Oracle® Advanced Scheduler

Concepts and Procedures Guide

Release 11*i*

Part No. B14395-01

October 2004

ORACLE®

Oracle Advanced Scheduler Concepts and Procedures Guide, Release 11*i*

Part No. B14395-01

Contents

3 Using Advanced Scheduler

A Profile Options

Send Us Your Comments

Oracle Advanced Scheduler Concepts and Procedures Guide, Release 11*i*

Part No. B14395-01

Oracle welcomes your comments and suggestions on the quality and usefulness of this document. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most?

If you find any errors or have any other suggestions for improvement, please indicate the document title and part number, and the chapter, section, and page number (if available). You can send comments to us in the following ways:

- Electronic mail: appsdoc_us@oracle.com
- FAX: (650) 506-7200 Attn: Oracle Applications Documentation Manager
- Postal service:
  Oracle Corporation
  Oracle Applications Documentation Manager
  500 Oracle Parkway
  Redwood Shores, CA 94065
  USA

If you would like a reply, please give your name, address, telephone number, and (optionally) electronic mail address.

If you have problems with the software, please contact your local Oracle Support Services.

Preface

Welcome to the Oracle Advanced Scheduler Concepts and Procedures Guide, Release 11*i*.

This guide assumes you have a working knowledge of the following:

- The principles and customary practices of your business area.

- Oracle Advanced Scheduler, Field Service, and Spares Management.

  If you have never used these applications, Oracle suggests you attend one or more of the Oracle Applications training classes available through Oracle University.

- Oracle Self-Service Web Applications.

  To learn more about Oracle Self-Service Web Applications, read the *Oracle Self-Service Web Applications Implementation Manual*.

- The Oracle Applications graphical user interface.

  To learn more about the Oracle Applications graphical user interface, read the *Oracle Applications User's Guide*.

See Other Information Sources for more information about Oracle Applications product information.

How To Use This Guide

This manual contains the information you need to implement and use the Oracle Advanced Scheduler application.

- Chapter 1 provides an introduction to and an overview of Oracle Advanced Scheduler.

- Chapter 2 provides all the implementation information, including prerequisite steps as well as the implementation methodology for Oracle Advanced Scheduler.

- Chapter 3 discusses using Advanced Scheduler, including scheduling scenarios, and it's integration with Field Service Dispatch Center and Spares Management.

- Appendix A provides a list of profile options necessary for the successful implementation and operation of Oracle Advanced Scheduler.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For additional information, visit the Oracle Accessibility Program Web site at http://www.oracle.com/accessibility/

Accessibility of Code Examples in Documentation

JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.

Other Information Sources

You can choose from many sources of information, including documentation, training, and support services, to increase your knowledge and understanding of Oracle Advanced Scheduler.

If this guide refers you to other Oracle Applications documentation, use only the Release 11*i* versions of those guides.

Online Documentation

All Oracle Applications documentation is available online (HTML or PDF).

- **PDF Documentation** - See the Documentation CD provided with each release for current PDF documentation for your product. This Documentation CD is also available on Oracle*MetaLink* and is updated frequently.

- **Online Help -** You can refer to Oracle Applications Help for current HTML online help for your product. Oracle provides patchable online help, which you can apply to your system for updated implementation and end user documentation. No system downtime is required to apply online help.

- **Release Content Document -** See the Release Content Document for new features listed release. The Release Content Document is available on Oracle*MetaLink*.

- **About document -** Refer to the About document for information about your release, including feature updates, installation information, and new documentation or documentation patches that you can download. The About document is available on Oracle*MetaLink*.

Related Guides

Oracle Advanced Scheduler shares business and setup information with other Oracle Applications products. Therefore, you may want to refer to other guides when you set up and use Oracle Advanced Scheduler.

You can read the guides online by choosing Library from the expandable menu on your HTML help window, by reading from the Oracle Applications Document Library CD included in your media pack, or by using a Web browser with a URL that your system administrator provides.

If you require printed guides, you can purchase them from the Oracle Store at http://oraclestore.oracle.com.

Guides Related to All Products

Oracle Applications User's Guide

This guide explains how to enter data, query, run reports, and navigate using the graphical user interface (GUI). This guide also includes information on setting user profiles, as well as running and reviewing reports and concurrent processes.

You can access this user's guide online by choosing "Getting Started with Oracle Applications" from any Oracle Applications help file.

Guides Related to This Product

Oracle Field Service User Guide

This manual contains detailed information about using the Oracle Field Service application, including the Dispatch Center, Debrief, and Spares Management modules, all of which are tightly integrated with the Oracle Wireless Solution for Service application.

Oracle Field Service Implementation Guide

This manual contains detailed information about implementing the Oracle Field Service application, along with all the other Oracle applications that support a successful implementation.

Oracle Self–Service Web Applications Implementation Guide

This manual contains detailed information about the overview and architecture and setup of Oracle Self–Service Web Applications. It also contains an overview of and procedures for using the Web Applications Dictionary.

Oracle Common Application Components User Guide

Oracle Advanced Scheduler uses many modules from among the Common Application Components, including Resource and Task Manager, among others. Refer to this guide for details on the usage of each module.

Installation and System Administration

Oracle Applications Concepts

This guide provides an introduction to the concepts, features, technology stack, architecture, and terminology for Oracle Applications Release 11*i*. It provides a useful first book to read before an installation of Oracle Applications. This guide also introduces the concepts behind Applications-wide features such as Business Intelligence (BIS), languages and character sets, and Self-Service Web Applications.

Installing Oracle Applications

This guide provides instructions for managing the installation of Oracle Applications products. In Release 11*i*, much of the installation process is handled using Oracle Rapid Install, which minimizes the time to install Oracle Applications and the Oracle technology stack by automating many of the required steps. This guide contains instructions for using Oracle Rapid Install and lists the tasks you need to perform to finish your installation. You should use this guide in conjunction with individual product user guides and implementation guides.

Upgrading Oracle Applications

Refer to this guide if you are upgrading your Oracle Applications Release 10.7 or Release 11.0 products to Release 11*i*. This guide describes the upgrade process and lists database and product-specific upgrade tasks. You must be either at Release 10.7 (NCA, SmartClient, or character mode) or Release 11.0, to upgrade to Release 11*i*. You cannot upgrade to Release 11*i* directly from releases prior to 10.7.

"About" Document

For information about implementation and user documentation, instructions for applying patches, new and changed setup steps, and descriptions of software updates, refer to the "About" document for your product. "About" documents are available on Oracle*MetaLink* for most products starting with Release 11.5.8.

Maintaining Oracle Applications

Use this guide to help you run the various AD utilities, such as AutoUpgrade, AutoPatch, AD Administration, AD Controller, AD Relink, License Manager, and others. It contains how-to steps, screenshots, and other information that you need to run the AD utilities. This guide also provides information on maintaining the Oracle applications file system and database.

Oracle Applications System Administrator's Guide

This guide provides planning and reference information for the Oracle Applications System Administrator. It contains information on how to define security, customize menus and online help, and manage concurrent processing.

Oracle Alert User's Guide

This guide explains how to define periodic and event alerts to monitor the status of your Oracle Applications data.

Oracle Applications Developer's Guide

This guide contains the coding standards followed by the Oracle Applications development staff and describes the Oracle Application Object Library components that are needed to implement the Oracle Applications user interface described in the *Oracle Applications User Interface Standards for Forms-Based Products*. This manual also provides information to help you build your custom Oracle Forms Developer forms so that the forms integrate with Oracle Applications.

Oracle Applications User Interface Standards for Forms-Based Products

This guide contains the user interface (UI) standards followed by the Oracle Applications development staff. It describes the UI for the Oracle Applications products and how to apply this UI to the design of an application built by using Oracle Forms.

Other Implementation Documentation

Oracle Applications Product Update Notes

Use this guide as a reference for upgrading an installation of Oracle Applications. It provides a history of the changes to individual Oracle Applications products between Release 11.0 and Release 11*i*. It includes new features, enhancements, and changes made to database objects, profile options, and seed data for this interval.

Oracle Workflow Administrator's Guide

This guide explains how to complete the setup steps necessary for any Oracle Applications product that includes workflow-enabled processes, as well as how to monitor the progress of runtime workflow processes.

Oracle Workflow Developer's Guide

This guide explains how to define new workflow business processes and customize existing Oracle Applications-embedded workflow processes. It also describes how to define and customize business events and event subscriptions.

