

ORACLE ADVANCED SCHEDULER



Oracle® Advanced Scheduler (OAS) helps leading field service providers book appointments and create optimized schedules that meet tough customer service objectives while minimizing travel and other key operational costs. OAS is highly scalable and considers a wide variety of configurable constraints, business rules, service objectives, and cost factors. This has allowed OAS to be successfully deployed in large sophisticated field service businesses in many industries including high tech, industrial manufacturing, office equipment, medical equipment, local government, utilities, retail, security, and telecommunications. Oracle Advanced Scheduler is a key component of the Oracle E-Business Suite Field Service Solution that also includes Field Service, Mobile Field Service, and Spares Management Products.

KEYBUSINESS BENEFITS

- Increase Customer Satisfaction
- Reduce Service Costs
- Scheduling highly configurable
- Optimize entire service delivery process from dispatch to invoice
- Increase productivity of Field Technicians and Dispatchers
- Reduce Travel duration for Technicians

Oracle Advanced Scheduler Overview

Oracle Advanced Scheduler (OAS) is used to schedule tasks and book appointments for all types of planned and reactive field service work including installations, moves, repairs (break/fix), preventive maintenance, inspections, field change orders, and upgrades. OAS provides capabilities that increase the productivity and effectiveness of customer service agents, tech support engineers, field service dispatchers, field managers, field office administrators, and even technicians in the field. OAS supports the complete spectrum of field service business models from decentralized technician self-scheduling and district office dispatching to the centralized, tightly controlled scheduling, dispatch, and work release.

OAS simultaneously considers many constraints and scheduling criteria including map based travel time and distance, overtime limits, skill requirements, parts requirements, customer access hours, service level objectives, and contractual obligations. This ensures the right technician with the right parts arrives at the customer site on time by traveling an optimized route. OAS's power comes from its high performance scheduling, geographical clustering, and trip optimization algorithms and its tight integration to Oracle Field Service, Oracle Spares Management, Oracle Mobile Field Service, Oracle Customer Service, Oracle Service Contracts, Oracle Asset Tracking, Oracle Order Management, Oracle Inventory and the CRM Foundation Modules.

SCHEDULING TOOLS

- Multiple Interactive Scheduling Modes (Intelligent, Window to Promise, Assisted)
- Autonomous Batch Scheduling (driven by customer defined queries)
- Interactive and Batch Optimization powered by geographical task sorting and clustering logic to further reduce travel and other costs
- Interactive Schedule Management features to block, unschedule and optimize trips

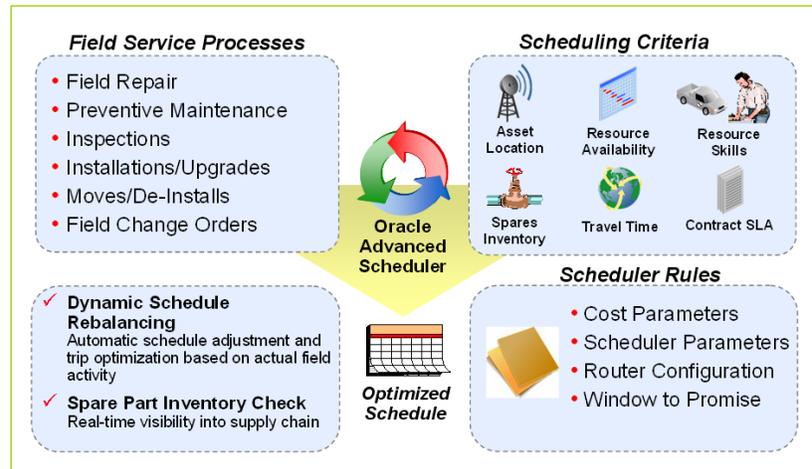


Figure 1. Oracle Advanced Scheduler Overview

FLEXIBLE TECHNICIAN QUALIFICATION

- Uses Oracle Territories, Contracts, and Installed Base to locate candidate Technicians
- Qualifies for Availability (per Calendar) and required Skills
- Supports scheduling Technicians working on-call/after-hours shifts

Scheduling tools for many service business models

Oracle Advanced Scheduler (OAS) provides scheduling tools with great flexibility and varying degrees of automation in order to support most field service operational models. The Autonomous Scheduler is a query driven, batch scheduling engine that can be run periodically or initiated manually from the Field Service Dispatch Center. In some high volume, short response time SLA environments, Autonomous Scheduler is run every few minutes to quickly get work from the call center out to the field.

