

Oracle® Scheduler

Concepts and Procedures

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1 Understanding Oracle Scheduler

This topic group provides overviews of the application and its components, explanations of key concepts, features, and functions, as well as the application's relationships to other Oracle or third-party applications.

Topics covered are:

- [Overview of Oracle Scheduler](#)
- [How Scheduler Relates to the E-Business Suite](#)
- [Oracle Scheduler Process Flow](#)

1.1 Overview of Oracle Scheduler

The objective of Oracle Scheduler is to provide state of the art scheduling and optimization capabilities of tasks and trips specifically for field service business needs. Oracle Scheduler offers intelligent scheduling or scheduling with the window to promise as scheduling methods. It largely depends on your business scope which method is preferred. For both methods this will be done by applying pre-defined constraints including travel time and distance to qualified resources, taking into account part availability. Constraints are related to costs and allow you to define the Oracle Scheduler algorithm, so that the resulting schedule fits your specific business needs.

Reviewed in more detail is:

- [Scheduling Intelligent](#)
- [Scheduling with the Window to Promise](#)
- [Relation to the Assignment Manager](#)

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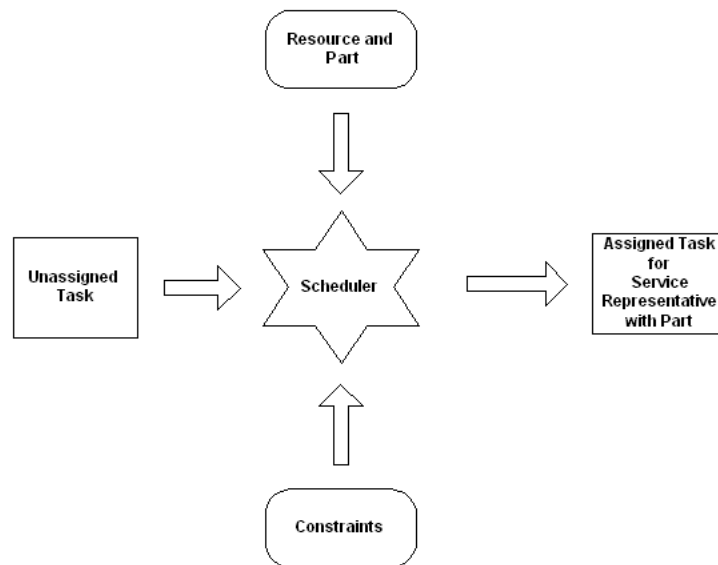
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- Introduction to the Cost Mechanism
- How the Scheduler makes use of the Geographic Component

1.1.1 Scheduling Intelligent

This option for scheduling is mostly used in a business to business organization. The scheduling intelligent method enables you to perform an automated and manual process of assigning tasks, based upon pre-defined constraints, to qualified service representatives. These constraints are defined as costs and are set up to meet your organizations business needs. Intelligent scheduling allows assigning of single and multiple tasks. The result of scheduling intelligent is the creation of a trip of sequenced tasks for each service representative. You can optimize a service representatives trip later in the process or reassign a task, before dispatching the schedule to the service representative.

The following graphic visualizes how Oracle Scheduler schedules using the Intelligent option.