Oracle Workflow User's Guide

This guide describes how Oracle Applications users can view and respond to workflow notifications and monitor the progress of their workflow processes.

Oracle Workflow API Reference

This guide describes the APIs provided for developers and administrators to access Oracle Workflow.

Oracle Applications Flexfields Guide

This guide provides flexfields planning, setup and reference information for the Oracle Advanced Scheduler implementation team, as well as for users responsible for the ongoing maintenance of Oracle Applications product data. This guide also provides information on creating custom reports on flexfields data.

Oracle eTechnical Reference Manuals

Each eTechnical Reference Manual (eTRM) contains database diagrams and a detailed description of database tables, forms, reports, and programs for a specific Oracle Applications product. This information helps you convert data from your existing applications, integrate Oracle Applications data with non-Oracle applications, and write custom reports for Oracle Applications products. Oracle eTRM is available on Oracle*Metalink*

Oracle Applications Message Manual

This manual describes all Oracle Applications messages. This manual is available in HTML format on the documentation CD-ROM for Release 11*i*.

Training and Support

Training

Oracle offers a complete set of training courses to help you and your staff master Oracle Advanced Scheduler and reach full productivity quickly. These courses are organized into functional learning paths, so you take only those courses appropriate to your job or area of responsibility.

You have a choice of educational environments. You can attend courses offered by Oracle University at any one of our many education centers, you can arrange for our trainers to teach at your facility, or you can use Oracle Learning Network (OLN), Oracle University's online education utility. In addition, Oracle training professionals can tailor standard courses or develop custom courses to meet your needs. For example, you may want to use your organization structure, terminology, and data as examples in a customized training session delivered at your own facility.

Support

From on-site support to central support, our team of experienced professionals provides the help and information you need to keep Oracle Advanced Scheduler working for you. This team includes your technical representative, account manager, and Oracle's large staff of consultants and support specialists with expertise in your business area, managing an Oracle server, and your hardware and software environment.

Do Not Use Database Tools to Modify Oracle Applications Data

Oracle STRONGLY RECOMMENDS that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle Applications data unless otherwise instructed.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle Applications data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle Applications tables are interrelated, any change you make using Oracle Applications can update many tables at once. But when you modify Oracle Applications data using anything other than Oracle Applications, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle Applications.

When you use Oracle Applications to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

About Oracle

Oracle develops and markets an integrated line of software products for database management, applications development, decision support, and office automation, as well as Oracle Applications, an integrated suite of more than 160 software modules for financial management, supply chain management, manufacturing, project systems, human resources and customer relationship management.

Oracle products are available for mainframes, minicomputers, personal computers, network computers and personal digital assistants, allowing organizations to integrate different computers, different operating systems, different networks, and even different database management systems, into a single, unified computing and information resource.

Oracle is the world's leading supplier of software for information management, and the world's second largest software company. Oracle offers its database, tools, and applications products, along with related consulting, education, and support services, in over 145 countries around the world.

Your Feedback

Thank you for using Oracle Advanced Scheduler and this user guide.

Oracle values your comments and feedback. In this guide is a reader's comment form that you can use to explain what you like or dislike about Oracle Advanced Scheduler or this user guide. Mail your comments to the following address or call us directly at (650) 506-7000.

Oracle Applications Documentation Manager
Oracle Corporation
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Or, send electronic mail to appsdoc_us@oracle.com.

1

Understanding Advanced Scheduler

This topic 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 in this chapter are:

- Overview of Oracle Advanced Scheduler
- How Advanced Scheduler Functionality Works
- How Advanced Scheduler Relates to the E-Business Suite
- New Features in Advanced Scheduler

1.1 Overview of Oracle Advanced Scheduler

Advanced Scheduler provides comprehensive scheduling functionality for assigning activities to field service technicians. For handling large volumes of tasks in a complex field service environment, Advanced Scheduler is ideal for optimizing scheduling activities.

Advanced Scheduler uses predefined constraints and associated costs for creating the highly optimized and cost-effective schedules for field service representatives. Constraints include: Territory coverage, work force skills and availability, SLA response times, preferred engineers and spare parts availability.

The use of skills assigned to tasks and technicians matches the right technician to the task. Advanced Scheduler's geographic component calculates travel times and distances in order to optimize the daily trips of each field service technician. Constraints as well as travel times are represented as costs. These costs are used to find the most optimal assignment for each task.

Efficient and accurate scheduling of field service technicians can improve service and decrease operational costs. The integration with Oracle Field Service, and especially Spares Management, offers a unique and powerful scheduling solution, which provide a high level of customer service.

Some main features of Advanced Scheduler include the following:

- Automated scheduling capabilities

- Optimized field service engineer routing based on road networks

- Cost and constraint based scheduling and optimization

- Integration with Spares Management offering schedule optimization based on spare parts availability

- Auto-commit of tasks to engineers

- Escalation Management

- Graphical overview of planning and scheduling process

1.2 How Advanced Scheduler Functionality Works

The objective of Oracle Advanced Scheduler is to provide state of the art scheduling and optimization capabilities of tasks and trips, specifically for field service business needs. Oracle Advanced Scheduler enables a field service operation to offer three advanced scheduling methods for dispatchers:

- Intelligent scheduling

- Scheduling through window-to-promise

- Scheduling based on parts availability to increase workforce efficiency

Choosing a preferred method of scheduling largely depends on your business scope and needs. In the first two cases, scheduling involves applying pre-defined constraints, including travel time and distance to qualified resources, and taking into account part availability using the Oracle Spares Management functionality.

Constraints, related to costs, allow you to define the Oracle Advanced Scheduler algorithm, so the resulting schedule fits your specific business needs.

All scheduling methods for Advanced Scheduler can be made either from the Dispatch Center in Field Service or from the Service Request form. In both cases, you access the Scheduling Advice UI.

The following sections detail the main Advanced Scheduler functionality:

- Scheduling Intelligent
- Scheduling Window-to-Promise
- Scheduling Based on Parts Availability
- Relation to the Assignment Manager
- Using the Cost Mechanism in Scheduling
- How Advanced Scheduler Uses the Geographic Component

1.2.1 Scheduling Intelligent

This option for scheduling is designed primarily for a business-to-business operation. The scheduling intelligent method enables a dispatcher to perform an automated or manual process of assigning tasks, based upon pre-defined constraints, to qualified service technicians.

These constraints are defined as costs and are set up to meet your organization's 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 technician. You can optimize a technician's trip later in the process or reassign a task before dispatching the schedule to the service representative.

The following graphic visually illustrates how Oracle Advanced Scheduler schedules using the Intelligent option.
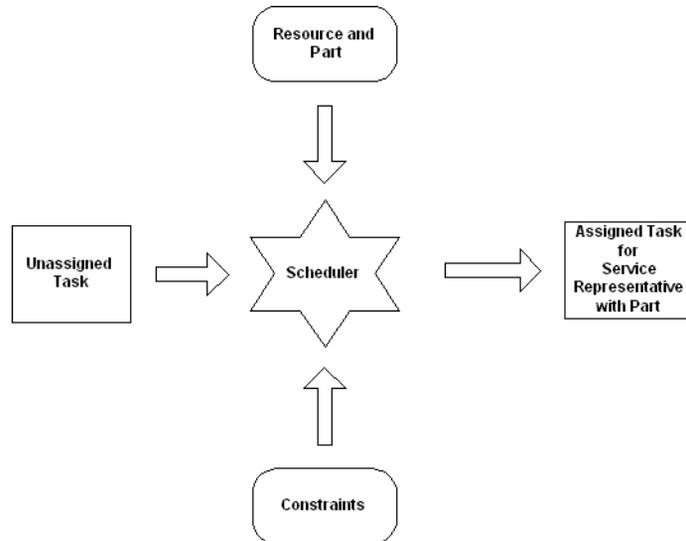
In the above diagram, Advanced Scheduler receives an unassigned task and then uses a set of pre-defined constraints, combined with the available parts and field service technicians, to produce an assignment and schedule for the task that optimizes the overall cost.

1.2.2 Scheduling Window-to-Promise

The Window-to-Promise scheduling option, which addresses a situation where your customer's want the option to dictate the date and time of a field service visit, is common in a business-to-consumer market. The Window-to-Promise is specifically designed to provide your customer with just such a date and time slot. A time slot is the period in which a service representative visits the customer to perform a service task.