DISPATCH CENTER INTEGRATION

- Scheduler user interface built into the Dispatch Center for interactive scheduling
- Drag and drop scheduling in Gantt Chart
- Schedule Management and Trip Optimization capabilities available in Dispatch Center
- Scheduling and managing multi-day tasks
- Visibility into Spare Part sourcing, shipping and availability

The screenshot shows the Oracle Advanced Scheduler interface. It includes sections for **Task Summary** (Task Number: 35791, Planned Start Date: 20-Mar-2014 10:00:00 AM, Planned Effort: 2 HR, Address: 1 Alviso Street, San Francisco, CA, US, Timezone Source: User Time Zone), **Schedule Search Criteria** (Search Mode: Intelligent, Route Mode: Off, Spares: Available Parts), **Resource Selection Criteria** (Territory: All, Install Base: All, Contracts: All, Resource Preference: Ignore Third Party Organizations), **Access Hours** (Greater Access Hours: No), **Shift Consideration** (Regular and then Standby), and **Override Task Plan Dates** (Planned Start Date: 21-Mar-2014 09:21:58 AM, Planned End Date: 30-Mar-2014 12:00:00 PM). Below these is a table of tasks:

Plot Selected Resource and task	Resource Type	Schedule Start	Schedule End	Travel Time	Travel Distance	Resource Source
1000	Employee Resource	21-Mar-2014 07:42:38 AM	21-Mar-2014 09:42:38 AM	00:30	25.0	Skills
1075	Employee Resource	21-Mar-2014 10:30:00 PM	22-Mar-2014 12:30:00 AM	00:30	25.0	Skills
1100	Employee Resource	24-Mar-2014 07:00:00 AM	24-Mar-2014 09:00:00 AM	00:30	25.0	Skills
	Employee Resource	25-Mar-2014 07:00:00 AM	25-Mar-2014 09:00:00 AM	00:30	25.0	Skills

Figure 2. HTML Schedule Task UI

OAS's Interactive Scheduler UI is now available both in HTML and Forms versions. The HTML Schedule Task UI can be accessed from within HTML Dispatch Center. It is accessible from the Oracle Customer Service and the Oracle forms based Field Service Dispatch Center allowing both customer service agents and dispatchers to schedule tasks and book customer appointments. OAS allows interactive adjustment of resource pool selection parameters, scheduling criteria, and scheduling assistance level (Window to Promise, Intelligent and Assisted), empowering these users to handle a wide variety of scheduling scenarios.

In addition, OAS can be accessed directly from Oracle Mobile Field Service so field technician can schedule follow up tasks while they are onsite with the customer. This is especially powerful in environments where technicians must frequently order replacement parts after diagnosis as Advanced Scheduler is fully integrated with Oracle Spares Management.

SCHEDULER UI

- Interactive Scheduling UI accessible from Customer Service, Dispatch Center and Mobile Field Service
- Multiple Interactive Scheduling Modes (Intelligent, Window to Promise, Assisted)

Promise, Assisted)

- Adjustable Resource selection and qualification preferences
- Spare Parts requirement can be made mandatory or optional
- Configurable search for Spare Parts in technicians Trunk stock or Warehouses
- Option to consider Technicians without all of the required parts
- Visibility into Spare Parts sourcing, shipping and availability for better decision making
- Scheduling to third party service providers based on skills and parts availability

SCHEDULING ALGORITHMS

- Geo-graphical Sorting
- Geo-Clustering
- Optimization across Technicians' Trips
- Work load balancing

