

Oracle Real-Time Scheduler
Server Application User Guide
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Chapter 1

Getting Started

This section provides an overview of Oracle Real-Time Scheduler.

About Oracle Real-Time Scheduler

Oracle Real-Time Scheduler simplifies and optimizes the scheduling, dispatching, and tracking of field activities and mobile service crews.

The application includes the following major functional components:

- **Resource scheduling and planning:** Supports resource planners and service managers in managing resources, planning shifts, and scheduling work. The system automatically generates shifts and optimizes the schedule based on your business rules. This component comprises the following user functions:
 - Resource Management setup and maintenance
 - Service Management setup and maintenance
 - Transfer of Goods process and maintenance
 - Scheduler setup and maintenance
 - Mail messaging
- **Common dispatching functionality:** Supports dispatchers as they handle exceptions throughout the day, and enables context-based decision making at the dispatcher level. The system can be configured to automatically dispatch all activities or limit auto-dispatching to certain activity types or shifts. The system maintains real-time communication with mobile resources, tracks the location of crews and vehicles, and allows dispatchers to monitor and manage activities, crews, alerts, and key performance indicators. Common dispatching functionality is provided through the Common Dispatching Interface (CDI) portal.
- **Mobile communications platform:** Supports mobile crews as they perform service work, facilitating communication with the dispatcher, providing GPS-based mapping services, and processing activity status updates and work completion details. Mobile communications platform functionality is provided through the Oracle Real-Time Scheduler mobile application.

Starting the Application

Use this procedure to start Oracle Real-Time Scheduler:

1. Click the **Desktop** icon or **Program** menu option to start the server application.
2. Log in using your user ID and password.
3. If prompted, select a language.
4. Use the toolbar or menu bar (on the left edge of the screen) to select the function you want to perform.

Understanding the User Interface

For information about the application's main toolbar, menu system, user setup and security, and user interface standards, see the System Wide Standards topic in the Framework Business Processes help.

Menus and Navigation

This topic describes the Oracle Real-Time Scheduler menus and general rules for navigating the system.

The menu displays on the left-hand side of the application screen. The menu is configurable, so the options that appear may vary based on your user profile and your system's configuration.

Main Menu and Admin Menu

By default, the system provides two menus: the **Admin** menu and the **Main** menu. The **Admin** menu provides access to functions used for setup and administration. Only users who have administrative privileges will be able to see this menu. The **Main** menu provides access to all other functions. The options displayed on each menu are based on the settings defined in your user profile. Your user profile also controls your access to different portals and dashboard zones.

The **Main** Menu is displayed by default. Click the **Menu** icon in the main toolbar to display a list of available menus, then select the menu you want to use. The selected menu appears on the left-side of the screen.

Functional and Alphabetical Menus

The system supports two different menu styles: alphabetical and functional.

The functional menu groups menu options by the function, such as Service Management, Device Management, and Resource Management. Thus, to add a new crew, you would first click the **Resource Management** submenu, and then select the Crew option.

The **Alphabetical** menu groups menu options by the first letter of the option name. Thus, to add a new crew, you would first click the C submenu, and then select the Crew option.

Note: Switching the way that the menus are sorted is a change that affects all users through Admin Installation Options.

The procedures in this documentation assume that you are using the functional menus. If you are using alphabetical menus instead, simply replace the functional submenu with the **Alphabetical** submenu. For example, if the procedure instructs you to select:

Main Menu > Resource Management > Crew

then you would instead select:

Main Menu > C > Crew

Access to Different Applications

The menu system provides access to both Oracle Utilities Application Framework functions and Oracle Real-Time Scheduler functions. If you have additional Oracle applications installed, the menu system will provide access to functions for that application as well. Framework functions are described in the Framework online help; Framework help topics are listed under the appropriate Framework heading in the help contents panel. Likewise, topics related to the base application are listed in the help contents panel under the appropriate heading.

Base Menu Functions

The following table lists base menu functions. Online documentation for all functions listed below is provided under the Oracle Real-Time Scheduler option on the online help contents panel.

Note: An implementation can add or remove any of these functions from the menu system, change the menu option name or the submenus under which they appear, or restrict access to the options for some or all users.

Menu (Admin or Main)	Functional Menu	Menu Option
Admin	Deployment Management	Deployment Part
Admin	Deployment Management	Deployment Type
Admin	Deployment Management	Deployment
Admin	Deployment Management	MDT Type
Admin	Deployment Management	MDT
Admin	Mail Management	Mail Template
Admin	Mail Management	Mailing List
Admin	Scheduler Management	Parameter Definition
Admin	Scheduler Management	Scheduler Area
Admin	Scheduler Management	Scheduler Configuration
Admin	Scheduler Management	Scheduler
Admin	Scheduler Management	Scheduler Registry
Admin	Resource Management	Crew Type
Admin	Resource Management	Depot
Admin	Resource Management	Dispatcher Type
Admin	Resource Management	Equipment
Admin	Resource Management	Location
Admin	Resource Management	Mobile Worker Type
Admin	Resource Management	Period of Unavailability Type
Admin	Resource Management	Shift Cost Profile
Admin	Resource Management	Shift Type
Admin	Resource Management	Vehicle Type
Admin	Service Management	Alert Type

Menu (Admin or Main)	Functional Menu	Menu Option
Admin	Service Management	Appointment Booking Group
Admin	Service Management	Dispatch Area
Admin	Service Management	Key Performance Indicator
Admin	Service Management	Priority Profile
Admin	Service Management	Remark Type
Admin	Service Management	Service Area
Admin	Service Management	Service Class
Admin	Service Management	Task Type
Main	Service Management	Activity
Main	Service Management	Alert
Main	Service Management	CDI
Main	Service Management	Override Time Window
Main	Service Management	Remote Message
Main	Resource Management	Crew
Main	Resource Management	Crew Shift
Main	Resource Management	Dispatcher
Main	Resource Management	Dispatcher Shift
Main	Resource Management	Mobile Worker
Main	Resource Management	Period of Unavailability
Main	Resource Management	Resource Route Replay
Main	Resource Management	Shift Weekly Template
Main	Resource Management	Vehicle
Main	My Mail	

Navigating to Portals in Add or Edit Mode

Most menu options display a + sign after the option name. If you click the plus sign, rather than the option name, you will go directly to a screen that lets you add a new record. For example, if you click **Crew +** the system navigates to the Crew add/edit screen so you can begin creating a new crew. This is referred to as 'navigating to the **Crew** portal in add mode.'

If you click the option name, rather than the + sign, the system navigates to a search portal, where you can select the entity you want to view or edit. (For admin-level data maintenance, the system navigates to a screen that lists the entities and lets you select one from the list.) This is referred to as 'navigating to the **Crew** portal in edit mode.' Once you have found the entity you want to work with, the system displays a maintenance portal listing all the actions you can take on that entity. The valid options will vary depending on the entity, your user privileges, and your system's configuration. Standard actions include Edit, Duplicate, and Delete. Valid actions also typically include changes to the entity's status. Thus, if you are viewing the maintenance portal for an activity, the available actions might include Dispatch, Allocate, or Complete.

Time Zones

To support businesses spanning across multiple time zones, the system stores all date and time information in a single common time zone which is the server's time zone.

The system time zone is also referred to as the base time zone. The system also allows data to be entered and displayed in a different time zone as needed, typically the user's preferred time zone, managing the conversion back and forth between the data entry and the storage time zones.

Entities associated with a geographic location such as activities, crew shifts and meetings, are entered and displayed in their corresponding time zone. The rest of the application uses the user's preferred time zone to display date and time information.

The **CDI** portal displays data according to the user time zone, however, users have the ability to toggle time zones as needed.

Crews using the mobile application (MCP) work their schedule using their local device time zone and the system handles the conversion of the data to and from the server time zone.

Chapter 2

User Documentation

This section describes the application functions that support day-to-day operations. These functions are available from the Oracle Real-Time Scheduler application **Main** Menu.

Resource Management

This section describes concepts and procedures related to managing mobile workers, vehicles, crews and crew shifts, dispatchers and dispatcher shifts, shift weekly templates and crew shift templates, break, non productive tasks, periods of unavailability, location based services, and resource route replay.

Understanding Resource Management

This section describes concepts related to resource management.

About Mobile Workers

A mobile worker is an individual workforce resource that performs work as part of a crew.

A mobile worker is associated with a mobile worker type that defines attributes of the mobile worker's job description. For example, a mobile worker type can define the assumed skills of all mobile workers of that type. You can override these settings if an individual mobile worker possesses more or fewer skills. If a mobile worker lacks assumed skills, the system lists them as missing skills on the **Mobile Worker** maintenance portal. If you attempt to allocate an activity to a crew's shift, the system warns you if a mobile worker currently allocated to that shift lacks the required skills and/or skill level.

Some skills have effective periods. For example, a skill might require a license that must be renewed every year. If a skill has an effective period, you will be required to enter an effective date and an expiration date when you assign that skill to a mobile worker. Skills can also be associated with activity types, indicating that the skill is required to perform this type of activity.

Mobile workers are assigned to crew shifts. When scheduling work, the system matches the requirements of each activity to the capabilities of available crew shifts. The scheduler considers the skills and equipment of all mobile workers and vehicles allocated to a crew shift to determine which activities the crew shift can work.

A mobile worker may be associated with one or more base service areas within which they typically work. A mobile worker may be part of only one crew shift at any time.

Planned Leave for Mobile Workers

If a period of unavailability, such as vacation time, has been entered for a mobile worker, the system also takes into account whether or not the leave period overlaps with any planned shift and factors this in when determining whether the mobile worker is available to be scheduled for a shift. If the leave overlaps with the shift for any amount of time, the mobile worker is considered unavailable, even if the overlap is only for a very short duration of time.

Leave time periods are displayed on the resource calendar so that it is easy for the resource planner to determine the availability of all resources.

About Vehicles

A vehicle is a workforce resource used by a crew to perform work.

Equipment can also be associated with activity types, indicating that the equipment is required to perform this type of activity. You can override these settings if a specific vehicle possesses more or fewer pieces of equipment. If a vehicle lacks assumed equipment, the system lists it as missing equipment on the **vehicle** maintenance portal.

A vehicle is associated with a vehicle type that defines attributes common to all vehicles of that type. For example, it can define the assumed equipment of all vehicles of that type. You can override these settings if a specific vehicle possesses more or fewer pieces of equipment. If a vehicle lacks assumed equipment, the system lists it as missing equipment on the **vehicle** maintenance portal.

Like mobile workers, vehicles are assigned to crew shifts. When scheduling work, the system matches the requirements of each activity to the capabilities of the available crew shifts. The scheduler considers the capabilities of all mobile workers and vehicles assigned to a crew shift to determine which activities the crew can work on a particular shift. If you attempt to allocate an activity to a crew's shift, the system warns you if a vehicle currently allocated to that shift lacks the required equipment.

A vehicle may be part of only one crew shift at any time.

Planned Unavailability for Vehicles

If a period of unavailability, such as for maintenance, has been entered for a vehicle, the system also takes into account whether or not the leave period overlaps with any planned shift and factors this in when determining whether the vehicle is available to be scheduled for a shift. If the leave overlaps with the shift for any amount of time, the vehicle is considered unavailable, even if the overlap is only for a very short duration of time.

Leave time periods are displayed on the resource calendar so that it is easy for the resource planner to determine the availability of all resources.

About Crews and Crew Shifts

A crew is a uniquely named group of mobile workers and vehicles that perform work in shifts. A crew shift is a planned period of time in which a crew (one or more mobile workers and vehicles) is scheduled to perform work.

For example, a crew shift might be defined as Crew A, consisting of Jack and his van, working Monday-Friday, 9 am – 5 pm.

The specific mobile workers and vehicles allocated to a crew may vary from one shift to another, and a crew may perform different types of work and cover different service areas on different shifts. Therefore, crew allocation is defined for crew shifts, not for crews. Likewise, activities are scheduled to crew shifts, not to crews.

Typically, crew shifts are automatically generated from crew shift templates that define the basic characteristics of the shifts. Shifts can also be manually created to address special situations on particular days.

Planned Unavailability for Crews

If a period of unavailability, such as for training or a meeting, has been entered for a crew, the system also takes into account whether or not the unavailability period overlaps with any planned shift and factors this in when determining whether the crew is available to be scheduled for a shift. Since periods of unavailability for crews are considered work related, these time slots can be integrated into a shift. For example, the crew can be out for work in the field, then the shift can factor in the location for their meeting on the route for the shift. The crew can then resume work in the field after taking an hour out of the shift to attend the meeting.

Periods of unavailability are displayed on the resource calendar so that it is easy for the resource planner to determine the availability of all resources.

Shift Time Zones

The time zone on a shift indicates the time zone in which the crew is planned to be working. All date and time information on the **Shift** portal, including set up of breaks and non productive tasks for the shift, is entered and displayed in that time zone.

Standby Shifts

Standby shifts can be planned as potential shifts that can be activated only when needed. For example, a crew may be planned to have a "stand by" shift on Sunday, typically to handle emergencies. A standby shift is not available for scheduling until the crew actually starts the shift or the dispatcher changes the status to "open". These shifts are also not considered as available capacity. If the crew is indeed called on that Sunday and starts that shift, it becomes an active shift as usual and gets sent to the scheduler. A shift is typically marked as "stand by" when created, but it can also be changed to standby while this shift is still in pending state.

Closed Shifts

Shifts can be closed in the following ways:

- If the crew goes offline, then all activities are dispatched to the crew and the shift is closed.
- A dispatcher can close a shift so as to finalize its schedule. When this is done, the crew cannot receive more work. The dispatcher can re-open the shift at any time.
- A custom process might also be configured in implementation to close a shift prior to the start of the shift so that all of the activities are allocated to the crew. In this case, the crew has the opportunity to review the shift before its start. This is useful for non-MDT crews.

About MDT, SMS, and Non-MDT Crews

The application supports dispatching directly to mobile data terminals (MDTs) and cellular phones. Communication with cellular phones is done using SMS (short messaging system).

MDT Crews

MDT crews use the mobile application running on a mobile device to log on and receive their assigned tasks. A crew must be connected (either wirelessly or over a wired network) to log on to their shift and receive dispatched activities. Once activities have been dispatched, the crew can work disconnected if wireless communication is not available. As they work each task, they enter status updates (en route, started, etc.) and completion details on the mobile device. They can also receive new tasks and updates to existing tasks throughout their shift. The system regularly checks the connection to the mobile device, and displays the connection status to the dispatcher on the **CDI Dispatcher** portal.

Offline MDT Crews

Once the MDT crew's activities have been dispatched, the crew can work offline if wireless communication is not available. When offline, the crew cannot provide status updates. When the crew does not provide status updates in these situations, the scheduler does not have a way to validate whether or not the crew is on schedule and therefore incorrectly pushes the schedule back. To prevent scheduling discrepancies the crew must notify the scheduler that they are offline by selecting the option on their mobile device. When the scheduler knows that the crew is offline, it does not modify the schedule to compensate for lateness. When the crew goes offline, the shift is also set to closed and their entire schedule is dispatched to them. The crew can also request to be online again, as needed.

SMS Crews

SMS crews communicate via text messages sent from their cell phone. For example, a text message of "Logon" logs the crew shift on and tells the server to send the first task. The system responds by sending a message with the details of the first assignment. Details include the activity type, arrival time, customer name and address.

As the crew works the assignment, they send simple messages to communicate their progress: a crew message of "1" indicates that the crew is traveling (en route) to the task; "2" indicates arrival at the task location; "3" indicates that work is done and the crew is ready for a new task.

The system also sends non productive tasks, POU's and breaks to the crew in the same way that it sends activities. At the end of a shift, the crew sends a "Logoff" message. Typically, an SMS crew enters completion details at the end of their shift when they return to their office.

Logic to interpret and process SMS messages is handled by a plug-in. Refer to the Configuration Guide for information about customizing this plug-in.

Non-MDT Crews

If a crew does not have either an MDT or SMS device, the dispatcher can start the crew shift from the **Crew Shift** maintenance portal on the server and communicate details of each task directly to crew. The dispatcher can also update the status of a task (using the task's maintenance portal) and enter activity completion details when the crew has completed work. Typically, the shifts of non-MDT crews are closed some time before their shift is planned to start. If a non-MDT crew's shift is closed then it is also set to offline. Non-MDT crews can also call in the dispatcher, and request them to decline the activity on their behalf, so crew does not get the activity again.

SMS Message Reference

This topic describes the messages that an SMS user can send to the server application.

Messages from the Crew to the Server

The following SMS messages are supported from crew members in the field.

Message	Description
Logon	Finds the next shift for the user associated with the mobile phone and starts it. Starting a shift causes the first task to be sent to the crew. The system validates the phone number and uses it to retrieve the mobile worker's current shift and send the first task. The cell phone number must be associated with an active SMS-enabled mobile worker record on the server.
1	If the current task is associated with a geographic location, this indicates that the crew is traveling to the task location. If the current task is a break, this starts the break.
2	If the current task is associated with a geographic location, this indicates arrival at the task location. This is invalid for breaks.
3	If the current task is associated with a geographic location, this completes the task. If the current task is a break, this completes the break. Once the current task is completed, the next task (if any) is sent to the crew.
9	Postpones the current task for a specified duration of time (in minutes) or until the end of shift.
0	Toggles the state of the current shift from In Service to Out of Service, and vice versa.
Return	Sent in response to an SMS recall. This indicates that the crew accepts the recall. The system then updates the assignment status to Returned.
Logoff	This message ends the current shift and returns any unfinalized activities.

Sample Messages from the Server to the Crew

The following table provides examples of the messages sent to crews when tasks are dispatched.

Message	Example
Activity Details	MREAD at 12.00.00 for Swetha Paspuleti at 6284 dressler Road NW, North Canton
POU Details	STATUS MEETING at 6284 dressler Road NW, North Canton from 14.00.00 to 14.30.00
Break Details	COFFEE from 13.00.00 to 13.30.00

About Shift Templates and Shift Weekly Templates

Templates provide a tool for quickly generating large numbers of shifts based on pre-defined parameters.

A shift weekly template defines a cyclical weekly pattern made up of crew shift templates. Shift weekly templates are either:

- effective for a specified number of weeks starting from their effective date, or
- perpetual, which means they have an effective date but no end date. The global planning horizon parameter (defined in the master configuration) controls the number of day's worth of shifts to generate for perpetual templates.

Each shift template defines the attributes for the corresponding recurring shift. For example, a weekly shift template might use a different crew shift template on Fridays than the one used on other days. Attributes on a shift template include the shift's planned start date and time, covered service areas, breaks, etc. The system generates actual crew shifts automatically from the crew shift templates. Shift weekly templates may be:

- **Crew specific** - These templates are defined for a single crew and are fully defined with everything that the shift generator needs to generate the shift. They reference the crew that they are defined for and how the resources are allocated on the shift.
- **Common** - These templates can be shared across multiple crews via subscription. As such they cannot define crew specific details such as the crew itself or its resource allocation. These details are therefore defined on the crew entity itself. Shift generation combines crew details on top of template details to generate shifts. Any crew that is subscribed to a common template must have these types of details defined.

In a situation where crew shift details should differ from their template on a particular date, generate the shift initially from the template and then you can manually adjust it to override the template settings. These modified shifts are called overridden shifts, as they no longer match the template from which they were generated. The **Overridden Shifts** zone on the **Shift Weekly Template** portal displays a list of overridden shifts linked to the current template.

A generated crew shift maintains a reference to the template that generated it, so any changes made to a template are automatically applied to all future shifts that were generated from that template. If you modify a shift weekly template after crew shifts have been generated from it, all previously generated crew shifts will be regenerated, and any manual overrides will be lost.

Common Weekly Templates

Resource planners can set up common weekly templates which can be shared across multiple crews. This is helpful for the efficient generation of shifts in organizations where there are sometimes hundreds or possibly even thousands of crews that follow the same weekly shift pattern. The resource planner can subscribe crews to the common template, then shifts generated from the common template are exactly the same and follow the same timing in the rotation except for crew specific details such as allocated resources.

Subscription to a common template is effective dated so that resources can subscribe to follow a common template as of a given date and this relationship can expire. Each resource can subscribe at different times but their shifts are generated in the same rotation timing as all other subscribed resources, regardless of when they subscribed.

The planner can also unsubscribe a crew from the common template at any time or change effective dates to affect the creation of future shifts for those crews.

Changes made to the common template affect future shifts of all subscribed crews. Since a common template may involve a large number of subscriptions, such changes are NOT applied right away to all these shifts but rather they take effect the next time the shift generation batch process runs. If you want to apply the recent changes to a specific crew without waiting for the next scheduled batch run you can select the **Process Now** button next to the crew on the subscription list.

Similarly subscriptions and unsubscription requests may involve multiple crews. Therefore these requests are applied the next time the shift generation batch runs or by clicking the **Process Now** button for a specific crew.

In an ideal workflow the resource planner would create a common weekly template then subscribe multiple crews to the template bearing the following in mind:

- Subscriptions require an effective date and allow an expiry date
- A crew's subscriptions and specific templates cannot overlap

About Working with Draft and Original Templates

If you attempt to modify a template from which shifts have already been generated, the system automatically creates a draft copy of the template. This allows you to make your changes to the draft, then preview the shifts that would be generated if you applied the draft.

You can also see if any manual edits were made to previously generated shifts. (Such manual overrides will be lost when the draft is applied and shifts are regenerated). When you have reviewed this information and are sure you want to make the proposed changes, you can apply the draft and be confident that you understand the impact of your action.

It is helpful to understand the following rules that apply when working with draft and original templates:

Initial Creation

- When you create a new shift weekly template, its status is pending.
- When you apply the pending template, its status changes to applied. The system will generate future shifts automatically from the template's effective date through the earliest of the planning horizon or the expiration date (if any). A background process manages the generation of shifts going forward.

Making Changes to an Applied Template

- If you attempt to update an applied template, the system will automatically create a draft template. The updates will be stored in the draft and the original template will remain unchanged.
- If you attempt to update an original template for which a draft already exists, the system will notify you that you must enter your changes in the existing draft.
- If you apply a draft (for which an original template exists), the system notifies you that any future shifts generated from the original template will be deleted and regenerated. At this point, you can continue or cancel the operation. If you continue, the following occurs:
 - The draft template's status changes to applied.
 - The original template is updated to match the draft.
 - All future shifts generated from the original template are either updated (if those shifts' templates also exist in the draft) or deleted (if those shifts' templates were deleted from the draft). New shifts are generated for any shift templates that were added to the draft.
 - Any additional changes made to this template will result in a new draft.

Setting an Applied Template Back to Pending Status

- If you attempt to set an applied template back to pending status, the system notifies you that any future shifts generated from the template will be deleted. If you confirm the action, the following occurs:
 - The original template's status changes to pending (no draft exists).
 - All future shifts that were previously generated from the original template are deleted.
 - If a draft template exists, it is deleted.

About Breaks

A break is a period of time during which a crew is entitled to take a break during their shift.

Shift breaks allow you to plan for nonworking time within a shift. For example, a shift might include two 15-minute breaks, one in the morning and one in the afternoon. The morning break could be taken anytime from 9:00 am to 11:00 am, and the afternoon break could be taken anytime from 1:00 pm to 4:00 pm.

Each break is associated with a break type, which defines the duration of the break and the duration of the break window (the period of time during which the break can be taken). When you create a crew shift or crew shift template, you can add one or more break types to the shift. When the shifts are generated, the system automatically creates break tasks and incorporates them into the crew shift's schedule.

Breaks are planned to be performed during a time window starting at an offset relative to shift start time. If the crew starts their shift earlier or later than planned the break's schedule is adjusted accordingly. For example, if the offset is 2 hours and the shift starts at 8am, the break cannot start before 10am. If the shift starts at 9am with the same 2 hour offset, then the task can start as early as 11am. Alternatively, you may specify the offset using an actual window start date and time. Here, the system calculates the offset of that time from the shift start.

Breaks are displayed at the end of a crew shift's schedule until they have been scheduled by the scheduler.

About Non Productive Tasks

A non productive task (NPT) is a period of time during which a crew must perform a task other than regular work as part of their shift, such as replenishing stock. Such tasks are built into a crew's schedule and are always associated to a location where the task is performed.

Non-productive tasks allow schedulers to plan for non-working time during a shift. For example, a shift might start with a task to replenish supplies on the truck in the morning, and to check tire pressure in the afternoon. The morning task might take place anytime from 6:00am to 9:00 am, and the afternoon task might take place any time between 1:00pm and 3:00pm.

Unlike a meeting the non-productive task is not planned to start on a specific fixed time but rather is planned to be performed during a time window starting at an offset relative to shift start time. If the crew starts their shift earlier or later than planned the task's schedule is adjusted accordingly. For example, if the offset is 2 hours and the shift starts at 8am, the task cannot start before 10am. If the shift starts at 9am with the same 2 hour offset, then the task can start as early as 11am. Alternatively, you may specify the offset using an actual window start date and time. Here, the system calculates the offset of that time from the shift start.

Each non-productive task is associated with a task type which defines the duration of the task, and the duration of the task window. When you create a crew shift or crew shift template, you can add one or more non productive task types to the shift. When the shifts are generated, the system automatically creates non productive task tasks and incorporates them into the crew shift's schedule.

The location of an NPT may be a reference to a common location or a specific address. A crew may be affiliated with a specific NPT location defined on the crew record. When creating an NPT if its location is not explicitly specified the system defaults it from the shift's crew record if any is defined.

NPTs are displayed at the end of a crew shift's schedule until they have been scheduled by the scheduler.

About Periods of Unavailability (POUs) and POU Templates

A period of unavailability (POU) is a specific period of time during which one or more resources are not available to perform work, for example, while attending meetings or training sessions. For example, resources may be unavailable due vacation, personal appointments, maintenance, attending meetings or participating in training sessions depending on the type of resource.

POUs

A POU defines the attributes of the period of unavailability, such as its duration, location, and the specific resources to which it applies. For POUs that are associated with crew resources (referred to as crew POUs), you can specify one or more service areas. This instructs the scheduler to incorporate the POU in the shift schedule of attending crews only if they are planned to work in the specified service areas. (This is used to discourage the incorporation of the POU event into a crew's shift schedule if the crew happens to work too far from the event that day.) If no service areas are specified, the POU will apply to all service areas. A crew POU is always associated with a location. Travel time to and from the POU location is taken into account when optimizing the crew shift's route.

POU Templates

POUs are either recurring or non-recurring. For recurring POUs, you define a template POU from which the actual POUs are generated. For example, if you create a template POU for a regular weekly staff meeting, the system will automatically generate individual POUs for each meeting.

In a situation where POU details differ from their template on a particular date, you can generate the POU initially from the template and then manually adjust it to override the template settings. For example, circumstances might require that a weekly staff meeting, typically held on a Monday morning, be held on Friday during one particular week. In this situation, POUs for every meeting would be generated automatically from the template, and then you would manually modify the POU for the special meeting. Modified POUs are called **overridden POUs**, as they no longer match the template from which they were generated. The **Overridden POUs** zone on the **Period of Unavailability** portal displays a list of overridden POUs linked to the current template.

A generated POU maintains a reference to the template that generated it, so any changes made to a template are automatically applied to all future POUs generated from that template. If you modify a POU template after POUs have been generated from it, the system notifies you that all previously generated POUs will be deleted and regenerated, and that any manual overrides will be lost.

POU Tasks

A POU task is a tool for tracking crew attendance of a POU event. The system automatically creates a POU task for every crew associated with a crew POU, and then incorporates it into the crew's shift schedule. A POU task is dispatched to a crew, just like an activity, and its status is updated and tracked in the same way.

Time Zones

If a POU is associated with a geographic location, like a meeting, all date and time information on the **Period of Unavailability** portal is entered and displayed in that location's time zone.

About Location Based Services

Location Based Services (LBS) refers to crew location and tracking services that utilize Global Positioning System (GPS) data obtained from a mobile resource. GPS data is used to display the location of resources on the map and to track crews and routes on the map.

LBS allows dispatchers and the scheduler know the precise whereabouts of crews and vehicles in relation to:

- Activities being performed in the field
- Log on and log off locations

- Other crews and vehicles
- The underlying map geography (street names, landmarks, etc.)

LBS services can only be provided if GPS data is obtained for a mobile resource. Data may be captured via the crew's mobile device (MDT) or independent of it via an external GSP system embedded in the vehicle.

Sending of GPS data from the mobile device can be enabled or disabled at the shift level using the **GPS Data Enabled** attribute.

Vehicles equipped with an external GPS system can be configured to transmit GPS data independently. If the shift is not configured to send GPS data, the system uses GPS sent from the vehicle if any.

If GPS data is not available or is too old (as defined in your system's global configuration), then the system estimates the crew's current location based on its last known location.

About Resource Route Replay

Resource Route Replay shows a replay of a crew's actual route during a specific period of time based on GPS coordinate history. This feature can be used to analyze route patterns and for auditing purposes.

A crew's mobile device may be configured to transmit GPS location data throughout the day. A vehicle's GPS data may be interfaced to the system from an external system. You can review resource routes for crews and/or vehicles, viewing them one at a time or adding multiple routes (up to 12) to the map at once. Multiple routes are displayed by representing each route in a different color.

When successive routes are displayed, route points are marked with a sequence number so that it is clear in which order the points were visited. Hover the mouse pointer over any route point to display the GPS details for that route point.

Click the **Clear All** button to remove all resources from the map and start again.

About Dispatchers and Dispatcher Shifts

A dispatcher record defines the dispatch areas and key performance indicators (KPIs) that the dispatcher is allowed to monitor. (Dispatch areas identify a set of service areas and service classes.) The dispatcher record also specifies the default date range for activities to be monitored and indicates whether the dispatcher will be allowed to modify that date range when they log on to their shift.

A dispatcher shift record controls the scope of data to be monitored by the dispatcher for a particular shift. When a dispatcher logs on to start their shift, the system creates the dispatcher shift record at that time. The dispatcher can select which dispatch areas (of those specified in the dispatcher record) they want to monitor for the shift. They can also change the date range of activities to monitor for the shift, if allowed (based on settings defined in the dispatcher record).

A dispatcher can log off and log on again at any time. Whenever a dispatcher logs off a shift, the system finalizes that dispatcher shift record. Whenever a dispatcher logs on to a shift, the system creates a new dispatcher shift record. From business perspective, a dispatcher's shift may be an 8-hour period from 9:00 to 5:00, but from a system standpoint, the shift lasts from logon to logoff.

Note: For a dispatcher to be "logged on," the dispatcher shift itself must be logged on. This is not just logging in to the application.

Working with Mobile Workers

This section describes common tasks related to working with mobile workers.

Creating Mobile Workers

Use this procedure to create a new mobile worker:

Prerequisites: You must define the mobile worker type, skills, and service areas before you can associate them to a mobile worker. The mobile worker must have a valid system user ID.

1. Select **Main Menu > Resource Management > Mobile Worker+** .
2. Select the mobile worker type and click **OK**.
3. Enter the mobile worker's system user ID or click the search icon to search the user list.
4. Enter contact information for the mobile worker.
5. Review the list of assumed skills. Remove any skills this worker does not have, and add any skills the worker has that are not listed.

If skill has an effective period, you must enter the effective and expiration dates.

6. Select the service areas in which this mobile worker typically works.
7. Click **Save**.

Mobile Worker Search

Use this procedure to search for a mobile worker on the **Mobile Worker Query** portal:

1. Select **Main Menu > Resource Management > Mobile Worker** .
2. Select one of the following query options in the **Mobile Worker Query** zone.
3. Click **Refresh**.
4. In the search results list, click the link for the mobile worker you want to view or edit.

Maintaining Mobile Workers

Use this procedure to maintain an existing mobile worker:

1. Navigate to the **Mobile Worker** portal in edit mode.
2. Click a button in the **Actions** zone to edit, delete, duplicate, or activate/deactivate the mobile worker.
3. Click **Save**.

If you add or remove skills from a mobile worker, all non-finalized shifts to which the mobile worker is currently allocated are resent to the scheduler. The scheduler then reevaluates the shift schedules accordingly, and may add or remove tasks as a result. If a task has already been dispatched or marked for dispatch, it remains on the shift; it is the responsibility of the crew to suspend an activity if they cannot perform the work. If a task is still being scheduled, it is rescheduled to another qualified crew.

Viewing Missing or Expired Skills for a Mobile Worker

Use this procedure to view missing or expired skills for a mobile worker:

1. Navigate to the **Mobile Worker** portal in edit mode.

If the mobile worker is missing any of the assumed skills defined for its mobile worker type, those skills are listed in the **Skills** section. If any of the mobile worker's skills are expired, the expiration date is displayed in red next to the skill.

2. To add a missing skill:

- Click the **Add** button next to the missing skill.
- If the skill has an effective period (as defined in the skill type), enter the effective and expiration date for the skill.
- Click **Save**.

3. To change the expiration date for a skill, click the **Edit** button, then enter the new expiration date and click **Save**.

Viewing the Mobile Worker Calendar

Use this procedure to view events and other items occupying time on the mobile worker's schedule for the current month:

1. Navigate to the **Mobile Worker** portal in edit mode.

2. In the **Mobile Worker Calendar** zone, do any of the following:

- Use the toolbar buttons to change the view (Day, Week, Month, or List) and to display the calendar for the previous or next viewing period.
- Click an object in the calendar to navigate to its maintenance portal.

Working with Vehicles

This section describes common tasks related to working with vehicles.

Creating Vehicles

Use this procedure to create a new vehicle.

Prerequisites: You must define equipment before you can associate it to a vehicle.

1. Select **Main Menu > Resource Management > Vehicle+** .
2. Select the vehicle type and click **OK**.
3. Enter a tag or license plate number to identify the vehicle and complete all other required fields.
4. Review the list of assumed equipment. Remove any equipment this vehicle does not have, and add any equipment the vehicle has that are not listed.

If equipment has an effective period, enter the effective and expiration dates.

5. Click **Save**.

Vehicle Search

Use this procedure to filter and search for vehicles.

1. Select **Main Menu > Resource Management > Vehicle** .
2. Enter your search criteria.
You can search by any combination of vehicle type, vehicle tag, and license plate. You can also exclude all inactive vehicles from the search results.
3. Click **Refresh**.
4. In the search results list, click the link for the vehicle you want to view or edit.

Maintaining Vehicles

Use this procedure to maintain an existing vehicle.

If you add or remove equipment from a vehicle, all non-finalized shifts to which the vehicle is allocated are resent to the scheduler. The scheduler then reevaluates the shift schedules accordingly, and may add or remove tasks as a result. If a task has already been dispatched or marked for dispatch, it remains on the shift; it is the responsibility of the crew to suspend an activity if they cannot perform the work. If a task is still being scheduled, it is rescheduled to another qualified crew.