To some customers, this is the most important fact in determining service requests at their site. The options generated by Scheduler's algorithm are a combination of selecting a qualified resource based upon pre-defined constraints and the time slots that are pre-defined by the customer. These constraints are defined as costs and are set up to meet your organization's 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 the specific customer on the service request.

One time slot can be reserved for multiple customers, assuming that you have the resources to service all the requests. The dispatcher can optimize a service

representative's trip later in the process -- before committing the schedule -- by accepting the current option, or he can reassign a task to determine if it is more economic to reschedule it. Scheduling through 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 Advanced Scheduler schedules using the Window-to-Promise option.
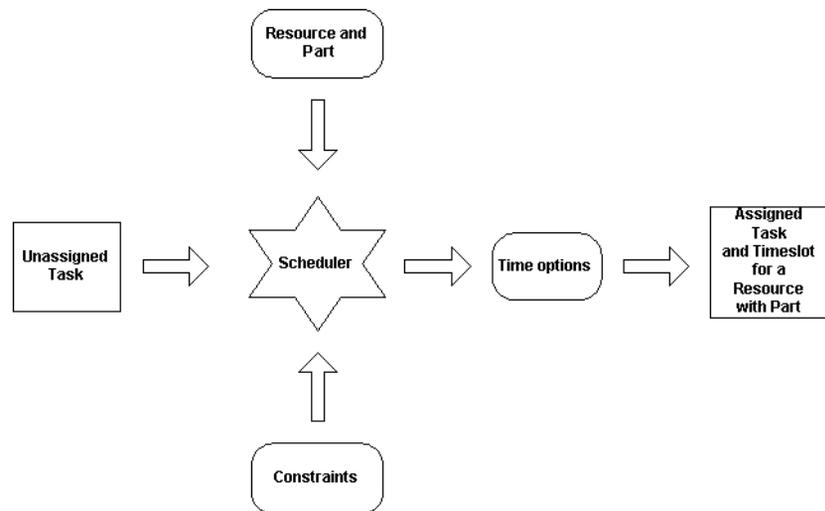
In the above diagram, Advanced Scheduler considers pre-defined constraints, availability of parts, availability of technicians and the time and date requested by the customer.

1.2.3 Scheduling Based on Parts Availability

Advanced Scheduler offers an efficient and optimal way of making sure that the right technician is assigned to the task. The availability of spare parts is an important consideration in this concept; it is of no use having the right technician on site unless the necessary spare parts to solve the problem also are on-hand.

For this purpose, the Advanced Scheduler is tightly integrated with the Spares Management application. This integration ensures that, when a task is assigned to a technician and scheduled, parts availability across the field service supply chain is considered. The inventory of the technician is first checked for parts availability. This is the most common and least expensive scenario. When the technician is assigned the task and has the parts on-hand, a reservation is automatically created

to insure that those parts are not treated as available for when other tasks are considered.

However, it may be necessary to assign a task to a technician who does not have the necessary parts on-hand. In this case, when spare parts must be ordered, Advanced Scheduler will automatically order the necessary parts for the technician and consider the arrival date and time when scheduling the task.

Spares Management has the capability to define and prioritize parts required for the product and task. This can be done manually when the parts are known, or automatically to define "frequently used parts" through a historical evaluation of debrief transactions for the product and task. The Advanced Scheduler's integration with Spares Management offers unique functionality in the Field Service market.

1.2.4 Relation to the Assignment Manager

The Assignment Manager is an E-Business Suite component that assists in the assigning of ownership of documents and tasks and the availability of qualified resources needed to perform a task. When Oracle Advanced 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 Advanced Scheduler to make the actual assignment based upon pre-defined constraints. The Oracle Advanced Scheduler uses the Assignment Manager's graphical user interface for scheduling field service specific tasks.

For more information on Assignment Manager, see *Oracle Common Application Components User's Guide*.

1.2.5 Using the Cost Mechanism in Scheduling

When a task can be performed by more then one service technician, you can increase your company's ROI by deciding which service representative can perform the task most cost effectively. 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 considered strictly as financial cost, but rather as 'penalty points' that are used to determine which is the most cost effective task assignment. Cost functions are parameterized as part of the setup process.

The cost parameters are predefined and consist of the following:

- Cost for not assigning a preferred resource

- Cost per day a task is planned after the day it was received

- Cost per minute traveling distance

- Cost per minute traveling time

- Cost per minute a resource is working overtime

- Cost per minute visiting too early

- Cost per minute visiting too late

Depending upon the needs of your business, you can assign relative "weights" to each of these parameters. For example, if you have a customer base that puts a high premium on having field service representatives that they've worked with before, or possess a particular expertise in their field, you might weight the "Cost for not assigning preferred resource" much higher than say, "Cost per minute traveling time." The cost factors depend upon your business needs and priorities.

1.2.6 How Advanced Scheduler Uses the Geographic Component

Managing travel time is a key objective of the field service organization. Advanced Scheduler automatically uses the location of the customer and the locations of the technicians to create optimal driving routes that minimize travel time consistent with the customer service agreement. Advanced Scheduler uses road network data to create these routes and to provide accurate driving directions to each engineer. This ensures that the technicians spend less time on the road and more time with the customer.

The component that determines travel time in Oracle Advanced Scheduler is the Time Distance Server. The time distance server determines the distance between two locations and the amount of time it takes to travel between the two, based upon the appropriate road network. To calculate travel time and distance between two tasks, Scheduler requires location information for each task. This location is derived from the site address, using street, city, country and/or zip code by the location finder.

1.3 How Advanced Scheduler Relates to the E-Business Suite

Advanced Scheduler integrates with several other Oracle Applications. The following figure visualizes this integration between Advanced Scheduler and the following applications:

- Field Service

- Service Request

- Assignment Manager

- Spares Management

The major applications involved in this process and their relationship to each other are explained in more detail in the sections following the figure.
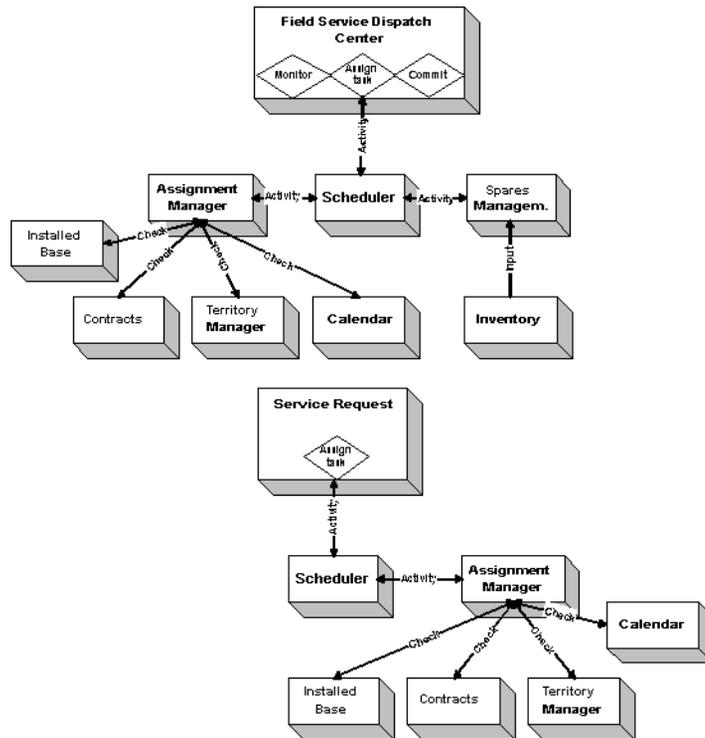
Advance Scheduler can create a task assignment and schedule from both the Service Request and the Dispatch Center.

1.3.1 Field Service

Advanced Scheduler is tightly integrated with the Field Service Dispatch Center. Use Advanced Scheduler from the Field Service Dispatch Center for task

assignment and scheduling. From the Scheduling Advice UI, you can set preferences for Scheduler to use when creating task assignments and also choose the method of scheduling you want to use.

Field Service also provides a concurrent program that identifies invalid addresses associated with scheduleable tasks. An address is considered invalid when it is not found in the spatial database proved by Navigation Technologies, which Advanced Scheduler integrates with. Once these addresses are identified, a user can update them to a correct address through the Change Invalid Address functionality prior to invoking the Advanced Scheduler.

1.3.2 Service Request

Advanced Scheduler is also integrated with Service Request, which can directly access scheduler through its integration with the Scheduling Advice UI. Use Advanced Scheduler from the Service Request for task assignment and scheduling.

