# Infor LN Service User Guide for Workload Distribution Workbench

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# About this document

This guide provides information about the various concepts and processes for the Workload Distribution Workbench. With the help of workbench, the most urgent orders can be prioritized and the service engineer travel time can reduce as the work allocated to engineer can be restricted to a particular region.

### Objectives

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

- **Understand the following concept**
  Group Planning
- **To perform the following tasks**
  Workload distribution
- Time base and Route based

### Document summary

This guide explains the various concepts and processes available in the Geographical Workload Distribution (tsspc8365m000) workbench.

### 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 Infor 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 you the introduction of the workload distribution workbench.

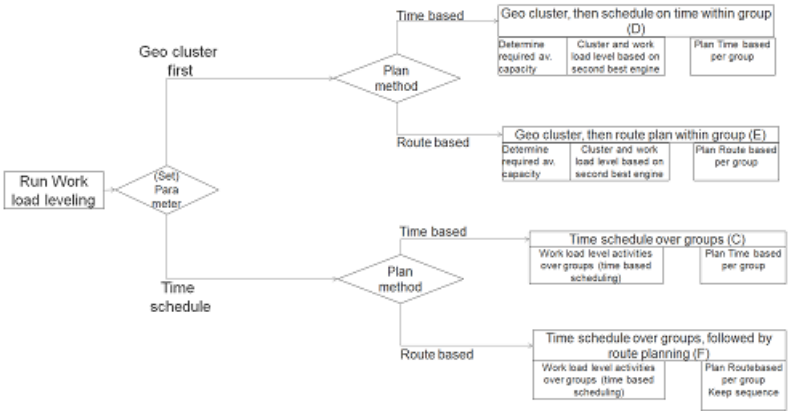
## Workload distribution workbench

The Workload distribution workbench provides an overview of the workload across various resources. With the help of workbench, the most urgent orders can be prioritized and the service engineer travel time can reduce as the work allocated to engineer can be restricted to a particular region. The workload leveling functionality enables you to monitor service level agreement during operational planning which results in improved customer services.

### Workload distribution process (Geographically)

Software components used for workload distribution:

- An engine which distributes the activities efficiently, across groups. The distribution is by mean of:
  - geo clustering
  - time scheduling
- The existing planning engine which plans the activities within a group. The planning can be done:
  - Time based
  - Route based
- A pre calculation engine to determine the availability capacity. The engine gives the capacity boundaries as input to the geo clustering engine.




The flow can be executed defining a complete new plan, that is, take all the non-firm planned activities into account and level work load.

# Chapter 2
# Time based workload leveling and scheduling

2

This chapter provides you a brief description of the time based workload leveling and scheduling.

## Time based work load leveling and scheduling

For time-based workload leveling, the planned start and finish times of the activities are used to distribute the activities across the groups within a set of groups.

Infor LN sorts the activities based on the latest finish time and assigns the activities with the 'earliest' end date, first.

### Example

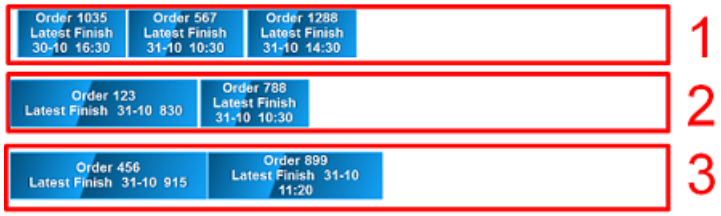
The seven activities (sorted by the latest finish time) for which workload planning must be performed. Three engineers are available to work on these activities.

Order 1035 has the earliest end date so this activity is assigned to group 1.

Activities are assigned to group 2 and 3, subsequently. Each time, an activity is assigned to a group, the end time of the group is considered.

The end time of group 1 is the earliest. Therefore, the subsequent activity is assigned to group 1.

The end time of group 2 is the earliest followed by group 3. Therefore, the subsequent activities are assigned to group 2 and 3, in that order.




