

Routing Visualization

for



FIELD SERVICE CLOUD

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1 Document Purpose and Scope

This document is intended as a description and user manual of Routing Visualization – a new feature of Oracle Field Service Cloud to be used by managers and dispatchers engaged in handling the incoming workload and assigning activities to resources. It is assumed that the reader is familiar with the Oracle Field Service Cloud (former ETAdirect) functionalities and operating principles.

2 Glossary

The glossary below contains the basic Oracle Field Service Cloud terms used in this document.

Term	Explanation
Activity	Entity of the Oracle Field Service Cloud system that represents any time-consuming
	activity of the resource
Bucket	Entity appearing on the resource tree which can contain resources of a defined type and be assigned activities
Company	1) Legal entity, using Oracle Field Service Cloud
	2) Entity that represents a Client in Oracle Field Service Cloud; company is created
	by TOA Technologies during the process of implementation
Group	Resource of the resource tree which represents a group of resources and cannot execute activities
GUI	Graphical User Interface, allowing people to use software by manipulating images rather than by issuing text commands
Inventory	Equipment that can be installed or deinstalled during an activity
Resource	Element in the resource tree representing a defined company asset
Resource Tree	Hierarchy of company resources, showing "parent-child" relationships
Route	List of activities assigned to a resource for a specific date, or a list of non-scheduled activities assigned to a resource
Routing	Process of assigning activities to resources (usually automated)
User	1) Person using Oracle Field Service Cloud
	2) Entity used for authentication and authorization, allowing people or external software to access Oracle Field Service Cloud
Work Skill	1) Activity that a resource is qualified to perform (resource property)
	2) Qualification required to perform an activity (activity property)

3 Introduction

Routing is a powerful Oracle Field Service Cloud functionality used to automatically assign activities to resources according to their availability, location, work skills and work performance costs. Routing is aimed at creating the most optimal routes in terms of reducing resources' overtime and travel, effective use of the available inventory, and even prioritizing certain activities.

Routing operates according to the so-called Routing Plans which determine the schedule, activity assignment conditions, resource selection criteria and the costs of activity assignment or non-assignment in terms of resources' overtime, travel, and activities priority. Such Routing Plans are then



run automatically or manually and can be manually interrupted. Results of completed Routing Plans are recorded in the 'Routing execution log' showing the number of activities assigned during the Routing run, the number of resources to which activities were assigned, the number of activities not assigned in the Routing run and the reasons of such non-assignment.

Now, in addition to the existing 'Routing' screen in Oracle Field Service Cloud GUI where Routing Plans can be managed and monitored, there is a totally new 'Smart Routing' screen giving a more graphic, visual, and transparent display of what is actually happening "in the black box" of the Routing module. Looking at the 'Smart Routing' screen, the user can see the summary of the Routing Plans assigned to the selected bucket, the autorouting efficiency ratio, the resource utilization ratio and the actual savings achieved as the result of Routing. Naturally, the information included in the 'Routing execution log' is also presented on the 'Smart Routing' screen.

4 'Smart Routing' Screen Overview

The 'Smart Routing' screen is accessible by selecting the 'Smart Routing' option from the Main Menu.

	Dispatch -	Tools - Setting	s- Rep	orts -	Company	y Settings ·	-
«Lå 🏹 🔍 Name o	Activities	unrise Enterprise	∢ Wee	dnesday,	October 1	5th, 2014	Þ
	DashBoard	Sources		n	1	2	
Sunrise Enterprise	Daily	3001003		-		-	
🛨 🤼 CA, USA	Forecasting						
🛨 🔼 Europe	Quota						
🛨 🦀 FL, USA	Routing						
+ 🔒 Newfoundland	Smart Routing						
+ 🕰 Planning (0)							
+ 🕰 Texas inventories (0))						

Figure 1: 'Smart Routing' selection

Access to Smart Routing is controlled by a special permission ('Permissions' \rightarrow 'Manage' \rightarrow 'Smart Routing').

