **Proposed Priority** field in the Service Planning Parameters (tsspc0100m000) session.

LN ranks the proposed resources based on the priority rules. The ranking or the prioritization enables LN to automatically allocate the resource with the highest ranking. If the **Automatically highest priority** check box, in the Service Planning Parameters (tsspc0100m000) session is selected, LN allocates the resources with the highest priority. If this check box is cleared, you must manually allocate the resources.

The defined rules:

S.No	Rule
1	Is not allocated to other Planning Groups
2	Has all Planning Group attribute values
3	Has all required skills
4	Has all preferred skills
5	Has Planning Group with earliest finished activity

LN checks all the rules and ranks for the proposed resources of a group. For example, if the first rule is applicable, the resource gets 24 (= 16) points. If the second rule is applicable, the resource gets 23 (= 8) points. If the rule three is applicable, the resource gets 22 (= 4) points. If the rule four is applicable, the resource gets 21 (= 2) points. If the rule five is applicable, the resource gets 20 (= 1) points. The resources have the same priority only if the same rules are applicable.

Resource A: If only rule 1 is applicable, this resource gets 16 points.

Resource B: If only rule 2, 3 and 4 are applicable, this resource gets 8 + 4 + 2 = 14 points.

Resource C: If only rule 1 and 5 are applicable, this resource gets 16 + 1 = 17 points.

Therefore, resource C gets the highest priority.

When resources are sorted on priority, the highest priority is displayed as the last record. To list the resource with highest priority as the first record, LN recalculates the priority based on the formula:

```
priority = 32-priority
```

Example

After the recalculation the priority for the resources is:

Resource A: If only rule 1 is applicable, the resource gets 16 points. Priority = 32 – 16 = 16.

Resource B: If only rule 2, 3 and 4 are applicable, the resource gets 14 points. Priority = 32 – 14 = 18.

Resource C: If only rule 1 and 5 are applicable, the resource gets 17 points. Priority = 32 – 17 = 15.

Description of the Priority Rules:

- **Rule 1- Is not allocated to other Planning Groups**
  This rule is true when, for a resource, no record exists in Group - Resources (tsspc3102m000) session for any other Planning Group.

- **Rule 2- Has all Planning Group attribute values**
  This rule is true when, for a resource, the **Match on Attribute Values** field in the Group - Proposed Resources (tsspc3104m000) session is set to specific.
- **Rule 3- Has all required skills**
  This rule is true when, for a resource, the **Match on Mandatory Skills** check box and the **Match on Preferred Skills** check box in the Group - Proposed Resources (tsspc3104m000) session is selected.
- **Rule 4- Has all preferred skills**
  This rule is true when, for a resource, the **Match on Preferred Skills** check box is selected in the Group - Proposed Resources (tsspc3104m000) session.
- **Rule 5- Has Planning Group with earliest finished activity**
  The rule is true when the resource is allocated to another Planning Group (or groups) in the Group - Resources (tsspc3102m000) session, and the **Planned Finish Time** of the latest Planning Group is earlier than the other proposed resources. When the resource is not yet allocated to a Planning Group, this rule is definitely true.

Resource allocation for group planning

The allocation of resources to planned groups and activity sets is the last step in the Group Planning process. Resources can be service engineers or service departments. The allocation of resources can be executed manually, semi-automatically, wherein, (LN proposes the resource and the user selects the resource manually), or fully automatically. The allocation can be based on skills, and/or planning attributes.

To allocate resources automatically, the required skills and attributes from the Planning Group are matched with the available skills and attributes of the resources. The Service Planning parameters determine whether resource allocation is based on skills and/or attribute values. Use the Planning Attributes (tsspc0110m000) session to indicates if the attribute must be used for resource allocation.

Skills and attributes can be defined by service engineer and by service department. Service engineers can be allocated to planning groups with activity origin Service Order. Service departments can be allocated to planning groups with activity origin Work Order or Planned Activity. When, for a Planning Group, more than one resource is identified, the resources are prioritized based on Priority Rules (For more information, refer to *Priority Rule (p. 18)*). The availability of the resource is also determined. The result of the group planning process, including the resource allocation, is saved in temporary tables, allowing the user to analyze and modify the result. LN allows you to allocate resources to a group, using various sessions, example, Groups for Service Orders - Resource Requirements (tsspc3604m000) session, Group - Proposed Resources (tsspc3104m000) session and so on. LN also allows you to allocate resources automatically.

When the Group Plan is released using the Release Plan (tsspc3240m000) session, the allocated resources are copied to:

- Service engineer assignments, in case of service orders
- Work order activities, in case of work orders (only one department).

- Planned activities, in case of planned activities (only one department).

The resource allocation process comprises of the following steps:

- Set up data
- Propose resources based on attributes and/or skills
- Optionally, check the availability of the resource
- Sequence the resources based on priority
- Select the resource(s) to be allocated to the Planning Group
- Allocate the resources to the Planning Group
- Release the Group Plan

Data set-up

The data set up for resource planning can be based on attribute values and skills.