1. Navigate to the **Vehicle** portal in edit mode.
2. Click a button in the **Actions** zone to edit, delete, duplicate, or activate/deactivate the vehicle.
3. Click **Save**.

Viewing Missing Equipment for a Vehicle

Use this procedure to view missing or expired equipment for a vehicle.

1. Navigate to the **Vehicle** portal in edit mode.
If the vehicle is missing any of the assumed equipment defined for its vehicle type, those items will be listed in the **Equipment** section. If any of the vehicle's equipment is expired, the expiration date is displayed in red next to the equipment.
2. To add a missing piece of equipment:
 - Click the **Add** button next to the missing equipment.
 - If the equipment has an effective period, enter the effective and expiration date.
 - Click **Save**.
3. To change the expiration date for a piece of equipment, click the **Edit** button, then enter the new expiration date and click **Save**.

Viewing the Vehicle Calendar

Use the **Vehicle Calendar** zone on the **Vehicle** portal to view events and other items occupying time on the vehicle's schedule for the current month.

1. Navigate to the **Vehicle** portal in edit mode.

2. In the **Vehicle Calendar** zone, do any of the following:

- Use the zone's toolbar buttons to change the view (Day, Week, Month, or List) and to display the calendar for the previous or next viewing period.
- Click an object in the calendar to navigate to its maintenance portal.

Working with Crews

This section describes common tasks related to working with crews.

Creating Crews

Use this procedure to create a new crew.

Prerequisites: You must define the crew type before you can create crews of that type.

1. Select **Main Menu > Resource Management > Crew+** .
2. Select the crew type and click **OK**.
3. Enter a unique crew name.
4. Click **Save**.

You can now create crew shifts for this crew.

Crew Search

Use this procedure to filter and search for crews.

1. Select **Main Menu > Resource Management > Crew** .
2. Enter your search criteria.

You can search by any combination of crew type and crew name. You can also exclude all inactive crews from the search results.

3. Click **Refresh**.
4. In the search results list, click the link for the crew you want to view or edit.

Maintaining Crews

Use this procedure to maintain an existing crew.

1. Navigate to the **Crew** portal in edit mode.
2. Click a button in the **Actions** zone to edit, delete, duplicate, or activate/deactivate the crew.
3. Click **Save**.

Viewing Shift Weekly Templates for a Crew

Use this procedure to view the shift weekly templates associated with a particular crew.

1. Navigate to the **Crew** portal in edit mode.

If one or more shift weekly templates have been defined for this crew, they are displayed in the **Shift Weekly Templates** zone. By default, only non-expired templates are displayed. To include expired templates, click the **Filter** icon in the zone title bar, then check the **Include History** checkbox and click **Refresh**.

2. Click on a template to navigate to the template's maintenance portal.

Viewing the Crew Calendar

Use this procedure to view events and other items occupying time on the crew's schedule for the current month.

1. Navigate to the **Crew** portal in edit mode.
2. In the **Calendar** zone, do any of the following:
 - Use the zone's toolbar buttons to change the view (Day, Week, Month, and List) and to display the calendar for the previous or next viewing period.
 - Click an object in the calendar to navigate to its maintenance portal.

Working with Crew Shifts

This section describes common tasks related to working with crew shifts.

Creating Crew Shifts

Use this procedure to create a new crew shift. Typically, crew shifts are generated automatically by the system from crew shift templates. However, you can create individual crew shifts to meet special situations.

Prerequisites: Crew, shift type, service classes, break types, non productive tasks, mobile workers, vehicles, service areas, and logon/off locations must have been previously defined.

1. Select **Main Menu > Resource Management > Crew Shift+**.
2. Select the crew shift type and click **OK**.
3. Complete the fields in the **Main** section.
4. Add each mobile worker and vehicle that will be working this crew shift. (Optionally, you can save the crew shift without selecting any resources, and then use the Maintain Crew Allocation feature, which recommends a list appropriate crews.)
5. Add each service area that the shift will cover, then select either **Allowed** or **Preferred**.
6. Specify any service classes of work that are not allowed on this shift.
7. Enter logon and logoff information.
8. Click **Save** .

The **Crew Shift** maintenance portal is displayed. Note that the crew shift status is pending. Review the shift details at this time and make any final updates:

- To add breaks or non productive tasks to the shift, click the **Add** link in the **Breaks/Non Productive Tasks** zone title, then select each break or non productive tasks you want added to the shift.
- If you want the system to recommend appropriate resources, click the **Maintain Crew Allocation** link.

- If you want the system to recommend an appropriate shift cost profile (by matching the service area and service class combination defined in existing profiles to this crew shift's service areas and service classes), click the **Recommend Change** link next to the **Shift Cost Profile** field.
9. When you ready for the system to begin scheduling tasks to this shift, click the **Plan** button in the **Actions** zone.
The shift is sent to the scheduler for planning.

Crew Shift Search

Use this procedure to filter and search for crew shifts.

1. Select **Main Menu > Resource Management > Crew Shift**.
2. From the **Crew Shift Search** zone, select the Query Option to use.
3. Click **Refresh**.
4. Click a shift in the search results to navigate to the **Crew Shift** portal.

Maintaining Existing Crew Shifts

Use this procedure to maintain existing shifts. You can change crew shift details, such as the primary function or shift cost profile. You can also update the crew shift's status and log a crew shift off the system.

Once a crew shift is started by an MDT or SMS crew, the crew should be in full control of the shift's status; changing the status of such a shift independently on the server may cause crew status updates to fail. A dispatcher should only update crew shifts for non-MDT crews.

If you change shift details for a logged on shift, the shift details are resent to the scheduler. If any tasks previously scheduled to the shift are no longer appropriate for it, they are rescheduled automatically, unless they have already been dispatched. If a task has already been dispatched to a crew, it will remain on the shift; the crew or dispatcher will be required to resolve the situation manually.

1. Access the **Crew Shift** portal in edit mode.
2. Use the buttons in the **Actions** zone to maintain the crew shift.

In addition to the standard **Edit**, **Duplicate**, and **Delete** buttons, the **Actions** zone displays buttons you can use to change the status of the crew shift. The buttons that are displayed at any time vary depending on the crew shift's current status and your system's configuration. Action buttons supported in the base system are described below.

Button	Description
Plan	Tells the system to begin scheduling tasks to this shift (when the shift start date falls within the planning horizon).
Cancel	Cancels the crew shift. If any tasks are currently scheduled to the shift, they will be rescheduled to another shift.
Start	Starts a crew shift. This applies only to crew shifts that are in a planned status. This effectively logs the crew shift on to the system so that scheduled tasks can be dispatched and worked.
In Service	Indicates that the crew is currently working (traveling to an activity location, working an activity, idle between activities, etc.).
Out of Service	Indicates that the crew is not currently working or available for work. The crew may be attending a meeting or may have experienced a vehicle breakdown, for example. You will be prompted to provide a reason for going out of service and an estimated duration.

Button	Description
Force Logoff	Forcibly logs the crew shift off. This may be required if a logged-on crew's MDT is not working and they need to receive data on a new device. This is not the same as logoff at end of shift. Force logoff is used to disconnect a crew shift from a device. Force logoff does not disassociate the crew shift from its crew leader. For security purposes, the system maintains a link between the crew shift and the last user who logged on to the crew shift. Only that user can log back on to the shift on the new device and retrieve the shift details.
Allocate All	Allocates all of the activities scheduled to the selected shift that have not yet been dispatched . Allocating all does not close the shift.
Open	Opens the shift's schedule allowing the scheduler to scheduler more activities to the shift as needed. If the shift was a stand by shift it becomes fully available for scheduling.
Close	Closes the shift and allocates all scheduled activities to the shift. The scheduler is prevented from removing any of the allocated activities or adding more activities to the current shift. The shift planner is also provided with the opportunity to dispatch the allocated activities also as part of closing the shift.
Complete	Indicates that the crew is done working. This is also referred to as End of Shift.

The system validates the action and displays an error message if the validation failed. Otherwise, the updated status is displayed.

Changing the Shift Cost Profile for a Crew Shift

Use this procedure to view a list of recommended shift cost profiles for the current shift. The system finds appropriate shift cost profiles by matching the service area and service class combination defined in the profile to the current crew shift's service areas and service classes. You can select one of the recommended profiles or specify any profile you wish.

1. Navigate to the **Crew Shift** portal in edit mode.
2. Click the **Recommend Change** link next to the **Shift Cost Profile** field.
The **Recommend Change** link is only displayed for crew shifts that are in pending or planned state.
3. Click the **Search** icon in the pop-up window to display the profile list.
4. Review and select a profile from the list (or cancel if you do not wish to select one).
5. Click **Save**.

Changing the Resource Allocation for a Crew Shift

Use this procedure to view a list of recommended resources from which you can choose when updating resource allocation for a crew shift.

1. Navigate to the **Crew Shift** portal in edit mode.
2. In the **Current Crew Allocation** section, click the **Maintain Crew Allocation** link.
The **Recommended Crew Allocation** portal is displayed. The **Recommended Mobile Worker** zone displays a list of mobile workers that have been identified as appropriate for this crew shift, based on the shift's attributes. The **Recommended Vehicle** zone displays a list of vehicles identified as appropriate for the shift.
3. To add a recommended mobile worker or vehicle, click the **Add** button displayed next to the resource.
4. To remove a resource that is currently allocated, click the **Remove** button.

5. To filter or search for additional resources, enter your search criteria and click **Refresh**.

Viewing a Crew Shift Schedule

Use the **Schedule** tab on the **Crew Shift** portal to view the tasks currently assigned to a crew shift.

1. Navigate to the **Crew Shift** portal in edit mode.
2. Click the **Schedule** tab.

The Crew Shift **Schedule Gantt** zone displays the schedule in a graphical time line. The crew shift is listed on the left, and all tasks scheduled to it are displayed in the task area to right. The **Scheduled Tasks** zone displays a list of all scheduled tasks in work order sequence.

3. To take action on a scheduled task, right-click the activity in the **Schedule Gantt** zone and choose an option from the pop-up menu. Options may vary depending on your system's configuration. Standard options allow you to allocate, dispatch, defer, and unassign a task from the Gantt.
4. To view summary details for a scheduled task, right-click the task in the **Schedule Gantt** zone. Details are displayed at the top of the pop-up menu.

To navigate to the task's maintenance portal, right-click the task and then select **View Details** from the pop-up menu. You can also click the link for the task in the **Scheduled Tasks** zone.

Viewing Crew Shift Capabilities

Use the **Capabilities** tab on the **Crew Shift** portal to view a list of all capabilities currently allocated to this shift. This includes all distinct skills for allocated mobile workers and all distinct equipment for allocated vehicles.

1. Navigate to the **Crew Shift** portal in edit mode.
2. Click the **Capabilities** tab.

You cannot change any information on this tab. To change crew allocation, click the **Maintain Crew Allocation** link on the **Main** tab of the **Crew Shift** portal.

Working with Shift Weekly Templates and Crew Shift Templates

This section describes common tasks related to working with shift weekly templates and the crew shift templates associated with them.

Creating Shift Weekly Templates and Crew Shift Templates

Use this procedure to create a shift weekly template and a set of crew shift templates that make up the weekly template.

Prerequisites: Crew, shift type, service classes, break types, mobile workers, vehicles, service areas, and logon/off locations must have been previously defined.

1. Select **Main Menu > Resource Management > Shift Weekly Template+**.
2. Select the shift weekly template type and click **OK**.

Types of templates you might create include: common shift template, a shift template for a specific crew, and a crew's subscription to a common template.

3. Complete the fields in the **Main** section.

4. Click **Save**.

The **Shift Weekly Template** portal is displayed. The status of the new shift weekly template is pending.

5. Click the **Add Shift Template** link in the **Shift Weekly Template Calendar** zone title bar to add the first crew shift template.

The **Crew Shift Template** add/edit screen is displayed.

6. Complete the fields as appropriate.

7. Click **Save**.

The system returns you to the **Shift Weekly Template** portal.

8. Repeat steps 5-12 for each shift template you want to add. (Alternatively, you can select the crew shift template you just created and click the **Duplicate** icon in the **Shift Weekly Template Calendar** toolbar. Modify the copy and save.)

9. Click the **Review** tab to display a month's worth of potential shifts that would be generated if you applied the template.

Use the scroll buttons to view the previous or next month. Click the **Broadcast** icon next to a shift to display its details in the **Crew Shift Preview** zone.

10. When you are satisfied with the shift weekly template, click the **Apply** button in the **Actions** zone of the **Shift Weekly Template** portal.

The status of the template is set to Applied. The system will generate future shifts immediately for the period beginning with the shift's effective date through the earliest of either the global planning horizon or the shift's expiration date, if specified. A shift weekly template monitor background process is responsible for generating shifts going forward.

Shift Weekly Template Search

Use this procedure to filter and search for shift weekly templates.

1. Select **Main Menu > Resource Management > Shift Weekly Template**.

2. Enter your search criteria on the **Shift Weekly Template Search** zone.

You can search by crew ID and/or effective date. The system will find all templates effective on or after the date you enter.

3. Click on a template in the search results to navigate to the **Shift Weekly Template** portal.

You can also click in the **Crew** column for any template listed to navigate to the **Crew** portal.

Maintaining Shift Weekly Templates and Crew Shift Templates

Use this procedure to view, edit, duplicate, or delete an existing shift weekly template and also to add and maintain the crew shift templates that make up the weekly template. To maintain a shift template, you must first access the shift weekly template from which it was created.

1. Select **Main Menu > Resource Management > Shift Weekly Template**.

2. Search for and select the shift weekly template you want to maintain.

If the shift weekly template has an existing draft, the system automatically displays the draft, rather than the original. To get to the original, you must click on the original template link from the draft.

3. Note the status of the template.

- If the status is Applied and the **Pending Draft Exists** link appears next to the status, you must enter your changes in the existing draft. Click the link to open the existing draft for editing. Use the **Show Differences** button to see the differences between the draft and the applied versions. You can also set the status back to Pending, which deletes the draft.
 - If the status is Applied and no draft exists, the system will automatically create a new draft template to store any new changes you make.
 - If the status is Pending, your changes will be made to the current pending template.
4. To edit shift weekly template details, click the **Edit** button in the **Actions** zone, then make your changes and save. To add and maintain shift templates, continue with the next step.

5. Review the **Shift Weekly Template Calendar** zone.

This zone displays a calendar that covers the weekly template period. Any crew shift templates already defined for this weekly template are displayed as colored bars spanning one or more days (the period of time covered by the shift template).

6. Click on the colored bar for the shift template you want to maintain.

When you click a shift template, a set of toolbar icons is displayed above the calendar. (Hover the mouse over an icon to view a brief description.)

7. Click the icon for the action you want to take:

Edit	Navigates to the Crew Shift Template add/edit screen for the selected crew shift template. Make any desired changes and click Save . The system returns you to the Shift Weekly Template portal. To associate a break type with this template, click the Add link in the Break zone title. (When the template is applied and shifts are generated, the system creates breaks for the break types associated with the template.)
Duplicate	Makes a copy of the selected crew shift template, and then navigates to the add/edit screen for the copy. Make any desired changes to the copy and click Save . The system returns you to the Shift Weekly Template portal.
Delete	Deletes the selected crew shift template. You will be prompted to confirm the deletion.
Go To	Navigates to the Crew Shift Template portal. From there you can view the template details or use the buttons in the Actions zone to edit, duplicate, or delete the template. When you are done, return to the Shift Weekly Template portal.

8. Repeat steps 5-7 to maintain another crew shift template, or click the **Add Shift Template** link in the zone title bar to create a new one.
9. When you have made all necessary changes, click the **Review** tab to preview the shifts that would be generated if you applied your changes.
10. Check the **Overridden Shifts** zone to see if any shifts generated from this template have been modified manually and no longer match the template from which they were generated. These manual overrides will be lost if you apply this template.
11. If you are updating a draft shift weekly template, use the **Show Difference** button in the **Actions** zone to view a list of the differences between the applied and draft version of this template before you apply the template.
12. To apply your changes, click the **Apply** button in the **Actions** zone of the draft template's **Shift Weekly Template** portal.

Viewing Overridden Shifts

An overridden shift is one that has been modified manually and no longer matches the template from which it was generated. The **Overridden Shifts** zone on the **Shift Weekly Template** portal displays a list of all overridden shifts for this template. If you apply the template, these shifts will be regenerated and any manual overrides will be lost.

To view details for an overridden shift, click the **Shift** link in the **Overridden Shifts** zone on the **Shift Weekly Template** portal.

Displaying Differences Between Draft and Original Templates

When you make changes to a template that has already been applied, the system automatically creates a new draft version of the template. It puts your changes in the draft version and leaves the original applied version unchanged until you manually apply the draft. Before you apply a draft template, you should view the differences between the draft and the original to make sure you want all changes applied.

To view differences, click the **Show Differences** button in the **Actions** zone of the Shift Weekly Template portal. The system displays a pop-up window listing each template that has been changed and the type of change (Deleted, Updated, or New). You may also want to preview the shifts that will be generated if the draft is applied. Use the **Review** tab on the **Shift Weekly Template** portal to preview shifts.

Navigating Between Original and Draft Templates

When the shift weekly template you are working with has an original version and a pending draft, you can navigate between them as follows:

- When viewing a draft template, click the **Original Template ID** link to navigate to the original template's maintenance portal.
- When viewing an original template, click the **Pending Draft Exists** link to navigate to the draft's maintenance portal.

Viewing the Capabilities for a Crew Shift Template

Use the **Capabilities** tab on the **Crew Shift Template** portal to view a list of all capabilities currently allocated to this shift. This includes all skills for allocated mobile workers and all equipment for allocated vehicles.

You cannot change any information on this tab. To change crew allocation, click the **Maintain Crew Allocation** link on the **Main** tab of the **Crew Shift** portal.

Using the Shift Weekly Template Calendar

Use the **Shift Weekly Template Calendar** zone on the **Shift Weekly Template** portal to view the time period covered by this template and manage the individual crew shift templates associated with the weekly template.

1. Navigate to the **Shift Weekly Template** portal in edit mode.

The **Shift Weekly Template Calendar** zone displays a calendar that covers the weekly template period. Any crew shift templates already defined for this weekly template are displayed as colored bars spanning one or more days (the period of time covered by the shift template).

2. Click on the colored bar for the shift template you want to maintain.

When you click a shift template, a set of toolbar icons is displayed above the calendar. (Hover the mouse over an icon to view a brief description.)

3. Click the icon for the action you want to take:

Edit	Navigates to the Crew Shift Template add/edit screen for the selected crew shift template. Make any desired changes and click Save . The system returns you to the Shift Weekly Template portal. To associate a break type with this template, click the Add link in the Break zone title. (When the template is applied and shifts are generated, the system creates breaks for the break types associated with the template.)
Duplicate	Makes a copy of the selected crew shift template. and then navigates to the add/edit screen for the copy. Make any desired changes to the copy and click Save . The system returns you to the Shift Weekly Template portal.
Delete	Deletes the selected crew shift template. You will be prompted to confirm the deletion.
Go To	Navigates to the Crew Shift Template portal. From there you can view the template details or use the buttons in the Actions zone to edit, duplicate, or delete the template. When you are done, return to the Shift Weekly Template portal.

Reviewing Shifts To Be Generated

Use the **Review** tab on the **Shift Weekly Template** portal to review the shifts that would be generated if the current template is applied.

The **Shift Weekly Template Preview Calendar** zone displays the shift weekly template calendar for the current month based on the changes you have made but not yet applied.

- Use the scroll buttons to view the previous or next month's calendar.
- Click the **Broadcast** button next to a shift to display its shift details in the **Crew Shift Preview** zone.

You cannot make changes from this tab. To make any changes, return to the **Main** tab.

Working with Common Weekly Templates

This section describes common tasks related to working with common weekly templates.

Subscribing Crews to a Common Shift Weekly Template

Use this procedure to subscribe crews to a common shift weekly template.

Prerequisites: Common shift weekly template, crew, shift type, service classes, break types, mobile workers, vehicles, service areas, and logon/off locations must have been previously defined.

1. Select **Main Menu > Resource Management > Shift Weekly Template** .

Alternately, you can select **Shift Weekly Template+** and create a new **Subscription Shift Weekly Template** to subscribe one crew at a time.

2. Search for and select the appropriate common weekly template.
3. In the **New Subscriptions** zone, select a crew or multiple crews.
4. Click **Subscribe**.

5. Enter the **Effective Date** and **Expiration Date** for the subscription.

6. Click **OK**.

The system lists the crew shift in the **Subscriptions** zone with options to process the subscription now, unsubscribe, or change the dates of the subscription.

7. Click **Process Now** next to each crew for which you want to immediately generate shifts for this crew.

If you do not click **Process Now**, the crew shifts are automatically generated next time the shift generation batch processing is scheduled to run.

Unsubscribing Crews from a Common Shift Template

Use this procedure to remove crews from a common shift weekly template.

1. Select **Main Menu > Resource Management > Shift Weekly Template** .

2. Search for and select the appropriate Common Weekly Template.

3. In the **Subscriptions** zone, select a crew or multiple crews.

4. Click **Unsubscribe**.

The selected crews are removed from the **Subscribed** list.

5. Click **Process Now** next to each crew for which you want to immediately delete all future shifts that may have been generated by the subscription.

If you do not click **Process Now**, the crew shifts are automatically deleted next time the shift generation batch processing is scheduled to run.

Changing Subscription Effective Period

Use this procedure to change the effective period on crew subscriptions to common templates.

Prerequisites: Common template must be created.

1. Select **Main Menu > Resource Management > Shift Weekly Template** .

2. Search for and select the appropriate common weekly template.

3. Select the subscription you want to change in the **Subscriptions** zone.

4. Click **Change Dates**.

5. Enter the new **Effective Date** and **Expiration Date** for the subscription.

6. Click **OK**.

The system lists the crew shift in the **Subscriptions** zone with options to process the subscription now, unsubscribe, or change the dates of the subscription.

7. Click **Process Now** next to each crew for which you want to immediately generate shifts for this crew.

If you do not click **Process Now**, the dates are automatically updated the next time the shift generation batch processing is scheduled to run.

Working with Breaks

This section describes common tasks related to working with breaks.

Adding Breaks to Crew Shifts

You can add breaks to existing crew shifts.

Prerequisites: The crew shift must have been previously defined. (If you are creating a new crew shift, you must save the crew shift and then add breaks.) The break type must have been previously defined.

1. Navigate to the **Crew Shift** portal in edit mode.
2. Click the **Add** link in the **Breaks/Non Productive Tasks** zone title.
3. Select the break type and click **OK**.
4. Enter the start time for the break.
5. Click **Save**.

Viewing and Editing Break Tasks for a Specific Crew Shift

Use this procedure to view break tasks associated with a particular crew shift and edit the window start date and time for a break. (This is the only field you can edit.)

1. Navigate to the crew shift for which you want to view or edit breaks.
All breaks defined for this crew shift are listed in the **Breaks** zone. You can also view scheduled breaks on the **Schedule** tab and on the **CDI Scheduling Gantt**.
2. Click the break in the **Breaks** zone.
3. Click **Edit**.
4. Enter the desired start date and time for the break window and click **Save**.

Break Actions

Use this procedure to start, complete or cancel a scheduled break.

Prerequisites: To start a break, it must have been dispatched to the crew and the previous task must have been finalized. To complete a break, it must have been started.

1. Navigate to the **Break Task** maintenance portal in any of the following ways.
 - From the **Scheduling Gantt** in the **CDI** portal, right-click the break and select **View Details** from the pop-up menu.
 - Select **Main Menu > Service Management > Crew Shift** and search for the crew shift to which the POU is scheduled. On the **Crew Shift** portal, click the **Schedule** tab and then click the **Break** link in the **Scheduled Tasks** zone. You can also click the break in the **Crew Shift Schedule Gantt** and then select **View Details** from the pop-up menu.
2. Click the appropriate button in the **Actions** zone.

Action Button	Description
Start	Indicates that the crew is starting the break.
Complete	Indicates that the crew has completed the break and is ready for the next assignment.
Cancel	Indicates the crew is not going to take the break. This action cancels the break task and removes it from the crew shift schedule.

Working with Non Productive Tasks

This section describes common tasks related to working with non productive tasks.

Adding NPTs to Crew Shifts

You can add non productive tasks to existing crew shifts.

Prerequisites: The crew shift must have been previously defined. (If you are creating a new crew shift, you must save the crew shift and then add non productive tasks.) The non productive task type must have been previously defined.

1. Navigate to the **Crew Shift** portal in edit mode.
2. Click the **Add** link in the **Breaks/Non Productive Tasks** zone title.
3. Select a non productive task type and click **OK**
4. Enter the offset or window start time.

These values determine the earliest time that the non-productive task can be scheduled to start after the start of the shift.

5. Select the location or specify address as applicable where the non productive task will occur. If not specified location is defaulted from the shift's crew if any.
6. Click **Save**.

Viewing and Editing NPT Tasks for a Specific Crew Shift

Use this procedure to view non productive task tasks associated with a particular crew shift and edit the window start date and time for a non productive task. (This is the only field you can edit.)

1. Navigate to the crew shift for which you want to view or edit non productive tasks. All non productive tasks defined for this crew shift are listed in the **Breaks/Non Productive Tasks** zone. You can also view scheduled non productive tasks on the **Schedule** tab and on the **CDI Scheduling Gantt**.

Note: Since they represent a type of period of unavailability, NPTs are displayed on the map using the same generic POU icon. A POU is resource oriented and fixed in time whereas NPT is shift related and is offset based. However they they both mark time not available to perform work and therefore use same icon.

2. Click the non productive task in the **Breaks/Non Productive Tasks** zone.
3. Click **Edit**.
4. Enter the desired offset or start date and time and location for the non productive task window. Adjust the address details as needed.
5. Click **Save**.

Non Productive Task Tasks

Use this procedure to start, complete or cancel a scheduled non productive task.

Prerequisites: To start a non productive task, it must have been dispatched to the crew and the previous task must have been finalized. To complete a non productive task, it must have been started.

1. Navigate to the **Non Productive Task** maintenance portal in any of the following ways
 - From the **Scheduling Gantt** in the **CDI** portal, right-click the non productive task and select **View Details** from the pop-up menu
 - Select **Main Menu > Service Management > Crew Shift** and search for the crew shift to which the NPT is scheduled.
 - On the **Crew Shift** portal, click the **Schedule** tab and then click the **non productive task** link in the **Scheduled Tasks** zone. You can also click the non productive task in the **Crew Shift Schedule Gantt** and then select **View Details** from the pop-up menu.
2. Click the appropriate button in the **Actions** zone.

Action Button	Description
Start	Indicates that the crew is starting the NPT.
Complete	Indicates that the crew has completed the NPT and is ready for the next assignment.
Cancel	Indicates the crew is not going to take the NPT. This action cancels the NPT task and removes it from the crew shift schedule.

Working with Periods of Unavailability

This section describes common tasks related to working with periods of unavailability (POUs).

Creating Periods of Unavailability (POUs)

Use this procedure to create a recurring or non-recurring period of unavailability.

Prerequisites: The POU type must have been previously defined.

1. Select **Main Menu > Service Management > Period of Unavailability+** .

If your system supports more than one period of unavailability type, the system prompts you to select a type before continuing.

2. If the selected POU type supports recurring POUs, indicate whether or not this POU is recurring.

For example, if you are creating a POU for a regular weekly meeting, check the **Recurring** checkbox. If you are creating a POU for a one-time event, leave the box unchecked.

If you select Recurring, the system displays the **Period of Unavailability Template** screen; otherwise, the system displays the **Period of Unavailability** screen.

3. Complete the fields in the **Main** and **Address** sections.

For template POUs, specify how often the POU occurs (every so many weeks) or the total number of occurrences of the POU within the effective period. (You cannot specify both.) For non-recurring POUs, these fields are not displayed.

4. Add the resources to which this POU applies.

The POU type defines which class of resource can be associated with this POU.

5. Add all service areas to which this POU applies.

This is applicable to crew POU's only (that is, POU's for which the resource class is defined as Crew). Service areas selections are used to discourage the inclusion of this POU into a crew's shift schedule if the crew is working too far from the event that day. If you specify service areas, the scheduler will include the POU only in the schedule of crews covering these areas at the time of the event. If you do not specify any service areas, the POU applies to all service areas.

6. Click **Save**.

Period of Unavailability (POU) Search

Use this procedure to filter and search for an activity POU.

1. Select **Main Menu > Service Management > Period of Unavailability** .

2. From the **Period of Unavailability Query** zone, enter your search criteria and click **Refresh**.

You can search by any combination of scheduled by POU type, start date/time, resource class or ID, or POU location. If you enter multiple criteria, the system will search for POU's that match all search criteria.

3. In the search results list, click a POU to display the **Period of Unavailability** portal.

Maintaining POU's and POU Templates

Use this procedure to view or edit POU's and POU templates.

1. Select **Main Menu > Service Management > Period of Unavailability** .

2. Search for and select the POU you want to maintain.

To maintain a POU, click the link in the **Period of Unavailability** column. To maintain a POU template, click the link in the **Generated by Template** column.

3. Use the buttons in the **Actions** zone to update the object. The buttons that appear may vary depending on the POU's current status and your system's configuration. Standard action buttons are described below:

Action	Description
Cancel	Applies only to POU's (not POU templates). This action cancels the POU and any associated non-cancelled POU tasks generated from this POU. You cannot cancel a POU if any of its corresponding POU tasks are completed.
Delete	Deletes the POU or POU template. If you delete a POU template, the system deletes all POU's generated from it. If you delete a POU, the system deletes all its POU tasks, if any.
Expire	Only applies to POU templates. This action sets the expiration date for a POU template to the current date and sets the status to expired. POU's will no longer be generated from this template. All future POU's that were generated from this template after the expiration date will be deleted.
Activate	Only applies to POU templates. This action sets the status for an expired POU template to Active and sets the effective date to the current date. Once the POU is activated, the system will generate POU's from the template automatically, based on its effective date and your system's planning horizon.

4. Click **Save**.

The system validates the action and displays an error if validation fails.

Viewing Overridden POU

An overridden POU is one that has been modified manually and no longer matches the template from which it was generated. The **Overridden POU**s zone on the **Period of Unavailability Template** portal displays a list of all overridden POU for the current template. If you apply the template, these POU will be deleted and regenerated, and any manual overrides will be lost.

To view details for an overridden POU, click the shift link in the **Overridden POU**s zone.

Adding or Removing Resources to Existing POU or POU Templates

Use the **Resource Search** zone on the **Period of Availability** portal to add or remove resources to an existing POU. The class of resources (mobile worker, vehicle, crew, etc.) that you can add is determined by the POU type.

The **Resource Search** zone displays a list of resources of the class specified for this POU type. You can add or remove resources from this list using the **Add/Remove** buttons. You can also search for additional resources using the search zone, and then add resources from the search results. You can also edit the POU and manipulate the resource list from here.

Working with Resource Route Replay

This section describes common tasks related to working with resource route replay.

Using Resource Route Replay

Follow these steps to use Resource Route Replay to monitor crew shift routes.

1. Select **Main Menu > Resource Management > Resource Route Replay** .
2. Search for and broadcast the appropriate crews and/or vehicles.
If you want to see routes for multiple resources, select the **Broadcast** button for all of the resources you want to see. You can select up to 12 crews/vehicles.
3. Fill in **Date** fields and click the **Show on Map** button.
The route of the resource you selected is shown on the map for the selected date range. If you selected multiple resources, each is shown in a different color on the map.

Working with Dispatchers

This section describes common tasks related to working with dispatcher records.

Creating Dispatchers

Use this procedure to create a dispatcher record.

Prerequisites: Dispatcher type, dispatch areas, key performance indicators must have been previously defined.

1. Select **Main Menu > Resource Management > Dispatcher+** .

2. Select the dispatcher type and click **OK**.
3. Complete the fields in the **Main**.
4. Add all dispatch areas. This dispatcher is allowed to monitor during their dispatcher shifts. (The dispatcher can select from this list when they log on to a shift.)
5. Add all key performance indicators this dispatcher can monitor during their dispatcher shifts.
6. Click **Save**.

Dispatcher Search

Use this procedure to filter and search for dispatcher records.

1. Select **Main Menu > Service Management > Dispatcher**.
2. From the **Dispatcher Query** zone, enter your search criteria and click **Refresh**.
You can search by first name and/or last name.
3. Click a dispatcher in the search results to navigate to the **Dispatcher** portal.

Maintaining Dispatchers

Use this procedure to edit, delete, duplicate or activate/deactivate an existing dispatcher record.

1. Select **Main Menu > Service Management > Dispatcher**.
2. Search for and select the dispatcher record you want to maintain.
3. Use the buttons in the **Actions** zone to perform the desired action.
4. Click **Save**.

Working with Dispatcher Shifts

This section describes common tasks related to working with dispatcher shifts.

Logging on to Start a Dispatcher Shift

Use this procedure to log on to start a dispatcher shift.

You do not need to create a dispatcher shift in advance. The system creates a new dispatcher shift automatically when an authorized dispatcher logs on to the system from the **CDI** portal.

1. Select **Main Menu > Service Management > CDI**.
If you are already logged on to a dispatcher shift, the **CDI** portal is displayed and is populated with data you are responsible for monitoring during the current shift. Otherwise, the **Logon** button is displayed.
2. Click the **Logon** button.
3. Specify the settings to use for this shift, such as the date range for monitoring activities. The available settings may vary depending on your dispatcher profile.
4. Select which dispatch areas you want to monitor.

The list of dispatch areas from which you can choose is predefined; you can only select dispatch areas you are authorized to monitor, based on your dispatcher profile. For each shift you work, you can select one, some, or all of these dispatch areas.

5. Click **Save** .

The system logs you on to the shift and displays the **CDI** tab for the current shift. You can now begin monitoring and managing tasks and crew shifts.

Dispatcher Shift Search

Use this procedure to filter and search for dispatcher shifts.

1. Select **Main Menu > Service Management > Dispatcher Shift** .
2. If prompted, select the dispatcher shift business object and click **OK**.
3. Enter your search criteria.
You can search by dispatcher and/or logged on date.
4. Click **Refresh**.
5. In the search results list, click the link for the dispatcher shift you want to view or edit.

Maintaining Dispatcher Shifts

Dispatchers can manage their current dispatcher shift directly from the **CDI** portal. Other authorized users can view and manage dispatcher shifts starting from the main menu.

If a dispatcher shift's status is Logged On, you can edit the shift details or change the status to Logged Off. If the status is Logged Off, you cannot modify the shift or its status.

1. To access the **Dispatch Shift** portal, do one of the following:
 - Select **Main Menu > Service Management > Dispatcher Shift** , then search for and select the dispatcher shift you want to maintain.
 - From the **CDI** portal, click the **Shift** tab.
2. Use the buttons in the **Actions** zone to modify the shift:
 - Click **Edit** to edit the shift details, including the dispatcher areas to monitor during this shift. Enter your changes and click **Save** .
 - Click **Log Off** to change the status of this shift to logged off.