CONFIGURABLE RESOURCE IDENTIFICATION PROCESS

- Support for After-Hours/Stand By shifts
- Contract Preferred Resources
- Territories based identification

POWERFUL SCHEDULER RULES

- Ability to define certain parameters even at Territory and Technician levels
- Support for combination of Rules
- Helpful Rules Merge Analyzer
- Informative Scheduler Simulator

CONFIGURABLE COSTING OPTIONS

- Cost Parameters configurable at Site, Territory, Technician and Responsibility levels
- Configurable Scheduler Rules support diverse business decisions

Geographical sorting and clustering

OAS's Autonomous Scheduler provides capability to sort the batch of tasks being scheduled by geographic proximity allowing it to create schedules where routes do not overlap and a single technician, if feasible, handles all work at a particular site. These schedules also keep technicians well dispersed so the field service organization can respond faster to emergency calls/outages.

Algorithms

Oracle Advanced Scheduler (OAS) uses sophisticated, high performance algorithms to determine the fastest route between two addresses, to geographically cluster tasks, to insert a task into the schedule, and to optimize the schedule once all tasks have been initially scheduled. These industry standard algorithms have been tuned to provide outstanding scheduling performance.

Resource pool identification and qualification

Oracle Advanced Scheduler (OAS) leverages the Oracle Territories module so service providers can define simple to complex task assignment rules using both geographic (city, state, zip, etc.) and non-geographic (product, service type, problem code, etc.) qualifiers. These territories, along with the preferred and excluded technicians defined in Oracle Assets and Oracle Service Contracts, are used by Advanced Scheduler to identify the technician pool that will be considered when scheduling a specific task.

Once the technician pool has been identified, Advanced Scheduler qualifies the pool by automatically eliminating technicians who are not available (per their calendar) and costs options for Technicians based on the technicians' skills and skills required to execute the task.

Defining and enforcing scheduler rules

OAS provides highly configurable rules and parameters to drive important scheduling priorities. It allows definition of rules at various levels including Site, Territory, Responsibility and Individual Technician. For example, default travel times can vary greatly in different regions and hence are best setup at the Territory level, whereas, overtime preference is an individual Technician parameter.

'Scheduler Rules' can be defined as a combination of Profiles, Cost Parameters, WTP windows, and Router Configuration parameters. These Rules can be setup for a combination of levels mentioned before, but it would also be possible to setup some of these parameters and profiles at Territory and Technician level as well, if the business demands such a granular configuration.

Scheduler Rules Configuration UI provides powerful Rules Merge Analyzer, to view how the scheduler will merge a combination of applicable rules during run time. Scheduler simulator UI will provide the capability to simulate the scheduling scenarios to visualize the possible scheduling options, without actually scheduling the Task.

and priorities

- Flexibility to treat spare parts requirement as mandatory or soft constraint
- Prioritize Critical Customer Tasks by Customer Importance level cost factor
- Cost Parameter to prefer scheduling tasks to tech's already going to the customer site.

SCHEDULING WITH SPATIAL DATA

- Support for uploading geo-spatial map data
- Certified Spatial Data from Navteq (Europe, North America, Australia and World Markets)
- Supports new Navteq ODF data format
- Several Time/Distance calculation modes including detailed Street Level Routing and point-to-point estimates

TRAVEL CALCULATIONS

- Geo-coding of addresses
- Support for Geo-Spatial map data based calculations
- Street level routing
- Point-to-point (as the crow flies) travel
- Supports calculating travel values with manual geometry
- Default travel time and travel distances

AFTER-HOURS/STAND BY SHIFT SUPPORT

- Associate Stand By shifts to Calendar and assign resources
- Flexible options to consider resources in Stand By Shifts
- Define different Territories for handling emergencies during After Hours
- Cost Parameter for scheduling Technicians from Stand By Shifts

OUTSOURCED FIELD SERVICE FUNCTIONS TO THIRD PARTY

Scheduler Rules Dashboard
Welcome to Scheduler Rules Dashboard - The One Stop Portal to configure Scheduler completely. All Rules applicable to the current Logged in User are displayed. This include the Rules tied to the current Logged in User, User's Responsibilities and its Applications and User's Selected Territories and its Resources.