## Time based – scheduling with slack optimization 'respect earliest'

If the **Respect Earliest Start Time** check boxes for service order, work order and planned activity, are selected in the Resource Planning Parameters (tsspc0101m000) session, there can be a gap or slack in the plan. You can manage the slack to a minimum. At the time of adding the activities to the group, the group with the minimal slack is preferred. Therefore, the selection of the group may differ from the one specified in the above example.

## Example

The activity of order 567 can be assigned to group 1,2 or 3. When the activity is assigned to group 2, the slack is less when compared to slack time for group 1 and 3. Therefore, adding the activity to group 2 is preferred.

However, this may create more slack if other possibilities are not considered. Therefore, Infor LN checks whether for the other options which can also minimize the slack. The other options are, to assign the activities at the beginning of the slack period and before

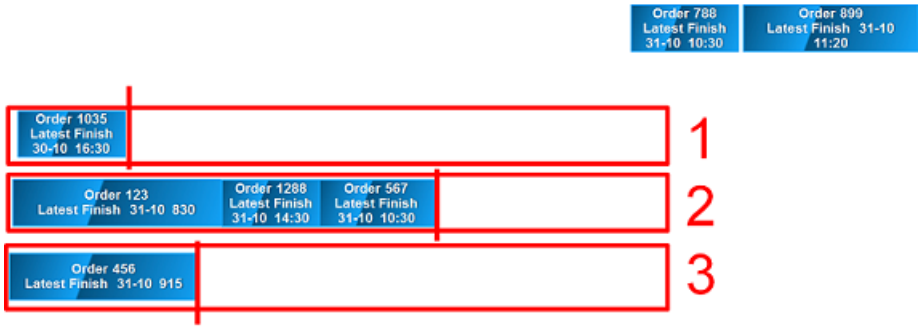
- - the earliest start moment of order 567
- - The latest start moment of order 567 in which case (latest start moment = latest finish – duration).

Consider that, the order 567 can be assigned to group 1, 2 or 3 with slack . Assume that order 567 cannot move into the future because of the latest finish time.

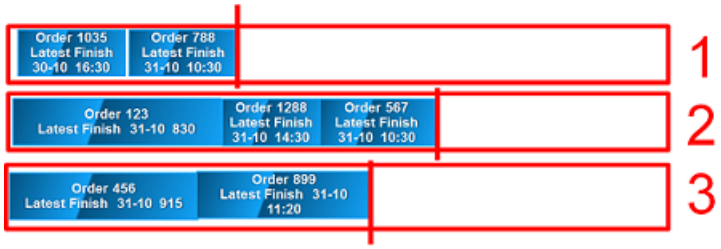
The Infor LN checks 3 options:

- The remaining slack after Infor LN fill the slack in group 1 - The remaining slack, after filling the slack period with other activities that fit in the slack period,10 minutes
- The remaining slack after Infor LN fill the slack in group 2- This is not possible to schedule 'to be planned' activities in the slack 2 period. Remaining slack is, 1 hour.
- The remaining slack after Infor LN fill the slack in group 3- Order 1288 fits exactly, making the remaining slack 0 minutes and therefore, group 3 is the preferred option for order 1288, followed

by the constrained order 567.




After minimizing the slack, the normal logic resumes:




## Respect latest

The respect latest time has less influence on the planning than the respect earliest time, since the planning logic is based on “plan forward”.

- If the **Respect Latest Finish Time** check boxes for the service order, work order and planned activity are selected in the Resource Planning Parameters (tsspc0101m000) session, Infor LN allots the activity into the plan and display a warning message when the latest finish time is exceeded.
- Infor LN allots the activity to the plan only when the latest finish time can be respected. Else, the activity is listed as exception.