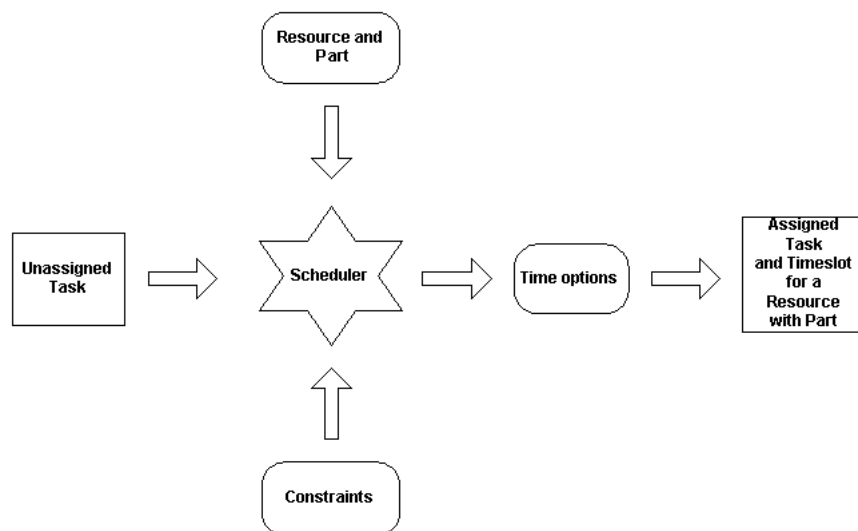


1.1.2 Scheduling with the Window to Promise

This option for scheduling is mostly used in a business to consumer market. The Window to Promise is designed to directly offer your customer a date and timeslot. A timeslot is the period in which a service representative is visiting the customer to perform a service task. To a customer this is the most important to know. The options presented to you to offer to the

customer are a combination of selecting a qualified resource based upon pre-defined constraints and the time slots that are pre-defined to offer to a customer. These constraints are defined as costs and are set up to meet your organizations business needs. The outcome of scheduling with the Window to Promise is a task and resource assigned to a time slot. The time slot is reserved for a customer. One timeslot can be reserved for multiple customers. You can optimize a service representatives trip later in the process before committing the schedule to the current situation or reassign a task to see if it is more economic to reschedule it. Scheduling with the window to promise does not allow for an automated process of scheduling and can only be done for one task at a time.

The following graphic visualizes how Oracle Scheduler schedules using the Window to Promise option.



1.1.3 Relation to the Assignment Manager

The Assignment Manager is a component in the CRM applications suite that assists in the assigning of ownership of documents and tasks and the availability of qualified resources needed to perform a task. When the Oracle Scheduler is installed, the Assignment Manager searches for qualified resources to complete the selected field service task(s) based upon selection criteria set within the Assignment Manager. These qualified resources are passed on to the Oracle Scheduler to make the actual assignment based upon pre-defined constraints. The Oracle Scheduler uses

the Assignment Manager's graphical user interface for scheduling field service specific tasks.

For more information see *CRM Foundation Concepts and Procedures*.

1.1.4 Introduction to the Cost Mechanism

When a task can be performed by more than one service representative, it's a matter of deciding which service representative can perform the task most efficiently. Costs are related to your organization's business rules for planning and allow the cost mechanism to compare the alternative options for scheduling. Costs should not be read as financial cost, but more as 'penalty points'.

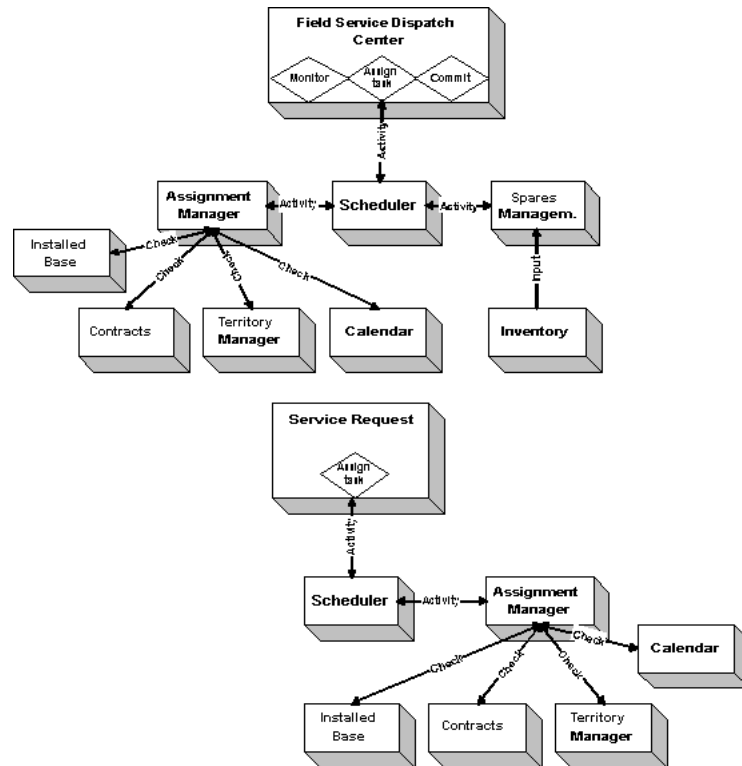
Cost functions are parameterized by cost settings that are stored in the database.