Service Management

This section describes concepts and procedures related to viewing and maintaining activities, tasks, alerts, override time windows, and remote messages.

Understanding Service Management

This section describes concepts related to service management.

About Activities

An activity is a task performed at a particular geographic location. Activities can be received from a host system or created in the base application. Each activity belongs to an activity type that identifies the skills and equipment required to work activities of that type and specifies how the activities should be dispatched, prioritized, and scheduled.

Activity Details

An activity must specify the site address, which is the address of the actual entrance to the site of service. This may be different than the service address, where the work is performed. The scheduler uses the site address to optimize schedules and routes, and attempts to assign activities at the same site to the same crew. Depending on your system's configuration, valid geo-coordinates may be required for the site address.

An activity must specify at least one time window during which the activity should be scheduled. If the activity is an appointment, it specifies the time during which the appointment should be scheduled.

An activity must also provide customer contact information. Other requirements may exist, depending on your system's configuration.

Activity Work Flow

When an activity is received from the host (or created on the server), it is validated by the system. If critical errors are found, the activity is rejected or, if created locally, the activity will not be saved until the errors are corrected. If errors are found that can be corrected within Oracle Real-Time Scheduler, the activity is saved in an Issues Detected state. Once the issues are corrected, the activity will be available for scheduling.

Activities are typically assigned automatically to crew shifts by the scheduler. However, a dispatcher or other authorized user can override virtually any scheduling decisions made by the system, as long as it permitted by your system's configuration.

The scheduler carefully matches the location, required skills, and scheduling time window of each activity to the location, capabilities, and availability of crews. Some activities have appointments, indicating that the activity must be scheduled within an agreed-upon appointment period.

Until it is time to dispatch an activity, the scheduler may change the assigned crew several times to find a more optimal assignment. However, some types of work require that the crew assignment is stabilized some time before the shift starts. In these cases the activity type is configured so that these activities are allocated to the crew at some time before the start of the shift.

A dispatcher or other authorized user can override virtually any scheduling decisions made by the system, as long as the change is allowed according to configuration settings.

Before a crew starts their shift, they may preview their first few tasks for the day. The maximum number of tasks to preview is defined on their shift. This is only available to MDT crews. Previewed tasks may be viewed, but no modifications are allowed.

When a crew starts their shift, they receive one or more of their scheduled tasks as per their shift drip mode configuration.

As the crew works each assignment, they update its status (from en route to on site, for example). The crew can also adjust the scheduled duration of an activity, from the field, if the activity takes much more or much less time than what was estimated. This type of update is sent back to the server so that the scheduler can adjust the crew's schedule accordingly.

If the crew captures digital content while in the field, it is sent to the server as an attachment of the activity which can be viewed in the **Attachment** zone of the **Activity** portal.

When the crew is finished working and they enter completion details, they update the status to completed. The crew may also provide interim completion details and send them right away to the server even before fully completing the assignment.

Completion details are then sent back to the requesting host system.

Creating Activities In The Field

Crews have the ability to create new activities which may or may not be related to any existing activity on their schedule. This is useful when the crew is out in the field and come across an issue. The crew can choose to work the activity or send it in to the server to have it assigned to a crew.

Emergency Activities

Emergency activities must be scheduled as soon as possible, as such they must be sent to the scheduler as mandatory. Typically, such activities would be of an emergency activity type properly referencing a mandatory priority profile. If a situation arises where an activity's state is changed to become an emergency, the system ignores the parameters set on the activity type and sends the activity to the scheduler as mandatory. The scheduler then allocates crew shift resources for the emergency activity irrespective of cost.

Expired Activities

Typically, if an activity has not been worked by the time its last effective time window expires, the scheduler stops attempting to schedule it. Depending on your configuration and business practices, activities of certain types may be configured to handle the situation as follows:

- Incorporate built in automatic extensions so that the scheduler will continue to try and schedule expired activities beyond the original effective time window by a set number of days or hours.
- If automatic extension is not allowed or exhausted the activity could be automatically canceled
- If automatic extension is not allowed or exhausted create a To Do for a user to make the necessary changes. Business rules handling expired activities reside in a plug-in associated with the activity's business object and is therefore customizable.

Bound Work

A group of activities that have dependencies is referred to as "bound work". This includes jobs, chains, and assist activities. Please refer to the Bound Work section for more information.

Time Zones

The activity's time zone is the time zone of its geographic location, i.e where work needs to be performed. All date and time information on the activity and its assignment portals is entered and displayed in that time zone.

About Capabilities

A capability is a skill, equipment, or other attribute of a crew which makes the crew qualified to perform work. Typically, activities specify a list of capabilities that are required of any crew that will be scheduled to work the activity. The scheduler uses required capabilities along with location, and the scheduling time window of each activity to the current location, and availability of crews to determine which crew shift can perform the work.

An activity's required capabilities are typically defined on the activity type. In some instances it is necessary to specify the list of required skills and equipment at the activity level. Specifying the capabilities on the activity overrides those specified on the activity type. For example, if a business is installing thousands of products, yet the skills and equipment needed to install product A is different from the skill needed to install product B. Rather than having to separate these products into different installation activity types, it would be efficient to simply define a generic "Install Product" activity type and specify the capabilities needed to install the specific product on the individual activity.

The **Crew Shift** and **Crew Shift Template** portals include a **Capabilities** tab which lists all capabilities currently allocated to a shift via its resources. This includes all distinct skills for allocated mobile workers and all distinct equipment for allocated vehicles.

About Assignments

An assignment is a copy of an activity created by the system to track the assigned crew's progress in accomplishing the work. When the crew's shift has started, assignments are created by the system on the server and sent to the mobile device. An assignment is created on the mobile device only created when the crew's shift has already started. Assignments are sent to the crew as a copy of the activity. The crew works on the copy and any updates made by them are updated on the activity.

If the crew uses an MDT, the assignment is also sent to the crew when the activity is dispatched and appears on the crew's task list.

As the crew works each task, they update the assignment's status. When they are finished working, they enter completions details and update the status to completed. When the assignment is completed by the crew, the associated activity is automatically completed on the server, unless concurrent assignments exist.

Typically, an activity is completed by the assigned crew. However, if the assigned crew does not complete the activity by the end of their shift, the assignment is automatically returned and the activity is rescheduled.

A dispatcher can update a crew's assignment if the crew is out of range or is not using an MDT.

The dispatcher or crew can also decline an assignment if the crew is unable to complete it for some reason. If an activity is declined because there is a capability mismatch or a missing capability, To-Do is created and assigned to the dispatcher. A declined activity cannot be rescheduled to the crew's current shift.

About Resource Restriction

The system includes functionality which allows restrictions to be applied as to which resources are allowed to work an activity. In general, these restrictions come from the host system then the dispatcher can unassign work from shifts or crews can decline taking on activities.

Allowed Crews

Typically, the host system specifies a list of possible crews as candidates to work an activity. However, the dispatcher can also make this designation. When specified, the scheduler selects only from this list, still considering all the usual service area and skill restrictions, when determining candidates to work the activity.

Excluded Shift

If a crew cannot work an activity, the crew or the dispatcher can decline the activity and enter a reason code. A declined activity cannot be rescheduled to the crew's current shift.

Base package reason codes include:

- Crew cannot reach the activity today.
- Crew does not have the capability to work the activity. The crew would also be required to enter free-form comments to explain the capability mismatch. A to do is created for an administrative user to update the resource's capabilities to reflect actual capabilities. This would ensure future activities of this type would not be assigned to the crew.

A dispatcher may unassign an activity from its current shift with the intention to reschedule it to another shift. This would also cause the current shift to be excluded on the activity.

This is managed in the Resource Restrictions section of the Activity.

About Bound Work

A group of activities that have dependencies is referred to as "bound work". This includes jobs, chains, and assist activities. This section describes the various types of bound work and the dependencies created when activities are tied to each other.

Jobs

A Job is a group of activities that need to be performed by a single crew during a single shift. Because of that functions performed on any activity that belongs to a job that may cause it to be rescheduled from its currently assigned shift affect the entire job. Examples include:

- Allocation to a shift
- unassigning from current shift
- deferring the schedule
- locking to depot
- booking
- rebooking

Similarly, If there is any scheduling issue for one activity on a job, all of the activities are disabled from scheduling until the issue is resolved. After resolution, all of the activities are rescheduled automatically by the scheduler.

The order in which the activities in a job should be performed is established as usual by their time windows. A scheduling order number may be specified to achieve a more explicit order. Notice that ordering should not contradict the time windows ordering.

The CDI provides a visual cue to indicate that an activity is part of a job and therefore has dependencies. This helps the dispatcher to be able to easily see how each activity is related.

In the **Activity** portal, if the activity belongs to a job, the **Job** zone lists all activities in the job in the order they should be performed, highlighting the current activity in that list.

The base product supports the interface of jobs from the host system. It does not provide means to compose such jobs in the application itself.

Chains

A chain represents linked activities where each activity is dependent upon the start or completion of another activity with dependency defined in terms of timing and assigned resource. Chains differ from jobs in that the activities and are not bound to a specific shift, they are bound in time and can span multiple shifts. They are set up so that each activity depends upon the completion of the prior activity before it can start. In some cases the activity must be done within a certain amount of time after the completion of the prior activity and/or within a specified time window. For example, if there is a project to dig a trench, lay pipes, and fill the trench, chain might be set up as follows:

- A surveyor is scheduled to lay out the plan before the start of work
- Only after the surveyor is finished can the digging begin
- The pipes cannot be laid out until the trench is complete
- The trench cannot be filled until the pipe is laid
- and so on

A dependent activity can start within an offset range relative to the start or finish time of the parent activity. An activity can also be restricted so that it can only be worked by a crew other than its immediate parent activity or by a crew other than any of those assigned to activities in the entire chain.

The CDI provides a visual cue to indicate that an activity is part of a chain and therefore has dependencies. The user can then navigate to the special **Activity Dependency** portal for an overview of the entire project to which the current activity belongs. The portal provides a schematic view of the dependency hierarchy as well as a Gantt view of the scheduled activity in the chain supporting the main activity related dispatcher functions enabled on the main **CDI** portal.

If an activity belongs to a chain you can also navigate to the **Activity Dependency** portal from the Dependencies section of the **Activity** portal.

The following considerations apply for chains:

- An activity can only be immediately dependent on one other activity.
- A circular dependency is not supported, i.e. the an activity cannot be dependent on itself even indirectly . (Example: A->B->C->A)
- Appointment booking, conditional booking and chooser request can only be used for an activity in a chain if the activity does not have any other activities dependent on it.
- The time windows for a dependent activity must be wide enough to support its timing dependency constraints, including offsets, with its parent activity. This has to take into account potential early or later start of the parent activity. For example, assume activity B is scheduled to start an hour after activity A starts. Since activity A may start earlier than planned by more than one hour, activity B should be defined with time windows wide enough to accommodate a reasonable early start of activity A. In other words that applying an offset towards the actual start of activity A would still be within the time window for activity B.
-

If the scheduler finds conflicts because these considerations have not been followed, the whole chain (non-started part of it) is disabled and not scheduled.

The base product supports the interface of chain dependencies from the host system. It does not provide a means to manually compose such chains in the application itself, with the exception of assist activities.

Assist Activities

When a crew is unable to complete an activity and requires additional help from another crew, the dispatcher can create an assist activity and have it dispatched to another crew. The assist activity must be scheduled at the same time as the original activity so that both crews are on site at the same time. In addition it must be scheduled to a crew other than the original activity's crew. The original and assist activities are an example of a small chain dependency.

The scheduler will attempt to assign the assist activity to a suitable crew. However the dispatcher can also manually allocated it to any specific crew as needed. To do that the dispatcher could take advantage of the shift chooser query option which consults the scheduler for a cost based recommended list of shifts to choose from.

It is recommended to set up the assist activity to require manual acknowledgment by the assisting crew. This serves as notification that they are aware of the fact that they have been assigned to assist another crew.

Only specific activity types, as determined by configuration settings, can be created as assist activities.

About Concurrent Assignments

If multiple assignments exist for the same activity, they are referred to as concurrent assignments.

Typically, only one crew is assigned to work an activity at any point in time. However, it is possible that multiple assignments could be created for the same activity if, for example, an activity has already been dispatched to a crew and the dispatcher needs to assign it to a different crew.

When the dispatcher allocates an already dispatched activity to another crew, the system warns the dispatcher that this action would result in a forced recall. If the dispatcher confirms the action, the system sends a recall message to the current crew and proceeds with allocating the activity to the other crew. If recall succeeds, the assignment is returned and no concurrent assignments exist. If the recall is not possible because, for example, the assignment is already completed, then the assignment is not returned on the device and concurrent assignments now exist.

Although the dispatcher will typically contact the crew by phone or radio to make sure they do not perform work for a recalled assignment, it is possible that both assignments could be completed. For example, the first crew might arrive at the location, see that the work was already done, and then complete their assignment with no work details.

If the system receives two finalized assignments for the same activity, the status of the activity changes to Collision Detected and a To Do entry is raised. The dispatcher (or who ever is assigned to resolve such issues) must review the assignments and choose which one to use to complete the activity.

About Forced Recall

If a dispatcher attempts to take certain actions on an activity that is already dispatched to a crew, the system allows the user to proceed with the action and forcibly recall the activity from the crew. Forced recall applies to actions such as defer, allocate, and unassign.

For example, if a dispatcher allocates an already dispatched activity to another crew, the system warns that this action would result in a forced recall. If the dispatcher confirms the action, the system sends a recall message to the current crew and proceeds with allocating the activity to the other crew.

When the recall message is received on a crew's MDT device, the system determines whether the assignment is in a state that allows it to be recalled.

- If recall is possible, the assignment is returned on the device, removed from the crew's task list, and then returned on the server.
- If the recall is not possible because, for example, the assignment is already completed, then the assignment is not returned on the device and remains completed. This also means that the assignment is not returned on the server, so concurrent assignments now exist for the activity.
To avoid this situation, the dispatcher will typically contact the crew by phone or radio to make sure they do not perform the work. However, it is possible that both assignments could be completed. (For example, the first crew might arrive at the location, see that the work was already done, and then complete their assignment with no work details).

When an SMS crew receives a recall, they can either ignore it (if it's too late to recall, for example) or confirm the recall by sending a recall confirmation message back to the server. The recall message causes the assignment to be returned.

For a non-MDT crew, there is no method of confirming a recall. The system assumes that the dispatcher has contacted the crew and confirmed the recall verbally. The system does not wait for confirmation to return the assignment of a non-MDT crew.

About Activity-Related Time Windows

This section describes the different time windows related to activities:

- **Effective Time Window (ETW):** The time period within which an activity can be scheduled. This is typically sent from the host.
- **Preferred Time Window (PTW):** The time period within which it is ideal to schedule an activity. This is typically sent from the host.
- **Arrival Time Window (ATW):** A period of time within an activity's effective time window during which the activity is allowed to be scheduled, based on applicable rules, restrictions, or conditions.
- **Service Time Window (STW):** A period of time within an activity's arrival time window during which it is preferable to schedule the activity.
- **Override Time Window (OTW):** A period of time during which the default arrival time window for activities of a particular type is overridden.

The system uses time windows in the scheduling process in the following ways:

- Typically, an activity's effective time windows and preferred time windows are sent from the host and establish the broadest scheduling window.
- Since some types of work may be restricted to certain times, each activity's effective time window is further broken down to one or more arrival time windows, representing a time period when the activity is allowed to be scheduled based on applicable restrictions.

Override time windows and public holidays can both be used to define such restrictions. If at least one of an activity's effective time windows overlaps with an override time window defined for the activity type, then the scheduling restrictions defined in the override time window are applied to the activity.

Note: The logic to calculate an activity's arrival and service time windows is defined in the activity business object's Update Time Windows plug-in, and is therefore customizable.

- The scheduler will honor an override as long as the activity has not been dispatched yet. If dispatching has not occurred, it will not schedule the activity to start or complete within an override time window. The activity may be scheduled late, but only as far as it does not overlap with an override time window.
- Dispatched activities that overlap with an override require manual intervention. The system provides a KPI algorithm to report these so that a dispatcher can recall them as needed.
- The arrival time windows are further broken down to one or more service time windows, representing the overlap between an arrival time window and a preferred time window.

The scheduler only considers an activity's arrival time window and service time window.

About Override Time Windows

An Override Time Window defines a period of time during which activities of a particular type are allowed or not allowed to be scheduled, overriding the default arrival time window for the activity itself. The override may be further restricted to activities within specific service areas.

For example, you might prohibit disconnects to be performed during certain periods of time.

When you define an override time window, you specify the time period during which the override applies, the service areas to which it applies (if you do not specify any, then it applies to all), and whether the activity type is allowed or not allowed during the override period.

The override is applied to all activities for which at least one their effective time windows overlaps with this override time window. Consider this example:

- Due to a backlog in repair and installation work, you want to limit the number of routine inspections performed for the next week.
- You create an override window that disallows inspection activities in all service areas between Monday at 8 am through Wednesday at 5 pm of the following week.
- An activity is received from the host for an inspection. Its effective time windows are Monday through Friday between 9 am and 2 pm on each day. The arrival time window is Monday through Friday between 9 am and 2 pm.
- When the override is applied, the activity is eligible to be scheduled only on Thursday or Friday between 9 am and 2 pm.

You can also use override time windows to allow an activity type to be scheduled during a holiday when it would otherwise not be allowed.

About Field-Referenced Activities (FRAs)

If the system is unable to dispatch an assignment to a crew (typically due to poor connectivity), the dispatcher can contact the crew and verbally communicate the key details of the activity. The crew can create a field-referenced activity (FRA) on their MDT. The crew uses the FRA to record status updates and completion details.

The procedure works as follows:

1. The dispatcher receives an alert when the synchronization of an assignment to the crew's mobile device takes too long or fails.
2. The dispatcher clicks the **Voice** button on the Alert Queue. The system updates the status of the assignment to Dispatched and sets the status reason to Voiced. This action also cancels any further attempts to send the assignment to the crew, so the assignment won't exist twice on the device once the FRA is created.
3. The system navigates to the **Activity** portal and displays a message instructing the dispatcher to voice-dispatch the activity to the specified crew. To simplify the voice-dispatch, the system generates a relatively short alternate ID for the crew to use when creating the FRA.
4. The dispatcher communicates the information to the crew (typically via phone), and the crew creates a field-referenced activity (FRA) on the MDT using the alternate ID.
5. The crew works the FRA, updating its status as work progresses through completion, just like any other assignment.
6. When the crew's connectivity is reestablished, the system automatically matches the FRA to the corresponding activity using the alternate ID.

About Alerts

An alert is a situation in which predefined condition(s) have been met that require user intervention. An alert is always related to either an activity or a shift that caused the condition.

The alert type defines the attributes and behavior associated with all alerts of that type, including:

- how the alert is raised
- how the system determines if the underlying issue has been resolved and the alert can be closed
- the threshold which causes the alert to trigger, such as the number of minutes the crew has to acknowledge an emergency alert before the alert triggers.
- how long before the alert expires (closes automatically after a period of time) or is recycled (is directed to another dispatcher if not acknowledged after a period of time)
- whether or not it can be closed manually
- whether the snooze feature is enabled for the alert and, if enabled, the length of the snooze period (snoozing removes an alert from the queue for a period of time and then re-issues it when the snooze period expires)
- e-mail address to be notified when alerts of this type cannot be assigned to a dispatcher
- whether or not the alert makes a sound when appears on the dispatcher's alert queue to help get the attention of the dispatcher (note: when the alert is displayed elsewhere, such as on the **Alert** portal, it does not make a sound, only on the alert queue)

When an alert is raised, it appears on the Alert Queue of the dispatcher assigned to the alert. (If no logged on dispatcher is found, an email is sent to the address defined on the alert type.) From the Alert Queue, users can take action on the alert (acknowledge or close it, for example) and can also navigate to the maintenance portal of the related shift or activity.

You can also manage alerts directly from the **Alert** maintenance portal.

Below are some examples of typical alerts:

- **Missed appointment alerts** are generated when an appointment has been missed.
- **Unacknowledged emergency alerts** are generated when a crew does not acknowledge an emergency alert within a specified period of time.
- **Crew Idle Alerts** are generated when the crew shift is idle for a specified period of time of time.
- **Synchronization Alerts** are generated when the crew does not receive a dispatched activity's assignment from the server within a specified period of time. The dispatcher can choose to cancel the synchronization process and voice the assignment details to the crew.
- **Cancel Activity Alert** is generated on an attempt, typically initiated by the host system, to cancel an activity that has been dispatched to the crew. This alert supports a special Force Cancel action that cancels the activity and closes the alert
- **Crew On Site For Too Long Alerts** are generated when the crew has been on site for "x" minutes since the estimated completion time.
- **Panic Alerts** are generated when a crew in distress presses the **Panic** button on their mobile device. These alerts are immediately assigned to an available dispatcher and should be given attention right away. If the mobile device has the capability, the alert is sent with the GPS location of the crew at the time that the panic alert was issued to better locate the crew on the map.
- **Timed Event** alerts are generated when a crew has created an event with an expiration date to indicate that the dispatcher should check on them if the event expires. This is used if the crew feels they may be in a dangerous or hazardous situation and would like higher visibility from the dispatcher. The alert only becomes in effect and shows up on a dispatcher's alert queue once expired. If the crew manages to close the event before it has expired the alert is closed and does not appear on any dispatcher's alert queue.

How Alerts are Generated

An alert is associated with an alert type, which defines the behavior of alerts of that type. Each alert type represents a unique business condition to be checked and establishes a threshold used to generate alerts of this type.

For example, your system might generate an alert if an emergency activity is not acknowledged by a crew within 5 minutes.

Most alerts are generated when a monitoring process determines that the conditions for the alert have been met. For critical conditions, such as gas leaks or downed power lines, alerts can be generated in advance and set to become effective some number of minutes in the future.

How Alerts are Distributed

Alerts are distributed to users based on a set of business rules.

Note: This topic describes the alert distribution rules configured for the base system. These rules can be customized during implementation to meet your organization's business requirements.

The system directs each alert to the most appropriate user currently available based on the following priority order:

1. A logged-on dispatcher who is currently monitoring a dispatch area covering the shift or activity related to the alert*
2. A logged-on dispatcher who is eligible to monitor a dispatch area covering the shift or activity related to the alert*
3. Any logged-on dispatcher*
4. If no logged-on dispatcher is found, an alert is issued to a supervisor, typically via email (using the email address specified in the alert type)

* If multiple dispatchers are eligible to receive the alert, the one with the least number of open alerts is preferred.

Alert Actions

The available actions for an alert vary depending on the alert type and its current state.

Common alert actions include the following:

- **Acknowledge:** Indicates that you have viewed the alert. If the Minutes to Snooze value for the alert type is greater than zero, the system removes the alert from the alert queue for this number of minutes and then reissues it. If an alert is not acknowledged within the time specified in the alert type, the system recycles it.
- **Close:** Closes the alert and removes it from the queue. This is only supported if the alert type supports Manual Close.
- **Voice:** For synchronization alerts only, this indicates that you want to voice-dispatch the activity. The system updates the activity status and then navigates to the **Activity** portal and displays a message instructing you how to voice-dispatch the activity.
- **Force Cancel:** Cancels the associated activity and removes the alert from the queue. This is only supported for Cancel Activity alerts.

About Remote Messages

Remote messages are used to transmit data from the crew in the field to the main application on the server. This data includes shift and task completion details as well as shift and task status updates.

Remote message processing ensures against data loss by saving or 'persisting' all data sent from the device so nothing is lost when the application closes or another user logs on to a new shift. This is important because devices may be shared by multiple mobile workers -- one crew may send data and then leave for the day, and another crew may use the same device on a subsequent shift.

Messages from the crew are received continually throughout the day. If message processing fails at any time, a To Do entry is created for a user to review and resolve the problem. You can view the XML content of any message, try to reprocess the message as is, or edit the message content and then reprocess.

Working with Activities

This section describes concepts and common tasks related to working with activities.

Creating Activities

Although activities are typically sent from the host, you can create new activities on the server to accommodate special situations.

Prerequisites: The activity type and service areas must have been previously defined. If your system is configured to generate task-based To Do entries, a To Do type must be associated with the activity type. Other prerequisites may apply, depending on your configuration.

1. Select **Main Menu > Service Management > Activity+** .
2. Select the activity type and click **OK**.
3. Provide the requested information in each section of the Activity add/edit screen.

You must provide a valid site address. The system will attempt to find the geocode coordinates from the address you provide. If it cannot, you may be required to enter the geocode coordinates, depending on your system configuration. You must also provide at least one effective time window. Additional fields may be required.

4. Click **Save**.

If any required information is missing or invalid, an error message is displayed at the top of the screen. You must correct these errors before the system can successfully save the activity.

If the activity is successfully saved and passes all validation, it is ready for scheduling.

If the system is able to successfully save the activity, but issues are detected that prevent it from being scheduled, the **Activity** portal is displayed and these issues are displayed at the top of the **Activity** zone. (A To Do entry is also created if issues are detected.) You must resolve these issues in order for the activity to be scheduled. To resolve the issues, edit and save the activity, then click the **Validate** button. If validation is successful, the detected issues are removed and the activity is ready for scheduling.

Creating Assist Activities

Use this procedure to create an activity for an alternate crew to provide assistance on an existing activity.

1. Open the **Activity** portal to the appropriate activity.

2. Click the **Assist** button.
3. Select an Activity Type for the assist activity and click **OK**.

The system creates the assist activity and navigates to the **Activity** portal so that you can add a note to the crew if needed.

You can either allow the scheduler to it to an available crew or you can manually allocate the activity to a specific crew.

If the original activity has already started, which is typical in assist situations, the scheduler would attempt to dispatch it right away. You may also manually dispatch the activity as needed.

Viewing Activity Dependencies

Activities that have been created as part of bound work such as assist activities, jobs or chains, are dependent upon other activities. There are different ways in which you can find out how an activity fits into a bound work structure or which other activities it is related to. Use the following methods to review activity dependencies:

1. Look for visual cues in the **CDI** for job or chain dependencies.
2. If an activity belongs to a job, you can view the entire job on the **Activity** portal.
3. If an activity belongs to a chain you can view the entire chain on the **Activity Dependency** portal which you can navigate to from **CDI** or **Activity** portal

Viewing Captured Content on an Activity

Use this procedure to review digital content that was captured on an MDT and synchronized to the server.

Prerequisites: Content must have already been captured on the device and synchronized to the server.

1. Select **Main > Service Management > Activity**
2. Search for and select the appropriate activity.
3. Select the attachment you want to open from the Attachment zone.

The attachment opens in the viewer needed to view the content. For example, if you are opening an image file, an image file viewer opens on your computer.

Activity Search

Use this procedure to filter and search for an existing activity.

1. Select **Main Menu > Service Management > Activity** .
2. From the **Activity Search** zone, select the Query Option to use.
3. Enter your search criteria and click **Refresh**.
4. In the search results list, click in the **Activity** column of the activity you want to work with. To view an assignment associated with this activity, click an assignment in the **Assignments History** zone.

Editing Activities

Use this procedure to edit the details of an existing activity.

Some fields may not be editable, based on the activity's current status and your system's configuration.

1. Navigate to the **Activity** portal and display the activity you want to edit.
2. Click the **Edit** button in the **Actions** zone.
3. Enter your changes and click **Save**.

If you change the address, the system recalculates the geocode coordinates.

If any errors are encountered while saving, the system displays the error messages at the top of the screen. You must resolve these errors before the changes can be saved.

If the activity is saved but issues are detected, the **Activity** portal is displayed and these issues are listed at the top of the **Activity** zone. You must resolve these issues in order for the activity. To resolve the issues, edit the activity to provide the necessary information, then click the **Validate** button.

Duplicating Activities

Use this procedure to create a new activity based on an existing one.

1. Navigate to the **Activity** portal and display the activity you want to duplicate.
2. In the **Actions** zone, click **Duplicate**.

A copy of the activity is created and displayed. The copy includes all fields from the original activity (except the activity ID).

3. Enter your changes and click **Save**.

The system saves the activity and assigns a new activity ID.

Validating Activities

If an activity has issues that prevent it from being scheduled, you must correct them and then validate the activity.

You can only validate an activity if the system has detected issues.

1. Navigate to the **Activity** portal and display the activity you want to validate.
2. If you have not already corrected the condition causing the issues, do so now. (Click the **Edit** button in the **Actions** zone, then edit the activity details and save. Upon successful save, you are returned to the Activity portal.)
3. Click the **Validate** button in the **Actions** zone.

The system will attempt to validate the activity. If validation succeeds, its status is updated and the activity is ready for scheduling. If the system still detects issues with the activity, the issues are displayed for your review. Repeat this process to resolve the issues and then revalidate.

Deleting Activities

Use this procedure to delete an existing activity.

If the activity is referenced by any assignments, the system will not allow you to delete the activity. Other business rules, specific to your system, may also prevent you from deleting an activity.

1. Navigate to the **Activity** portal and display the activity you want to delete.
2. Click the **Delete** button in the Actions zone.
3. Confirm the action.

Activity Actions

This section describes the actions you can take to update an activity's status.

The actions available at any time depend on the activity's status, your user privileges, and your system's configuration. All valid actions can be performed from the **Activity** maintenance portal. Some actions, such as Allocate, Dispatch, Defer, and Unassign can also be performed directly from the **CDI** portal. The following topics provide instructions for performing all standard activity actions.

Allocating Activities

Use this procedure to lock an activity to a particular crew's shift. Once an activity has been allocated, the scheduler can continue to optimize its scheduled time, but cannot assign the activity to another crew shift.

You can only allocate an activity if its current status supports it.

You can allocate an activity in several different ways, as described in the following table.

Starting from ...	You can ...
CDI Scheduling Gantt zone or the Scheduling Gantt on the Crew Shift portal's Schedule tab	Do one of the following: <ul style="list-style-type: none">• Right-click the activity in the task area and select Allocate from the pop-up menu. When prompted, specify the crew shift to which you want the activity allocated.• Click on an activity that is currently scheduled to one crew shift and drag it to another crew shift. This is not available if you are viewing a single shift (such as from the Crew Shift portal).• Select a shift then select Allocate All to allocate to the shift all activities that have been scheduled but not yet dispatched. This action does not close the shift.
CDI Activity Search zone	Do one of the following: <ul style="list-style-type: none">• Click the check box to the left of one or more activities you want to allocate, then click the Allocate button. When prompted, specify the crew shift to which you want the selected activities allocated. (If you selected multiple activities, they will all be allocated to the same crew shift.)

Starting from ...	You can ...
Activity maintenance portal	<ul style="list-style-type: none"> Click the checkbox for one or more activities, then right-click a crew shift in the Scheduling Gantt zone and select the Allocate option. All checked activities will be allocated to the same crew shift. <p>Click the Allocate button in the Actions zone, then specify the crew shift to which you want the activity allocated.</p>
Where you can specify a crew shift to allocate an activity (the system opens a pop up window where the user can search for a shift)	<p>Select Chooser from the query options to prompt the scheduler to return a list of recommended shifts to choose from for that activity. The list is sorted by scheduling cost from lowest to highest, but you can click on any column to sort by as needed. You can also choose to relax some of the scheduling restrictions so that more shifts are considered by the scheduler. For example, removing skill compatibility allows the scheduler to return shifts that do not possess the skills that were indicated as required to perform the activity. You can also set the maximum number of shifts to return to prevent the scheduler from showing an unmanageable number of results.</p>

The system validates the action and displays an error message if validation fails. You must resolve errors before the activity can be allocated.

Some validation checks result in warning messages. For example, a warning is displayed if the shift lacks a required skill; however, the system may still permit you to allocate the activity (based on your configuration).

If the activity has already been dispatched to a crew, a warning message notifies you that the activity will need to be recalled. You can continue the action or cancel.

If you confirm the action, the system completes the requested allocation and does the following:

- If the crew is using an MDT, the system attempts to recall the activity.
- If the crew is using an SMS device (cell phone), the system sends the crew an SMS message notifying them of the recall. It is the crew's responsibility to return the assignment.
- If the crew is not using any device (non-MDT), its assignment is automatically returned.

Cancelling Activities

Use this procedure to cancel an activity that has not been finalized.

You can only cancel an activity if its current status supports it.

1. Navigate to the **Activity** portal and display the activity you want to cancel.
2. Click the **Cancel** button in the Actions zone.

The system validates the action and displays an error message if the action cannot be completed. The activity is removed from consideration for scheduling and, if already assigned to a crew shift, will be removed from the crew shift's schedule.

Completing Activities with Concurrent Assignments

If multiple completed assignments are received for the same activity, the system will not automatically complete the associated activity. The dispatcher must decide which assignment to accept, and then complete the activity from that assignment's maintenance portal.

Prerequisites: Before you begin this procedure, make sure you have reviewed all assignments and have determined the correct one to use to complete the associated activity.

To complete an activity from an assignment, follow these steps:

1. Navigate to the **Activity** portal and display the activity you want to complete.
2. In the **Concurrent Assignments** section, click on the assignment you want to use to complete this activity.
3. Click the **Complete Activity** button in the **Actions** zone of the Assignment portal.

The system validates the action and displays an error if it cannot complete the activity.

Declining Activities

Use this procedure to decline an activity's current assignment on the server on behalf of a non MDT crew.

This procedure is only applicable for non-MDT crews. The dispatcher must act on behalf of the crew.

Starting from the ...	You can ...
Select the Current Assignment link on the activity.	Click the check box to the left of one or more activities you want to remove, then click the Decline button. The system opens the Decline Assignment pop-up window where you enter a decline reason and provide comments as needed.

A copy of the activity is sent to crew in the form of an assignment, so the crew works on the copy and any updates made by them are updated on the activity.

Deferring Activities

Use this procedure to put off the scheduling of an activity to a later date. When you defer an action, you change its original effective time window. This differs from the hold action, which puts an activity on hold and removes it from consideration for scheduling until you manually remove the hold.

You can only defer an activity if its current status supports it.

You can defer an activity in several different ways, as described in the following table.

Starting from the ...	You can ...
CDI Scheduling Gantt zone	Click the Defer button in the Actions zone. When prompted, enter the deferment
CDI Activity Search zone	Right-click on the activity in the task area, then select Defer from the pop-up menu.
Activity's maintenance portal	Click the checkbox to the left of one or more activities you want to defer, then click the Defer button.

When prompted, enter the date to which you want the activity deferred, the reason for the deferment, and any other relevant remarks, then click **OK**. The system validates the action and displays an error message if the action cannot be completed.

If the activity is successfully deferred, its status is updated, indicating that the activity is ready for scheduling based on its adjusted arrival time window.