# Chapter 3
# Route based workload leveling and scheduling-regenerative

3

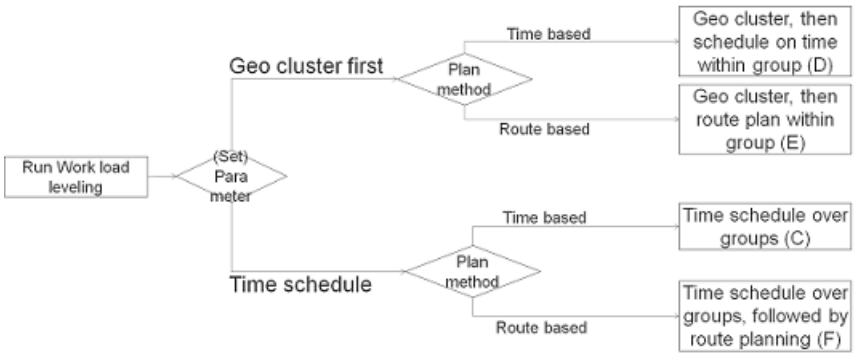
This chapter provides you a brief description of the route based workload leveling and scheduling.

## Route based work load leveling and scheduling – regenerative

When the workload leveling is executed geographically, the engine calculates the length of the route, for each group.

The objective of dividing the work based on geographical area, is to divide the map first in geographical 'clusters' and later schedule or route plan within the cluster.

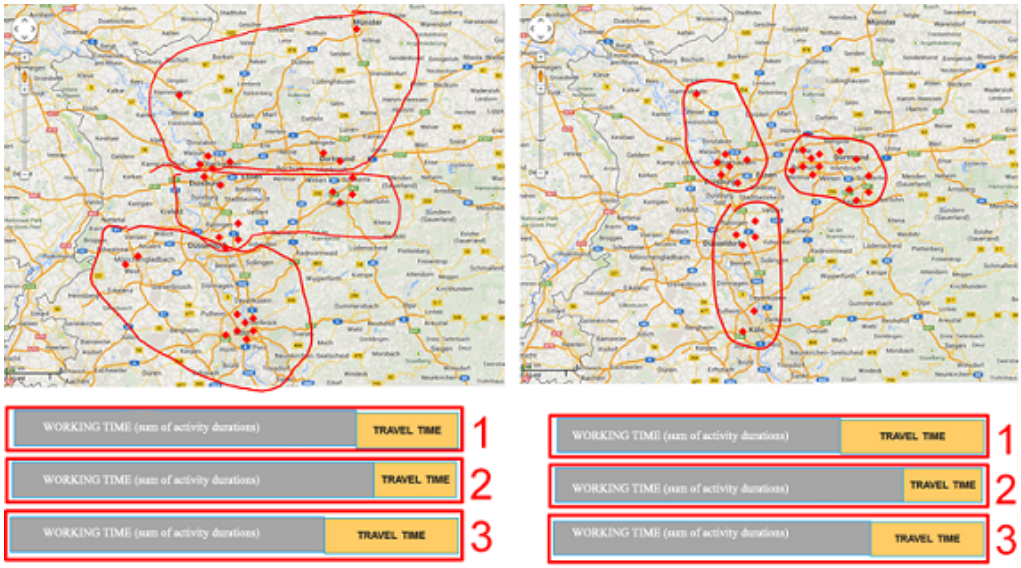
When the sequence of the time schedule is respected by route planning, the Time Schedule based and Route Based planning is not applicable. The route planning therefore continues in a 'keep sequence' mode. The distance between the activities is calculated by the route planning routine, but the sequence is NOT optimized to minimize the distance.




### Geographical clustering of jobs

All the activities for which work must be performed are grouped together as a cluster to which the engineers are assigned.

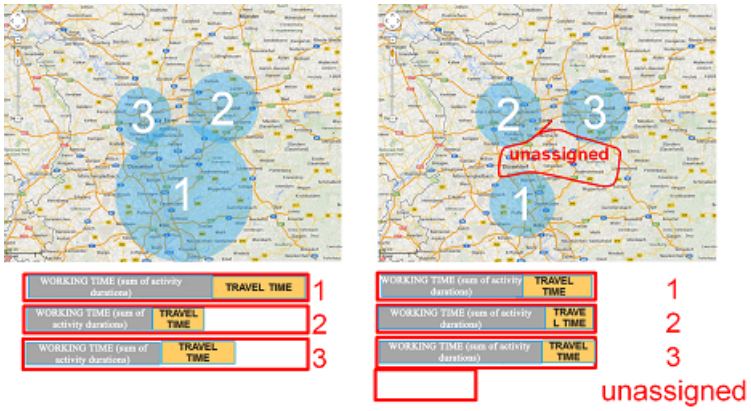
Infor LN, calculates the cluster, dynamically. This depends on where the work load is (geographically ), and which determines the composition of the cluster. The planning engine that calculates the cluster is already in use for the territory planning and is available for group planning. In the picture on the left, represents the work load for Wednesday and picture on the right, represents the work load for Thursday. The enginee calculates the various geographical clusters.