Q smart routing	Permis	sions > Manage > Smart Rout	ling			
🛅 Manage	ID	Profile Name +	Denied from level	Status	Show	🔵 Hidden
Smart Routing	71	Admin		¥	\odot	0
Smart Routing Baseline settings	69	CSR		×	0	۲
	66	Dispatcher		×	0	\odot
	72	File upload	Manage	 Image: A second s	0	$\overline{\mathbf{O}}$
	70	Manager		×	0	\odot
	115	Routing Manager		 Image: A set of the set of the	0	$\overline{\bullet}$
	68	soap	Manage	 Image: A set of the set of the	0	$\overline{\bullet}$
	67	Technician		×	0	\odot
	73	Users Admin		×	0	$\overline{\bullet}$
	Rese	et				Save

Figure 2: 'Smart Routing' permission



When the 'Smart Routing' permission is enabled, the 'Smart Routing' menu item is available, otherwise it is hidden.

The 'Smart Routing' screen consists of the Resource Tree, the Summary Bar and the Routing execution log.

CETAdirect Dispatch -	Tools - Settings	- Reports - Company Se	ettings - File Storage usag	e			Admin	Q
KLA Rame or ID	DALLAS 4 Mor	nday, September 22nd, 2014						
Sunrise Enterprise	Routing Plans	Scheduled 71	Autorouting	Resource	ce Utilizatio	on Savinos		
🛨 🐴 CA, USA			(* 400%	* 1	- 4 %	S.	107	
🛨 🦺 Europe	C 15	Completed 11	UU [*]		D 1 /	S.	PO /	
🛨 🦀 FL, USA		Falled U						
+ 🔒 Newfoundland	Time	Bucket	Routing Plan	Туре	Activities	Technicians	State	
+ 2 Planning (0)	07:21	DALLAS	Plan that runs often	Ð	130	16	Scheduled	
O Routing Visualization Demo	07:11	DALLAS	Plan that runs often	Ð	0	16	Completed	
+ @ DALLAS (130)	08:50	DALLAS	Plan that runs often	Ð	130	16	Scheduled	
+ 🔂 EUREKA (103)	07:06	DALLAS	Bulk Routing	۲	34	16	Completed	
+ 🔂 FREEPORT (15)	08:40	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 👸 GAINESVILLE (4)	08:30	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🔂 HEREFORD (21)	08:20	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
	08:10	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🔂 JASPER (11)	08:00	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
	07:50	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ OL LIBERTY (8)	07:40	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🔂 MEMPHIS (1)	07:30	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🔂 NEWCASTLE (1)	07:20	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🔂 ODESSA (4)	07:10	DALLAS	Plan that runs often	Ð	164	16	Scheduled	
+ 🚯 PETERSBURG (3)		B		0	_			

Figure 3: 'Smart Routing' screen

The calendar widget in the top part of the screen is used to select the date for which Routing data is to be displayed.

Planning	•	Thur	sday	, Nov	/emb	er 27	'th, 20	14	Þ													
October					November					December				Þ								
Routing	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	
575				1	2	3	4							1		1	2	3	4	5	6	
	5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13	
	12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20	
Time	19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27	le
00.00	26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31				
08:32								30														
08:12																			-			

Figure 4: Smart Routing Calendar

The Resource Tree in the left part of the screen allows selecting buckets for which data is to be displayed. When a bucket is selected, the screen shows the Routing status of such bucket. The Resource Tree has a hierarchical structure, that is, when a parent bucket or group is selected, the screen shows aggregated data of its child buckets.



4.1 Configuration

The 'Routing Visualization' feature is, in fact, another form of visual representation of the Routing progress and results. It is based on the same functionality and, therefore, the underlying Routing configuration (Routing Profiles and Plans, Resource Types, Statistics Parameters, Activity Types, etc.) is the same, whether Routing Visualization is used or not.

However, the enhanced functionality allows to actually see the savings achieved for the selected bucket as the result of Routing runs. This requires setting of the average company parameters based on the existing statistics of the company business. In Oracle Field Service Cloud these parameters are called 'Baseline Settings'.

The user's ability to set or modify the 'Baseline Settings' is controlled by the 'Smart Routing Baseline settings' permission.