If the activity has already been dispatched to a crew, a warning message notifies you that the activity will need to be recalled. You can continue the action or cancel it.

If you confirm the action, the system completes the requested allocation and does the following:

- If the crew is using an MDT, the system attempts to recall the activity.
- If the crew is using an SMS device (cell phone), the system sends the crew an SMS message notifying them of the recall. It is the crew's responsibility to return the assignment.

- If the crew is not using any device (non-MDT), its assignment is automatically returned.

Dispatching Activities

Use this procedure to lock an activity's sequence in the shift schedule and mark it as ready to be sent to the crew.

You can only dispatch an activity if its current status supports it.

You can dispatch an activity in several different ways, as described in the following table.

Starting from the ...	You can ...
CDI Scheduling Gantt zone or the Scheduling Gantt on the Crew Shift maintenance portal's Schedule tab	Right-click on the activity in the task area, then select Dispatch from the pop-up menu.
CDI Activity Search zone	Click the checkbox to the left of one or more activities you want to dispatch, then click the Dispatch button.
Activity's maintenance portal	Click the Dispatch button in the Actions zone.

The system validates the action and displays an error message if the action cannot be completed. If the action is successfully completed, the activity will be queued for dispatch to the crew's mobile device.

Note: Activities are not actually dispatched until the assigned crew's shift has started. Until then, the activity is considered queued for dispatch. For an MDT crew, an activity is considered dispatched only upon receipt of acknowledgement from the crew's MDT. For SMS crews, an activity is considered dispatched once it is sent. For a non-MDT crew, queued activities are considered dispatched when the crew shift starts.

Putting Activities on Hold

Use this procedure to place an activity on hold if something needs to be done before work can be started. Putting a hold on an activity removes it from consideration for scheduling until you manually remove the hold.

You can only put an activity on hold if its current status supports it.

1. Navigate to the **Activity** portal and display the activity you want to put on hold.
2. Click the **Hold** button in the **Actions** zone.
3. Enter a reason for the hold and click **OK**.

The system validates the action and displays an error message if the action cannot be completed.

When you are ready to remove the hold on this activity, navigate back to the **Activity** portal and click the **Schedule** button in the **Actions** zone.

Rescheduling Activities

Use this procedure to reschedule an activity that is currently queued for dispatch. This action effectively reverses a dispatch action taken on an activity, and indicates to the scheduler that the activity is no longer locked to its current location in the schedule.

If the activity was manually allocated, the scheduler cannot schedule the activity to a different crew shift but can still optimize its location in the schedule. If the activity was not manually allocated, the activity can now be scheduled to any crew.

You can only reschedule an activity if its current status supports it.

1. Navigate to the **Activity** portal and display the activity you want to reschedule.
2. Click the **Reschedule** button in the **Actions** zone.

The system validates the action and displays an error if it cannot complete the action. If the status is successfully updated, it is sent to the scheduler to be rescheduled.

Unassigning Activities

Use this procedure if you want to unassign an activity and send it back to the scheduling pool. If the activity is currently manually allocated, it becomes available for scheduling to any crew. If it is currently dispatched to a crew, then the system attempts to recall it from that crew. Once an activity is unassigned from its current crew's shift, the activity is never given back to the same shift. In addition to excluding the shift, unassigning also removes manual allocation to the shift.

You can only unassign an activity if its current status supports it.

You can unassign an activity in several different ways, as described in the following table.

Starting from the ...	You can ...
CDI Scheduling Gantt zone or the Scheduling Gantt on the Schedule tab of the Crew Shift portal	Right-click on the activity in the task area, then select Unassign from the pop-up menu.
CDI Activity Search zone	Click the checkbox to the left of one more activities you want to unassign, then click the Unassign button.
Maintenance portal for the activity	Click the Unassign button in the Actions zone.

The system validates the action and displays an error message if the action cannot be completed. If the activity is successfully unassigned, it will be available for rescheduling. You can manually allocate the activity to another crew shift or let the scheduler assign it.

If the activity has already been dispatched to a crew, a warning message notifies you that the activity will need to be recalled. You can continue the action or cancel.

If you confirm the action, the system completes the requested action and does the following:

- If the crew is using an MDT, the system attempts to recall the activity.
- If the crew is using an SMS device (cell phone), the system sends the crew an SMS message notifying them of the recall. It is the crew's responsibility to return the assignment.
- If the crew is not using any device (non-MDT), its assignment is automatically returned.

Viewing Activity Schedule Information

Use the **Schedule** tab on the **Activity** portal to view scheduling details for an activity.

These values cannot be changed.

The **Schedule** tab displays the crew shift to which this activity is currently scheduled, as well as the sequence in which this activity is expected to be worked with respect to other tasks currently assigned to the scheduled shift. Additional schedule details include the calculated travel time and distance from the previous task on the shift schedule, and the calculated or actual arrival, start, and completion times. If there are any scheduling warnings or errors associated with this activity, they are also displayed.

Viewing and Updating Assignments for an Activity

Use this procedure to view and update assignments associated with an activity.

1. Navigate to the **Activity** portal and display the activity you want to work with.

The current assignment is displayed in the **Main** section of the **Activity** portal. The **Activity Display** zone also displays the following:

- A link to the assignment used to complete the activity, if applicable
- Any concurrent assignments, if applicable
- A list of completed assignments, if the activity's status is collision detected

If more than one assignment exists, the assignments associated with this activity are also listed in the **Assignments History** zone.

2. Click the assignment you want to view or edit.
3. Use the buttons in the **Actions** zone of the **Assignment** maintenance portal to perform valid actions on an assignment.

The buttons that are displayed at any time depend on the current status of the assignment and your system's configuration. The table below describes a set of standard action buttons.

Button	Description
En Route	Indicates that the crew is currently on its way to the activity.
Arrived	Indicates that the crew has arrived at the activity address but has not yet started work. This can be used if there is some delay for the crew in starting.
Started	Indicates that the crew has started work.
Postpone	Indicates that the crew has not yet arrived on site to the location and must postpone work on the assignment. After you click Postpone , you will be prompted to enter the reason for postponing and the date and time to which the work will be postponed. The activity remains assigned to the crew, allowing them to return to it later on.
Suspend	Indicates that the crew arrived on site and started work, but was unable to complete it. After you click Suspend , you will be prompted to enter the reason for suspending and the date and time to which the work will be postponed. You must also indicate how much time is still required to complete the work. The activity remains assigned to the crew, allowing them to return to it later on.
Work Done	Indicates that the crew completed work, but completion details have not been entered yet. (This is typically used by an SMS crew or by a dispatcher on behalf of a non-MDT crew.) When completion details are available, you can enter them and then complete the activity.
Complete	Indicates that the crew has completed work and all completion details have been entered. Enter completion details before clicking the Complete button. If there is no collision with another assignment, the activity is also completed.
Complete Activity	Use this action to complete an activity using the completion information contained in this assignment. This action is only available if an activity has more than one completed assignment. The dispatcher must first choose which assignment to accept and then click the Complete Activity button from that assignment's maintenance portal.

Viewing and Processing Alerts

You can manage alerts using the Dashboard Alert Queue or the **Alert** maintenance portal.

Alert Search

Use this procedure to filter and search for a particular alert.

The **Alert** Portal is used only on an as-needed basis for investigating a particular alert or for audit purposes. The Alert Queue is the primary tool for viewing and managing alerts.

1. Select **Main Menu > Service Management > Alert** .

2. Enter your search criteria in the **Alert Query** zone.

You can enter any combination of alert type, creation date, dispatcher, activity, or shift. You can also limit the search to include or exclude finalized alerts.

3. Click **Refresh**.

4. From the search results, do one of the following:

- Click the **Alert** link to navigate to the **Alert** maintenance portal.
- For activity-related alerts, click in the **Activity** column to navigate to the **Activity** maintenance portal.
- For shift-related alerts, click in the **Shift** column to navigate to the **Shift** maintenance portal.

Working with Override Time Windows

This section describes common tasks related to working with override time windows.

Creating Override Time Windows

Use this procedure to create an override time window.

Prerequisites: The activity type and service areas must have been previously defined.

1. Select **Main Menu > Service Management > Override Time Window+** .

2. Select the type of activity to which the override applies.

3. Enter the start and end time for the time window.

4. Indicate whether activities of this type should be allowed or not allowed during this time period. (Use the Allowed option if you want activities of a particular type to be scheduled on a holiday, when they would otherwise not be allowed.)

5. Select one or more service areas to which the override applies.

If you do not select any, the override applies to all service areas.

6. Click **Save**.

The system checks to see if any existing activities would be affected by this override time window. (The override affects all activities for which at least one of their effective time windows overlaps with the override time window.) If any such activities exist, the system notifies you how many activities would be affected and asks if you want to continue. If you

confirm the action, the system saves the override time window, recalculates the time windows for all affected activities, and resends the activities to the scheduler if necessary. If you cancel the action, the override time window is not saved.

Override Time Window Search

Use this procedure to filter and search for existing override time windows.

1. Select **Main Menu > Service Management > Override Time Window** .
2. Enter your search criteria in the Override Time Window Query zone.
You can enter any combination of activity type, start date/time, end date/time or service area.
3. Click **Refresh**.
4. Click the override time window you want to work with from the search results.

Maintaining Existing Override Time Windows

Use the buttons in the **Actions** zone of the **Override Time Window** portal to maintain existing override time windows.

1. Select **Main Menu > Service Management > Override Time Window** .
2. Search for and select the override time window you want to maintain.
3. Use standard actions to edit, delete, and cancel the time window.

Working with Remote Messages

This section describes tasks related to working with remote messages used to transmit data from the crew in the field to the main application on the server.

Remote Message Search

Use this procedure to filter and search for crew messages.

1. Select **Main Menu > Service Management > Remote Message** .
2. Enter your search criteria and click **Refresh**.
You must enter a processing date and time for the search. The system will search for all messages processed on or after that date. You can also search by the user or MDT associated with the message.
3. Click on a message in the search results to navigate to the **Remote Message** maintenance portal.

Viewing, Editing, and Retrying Remote Messages

Use this procedure to view remote messages from crews. If an error occurred while processing the message, you can retry the message. You can also edit the XML content before resending. You cannot create a new remote message.

1. Select **Main Menu > Service Management > Remote Message** .
2. Search for and select a message.
The **Remote Message** portal displays the message content in XML format.

3. Click the **Edit** button in the **Actions** zone to modify the XML content of the message.

Be sure to maintain the integrity of the message structure and conform to the message's schema.

4. Click the **Retry** button to reprocess the message.

The system will attempt to reprocess the message. If the action is successful, the message's status changes to Processed and the **Retry** button is removed from the screen; otherwise, the status Error status remains unchanged and the **Retry** button is displayed again.

Transfer of Goods

This section describes concepts and procedures related to the transfer of goods.

Understanding Transfer of Goods

This section describes concepts related to the transfer of goods.

About the Transfer of Goods

Transfer of goods involves the process of transporting goods from one location to another. Not all organizations use this business practice, however, if they do, the system provides a way to manage goods, restrictions and capacities related to the transfer of goods.

Transfer of goods functionality creates activities and vehicle types that answer the questions: What are the goods? What can and cannot be shipped with these goods? and What are the vehicle capacities for these goods?

When this functionality is in use, the goods being transferred are specified on activities. All goods being delivered must be both picked up and dropped off so that at the end of the day the net pickups and deliveries are balanced. For example, you might have a job with 2 activities in it - one to pick up 1 item from location A and one to deliver 1 item to location B. The total goods being transferred must be 0 at the end of the job, 1 picked up – 1 delivered = 0 on board at the end of that job.

Businesses might also take managing transfer of goods one step further and also manage locations where the goods are picked up and dropped off by incorporating the use of depots.

Capacities

Your implementation defines maximum capacities to indicate limits such as maximum weight, maximum volume, maximum size or any other measurement as needed. Once capacities are defined, they can be applied to activities that handle the transport of goods.

About the Goods Being Handled

Activities that handle goods specify information about the transferred goods such as capacities and restrictions relative to other goods on board. For example, an activity would indicate if hazardous load combinations should be avoided.

About Vehicle Maximum Capacity

As goods are being transported, it is important to know how much of a load the transport vehicle can handle. Maximum capacity of vehicles is defined on the vehicle type, not the crew shift. Any shift that references the vehicle type is bound by those capacity restrictions. However this can be overridden on a specific shift. For example if a dispatcher is aware that a

truck has low tire pressure, he might override the maximum capacity to indicate that the truck cannot carry such a heavy load.

Note: The base product is delivered with the core pieces needed to support transfer of goods, however some configuration is needed. For example, creating activities to handle goods as well as defining vehicle maximum capacities requires special configuration. Refer to the configuration guide for more information

About Depots and Depot Runs

If transferred goods are loaded or unloaded at a particular centralized location, your organization can set up depots to capture the information related to these locations. Details such as whether the depot is a pick up or drop off location, what types of goods the depot can handle, the physical address and the days and times that it is open are all specified.

Two types of depot operations are supported:

- **Distribution** - a depot where crews pick up goods for delivery.
- **Collection** - a depot where crews drop off goods picked up from customers.

Crews can be scheduled to drop off and pick up goods at depots based on time windows, crew availability, and depot details. Crews can be configured to be affiliated with one or many specific depots, or they might be allowed to visit any depots as needed. The crew's depot affiliation is defined on the crew record. As with any task they perform, crews can provide status updates related to each depot visit. Likewise, dispatchers have visibility into the location of depots via the CDI map. Dispatchers can also indicate restrictions to limit which depots a shift can visit.

Note: The depot layer on the map is only available when there are depots defined in the system.

Activities, Tasks and Runs

A crew's interaction with a depot is managed in terms of activities, tasks and runs:

- Depot based activities involve either picking up goods from a customer location and returning them to a depot center, or loading/collecting goods at a depot center and delivering them to a customer location.
- Depot tasks represent a scheduled visit to a depot, with a task duration for loading or off-loading the goods. The scheduler automatically creates these depot tasks to handle activities as needed.
- Depot runs represent the entire trip or travel to visit a depot, including the depot task and one or more depot activities. A single run never mixes distribution and collection operations, so a run would only consist of the activity to pickup goods at a distribution depot and a second run would consist of the activity to drop off goods at a collection depot.

Depot Activities

In addition to standard activity attributes, a depot activity includes information related to the goods being transferred such as one or more possible depots the goods should be picked up from or dropped to, the overall capacities of the goods such as weight and volume, or any other measurement as configured by your implementation. Restrictions on what other goods can be present aboard the vehicle are also indicated on the activity. Whether an activity is a collection or distribution type is defined on the activity type.

Note: Depot specific activities require specific configuration. Check with your system administrator for examples or details.

Depot Runs

A depot run is either a distribution trip to a depot to load goods and deliver them to various customer locations or a collection trip to a depot to unload goods previously picked up from customer locations. If the depot run is for a distribution, the depot run *starts* at the distribution depot with a depot distribution task. Likewise, if the depot run is for a collection, the run *ends* at the collection depot collection task.

Each depot run is represented by a depot task. As with other tasks, depot tasks are represented on the Scheduling Gantt with a specific icon. If the user right-clicks a depot task, the system highlights the depot run showing the depot task and the associated activities.

As long as none of the activities or the depot task have been dispatched, the scheduler can adjust a depot run to include more or fewer depot activities as needed. Once any task in the run is dispatched the scheduler closes the run. This means that the scheduler cannot add or remove any more activities on that run.

A dispatcher can manually close a depot run by using the right-click menu associated with the corresponding depot task. This action causes all activities currently scheduled to the run to be locked to that run. In the same way, the dispatcher can also open a closed run. This allows the scheduler to add more activities to the run as needed. Reopening the run does not unlock the activities already locked to it.

Depot Breaks

The system can also be configured to designate breaks which can only be taken at a depot. If a shift is not scheduled for depot work, the break is scheduled as a standard break.

Depot Time Windows

Depot time windows define when the depot is open. They are used by the scheduler to determine when depot tasks to visit a specific depot should be scheduled.

The access time window defines the time frame that the depot is open. Each access time window also has an associated window cost and late cost. The window cost indicates the cost of using the time window, whereas the late cost indicates the cost of being late and arriving at the depot outside of the allotted time frame.

The service time window defines the *preferred* time windows within the normal operational hours. Lower cost is associated with scheduling work during preferred service time.

Access times and service times cannot overlap, so if there is a preferred service time defined, the general access times should be defined during time frames outside of the defined service times.

Multiple depots can share this information by referring to a depot profile which also has these values defined. If there are no times specified, there is no restriction on when the depot is available.

Maximum capacities might also be specified for a time window to indicate limits such as maximum weight, maximum volume, or any other measurement as configured by your implementation applicable during that time window.

Depot Time Window Overrides

An override time window is used to redefine a depot's access or service time window as originally defined on the depot. For example, if the dispatcher knows that the depot will be open later than usual on a particular day, he can override the default time window and adjust for the later time. The override will apply to a specific day and time for the depot rather than the generalized weekly schedule defined by the default time windows.

An override can also be used to completely remove a specific time window or to adjust the maximum capacities defined on the time window such as the maximum size or weight of distribution that the depot can handle. These capacity fields are defined by your implementation and are therefore specific to your business practices.

Crews Can Be Restricted To Specific Depots

Since crews typically logon and logoff from their base depots in depot based operations, crews can be configured so that they are restricted to specific depots. This may be necessary, for example, if the crew's vehicle is too large to visit some depots. In these cases, the scheduler is limited to only scheduling the crews to visit depots where the crew is allowed. If a crew is not limited to specific depots, it is assumed that they are allowed at any depot. Moreover, a dispatcher can override the list of depots a crew is restricted to on a specific shift.

Note: Associating crews and shifts with restricted depots requires special configuration.

About Depot Cutoff

A depot cutoff event closes all distribution depot runs that are planned to depart from the depot before a specified cutoff time, and instructs the scheduler to build new runs for the depot to depart after that cutoff time. The depot cutoff automatically locks all such runs from the distribution depot.

The cutoff events are initiated by the host system. However, a user can also initiate a depot cutoff manually. This only applies for distribution depots and cannot be set in advance to be triggered in the future.

As an example, think of depot cutoff functionality applied for grocery delivery. All deliveries for a given day must be on the truck and ready to go by 10 am to make the “early run”. With depot cutoff, the scheduler enforces that orders must be processed before a certain trigger date and time, say 5pm, on the previous day. The runs would be locked after 5 pm and any orders processed after that time would be pushed to later runs.

The **Cutoff History** zone in the **Depot** portal shows a history of cutoff requests that have been processed for the depot. You can select a cutoff request and navigate to the **Depot Cutoff** portal. The **Closed Depot Runs** zone lists the depot tasks closed by the cutoff event. Navigate to one of these depot tasks to see the current state.

Working with Depots

This section describes common tasks related to working with depots.

Note: Depot activities are not delivered with the base package and must be configured by your implementation team before you have access to these functions.

Viewing Depot Runs

Use this procedure to view the entire run that a depot activity belongs to.

Prerequisites: None.

1. Navigate to the **Activity** portal in edit mode.

Alternately, dispatchers can review the run on the **CDI** portal by clicking on **Show Run** on the run's corresponding depot task.

2. Search for and select the appropriate activity.

Look in the **Activities In Depot Run** zone to see all of the activities in the run and where the current activity falls in sequence with the others.

Closing a Depot Run

Use this procedure to close a depot run. You would close a depot run to prevent the scheduler from making further changes to the set of activities in the run.

You can also complete this process from the **Depot Task** portal.

1. Navigate to the **CDI** portal.
2. Locate the depot task related to the run.
3. Right click and select **Close**.

Opening a Depot Run

Use this procedure to open a depot run. You would open a depot run to allow the scheduler to further optimize the run and make changes to the set of activities in it.

You can also complete this process from the **Depot Task** portal.

1. Navigate to the **CDI** portal.
2. Locate the depot task related to the run.
3. Right click and select **Open**.

Overriding a Depot Time Windows

Use this procedure to change or remove the time windows on a depot.

1. Navigate to the **Depot** portal in edit mode.
2. Search for and select the appropriate Depot record.
3. Click the **Add** link in the **Override Time Windows** zone.
4. Follow the prompts to add a new override.

Initiating a Depot Cutoff Event Manually

Use this procedure to manually execute a depot cutoff event.

1. Navigate to **Admin – Depot**.
2. Select a distribution depot.
3. Click the **Cutoff** button.
4. Enter the cutoff date and time.

The cutoff date/time on the depot is set to the new cutoff time. The scheduler automatically closes all depot runs to this depot planned to depart on or before the date and time mentioned.

Dispatcher Functions (CDI)

This section describes concepts and procedures related to the dispatching functionality. Most dispatcher functions are performed from the **Common Dispatching Interface (CDI)** portal, which provides a single point of interaction for monitoring and managing tasks, crew shifts, and KPIs. You can also view and manage alerts and To Do entries from dashboard zones without ever leaving the **CDI** portal.

About the CDI Portal

The **CDI** portal helps dispatchers effectively manage day-to-day operations and facilitates communication with crews in the field. CDI supports context-based decision making for handling exceptions that arise during the day. Although the system automatically schedules and dispatches tasks to available and qualified crews (based on your system's business rules), a dispatcher can override virtually any decision made by the system to handle special situations.

The system provides two versions of the **CDI** portal:

- The main **CDI** portal that is displayed after you log into your dispatcher shift.
- The KPI-Specific **CDI** portal that is displayed when you click on an actionable KPI from the **KPI Summary** zone on the main **CDI** portal.

Both **CDI** portals contain the same zones and look similar, but the data represented in each portal is different.

Time Zones

On the CDI date/time information of all shifts and tasks is displayed in the user's time zone, by default. The user can toggle to display in other time zones as needed.

About the Scope of Data

The scope of data refers to the crew shifts and tasks for which data is displayed in the **CDI** portal.

When a dispatcher logs on to a shift, they select which dispatch areas to monitor and, depending on their user privileges, they may also be able to set the range of dates to monitor. These settings determine which tasks and crew shifts will be displayed on the **CDI** portal and also which alerts will be directed to the dispatcher for situations requiring attention or manual intervention. If the dispatcher changes these shift settings during a shift, the scope of data changes.

KPI-Specific CDI Data Scope

The dispatcher can further limit the scope of data by clicking a KPI link in the **KPI Summary** zone. The system displays the KPI-Specific CDI, which shows crew shifts and tasks related to the selected KPI. For example, if you were to click on an Appointments in Jeopardy KPI, the KPI-Specific CDI might display all appointment tasks that were in danger of being missed. (The logic used to narrow down tasks and shifts for a KPI is defined in the KPI's calculation algorithm KPI and can be customized.)

Crew Shift Data Scope

A crew shift is considered within the dispatcher's data scope when its service areas and service classes are covered by at least one of the dispatch areas currently being monitored and one of the following is true:

- The crew shift is currently logged on
- The crew shift's status is planned and its planned time window falls within the dispatcher shift's monitoring period

Activity Data Scope

An activity is considered within the dispatcher's data scope if its service area and service classes are covered by at least one of the dispatch areas currently being monitored and at least one of its arrival time windows is within the monitoring date range for the dispatcher shift. In addition, any activity scheduled to a shift in the dispatcher's data scope, regardless of dispatch area eligibility, is also considered in scope.

Map Data Scope

The map's scope of data is the same as the scope of data for the portal from which it was launched (either the main CDI or the KPI-Specific CDI).

About the KPI Summary

The **KPI Summary** zone on the **CDI** portal displays a summary of key performance indicators (KPIs) that the dispatcher is responsible for monitoring.

Key performance indicators (KPIs) are quantifiable measurements that support dispatcher decision making and in-day exception handling. KPIs are associated with either activities or crew shifts. For example, an activity-related KPI might indicate the number of appointments in jeopardy of being missed. A shift-related KPI might indicate the number of out-of-service crews.

If action is required to resolve a KPI, you can navigate to the KPI-specific **CDI** portal, which displays only tasks and crew shifts related to the KPI. The KPI-specific **CDI** portal displays the **Scheduling Gantt** and **Activity Search** zones as on the main CDI, but with a potentially narrower scope of data. From the KPI-Specific portal, you can take action on specific tasks and crews to resolve the underlying problem.

For example, if you clicked on a Crews Out of Service KPI in the KPI Summary, a KPI-Specific **CDI** portal would show a list of out-of-service crew shifts. You could then view and change the shift status or reallocate activities as needed.

The KPI Summary uses colors and icons to help dispatchers easily identify KPIs that need their attention. Color coding is fully customizable. Typically, green indicates normal KPI values; red is used for values that fall outside a pre-defined range and require immediate attention; yellow is used for warnings and to indicate a potential problem.

About the Scheduling Gantt

The **Scheduling Gantt** zone on the **CDI** portal displays a graphical representation of the crew shift schedules you are monitoring, and allows you to take action on scheduled tasks.

The Crew Pane

The **Crew** pane on the **Scheduling Gantt** zone displays the crew name and associated shift start date and time. It also displays an icon indicating whether the crew is using a mobile device or SMS to work their shift.

In addition it shows the current state of the crew, i.e. whether they are out of range, enroute to an activity, working on site out of service, etc.). If any of the tasks for a shift are clustered, an **Expand Shift** button also appears.

This pane supports the following actions:

- Click on a crew shift to navigate to its maintenance portal.
- Click the **Expand Shift (+)** button to expand all clustered tasks for this crew shift.
- Right-click a crew shift to display detailed information about the crew shift, such as its primary function and crew allocation. This information is displayed at the top of the pop-up menu, followed by a list of available options. The available options may vary depending on the selected shift and your system's configuration. Standard options include:

Crew Menu Option	Description
Allocate	Allocates the activities currently selected in the Activity Search zone to this crew shift. Allocating an activity locks it to a particular crew shift. Once an activity has been allocated, the scheduler can continue to optimize its scheduled time, but cannot assign the activity to another crew shift.
Allocate All	Allocates all of the activities scheduled to the selected shift that have not yet been dispatched . Allocating all does not close the shift.
Close	Closing a shift allocates to the shift all activities that have been scheduled to it but not yet dispatched. Once the shift is closed the scheduler cannot add any more work nor remove any allocated work from the shift. The dispatcher is also provided with the opportunity to dispatch the entire schedule of the shift also as part of closing the shift.
Open	Opening the crew shift allows the scheduler to add more work to the shift again. However, it does not remove the existing allocations.
Send Mail	Sends a message to the selected crew using the internal messaging system.
Expand Shift	Expands (unclusters) all clustered tasks for this crew shift, and re-clusters any previously expanded shift. Only displays if the shift contains clustered tasks.
Show Crew on Map	Displays the location of this crew in the open map window. (The map window must have already been launched. This action switches to the map window and focuses on the selected crew.) The crew's location is determined by the latest GPS data or its last known or estimated location.
Show Route on Map	Draws the route for this crew shift in the map window. (The map window must have already been launched.)
Hide Route on Map	Removes the route for this crew shift from the map. (The map window must have already been launched.)
View Details	Navigates to the maintenance portal for this crew shift.

The Task Schedule Area

The task schedule area of the CDI **Scheduling Gantt** displays all scheduled tasks for each crew shift listed in the **Crew** pane. Tasks appear across a time line. A red vertical line indicates the current date/time.

Each task bar uses visual cues to convey information about the task.

Note: The colors, shapes, borders, and icons used to convey information are customizable. You can refer to the embedded help for the **Gantt** zone for a list and descriptions of the actual cues used in your system if your implementation has updated the embedded help to reflect how these elements were configured.

- Icons represent activities, breaks, and administrative tasks such as meetings and non-productive tasks
- The length of the task bar represents the task's duration.
- The line preceding a task represents the travel time for the crew to get to the task.
- The color of the task indicates its status (initial, interim, or final).
- The *planned* start/end of a shift is displayed as an underlay on started shifts in the same color as the planned shift.
- If the shift enters overtime, the remainder of the shift is drawn using the configured overtime color.

- The border of the task bar indicates the kind of activity and its scheduled status:

Emergency: An emergency activity.

Regular: A non-emergency activity.

Appointment: An appointment activity.

Scheduled: The task is considered scheduled when the scheduler places it in a specific work sequence on a crew shift schedule. Scheduled tasks may be clustered.

Non-Scheduled: The task is allocated to the crew, but has not been incorporated by the scheduler into the crew's schedule. When a user manually allocates an activity to another crew, the scheduler must find a place on the new crew's schedule. During the time it takes to do that, the task is stacked at the end of the new crew's schedule, with no travel time from the previous task (since it is not yet sequenced in the route and the previous task is not know yet). Likewise, if a break is added to a crew shift but has not yet been incorporated into the schedule yet, the break is stacked at the end of the schedule.

Deferred: This indicates that the activity was deferred to a future time, and the scheduler has not yet processed the deferment and provided a new schedule for the task.

If you right-click a task, detailed information about the task is displayed at the top of the pop-up menu, followed by a list of available options. Options may vary depending on the class and status of the selected task and your system's configuration.

Note: Clustered tasks do not have a popup menu.

To select multiple contiguous tasks, hold down the shift key and select the tasks.

Standard options include:

Task Menu Option	Description
Expand Shift	Expands (unclusters) all clustered tasks for this crew shift, and re-clusters any previously expanded shift. Only displays if the shift contains clustered tasks. (See related topics for more information about clustered tasks.)
Dispatch	Marks all selected tasks as ready for dispatched. If the shift is not started, the tasks will remain queued for dispatch. If the shift has started, the system attempts to dispatch the selected tasks to the crew.
Allocate	Prompts you for the crew shift to which you want the selected activities allocated, then allocates them. Allocating an activity locks it to a particular crew shift. Once an activity has been allocated, the scheduler can continue to optimize its scheduled time, but cannot assign the activity to another crew shift.
Defer	Prompts you for the reason for the deferment, the date to which the selected activities should be deferred, and any relevant comments. Deferring an activity modifies its arrival time window to a future date.
Unassign	Unassigns the activity and sends it back to the scheduling pool. If the activity is currently manually allocated, it becomes available for scheduling to any crew. If it is currently dispatched to a crew, then the system attempts to recall it from that crew.
Show on Map	Displays the selected task on the map. (The map window must have already been launched. This action switches to the map window and focuses on the selected task.)
View Details	Navigates to the maintenance portal for the selected task.

About Clustered Tasks

If a crew shift contains multiple tasks of the same class and status, and those tasks have a short period of idle between them so they can be viewed as "back to back," then the system collapses the individual tasks into one clustered task in the **Scheduling Gantt** task area.

Note: Other business rules apply that may prevent a task from being clustered. For example, an emergency activity is never clustered, nor is an activity in the KPI-Specific CDI that contributes to a KPI. Clustering rules are customizable.

You cannot perform actions on clustered tasks; you must expand them first using the Expand (+) icon in the **Shift** column on the **crew** pane or right-click the shift and select **Expand Shift**. When you expand clustered tasks for one shift, the system unclusters all tasks for that shift and clusters tasks for all other shifts (where applicable).

About the Activity Search Zone

The **Activity Search** zone on the **CDI** portal displays a list of activities within the current scope of data, and allows you to search, sort, and filter the list. You can perform standard dispatching functions on one or more selected activities displayed in the list or navigate to the maintenance portal of any activity listed. You can also use the **Show Map** icon to display the task on the map.

When the **CDI** portal is initially displayed (after logon), the **Activity Search** zone displays a list of activities within the dispatcher's data scope that require attention. This list includes all non-finalized emergencies and all unassigned activities that are due on or before today's date. Activities are displayed in the following order:

1. Emergencies
2. Priority Profile Sort Sequence
3. Creation Date/Time

About the KPI-Specific CDI

The KPI-Specific **CDI** portal looks just like the general **CDI** portal, but only displays data related to a particular KPI. This is useful for troubleshooting the underlying conditions that contribute to the KPI.

The KPI-Specific **CDI** portal is displayed when you click on an actionable KPI. (Actionable KPIs display as hyperlinks in the **KPI Summary** zone.)

From the KPI-Specific **CDI** portal, you can view and manage crew shifts and activities just as you would from the general **CDI** portal.

About the CDI Map

The **CDI Map** allows you to view the location of activities, meetings and non productive tasks, crews, and vehicles on a map. You can also view the route a crew will travel during its shift, based on the shift's currently scheduled tasks.

The location of a vehicle is determined based on its last known GPS location if any. The location of a crew is determined by its last known or estimated location. Each task uses its own specified location for display on the map.

For consistency, the **CDI** map shows request routing and driving directions which directly mirrors the information used by the scheduler when creating the schedule. This allows the dispatcher to see an accurate depiction of the crew's actual work route.

The map is started from the **CDI** portal's **Show Map** toolbar button. A box in the upper right hand corner of the map window displays a set of checkboxes, representing the different types of objects that can be displayed on the map. Each

type is referred to as a map layer. You can display or hide layers by checking or unchecking these boxes. For example, if you check the box, the map displays all meetings and other non productive tasks within the current data scope. (The map's scope of data is the same as the scope of data for the portal from which it was launched, either the main CDI or the KPI Specific CDI). Some layers are checked, and thus displayed, by default. The layers that are displayed initially by default vary depending on where the map was launched from.

- The **Clear All** button clears all route lines, if any are displayed, and also clears the latest marker of a crew or task shown on map
- The **Refresh** button updates the map with the latest available data.
- The **Legend** in the lower right-hand corner of the map window shows the icons used to represent different objects on the map.

The map interface works similar to other common mapping programs. You can pan and zoom using the icons in the upper left-hand corner of the map window. You can also click and drag any point on the map to move its position within the map window.

When you hover over a point on the map that is related to a shift or task, the system displays detailed information about the object in a context window.

Map Layers

This topic lists and describes the different types of objects that can be displayed on the map. Each type is referred to as a map layer. You can display or hide layers using the checkboxes in the top-right corner of the map window.

Map Layer	Description
Crews	Check this box to display current crew locations of all active shifts in the current data scope.
KPI Activities	Check this box to display activities within the data scope that contribute or relate to a KPI.
Activities	Check this box to display all activities scheduled to crew shifts in the current data scope.
Unassigned Activities	Check this box to display all unassigned activities in the data scope.
Admin Tasks	Check this box to display locations of periods of unavailability such as meetings or other non productive tasks scheduled to crew shifts in the data scope.
Logon/Logoff	Check this box to display logon and logoff locations of shifts in the current data scope.
Vehicles	Check this box to display the current locations of all vehicles.

About the CDI Shift Tab

Use the **Shift** tab on the **CDI** portal to log on or off a dispatcher shift and select which dispatcher areas to monitor for the shift. Depending on how your system is configured, you may also be able to select the dates of tasks to monitor.

Managing your Dispatcher Shift

This section describes common tasks related to managing your dispatcher shift.

Logging On to Start a Dispatcher Shift

You can log on to start a dispatcher shift directly from the **CDI** portal.