1.3.3 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 Advanced Scheduler:

- Installed Base can recommend a preferred service technician.

- Contracts Core or Service Contracts also can recommend a preferred service technician.

- Territory Manager defines territories with qualifiers to filter eligible service technicians.

- Calendar is used to define shift availability of the service technician.

This information is passed on to Advanced Scheduler.

1.3.4 Spares Management

The list of eligible resources and parts priority is passed to Spares Management by Advanced Scheduler. Spares Management defines parts availability and location for the task for each resource from this list. The technicians are sent back to Scheduler with an arrival date and time and cost for each part required by the task. Spares Management will also multiple methods of shipment and provide these to Scheduler as additional options.

Advanced 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 if the technician has the part in on-hand available. When the task is committed, an order for the part is created.

1.4 New Features in Advanced Scheduler

For the 11.5.10 release, the following features are supported by Oracle Advanced Scheduler.

1.4.1 Change Invalid Address for Scheduling

An address is considered invalid when it is not found in the spatial database, provided by Navigation Technologies, of which Oracle Advanced Scheduler integrates. When scheduling tasks, often times a dispatcher will encounter situations where the customer's address in the system is invalid. For example, if the address was entered incorrectly by a representative in a call center.

As a result, if you are using automatic scheduling through Advanced Scheduler, the application can't link up a technician with a task and the task remains unscheduled.

To address this issue, Field Service provides a program that identifies invalid addresses and allows a dispatcher to modify the addresses to correct the problem.

Identifying and changing invalid addresses is a three-step process, whereby you run the Find Invalid Address concurrent program to identify the addresses, query the system from the Dispatch Center to identify all the invalid addresses that appear for a particular day, and then change and validate the addresses.

This Field Service functionality streamlines the amount of time Advanced Scheduler uses to schedule tasks by identifying and correcting invalid addresses before they are called by Advanced Scheduler.

For more information on identifying and changing invalid addresses, see the Using Field Service Dispatch Center chapter of the *Oracle Field Service User Guide*.

1.4.2 Calculate Commute Time in Technician Shift

Oracle Advanced Scheduler allows a field service operation to exclude technician travel times when calculating the technician's shift. This feature supports travel both to and from the job site, or both. This functionality is useful if you are including travel costs in your planning options.

1.4.3 Support Route Calculation Alternatives

Advanced Scheduler supports alternative methods for route calculations, which are available for Window-to-Promise, Intelligent, and Auto-Schedule modes, as well as Autonomous Scheduler. The default quick calculation is based on the "As the crow flies" method.

The detailed rout analysis is done without user involvement, and it is performed in the background. there are several new profile options that must be configured to enable any of these alternative methods.

2

Implementing Advanced Scheduler

This chapter details the dependencies and steps necessary to perform a successful implementation of Oracle Advanced Scheduler.

The implementation section consists of the following topics:

- Confirming Setup of Oracle Applications
- Implementing Oracle Advanced Scheduler Overview
- Implementation Tasks for Advanced Scheduler
- Technology, Requirements, and Performance

2.1 Confirming Setup of Oracle Applications

This section provides an overview of the mandatory and conditional application dependencies among the Oracle Applications that affect Advanced Scheduler, as well as a 3rd-Party application that must be implemented prior to implementing Oracle Advanced Scheduler, in order to use the spatial data module.

Please address the following topics for details:

- Mandatory Dependencies
- Conditional Dependencies
- Installation and Dependency Verification

2.1.1 Mandatory Dependencies

Before setting up Oracle Advanced Scheduler, you must install and fully implement these Oracle applications or components:

- Oracle Field Service

A prerequisite to the Oracle Field Service implementation requires several other Oracle Applications be installed, such as Oracle System Administrator, Oracle General Ledger, Oracle Inventory, and so on. Because of its tight integration with Field Service, Oracle Advance Scheduler requires that you install all of these applications as well.

For details, please see the *Oracle Field Service Implementation Guide.*

- Oracle Common Application Components

  The following components are applicable to Advanced Scheduler:

  - Resource Manager

  - Assignment Manager

  - Calendar

For information regarding the installation and implementation of these applications, see the *Oracle Common Application Components Implementation Guide*.

2.1.2 Conditional Dependencies

To work effectively with Oracle Advanced Scheduler, it is recommended that you install and fully implement these optional Oracle applications or components:

- Oracle Spares Management

- Navigation Technologies (Navtech) spatial data

For information regarding the installation and implementation of these applications, see the appropriate documentation. For the current release, Spares Management implementation documentation is contained in the *Oracle Field Service Implementation Guide*.

The implementation tasks necessary to set up Advanced Scheduler to use the additional functionality that is enabled by setting up these conditional applications or components is included in the following sections.

2.1.3 Installation and Dependency Verification

For each mandatory and conditional dependency make sure the following release of the application has been installed:

Dependency	Installation Requirement
Oracle Field Service	Version 11.5.10 or better

Dependency	Installation Requirement
Oracle Common Application Components	Version 11.5.10 or better
Oracle Spares Management module	Version 11.5.10 or better

The tasks that are necessary to use the additional functionality included with Oracle Advanced Scheduler are described in the following chapters.

2.2 Implementing Oracle Advanced Scheduler Overview

This section provides a recommended implementation task sequence to follow when setting up Advanced Scheduler.

2.2.1 Implementation Task Sequence

Complete the following implementation steps in sequential order.

> **Note:** Spatial Data and Spares Management are optional modules for Oracle Advanced Scheduler, but without them certain functionality will not be available.

Step	Required	Step Title
1	Yes	Confirming Implementation and Setup of Field Service
2	Yes	Confirming Setup of Spatial Data
3	Yes	Confirming Setup of Spares Management
4	Yes	Setting Up Oracle Advanced Scheduler

2.3 Implementation Tasks for Advanced Scheduler

This section describes the implementation tasks in detail in the recommended order. Please refer to the following implementation tasks for details:

- Confirming Implementation of Field Service

- Confirming Setup of Spares Management

- Confirming Setup of Spatial Data

■ Setting Up Oracle Advanced Scheduler

2.3.1 Confirming Implementation of Field Service

Make sure Field Service is fully installed, implemented, and set up as described in the *Oracle Field Service Implementation Guide*.

Ensure that all the following implementation steps have been reviewed and completed as necessary:

- Confirming set up of Assignment Manager

- Confirming set up of Calendar

- Setting Up Field Service

    - Generating Shift Tasks

    - Assigning Resources to Subinventories

> **Note:** During this implementation, keep in mind that all Oracle Applications required for Field Service are also required to run Oracle Advanced Scheduler.

2.3.1.1 Field Service Profile Options for Oracle Advanced Scheduler

There are two Field Service profile options that you can set to determine default values for your scheduling scenarios.

Profile Option Name	Description
CSF: Default Scheduling Scenario	This is the scheduling type to be used by default for scheduling service requests. Possible values are: Window to Promise, Schedule for Resource, or Intelligent.
CSF: Default Spares Availability	Default likelihood value of spare parts availability used for automatic scheduling. The possible values are "All Parts" and "No Parts."

2.3.2 Confirming Setup of Spares Management

If Spares Management module is enabled, Oracle Advanced Scheduler can take into account the spare parts availability for a resource when scheduling a task. The information used from Spares Management is expressed in both time and cost.

Oracle Advanced Scheduler provides Spares Management with an availability condition for a part definition for a task. 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, Spares calculates which one is used the most. Then 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 in the profile option, "CSF: Default Spares Availability." The possible values are "All Parts" or "No Parts." The default value is "All Parts."

For more information, see the Setting Up Spares Management section of the *Oracle Field Service Implementation Guide*.

2.3.3 Confirming Setup of Spatial Data

Spatial data is a separate product and is used for Map Display (Field Service Dispatch Center module), and Oracle Advanced Scheduler functionality, such as Route Calculation (Time Distance Server) and Location finding (geocoding).

The supplier for Spatial Data is Navigation Technologies (Navtech). Navtech supplies spatial data standardized to be used with Oracle applications by conforming to the Geographic Data Format (GDF). In 11i10, Navtech data covers all of North America.

If spatial data was not already installed during the Field Service implementation please do so as described in the Setting up Spatial Data section of *Oracle Field Service Implementation Guide*.

2.3.4 Setting Up Oracle Advanced Scheduler

Setting up the Oracle Advanced Scheduler application includes the following setup steps:

Step	Description
Setting Up Scheduling Parameters	Use this Oracle Advanced Scheduler setup screen to refine your business needs and define business rules for planning.