Q smart routing	Permis	sions > Manage > Smart Routin	ng > Smart R				
Manage	ID	Profile Name †	Denied from level	Status	O ReadWrite	ReadOnly	O Hidden
	71	Admin		 Image: A second s	۲	\bigcirc	0
Smart Routing Baseline settings	69	CSR	Smart Routing	 Image: A second s	\bigcirc	\bigcirc	\odot
	66	Dispatcher	Smart Routing	 Image: A second s	\bigcirc	\bigcirc	\odot
	72	File upload	Manage, Smart Routing		0	0	\odot
	70	Manager	Smart Routing	 Image: A second s	0	\bigcirc	$\overline{\bullet}$
	115	Routing Manager	Smart Routing	 Image: A second s	\bigcirc	\bigcirc	\odot
	68	soap	Manage, Smart Routing	× .	0	0	۲
	67	Technician	Smart Routing	 Image: A second s	0	\bigcirc	$\overline{\bullet}$
	73	Users Admin	Smart Routing	 Image: A second s	\bigcirc	\bigcirc	\odot
	Rese	et					Save

Figure 5: 'Smart Routing Baseline settings' permission

When the permission is set to ReadOnly or Hidden, the user is unable to edit the 'Baseline Settings'.

The 'Baseline Settings' can be found in the drop-down menu appearing on a click on the 'Savings' block on the 'Smart Routing' screen.

Resource Utilizati	on	savings Savings -\$13	1,244
Туре	Activitie	Baseline Settings	
۲	0	Work time increase	-\$151,971
۲	836	Travel time reduction	\$15,920
١	0	Overtime reduction	\$4,807

Figure 6: 'Baseline Settings' link

Clicking the 'Baseline Settings' link opens the list of parameters which need to be configured for the savings to be calculated and displayed.



Resource Utilizati	on	Savings -\$35,	378
Туре	Activitie	Baseline Settings	
Ð	2		
Ð	2	Cost savings view	\odot
Ð	5	Time savings view	\bigcirc
Ð	6	Fully-loaded tech. hourly cost	\$ 60
Ð	9	Cost per mile	\$ 0.57
Ð	10	Overtime increase	50 %
Ð	229	Average tech. daily worktime	4.8 h
Ð	62	Average tech. daily travel time	2.4 h
Ð	18	Average technician overtime	0.316 h
Ð	13	Travel speed	36 mph
Ð	15		30 mph
Ð	208		
Ð	229	Discard	Save
Ð	0		
Ð	0	Work time increase	-\$46,692
Ð	0	Travel time reduction	\$6,418
Ð	0	Overtime reduction	\$4,896
Ð	0	16 Con	npleted

Figure 7: Baseline Settings

The following parameters are to be set:

- Fully-loaded tech. hourly cost (cost of 1 hour of the resource's work based on the resource's salary, benefits, training, overhead costs, equipment costs or depreciation) in US dollars. When the 'Time savings view' is selected, this setting is disabled as it has no influence on time savings
- Cost per mile (cost of 1 mile of the resource's travel) in US dollars. When the 'Time savings view' is selected, this setting is disabled as it has no influence on time savings
- Overtime increase (resource's hourly cost increase in case of overtime) in per cent
- Average tech. daily worktime (average time the resource spends on activities performance in a day) in hours
- Average tech. daily travel time (average time the resource spends on travel between activities in a day) in hours
- Average technician overtime (average acceptable overtime per resource) in hours
- Travel speed (average speed with which resources travel) in miles per hour

4.2 Summary Bar

The Summary Bar shows the Routing results for the selected bucket or group. In each case, the data



shown in the Summary Bar is the aggregated data of all individual resources' routes created as the result of Routing runs.



Figure 8: Summary Bar

Note: the 'Resource Utilization' and 'Savings' blocks also show data for individual resources (technicians), when such resources are selected in the Resource Tree. These parameters are calculated per each resource and aggregated when a bucket or group is selected.

4.2.1 Routing Plans

The Routing Plans block shows the number of scheduled Routing Plans, number of currently running Routing Plans, number of completed and failed Routing Plans. The number next to the 'puzzle' icon is the number of Routing Plans assigned to the selected bucket.



Figure 9: Routing Plans' block

Clicking the 'Routing Plans' block opens the summary of Routing Plans assigned to the selected bucket and their statuses. The following data is displayed:

- Number of routing plans total number of Routing Plans assigned to the selected bucket and its child buckets
- Buckets with routing plans number of child buckets to which at least one Routing Plan is assigned. If the selected bucket has no child buckets, this parameter shows '1'
- Routing plans summary aggregated data of the statuses of the Routing Plans assigned to the selected bucket. The following statuses are available:

- Scheduled (Routing Plans to be run according to the schedule)
- **Completed** (finished Routing Plans)
- **Running** (Routing Plans run currently in progress)
- Rolled back (Routing Plan runs the results of which were not accepted by the user.
 When a Routing Plan run is rolled back, all activities are returned to the bucket and can be assigned again in the next Routing Plan run)
- **Stopped** (Routing Plan runs interrupted manually)
- Skipped (finished Routing Plan runs in which no activities were assigned, for example, due to absence of activities in the bucket)
- **Failed** (Routing Plan runs in which no server response was received)

4.2.2 Autorouting

The Autorouting block shows the efficiency of automatic Routing in per cent. The Autorouting efficiency is calculated as the ratio of the number of autorouted activities to the total number of routed activities (both automatically and manually). This statistics takes into account the number of operations resulting in 'meaningful' changes to the activity routing, that is, changes to the date of the route or the resource to whose route the activity has been assigned. Operations bringing no changes to the activity date or resource to which the activity is assigned, are ignored. Similarly, reverse operations resulting in no change to the initial activity assignment are ignored, as well.

The figures shown in the 'Autorouting' block are aggregated results of all resources in the selected bucket and its child buckets, if any. If no activities were routed manually, the Autorouting efficiency is 100%.



Figure 10: 'Autorouting' block



The 'Autorouting' drop-down contains the following data:

- Without change (number of auto-routed activities)
- Manually processed (number of manually routed activities)

Note: the sum of 'Without change' and 'Manually processed' is the total number of activities routed in the selected bucket.

- By Dispatcher / By Technician (selector allowing to view the number of manual operations performed by the dispatcher or by the technician). This section contains the breakdown of manual operations in the following types:
- **Assigned** (activities moved from the bucket to resources' routes)
- **Reassigned** (activities moved between resources)
- **Unassigned** (activities moved from resources' routes to the bucket)
- Reordered (activities moved to a different position in the route). The 'Reordered' category is not available when the 'By Technician' option is selected

4.2.3 Resource Utilization

The 'Resource Utilization' block shows the efficiency of resources working time use in per cent. The resource utilization ratio is calculated as the ratio of the actual resource useful time to the useful time defined by the baseline settings. The figure shown in the block is the aggregated result of all routes created as the result of Routing in the selected bucket.



Figure 11: 'Resource Utilization' block

The 'Useful Time' shown in the 'Resource Utilization' drop-down window consists of the 'Service Time'



and 'Travel Time'. In its turn, the 'Service Time' consists of the 'Working Time' (the time spent by the resources for actual activities performance) and the 'Overtime'.

The window also includes the 'Idle Time' created as the result of the Routing run which is the waiting time between activities.

4.2.4 Savings

The 'Savings' block shows the value of savings achieved by the Routing runs in the selected bucket. It is possible to view the cost savings, that is, the money which the company can save by applying the Routing results, or the time savings, that is, the working time which can be gained or travel time and overtime which can be reduced by applying the Routing results. The savings amount is calculated on the basis of the Baseline Settings defined in the same window.

Savings \$1,438	Savings				
Baseline Settings	Baseline Settings				
Cost savings viewIme savings viewTime savings viewImeFully-loaded tech. hourly cost60Cost per mile\$ 0.57Overtime increase50 %Average tech. daily worktime4.8 hAverage tech. daily travel time2.4 hAverage technician overtime0.316 hTravel speed36 mph	Cost savings viewIme savings viewTime savings viewImeFully-loaded tech. hourly cost60Cost per mile0.57Overtime increase50 %Average tech. daily worktime4.8 hAverage tech. daily travel time2.4 hAverage technician overtime0.316 hTravel speed36 mph				
DiscardSaveWork time increase\$589Travel time reduction\$393Overtime reduction\$456	DiscardSaveWork time increase-3 h 12 minTravel time reduction19 h 12 minOvertime reduction15 h 12 min				

Figure 12: 'Savings' block: Cost savings view (left) and Time saving view (right)

Both the 'Cost savings' and the 'Time savings' options show the total savings and their breakdown as follows:

 Work time increase (increase of the time spent on actual activities performance) which can be represented as actual time in hours and minutes (Time savings) or converted to money according to the Baseline Settings (Cost savings)



- Travel time reduction (reduction of the time spent on travel between activities) which can be represented as actual time in hours and minutes (Time savings) or converted to money according to the Baseline Settings (Cost savings)
- Overtime reduction (reduction of the overtime created for the resources as the result of Routing run) which can be represented as actual time in hours and minutes (Time savings) or converted to money according to the Baseline Settings (Cost savings)

The value in the 'Savings' block is the sum of the above-mentioned three values.