User Applicable Rules

Select Focus	Rule Name	Application	Responsibility	User	Territory	Resource	Enabled	Actions
	Root Node							
	Site Rule							
	Field Service Representative, Vision Operations		Field Service Representative, Vision Operations					
	Field Service Manager, Vision Operations		Field Service Manager, Vision Operations					
	ARCHITERRITORY				Arch-territory			
	BreakFix-P					BreakFix-P		
	AllBreakFix					AllBreakFix		
	BreakFix-CABLES					BreakFix-CABLES		
	Scheduler Rule Configuration					Arch-Res-4, Arch_res_2		

Scheduler Rule Configuration: BreakFix-P

Rule Name: BreakFix-P
Description: Break Fix
Base Rule: BreakFix-P

Rule Eligibility Criteria

Application	Responsibility	User
BreakFix-P	Resource Type	Resource

Scheduler Parameters

- General**
 - Plan Scope (in days): 7
 - Maximum no. of Plan Options: 10
 - Maximum Calculation Time (in ms): 30000
 - WIP Threshold: 10
 - Enforce Planned Dates: Yes
 - Spare Mandatory: No
 - Spare Source: Spares
- Route Mode**
 - Router Mode: Off
 - Extra Travel Time (in minutes): 0
 - Use Default Values for Invald Addresses: No
 - Default Travel Distance (in kms): 40
 - Default Travel Duration (in minutes): 40
 - Max Distance to skip Actuals (in kms): 0
- Task Longer than Shift**
 - Minimum Child Task Duration (in minutes): 5
 - Effort for determining Task longer than Shift (in minutes): 0
 - Distribute Last Child Effort: No
- Commutes**
 - Commutes Position in Shift: 5
 - Personal Commute Time (in minutes): 0
 - Include Cost to commute Home for Empty Trip: No
- Technicians**
 - Prefer Contract Resources: No
 - Prefer B Resources: No
- Background Engines**
 - Auto Reject Status - Spares Unavailability: No
 - Auto Reject Status - Others: No

Cost Parameters

Resource Level Costs	Travel Costs
Overtime Cost (per minute): 0	Travel Distance Cost (per km): 10
Non Preferred Resource Usage Cost: 0	Travel Time Cost (per minute): 10
Skill Level Cost: 0	Defer Same Site Cost: 0
Standby Shifts Usage Cost: 0	

WIP Parameters

Record History

Figure 3. Scheduler Rules UI

Schedule option identification and costing

When identifying possible scheduling options, Oracle Advanced Scheduler (OAS) automatically applies constraints such as site access hours and overtime limits to insure only realistic options are considered. It then calculates a relative cost for each scheduling option using configurable cost factor weightings, which include customer service costs (such as violating contracted response times) as well as operational costs (such as travel distance and overtime). The configurability of these cost factor weightings allows service providers to tailor the Advanced Scheduler to meet their unique business objectives. Autonomous Scheduler automatically selects the lowest cost option while the interactive Scheduler UI presents scheduling options to the user sorted by relative cost or start date.

Travel time and distance calculations

Oracle Advanced Scheduler (OAS) utilizes detailed geo-spatial map data to accurately calculate travel distance and time. It first assigns a geo-code and street segment to the incident address (if not already assigned) and then determines the fastest route to get there considering road types (highway, thoroughfare, side street, one way street, etc.) and travel speeds. Service providers who do not require this level of accuracy (for just appointment booking or for all scheduling functions) can configure Advanced Scheduler to use point-to-point travel calculations or a default travel time.