You do not need to create a dispatcher shift in advance. The system creates a new dispatcher shift automatically when an authorized dispatcher logs on to the system from the **CDI** portal.

1. Select **Main Menu > Service Management > CDI**.

If you are already logged on to a dispatcher shift, the **CDI** portal is displayed and is populated with data you are responsible for monitoring during the current shift. Otherwise, the **Logon** button is displayed.

2. Click the **Logon** button.

3. Specify the settings to use for this shift, such as the date range for monitoring activities. The available settings may vary depending on your dispatcher profile.

4. Select which dispatch areas you want to monitor.

The list of dispatch areas from which you can choose is predefined; you can only select dispatch areas you are authorized to monitor, based on your dispatcher profile. For each shift you work, you can select one, some, or all of these dispatch areas.

5. Click **Save**.

The system logs you on to the shift and displays the **CDI** tab for the current shift. You can now begin monitoring and managing tasks and crew shifts.

Changing the Date Range for Dispatch Monitoring

Use the **Shift** tab on the **CDI** portal to view and change the initial date and the date range of activities and crew shifts to monitor during your current dispatcher shift.

Note: One or more fields on this tab may be set to read-only, indicating that you are not allowed to change these settings.

When you change any date settings, the system automatically updates the scope of data for the **CDI** portal and all its zones.

Changing the Dispatch Areas to Monitor

Use the **Shift** tab on the **CDI** portal to add or remove dispatch areas to monitor during the current shift.

Note: The list of dispatch areas from which you can choose is predefined; you can only select dispatch areas you are authorized to monitor, based on your dispatcher profile. For each shift you work, you can select to monitor one, some, or all of these dispatch areas.

When you change the dispatch area selections, the system automatically updates the scope of data for the **CDI** portal based on your selections. These selections also determine which alerts and To Do entries you will receive during your shift.

Logging Off a Dispatcher Shift

Use the **Shift** tab on the **CDI** portal to log off a dispatcher shift.

1. From the **CDI** portal, click the **Shift** tab.

Although dispatchers access their current shift directly from the **CDI** portal, other authorized users can access a dispatcher shift by selecting **Main Menu > Resource Management > Dispatcher Shift**, then searching for and selecting the logged-on dispatcher shift they want to maintain.

2. Click **Logoff**.

The system logs off the shift and redistributes any open alerts to another eligible dispatcher.

Managing Tasks and Crews using the CDI

This topic describes procedures related to managing tasks and crews using the CDI.

Using the Scheduling Gantt

This section describes tasks related to using the **Scheduling Gantt** zone on the **CDI** portal.

Viewing Task Details from the Scheduling Gantt

To view summary details about a task, right-click the task in the task schedule area. Detailed information displays for the selected task(s) at the top of the pop-up menu. To navigate to the task's maintenance portal, right-click the task and then select **View Details** from the pop-up menu.

Viewing the Crew Shift Details from the Gantt

To view summary details about a shift, right-click the shift in the **Crew** pane. Detailed information displays for the selected shifts(s) at the top of the pop-up menu. To navigate to the crew shift's maintenance portal, click the **Shift** link. You can also right-click the shift in the **Crew** pane and then select **View Details** from the pop-up menu.

Filtering the Scheduling Gantt by KPI

To see only those crew shifts and tasks that are related to a KPI, click the link for the KPI in the **KPI Summary** zone on the **CDI** portal. The KPI-Specific **CDI** portal is displayed, and its **Scheduling Gantt** zone is filtered by the selected KPI.

Setting the Display Date for the Gantt View

You can jump directly to any date (within the period of time you are monitoring) and display crew shifts and tasks beginning with that date. To scroll the Gantt view to a specific date and time, click the **Go to Date Time** toolbar icon, then enter the desired date.

To scroll to the current date, click the **Go to Now** toolbar icon.

Zooming In and Out in the Gantt View

Use the **Zoom In** and **Zoom Out** buttons on the **Scheduling Gantt** toolbar to adjust the time frame.

Zoom In: Adjusts the task area to show a narrower time frame (for example, from 12 hours to 6 hours), thus expanding the task bars.

Zoom Out: Adjusts the task area to show a wider time frame (for example, from 3 hours to 6 hours), thus compressing the task bars.

Launching the CDI Map

The CDI Map can only be launched from the CDI **Scheduling Gantt** zone. Click the **Show Map** toolbar icon on the **Scheduling Gantt** zone to start the map.

The map opens in a separate window. When initially loaded, the scope of data displayed in the map is the full scope of data you are monitoring in the **CDI** portal. Use the checkboxes in the upper right-hand corner of the map window to include or exclude specific layers (types of objects) from the map display.

Note: You must launch the map before you can use the **Show on Map** options to display specific crews, activities, or routes on the map. After launching the map, leave the map window open and return to the **CDI** portal to use these options.

The map's scope of data is the same as the scope of data for the portal from which it was launched, either the main CDI or the KPI-Specific CDI.

Activity Actions

This topic lists and describes the standard actions that can be taken to change the status of an activity. The actions that are available for an activity vary depending on its current status and your system's configuration. All valid actions can be performed from the **Activity** maintenance portal. Some actions, such as Allocate, Dispatch, Defer, and Unassign can also be performed directly from the **CDI** portal.

Click the link in the Action column to go to the associated procedure.

Action	Description
Validate	Use this to validate an activity after you have edited it to resolved one or more issues detected by the system.
Unassign	Use this to unassign an activity.
Allocate	Use this to lock an activity to a particular crew shift.
Defer	Use this to put off scheduling of an activity to a later date by modifying its arrival time window (ATW).
Dispatch	Use this to manually dispatch an activity to a crew.
Hold	Use this to place the activity on hold and remove it from consideration for scheduling.
Cancel	Use this to cancel an unfinalized activity and remove it from consideration for scheduling.
Schedule	Use this to put an activity back into consideration for scheduling after it has been placed on hold, for example.
Reschedule	Use this to reschedule an activity that is currently queued for dispatch. This action effectively reverses a dispatch action taken on an activity, and indicates to the scheduler that the activity is no longer locked to its current location in the schedule.
Complete	Use this to manually complete an activity.

* This column lists the statuses that support the action in the standard activity life cycle. For example, you can only dispatch an activity if its current status is Being Scheduled. This list does not include standard actions such as Edit, Duplicate, or Delete, which are supported by all objects.

POU Task Actions

Use this procedure to update POU tasks on a crew shift's schedule.

1. Navigate to the **Period of Unavailability Task** maintenance portal in any of the following ways.
 - From the **Scheduling Gantt** in the **CDI** portal, right-click the POU and select **View Details** from the pop-up menu.
 - Navigate to the **Crew Shift** portal and search for the crew shift to which the POU is scheduled. On the **Crew Shift** portal, click the **Schedule** tab and then click the **POU** link in the **Scheduled Tasks** zone. You can also click the POU in the Crew Shift Scheduling Gantt and then select **View Details** from the pop-up menu.
2. Use the buttons in the **Actions** zone of the **Period of Unavailability Task** maintenance portal to perform valid actions on POUs.

The actions that are valid at any time depend on the current status of the POU and your system's configuration. The table below describes a set of standard actions.

Action Button	Description
Edit	Allows you to enter comments and add standard completion remarks.
En Route	Indicates that the crew is currently on its way to the POU.
On Site	Indicates that the crew has arrived at the POU location.
Complete	Indicates that the crew has completed the POU and is ready for the next task.
Cancel	Indicates the crew is not going to attend the event. This action cancels the POU task and removes it from the crew shift schedule.

Break Actions

Use this procedure to start, complete or cancel a scheduled break.

Prerequisites: To start a break, it must have been dispatched to the crew and the previous task must have been finalized. To complete a break, it must have been started.

1. Navigate to the **Break Task** maintenance portal in any of the following ways.
 - From the **Scheduling Gantt** in the **CDI** portal, right-click the break and select **View Details** from the pop-up menu.
 - Select **Main Menu > Service Management > Crew Shift** and search for the crew shift to which the POU is scheduled. On the **Crew Shift** portal, click the **Schedule** tab and then click the **Break** link in the **Scheduled Tasks** zone. You can also click the break in the **Crew Shift Schedule Gantt** and then select **View Details** from the pop-up menu.
2. Click the appropriate button in the **Actions** zone.

Action Button	Description
Start	Indicates that the crew is starting the break.
Complete	Indicates that the crew has completed the break and is ready for the next assignment.
Cancel	Indicates the crew is not going to take the break. This action cancels the break task and removes it from the crew shift schedule.

Using the Activity List

The **Activity Search** zone on the **CDI** portal allows you to search for activities and take action on them.

From the **Activity Search** zone, you can:

- Find the activities you want to work with.
- Use the action buttons to update the status of selected activities. (Check the box to the left of each activity you want to update before you click the action button.) The available actions may vary depending on your system's configuration.
- Click the **Activity** link to navigate to the activity's maintenance portal.
- Click the **Show on Map** icon to display the selected activity on the **CDI Map**. (You must have already launched the map using the **Show Map** button. **Show on Map** switches to the map window and focuses on the selected activity.)

Activity Search

Use this procedure to filter and search for activities in the **CDI** portal.

1. Access the **CDI** portal for a logged on dispatcher shift.
2. From the **Activity Search** zone, select the Query Option to use.
You can only search for activities within the current scope of data.
3. Enter your search criteria and click **Refresh**.

Filtering the Activity List by KPI

To see only activities related to a particular KPI, select the link for the KPI in the **KPI Summary** zone on the **CDI** portal. The KPI-Specific **CDI** portal is displayed, and its Activity list is filtered by the selected KPI.

Activity Actions

This topic lists and describes the standard actions that can be taken to change the status of an activity. The actions that are available for an activity vary depending on its current status and your system's configuration. All valid actions can be performed from the **Activity** maintenance portal. Some actions, such as Allocate, Dispatch, Defer, and Unassign can also be performed directly from the **CDI** portal.

Click the link in the Action column to go to the associated procedure.

Action	Description
Validate	Use this to validate an activity after you have edited it to resolved one or more issues detected by the system.
Unassign	Use this to unassign an activity.
Allocate	Use this to lock an activity to a particular crew shift.
Defer	Use this to put off scheduling of an activity to a later date by modifying its arrival time window (ATW).
Dispatch	Use this to manually dispatch an activity to a crew.
Hold	Use this to place the activity on hold and remove it from consideration for scheduling.
Cancel	Use this to cancel an unfinalized activity and remove it from consideration for scheduling.

Action	Description
Schedule	Use this to put an activity back into consideration for scheduling after it has been placed on hold, for example.
<i>Reschedule</i>	Use this to reschedule an activity that is currently queued for dispatch. This action effectively reverses a dispatch action taken on an activity, and indicates to the scheduler that the activity is no longer locked to its current location in the schedule.
<i>Complete</i>	Use this to manually complete an activity.

* This column lists the statuses that support the action in the standard activity life cycle. For example, you can only dispatch an activity if its current status is Being Scheduled. This list does not include standard actions such as Edit, Duplicate, or Delete, which are supported by all objects.

Using the CDI Map

This section describes common tasks related to using CDI Map.

Launching the CDI Map

The CDI Map can only be launched from the **CDI Scheduling Gantt** zone. Click the **Show Map** toolbar icon on the **Scheduling Gantt** zone to start the map.

The map opens in a separate window. When initially loaded, the scope of data displayed in the map is the full scope of data you are monitoring in the **CDI** portal. Use the checkboxes in the upper right-hand corner of the map window to include or exclude specific layers (types of objects) from the map display.

Note: You must launch the map before you can use the **Show on Map** options to display specific crews, activities, or routes on the map. After launching the map, leave the map window open and return to the **CDI** portal to use these options.

The map's scope of data is the same as the scope of data for the portal from which it was launched, either the main **CDI** or the **KPI-Specific CDI**.

Displaying Activities on the Map

You can display all activities within the current scope of data on the map, or choose a particular activity to display. You can also display only activities related to a particular **KPI**.

1. If the map window is not already open, click the **Show Map** toolbar icon on the **CDI** portal to launch the map.
By default, the map shows all activities for the dispatch areas and dates you are monitoring.
2. To focus the map on a particular activity:
 - Leave the map window open and then return to the **CDI** portal.
 - Right-click on an activity in the **Scheduling Gantt** task area, then select **Show on Map**.
3. To display only activities related to a particular **KPI**:
 - Click the **KPI** link in the **KPI Summary** zone to display the **KPI-Specific CDI**.
 - Click the **Show Map** button on the **Scheduling Gantt** toolbar (in the **KPI-Specific CDI** portal, not the general **CDI** portal). The map window is displayed with data filtered by the selected **KPI**.
4. To display detailed information about the object in a context window

When you hover over a point on the map that is related to a task (or a crew shift), the system displays detailed information about the object in a context window.

Displaying Routes on the Map

Use this procedure to display the route for a crew shift on the map.

1. If the map window is not already open, click the **Show Map** toolbar icon on the **CDI** portal to launch the map.
2. To focus the map on the route for a particular crew shift:
 - Leave the map window open and then return to the **CDI** portal.
 - Right-click on a crew in the **Scheduling Gantt** crew pane, then select **Show Route on Map**.
3. Use the **Clear All Routes** button in the map window to remove the route display.

Displaying Crews on the Map

You can display all crews within the current scope of data on the map, or choose a particular crew to display. You can also display only crew shifts related to a particular KPI.

1. If the map window is not already open, click the **Show Map** toolbar icon on the **CDI** portal to launch the map.
2. Check the **Crews** box. The map displays all crews within the current scope of data.
3. To focus the map on a particular crew:
 - Leave the map window open and return to the **CDI** portal.
 - Right-click on a crew in the **Crew** pane, then select **Show Crew on Map**.
 - Select **Show on Map**. The map window is displayed showing the location of the crew or the activity related to the alert.
4. To display only crews related to a particular KPI:
 - Click the **KPI** link in the **KPI Summary** zone to display the KPI-Specific CDI.
 - Click the **Show Map** button on the Scheduling Gantt toolbar (in the KPI-Specific **CDI** portal, not the general **CDI** portal). The map window is displayed, and the data is filtered by the selected KPI.

When you hover over a point on the map that is related to a crew shift (or a task), the system displays detailed information about the object in a context window.

Clearing All Routes

Use the **Clear all Routes** button on the **CDI Map** page to clear all route lines from the map. This button is displayed only if route lines are currently drawn on the map.

Filtering the Map by KPI

To show only crew shifts and tasks that are related to a particular KPI, click **KPI** link in the **KPI Summary** zone on the **CDI** portal. Then, on the KPI-Specific **CDI** portal, click the **Show Map** button in the Scheduling Gantt toolbar. The map window is displayed, and its data is filtered by the selected KPI.

Monitoring KPIs

Use the **KPI Summary** on the **CDI** portal to view and manage the KPIs you are responsible for monitoring.

1. Review the KPIs listed in the **KPI Summary** zone.
2. Click a KPI link to view the KPI-Specific **CDI** portal, which displays only tasks and crew shifts related to the selected KPI.
3. Review the information and take action as needed.
 - Right-click a task in the **Scheduling Gantt** task area, then select the desired option from the pop-up menu. To navigate to the task's maintenance portal, select **View Details** from the pop-up menu or click the activity link in the **Activity** zone.
 - Right-click a crew in the **Scheduling Gantt** crew pane area, then select the desired option from the pop-up menu. To navigate to the crew shift's maintenance portal, select **View Details** from the pop-up menu or click the shift link in the **Crew** pane.

Mail Management

This section describes concepts and procedures related to managing mail messages.

Understanding Mail Management

This section describes concepts related to mail messages.

About Mail Management

The main purpose of the mail management system is to allow dispatchers to communicate with crews without leaving the application. Crews can respond to and communicate with dispatchers from their mobile device.

Messaging is dynamic and interactive allowing the dispatcher control over communication with crews based on their shift, availability, and whether or not they are logged on. For example, the system triggers context driven messages such as sending mail to all of the crews that the dispatcher monitors.

Mail messaging also provides control over message behavior. For example, an emergency message sent to a crew's mobile device, pops up over the mobile device screen to grab the user's attention. Messages can also be tracked to show whether or not they have been acknowledged.

Users receive notifications of new messages via the **Mail Summary** zone on their dashboard. They can also review all of the messages that they have sent or received using the **My Mail** portal.

Message Creation

Users have the option of selecting from a mail template to send preset mail content for specific situations, or they can create unique messages from scratch.

Mailing lists are also available so that a predefined list of users can be selected quickly and easily.

Dispatchers can choose to send messages as normal delivery, as emergency mail, or with other special handling such as setting the message to require manual acknowledgement or setting the message to expire after a certain amount of time without being acknowledged.

Dispatchers can send mail to:

- Their monitored crews
- All crews
- Another user, typically a mobile user
- A list of predefined users in a mailing list

Crews can send mail to:

- All logged on dispatchers monitoring them
- All logged on dispatchers
- Another user, typically their supervisor(s)

About the My Mail Portal

The **My Mail** portal provides access to view mail you have received or sent.

Any user with a valid login can use this portal to see their messages. This is also useful for non-MDT or SMS crew members who do not have access to mail from a portable device.

You can create new mail, reply, acknowledge mail you received and archive your mail using this portal.

Users can also receive notifications of new messages via the **Mail Summary** zone on their dashboard.

Archive your messages to remove them from your sent or received folder for a clean work space, but to still have access to them.

Mail Summary

You can also manage your mail using the **Mail Summary Dashboard** zone. The zone includes the following features:

- Refer to the zone for notifications whenever you receive a new message.
- Select the **Mail** link on the toolbar to open the **My Mail** portal directly from the dashboard.
- Click the **New** button to start a new mail message directly from the dashboard.

Working with Mail

This section describes common tasks related to working with mail messages.

Creating a New Mail Message from a Mail Template

Use this procedure to create a new mail message from a mail template.

Prerequisites: Mailing Template must be configured.

You can start a new message in one of several ways:

- Dispatchers can right-click on a shift to send mail to the entire crew from the **CDI** portal.
- General users and dispatchers can also click the **New** button on the **Mail Summary Dashboard** zone or click the **Mail** link on the same zone to navigate to the **My Mail** portal. They can also access the **My Mail** portal directly by selecting **Main Menu > My Mail+**

After navigating to where you can create a new message, the general message creation steps are the same:

1. Click the **Use Template** button.
2. Select the appropriate template.
3. Verify that all of the message details are as you would like them to apply for the message. Make changes as appropriate.
4. Click **Send**.

Creating a New Free Form Mail Message

Use this procedure to create a new mail message.

Prerequisites: None.

You can start a new message in one of several ways:

- Dispatchers can right-click on a shift to send mail to the entire crew from the **CDI** portal.
- General users and dispatchers can also click the **New** button on the **Mail Summary Dashboard** zone or click the **Mail** link on the same zone to navigate to the **My Mail** portal. They can also access the **My Mail** portal directly by selecting **Main Menu > My Mail+**

After navigating to where you can create a new message, the general message creation steps are the same:

1. Enter a subject and message body in the appropriate fields.
2. Select additional message options, as applicable.
3. Select a message group, user or mailing list for where the message will be sent, as appropriate.
4. Click **Send**.

Archiving Messages

Use this procedure to archive your sent or received messages.

Prerequisites: You must have existing received or sent messages.

1. Access the **My Mail** portal.

Click the **Mail** link on the **Mail Summary Dashboard** zone to navigate to the **My Mail** portal. You can also access the **My Mail** portal directly by selecting **Main Menu > My Mail+**

2. Search for and open the appropriate message.
3. Click the **Archive** button.

Archiving a message removes it from your received or sent box, but allows you to search for it in the Archived folder.

Reviewing Mail Messages

Use this procedure to filter and search for mail messages.

Prerequisites: None.

1. Access the **My Mail** portal.

Click the **Mail** link on the **Mail Summary dashboard** zone to navigate to the **My Mail** portal. You can also access the **My Mail** portal directly by selecting **Main Menu > My Mail+**

2. Enter search criteria.

To see the messages that have been sent to you, select **Received** as the **Query** option. Additionally, you can search by messages that you sent or that you archived. You can also enter additional criteria to filter the list of messages further.

3. Click **Refresh**.

In the search results list, click the link for the message you want to view or edit.

Chapter 3

System Administration

This section describes the functions available from the **Admin** Menu. It provides conceptual information and instructions for performing various setup and administration tasks.

Resource Management Administration

This section describes concepts and common tasks related to resource management administration.

Understanding Resource Management Setup and Administration

This section describes entities used to support the management of resources and shifts.

About Locations

You can predefine a set of common locations, such as service centers, parts depots, or business offices, that can be selected and referenced later. For example, predefined locations can be used as logon and logoff locations for crew shifts or as meeting locations for periods of unavailability. Locations save you time and simplify data entry.

About Mobile Workers and Skills

A mobile worker is an individual workforce resource that performs work as part of a crew. A skill indicates the ability to perform certain types of work. Mobile workers can have skills; mobile worker types can have assumed skills; activity types can require skills, and skills can require a certain skill level.

A mobile worker is associated with a mobile worker type that defines attributes of the mobile worker's job description. For example, a mobile worker type can define the assumed skills of all mobile workers of that type. You can override these

settings if an individual mobile worker possesses more or fewer skills. If a mobile worker lacks assumed skills, the system lists them as missing skills on the **Mobile Worker** maintenance portal. If you attempt to allocate an activity to a crew's shift, the system warns you if a mobile worker currently allocated to that shift lacks the required skills and/or skill level.

Some skills have effective periods. For example, a skill might require a license that must be renewed every year. If a skill has an effective period, as defined in the **Limited Time** attribute for the skill, users will be required to enter an effective date and an expiration date when they assign that skill to a mobile worker.

A skill may represent a specific level of expertise within a more complex skill set. For example, a "novice inspector" skill represents a lower level of inspection expertise compared to an "expert inspector". Skill levels are used to make sure that skilled resources are being used as efficiently as possible. Schedulers are encouraged to assign a crew to an activity based on their level of skill so as not to waste more experienced resources on simple tasks, or to be sure to have a worker with a high level of skill where needed. For example, Novice Inspector would be Level 1, Standard Inspector would be Level 2 and Expert Inspector would be Level 3. If an activity requires a Novice Inspector skill the scheduler would first look for novice inspector crews before considering standard or expert inspectors. Skill level can be left blank if the skill does not require levels.

Note: When you add skill levels you Duplicate an existing skill level of the skill set. Please refer to [Defining Skills and Skill Levels](#) for more information.

Mobile workers are assigned to crew shifts. When scheduling work, the system matches the requirements of each activity to the capabilities of available crew shifts. The scheduler considers the skills and equipment of all mobile workers and vehicles allocated to a crew shift to determine which activities the crew can work on a particular shift.

You must define a mobile worker type before you can create mobile workers of that type. You must define skills before you can associate them to mobile worker types, mobile workers and activity types.

About Vehicles and Equipment

A vehicle is a workforce resource used by a crew to perform work. Equipment is any device or apparatus used to perform certain types of work. Vehicles can carry pieces of equipment needed to perform certain types of work; vehicle types can have assumed equipment; activity types can require equipment.

A vehicle is associated with a vehicle type that defines attributes common to all vehicles of that type. For example, it can define the assumed equipment of all vehicles of that type. You can override these settings if a specific vehicle possesses more or fewer pieces of equipment. If a vehicle lacks assumed equipment, the system lists it as missing equipment on the **vehicle** maintenance portal.

Equipment can also be associated with activity types, indicating that the equipment is required to perform this type of activity. You can override these settings if a specific vehicle possesses more or fewer pieces of equipment. If a vehicle lacks assumed equipment, the system lists it as missing equipment on the **vehicle** maintenance portal.

Like mobile workers, vehicles are assigned to crew shifts. When scheduling work, the system matches the requirements of each activity to the capabilities of the available crew shifts. The scheduler considers the capabilities of all mobile workers and vehicles assigned to a crew shift to determine which activities the crew can work on a particular shift. If you attempt to allocate an activity to a crew's shift, the system warns you if a vehicle currently allocated to that shift lacks the required equipment.

You must define a vehicle type before you can create vehicles of that type. You must define equipment before you can associate them to vehicle types, vehicles and activity types.

About Crews and Crew Shifts

A crew is a uniquely named group of mobile workers and vehicles that perform work in shifts. A crew shift is a planned period of time in which a crew (one or more mobile workers and vehicles) is scheduled to perform work.

For example, a crew shift might be defined as Crew A, consisting of Jack and his van, working Monday-Friday, 9 am – 5 pm.

The specific mobile workers and vehicles allocated to a crew may vary from one shift to another, and a crew may perform different types of work and cover different service areas on different shifts. Therefore, crew allocation is defined for crew shifts, not for crews. Likewise, activities are scheduled to crew shifts, not to crews.

Typically, crew shifts are automatically generated from crew shift templates that define the basic characteristics of the shifts. Shifts can also be manually created to address special situations on particular days.

About Shift Cost Profiles

Shift cost profiles define shift-based cost factors that are used as multipliers against global costs.

For example, a shift-based overtime cost of 3 means that overtime for all crew shifts associated with this profile is three times more than the overtime cost defined globally. Note that small changes to shift-based factors may result in significant schedule changes.

Global and shift-based costs are used by the scheduler to evaluate and compare possible schedule solutions. A less costly schedule is preferred over a most costly one.

When you define a shift cost profile, you can associate it to specific service classes and/or service areas. For example, you might set up a shift cost profile to discourage the scheduler from utilizing overtime for shifts covering certain areas or performing certain types of work. The service classes and service areas associated with a shift cost profile do not restrict the use of the shift cost profile in any way; you can associate any shift cost profile to any shift. Rather, the system uses these service class and service area associations to recommend appropriate shift cost profiles when you are defining crew shifts. (If you click the **Recommend Change** link next to the shift cost profile field on the **Crew Shift** portal, the system displays a list of shift cost profiles that match the current shift's service area and service class combination.)

You can assign a shift cost profile to one or more shift templates or to individual shifts. Each shift is associated with a single shift cost profile.

About Periods of Unavailability (POUs) and POU Types

A period of unavailability (POU) is a specific period of time during which one or more resources are not available to perform work, for example, while attending meetings or training sessions.

To understand the concept of POUs, it is important to understand the difference between the following objects.

POU Type

A POU type defines basic characteristics of all POUs of a particular type. For example, a POU type specifies whether POUs of that type can be recurring or not. Recurring POU types are used for events such as regular weekly staff meetings. If a POU type supports recurring POUs, it also specifies the POU template business object used to create recurring POUs of that type.

POU type also identifies the class of resource (crew, mobile worker, vehicle, etc.) that can be associated with POUs of that type. Note that multiple resources may attend the same POU event, but all resources must be of the same class. The POU itself identifies the specific resources.

POU

A POU defines the attributes of a particular period of unavailability, such as its duration, location, and the specific resources to which it applies.

When you create a POU, you must first select the POU type. If the POU type supports recurring POUs, you can create a recurring or a one-time POU of that type; if the POU type does not support recurring POUs, you can only create a one-time POU.

POUs are sometimes referred to as POU events to distinguish them from POU tasks, which occupy time on a specific crew's shift schedule.

POU Tasks and POU Task Types

A POU task is a tool for tracking crew attendance of a POU event. It is therefore only relevant to crew-related POUs (POUs for which the resource class is Crew).

A POU task does not bear specific event details; these are defined on the POU itself. The system generates POU tasks from POUs automatically, and incorporates these tasks into the schedules of all specified crews at the appropriate time. The system uses a single type of POU task, which is defined on the master configuration, to generate all POU tasks.

A POU task is dispatched to a crew, just like an activity, and its status is updated and tracked in the same way. If a POU is modified, the system automatically adds, updates, or deletes any related POU tasks, based on the type of change and the POU task's status.

About Dispatchers and Dispatcher Shifts

A dispatcher record defines the dispatch areas and key performance indicators (KPIs) that the dispatcher is allowed to monitor. (Dispatch areas identify a set of service areas and service classes.) The dispatcher record also specifies the default date range for activities to be monitored and indicates whether the dispatcher will be allowed to modify that date range when they log on to their shift.

A dispatcher shift record controls the scope of data to be monitored by the dispatcher for a particular shift. When a dispatcher logs on to start their shift, the system creates the dispatcher shift record at that time. The dispatcher can select which dispatch areas (of those specified in the dispatcher record) they want to monitor for the shift. They can also change the date range of activities to monitor for the shift, if allowed (based on settings defined in the dispatcher record).

Occasionally, as part of the shift, a dispatcher might be responsible for backing up another dispatcher by monitoring that dispatcher's alerts. Any dispatcher shift can be configured with a list of user IDs that the current dispatcher is backing up when these users are away. Alerts assigned to these dispatchers also appear on the current dispatcher's backup alert queue.

A dispatcher can log off and log on again at any time. Whenever a dispatcher logs off a shift, the system finalizes that dispatcher shift record. Whenever a dispatcher logs on to a shift, the system creates a new dispatcher shift record. From business perspective, a dispatcher's shift may be an 8-hour period from 9:00 to 5:00, but from a system standpoint, the shift lasts from logon to logoff.

Defining Locations

Use this procedure to define physical locations, such as service centers.

Prerequisites: None

To maintain existing locations, select **Admin Menu > Resource Management > Location** , then use *standard actions* to edit, duplicate, or delete a location.

To define a new location:

1. Select **Admin Menu > Resource Management > Location+** .

If your system supports more than one location type business object, you will be prompted to select a business object for this location.

2. Enter the location name and a meaningful description.

3. Provide the address of the location.

The system will attempt to find the geocode coordinates from the address you provide. If it cannot, you may be required to enter the geocode coordinates, depending on your system configuration.

4. Click **Save**.

You can now select this location as a shift logon or logoff location on the **Crew Shift** maintenance portal or select it as a POU location on the **POU** maintenance portal.

Defining Equipment

Use this procedure to define equipment needed to perform certain types of work.

Prerequisites: None

To maintain existing equipment, select **Admin Menu > Resource Management > Equipment** , then use *standard actions* to edit, duplicate, or delete the equipment.

To define a new equipment record:

1. Select **Admin Menu > Resource Management > Equipment+** .

If your system supports more than one equipment type business object, you will be prompted to select a business object for this equipment.

2. Enter a name and a meaningful description for the equipment.

3. Click **Save**.

You can now associate this equipment with an activity type, indicating that the equipment is required to work this type of activity. You can also associate it with a vehicle or a vehicle type (as assumed equipment).

Defining Skills and Skill Levels

Use this procedure to define a human skill needed to perform certain types of work.

Prerequisites: None

To maintain existing skills, select **Admin Menu > Resource Management > Skill** , then use *standard actions* to edit, duplicate, or delete a skill.

To define a new skill:

1. Select **Admin Menu > Resource Management > Skill+** .

2. Enter the skill name and a meaningful description.

3. If the skill has an effective period (such as a skill that is only valid within a licensed period), set **Limited Time** to Yes.

When this skill is assigned to a mobile worker, the system will prompt for an effective and expiration date for the skill.

4. If applicable, set a skill level to indicate the amount of knowledge or experience needed by the person with this skill.

Note: if you need to add another skill level for the same skill set you must use the **Duplicate** action and not the **Add** action. Using **Add** always creates either an independent skill, i.e. not level based, or starts a new set of skill levels. To add another skill level to an existing set you have to duplicate an existing skill level of that set. For example you first create the novice inspector using the **Add** action. Then if you want to create the standard inspector you duplicate the novice and set the proper level. By duplicating you ensure they are of the same set.

5. Click **Save**.

You can now associate this skill with an activity type, indicating that the skill is required to work this type of activity. You can also associate it with a mobile worker or a mobile worker type (as an assumed skill).

Defining Mobile Worker Types

Use this procedure to define a classification of mobile worker and identify the skills typically associated with mobile workers of that type.

Prerequisites: You must define skills before you can associate them with a mobile worker type.

To maintain existing mobile worker types, select **Admin Menu > Resource Management > Mobile Worker Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new mobile worker type:

1. Select **Admin Menu > Resource Management > Mobile Worker Type+** .

If your system supports more than one mobile worker type business object, you will be prompted to select a business object for this mobile worker type.

2. Enter a name and meaningful description.
3. Select the business object to use when creating mobile workers of this type.
4. To add or remove skills for this mobile worker type, click the + or – sign in the **Assumed Skills** section and select a skill from the drop-down.

Assumed skills can be overridden for an individual mobile worker.

5. Click **Save**.

You can now create new mobile workers of this type.

Defining Vehicle Types

Use this procedure to define a classification of vehicles and identify the equipment typically associated with vehicles of that type.

Prerequisites: You must define equipment before you can associate it with a vehicle type.

To maintain existing vehicle types, select **Admin Menu > Resource Management > Vehicle Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new vehicle type:

1. Select **Admin Menu > Resource Management > Vehicle Type+** .

If your system supports more than one vehicle type business object, you will be prompted to select a business object for this vehicle type.

2. Enter a name and meaningful description.
3. Select the business object to use when creating vehicles of this type.
4. To add or remove equipment for this vehicle type, click the + or – sign in the **Assumed Equipment** section and select the equipment from the drop-down.

Assumed equipment can be overridden for an individual vehicle.

5. Click **Save**.

You can now create vehicles of this type.

Defining Crew Types

Use this procedure to define a classification of crew.

Prerequisites: None

To maintain existing crew types, select **Admin Menu > Resource Management > Crew Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new crew type:

1. Select **Admin Menu > Resource Management > Crew Type+** .

If your system supports more than one crew type business object, you will be prompted to select a business object for this crew type.

2. Enter a name and meaningful description.
3. Select the business object to use when creating crews of this type.
4. Click **Save**.

You can now create crews of this type.

Defining Period of Unavailability Types

Use the **Period of Unavailability Type** portal to define a type of period of unavailability (POU), such as a meeting or training session for crews, maintenance for vehicles, or leave time for mobile workers.

Prerequisites: None

To maintain existing period of unavailability types, select **Admin Menu > Resource Management > Period of Unavailability Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new period of unavailability type:

1. Select **Admin Menu > Resource Management > Period of Unavailability Type+** .

If your system supports more than one period of unavailability type business object, you will be prompted to select a business object for this POU type.

2. Enter the POU type name and a meaningful description.
3. Select the resource class associated with this POU.

The resource class selection determines which resources can be associated with POUs of this type. For example, if you select **Mobile Worker** as the resource class, then you will be able to associate one or more mobile workers with POUs of this type and the system will automatically incorporate POU tasks into the schedules of those mobile workers at the appropriate time.

4. Select the business object to use when creating POUs of this type.
5. Select the business object to use when creating POU templates of this type.
POU templates are used to create recurring POUs.
6. Click **Save**.

You can now create periods of unavailability based on this type.

Defining Shift Cost Profiles

Use this procedure to define shift-based scheduling cost factors that serve as multipliers against global costs.