1.1.5 How the Scheduler makes use of the Geographic Component

Providing field service always includes managing travel, therefore the appropriate geography is always a key consideration for the Oracle Scheduler scheduling process, in particular for geography based scheduling. The component that determines travel time in Oracle Scheduler is the Time Distance Server. The time distance server determines based upon the appropriate road network the distance between two locations and the amount of time it takes to travel. To calculate travel time and distance between two tasks each task therefore needs location information, a locus, this is derived from the address using street, city, country and/or zip code by the location finder.

1.2 How Scheduler Relates to the E-Business Suite

Scheduler is integrated with many other Oracle Applications. The following figure visualizes this integration. All applications involved and their relation are explained in more detail in the sections following the figure.



1.2.1 Field Service

Scheduler is tightly integrated with Field Service. Use Scheduler from the Field Service Dispatch Center for task scheduling and parts reservations.

1.2.2 Service Request

Scheduler is also integrated with Service Request. Use Scheduler from the Service Request for task scheduling.

1.2.3 Assignment Manager

The Assignment Manager assists in the scheduling of tasks by finding an initial qualified service representative to resolve the task. Indirectly the following applications have a relation with Scheduler:

- Installed Base, a preferred service representative to perform the field visit can be recommended from the installed base.
- Contracts, a preferred service representative to perform the field visit can be recommended from Contracts Core, or Contracts Service.
- Territory Manager, territories with qualifiers are created to filter qualified service representatives.
- Calendar, the availability of the service representative is checked in his or her calendar.

This information is passed on to Scheduler.

1.2.4 Spares Management

The list with qualified resources retrieved from the Assignment Manager is passed on to Spares Management by Scheduler. In Spares Management a check is done on the availability and location of the parts for the task for each resource from this list. A list with feasible options and related cost is then returned to Scheduler. Scheduler applies it's pre-defined constraints including travel time and distance to this list of resources. When a task assignment is created, a reservation for the part is made. When the task is committed, an order for the part is created.

1.3 Oracle Scheduler Process Flow

Scheduler is used to schedule tasks from either Service Request or Field Service. The scheduling process uses the following criteria to find qualified resources:

- preferred resources
- resource availability
- skills
- territories
- part location and availability
- travel time and distance
- business-driven constraints

Based on the selection criteria set in the Assignment Manager, initial qualified service representatives are found. These selection criteria include preferred resources, resource availability, and territories information. Scheduler passes this list on to Spares Management. In Spares Management a check is done on the availability and location of the parts for the task for each resource from this list. A list of feasible options and related costs is then returned to Scheduler.

Scheduler reconsiders the resources availability, skills, calculates travel time and distance, and applies its business-driven constraints. These business-driven constraints are built around a cost mechanism. Costs are defined for each constraint. Scheduler calculates the cost for each possible plan option in each qualified service representative's trip, taking into account the cost related to a part transaction.

Finally, Scheduler presents a list of qualified resources with a related cost or time slots with a related cost. The option with the lowest cost is the best option. When the task is scheduled, Spares Management reserves the part. When the task is committed, Spares Management creates an order for the part.

The scheduling process is driven manually or automatically.