Data set-up based on attribute values:

- In the Planning Attributes (tsspc0110m000) session, **Used for Resource Allocation** check box to indicate that the attribute is used for resource allocation.
- In Attribute Group - Preferred Resources (tsspc0120m100) session, a group of type Resource is added. LN adds the default set of attributes to this group. For this default set of attributes, the **Any Value** field is set to Yes. LN assigns the proposed resources to the group. This is the fall back mechanism.
- To allocate resources manually, specific attributes value have to be configured and the **Any Value** check box must be cleared.
- You can add, modify and or delete the attributes.

Note

LN allows you to add attributes that are not defined in the Planning Attributes.

- In the Group - Resources (tsspc3102m000) session, add resources for the Attribute Group. When you add a resource that is already linked to an attribute group, LN generates a warning message.

Data set-up based on skills

Define skill of the type Service Department. When the available skills match with the skills required for the work order activities, or planned activities, resources are proposed during group planning.

Proposed resources

Use the Propose Resources for Planning Groups (tsspc3270m000) session to initiate the process of resource allocation for a range of planning groups. Resources are identified based on attributes and/or skills.

- Allocate resources based on attribute values : You must allocate resources to Planning Groups generated as a result of Group Planning process. Resources are allocated only when the **Check Resource** check box is selected in the Group (Set) - Attribute Values (tsspc3101m000) session. LN searches attribute groups for the set of attributes / attribute values, taking into account the activity origin of the Planning Group. The number of proposed resources can be modified (conventionally, can be increased) by clearing the **Check Resource** check box for the attribute.
- Allocate resources based on skills : For every skill, the resources can be accessed in the Service Department - Skills (tsmdm1130m000) session, or Service Employee - Skills (tsmdm1135m000) session, based on the activity origin of the Planning Group. When the activity origin is Service Order, the Service Employee - Skills (tsmdm1135m000) session is accessed. When the activity origin is Work Order, or Planned Activity, the Service Department - Skills (tsmdm1130m000) session is accessed. For service employees, the skill is effective when the effective date is equal to or before the planned start time, and the expiry date is on or after the planned finish time of the Planning Group. The **Effective Date** and the **Expiry Date** are defined in the Skills by Employee (tcppl0120m000) session. A resource can only be proposed for group planning when the resource has all the mandatory skills. The **Match on Mandatory Skills** check box in the Group - Proposed Resources (tsspc3104m000) is selected. When the resource has also all preferred skills, the **Match on Preferred Skills** check box is selected.
  - **Note**: When a group does not require skills and the **Check Resources for Skills** check box is selected, for a service order, work order or planned activities, LN displays all the resources on proposed resources for the group.
  - **Note**: When LN checks the resources availability for a group, the resources list includes *attribute based match* resources as well as *matching skills* resources.
- Allocate Resources based on Attributes and Skills : In this scenario, resources are allocated based on attributes and on skills.

Resource selection

Use the **Allocate Resource to Planning Group** checkbox in the Group - Proposed Resources (tsspc3104m000) session to indicate that the resource is allocated to the Planning Group. For Planning Groups with activity origin Service Order, one or more resources can be selected. For Planning Groups with activity origin Work Order, or Planned Activity, only one resource can be selected. When the **Automatically when only one found** check box in the Service Planning Parameters (tsspc0100m000) session is selected, LN selects the **Allocate Resource to Planning Group** check box when only one resource is proposed.

When more than one resource is proposed, and the **Automatically highest priority** check box is selected, LN selects the **Allocate Resource to Planning Group** check box for the resource with the highest priority.

Allocate resources

Resource allocation can be executed in the following two ways:

- Using the **Allocate Resources to Planning Groups** option on the **References** menu in the Group - Proposed Resources (tsspc3104m000) session, the resource is allocated to the Planning Group.
- Using a batch session.

Merge/Split planning groups

When Planning Groups are merged, LN merges proposed and/or allocated resources. This is applicable only for Groups with activity origin Service Order. When Planning Groups are split, you must propose/allocate resources to the new group, that is created.

Release the plan

Use the Release Plan (tsspc3240m000) session to release the plan.

Chapter 4
Territory Planning

4

This chapter provides a brief description of the Territory Planning concepts in Group Planning.

Territory Planning

Use Territory Planning module to perform territory and preferred engineer simulations. You can select the serialized items, which need to be serviced (required capacity) in a certain geographical area, and LN calculates the required capacity on historical and/or already known data.

To calculate available capacity, you also can specify simulation engineers, to have a maximum flexibility. If the calendar and availability type of an engineer is specified, LN calculates the available capacity. If not you must enter this data manually. In a simulation, LN specifies geographical areas as per the selected resources (existing service engineers and/or simulation engineers).

Territory planning process

The territory planning functionality enables you to perform territory and preferred engineer simulations. The objective is to reduce travel by clustering the interchangeable work in geographical areas. The territory engine compares the required capacity for the serials, with the available capacity (the engineers or simulations engineers). The engine calculates the best possible combination of the required capacity for the serialized item and the available capacity. Optionally, an engineer can be made responsible for a territory and the optimal territories can also be calculated.