Prerequisites: You must define service areas and service classes before you can associate them to a shift cost profile.

To maintain existing shift cost profiles, select **Admin Menu > Resource Management > Shift Cost Profile** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new shift cost profiles:

1. Select **Admin Menu > Resource Management > Shift Cost Profile+** .
2. Enter a name and meaningful description.
3. Specify the shift-based cost factors that will be used as multipliers against global costs.
4. Select the service areas to which the profile applies.
If you do not select any, the profile will apply to all service areas.
5. Select the service classes to which the profile applies.
If you do not select any, the profile will apply to all service classes.
6. Click **Save**.

You can now associate this shift cost profile with a crew shift template, so that it will be applied to all crew shifts generated from the template.

Defining Shift Types

Use this procedure to define basic attributes associated with a type of crew shift, such as its start time and duration.

Prerequisites: None

To maintain existing shift types, select **Admin Menu > Resource Management > Shift Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new shift type:

1. Select **Admin Menu > Resource Management > Shift Type +**.
If your system supports more than one shift type business object, you will be prompted to select a business object for this shift type.
2. Enter a name and meaningful description.
3. Enter the start date and duration for all shifts of this type.
4. Select the business object to use when creating shifts of this type.
5. Select the business object to use when creating shift templates of this type.
6. Click **Save**.

You can now create crew shifts and crew shift templates based on this type.

Defining Dispatcher Types

Use this procedure to define a type of dispatcher resource.

Prerequisites: None

To maintain existing dispatcher types, select **Admin Menu > Resource Management > Dispatcher Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new dispatcher type:

1. Select **Admin Menu > Resource Management > Dispatcher Type+** .

If your system supports more than one dispatcher type business object, you will be prompted to select a business object for this dispatcher type.

2. Select the business object to use when creating dispatcher records of this type.
3. Click **Save**.

You can now create new dispatchers of this type.

Service Management Administration

This section describes concepts and common tasks related to service management administration.

Understanding Service Management Setup and Administration

This section describes the entities used to support service management and dispatcher functions.

About Task Types

A task type defines default attributes for all tasks of a particular type. A task is any activity, period of unavailability (POU), or break that occupies time on a crew shift's schedule.

Task types are described below:

- **Activity Type:** An activity is a task to be performed at a specific location. The activity's type defines skills and equipment required to work activities of this type as well as details about how the activities should be dispatched, prioritized, and scheduled. The activity type also defines which predefined standard remarks are valid when completing activities of this type.
- **Break Type:** Break type specifies the duration of the break and duration of the break window (period of time during which the break can be taken).
- **Non Productive Task Type :** Specifies the duration of the non productive task and duration of the task window (period of time during which the task should be scheduled).
- **POU Task Type:** The system uses a single POU Task Type (specified in the master configuration) to create all POU tasks for a crew-related POU. The POU task type does not contain any specific attributes; the attributes are defined in the POU record.

About Priority Profiles

A priority profile defines allocation factors used to prioritize the scheduling of activities.

Priority profiles are associated to activity types, indicating that the settings defined in the priority profile should be applied to all activities of that type.

The priority profile defines the following attributes:

- The sequence in which activities will be displayed in application screens.
- Whether or not allocation is mandatory or optional. If mandatory the activity will be allocated to a crew shift regardless of cost. If optional, allocation is driven by costs. Note that emergencies are typically set as mandatory.
- The allocation priority window, which may remain constant throughout the activity's arrival time window or may be more critical at the beginning or end of this window. For example, short-cycle, SLA-oriented work is critical at the beginning of the window and diminishes after that. Long-cycle work, such as meter inspections, is low priority in the beginning of the window and becomes critical toward the end.
- Initial and final priority. Initial priority applies until the priority window starts. Final priority applies once the priority window ends. During the priority window itself, priority is calculated as a linear function between the initial and final values.

About Auto-Dispatching

This topic describes the auto-dispatch process.

Dispatching is an action that locks a task's sequence in the shift schedule so no further optimization takes place and marks it as ready to be sent to the crew. Dispatching can be either manual (initiated by a dispatcher) or automatic (performed by the system without user initiation).

Note the following regarding auto-dispatching:

- Automatic dispatching applies only to a started shift. Until the crew starts their shift, the system does not automatically mark any task as ready to be dispatched.
- Manual dispatching applies to activities only. Breaks and POU tasks are always automatically dispatched.
- A dispatcher may manually request to dispatch an activity at any time. If a crew's shift has not started yet, then the activity remains queued for dispatch until the crew starts the shift.

You can enable or disable automatic dispatching of activities globally or for specific crew shifts or activity types.

Setting Auto Dispatch Globally

To enable or disable auto dispatching globally, set the **Enable Auto Dispatch** scheduler parameter to True or False in the scheduler configuration. (This is listed under Real Time parameters on the Scheduler Configuration portal.) If set to True (checked), auto dispatching of activities is enabled globally, but can be disabled at the activity or shift level. If False (unchecked), auto dispatching is disabled and cannot be enabled at the shift or activity level.

Setting Auto Dispatch for Crew Shifts

To enable or disable auto dispatching at the crew shift level, set the following attributes for a particular crew shift or crew shift template:

- **Drip Mode:** Indicates how the system should handle dispatching of activities to the crew shift. Valid options are:
 - None:** Automatic dispatching is disabled. All scheduled activities must be manually dispatched to the crew by the dispatcher or by another system-invoked process.

All: All scheduled activities are automatically dispatched to the crew and any additional activities scheduled throughout the shift are also auto-dispatched. This excludes any activities where the **Auto Dispatch** attribute is set to No on their Activity Type.

Standard: Only a fixed number of scheduled activities are automatically dispatched to the crew at any given point of time. The fixed number is specified in the Drip Horizon. Note that if an activity's type does not allow automatic dispatching, the activity will not be assigned to shifts that are set to Standard drip mode.

- **Drip Horizon:** Number of activities that can be dispatched to a crew at any time. Valid only if Drip Mode is set to Standard.

Setting Auto Dispatch for Activity Types

To enable or disable auto dispatching for a particular activity type, set the **Auto-Dispatch** attribute at the activity type level. If set to Yes, activities of this type will be automatically dispatched to the assigned crew. If set to No, activities of this type will not be automatically dispatched, overriding the global or shift-based auto-dispatch settings.

Note: Preventing certain types of activities from being automatically dispatched is applicable only if auto-dispatch is enabled globally and the Drip Mode of the crew shift is set to All. Manual dispatching is not allowed if a shift is being drip fed tasks (Drip Mode of Standard).

Scheduler Configuration Settings

The scheduler configuration defines additional scheduler parameters affecting auto dispatching. These are typically defined at implementation and should not need to be changed. These additional parameters are listed below (and described in the Configuration Guide and in the embedded help available from the **Scheduler Configuration** maintenance portal):

- Break Dispatch Mode
- POU Dispatch Mode
- Auto Dispatch Stability Period
- Auto Dispatch Interval
- Auto Dispatch On Completion
- Auto Dispatch Time Horizon
- Emergency Dispatch Mode

About Service Classes

A service class is a broad categorization of activity types. Activity types can belong to more than one service class.

Service classes are associated with the following objects:

- **Crew Shifts:**

A crew shift may be associated with one service class of work that is defined as the primary function of the crew on that shift. This is considered the preferred service class. The scheduler is encouraged to assign work of the preferred type over non-preferred work to a crew shift.

A crew shift may also be associated with one or more services classes it is not allowed to perform. This association is used to discourage the scheduler from assigning certain classes of work to the shift; however, a dispatcher can allocate any class of work to any crew.

Example: The system sends a shift to the scheduler specifying class A as the preferred service class and classes C and D as not allowed. Activities belonging to service class A, B, or E are all allowed on the shift, but an activity belonging to class A is preferred.

A crew shift can designate one service class for which a percentage of its capacity is reserved.

- **Shift Cost Profiles:** A shift cost profile can be associated to specific service classes and/or service areas. These associations do not restrict the use of the shift cost profile in any way; you can associate any shift cost profile to any

shift. Rather, the system uses these associations to recommend appropriate shift cost profiles when you are defining crew shifts.

- **Dispatch Areas:** A dispatch area is a predefined set of service areas and service classes that determine which activities and crew shifts a dispatcher is responsible for monitoring.
- **Activity Type:** An activity type can belong to one or more service classes of work.

About Service Areas

A service area is a logical boundary of an organization's territory that may or may not be based on geography.

Service areas are associated with the following objects:

- **Activities:** Each activity is associated with a single service area.
- **Mobile Workers:** Mobile workers may typically work in specific service areas, which comprise their base service areas.
- **Crew Shifts:** Each crew shift has a list of service areas in which its crew is allowed to work and service areas in which it is preferred to work. Lower costs are typically associated with preferred service areas.
- **Shift Cost Profiles:** A shift cost profile can be associated to specific service classes and/or service areas. These associations do not restrict the use of the shift cost profile in any way; you can associate any shift cost profile to any shift. Rather, the system uses these associations to recommend appropriate shift cost profiles when you are defining crew shifts.
- **Periods of Unavailability (POUs):** If a crew-related POU is associated with a service area, the scheduler will include a task for that POU in the schedules of associated crews that are covering any of these areas at the time of the POU event.
- **Dispatch Areas:** A dispatch area is a predefined set of service areas and service classes that determine which activities and crew shifts a dispatcher is responsible for monitoring.
- **Scheduler Areas:** A scheduler area is a predefined set of service areas, or subsets of them, covered by a particular scheduler.
- **Override Time Windows:** An override time window applies to a specific activity type and may be further restricted to specific service areas.

About Dispatch Areas

A dispatch area is a predefined set of service areas and service classes that can be monitored by one or more dispatchers.

Dispatch areas are associated to dispatcher records, indicating which areas the dispatchers are allowed to monitor. When dispatchers log on to start their shift, they can select which of the authorized dispatch areas they will monitor during that shift.

The system determines which activities and crews the dispatcher is responsible for monitoring during their shift based on the selected dispatch areas:

- A crew's shift matches a dispatch area if at least one of the shift's service areas and at least one of its allowed service classes are included in the dispatch area definition.
- An activity matches a dispatch area if its service area and at least one of its service classes are included in the dispatch area definition.
- It is enough for an activity or shift to match one of the monitored dispatcher areas to be monitored by the dispatcher.
- A single dispatch area may be monitored by multiple dispatchers.

Dispatch areas are also used when forwarding alerts, to ensure that alerts are sent to the proper dispatchers.

About Alert Types

Alert types define common attributes and behavior associated with conditions that require human attention, or alerts.

The alert type can specify a creation algorithm that monitors system data and raises an alert if needed. A creation algorithm is not required if there is another mechanism that raises alerts of this type. The alert creation algorithm is called by the alert type batch monitor process. This process should be scheduled to run frequently to ensure that alerts are raised in a timely manner.

The alert type can also specify an evaluation algorithm that checks to see whether the underlying condition for an alert of this type has been resolved so the alert can be automatically closed.

Note: The alert evaluation algorithm is called by the alert batch monitor, which should be scheduled frequently enough to ensure that alerts are evaluated and recycled in a timely manner.

The alert type can also be defined with the following:

- A priority level for an alert type, which controls the order in which the alerts of this type are displayed in the alert queue.
- A creation threshold time, in minutes. For example, a crew idle alert is raised if a crew is idle more than the amount of time specified in the creation threshold.
- The length of time before the alert automatically expires or is recycled to another dispatcher. If the currently assigned dispatcher does not respond to the alert within this number of minutes, the system reassigns the alert to another dispatcher.
- A snooze feature, similar to the snooze on an alarm clock. You can set the length of time to snooze (stop issuing alerts) before redisplaying alerts of this type in the alert queue. Snoozing is not available for some alerts, such as those for missed appointments or other events that happened in the past.
- Enable or disable the manual close option for an alert type. If manual close is not enabled, then the condition that raised the alert must be cleared in order for the alert to be closed.
- Whether or not a sound is played when the alert appears in the dispatcher's queue to better attract the dispatcher's attention. A sound is only played if a sound file and parameters are set up on the master configuration.
- An e-mail address where messages will be sent if an alert is raised and no available dispatcher can be found to address it.
- A listing of activity types that can be used to restrict this alert type.

About Key Performance Indicators (KPIs)

Key performance indicators (KPIs) are quantifiable measurements used to monitor and evaluate performance.

KPIs are displayed on the **KPI Summary** zone on the **CDI** portal and support dispatcher decision making and in-day exception handling. A KPI is either crew shift-oriented (for example, the number of idle crews) or activity-oriented (the number of appointments in jeopardy). The user can click a KPI to narrow the scope of data to better address those shifts or activities contributing to the KPI. Clicking a shift-oriented KPI typically impacts only the data displayed in the **Gantt** zone, while clicking an activity-oriented KPI impacts both the Scheduling Gantt and the Activity Search.

If a KPI is actionable, the KPI will appear as a link on the **KPI Summary** zone. This allows the dispatcher to drill in to a **KPI-specific** portal where actions can be taken to address the underlying condition. If a KPI is not actionable, the KPI appears as plain text for information purposes only.

Each KPI has an associated plug-in (algorithm) that defines how the KPI is calculated. The plug-in also identifies which shifts to include in the Scheduling Gantt and which activities to include in the Activity Search when the user drills in to the **KPI-specific** portal.

Alert Based KPIs

When you define a KPI, you must specify the algorithm used to calculate the KPI and indicate whether or not the KPI is alert-related. If a KPI is alert-related, you must also specify the corresponding alert type. (If the KPI is alert-related, an alert condition is associated with the same underlying conditions as the KPI.) The KPI record also defines the normal, warning and severe thresholds values for the KPI. If the KPI value is less than the normal threshold, the KPI will not be presented to the dispatcher, even if it is actionable.

KPIs and Dispatchers

KPIs are associated to dispatcher records, indicating which KPIs will be monitored during the dispatcher shifts. A dispatcher is not allowed to choose which KPIs to monitor when they start their shift. Instead the list of KPIs that they are assigned to monitor is defined on the dispatcher record.

Alert based KPIs count the number of related alerts for activities/shifts that the dispatcher actively monitors regardless of whether or not they are assigned to that dispatcher in the alert queue. For example, if there are multiple dispatchers covering the same dispatch area the KPI counts would appear for all of these dispatchers even though the alerts would not necessarily be assigned to all of them.

About Appointment Booking Groups

Appointment booking groups define one or more valid time windows for appointment booking.

Some activities require an appointment to be made with the customer to ensure that the crew will have proper access to the service location. The host system uses the Appointment Booking XAI inbound service to request a list of available appointments for an activity prior to interfacing it.

When the system receives an appointment booking request from the host, it uses the appointment booking group specified on the request to identify the actual time windows during which appointments can be scheduled. If no appointment booking group is supplied by the host, the system uses the activity type's default appointment booking group.

Defining Alert Types

Use this procedure to define common attributes and behavior associated with alerts of a given type.

Prerequisites: None

To maintain existing alert types, select **Admin Menu > Service Management > Alert Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new alert type:

1. Select **Admin Menu > Resource Management > Alert Type+** .

If your system supports more than one alert type business object, you will be prompted to select a business object for this alert type.

2. Complete the fields in the **Main** section.
3. Click **Save**.

You can now create alerts of this type. You can also associate this alert type to key performance indicators (KPIs).

Defining Dispatch Areas

Use this procedure to define a set of service areas and service classes that determine which activities and crews a dispatcher is responsible for monitoring.

Prerequisites: You must define service areas and service classes before you can associate them to a dispatch area.

To maintain existing dispatch areas, select **Admin Menu > Service Management > Dispatch Area** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new dispatch area, follow these steps:

1. Select **Admin Menu > Service Management > Dispatch Area +**.

If your system supports more than one dispatch area business object, you will be prompted to select a business object for this dispatch area.

2. Enter a name and meaningful description.

3. Select the service areas to be monitored by this dispatch area.

If you do not select any, the dispatch area will cover all service areas.

4. Select the service classes of work to be monitored by this dispatch area.

If you do not select any, the dispatch area will cover all service classes.

5. Click **Save**.

You can now associate this dispatch area with one or more dispatcher records.

Defining Key Performance Indicators (KPIs)

Use this procedure to define a quantifiable measurement that supports dispatcher decision making and in-day exception handling.

Prerequisites: If a KPI is alert-related, you must define alert types before you can associate them to KPIs. Each KPI is associated to a plug-in that determines how the KPI is calculated. The plug-in and the calculation algorithm must have been previously defined.

To maintain existing KPIs, select **Admin Menu > Service Management > KPI** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new KPI, follow these steps:

1. Select **Admin Menu > Service Management > >KPI +**.

If your system supports more than one KPI business object, you will be prompted to select a business object for this KPI.

2. Complete the fields in the **Main** section.

3. Click **Save**.

You can now associate this KPI with dispatchers, so they will be able to monitor the KPI during their shifts.

Defining Priority Profiles

Use this procedure to define a set of allocation factors used by the scheduler to prioritize the scheduling of an activity relative to other activities.

Prerequisites: None

To maintain existing priority profiles, select **Admin Menu > Service Management > Priority Profile** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new profile, follow these steps:

1. Select **Admin Menu > Service Management > Priority Profile+ .**

If your system supports more than one priority profile business object, you will be prompted to select a business object for this priority profile.

2. Complete the fields in the **Main** section.
3. If you selected **Start Window** or **End Window** as the Offset option, complete the fields in the **Allocation Priority Window** section.
4. Click **Save**.

You can now associate this priority profile with one or more activity types.

Defining Remark Types

Use this procedure to define a particular type of comment that can be entered when an activity is completed.

Prerequisites: None

To maintain existing remark types, select **Admin Menu > Service Management > Remark Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new remark type:

1. Select **Admin Menu > Service Management > Remark Type+** .

If your system supports more than one remark type business object, you will be prompted to select a business object for this re mark type.

2. Enter a name and meaningful description for the remark type.
3. Click **Save**.

You can now associate this remark type with an activity type, indicating that remarks of this type can be entered by a crew when the activity is completed.

Defining Service Areas

Use this procedure to define a logical boundary of an organization's territory that may or may not be based on geography.

Prerequisites: None

To maintain existing service areas, select **Admin Menu > Service Management > Service Area** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new service area:

1. Select **Admin Menu > Service Management > Service Area+** .

If your system supports more than one service area business object, you will be prompted to select a business object for this service area.

2. Enter the service area name and a meaningful description.
3. Click **Save**.

You can now associate this service area with one or more mobile workers, dispatch areas, shift cost profiles, scheduler areas, or crew shifts.

Defining Service Classes

Use this procedure to define a broad categorization of activity types that can be used to restrict a crew shift to performing certain types of work.

Prerequisites: You must define activity types before you can associate them with a service class.

To maintain existing service classes, select **Admin Menu > Service Management > Service Class** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new service class:

1. Select **Admin Menu > Service Management > Service Class +**.

If your system supports more than one service class business object, you will be prompted to select a business object for this service class.

2. Enter a name and meaningful description for the service class.
3. Select one or more activity types that belong to this service class.
4. Click **Save**.

You can now associate this service class with one or more shift cost profiles, dispatch areas, or crew shifts.

Defining Task Types

A task type defines the attributes of a particular type of activity, period of unavailability, or break.

Defining Activity Types

Use this procedure to define activity type attributes.

Prerequisites: You must define the following objects before you can associate them to an activity type:

- Priority profile
- Appointment booking group
- Skill
- Equipment
- Remark type
- Additional objects may be required based on the activity type and your system's configuration

To maintain existing activity types, select **Admin Menu > Service Management > Task Type** , then use *standard actions* to edit, duplicate, or delete an activity type record.

To define a new activity type:

1. Select **Admin Menu > Service Management > Task Type+ .**

If your system supports more than one activity type business object, you will be prompted to select a business object for this activity type.

2. Complete the fields in the **Main** section to define the basic attributes of the activity type.
3. In the **Skill** section, specify the number of mobile workers and the skills required to perform this activity.

4. Select the equipment required to perform this type of activity.
5. Select the type of completion remarks that are valid for this activity type.
6. 6. Indicate whether or not this activity type is eligible to be created as an assist activity.
If set to yes, an activity of this activity type can be created and scheduled to be worked by an assisting crew if the original crew needs assistance in completing the assignment.
7. Specify the To Do Types and Roles associated with activities of this type. To Do entries will be generated automatically when certain predefined conditions occur.
8. Click **Save**.

You can now create new activities of this type. You can also associate this activity type with one or more shift cost profiles, dispatch areas, or crew shifts.

Defining Period of Unavailability Task Types

Use this procedure to define types of POU tasks used for tracking crew attendance of a POU event.

The system uses a single POU task type, specified in the master configuration, to create all POU tasks. This POU task type is typically defined during implementation and should not need to be changed. The POU task type does not contain any specific attributes; the attributes of the POU are defined in the POU record.

Prerequisites: None

To maintain existing POU types, select **Admin Menu > Service Management > Task Type** , then use *standard actions* to edit, duplicate, or delete a POU task type record.

To define a new POU task type:

1. Select **Admin Menu > Service Management > Task Type+** .
If your system supports more than one POU task type business object, you will be prompted to select a business object for this task type.
2. Enter the task type name and a meaningful description.
3. Select the business object to use when creating POU tasks of this type.
4. Click **Save**.

Defining Break Types

Use this procedure to define types of breaks that can be added to crew shift schedules.

Prerequisites: None

To maintain existing break types, select **Admin Menu > Service Management > Task Type** , then use *standard actions* to edit, duplicate, or delete a break type record.

To define a new break type, follow these steps:

1. Select **Admin Menu > Service Management > Task Type +** .
If your system supports more than one break business object, you will be prompted to select a business object before continuing.
2. Enter a name and meaningful description for the break type.
3. Enter the break window duration and the break duration.
4. Select the business object to use when creating breaks of this type.

5. Click **Save**.

You can now add breaks of this type to crew shifts.

Defining Non Productive Task Types

Use this procedure to define types of non productive tasks that can be added to crew shift schedules.

Prerequisites: None

To maintain existing non productive task types, select **Admin Menu > Service Management > Task Type** , then use *standard actions* to edit, duplicate, or delete a non productive task type record.

To define a new non productive task type:

1. Select **Admin Menu > Service Management > Task Type** +.
2. Select a business object for the non productive task type.
3. Enter a name and meaningful description for the non productive task type.
4. Enter the scheduling window duration and the duration of the non productive task
5. Select the business object to use when creating non productive tasks of this type.
6. Click **Save**.

You can now add non productive tasks of this type to crew shifts.

Defining Appointment Booking Groups

Use this procedure to define a set of valid time windows for scheduling appointments.

Prerequisites: None

To maintain existing appointment booking groups, select **Admin Menu > Service Management > Appointment Booking Groups** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new appointment booking group:

1. Select **Admin Menu > Service Management > Appointment Booking Group**+ .
2. In the **Time Windows** section, use the + and – signs to add and remove time windows. Enter the beginning and ending day and time for each time window that is valid for this appointment booking group.
3. Click **Save**.

You can now associate this appointment booking group to one or more activity types.

Transfer of Goods Administration

This section describes concepts and common tasks related to transfer of goods administration.

Understanding Transfer of Goods Management

Transfer of goods management refers to the creation of depots and all aspects of depot functions such as; depot profiles, depot task types, depot time windows and depot override time windows.

About Depots

A depot is a central location where goods are loaded for delivery or collected goods are unloaded. Depot functionality enables the scheduling of drop-off or pick-up activities tied to specific Depot locations.

Two types of depot profiles can be defined:

- **Distribution** - a depot where crews pick up goods for delivery.
- **Collection** - a depot where crews drop off goods picked up from customers.

Note: If a Depot location can function as both a distribution and a collection depot, one depot of each type should be created to refer to the same location.

About Depot Profiles

Depot profiles can be set up to establish common settings for site delay, access time windows and service time windows across multiple depots. All other details are defined on each individual depot.

If a depot refers to a profile, the settings established by the profile cannot be overwritten. However, anything that is changed on the depot profile is also changed on any depot that references the profile.

The access time windows define time slots during which the depot is accessible for work. They also establish capacity limits which represent metrics such as maximum weight, maximum volume, or any other measurement.

The service time windows define preferred time windows within the normal operational hours. Lower cost is associated with scheduling work during preferred service time. Multiple depots can share this information by referring to a depot profile which also has these values defined.

About Depot Task Types

Depot task is a tool for tracking the crew's travel, arrival and completion of the depot visit.

The system generates depot tasks as needed when planning depot runs to and from depot centers. The system uses a single type of depot task, which is defined on the master configuration, to generate all depot tasks. A depot task is dispatched to a crew, just like an activity, and its status is updated and tracked in the same way.

About Breaks at Depots

The system can also be configured to designate breaks which can only be taken at a depot. If a shift is not scheduled for depot work, the break is scheduled as a standard break.

Defining Depot Profiles

Use this procedure to define depot profiles that will be used to establish common settings for site delay, access time windows and service time windows across multiple depots.

To maintain existing depot profiles, select **Admin Menu > Resource Management > Depot** , then use standard actions. To define a new depot profile:

1. Select **Admin Menu > Resource Management > Depot+** .

You will be prompted to select a depot profile business object before continuing.

2. Enter a name and meaningful description for the depot profile.
3. Select the depot class to determine whether this is a profile for a distribution depot or a collection depot.
4. Enter a numerical value to indicate the site delay.

Site delay is a fixed delay involved in transferring goods in the depot. For example the amount of time needed to access the depot center on each visit regardless of specific goods being transferred.

5. Enter start and end dates and time to determine the Access Time Windows and Service Time Windows.
6. Select the business object to use when creating depots of this type.
7. Click **Save**.

Defining Depots

Use this procedure to define depots that will indicate distribution or collection locations for crew shifts.

Prerequisites: The depot location is specified by referencing a common location

To maintain existing depots, select **Admin Menu > Resource Management > Depot** , then use *standard actions*.

To define a new depot, follow these steps:

1. Select **Admin Menu > Resource Management > Depot+**

You will be prompted to select a depot business object before continuing.

2. Enter a name and meaningful description for the depot.
3. Select the depot class to determine whether this is a profile for a distribution depot or a collection depot.
4. Select a depot profile if you want the depot to use predefined values for the site delay and time windows depot configuration.
5. Enter an expiration date, if applicable.

The expiration date indicates if the depot will not be available after a certain date.

6. If you have not references a depot profile, Enter or modify date and time values for the time windows.

Defining Depot Task Types

Use this procedure to define the type of depot task the scheduler would use to create depot tasks. There should only be one such task type and it needs to be referenced on master configuration.

Prerequisites: None

To maintain existing depots, select **Admin Menu > Service Management > Task Type** , then use *standard actions* .

To define a new depot:

1. Select **Admin Menu > Service Management > Task Type+**

If your system supports more than one depot business object, you will be prompted to select a business object before continuing.

2. Enter a name and meaningful description for the depot type.

3. Enter the depot window duration and the depot duration.

4. Select the business object to use when creating depots of this type.

5. Click **Save**.

You can now add depot tasks of this type to crew shifts.

Device Management Administration

This section describes concepts and common tasks related to device management administration.

Understanding Device Management

Device management refers to the packaging and delivery of application components to a mobile device terminal (MDT).

About Deployments

A deployment refers to a specific cut or build of a deployment type for a specific language. It represents a packaged application to be delivered to a mobile data terminal (MDT).

Developing mobile application components, such as business objects, UI maps, and service scripts, is done using the same development tools used for the main application. Once the mobile application components have been developed and tested, they must be gathered together and packaged for delivery. This is referred to as the deployment process.

Each deployment belongs to a specific **deployment type** that defines attributes of the application to be deployed, including the authorized user groups (user groups associated with a deployment type have access to all modules and functions in that deployment type), supported MDT types, messages used, and application objects included. The deployment type specifies which application objects are included by referencing one or more deployment parts.

A **deployment part** is a collection of application components, such as business objects, UI maps, service scripts, etc. Deployment parts provide a way to create reusable groups of application components. To create a deployment part, you must first gather the application components together into a bundle and then upload the bundle entities to the deployment part.

A deployment can only be created using the batch deployment process. The user creates a batch job submission using the batch code for deployment creation. Once the batch job runs and the deployment has been created, the user must manually

activate the deployment before it can be deployed to any devices. Use the **Deployment** maintenance portal to view existing deployments and change the status (activate or inactivate).

Once a deployment has been activated, it is available for download to MDTs. When the mobile user logs on, the system looks for the most recent version of all active, qualified deployments based on the user's user group, language, and MDT type.

- If no deployments are found, the system displays an authorization error message and prevents the user from continuing.
- If only one deployment is found and it is newer than the one currently deployed or there is none currently deployed, then the deployment is downloaded to the MDT.
- If only one deployment is found and it is the same as the one currently deployed, then the deployment is not downloaded.
- If more than one deployment is found, the user can select the one they want to download. Once the application components defined in the deployment are downloaded to the MDT, the user can begin using the system.

Note: The new deployment will not be downloaded if unprocessed data from a previous shift still exist on the device. If the user is authorized to use the deployment currently on the device, it will be used; otherwise, an authorization error will be displayed.

MCP Versioning

The MCP communication architecture involves both client side and a server side pieces. These must be compatible or else errors will occur.

To enforce compatibility, the system validates the MCP version as follows:

- When the MDT attempts to connect to the server, the system versioning check validates whether or not the MCP Version on the MDT is compatible with the MCP version on the server. If the versions are not compatible, the device is not allowed to work online and no communication is sent to/from the server. In this situation, the MDT must be upgraded to the correct version before it can work online again. If there was data on the MDT, the user can continue offline and manually collect any data they need before the MDT is upgraded. If a user tries to log on with an incompatible MCP on their device, they receive a message.
- When a deployment is created on the server, it is marked with the version number of the server side MCP Components that created it. Then when a MDT logs on to download a deployment, only deployments with compatible MCP Version can be downloaded. This prevents getting into the situation above.

Before the server is upgraded, all MDT's should end shift and be allowed to logoff. This will prevent the need for manual data copying.

The About screen on the MDT shows the MCP version number. This version is also marked on the MDT record on the online MDT screen. Deployments show the MCP Version as well on the online user interface.

About Data Encryption

You have the option of enabling or disabling data encryption by altering the master configuration setting, Data Encryption, to either On or Off.

Each MDT Type also has a Data Encryption setting which you can set to "Default," "On," or "Off." If this is set to "Default" the MCP uses the setting from master configuration. Otherwise the MDT Type takes the localized setting of on or off.

About MDTs and MDT Types

An MDT Type defines default attributes, such as the display and GPS settings, for all MDTs of that type. In addition the MDT Type may define a list of device capabilities representing features or functions supported by mobile devices of the type. This includes functions such as capturing photo or sound, or launching a geographic map.

When enabled, MDT users can capture digital content such as pictures and voice recordings related to an activity which are sent to the server as an attachment linked to the activity and may be viewed on the **Activity** portal. The content is also accessible later on the MDT.

You must create an MDT record for each device that will communicate with the main server application. Mobile application users log on to a particular MDT from the mobile application. The first time a mobile user runs the mobile application, they will be required to register their MDT. The system will ask for the Device Tag (assigned when the MDT record is created on the server) and the URL of the server application. As part of the registration process, the system creates a unique registration ID and saves it in the MDT record. Once the device is registered, the mobile user will be able to log on to the application from that device without further prompting.

Defining Deployment Types

Use this procedure to define attributes of an application to be deployed, including all deployment parts, authorized user groups, supported MDT types, and associated message categories.

Prerequisites: You must define all deployment parts, user groups, MDT types, and message categories before you can associate them to a deployment type.

To maintain existing deployment types, select **Admin Menu > Device Management > Deployment Type** , then use [standard actions](#) to edit, duplicate, or delete a record.

To define a deployment type, follow these steps:

1. Select **Admin Menu > Device Management > Deployment Type+** .
2. If prompted, select the deployment type business object and click **OK**.
3. Enter a unique name for the deployment type and provide meaningful descriptions.
4. Select the service script to be executed when application starts.
5. Add all deployment parts, MDT types, message categories, and user groups associated with this deployment type.
6. Click **Save**.

You can now create deployments of this type.

Defining Deployment Parts

Use this procedure to define a collection of deployment items, such as maintenance objects, business objects, UI maps, service scripts, business object schemas, algorithms, etc. A deployment type is made of deployment parts.

Prerequisites: You must define the export bundle containing the items that comprise this deployment part before you can upload them to the deployment part.

To maintain existing deployment parts, select **Admin Menu > Device Management > Deployment Part** , then use [standard actions](#) to edit, duplicate, or delete a record.

To define a new deployment part, follow these steps:

1. Select **Admin Menu > Device Management > Deployment Part+** .
2. If prompted, select the deployment part business object and click **OK**.
3. Enter a name and meaningful description.
4. Select the bundle containing the items that comprise this deployment part.
5. Click **Upload** to upload the items in the bundle.

The bundle items are displayed in the **Entities** list. When you upload bundle entities, the system replaces all existing entities with the uploaded entities from the bundle.

6. If you want to remove an entity from this **Deployment Part** list, click the - sign to the left of the object in the **Entities** list.
7. Click **Save**.

You can now add this deployment part to a deployment.

Defining MDT Types

Use this procedure to define the attributes associated with a particular type of MDT, such as the display type and GPS settings.

Prerequisites: None

To maintain existing MDT types, select **Admin Menu > Device Management > MDT Type** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new MDT Type:

1. Select **Admin Menu > Device Management > MDT Type+** .
2. If prompted, select the MDT type business object and click **OK**.
3. Enter a unique name for the MDT type and provide meaningful descriptions.
4. Select the display type and GPS settings, then enter interval and timeout values.
5. Select the business object to use when creating MDTs of this type.
6. Click **Save**.

You can now create MDTs of this type.

Defining MDTs

Use this procedure to define mobile data terminals that will communicate with the base application to send and receive work order information.

Prerequisites: You must define the MDT Type before you can create MDTs of that type.

To maintain existing MDTs, select **Admin Menu > Device Management > MDT** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new MDT:

1. Select **Admin Menu > Device Management > MDT+** .
2. If prompted, select the MDT type and click **OK**.
3. Enter a unique ID for the device in the **Device Tag** field.

4. Enter the serial number of the device.
5. Enter values for logging and update intervals.
6. Click **Save**.

Make note of the Device Tag value. The first time a user logs onto the mobile application from this device, the system will prompt for this value. The Device Tag is required to register the mobile application to the MDT.

Changing the MDT Log Level

To change the logging level for a device, click the **Set Current Log Level** button on the **MDT** portal and then select the desired logging level (such as INFO or ERROR). An asynchronous request is sent to the device to update its logging level. Once the MDT is updated, it will send a response back to the server to update the Current Log Level for the device on the server.