Step	Description
Setting Up the Time Distance Server (TDS)	The Time Distance Server is Oracle Advanced Scheduler functionality used to calculate travel time and distance.
Activating Autonomous Scheduling	Start this concurrent program to activate automatic scheduling.

2.3.5 Setting Up Scheduling Parameters

Use the Oracle Advanced Scheduler Setup screen to refine your business needs and define business rules for planning. Correct setup provides you with state of the art scheduling and optimization capabilities.

The setup screens consist of the following two tabs:

Tab Name	Description
Cost Parameters	The cost parameters are setup to create a schedule that will take into account your organizations business rules for planning.
Window To Promise	Use the Window To Promise tab to adjust the time slots of service you want to offer to your customer.

Setting Up Cost Parameters

Advanced Scheduler has the capability to provide a schedule based upon cost. This cost is a weighted factor that you assign to a variety of scheduling parameters, which Advanced Scheduler then factors into its task assignment analysis. Each cost is related to a factor that might influence your schedule and these factors are pre-defined.

The Cost Parameters are predefined and consist of the following:

- Cost for not assigning a preferred resource
- Cost per day a task is planned after the day it was received
- Cost per minute traveling distance
- Cost per minute traveling time
- Cost per minute a resource is working overtime
- Cost per minute visiting too early
- Cost per minute visiting too late

Depending upon the needs of your business, you can assign relative "weights" to each of these parameters. For example, if you have a customer base that puts a high premium on having field service representatives that they've worked with before, or possess a particular expertise in their field, you might weight the "Cost for not assigning preferred resource" much higher than say, "Cost per minute traveling time." The cost factors depend totally upon your business needs and priorities.

The information regarding these factors must be set up and made available to enable the cost mechanism to work. In this way, the Cost tab allows you to assign a lower cost value to a parameter with low priority and higher cost values to parameters with higher priorities. All these cost parameters are taken into account when scheduling a task.

Advanced Scheduler will calculate the cost of adding a task to the day trip of a service representative at different positions and compare the options. The option with the lowest cost will be the option presented to the planner. This will be done for each qualified service representative.

When using Auto-assign the option with the lowest cost is used to schedule the task automatically.

Please refer to the Using Oracle Advanced Scheduler chapter of this manual for more information on cost parameters.

Perform the following steps to setup cost parameters.

Prerequisite
None

Responsibility
Field Service Administrator

Field Service Manager

Navigation
Scheduler Setup

Steps
1. From the Scheduler Setup screen, navigate to the Parameter Settings tab.

   You will see a table listing all the default parameters under the Description heading along with a corresponding Value column.

2. Enter a value for each of the cost parameters you want Advanced Scheduler to consider when scheduling.

   Assign a higher number (or weight) to those parameters you deem most important, and a smaller number to those parameters that are least important.

3. Save your work.

Setting Up Window to Promise

The Window to Promise concept is designed to combine two objectives:

- Satisfy time slot needs of the service supply side (your field service operation)
- Satisfy time slot requests from the service demanding side (your customer)

When setting up the available Window-to-Promise time slots, you'll want to create a varied amount of slots (both in length of the time slot, and the time of day it occurs), so that you have the flexibility to schedule in a way that works efficiently for both the customer and your field service operation.

Typically, your customer will want to block out a time that is as small as possible for the service in order to reduce the time and resources committed to the project. The field service operation, on the other hand, may want to block a larger time slot for a particular task, to allow for unforeseen issues and to reduce the chances of running overtime or showing up late for the task. The Window-to-Promise settings allow you to define the time bounds by Start Time and End Time, based on a 24-hour work cycle.

Within the Window-to-Promise tab, you can adjust the default time bounds to the biggest time slot that is acceptable to offer to the customer. You can also add as many time slots as you feel you might use during your Window-to-Promise scheduling.

The following table illustrates a partial set of Window-to-Promise time slots:

Name	Start time	End Time	Description
Whole Day	08:00	17:00	Entire work day of engineer
Morning	08:00	12:00	Four-hour morning slot
Afternoon	13:00	17:00	Four-hour afternoon shift
First 3h interval	08:00	11:00	First 3 hour interval
Second 3h interval	10:00	13:00	Second 3 hour interval
First 2h interval	08:00	10:00	First 2 hour interval

In the above table, various start times and lengths are made available for scheduling.

To set up the Window-to-Promise time slots, perform the following steps.

Prerequisite
None

Responsibility
Field Service Administrator

Navigation
Scheduler Setup

Steps
1. From the Parameter Settings window, click the Window To Promise tab.

2. In the Name column, enter a name for the time slot.

3. Enter the Start Time for the time slot.

   This time must be entered using a 24-hour clock (military time). For example, 1 p.m. should be expressed as 13:00.

4. Enter the End Time for the time slot.

5. Enter a Description.

6. Repeat steps 2-5 for each time slot you want to create.

7. Save your work.

8. Click OK to return to the main menu.

2.3.6 Setting Up the Time Distance Server (TDS)

The Time Distance Server (TDS) is used to calculate travel time and distance in between two tasks. You can calculate the travel time and distance with the TDS in three ways. You can also combine the options when scheduling.

Please refer to the following topics for details on TDS setup:

- Using Default Values for Route Calculation

- Calculating a Route with Time Boundaries and Average Speed

- Calculating the Actual Travel Time and Distance

2.3.6.1 Using Default Values for Route Calculation

You can choose to use default values for route calculation by the TDS.

This is done by setting the following profile options:

- CSR: TDS Mode
- CSF: Default travel distance for Time Distance Server
- CSF: Default travel duration for Time Distance Server

Prerequisite

None

Responsibility

Field Service Administrator

Navigation

Other > Profiles

Steps

1. Open the Find Personal Profile Values window.

2. At Profile Name enter CSR%.

3. Click Find.

   Set this profile option:

Option	Description
CSR: TDS Mode	Choose Off to calculate the travel time and distance by setting default values for both.

4. Save your work.

5. Close the window and again navigate to Other > Profiles.

6. Open the Find Personal Profile Values window.

7. At Profile Name enter CSF%.

8. Click Find.

You can set these options in any sequence.

Option	Description
CSF: Default travel distance for Time Distance Server	The value is used as the default travel distance between two tasks.
CSF: Default travel duration for Time Distance Server	The value is used as the default travel duration between two tasks.

9. Save your work.

2.3.6.2 Calculating a Route with Time Boundaries and Average Speed

You can choose to calculate a route between to locations (where there has been two separate tasks assigned) by applying time boundaries and average speed. The following method is applied:

1. You define the maximum amount of travel distance a service technician has to travel to a customer (as a crow flies).

2. You divide this distance into a maximum of three sections and define a maximum average speed for each section. Typically, the average speed in the first part would be the lowest, such as surface street travel in a city, the second a little faster (major two-lane roads), and the third part the fastest (freeway travel). Each section is restrained by a user-defined boundary. This is all defined by setting profile options.

3. TDS calculates the actual distance in between two tasks as a crow flies.

4. Then it applies the boundaries set and the average speed for each boundary to this distance.

> **Note:** Spatial data needs to be installed and a location for each task that includes a geocode to represent the address needs to be defined.

When the geocode is not defined, the location finder will try to create one based on the address information defined for the task.

Set the following profile options to calculate a route in between two tasks by applying the above method.

Prerequisite

None

Responsibility

Field Service Administrator

Navigation

Other > Profiles

Steps

1. Open the Find Personal Profile Values window.

2. At Profile Name enter CSR%.

3. Click Find.

   You can set these options in any sequence.

Step	Option	Description
1.	CSR: Create location	Set this profile to 'Yes' in order to call upon the location finder to create a geocode if one does not exist for the task location.
		Please not that a task must have a geocode when using Oracle Advanced Scheduler in order to schedule it using the TDS.
2.	CSR: TDS Mode	Enter a 'Y' for Yes to enable the Location TDS to calculate the travel time and distance between two locations by applying the time boundaries and average speed options to the distance measured.
3.	CSR: First boundary for Location TDS	Determine the first distance (km) in which the set value for first average speed is used.
4.	CSR: First average speed for Location TDS	The set value for average speed (km/h) is used for the first boundary distance defined.
5.	CSR: Second average speed for Location TDS	The set value for average speed (km/h) is used for the second boundary distance defined.