ORGANIZATIONS

- Supports scheduling Tasks to Third Party Service Providers
- Release Tasks automatically to Third Party Service Providers
- Monitor and update Tasks being executed by Third Party Service Providers in Dispatch Center

SPARE PARTS REQUIREMENTS

- Spare Parts requirement can be made mandatory or a soft constraint
- Configurable sources for searching for Spare Parts (Technicians trunk stock or Warehouses)
- Reserves spare parts if available in trunk stock
- Cost of part shipment automatically applied to the schedule option cost
- Considers and Costs option(s) for Technicians with fewer or no parts
- Creating part orders and shipping spare parts to third party addresses

SCHEDULING COMPLEX TASKS

- Support for planned work
- Tasks longer than a standard shift
- Customer Confirmation Process
- Customer Access Hours and After-Hours constraints
- Tasks with dependencies

WORK LOAD BALANCING

- Ensure all technicians are allocated work
- Cost based and Statistics based load balancing

RELEASING TASKS TO THE FIELD

- Interactive task release process for complete control and background process for complete automation
- Support for time based drip-feed with flexible task commit process
- Support for Resource, Territory, criteria or Time Horizon based task

Scheduling emergencies during after-hours/stand by shifts

Oracle Advanced Scheduler (OAS) enables Service Providers to operate a 24x7x365 support and field service especially when their equipment is mission critical (e.g. medical devices). To provide this service, field technicians are typically required to intermittently be on standby in case an emergency call comes in after regular hours or on the weekend. Scheduler provides the ability to create standby shifts, to view stand by shifts in the Dispatch Center, and to include stand by shifts in the Advanced Scheduler's logic. Several options are provided on how OAS uses technicians on standby shifts (never, day by day, regular then stand by).

Outsourcing Field Service functions to Third Party service providers

Often Service Providers and Original Equipment Manufacturers (OEMs) work on a 24x7x365 basis for attending to Break-Fix calls, in order to meet customer SLAs and contractual obligations. They have to dispatch in house Technicians or transfer the call to a competent Third Party service providers possessing necessary skills already identified and designated to work in a specific territory. Advanced Scheduler supports OEM's mixed mode of field service operation where in they have their employees (Technicians) as well as a few Third Party Organizations contracted to handle field service calls and to absorb the overflow work. Scheduler provides flexibility for OEMS for preferring the internal Resources and Resource Groups or Third Party Organizations. Advanced Scheduler's Scheduler Rules model supports flexible options for scheduling Tasks to Third Party Group Resources (Organizations). Scheduler's Auto Commit process can also automate releasing Tasks scheduled to Third Party resources.

Scheduling tasks with spare part requirements

Oracle Advanced Scheduler (OAS) is integrated with Oracle Spares Management to insure tasks with part requirements are properly scheduled. After identifying the pool of qualified technicians, OAS interfaces to Oracle Spares Management to find out which technicians have the required parts, or, if not, when they can be delivered. OAS then uses this availability/delivery information to identify feasible scheduling options. Scheduler offers flexibility to define the sources (trunk stocks of Technicians or Warehouses).for searching spare parts.

When costing scheduling options for technicians who do not have the required parts on-hand, Advanced Scheduler adds in the cost of shipping the required parts from stocking locations where they are found to the technician or customer site. When one of these options is selected, Advanced Scheduler automatically creates the required spares orders with coordinated delivery dates and times. Scheduler offers flexibility to treat the spare part requirement as mandatory or as a soft constraint.

release

TRIP OPTIMIZATION

- Powerful Trip Optimization algorithm
- Interactive and background optimization processes
- Intra-day, multi-day and cross trip optimization support for flexible, yet efficient trip management

SCHEDULER WEB SERVICES

- Scheduler web services to schedule, unscheduled, reschedule, cancel, mass schedule field service Tasks in real-time
- Easy to integrate for external, third party or home grown custom call centers and service execution solutions
- Based on industry standards and fully secured

OPTIMIZED TECHNICIANS SCHEDULES

- Optimized schedules lead to significant decrease in travel time and cost
- Increased work force productivity

AFTER HOURS/STAND BY SHIFT SUPPORT

- Associate Stand By shifts to Calendar and assign resources
- Flexible options to consider resources in Stand By Shifts