Please review the following to understand more about the scheduling process:

- [Scheduling Dependencies](#)
- [Scheduling Criteria](#)
- [Integration with Spares Management](#)
- [Cost Related Constraints](#)

1.3.1 Scheduling Dependencies

The scheduling process uses criteria based on preferred resources, availability, territories, parts availability, and travel time and distance to select a qualified resource for a task. There are a few dependencies the scheduling process relies on. The following table lists the dependencies.

Dependency	Description
Preferred resource information	A preferred resource is a single person or a resource group that is defined in Oracle Contracts or recommended from the Installed Base in Oracle Service.
Skill	Skills are the field service representative's competencies. Skills fall into 3 major categories: technical product skills, other technical skills, and non-technical skills, for example specific knowledge of a certain language. When scheduling each task, Advanced Scheduler matches the field service representatives' skills to the skills required to perform the task
Skill level	The skill level indicates the expertise scale of the field service representative's skill.
Territory definition	Territories are defined in Territory Manager. For more information please refer to Territory Manager.
Planned task effort information	Task effort information is essential for checking the availability of the resource and for designating a resource as unavailable in the resources calendar after a task has been assigned. Task effort information is the amount of effort Planned at creation of the task.
Resource's availability information	Availability of the resource is provided by the Calendar component in which a resources shifts and unavailability is defined. For more information please refer to Calendar.
Spare parts location and availability	Spare part location and availability information is a dependency for Scheduler to make a reservation at task assignment. Spare part information is provided by Spares Management.
Road network for calculation of travel time and distance	A road network is a dependency for Scheduler to be able to calculate travel time and distance in between tasks.

1.3.2 Scheduling Criteria

There is a difference in how Service Request and Field Service consider selection criteria to retrieve a qualified resource for a task. Also when scheduling manually you can partly influence how the selection criteria are applied by making a selection from it. When you are scheduling automatically, an assumption is made on how selection criteria are applied.

Please address the following table to learn about the differences and how the criteria are used to select a qualified resource for a task:

Criteria	Service Request	Field Service	Automatic Scheduling
Territory Qualifiers	Used to retrieve all the qualified resources for the assignment from the selected territories.	Used to retrieve all the qualified resources for the assignment from the selected territories.	Used to retrieve all the qualified resources for the assignment from all territories defined.
Contracts	When selected, this is the foremost resource considered.	When selected, this is the foremost resource considered.	Selected as the first and foremost criteria considered.
Installed Base	When selected, this is the foremost resource considered.	When selected, this is the foremost resource considered.	Selected as the first and foremost criteria considered.
Skills	Not used.	Matched are the field service representatives skills to the skills required to perform the task.	Matched are the field service representatives skills to the skills required to perform the task.
Resource Available	The availability of the resource is always considered.	The availability of the resource is always considered.	The availability of the resource is always considered.
My Suggestion	Not used.	When entered, the suggestion is always returned as a plan option.	Not used.
Spares	Not used.	A list of qualified resources based on the criteria above is passed on to Spares Management to check parts availability based on the availability condition selected.	A list of the qualified resources based on the criteria above is passed on to Spares Management to check parts availability based on a predefined availability condition.

Criteria	Service Request	Field Service	Automatic Scheduling
Travel time and distance	The travel time and distance for each plan option are calculated for the resources returned from Assignment Manager.	The travel time and distance for each plan option are calculated for the resources returned from the Assignment Manager (when no parts are used) or Spares Management.	The travel time and distance for each plan option are calculated for the resources returned from the Assignment Manager (when no parts are used) or Spares Management.
Cost Related Constraints	Pre-defined business driven constraints are applied for each plan option to produce a list of qualified resources or available time slots.	Pre-defined business driven constraints are applied for each plan option to produce a list of qualified resources or available time slots.	Pre-defined business driven constraints are applied for each plan option to produce a list of qualified resources or available time slots.

1.3.3 Integration with Spares Management

Scheduler takes into account the spare parts availability for a resource for a task at a certain time.