Step	Option	Description
6.	CSR: Second boundary for Location TDS	Determine the distance from the first boundary to the second boundary (km) in which the set value for second average speed is used.
7.	CSR: Third average speed for Location TDS	The set value for average speed (km/h) is used after the second boundary distance defined.

4. Save your work.

5. Navigate to View > Query By Example

6. At Profile Name enter CSF%.

7. Click Ctrl+F11.

   Scroll through the profile options until you see the following: CSF: Location Finder Installed. Set the option. Enter a 'Y' (Yes) if the Location Finder is installed. It is launched when a location for a task is missing.

8. Save your work.

2.3.6.3 Calculating the Actual Travel Time and Distance

You can choose to have the TDS calculate the actual travel time and distance in between two tasks based on a road network.

Spatial data needs to be installed and a location for each task with a geocode for the address needs to be defined. When the geocode is not defined, the location finder will try to create one based on the address information defined for the task.

Prerequisite

None

Responsibility

Field Service Administrator

Navigation

Other > Profiles

Steps

Set the following profile option:

1. Open the Find Personal Profile Values window.

2. At Profile Name enter CSR%.

3. Click Find.

   You can set these options in any sequence.

Option	Description
CSR: Create location	Enter a 'Y' to enable the location finder and to call upon it when a task has no geocode to create one. A task must have a geocode when using Oracle Advanced Scheduler to be able to schedule it with the TDS.
CSR: TDS Mode	Choose the 'Route' value to set the default search as the road network.

4. Save your work.

2.3.7 Activating Autonomous Scheduling

You can run a concurrent program that schedules tasks automatically without requiring intervention by a field service dispatcher. When a task becomes schedulable, it is automatically picked up by the concurrent program for scheduling.

> **Note:** To improve scheduling efficiency within your field service operation, you should try to identify as many potential task candidates for automatic scheduling as possible.

When Oracle Advanced Scheduler isn't able to schedule a task for some reason, the task status is set to Auto-reject and a log is generated. Use the Viewing Failed Autonomous Schedule Assignments procedure from the *Oracle Field Service User Guide* to view these logs.

Use the following three-step procedure to activate the concurrent program and define at what time intervals you want the program to pick up tasks to schedule:

- Define Task Status to be Scheduled Automatically

- Set Profile Option for Automatic Scheduling

- Autonomous Scheduling

If for some reason the concurrent program doesn't execute, perform the following tasks:

- Define an Executable

- Setup Concurrent Program

2.3.7.1 Define Task Status to be Scheduled Automatically

In order to enable this feature, you first must decide which tasks you want to be picked up for automatic scheduling. Then you create a query to select these tasks. By default some queries have already been created for this purpose. The following table details these queries along with their values:

Query Name	Description	Query Definition
Inbox	All tasks that are schedulable, entered today and have yet to be assigned.	creation_date > trunc(sysdate) and scheduled_start_date is null and nvl(status_schedulable_flag,'N') = 'Y' and nvl(type_schedulable_flag,'N') = 'Y'
All Open	All tasks that are available for planning and schedulable.	nvl(status_schedulable_flag,''N'') = ''Y'' and nvl(type_schedulable_flag,''N'') = ''Y'' and not exists (select '''' from csf_ct_task_assignments where task_id = csf_ct_tasks.task_id)
Auto Scheduling	All tasks that can be scheduled by the Autonomous Scheduler.	Task_status = Auto in planning

Use the following procedure to create a query for the tasks you want to schedule automatically with a different task status.

Prerequisites

You must have tasks that carry a 'schedulable' status and type. Field Service Dispatcher must me best up

Responsibility

Field Service Manager, Field Service Dispatcher

Navigation

Field Service Dispatcher > Dispatch Center

Steps

1. With the Dispatcher Center, open, click the flashlight icon on the tool bar.

   The Find Tasks window is opened.

2. Enter information to query the tasks you want to schedule automatically. You can create a query based on a combination of search criteria.

3. Click Find.

   The Tasks list of the Dispatch Center is populated with tasks found.

4. To add your query to the list of values from the Tasks list, choose Save Query As from the Tools menu on the tool bar.

   The Save Query As window is opened.

5. Enter a Name for the query.

   This name is returned in the list of values in the Dispatch Center.

6. Enter a Description for the query.

   This text entry is returned when setting the profile option.

7. Click OK.

   The query is added to the list of values when selecting View By from the Tasks region or the profile option.

Guidelines

If you want to close a query, navigate to the Edit Query window (Tools > Edit Query) and enter the date you want to end the Query in the Active End field. The Active Start date is defaulted when you set up the Query. To change the start date, use this window to navigate to the Active Start field and make the necessary change and save your work. You can modify the information but you can not delete a query in this window. When the Active End date is reached the query will disappear from the list of values when selecting View By from the Tasks region.

2.3.7.2 Set Profile Option for Automatic Scheduling

In order to define which query you want to use for automatic scheduling, you must set a profile option. The default Query in this profile option is 'Inbox.' This profile option is user extensible.

Prerequisites

None.

Responsibility

Field Service Administrator

Navigation

Other > Profile

Steps

1. From the Personal Profile Values window, query the following profile:

Profile Option	Description
CSF: Default Query	Query used for automatic scheduling.

2. Choose the appropriate query from the list of values.

3. Save your work.

2.3.7.3 Autonomous Scheduling

You can choose to schedule tasks without requiring a dispatcher to access the tasks.

The autonomous scheduling concurrent program is used for this purpose. Use the following procedure to start it and to define the time intervals at which tasks are scheduled automatically.

Prerequisites

None.

Responsibility

Field Service Manager, Field Service Dispatcher

Navigation

Field Service Dispatcher > Field Service Setup > Autonomous Scheduler

Steps

1. From the Parameters window of the Autonomous Scheduler concurrent program window, if you want to query tasks based on the task assignment status, choose a task assignment status from the list of values in the Task List Query field.

2. Click Ok.

   The Autonomous Auto Schedule setup window is opened. The Parameters window contains the name of the program and allows you to schedule it to run at specific times.

3. To do so, click Schedule in the At These Times block.

   The Schedule window is opened. Define how often you want to schedule tasks. You can schedule for specific periods by selecting either of the following radio buttons:

   Periodically - If you choose this option, enter a Start date and, optionally, an end date. You can also specify how often to rerun the program and when to apply the interval.

   On Specific Days - With this option, you can choose specific days of the month or week to run the program. The Start date and end date fields are also editable.

4. Click OK to save the schedule and return to the main window.

5. Click Submit to run or schedule the job.

2.3.7.4 Define an Executable

If Autonomous Scheduling does not work, perform the following steps to define an executable.

Prerequisites

None.

Responsibility

System Administrator

Navigation

Concurrent > Program > Executable

Steps

1. At the Concurrent Program Executable window, enter the following values into the fields:

Field	Value
Executable	CSR: Autonomous Scheduling
Short Name	CSR_AUTO_SCHED
Application	Oracle Scheduler
Description	Free, e.g. Schedules tasks automatically that become schedulable at defined time intervals.
Execution Method	Java Concurrent Program
Execution File Name	`SchedulerConcurrentProgram`
Execution File Path	oracle.apps.csr.concurrent

2. Click Save.

2.3.7.5 Set Up Concurrent Program

If Autonomous Scheduling is not enabled, you can set up the concurrent program with the following steps.

Prerequisites

You must define an executable, as detailed above.

Responsibility

System Administrator

Navigation

Concurrent > Program > Define

Steps

1. From the Concurrent Programs window, enter the following values into the fields:

Field	Value
Program	Autonomous Auto Schedule
Short Name	CSR_AUTO_SCHED
Application	Oracle Advanced Scheduler
Description	Free, e.g. Schedules tasks automatically that become schedulable at defined time intervals.
Executable Name	CSR_AUTO_SCHED
Executable Output format	Text

2. Make sure that in the Output region the Save check box is checked and the Print check box is unchecked.

3. Click Save.

2.4 Technology, Requirements, and Performance

Oracle Advanced Scheduler is compliant with the latest technology-stack and conforms to all the standard components required on client, middle, and database tiers. For more information please refer to *Installing Oracle Applications*.

Please refer to *Installing Oracle Applications* for software and hardware requirements to successfully implement these Oracle applications.

3

Using Advanced Scheduler

Advanced Scheduler offers enhanced scheduling capabilities to field service operations. Using this application enables you to consider a variety of factors when scheduling tasks for assignment. It also uses an autonomous scheduling feature, which enables you to identify certain tasks that you deem "routine" in nature, that you can set up to be scheduled automatically.