Activating and Deactivating MDTs

When an MDT record is created, its status is set to Active. Use the **Inactivate** action button on the **MDT** portal to set the status to Inactive. The system will not allow users to log on to the mobile application from an inactive device. Use the **Activate** button on the **MDT** portal to set the status from Inactive to Active.

Getting the MDT Log Files

Log files are not sent to the server automatically; they are only sent on demand, usually for debugging or tracing purposes.

To send log files for a device to the server, click the **Get MDT Log Files** button on the **MDT** portal. This initiates a request to the device to send the active log files to the server. See the Configuration Guide for more information about MDT logging.

Use the **Log Files** tab to view the contents of the log files.

Creating Deployments

Use this procedure to create a new deployment using the batch deployment process.

Prerequisites: You must have already created the deployment type and any deployment parts, MDT types, message categories, service scripts, and user groups associated with the deployment type.

1. Select **Main Menu > Batch > Batch Job Submission+** .
2. Do not enter a value in the **Batch Job ID** field. This will be assigned automatically by the system.
3. In the **Batch Code** field, select the batch control ID of the deployment creation batch control. (The base system provides batch control M1-DPLOY for this purpose.)
4. Enter batch control settings as desired.

The Desired Execution Date/Time defaults to the current date and time. If you want the batch job to run immediately, accept the default. If you want the job to execute at a future date, enter the date and time you want the job to start.

5. In the Deployment Type Parameter Value, enter the Deployment Type ID for this deployment. The deployment type determines which application components will be included in the deployment.
6. Click **Save**.

The batch job will run automatically at the Desired Execution Date/Time.

7. To check the progress or view the results of the batch job, select **Main Menu > Batch > Batch Run Tree** .
8. Search for the batch control ID (M1-DPLOY), then select it in the search results list.

Note the time at which the job ran, the status, and any processing details.

The status of the new deployment is Created. You must manually activate the deployment before it can be deployed to any MDTs.

Activating and Inactivating Deployments

Use this procedure to activate a deployment so that it can be downloaded to MDTs. You can also inactivate a deployment so that it can no longer be deployed.

Prerequisites: The deployment must have been created using the batch deployment creation process.

1. Select **Admin Menu > Device Management > Deployment** .
2. Use the **Deployment Search** zone to find the deployment you want to activate.
3. On the **Deployment Portal**, click the **Activate** or **Inactive** button in the **Actions** zone.

Once a deployment has been activated, it is available for download to MDTs that logon on from the mobile application. When the mobile user logs on, the system looks for all qualified deployments and downloads the appropriate one. If more than one eligible deployment exists, the system prompts the user to select one. If the user's current shift is not complete, no downloads are performed.

Once a deployment has been inactivated, it is no longer available for download to MDTs.

Reviewing Log Files from an MDT

Use the **Log Files** tab on the **MDT** portal to view log files that were sent from the MDT to the server.

Prerequisites: The log files must have been previously sent to the server using the **Get MDT Log Files** button on the **MDT** portal.

To view log files for an MDT:

1. Select **Admin Menu > Device Management > MDT** .
2. Click the **Log Files** tab.
3. Enter the dates for which you want to see log files and click **Refresh**.
4. Click a log file in the search results to view the log contents.

Scheduler Administration

This section describes concepts and common tasks related to scheduler administration.

Understanding Scheduler Setup and Administration

This section describes concepts related to scheduler setup and administration.

About the Scheduling Process

The scheduling process automatically assigns tasks to crew shifts, matching field work requirements to crew capabilities and optimizing the routes traveled by crews. The goal of the scheduling process is to produce the most cost-effective schedule. The scheduling process considers a large number of configurable factors to arrive at the optimum schedule.

The scheduling process has the following basic inputs:

- **Tasks:** Tasks represent the types of "things" the crew might have to do during their shift. They can be any one of the following, all of which are incorporated into the schedule as needed.
 - Activities indicate the type of work, required skills, task duration, service location, time windows, and task-based cost factors.
 - Periods of Unavailability tasks (POUs) indicate a fixed period of time as well as a location where the crew must attend to some task unrelated to shift work, such as a meeting.
 - Non productive tasks (NPTs) indicate a window of time as well as location where the crew must attend to some task unrelated to shift work. The start time for a NPT is defined as an offset period so that it must start within a certain amount of time after the start of a shift, but is not scheduled for a particular time.
 - Breaks indicate a broad window during which the crew may take their break, as well as the allowed break duration.
- **Crew Shifts:** Shift data includes crew capabilities, covered service areas and service classes, logon and logoff location, and shift-based cost factors.
- **Map Data:** All locations within the service territory are represented in the map data.
- **Static Control Data:** This includes global cost controls and appointment booking groups.

The scheduling process assigns each task a scheduled date/time on a particular shift of a crew. As part of the optimization process, a task may be assigned, unassigned, and reassigned any number of times until its current scheduled shift starts. This happens when a crew logs on to the shift and the task is dispatched.

Dispatchers can manually override virtually all scheduling decisions made by the system.

About the Appointment Booking Process

Appointment booking refers to how the host system (such as a customer relationship management or customer information system) handles requests from the host for appointments and how it responds with available appointment windows. The appointment booking process receives appointment requests from the host that specify the time periods for which the scheduler should return a list of available appointment windows. The process generates a set of possible appointment windows from which customers can choose.

If the activity being booked is part of a job, the request must include all of the activities in the job. The possible time windows returned reflects available times for the target activity as well as all of the other activities in the job.

Appointment booking, conditional booking and chooser request cannot be used for activities that have dependent activities.

Conditional Booking

When an appointment is booked from an outside application, the host requests a list of available appointment windows from the scheduler. By the time the user makes a selection for a specific appointment window there is a chance that the selected window may no longer be available. Therefore the booking is sent as "conditional" pending the availability of the selected appointment window. If the activity is still available, it is created as per usual. However, if it is no longer available, then the activity is not created.

If the activity being booked is part of a job, the request must include all of the activities in the job.

Conditional booking cannot be used for activities that have dependent activities.

Re-Booking

The system allows users to change an existing appointment in the host application. When the user requests a change to the appointment, similar to requesting an appointment for the first time, the host system reconciles with the base application to present the user with a new set of available appointment windows to match the new booking details. Typically the request to rebook an existing appointment is sent from the host as conditional upon the ability to accommodate the new booking instead of the original booking. As such, if the new booking is no longer available or the old booking can no longer be canceled, the rebooking attempt fails and the user is notified of the situation. Once rebooking is confirmed, the system cancels the original booking and schedules the new one instead.

If the original booking is already dispatched to a crew, the system cannot guarantee its successful recall from the crew as this requires human intervention. If the rebooking request states that it must be fully guaranteed then the rebooking attempt fails and the user is notified of the reason. If however the rebooking request can tolerate it not being guaranteed, then the system alerts a dispatcher to follow up with the crew on the cancellation of the original appointment but at the same time also schedules the new booking. If the dispatcher manages to cancel the original appointment in time then it is canceled. If it is not canceled in time then both the original and the new booking are scheduled temporarily until the dispatcher cancels the new one.

If the activity was manually allocated to a specific shift or locked to its depot run by a dispatcher then a subsequent rebooking change frees the activity from these allowing it to be fully rescheduled.

When rebooking activities that are part of a job, the new job composition must fully replace the old job composition so that any activity that used to be in the old job and is no longer part of the new one is canceled.

About Activity-Related Time Windows

This section describes the different time windows related to activities:

- **Effective Time Window (ETW):** The time period within which an activity can be scheduled. This is typically sent from the host.
- **Preferred Time Window (PTW):** The time period within which it is ideal to schedule an activity. This is typically sent from the host.
- **Arrival Time Window (ATW):** A period of time within an activity's effective time window during which the activity is allowed to be scheduled, based on applicable rules, restrictions, or conditions.
- **Service Time Window (STW):** A period of time within an activity's arrival time window during which it is preferable to schedule the activity.
- **Override Time Window (OTW):** A period of time during which the default arrival time window for activities of a particular type is overridden.

The system uses time windows in the scheduling process in the following ways:

- Typically, an activity's effective time windows and preferred time windows are sent from the host and establish the broadest scheduling window.

- Since some types of work may be restricted to certain times, each activity's effective time window is further broken down to one or more arrival time windows, representing a time period when the activity is allowed to be scheduled based on applicable restrictions.

Override time windows and public holidays can both be used to define such restrictions. If at least one of an activity's effective time windows overlaps with an override time window defined for the activity type, then the scheduling restrictions defined in the override time window are applied to the activity.

Note: The logic to calculate an activity's arrival and service time windows is defined in the activity business object's Update Time Windows plug-in, and is therefore customizable.

- The scheduler will honor an override as long as the activity has not been dispatched yet. If dispatching has not occurred, it will not schedule the activity to start or complete within an override time window. The activity may be scheduled late, but only as far as it does not overlap with an override time window.
- Dispatched activities that overlap with an override require manual intervention. The system provides a KPI algorithm to report these so that a dispatcher can recall them as needed.
- The arrival time windows are further broken down to one or more service time windows, representing the overlap between an arrival time window and a preferred time window.

The scheduler only considers an activity's arrival time window and service time window.

About Schedulers

The term scheduler refers to the system component that manages a single scheduling process. An implementation typically runs at least two schedulers to provide for backup, but may run additional sets of schedulers if required for scalability.

Each uniquely named scheduler is configured to manage a single scheduling process. Scheduling process responsibilities include:

- Holding
- Request Handler Only
- Optimization
- Optimization and Request

A holding scheduler does not schedule shifts or tasks. It is designed to capture tasks and shifts that cannot be assigned to any online scheduler. One and only one holding scheduler should exist. Any task or shift attached to a holding scheduler is evidence of a scheduling error.

A scheduler that handles requests can handle the following types of requests:

- **chooser** – returns a list of recommended shifts for an activity
- **appointment booking** - returns a list of valid possible appointments for an activity
- **conditional booking** - confirms the schedule of an activity •
- **crew route and directions** – returns the street level route as well as driving directions for a list of tasks in a crew shift's schedule

Each scheduler is associated with a scheduler configuration that defines the scheduling parameters to be used by that scheduler during the scheduling process. These parameters include cost controls, performance and optimization settings, and settings to control logging, auto-dispatching, and other scheduler functions.

Each scheduler is also configured to cover a specific geographic area called a scheduling area. Multiple schedulers may be used to handle high task loads. Oracle provides guidelines for determining the number of schedulers needed and the optimum task load for each scheduler. See the Configuration Guide for more information.

About Short Term and Long Term Booking

The scheduler uses a scheduling horizon to determine the number of days into the future to consider when scheduling crew shifts and activities.

Appointments that would be set outside of the scheduling horizon are considered by the scheduler as "long term" appointments. A scheduler configured to handle requests may be restricted to handle short term requests only (i.e. those set within the scheduling horizon), long term requests only or both.

The scheduler uses a long term horizon to determine the number of days into the future to consider for long term requests. The long term horizon must be same or larger than the scheduling horizon. Both horizons are defined on the scheduler configuration record.

About Scheduler Areas

A scheduler area defines a geographic area to be scheduled by a number of cooperating schedulers.

A scheduler is limited to scheduling tasks within its scheduler area. A scheduler area may comprise one or more service areas. If a scheduler area has too many tasks for a single scheduler, it may be broken down into smaller segments called optimization areas. Optimization areas are defined by a geocode pairs.

Oracle provides guidelines for planning and designing scheduler areas and optimization areas. See the Configuration Guide for more information.

About Scheduler Configurations

A scheduler configuration is a predefined set of parameter values that can be associated with one or more schedulers.

Scheduling parameters include cost controls, optimization settings, and real-time processing parameters. A scheduling configuration also specifies the number of days in the future for which data should be for scheduling as well as long term booking requests.

All schedulers whose scheduler area is associated with the same service area must use the same scheduler configuration. Only schedulers that do not cooperate (that is, they have different service areas) may have different scheduler configuration.

For a complete list and description of all scheduling parameters, see the Configuration Guide. (The system provides a description of each scheduler parameter in the embedded help available from the **Scheduler Configuration** portal. Descriptions are also displayed on the **Parameter Definition** portal.)

About Scheduler Parameters

Scheduler parameters control how a particular scheduler will schedule tasks, optimize routes, and dispatch activities to crews.

Parameters are typically defined as part of the implementation process. The **Parameter Definition** portal allows admin users to set the minimum, maximum, and default values for each scheduler parameter. This portal also displays detailed descriptions of all parameters.

Most scheduler parameters are associated with a scheduler configuration and their values are maintained on the **Scheduler Configuration** portal. Entity parameters are associated with other objects in the system, such as shifts or activity types, and are maintained on the maintenance portals for those objects.

For a complete list and description of all scheduling parameters, see the Configuration Guide.

Parameter Types

This topic describes the different types of scheduler parameters.

You can view scheduler parameter definitions and their default values on the **Parameter Definition** portal. You can also filter by parameter type.

Parameter Type	Description
appointment generation	Controls how appointment booking requests from the host are processed.
connection	Controls how the scheduler sends and receives data to/from client applications.
cost control	Defines how to calculate and apply costs used to build the most cost-effective schedule.
entity	Defines shift-based and task-based parameters that are applied against global parameters.
general administration	Defines system-wide scheduling parameters.
logging	Controls how and where the scheduler creates log files.
map configuration	Defines mapping parameters used to build and optimize routes.
optimization behavior	Defines parameters that affect optimization of the scheduler.
optimization performance	Defines parameters that affect system performance.
real time	Controls the scheduler's real-time functionality.
reference time	Controls how and when reference time is updated. (Reference time is the time used by the scheduler as input to cost-calculations that are sensitive to the current time.)
site	Defines the default (UTC) Coordinated Universal Time and the error translation file used to translate error messages at initialization.

Understanding Cost Parameters

The system uses cost control parameters to encourage or discourage particular actions within the system. Applying cost controls allows the system to produce the most cost-effective schedule while adhering to your business rules and processes.

Cost Parameters are of two types:

- **Relative:** Cost factors that work as multipliers against global costs. For example, consider that an organization has full-time crews and contractors that may be called on to handle excess work. In order to encourage the system to schedule work to contractors only when no full-time crew is available, you could apply a relative cost of ten to contractor shifts, indicating that these shifts would cost ten times as much to use in the schedule as a full-time crew shift. Examples of relative cost parameters are Relative Shift Cost, Relative Late Cost. Relative costs factors default to a value of 1.0.
- **Global:** Costs that are applied globally at a base level within the schedule. Examples of global cost settings are Late Cost, Shift Cost, Travel Time Cost, and Travel Distance Cost.

Global costs can be of various types:

- **Flat:** Costs that are applied once, when the object is activated, and removed when the object is no longer being used. The cost for using this object does not go up over time but stays at a standard or flat cost. For example, the global Shift Cost is the flat cost of utilizing a shift. The Relative Shift Cost parameter can be used as a multiplier against the flat cost.

- **Variable:** Costs that are applied per use or per unit. These are also referred to as running costs. Travel Time Cost and Travel Distance Cost parameters fall into this category.
- **Complex:** Costs that increase exponentially and are nonlinear in nature. Complex costs are determined by mathematical functions controlled by a group of three cost control parameters:
 - Cost Value A represents the initial slope for $x \geq 0$ (at $x=0$).
 - Cost Value B represents the doubling rate (the slope of the function doubles every x_B).
 - Cost Value C represents a flat additional cost, creating an initial step.

For more information about complex costs, see the Configuration Guide.

- **Time-Dependent:** Factors that adjust shift-based costs based on when a shift begins. Six independent variables (TDC Values A-F) are used to define time-depending costs:
 - **TDC Value A:** Initial value for the time-dependent cost factor. This value must be greater than or equal to zero.
 - **TDC Value B:** Controls how long the initial TDC Value A applies, in hours.
 - **TDC Value C:** Controls the shape of the curve between the initial value and the final slope, referred to as the transition curve. The valid range is 0.1 to 10.
 - **TDC Value D:** Number of hours after which the function changes from curved to linear. This value must be greater than TDC Value B.
 - **TDC Value E:** Factor at the point at which the function changes from curved to linear. (This the final factor for the transition curve and the initial factor for the final curve.) This value must be greater than or equal to zero.
 - **TDC Value F:** Controls the gradient of the final slope (units/hour).

For more information and examples of time-depending costs, see the Configuration Guide.

About the Scheduler Registry

The scheduler registry contains a record for each task, shift, appointment booking group, and scheduler configuration that is linked to a scheduler.

Registry Objects

All objects associated with the scheduling process register themselves to the scheduler registry.

- An activity is registered with all schedulers that host its geographic location or at least its service area. (If a scheduler's scheduler area is defined using optimization areas, then the activity registers itself to that scheduler only if the scheduler covers the activity location's geocode. If a scheduler is defined using service areas only, then the activity registers itself to that scheduler if it covers its service area.)
- A break is registered with all schedulers that host its shift.
- A POU task is registered with all schedulers that have the common services areas with the POU.
- A shift is registered with all schedulers that host any of its service areas.
- Every appointment booking group is registered with all schedulers.
- A scheduler configuration is registered with all schedulers linked to that configuration.

Online scheduler monitoring processes update the scheduler registry automatically to remove shifts and tasks that no longer belong to any of the scheduler's optimization areas (if used) or service areas (if no optimization areas are used), and to add tasks and shifts that belong to one of the scheduler's service areas/optimization areas but are not already linked to the scheduler. This could happen if a scheduler's service areas/optimization areas are altered while the scheduler is running .

Posting Actions

The system uses a posting action to communicate information to the scheduler manager about a change that was made to an entity. The scheduler then communicates this information to its scheduler process. Posting actions in the registry include:

Send: An entity has changed and the entire entity needs to be sent to the scheduler.

Send Status: An entity's state has changed and state-related details for the entity, rather than the entire entity, need to be sent to the scheduler.

Send Schedule: Another scheduler manager has made a schedule change to an entity and schedule-related details need to be sent to the scheduler.

Processed: The registry record has been processed by the scheduler. For example, an object that needed to be sent to the scheduler process was delivered.

Remove: The system has deleted or cancelled an entity (or changed it so that it is no longer relevant to the scheduler) and the entity needs to be removed from the scheduling process (that is, it should no longer be considered for scheduling). After removing the object, the scheduler deletes the registry entry.

Errors

If any errors or warnings resulted from the posting action, they appear in the registry record. Depending on your configuration, To Do entries may also be generated for scheduler registry errors.

Read Plug-Ins

Read plug-ins are used to read registered objects and package them for transfer between the scheduler manager and the scheduling process. Read plug-ins are enabled for tasks, shifts, appointment booking groups, and scheduler configurations. For more information, see the Configuration Guide.

Defining Scheduler Parameters

Use this procedure to view scheduler parameter definitions and edit the minimum, maximum, and default values that can be entered by the user for each parameter. Scheduling parameters are typically defined during system implementation.

Prerequisites: None

Note: Most scheduling parameters are associated with scheduler configurations and control how the scheduler processes tasks and shifts to arrive at the most cost-effective schedule. Use the **Scheduler Configuration** portal to specify the parameter values for a particular scheduler.

Some scheduling parameters are associated with crew shifts, activity types, or resources. Use the appropriate maintenance portal to set these parameter values.

To view descriptions of all scheduler parameters and determine where each parameter value is set, see the Scheduler Parameter table in the Reference Topics. Descriptions are also displayed on the **Parameter Definition** portal.

To maintain scheduling parameter definitions:

1. Select **Admin Menu > Scheduler > Parameter Definition**.
2. Select the parameter you want to maintain and click the **Edit** icon.
3. In the **Value** section, edit the default and, if appropriate, minimum and maximum values for this parameter.
4. Click **Save**.

Defining Schedulers

Use this procedure to add or maintain an individual scheduler. Scheduler attributes include the application server (node), scheduler configuration, scheduler area, and process type.

Prerequisites: You must define the scheduler configuration and scheduler area before you can associate them to a scheduler.

To maintain existing schedulers, select **Admin Menu > Scheduler > Scheduler** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new scheduler, follow these steps:

1. Select **Admin Menu > Scheduler > Scheduler+** .

If your system supports more than one scheduler business object, you will be prompted to select a business object for this scheduler.

2. Complete all fields in the **Main** section.
3. Click **Save**.

When you create a new scheduler, its status is set to Offline. Use the **Boot** action to bring an offline scheduler online.

Starting or Shutting Down Schedulers

Use this start a scheduler that is currently offline or shut down a scheduler that is currently online.

1. Select **Admin Menu > Scheduler > Scheduler** .
2. Select and broadcast the desired scheduler.
3. Click **Boot** to bring an offline scheduler online; click **Shut Down** to take an online scheduler offline.

Defining Scheduler Areas

Use this procedure to define geographic areas to be scheduled by one or more cooperating schedulers.

Prerequisites: Before you create a scheduler area, identify its service areas and count the number of tasks expected to be scheduled within the service areas. If the count exceeds the threshold for a single scheduler, then you should plan and design optimization areas within the service areas.

To maintain existing scheduler areas, select **Admin Menu > Scheduler > Scheduler Area** , then use *standard actions* to edit, duplicate, or delete a record.

To define a new scheduler area, follow these steps:

1. Select **Admin Menu > Scheduler > Scheduler Area+** .

If your system supports more than one scheduler area business object, you will be prompted to select a business object for this scheduler area.

2. Enter a name and meaningful descriptions.
3. If you want to define optimization areas for this scheduler, select **Enabled** from the Optimization Area drop-down.
4. Select one or more service areas to be managed by this scheduler.

5. If you enabled optimization areas in step 4, continue with the next step; if you will not be defining optimization areas for this scheduler, click **Save** and exit this procedure.
6. Provide a name and meaningful descriptions for the first optimization set.
7. Enter the latitude and longitude boundaries for this optimization set (NW and SE latitude, and NW and SE longitude).
8. Enter the latitude and longitude boundaries for the first optimization area within this optimization set.
9. Click the + sign next to the optimization area and repeat step 8 for each optimization area you want to define.
10. Click the + sign next to the optimization set and repeat steps 6- 9 for each optimization set you want to define.
11. Click **Save**.

You can now assign this scheduler area to one or more schedulers.

Defining Scheduler Configurations

Use this procedure to configure a set of parameters that can be used by one or more schedulers.

Prerequisites: All parameters used by a scheduler configuration must have been previously defined. Parameters are typically defined as part of the implementation process.

To maintain existing scheduler configurations, select **Admin Menu > Scheduler > Scheduler Configuration**, then use *standard actions* to edit, duplicate, or delete a record. (See Scheduler Configuration Actions below for information about additional actions.)

To define a new scheduler configuration:

1. Select **Admin Menu > Scheduler > Scheduler Configuration+**.
2. If prompted, select the scheduler configuration business object.
3. Complete the fields in the **Main** section and click **Save**.

You can now set the parameter values for the configuration and perform other actions, as described below.

Scheduler Configuration Actions

The following table describes the additional actions you can perform from the **Scheduler Configuration** maintenance portal.

To...	Do this...
View parameters of a particular type	Click the Expand Zone box to the right of the parameter type name.
Edit the value of a parameter	Expand the parameter type section and then click the Edit button to the right of the parameter name. Enter the values on the Scheduler Configuration Parameter screen and click Save .
Complete a scheduler configuration that is in a Pending state	<p>Click the Complete button in the Actions zone to indicate that the scheduler configuration is complete.</p> <p>Only complete configurations can be associated with online schedulers. When a scheduler configuration is in the Complete state, you cannot change any of its parameter values.</p> <p>To change a completed scheduler configuration, you must set the status back to Pending first.</p> <p>If you need to change a scheduler configuration that is being used by one or more online schedulers, you will need to duplicate it first, then edit the copy and change its status to Complete. You can publish the configuration as described below.</p>

To...	Do this...
Publish a configuration	The publishing action replaces an existing configuration with an updated one. This has the advantage of keeping the previous configuration intact. See Publishing Scheduler Configurations for instructions.
Assign a scheduler configuration to a scheduler	Navigate to the Scheduler maintenance portal in add or edit mode. In the Scheduler Configuration field, select the configuration you want to assign to this scheduler and click Save .

Publishing a Scheduler Configuration

Use this publish a scheduler configuration.

1. Identify the existing scheduler configuration you want to replace, and navigate to its maintenance portal.
2. Make a copy of this configuration using the Duplicate action. When prompted, enter a name for the new configuration.
3. Enter your changes to the configuration and save, then click **Complete**.
4. Navigate back to the original configuration (the one you are replacing).

The **Scheduler Configuration's Scheduler List** zone shows the status of all schedulers linked to this configuration. The publish action will only update offline schedulers.

If any of the listed schedulers are currently online, you must take them offline. Navigate to the **Scheduler** portal, locate each scheduler, and click **Shut Down**.

5. Navigate to the new configuration, and click **Publish**. When prompted, select the original configuration you want to replace.

The new configuration will now be linked to every scheduler the old configuration was previously linked to. You can put the schedulers back online from the **Scheduler** portal.

Viewing the Scheduler Registry

Use this procedure to view the scheduler registry, which contains a record for each object (task, shift, appointment booking group, or scheduler configuration) that is currently owned by a scheduler.

Prerequisites: None

1. Select **Admin Menu > Scheduler > Scheduler Registry** .
2. Use the **Scheduler Registry Search** zone to find the registry record.
3. Click an entry in the Scheduler Registry search results to view the registry record.

The information displayed in the **Scheduler Read** section describes the details that would be sent to the scheduler. This information varies depending on the type of registry object.

Registry records are view only.

Mail Management Administration

This section describes concepts and common tasks related to mail management administration.

Understanding Mail Management

This section describes entities used to support the management of mail messages.

About Mailing Lists

Mailing lists define a list of users for mail distribution purposes. When mail is sent to the list, each user receives a copy.

Mailing lists have a status of active or inactive. Mail cannot be sent to inactive lists.

About Mail Templates

Mail message templates establish standard settings for the fast creation of mail messages. Users can then select the template when creating new mail and the pre-defined subject, message and other settings are automatically copied to the new message from the template.

The following options can be included on the mail template:

- **Queue:** The queue setting specifies how the message should be delivered: emergency or normal. If set as Emergency, the system delivers the mail on the emergency queue which is faster than the normal queue.
- **Acknowledgement Required:** The acknowledgement required value determines whether or not the message recipient is required to respond to the message. The system notifies the sender if the acknowledgement is not returned within a specified time limit.
- **Deliver Now:** The deliver now setting tells the system whether or not to send the message immediately. If this is set to Yes but the recipient cannot be contacted, the message sending fails. This could occur if the crew does not have a device or if they have not started their shift yet. If this is set to No, the system attempts to send the message immediately but if send is not possible, the system attempts to send the message later. For example, it waits until the crew starts their shift.
- **Time Limit:** The time limit establishes the amount of time the system waits before stopping delivery attempts. If the mail requires acknowledgement, then the system only alerts the sender of unacknowledged mail while in this time limit. For example, if the dispatcher has sent a message that is only relevant for today, he or she can set the time on the message to expire at the end of the day. If the crew connects for the first time after the expiration time, the expired mail is not sent to their device. If this value is not specified the system assumes there is no time limit and continues to try and send the message indefinitely.
- **Group, User, Mailing List:** Distribution options for the mail including sending it to a mailing group, a predefined list of users (mailing list) or a single user.
Mailing Lists differ from Groups in that a group is dynamic. For example, a mailing group changes based on the logged on or logged off status of members of the group.

Defining Mailing Lists

Use this procedure to create a new mailing list.

Prerequisites: None.

1. Select **Admin Menu > Mail Management > Mailing List+** .
2. Enter a descriptive mailing list name and a description of the list.
3. Click **Save**.

Adding Users to a Mailing List

Use this procedure to add users to a mailing list.

Prerequisites: Mailing List must be configured.

1. Select **Admin Menu > Mail Management > Mailing List** .
2. Click the **Broadcast** icon for the appropriate mailing list.
3. In the **Add User's Zone**, enter selection criteria and click **Refresh**.
4. Click the **Add** button next to the name of the person to add.

Removing Users from a Mailing List

Use this procedure to remove users from a mailing list.

Prerequisites: Mailing List must be configured with users added.

1. Select **Admin Menu > Mail Management > Mailing List** .
2. Click the **Broadcast** icon for the appropriate mailing list.
3. Click the **Remove** button next to the name of the person to remove in the **Mailing List Users** zone.

Defining Mail Templates

Use this procedure to create a new mail template.

Prerequisites: None.

1. Select **Admin Menu > Mail Management > Mail Template+** .
2. Enter a descriptive template name and a description.
3. Enter template body text as appropriate.
4. Enter details appropriate to defining the mail template.
5. Click **Save**.

Chapter 4

Reference Topics

This section provides reference information to support tasks.

Glossary

This glossary provides definitions of commonly used terms.

[A-E](#) [D-G](#) [H-K](#) [L-O](#) [P-R](#) [S-U](#) [V-Z](#)

Acknowledgement Required	Indicates that the crew is required to manually confirm receipt of activities of this type.
activity time window	The time period during which an activity can be scheduled. See also effective time window (ETW), preferred time window (PTW), arrival time window (ATW), and service time window (STW)
activity type	Defines the nature of the task to be performed at a specific location.
alert	A situation in which predefined condition(s) have been met that require user attention or intervention.
algorithm	A set of rules for solving a problem in a finite number of steps.
allocate	A user-initiated action that locks an activity to a particular crew shift. See also assign and unassign.
allocation priority profile	See priority profile
alternate ID	A different way of uniquely identifying an activity, in addition to its system-generated primary key. A short and simple alternate ID is typically used if an activity is dispatched to a crew by voice and the activity's system-generated key is too long to communicate verbally.
application service	Defines the actions (access modes) supported by a securable function in the system. An application service exists for every transaction

	and zone in the system, and every business object must reference an application service. Application security is defined by granting or denying user groups access to specific application services.
appointment	An activity for which an arrival time window has been set in advance.
Appointment Booking Group	Defines valid time windows for appointment booking.
arrival time window	A period of time within an activity's effective time window (ETW) during which the activity is allowed to be scheduled, based on applicable restrictions or conditions. See also effective time window (ETW), preferred time window (PTW), and service time window (STW)
arrived	A task status indicating that the crew is at the service site or event location site but has not yet started work.
assign	An action, performed by the scheduler, that links an activity to a particular crew shift. Assigning is done only by the system. A user can unassign an activity, which unlinks it from its current crew shift and makes it available for rescheduling to any other crew shift, and then the user can allocate it to a different shift; however, a user cannot assign activities.
assignment	A crew's copy of an activity. It is used by the crew to record status changes and completion information. If the crew uses a mobile data terminal (MDT) to work their schedule, a copy of the assignment is dispatched to the crew's mobile device.
assignment in progress	An activity status indicating that a copy of the activity, referred to as an assignment, has been created. The activity remains in this status until the crew completes the assignment or returns it.
assist activity	An activity created to address a situation where a crew needs assistance with an activity.
assumed equipment	Equipment (capabilities) typically associated with vehicles of a particular type.
assumed skills	Skills (capabilities) typically associated with mobile workers of a particular type.
auto dispatch	A system feature that provides automatic dispatching of activities to crews once they are logged on. Also refers to an Activity Type attribute that enables or disables auto dispatch for specific activity types. The Drip Mode attribute defines auto dispatch settings at the crew shift level.
base service areas	Service areas within which a mobile worker typically works.
base time	The Time zone defined on installation options, which is typically the Server Time zone.
being scheduled	An activity status indicating that the activity has been sent to the scheduler and is in the process of being scheduled. An activity also transitions back to this status if its current assignment to a crew has been recalled or returned.
BPA	Business Process Assistant. See BPA script.
BPA script	A set of commands that run on the client's browser and guide a user through a business process.
break	A planned time period within a crew shift during which the crew is eligible for taking a break. During a break, the crew may not carry out work or travel.

break duration	Duration of the break.
break window duration	Duration of the period of time during which the actual break can be taken. For example, a 15-minute morning break might have a 60 minute window during which the break can be taken.
calculated	Computed; arrived at or determined by mathematical calculation.
cancel	An action that typically terminates the lifecycle of a business entity. For example, canceling an activity stops the effort of scheduling and performing it.
cancelled (status)	The status resulting from a cancel action. This is typically a final state. For activities, a cancelled status indicates that the host system or the dispatcher has cancelled the activity and it is no longer being considered for scheduling. For crew shifts, a cancelled status indicates that the shift was manually cancelled.
capability	An ability associated with a resource that qualifies the resource for a certain type of work.
capability type	A type of ability that qualifies a resource for a certain type of work. Capability types may define human skills or equipment.
chain	A number of activities that are dependent upon each other.
class	A broad grouping or categorization.
clustered tasks	If a crew shift contains multiple tasks of the same class and status that are back-to-back (with only a short period of idle between), then the system collapses the individual tasks into one clustered task in the Scheduling Gantt task area. You cannot take action on clustered tasks; you must first expand the shift to uncluster the tasks.
collision	A clash; a conflict; a meeting of objects that causes an adverse impact. See collision detected.
collision detected	An activity status that occurs when more than one completed assignment is received by the server for the same activity.
Common Dispatching Functionality	A component of the application that provides functionality for dispatchers to effectively monitor and manage workforces and activities.
Common Dispatching Interface	The primary point of user interaction for the Common Dispatching Functionality (CDF).
complete	An action that finalizes the processing of a business entity and ends its lifecycle.
complete (activity status)	An activity status indicating that the requested work has been done and completion details are available to be sent back to the requesting host system. A completed assignment has been received (one and only one) for an activity and all other assignments for that activity are finalized. The activity remains on the mobile device until logoff. If an activity was in a Collision Detected status and the dispatcher has identified which completed assignment to use, the activity transitions to the Completed status.
complete (shift status)	A crew shift status indicating that the crew is done working. This is also known as the End Of Shift. A shift cannot be completed if any of its tasks are not completed or returned.
completion remarks	Comments typically entered by a crew when an activity is completed.

crew	A uniquely named group of resources (mobile workers and vehicles) scheduled to perform work.
crew allocation	The specific mobile worker(s) and vehicle(s) assigned to a crew on a particular shift.
crew shift	A planned period of time in which a crew is available to work.
crew shift template	A tool for quickly generating crew shifts based on pre-defined parameters.
crew size	The minimum number of mobile workers needed to perform activities of a particular type.
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dashboard	A portal that always appears on the desktop. Its zones contain tools and data used to complete common tasks.
deadreckoning	A method of estimating the current position of a moving vehicle where GPS is not available or updates are received infrequently.
dependent activity	An activity that depends on another activity either by time or resource. The dependent activity may also have other activities dependent on it to form a chain. Such dependency may span resources and shifts.
deployment	A specific cut or build of a deployment type for a specific language; a packaged application to be delivered to a mobile device terminal (MDT); also refers to the gathering up of application components (maintenance objects, business objects, UI maps, SS, etc.) and their preparation for delivery to and usage on the MDT.
deployment part	A collection of deployment items, such as maintenance objects, business objects, UI maps, etc.
deployment type	Defines attributes of an application to be deployed, including authorized user groups, supported MDT types, messages used, and objects included.
depot	A central location where goods are loaded for delivery, or collected goods are unloaded.
depot run	When a crew makes a trip to a depot.
detected	Discovered; found.
disable	To make unavailable or inactive.
dispatch	An action, either system- or user-initiated, that locks an activity's sequence in the shift schedule and marks it as ready to be sent to the crew. See dispatched status.
dispatched (status)	An assignment status indicating that the assignment has been synchronized to the crew and the activity is now locked to its assigned crew shift and sequence. If required, manual acknowledgement has been given.
dispatch area	A predefined set of service areas and service classes monitored by one or more dispatchers.
dispatcher	An individual responsible for monitoring and managing day-to-day field operations.
drip mode	A Crew Shift attribute that indicates how the system should handle dispatching of activities to that crew shift. Valid options are:

	<p>None: Automatic dispatching is disabled. All scheduled activities must be manually dispatched to the crew's shift by the dispatcher or by another system-invoked process.</p> <p>Auto All: All scheduled activities are automatically dispatched to a shift once it has started. This applies to any additional activities being scheduled throughout the duration of that shift. This excludes any activities where the Auto Dispatch attribute is set to No for the Activity Type.</p> <p>Standard (Drip Mode): Only a fixed number of scheduled activities are dispatched to the crew at any given point of time. The fixed number is specified as the Drip Horizon.</p>
drip horizon	The number of activities to dispatch when drip mode is set to Standard or Hybrid.
effective date	The date on which a characteristic, parameter value, or other element becomes effective. See also arrival time window (ATW), preferred time window (PTW), and service time window (STW)
effective time window	The time period within which an activity should be scheduled, based on values sent from the host.
emergency task	A task of highest priority, indicating that its scheduling takes precedence over all non-emergency tasks.
en route	An assignment or POU status indicating that the crew is on its way to the service address or meeting address.
enable	To make available or active.
end odometer	The final odometer reading (total distance traveled by the vehicle) recorded at shift logoff.
equipment	Device or equipment used to perform certain types of work. In ORS, equipment is a capability that can be associated with one or more vehicles (resources).
estimated duration	The approximate length of time it should take to complete an activity.
field referenced activity	An activity created by a crew when connectivity problems prevent the crew from receiving an activity and require the dispatcher to voice dispatch it. The FRA references the original activity and, when connectivity is re-established, the FRA is synchronized with that activity on the server.
finalized	Indicates that an object's current status represents the end of its defined lifecycle. For example, in the base system an activity is finalized if it is in a canceled or completed state.
foreign key	A referential constraint between two tables. The foreign key identifies a column or a set of columns in one (referencing) table that refers to a column or set of columns in another (referenced) table.
foreign key reference	Defines the program used to construct a maintenance object's info string. It may also define the transaction used to display, add, and update instances of the maintenance object.
Gantt	A tool that allows dispatchers to view shifts in a timeline and perform actions on activities for those shifts.
Geocode	The latitude and longitude associated with an address, which is used for optimizing routes and displaying crews and activities on a map.