## Assign to closest engineer versus work load leveling – find average available capacity for clustering engine

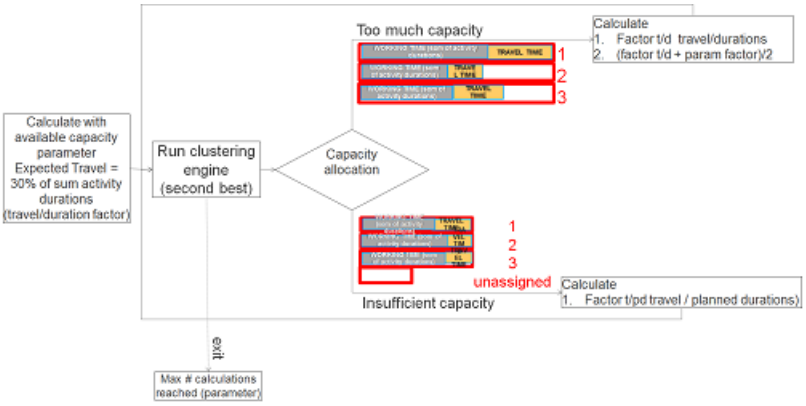
In the above image, the workload per group is ideally distributed over the various groups. However, the engine always tries to balance the available capacity with the minimal travel time. When capacity is infinite, the cluster engine allocates an activity to the engineer, who is closest, geographically. When sufficient capacity is not available, a number of activities remains unallocated. Both the scenarios are not the preferred solution. Therefore, the user has to manually set the allocation and influence the distribution.

When there is more capacity (picture on the left ), one group (1) may get too many activities allocated and the other groups (2,3) less. On the other hand, groups 1,2,3 can be fully booked with activities




remains unassigned.(Picture on the right)

To achieve a reasonable distribution, the engine consider the travel/duration factor. The travel time is compared to the working time (i.e. the sum of the durations). The engine uses a group setting to allocate a resource based on the estimated travel time. This may result in a over- or under-capacity situation. In an 'over capacity' situation, the engine reduces the travel duration factor using the formula (the input travel-duration ratio) + (resulting travel-duration ratio)/2. In an under capacity situation, the resulting travel-duration ratio is used as the next option. You can set the **Number of Iterations** in Resource Planning Parameters (tsspc0101m000) session to restrict the impact on performance.



# Chapter 4
# Re workload level-time based

4

This chapter provides you a brief description of the re workload leveling-time based.

## Re work load level – time based

The re-work load leveling functionality is implemented only when one set of attributes are selected.

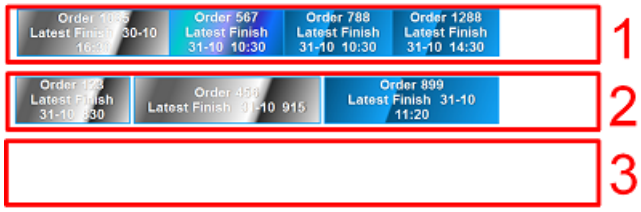
For example, the user selects one group with reference point (Essen) and skill (Support). The engine checks for non frozen groups with the same characteristics. If present, the number of non frozen groups leads to the default number of groups, as output. The number of groups input must equals the number of groups output. However, this is not mandatory. The number of parallel groups can be increased or decreased. A part of the group can be firm planned (as some part of the group is already completed). The system levels the work load from the firm planned point onwards, in the group.