The spare part process handled by Scheduler is as follows:

1. Scheduler provides Spares Management with a list of resources qualified to resolve the task and available dates. Indicated is the availability condition for a part. The availability condition for a part tells Spares Management what part definitions for the task, based on the likelihood they are required to resolve the task are considered.

The availability conditions are defined in Spares Management. The availability condition represents the urgency for a part to be available to resolve the task, based on the likelihood a part is used to resolve a task. In Spares Management a relation between the problem definition of a task, and the parts that are likely to be used to resolve the task is established. For each of these parts it is calculated which one is used the most. The part used the most is mapped to a high likelihood percentage to resolve the task.

For automatic scheduling an availability condition is defined at setup, this availability condition might differ from one of the seeded values.

2. In Spares Management, based on the availability condition indicated, for each resource from the list the part availability to a resource is checked for the time options given. Costs are calculated for each possible option, this might include shipping parts to a resource from another resource, from a warehouse, or even from a secondary support location. When no feasible options are found, this will be prompted to the dispatcher. When scheduling automatically using the background process, a log is generated and the task is set to a not schedulable status.
3. A list with resources with a related date and cost for the parts to be available is returned to Scheduler.
4. When a task is scheduled for a resource, a part reservation is created automatically.
5. When a task is committed for a resource, either manually or automatically, an internal order is created automatically for the part.

The availability conditions listed in the following table are seeded values, indicating the urgency for a part to be available to resolve a task, based on the likelihood a part is used to resolve a task.

Availability Condition	Description
All Parts	The availability for all part definitions for the task are considered and required. This could be very restrictive to be able to schedule the task.
P1	The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered. P1 indicates a likelihood based on what is setup.
P2	The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered. P2 indicates a likelihood based on what is setup.
P3	The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered. P3 indicates a likelihood based on what is setup
P4	The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered. P4 indicates a likelihood based on what is setup.
No Parts	The availability for the parts defined is not considered.

1.3.4 Cost Related Constraints

The Scheduler provides a schedule advice based upon cost. Costs, read as penalty points, are defined for factors that might influence your schedule. These factors are predefined, and related to as constraints, and reflect your organizations business rules for planning. The information regarding these constraints must be available to make the cost mechanism work effectively.

The cost related constraints used for scheduling are described in the following table, they are applied to each schedule option Scheduler finds.

Cost Related Constraint	Description
Cost for not assigning preferred resource	Applied to an option other then the preferred resource defined.
Cost per day a task is planned after the day it was received	Each day the task is scheduled after the log day.
Cost per unit traveling distance	The total of travel distance in a trip for a day is broken up in units. A cost per unit travel distance is applied.

Cost Related Constraint	Description
Cost per minute traveling time	The total of travel time that is spend in a trip for a day is calculated and a cost for each minute is applied.
Cost per minute a resource is working overtime	The time the service representative is working overtime in the trip in relation to his shifts.
Cost per minute visiting too early	The time the service representative is scheduled to arrive at the customer site in relation to the planned start time.
Cost per minute too late	The time the service representative is scheduled to arrive at the customer site in relation to the planned end time.

2 Using Oracle Scheduler

This topic group provides process-oriented, task-based procedures for using the application to perform essential business tasks.

Please refer to the Working with the Field Service Dispatch Center topic from the *Oracle Field Service Concepts and Procedures* to use Scheduler functionality.

The topics covering Scheduler functionality in this section are:

- Scheduling Tasks
 - Scheduling with the Intelligent Option
 - Scheduling with the Window to Promise Option
- Scheduling a Single Task or Multiple Tasks Automatically
- Viewing Failed Autonomous Schedule Assignments
- Optimizing a Service Representatives Trip
- Recalculating a Service Representatives Trip
- Recalculating all Trips
- Re-assigning a Scheduled Task
 - Re-assigning a Scheduled Task from the Gantt chart
 - Re-assigning a Scheduled Task from the Plan Board

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