THIRD PARTY (OUTSOURCED) FIELD SERVICE FUNCTIONS

- Supports scheduling Tasks to Third Party Service Providers
- Monitor and update Tasks being executed by Third Party Service

Scheduling complex tasks

Oracle Advanced Scheduler (OAS) has the capability to handle complex field service tasks that are frequently encountered when scheduling planned work such as installations, inspections and preventive maintenance. When scheduling tasks requiring longer than a standard work shift to complete, OAS automatically breaks these tasks (called parent tasks) into smaller tasks (called child tasks) that fit into the defined technician shifts. OAS provides a Parent/Child Task UI so Dispatchers can manage these long tasks and reschedule or cancel work in response to actual progress (e.g. finishes early) and changes in technician availability (e.g. calls in sick).

Oracle Field Service and Oracle Advanced Scheduler provide functionality for handling tasks that require customer confirmation before the technician arrives on site. Confirmation requirements can be written into the Service Contract (in Oracle Service Contracts) and captured manually in the call center. Confirmation can be recorded on the interactive Scheduler UI or in the Dispatch Center.

Child Number	Scheduled Start	Scheduled End	Effort	Status	Assignee
37264	07-SEP-2006 09:00:00	07-SEP-2006 17:00:00	8 Hour	Planned	Emery, Mr. Matt
37265	08-SEP-2006 09:00:00	08-SEP-2006 17:00:00	8 Hour	Planned	Emery, Mr. Matt
37266	11-SEP-2006 09:00:00	11-SEP-2006 17:00:00	8 Hour	Planned	Emery, Mr. Matt
37267	12-SEP-2006 09:00:00	12-SEP-2006 11:00:00	2 Hour	Planned	Emery, Mr. Matt

Figure 4. Parent / Child Task Management UI

Work Load Balancing

Oracle Advanced Scheduler (OAS) provides cost based and statistics based load balancing functionality for Service Providers who want to ensure all field technicians are fairly allocated work as well as optimizing other field service costs like travel and SLA violation penalties.

Releasing work to the field

Oracle Advanced Scheduler (OAS) provides functionality to automatically release batches of tasks to the field for execution. Depending on operating priorities, this process is used by field service providers to release several weeks of work or just work due to start in the next few hours.

Individual tasks or all tasks in a technician's trip can also be manually released / committed in the Dispatch Center. This flexibility allows service providers to use a variety of work management approaches to improve technician focus and productivity

Providers

- Third Party Administrators reassign, reschedule and capture debrief for Tasks on behalf of their Technicians

while keeping schedules flexible.

Schedule optimization and optimization across Trips

Oracle Advanced Scheduler (OAS) provides a powerful optimization engine to refine technician schedules after an initial schedule has been created. An opportunity for schedule improvement exists because Scheduler, when initially inserting tasks, doesn't see tasks that haven't been created or scheduled yet. The optimization engine considers all scheduled tasks at once and reschedules and reassigns them to squeeze out additional travel and other costs. This optimization engine can be run in a batch mode for multiple technicians across multiple days. An informative log file is generated which captures key parameters and optimization statistics. Trip Optimization can also be initiated interactively in the Dispatch Center for a selected set of technicians for a date range or for a specific technician's trip

RELATED PRODUCTS

- Oracle Mobile Field Service
- Oracle Spares Management
- Oracle TeleService
- Oracle Contracts
- Oracle Order Management
- Oracle Inventory

Scheduler Web Services

Oracle Advanced Scheduler (OAS) provides a standards based comprehensive set of web services to facilitate building integrations to third party applications. Service providers utilizing legacy or third party call center/tech support applications (on premise or in the cloud) can easily leverage these web services to integrate to Oracle Field Service and Advanced Scheduler. Scheduler functions like scheduling, rescheduling, cancelling, and customer confirmation can be provided directly to call center agent. These web services incorporate by the security features provided by oracle applications security framework.

RELATED SERVICES

The following services support Oracle Main Product:

- Update Subscription Services
- Product Support Services
- Professional Services



CONTACT US

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