Let us assume that the part of the activities is completed and marked as firm planned in the groups. However, in group 1 the activity is running late and in group 2 the order was completed earlier as expected. The planning has not been executed, so far.

When executing the work load leveling, the engine removes the not-firm planned activities from the groups and starts re-allocating the activities. The first activity to be allocated is order 567. Group 2 is available first, therefore the activity is added to group 2. The earliest end times are checked every time (or the minimal slack with respect earliest on) and this leads to the following end result.

In the image above, owing to the work load leveling, jobs allocated to group 1 and 2 are now different. Assuming an employee reports sick in the morning, the capacity must be decreased from 3 parallel tracks (groups) to 2. The firm planned activity from group 3 is manually moved to group 2.

The end result for the 2 parallel groups is:



# Chapter 5
# Re workload level-route based

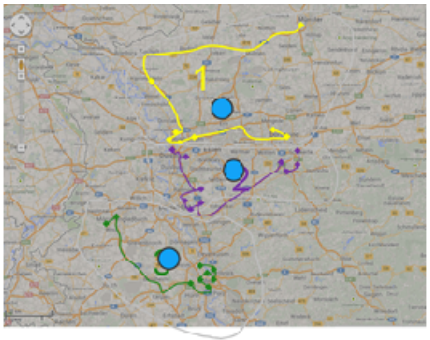
5

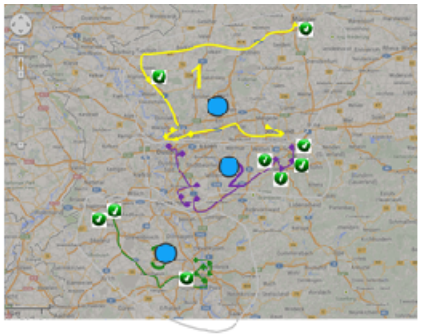
This chapter provides you a brief description of the re workload leveling-route based.

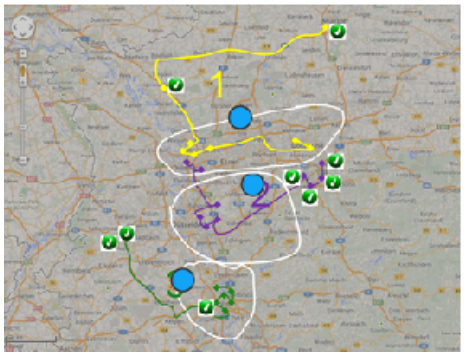
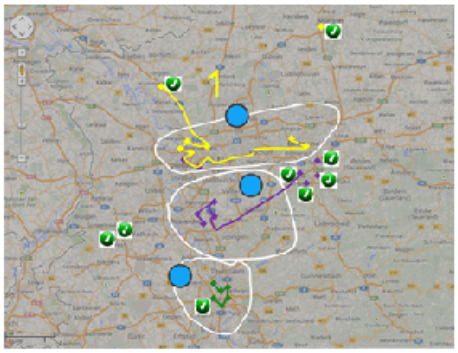
## Re work load level – route based

The existing groups are executed in a specific region and in the region, the planner aims to achieve the highest possible match to the times agreed with the customer. However, the engineer is already driving in a specific area and must stay there as much as possible to avoid the travel. The area in which the service engineer is working, is marked by the Center of Gravity of the cluster calculation. This point is the average GPS longitude and latitude of the activities in the group, represented by the blue dots on the map.

In the selected areas, routes are calculated according to the route planning algorithm. Since the plan is already in execution, generating a new plan is not considered, represented by the 'check' marks in the picture on the right. The next activity is already frozen because the engineer has started working on the activity.





Therefore only the not-firm planned activities can be rescheduled and re-leveled. The engine considers the existing Center of Gravity to allocate the activities. When the capacity end point of the firm planned activities is roughly equal, the engine re- clusters.

This leads to the situation indicated by the white lines in the picture on the left (with the original routes for reference). After implementing route calculation, in the newly calculated clusters, the route planning connects the firm planned activities. This is shown in the picture on the right.