The main principal driving Advanced Scheduler functionality is the notion that you can more effectively schedule task assignments to benefit your field service operation -- either through reducing cost, or enhancing customer satisfaction -- if you have a carefully designed methodology in place to help you select the best possible field service representative to handle a particular task.

Scheduler allows you to consider several filtering criteria, such as proximity to the customer site, possessing the necessary skill set, whether or not a representative is notated as a a "preferred resource" on the customer contract, etc., and to weight these factors to best suit your business needs.

The following topics are covered in this chapter:

- Oracle Advanced Scheduler Process Flow
- Scheduling with Oracle Advanced Scheduler

3.1 Oracle Advanced Scheduler Process Flow

Advanced 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, initial qualified service representatives are found. These selection criteria include preferred resources, resource availability, and territory information. If you are using spare parts on the task, Advanced Scheduler passes this list on to the Spares Management module where a check is done on the availability and location of the parts for the task for each resource on this list. A list of feasible options and related costs is then returned to Advanced Scheduler as plan options that a dispatcher can choose from

> **Note:** When using Autonomous Scheduling, the plan option with the lowest cost factor is always chosen.

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

Finally, Advanced 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 displayed as 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.

Review the following topics to understand more about the scheduling process:

- Scheduling Dependencies

- Scheduling Criteria

- Integration with Spares Management

- Cost Related Constraints

3.1.1 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 for a customer.
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 representative's 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 and Advanced Scheduler requires that the representative's skill level meet or exceed that which is required for the task.
Territory definition	All scheduling is based on territories, which are defined in the Territory Manager module. For more information, see Territory Manager in the *Oracle Common Application Components User Guide*.
Planned task effort information	Task effort information (how long the task will take to complete) is essential for checking the availability of the resource and for designating a resource as unavailable in the resource's 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.
Spare parts location and availability	Spare part location and availability information is a dependency for Advanced Scheduler to make a reservation at task assignment if spares are to be considered. Spare part information is provided by Spares Management.

Dependency	Description
Road network for calculation of travel time and distance	A road network is a dependency for Advanced Scheduler to be able to calculate travel time and distance in between tasks. If the Road Network is not installed, default travel times can be defined.

3.1.2 Scheduling Criteria

There are differences in how the Service Request and Field Service modules consider selection criteria to retrieve a qualified resource for a task. Furthermore, when scheduling manually, you can influence how the selection criteria are applied by making different filtering choices. When you are scheduling automatically, the selection criteria is set at the profile option level.

The following table outlines the differences in scheduling between the various methods and modules and also shows 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 representative's skills to the skills required to perform the task.	Matched are the field service representative's skills to the skills required to perform the task.

Criteria	Service Request	Field Service	Automatic Scheduling
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	When entered, the suggestion is always returned as a plan option.	When entered, the suggestion is always returned as a plan option.	Not used.
Spares	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 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.
Travel time and distance	The travel time and distance for each plan option are calculated for the resources returned from Advanced Scheduler.	The travel time and distance for each plan option are calculated for the resources returned from Advanced Scheduler (when no parts are used) or Spares Management.	The travel time and distance for each plan option are calculated for the resources returned from Advanced Scheduler (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.

3.1.3 Integration with Spares Management

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

The spare part process, as it applies toAdvanced Scheduler, is as follows:

1. Advanced 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 available is returned to Advanced 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 seeded availability conditions in Advanced Scheduler are as follows:

- **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.

- **No Parts** - The availability for the parts defined is not considered.

The part condition availability is user definable and you can add conditions when you define Parts Categories during implementation of the Spares Management module. The following table is an example of possible availability conditions that you could set up and assign to various parts for scheduling purposes.

Availability Condition	Description
Priority1	The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered.

In this case, Priority1 indicates a likelihood based on what is setup. |
| **Priority2** | The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered.

Priority2 indicates a likelihood based on what is setup. |
| **Priority3** | The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered.

Priority3 indicates a likelihood based on what is setup. |
| **Priority4** | The availability condition for the part definitions for the task, based on the likelihood they are required to resolve the task is considered.

Priority c4 indicates a likelihood based on what is setup. |

For more information on defining Part Categories, see the Spares Management section of the *Oracle Field Service Implementation Guide*.

3.1.4 Cost Related Constraints

Advanced Scheduler provides a mechanism that allows schedule advice to be influenced by cost factors. Costs, which should be understood as penalty points, are defined for factors that might influence your schedule. These factors are predefined, and related to as constraints, and reflect your organization's business rules used for planning decisions. Values for each of these seeded constraints must be defined to allow the cost mechanism work effectively.

You can assign values to each of the cost parameters you plan to use during scheduling. To set up cost parameters, see the Setting Up Scheduling Parameters section of the Implementing Advanced Scheduler chapter.

The cost related constraints used for scheduling are described in the following table. These seeded constraints are applied to each schedule option Advanced 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 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.

3.2 Scheduling with Oracle Advanced Scheduler

Advanced Scheduler enables a field service operation to make complex task scheduling decisions both manually and automatically. In both cases, Advanced Scheduler considers a host of applicable criteria and returns plan options that best meet the needs of the company based upon the criteria used.

A key difference between manual scheduling and automated scheduling (either through the use of the Advanced Scheduler's Autonomous Scheduling functionality or through the use of the Auto Schedule functionality) is that with manual scheduling the dispatcher is given several plan options to choose from for scheduling purposes, which automatic scheduling always assigns the plan option with the lowest cost value to the task.

To enable Autonomous Scheduling, there are some profile options that you must set and a concurrent program that you have to run. This process is covered in Activating Autonomous Scheduling section of the Implementing Advanced Scheduler chapter.

For more details on manual scheduling with Advanced Scheduler, see the following topics:

- Understanding and Using the Advice Window
- Using Advanced Scheduler in the Dispatch Center

3.2.1 Understanding and Using the Advice Window

One of the key components of manually scheduling using Advanced Scheduler is the Advice Window. The Advice Window is the UI where a task can be scheduled based upon the criteria chosen by a Dispatcher or a Customer Service Representative.

Accessing the Advice Window

There are two Oracle Applications modules, which allow access to this Advice Window:

- Field Service Dispatch Center
- Service Request

From the Dispatch Center, when a dispatcher is in the process of scheduling unassigned tasks, as long as the task carries a status that is schedulable, he can click the Advise button to access the Scheduling Advice UI.

From the Service Request window, under the Tasks tab, a customer service representative can access the Advice Window by clicking the Assignment Manager icon next to the Assignee field.

> **Note:** In order to access this window from Service Request, the task must be of type 'Field Service' and it must also carry a status that is 'Schedulable.'

For more information on using the Assignment Manager, see the *Oracle Common Application Components User's Guide*.

3.2.1.1 Using the Scheduling Advice Window

The Scheduling Advice window consists of two tabs:

- Preferences tab
- Advice tab

Preferences Tab

The preferences tab is where you will determine what scheduling criteria you want Advanced Scheduler to use when determining scheduling plans. There are four main blocks within the tab, which you can use: Assistance Level, Resources, My Suggestion, and Spares.

The Assistance Level allows you to choose the type of scheduling method you want to employ. The four possibilities are: Intelligent, Window to Promise, Assisted, and Unassisted. The following table details these options:

Assistance Option	Description
Assisted Assignment	Use this option to find a list of qualified resources based on a predefined set of criteria. When no qualified resource is shown, you must adjust your criteria and search again. When no resource can be found based upon the selection criteria, you must adjust your criteria and perform a search again.
Unassisted Assignment	Use this option to assign a document or task without considering search criteria. For example, to assign a group to a task, either specify the exact group name or partial name, if known, or search for all group resources and then select them based on resource availability for the task.
Intelligent Assignment	This option provides relative cost and travel time information, which is particularly useful in a field service operation, and uses that to schedule trips that are the most cost effective for your operation based on pre-defined business rules.
Window to Promise Assignment	The Window to Promise displays time intervals at which a resource (service representative) can visit the customer to perform the task.