Global Positioning System	A navigation system based on a network of satellites that send out radio signals to pinpoint an entity's location.
holding scheduler	A holding scheduler is not associated with a schedule manager and therefore does not schedule shifts or tasks. It is designed to capture tasks and shifts that cannot be assigned to any online scheduler. One and only one holding scheduler should exist. Any task or shift attached to a holding scheduler is evidence of a scheduling error.
host external system	A computer system external to the base application that sends work orders (activities) to and receives updated information from the server.
idle time cost	A scheduling factor that indicates whether or not crew idle time cost should be considered by the scheduler.
in service	A crew shift status indicating that the crew is considered to be performing work. The crew may be traveling to an activity location, working an activity, or idle between activities. The crew status transitions to In Service automatically when an activity is started or a POU or break is ended. The user can manually transition to this status.
issue	A situation, problem, or potential problem requiring attention or resolution.
issues detected	An activity status indicating that the activity is not valid and processing cannot proceed. Manual dispatcher intervention is required to resolve the issue. Once the problem has been fixed, the status of the activity can transition to Being Scheduled.
job	Multiple activities that must be all performed by the same crew on a single shift.
key performance indicators	Quantifiable measurements that support dispatcher decision making and in-day exception handling. A KPI may apply to activities and crew shifts that dispatchers are responsible for in their current shift.
late cost	A scheduling factor that defines a cost associated with late arrival to an activity. It is used to discourage scheduling of the activity outside its time window.
lead time	Number of minutes before a shift is planned to start that the reserved capacity is released.
limited time	Indicates an entity or capability that has an effective and expiration date.
location	A predefined physical location, such as a service center.
logoff delay	Number of minutes before the end of the shift that the scheduler should stop scheduling work. This is used to reserve time at the end of the shift for any end-of-shift work.
logon delay	Number of minutes after start of the shift that the scheduler should begin scheduling tasks to the shift. This is used to reserve some time at the beginning of the shift for performing review and preparation work.
location based services	Crew location and tracking services that utilize GPS data obtained from a mobile resource.
maintenance object	A group of tables maintained together within the system.

manual	Occurring as a result of a user action, rather than automatically by the system.
manual acknowledgement	See acknowledgement required.
MapView	A tool, based on Oracle Application Server MapViewer, that provides a visual representation of monitored activities, crews, and routes on a map in the Common Dispatch Interface.
MDT	mobile data terminal
message category	A set of application messages.
metadata	Data about data. Metadata may define formatting, validation, possible values, data type, etc.
missing equipment	Equipment typically associated with the vehicle type but missing from this vehicle.
missing skills	Skills that a mobile worker of the specific job type is assumed to have, but this mobile worker does not have.
mobile data terminal	A computerized device typically used to communicate with a central dispatch office.
mobile worker	An individual performing work as part of a crew. A mobile worker is a resource.
odometer	An instrument that indicates distance traveled by a vehicle.
non-productive task	Non-work related activities that are planned as part of a shift. For example, replenish stock on a vehicle for 1 hour at the beginning of a shift.
on hold	An activity status indicating that the activity was placed on hold, either by the dispatcher or by the system based on a business rule. An activity may be placed on hold because something needs to be done before the order can be worked (e.g., parts, permit, etc.). An activity cannot be put on hold once an assignment has been created (unless the assignments are returned). The activity will remain in this status until a user removes the hold manually or a condition occurs that prompts the system to remove the hold, at which time it will return to its previous status.
optimization area/set	A set of sub-regions, called optimization areas, within a scheduler area. The optimization set is used when a scheduler area has too many tasks for a single scheduler to manage. A geocode pair defines an optimization area boundary.
out of service	A crew shift status indicating that the crew is not performing work. The crew may be attending a meeting, taking a break or having a vehicle breakdown, etc. When a crew goes out of service, they provide a reason and an estimated duration. At logon, a shift is Out of Service until a task is started and then it switches to In Service. Starting a POU or break automatically sets the crew status to Out of Service. The user may manually transition to this status.
overridden POU	A POU that has been modified manually and no longer matches the POU template from which it was generated.
overridden shift	A crew shift that has been modified manually and no longer matches the template from which it was generated.
overtime cost	A scheduling factor that defines the cost of exceeding the planned shift duration.

pending (shift status)	A shift's initial status when it is first created, before it is considered planned and ready to be started.
pending dispatch	An assignment status indicating that the assignment has not yet been synchronized to the crew's mobile device or has not been manually acknowledged by the crew, if the activity requires manual acknowledgement.
period of unavailability	A period of time in which a crew is planned not to perform work, such as while attending a meeting.
planning horizon	The number of days into the future to plan for crew shifts and periods of unavailability. For example, if the planning horizon is set to 60, the system generates crew shifts and periods of unavailability (POU) sixty days into the future. Generation occurs in a sliding window in that each day generates data for the last day incrementally. At any given time, the number of days of planned shifts and periods of unavailability is equal to this value. Planning horizon should be equal to or greater than the scheduling horizon.
portal	A page in an application that contains one or more zones.
posting action	A posting action is associated with every scheduler registry entry. It identifies the type of change made to an entity that impacts scheduling, and is used to communicate this information to the scheduler manager.
postpone	An user-initiated action that occurs when a crew has not yet started work on an activity but must postpone the scheduled work.
postponed	An activity status resulting from the postpone action.
preferred time window	The time period within which it is ideal to schedule an activity, based on values sent from the host. See also effective time window (ETW), arrival time window (ATW), and service time window (STW)
preview calendar	Calendar based on the changes that have been entered but not yet applied.
primary key	A single column or set of columns in a table that uniquely identifies each row in the table.
priority profile	A predefined set of allocation factors used by the scheduler to prioritize the scheduling of an activity relative to other activities.
queue	A list of items, such as activities, that are awaiting processing.
queued for dispatch	An activity status indicating that the activity has been successfully scheduled to a particular crew shift and is no longer eligible for rescheduling during optimization, but has not yet been synchronized to the crew's mobile device.
rebooking	A request to reschedule an activity because the activity details, typically requested time, have changed.
recall	An action, typically initiated by a dispatcher, that requests the return of an assignment from its assigned crew.
recommended allocation	One or more mobile workers and/or vehicles identified as appropriate or desirable for a crew shift.

recycle (alert)	An action that reassigns an alert to another dispatcher if the currently assigned dispatcher does not respond to it within a configurable amount of time.
reference time)	Time used by the scheduler as input to cost-calculations that are sensitive to the current time. Applies only to time-dependent costs.
relative efficiency	Scheduling factor that defines a mobile worker's efficiency as a percentage of the expected efficiency for mobile workers of this type.
relative speed	Scheduling factor that defines a vehicle's speed as a percentage of the expected speed for vehicles of this type.
reserve capacity	A scheduling concept allowing shifts to reserve a portion of their time for a specific service class of work.
reserve capacity percentage	Percentage of shift time to be reserved for work associated with the reserve capacity service class.
reserve capacity type	Service class for which a percentage of the crew shift's capacity is reserved.
resource	A workforce resource, such as a crew, vehicle, mobile worker, or dispatcher.
resource class	A broad classification of resource. Resource classes include mobile worker, vehicle, crew, and dispatcher, and may include additional user-defined classes.
resource planner	An individual responsible for allocating workforce resources to perform work across multiple shifts.
Resource Planning and Scheduling	A component of Oracle Real-Time Scheduler system that handles resource planning, resource management, service management, and scheduling.
returned	An assignment status indicating that the crew has returned the assignment or the assignment was recalled. This is the end of the assignment's lifecycle; the activity will be rescheduled.
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scheduler	A component of the Oracle Real-Time Scheduler system that assigns tasks to crew shifts in such a way as to optimize the use of resources and reduce overall costs. An implementation typically runs multiples schedulers in parallel for performance and backup.
scheduler configuration	Defines parameters used to control the scheduler.
scheduler registry	Contains a record for each object currently owned by a scheduler.
scheduling horizon	The number of days into the future the scheduler will consider when scheduling crew shifts and activities. Only shifts that have already started or are planned to start within that time frame, as well as activities that may be scheduled during that time, are considered. For example, if the scheduling horizon is set to 21, the scheduler considers shifts and activities for the next 21 days. Oracle recommends that the scheduling horizon be kept as short as is practical while still meeting customer business requirements. The optimum value for scheduling horizon strikes a balance between long term planning and short term flexibility.
service area	A logical boundary of an organization's territory that may or may not be based on geography.

service class	A broad categorization of activity types, such as Meter Work or Emergency Work.
service level agreement	A part of a service contract where the level of service is formally defined.
service time window	A period of time within an activity's arrival time window (ATW) during which it is preferable to schedule the activity. See also effective time window (ETW), preferred time window (PTW), and arrival time window (ATW).
shift	Short version of crew shift.
shift cost	A scheduling factor that defines the cost of utilizing a shift.
shift cost profile	A preconfigured set of shift cost-based factors that affect scheduling decisions.
shift promotion cost	A scheduling factor that specifies the multiplier by which the shift promotion cost for an activity type is increased or decreased. This is used to discourage creation of additional shifts.
shift weekly template	A tool used to define a cyclical weekly pattern made up of crew shift templates.
site address	The address of the actual entrance to the site of service, which may be different than the service address.
site delay	The delay involved in arriving at this site.
Short Messaging Service	A service that allows the interchange of short text messages between mobile telephone devices.
shuffler	A shuffler changes the current solution (schedule). The scheduler operates by repeatedly calling a shuffler to change the current solution and calculating the new solution cost to determine whether the change was beneficial or not. The scheduler employs many shufflers, each with its own specialization.
skill	A capability that indicates the ability to perform certain types of work. Mobile workers have skills; mobile worker types have assumed skills; activity types require skills.
SLA	Service level agreement.
SLA Flexibility	A scheduling factor that defines the period of time within which an activity must be scheduled to avoid incurring the SLA Priority cost.
SLA	service level agreement
SLA Priority	A scheduling factor that defines the fixed cost that will be applied for working an activity outside its service time window's SLA Flexibility period.
snooze (alert)	To stop (sleep) for a certain amount of time before reissuing the alert.
solution	The scheduler (activity-to-shift assignments) generated by the scheduler.
solution cost	The value calculated by the objective function for a schedule. This value is indicative of how well the schedule attains its cost goals. The lower the value, the better.
sort sequence	The order in which items appear in a list.
start odometer	The initial odometer reading (total distance traveled by the vehicle) recorded at shift logon.

started	A task status indicating that the crew is at the service site or event location site and has started work.
status reason	The reason why an entity transitioned to its current state.
suspend	A user-initiated action that occurs when a crew has started work on an activity but cannot complete the work due to time, material or other resource constraints. When the crew suspends an order, they must provide an estimate of the time required to complete the work.
suspended	An assignment status resulting from the suspend action. The assignment's life cycle is not terminated and remains on a crew shift until the assignment is completed, a dispatcher re-assigns the activity to another shift (a new assignment is created), or the crew logs off the shift and the assignment is returned. When a crew is ready to resume work on a suspended activity, it transitions to En Route status.
synchronize	To communicate data between the server and the MDT so that both have the same up-to-date information.
task	Any activity, POU, or break that occupies time on a crew shift's schedule.
task class	A classification of task. Task classes include activity, POU, and break. Within each task class, there can be any number of task types.
task type	Defines the attributes of a particular type of activity task, POU task, or break. Examples of activity tasks are Meter Read or Equipment Installation.
template	A pre-defined model or example used as a guide to make other objects. POU templates are used to generate actual POUs. Crew shift templates are used to generate crew shifts.
travel time cost	A scheduling factor that defines a cost associated with crew travel time.
UI map	An entity that contains predefined HTML for building a map zone. Its schema defines the fields whose values are inserted into the map at run time.
unassign	A user-initiated action that unlinks an activity from the crew shift to which it has been assigned by the scheduler.
user-defined	Configured or set by a user rather than being assigned by the system.
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vehicle	A non-human mobile resource used by a crew.
window cost	A scheduling factor that defines the preference of an activity's time window relative to other time windows.
work calendar	Defines work holidays within a specified time frame.
work done	An assignment status indicating that the crew completed the work but has not entered the completion details yet. The crew may enter the details later in the day. This is typical to crews using SMS to work their schedule. This is the end of the assignment's lifecycle. The activity remains in the Assignment in Progress status while waiting for the completion details to be entered.
work sequence	The task's sequence within the crew shift.
zone	A section of a portal. Examples of zones include Query zones, List zones, and Actions zones.

Standard Actions for Admin-Level Data Maintenance

A standard set of maintenance portals are used to define objects that are maintained from the **Admin** menu. These portals use a common interface and support a set of standard actions for creating and maintaining objects. The following quick reference table provides the basic steps for performing any of the standard actions.




Action	Steps
Add	Click the Add link in the list or search zone title bar. Provide all necessary information and click Save .
Edit	Select the object you want to edit from the List zone, then click the Edit icon. Enter your changes and click Save .
Delete	Select the object you want to delete from the List zone, then click the Delete icon. Confirm the deletion.
Duplicate	Select the object you want to duplicate from the List zone, then click the Duplicate icon. Key fields will be cleared in the new record. Complete all required fields and click Save .
Broadcast	Select the object you want to broadcast from the List zone, then click the Broadcast icon. The details and available actions for the selected object are displayed in the appropriate zones.
Activate or Deactivate	Select the object you want to activate or deactivate from the List zone, then click the Broadcast icon. Click Activate or Deactivate in the Actions zone. Note: These actions only apply to objects that support an Active and Inactive status, such as resource types, task types, and alert types. When such an object is deactivated, no new objects of this type can be created
Sort	Click a column header in the List zone to resort by the values in that column. Click again to reverse the order (from ascending to descending or descending to ascending).
Filter	If a list zone supports filtering, a Filter icon is displayed in the List zone title bar (on the far right). Click the Filter icon, then select the field by which you want to filter and click Refresh .
View or add log entries	Click the Log tab to view log entries. To add an entry, click the Add link in the List zone title bar and provide the requested information.

Standard Actions for Data Maintenance

This topic provides the basic steps for performing standard actions on data maintained from the **Main** Menu.

Note: The system displays buttons for all valid actions, based on the object's current status, your user privileges, and your system's configuration. The following table provide instructions for performing all standard actions.

Action	Steps
Edit	From the MainMenu : <ol style="list-style-type: none">1. Select the option for the object you want to maintain. A query portal is displayed.2. Enter search criteria to locate the object. The maintenance portal is displayed.

Action	Steps
Cancel	<ol style="list-style-type: none"> 3. Click the Edit button in the Actions zone. 4. Enter your changes. Click  to display field descriptions. 5. Click Save. <hr/> <p>From the Main Menu:</p> <ol style="list-style-type: none"> 1. Select the option for the object you want to cancel. A query portal is displayed. 2. Enter search criteria to locate the object. The maintenance portal is displayed. 3. Click the Cancel button in the Actions zone. The object's status changes to Cancelled and the available actions change to reflect the new status.
Duplicate	<p>From the MainMenu:</p> <ol style="list-style-type: none"> 1. Select the option for the object you want to duplicate. A query portal is displayed. 2. Enter search criteria to locate the object. The maintenance portal is displayed. 3. Click the Duplicate button in the Actions zone. A new record is created and the Add/Edit screen is displayed. Key fields will be cleared in the new record. 4. Complete all required fields. Click  to display field descriptions. 5. Click Save.
Activate/ Deactivate	<p>These actions are valid only for resources, such as mobile workers and vehicles. If a resource is currently in Active status, deactivating it makes it ineligible to perform work. If the resource is currently inactive, deactivating it will allow it to scheduled for work again.</p> <p>From the Main Menu:</p> <ol style="list-style-type: none"> 1. Select the option for the object you want to duplicate. A query portal is displayed. 2. Enter search criteria to locate the object. The maintenance portal is displayed. 3. Click the Duplicate button in the Actions zone. A new record is created and the Add/Edit screen is displayed. Key fields will be cleared in the new record. 4. Complete all required fields. Click  to display field descriptions. 5. Click Save.
View or add log entries	<p>From the Main Menu:</p> <ol style="list-style-type: none"> 1. Select the option for the object you want to manage log entries for. A query portal is displayed. 2. Enter search criteria to locate the object. The maintenance portal is displayed. 3. Click the Log tab.

Action	Steps
	4. To add a log entry, click the Add link in the Log zone title bar.
	5. Type the log detail and click Save .

Viewing and Adding Log Entries

Use the **Log** tab to view or add log entries for the current object.

The log displays a list of user and system actions associated with an object, such as when it was created, last updated, or transitioned to different status. For each log entry, the system displays the date and time the action occurred, the user/system that initiated the action, the type of action, and related object, if any.

To create a new log entry, click the **Add Log Entry** link in the zone title, then enter log entry details and click **Save**. Your user ID is saved with the log entry.

Navigation Topics

Navigating to the Activity Portal

You can access the **Activity** portal in any of the following ways:

- Select **Main Menu > Service Management > Activity** to display the **Activity Query** portal, then search for and select the activity you want to allocate.
- From the **CDI** portal, search for and select an activity in the **Activity List**.
- From the **CDI** portal, right-click on an activity displayed in the Gantt and select **View Details** from the pop-up menu.
- From the To Do List, click in the **Message** column for a To Do entry associated with an activity.
- From the **Schedule** tab on the **Crew Shift** portal, do one of the following:
 - Right-click an activity in the **Crew Shift Schedule Gantt** and select **View Details** from the pop-up menu.
 - Click on an activity link in the **Scheduled Tasks** zone or **Rogue Assignments** zone.
- From the Alert Queue, click on an activity associated with the alert (activity-related alerts only).
- From the **Alert Search** portal for an activity-related alert, click the **Activity** link.

Navigating to the Crew Shift Portal

You can access the Crew Shift portal in any of the following ways:

- Select **Main Menu > Resource Management > Crew Shift**, then search for and select the crew shift.
- Click the **Crew Shift** link from the **Scheduling Gantt** on the **CDI** portal.
- Click the **Crew Shift** link on the **Scheduling** tab of the **Activity** portal (if the activity has been scheduled to a shift).
- Click the **Allocated Shift** link from the **Activity** portal (if the activity has been allocated to a crew shift).
- Click the **Crew Shift** link from the **Calendar** zone on the **Crew** portal, **Mobile Worker** portal, or **Vehicle** portal.
- From the Alert Queue, click on a crew shift associated with the alert (shift-related alerts only).
- From the **Alert Search** portal for a shift-related alert, click the **Shift link**.

Navigating to the Mobile Worker Portal

You can access the **Mobile Worker** portal in any of the following ways:

- Select **Main Menu > Service Management > Mobile Worker** to display the **Mobile Worker** Query portal, then search for and select the mobile worker you want to allocate.
- From the **Crew Shift** and **Crew Shift Template** portals, click the **Mobile Worker** link displayed in the **Current Crew Allocation** section.

Navigating to the Vehicle Portal

You can access the **Vehicle** portal in any of the following ways:

- Select **Main Menu > Service Management > Vehicle** to display the **Vehicle** Query portal, then search for and select the vehicle you want to allocate.
- From the **Crew Shift** and **Crew Shift Template** portals, click the **Vehicle** link displayed in the **Current Crew Allocation** section.

Chapter 5

FAQs

This section provides answers to commonly asked questions.

How do I ... ?

This topic answers questions about how to perform day-to-day functions.

Q. How do I reassign all work assigned to a mobile worker if he calls in sick?

A. You can do this in two ways:

- If you want to allocate all of the tasks to a specific crew shift, use the drag-and-drop allocate feature from the **CDI Scheduling Gantt**. Click and drag the tasks from the current crew and drop them on the new crew.

You can also accomplish this by checking the box to the left of each task in **CDI Activity Search** zone. Then, in the **Scheduling Gantt** zone, right-click the crew shift to which you want the tasks allocated and select **Allocate** from the pop-up menu. (You can also use the **Allocate** button in the **Activity Search** zone and then specify the crew shift.)
- If you want to send the tasks back to the scheduler to be rescheduled, use the Unassign action. From the **CDI Activity Search**, click the checkbox to the left of each task, then click the **Unassign** button.

Q. How do I determine whether all mobile workers have logged on to their shift on time?

A. The **Crew** pane on the **CDI Scheduling Gantt** zone displays the current status of each crew shift within the scope of data. If the crew has started their shift, the crew state is displayed as In Service and the shift start time is displayed.

Q. How do I determine if a mobile resource is out of range?

A. The system monitors the connection between the server and the mobile devices, and displays a connection status icon to the left of each crew on the **Crew** pane of the **Scheduling Gantt** zone on the **CDI** portal.

Q. How do I change the snooze time for alerts?

A. The snooze time for an alert, as well as the recycle and expire time, are controlled by the settings in the alert type record. If you have appropriate administrative privileges, you can change this value on the **Alert Type** maintenance portal. The alert type associated with an alert is displayed on the alert's maintenance portal. Note that if you change the setting for alert type, it will affect all alerts of this type.

Q. How do I disable Auto Dispatching for a particular shift?

A. If automatic dispatching is enabled globally for your system (on the scheduler configuration), you can disable it at the shift level by changing the Drip Mode setting on the **Crew Shift** or **Crew Shift Template** maintenance portal to None.

Q. How does reserve capacity work?

A. Reserve capacity is a scheduling concept that allows you to reserve a portion of a crew shift's time for a specific service class of work. For example, consider that your business is entering a seasonal busy cycle, and you want to reserve more time for emergency work during this period. You can also disallow certain types of work during the same period, if you like. Reserve capacity settings are defined on the **Crew Shift** and **Crew Shift Template** portals. Select the reserved class of work in the **Reserve Capacity Type** field. Then specify the percentage of time you want reserved for this type of work in the **Reserve Capacity** field, and enter the amount of time before the shift starts that unused reserved time is released and made available to any class of work. Note that you can only specify one reserve capacity class per crew shift.

Q. How do I change the dispatch areas, KPIs, and dates of activities I can monitor in the CDI?

A. The scope of data for the CDI is controlled by the dispatcher shift settings. The dispatcher initially sets the scope at logon, and can change it at any time during a shift using the **Shift** tab on the **CDI** portal. The list of dispatch areas a dispatcher is allowed to monitor is predefined on the dispatcher record. For any particular shift, a dispatcher can choose to monitor one, some, or all of these authorized dispatch areas. The KPIs that appear in the **KPI Summary** are also defined in the dispatcher record, and these cannot be changed for an individual shift. The dispatcher record also determines the default date range for monitoring and specifies whether or not the dispatcher can change the date range for an individual shift.

Q. When is an activity actually dispatched to a crew shift?

A. If auto-dispatch is enabled, an assigned activity will be dispatched to the mobile device when the crew is logged on and the activity is within the crew shift's drip horizon. Here's an overview of how the process works:

- An activity is sent to the scheduler to be considered for scheduling.
- The scheduler assigns the activity to a crew shift or, alternatively, a dispatcher allocates the activity to a crew shift.
- The scheduler continues to optimize a crew shift's schedule up until the time the crew shift starts.
- Based on auto-dispatch drip-feed settings or following a manual dispatch action performed by the dispatcher, the activity is queued for dispatch. This means that the activity is no longer eligible for rescheduling, but has not yet been synchronized to the crew's mobile device.
- Once the crew starts their shift, the dispatch process differs depending on the type of device (if any) the crew is using:
 - For an MDT crew, all Queued for Dispatch tasks are sent to the crew's mobile data terminal (MDT). An activity is considered dispatched only upon receipt of acknowledgement from the crew's MDT.
 - For an SMS crew, the system sends one task at a time via SMS and that task is considered dispatched once it is sent.
 - For non-MDT crew, queued activities are immediately set to dispatched.

Q. How does the system decide which activities to schedule to a crew shift?

A. The scheduler matches the requirements and location of each activity to the capabilities and availability of scheduled resources. It considers a large number of configurable parameters to produce the most cost-effective schedule possible. These include cost factors, which can be set globally as well as at the shift or activity type level. Global parameters are typically established when the system is implemented, and should not need to be changed. Shift-based cost factors are defined in shift cost profiles and then assigned to crew shifts and crew shift templates. Task-based cost factors are defined for an activity type, and apply to all activities of that type. For more information, see the following topics:

- [About the Scheduling Process](#)
- [About Scheduling Parameters](#)
- [Understanding Cost Parameters](#)
- [About Shift Cost Profiles](#)

Q. If an MDT crew has back-to-back shifts, do they need to log out after the first shift and then log in again for the next one?

A. Yes. If a crew has a 1:00 - 4:00 PM shift and then a 4:00 - 6:00 PM shift directly following it, the system will log the crew off the application at end of shift. The crew will need to log on again to start the second shift.

Q. What happens if a mobile worker's device breaks or is lost during a shift?

A. If an MDT device breaks or is lost during a shift, the dispatcher can forcibly log the crew leader (the last user to log on to the shift) off the shift. The crew leader can then log in from another device and request shift details from the server.

The system provides security measures to ensure that only one device at a time can have the shift data. When a crew logs on to a shift, the system links both the MDT and the user to the crew shift. The system will allow any member of the crew to log on to the shift from this MDT, but will only allow the crew leader to log on from a different device. The force logoff action can be used to unlink the MDT from the crew shift (so the crew leader can log on using a different device), but it does not unlink the user from the shift.

If a device dies and the crew leader is unavailable to log back on, then a user with administrative privileges must revoke the crew leader's password and create a new one, then communicate the new password to another crew member so they can log in from a different device.

What's the Difference Between ... ?

This topic describes the difference between terms and concepts that are closely related.

Q. What's the difference between an activity and an assignment?

A. An **activity** is a task that must be performed at a particular geographical location. Activities can be received from a host system, or created within the application or initiated by crews in the field.

An **assignment** is a copy of an activity created by the system to track the assigned crew's progress in accomplishing the work. An assignment is only created when the crew's shift has already started. If the crew uses an MDT, the assignment is also sent to the crew when the activity is dispatched and appears on the crew's task list.

The crew enters status updates and completion details for the assignment on their MDT, and the system communicates this information back to the server, where the original activity is updated. A dispatcher can create multiple assignments for the same activity if, for example, the original crew has gone out of range and an attempt to recall the original activity has failed. For more information, see:

[About Concurrent Assignments](#)

[About Forced Recall](#)

Q. What's the difference between a task and an activity?

A. A **task** is any activity, period of unavailability (POU), or break that occupies time on a crew shift schedule. An **activity** is a task that must be performed at a particular geographic location.

Q. What's the difference between allocating and assigning an activity?

A. **Allocate** is an action performed by a user that manually locks an activity to a particular crew shift. Once allocated, the scheduler can optimize the activity's scheduled time, but cannot assign it to another crew shift.

Assign is an action performed by the scheduler that assigns an activity to a particular crew shift. Assigning is done only by the system. A user can unassign an activity, which unlinks it from its current crew shift and makes it available for rescheduling, and then the user can allocate it to a different shift; however, a user cannot assign an activity.

Q. What's the difference between Postpone, Suspend, Defer, and Hold?

A. Hold and Defer are dispatcher actions, whereas Postpone and Suspend are crew actions that can be performed by the dispatcher on behalf of a non-MDT crew. Here's a brief description of each term and how they differ:

Use the **Suspend** action if a crew has arrived on site to an activity and cannot complete it. The system will prompt for a reason for the postponement, the time to which the activity should be postponed (within the current crew shift), and the estimated length of time that will be required to finish the work once it is resumed. This causes the scheduler to re-optimize the position of that activity within the crew's route on that shift based on the estimated postponed time.

Use the **Postpone** action if a crew has not yet arrived to an activity location and wants to postpone the start of work until a later time. The system will prompt for a reason for the postponement and the time to which the activity should be postponed, which should be within the current crew shift. This causes the scheduler to re-optimize the position of that activity within the crew's route on that shift based on the estimated postponed time.

Use the **Hold** action if an activity has not yet been dispatched to a crew (or if it has been dispatched and returned) and you want to hold the activity from being scheduled. This is useful if something needs to be done before the order can be worked, like acquiring parts or permits. When you are ready for the activity to be worked, you can update its status accordingly (to allocate or dispatch, for example).

Use the **Defer** action to modify an activity's arrival time window to a future date. Unlike the Hold action, which applies an indefinite hold, the Defer action causes the activity to be automatically rescheduled based on its new arrival time window.

Q. What's the difference between a POU and a POU task?

A. A **POU** is a period of time during which a crew is planned not to perform work, for example, while attending meetings or training. A **POU task** is a way of tracking a specific crew's attendance of a POU event.

To define the attributes of a POU, you create either a Template POU (for recurring POU's) or a Real POU (for non-recurring POU's). You can specify the resources (crews, mobile workers, vehicles, dispatchers, etc.) that will be attending the POU event, and also specify one or more service areas.

If the resource type is set to crew for the POU type, the system will automatically generate POU tasks for all crews associated with the POU event. Tasks for crews that happen to be working in the specified service areas at the time of the POU event are incorporated into the crew's shift schedule.

Q. What's the difference between unassigning and rescheduling an activity?

A. Both actions cause the activity to be rescheduled. The Unassign action tells the schedule to deallocate an activity if it was manually allocated to a crew shift. The Reschedule action retains the manual allocation if one exists.

Can I ... ?

This topic answers questions about whether certain actions are permitted.

Q. Can I change the capabilities of a resource if that resource is currently logged on to an active shift?

A. Yes. Whenever you update a resource to add or remove capabilities, all non-finalized shifts to which that resource is allocated are resent to the scheduler. The scheduler then reevaluates the shift schedule accordingly, and may add or remove tasks as a result. If an activity has already been dispatched or marked for dispatch, it remains there; it is the responsibility of the crew to suspend the activity if they cannot perform the work and cannot contact the dispatcher. If an activity is still being scheduled when required capabilities are removed, the task is rescheduled to another qualified crew.

Q. Can I change shift details (crew allocation, covered areas, service classes) for a logged on shift?

A. Yes. Any activities that are still being scheduled are rescheduled accordingly. If a task is already dispatched to the shift, it remains there; it is the responsibility of the crew or the dispatcher to resolve the issue manually.

Q. Can I manually dispatch activities if auto dispatching is enabled?

A. Yes. A dispatcher can manually override virtually any scheduler decision. If the scheduler has already assigned an activity to a crew shift, the dispatcher can reallocate it and mark it for dispatch to a different crew shift.

What happens if...?

Q. What happens if a crew doesn't take a scheduled break?

If the crew does not intend to take the break they should cancel it. This allows the scheduler to release the reserved time for the break and better optimize the remainder of the shift schedule. Otherwise, the mobile worker could take the break at any time within its defined window.

Q. What happens if a mobile worker's device breaks or is lost during a shift?

A. If an MDT device breaks or is lost during a shift, the dispatcher can forcibly log the crew leader (the last user to log on to the shift) off the shift. The crew leader can then log in from another device and request shift details from the server.

The system provides security measures to ensure that only one device at a time can have the shift data. When a crew logs on to a shift, the system links both the MDT and the user to the crew shift. The system will allow any member of the crew to log on to the shift from this MDT, but will only allow the crew leader to log on from a different device. The force logoff action can be used to unlink the MDT from the crew shift (so the crew leader can log on using a different device), but it does not unlink the user from the shift.

If a device dies and the crew leader is unavailable to log back on, then a user with administrative privileges must revoke the crew leader's password and create a new one, then communicate the new password to another crew member so they can log in from a different device.

Q. What happens if a crew doesn't attend a POU event?

A. If the crew did not attend a POU and the event has already ended, the crew would need to cancel it before starting their next task. This allows the scheduler to release the reserved time for the event and better optimize the remaining of the shift schedule.

What happens if a crew shift does not finish all assigned tasks by the end of the shift?

When the crew completes its shift, the system automatically returns any unfinalized activities so they can be rescheduled.