You can select the serialized items that are to be serviced (required capacity) in a certain geographical area. The engine calculates the required capacity on historical and/or already known data. To check the available capacity, the user can specify existing service engineers, as well as simulation engineers, for maximum flexibility. If the calendar and availability type of an engineer is defined, the engine calculates the available capacity. The user can use the simulation results, to modify the preferred engineer on the serialized item and/or the territory.

Note

The user can also manually change the preferred engineer and the territory of the serialized item.

Step 1: Determining or calculating the required capacity for a list of serials

In order to determine the required capacity, the user specifies the serialized items for which the capacity requirements must be considered. The user can select the serials that must be part of the geographical clustering calculation based on:

- Top serial
- Service department
- Installation group
- Service area. This information can be obtained from the related installation group (when applicable)
- Serialized item groups
- The manufacturer of the serial
- The sold-to business partner of the serial

Based on these criteria, Infor LN compiles a list of serials. The list can be modified by the user.

The user can trigger the calculation to aggregate the available capacity data into different categories such as planned activities, service orders. After triggering the calculation, LN provides an overview wherein the capacity figures can be maintained manually including the number of visits. The user loads the known capacity requirements data into the territory plan. For Field Service, LN bases the number of visits on the number of planned activities and service orders. The number of visits determine how much travel time is used for the serial during the simulation. The user has the option to roll up the underlying capacity figures to the top serial item. In case the top serial item is the planning level, it is advised to roll up the capacity of the parts to the top serial. The required capacity is loaded into the territory plan.

Step 2: Determining the available capacity

The available capacity must be configured by the user:

- Using simulation users for a rough identification of the territories
- Using named resources for a more detailed identification of the territories. To do so, you can either use the actual calendar of the employee or multiplying the number of days with the available hours for a day.

Configuring the available capacity - The available capacity for resources and the number of territories determine the output of the engine. For the input parameter, the number of territories determine the number of geographical clusters into which the total data set is divided. The capacity available for a territory determines whether the set of serials and the related capacity requirements match, (for example, travel as activity duration) This input parameter helps determine the optimal geographical distribution of territories, on the map.

Step 3: Calculating the capacity allocations

The purpose of the engine is to assign as many required capacities (serialized items) as possible to resources (available capacities, that is the (simulation) employees), taking available capacity, required capacity, and travel time into account. Use the Calculate Capacity Allocations (tsspc4200m000) session to start the territory engine.

The engine can be triggered after configuring the input data:

- The user runs a quick simulation with the average available capacity to be divided over a fixed number of territories. After the simulation, the user can update the territory of the serialized item.
- The simulation can also be performed with actual resources. After the simulation, the territory and the preferred engineer can be updated for the serial item.

Calculation of the territory plan:

1. Indicate the territory reference point on the map (starting location) : The reference points are indicated 'on the map' to run the initial calculation. The first calculation of distances in step 2 is based on these reference points.
2. Allocate serials to the territory: LN allocates serials to the territory according to the second best algorithm.
3. Swap logic: LN finds the longest distance between the (arbitrary) territory reference point and the serial and tries to minimize the long radius by swapping the serial with another territory reference point.
4. For a set of serials, determine the center of gravity (Optional): For reference points that are not fixed, the system determines the average longitude and latitude and shifts the reference point to the center of gravity of the territory. After a shift in the territory reference point, the system starts again with step2. This process (reiterating from step 2 – step 4) repeats until no substantial improvements are identified anymore.
5. Swap logic for the complete list of serials : For all serialized items, LN verifies if the items can be exchanged with other territories. This is a one-time activity.

Step 4: Using the output of the engine

The basic output of the calculation is the territory or preferred engineer identified for a serialized item. The territory plan can be used to update these attributes of the serialized item.

- Graphical overview: The output of the engine can be viewed using maps that provide an overview of territories. The information about the serial and the required capacity for the serial, along with the activity duration and travel time, is also included. Various colors are used to indicate various territories. The user can update the preferred engineer of the serial based on the territory. The territory planning session can be used to compare territory scenarios. Scenario 1 is on the left side and Scenario 2 is on the right side of the screen. Dual coloring mechanism is used for the markers on the map. In the marker, the color on the left corresponds to the scenario on the left side and the color on the right corresponds to the scenario on the right side. You can also compare the output of the engine with the actual data. The preferred

engineer and territory calculated for a scenario can be compared to the preferred engineer or territory in the serialized item master data.

- Territory and preferred engineer without map : You can view the assigned territory and potentially, the preferred engineer data without the map in the Serialized Item 360 (tscfg2100m100) session. The user can filter and select multiple serials. The serials can be assigned to a preferred engineer using the Update Engineer and Location Address... option from the **References** menu.

Step 5: Recalculating the travel time

When the territory engine is run, you can recalculate the travel time, because the travel time used by the engine is based on the center of gravity. However, the center of gravity is typically, not the home address of the engineer. Therefore, there can be a discrepancy between the calculated and the actual travel times. For example employees are hired to complete assignments in an area that is not, by default, close to the employee's home address resulting in a deviation from the reference point and the center of gravity. This is applicable only for two calculation options:

1. Direct (as the crow flies)
2. Road-based (using a web service [call to Google or Bing API])