In the Resources block, you can select which criteria you want Advanced Scheduler to consider when making task assignment recommendations. The following criteria can be included in the search

- Territory Qualifiers (any combination of the following are available)

    - Area Code

    - City

    - Country

    - Customer Name

    - Postal Code

- - Request Severity

  - Request Type

  - Request Urgency

  - State

  - Task Type

  - VIP Customers

- Contracts

- Installed Base

- Skills

Advanced Scheduler prioritizes its scheduling process based upon which criteria you choose. In cases where a dispatcher selects more than one of the criteria in the Resources region, Advanced Scheduler will return either all the resources found, or just those that fit both criteria. The following table details how Advanced Scheduler filters when using a single criteria or multiple resource criteria:

Selected Criteria	Scheduler Results
Territories	Returns resources that satisfy the Territories requirement.
Install Base (IB)	Returns resources that satisfy the Install Base requirement.
Contracts	Returns resources that satisfy the Contracts requirement.
IB + Contracts	Returns all resources that are identified in either IB or Contracts.
IB + Territories	Returns only those resources that satisfy both the IB and the Territory requirement.
Contracts + Territories	Returns only those resources that satisfy both the Contracts and the Territory requirement.
IB + Contracts + Territories	This returns all resources that are identified in either IB or Contracts AND who also satisfy the Territory requirement.

If Skills is checked, then in each of the above scenarios, after the relevant resources are identified, additional Skills filtering is done to determine which of the initially identified resources also fill the Skills requirement. In other words, the Skills requirement is only applied after a set of resources has been identified based on the other criteria.

> **Note:** For Autonomous and Auto scheduling, you must set the appropriate profile options to 'Yes' if you want to insure that Advanced Scheduler consider those Resource criteria. For example, if you want Autonomous scheduling to consider Install Base (IB), then set the profile option 'CSR: Installed base resource selection for auto-schedule and autonomous scheduler' to 'Yes."

In the My Suggestions block of the Preferences tab, you can add a specific Resource Type and Resource Name that you want considered.

In the Spares block, you must select an Availability Condition. There are two seeded conditions in Field Service: No Parts and All Parts. If you don't want Advanced Scheduler to consider spare parts availability, then choose No Parts. If you want Advanced Scheduler to consider all parts for a task, then select All Parts. For details on Advanced Scheduler's integration with Spares Management, see Integration with Spares Management.

You add additional values to this list, depending upon the needs of your particular field service operation. For more information on setting up Parts Categories, see the *Oracle Field Service Implementation Guide*.

Advice Tab

In the Advice tab, the plan options that Advanced Scheduler identifies after its search are displayed. The plans consist of the Resource name, start and end times available for the task, along with other optional information such as Cost, Travel Time, Spares Date and Spares Cost.

The plan options are displayed and prioritized based upon their cost effectiveness in accordance to the criteria selected for the search.

> **Note:** The default view of the Advice tab is a Table. To view the information in a Gantt chart, click the Gantt button.

Once Scheduler has returned plan options, the dispatcher can schedule the task assignment by selecting the preferred plan option and clicking the Schedule button. At that point, Advanced Scheduler makes the scheduling assignment.

3.2.2 Using Advanced Scheduler in the Dispatch Center

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

Please refer to the Scheduling Tasks section of the Using Field Service Dispatch Center chapter of the *Oracle Field Service User Guide* to use Advanced Scheduler functionality.

The topics covering Advanced Scheduler functionality in this section are:

- Scheduling Using the Intelligent Option

- Scheduling Using the Window to Promise Option

- Scheduling a Task or Tasks Automatically

- Viewing Failed Autonomous Schedule Assignments

- Optimizing a Service Representative's Trip

- Recalculating a Service Representative's 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

A

Profile Options

During implementation, you set values for profile options at various levels to specify how Oracle Advanced Scheduler controls access to and processes data. The system administrator sets and updates profile values. See: *Oracle Applications System Administrator's Guide*, Setting User Profile Options for more information.

A.1 Setting Up Profile Options

The following profile options are unique to Oracle Advanced Scheduler. The abbreviation TDS stands for Time Distance Server.

You can set the profile options described in the following table in any sequence.

Option	Description
CSR: Calculation type of TDS	Set the calculation type of the Time Distance Server (TDS): 1 = fastest, 2 = shortest, 3 = cost based.
CSR: Commit batch size for Auto Scheduling	The batch size of tasks that will be saved to the database during the auto-assign scheduling process.
CSR: Contracts based resource selection for auto-schedule and autonomous scheduler	If set to 'YES' contracts based resources are taken into account by auto-schedule and the autonomous scheduler. Note: Make sure that either 'Yes' or 'No' is used.

Option	Description
CSR: Create location	To call upon the location finder when a task has no geocode to create one.
	Please note that a task must have a geocode when using Oracle Advanced Scheduler to be able to schedule it with the TDS.
CSR: Desired type of logging	No longer used.
CSR: Extension of time bounds	The number of minutes the time bounds of a task are extended to find schedule advises outside the task time bounds.
CSR: First boundary for Location TDS	Determine the first distance (km) in which the set value for first average speed is used.
CSR: First average speed for Location TDS	The set value for average speed (km/h) is used for the first boundary distance defined.
CSR: Functional class 0 delay factor	The calculated travel time is multiplied with the functional class 0 delay factor.
CSR: Functional class 1 delay factor	The calculated travel time is multiplied with the functional class 1 delay factor.
CSR: Functional class 2 delay factor	The calculated travel time is multiplied with the functional class 2 delay factor.
CSR: Functional class 3 delay factor	The calculated travel time is multiplied with the functional class 3 delay factor.
CSR: Functional class 4 delay factor	The calculated travel time is multiplied with the functional class 4 delay factor.
CSR: Include Commutes in Shift	If you want to include a technician's travel time to and/or from a customer site in the shift, then this profile option must be set to 'Yes.'
CSR: Installed base resource selection for auto-schedule and autonomous scheduler	If set to 'YES' installed base resources are taken into account by auto-schedule and the autonomous scheduler.
	Note: Make sure that either 'Yes' or 'No' is used.
CSR: Log Activated	To display internal Scheduler log messages on the server window.

Option	Description
CSR: Maximum calculation time	The maximum number of milliseconds Oracle Scheduler can calculate schedule advise.
CSR: Maximum number of plan options	The maximum number of plan options calculated and presented. This are always the schedule advises with the lowest cost addressed. Default value: 50
CSR: Maximum overtime	This profile sets the maximum time an engineer can overwork. The default is 120 minutes (2 hours). Beyond this, Advanced Scheduler will not enter tasks in the respective resource's trip(s).
CSR: Maximum selected resources	The maximum number of resources that are considered to create a schedule advise for. This are always the resources closest to the task.
CSR: Maximum time difference appointment	This is no longer used.
CSR: Minimal travel time	This travel time in minutes is added to all calculated travel times by the TDS, e.g. time for parking, walking to the car. Not applied when using default travel time.
CSR: Plan option delay	The maximum number of minutes to choose a schedule option. When time has passed new schedule options have to be calculated by Advanced Scheduler.
CSR: Plan scope	Default number of schedulable days.
CSR: Rejected by Autonomous Scheduling Status	Default status tasks are set to when they can't be scheduled by the Autonomous Scheduler program.
CSR: Second average speed for Location TDS	The set value for average speed (km/h) is used for the second boundary distance defined.
CSR: Second boundary for Location TDS	Determine the distance from the first boundary to the second boundary (km) in which the set value for second average speed is used.

Option	Description
CSR: Selection of tasks for autonomous auto assigning	This sets the selection of tasks by the autonomous scheduler as created by a query which is shown in the task list in the Dispatch Center. The default is All Open.
CSR: Skill based resource selection for auto-schedule and autonomous scheduler	If set to 'YES' skill based resources are taken into account by auto-schedule and the autonomous scheduler. Note: Make sure that either 'Yes' or 'No' is used.
CSR: TDS Mode	This profile allows the user to enable Route Calculation alternatives. Values include: Route, Estimate, Only Route, Only Estimate, or Off. Replaces the following profile options: CSR: Use Default TDS, CSF: Use Location TDS, CSR: Use Route TDS.
CSR: Territory based resource for auto-schedule and autonomous scheduler	If set to 'YES' Territory based resources are taken into account by auto-schedule and the autonomous scheduler. Note: Make sure that either 'Yes' or 'No' is used.
CSR: Third average speed for Location TDS	The set value for average speed (km/h) is used after the second boundary distance defined.
CSR: UOM for minutes	Not used.
CSR: Use Fixed values for Invalid addresses	Determines whether or not to use a fixed value for fixing invalid addresses (Y/N).
CSR: User specified log message identification	The User can enter a prefix text which will appear in the name of log files (i.e. ABC_). The default value is 'csr'.
CSR: WTP Threshold	This sets the threshold value for your Window-to-Promise functionality.