In some cases savings values may be negative when some technicians in the bucket were not assigned enough activities to earn their daily salary. However, such negative result may be compensated by other optimizations and the overall Routing result may be positive.

5 Manual and Automatic Routing Run

Routing Plans scheduled to run according to the 'Run schedule' settings ('Company Settings' \rightarrow 'Routing Profiles') are run automatically at the scheduled time. However, each Routing Plan assigned to the selected bucket can be started manually when necessary.

5.1 Manual Routing Run

The 'Activities' screen (Time View, List View and Map View) now has a button allowing to start a Routing Plan manually for a bucket. When a bucket is selected in the Resource Tree, a 'puzzle' button appears next to the bucket name in the 'Activities' view.

DALLA	S 🚁 🖪 Thurs	day, October	16th, 2014		View 👻
Resour	Manual Routing Plans	Activities	Technician	 S	8
🔒 ALE	D. II. D II.	407	40	_	
🙆 AUS	Bulk Routing	197	16	Run	
🚳 BAC	Plan that runs often	197	16	Run	
	Morning Mon, Wed, Fri	197	16	Run	
	Morning Tue, Thu	197	16	Run	
L GEF	Evening for tomorrow	197	16	Run	
A IVAN	JAMESON				
🔒 JAM	ES KEATING				
A JUS	TIN HENDERSON				
	BI MARTIN				

Figure 13: Button allowing to select and start Routing Plan

Note: when a resource other than bucket is selected, this button is hidden.

The button is controlled by the general 'Routing' permission and the 'Smart Routing' permission. When either or both permissions are disabled for the user, the 'puzzle' button is hidden, therefore, the user is unable to start routing plans manually.

Clicking on the 'puzzle' button opens the list of all routing plans assigned to the bucket. The list also



shows the number of non-assigned activities in the bucket and the number of available technicians. The 'Run' link against each Routing Plan name allows starting the Routing Plan manually. When 'Run' is clicked, a confirmation window appears where the user is requested to confirm that the selected plan is to be started manually.



Figure 14: Confirmation window

The 'Manual Routing Plans' list corresponds to the Routing Plans list in the 'Routing' window where each Routing Plan can similarly be started by clicking 'Start manually'.

				1-5 of 5
ID +	Routing plan	Last run	Next run	Actions
5	Evening for tomorrow	09/23/14 07:50 AM	09/24/14 11:00 PM	Modify Start manually
4	Morning Tue, Thu	09/23/14 01:11 AM	09/25/14 01:10 AM	Modify Start manually
3	Morning Mon,Wed,Fri	09/23/14 08:24 AM	09/24/14 01:00 AM	Modify Start manually
2	Plan that runs often	09/23/14 08:22 AM	09/23/14 08:32 AM	Modify Start manually
1	Bulk Routing	-	-	Modify Start manually

Figure 15: Routing Plans list in 'Routing' window

Manual Routing: Plan that runs often - ID98885 Routing run time 3 sec Technicians 20 Activities 39 Å **Current Cluster Average Savings** Working time optimization savings **\$0** Overtime optimization savings **\$**0 Travel time optimization savings \$0 Total Savings STOP

When a Routing Plan has been started manually, the 'Manual Routing' window appears.

Figure 16: 'Manual Routing' window



The title of the 'Manual Routing' window contains the Routing Plan name and ID. During the Routing Plan run the window shows a shuffling puzzle representing the Routing run progress. The right-hand part of the window shows the Routing run statistics. The current Routing run can be interrupted by clicking 'Stop'. When a Routing run is interrupted, all activities remain in the bucket.

The effect of the 'Stop' button is the same as that of the 'Stop process' action link in the 'Routing execution log' which stops a running Routing Plan returning all activities to the bucket.

Rou << F	Routing execution log << Previous 1 2 3 Next >> 1-20 of 44								
	ID	Routing run +	Resources	Activities	Result	Actions			
	99227	Morning Mon,Wed,Fri(3) at 09/23/14 09:03 AM by Admin	28	New: 1192 Already routed: 262	running	Stop process			
	99200	Plan that runs often(2) at 09/23/14 08:32 AM - 09:03 AM by Routing	28		stopped				
	99183	Morning Mon,Wed,Fri(3) at 09/23/14 08:23 AM - 08:24 AM by Admin	28		stopped				

Figure 17: 'Stop process' link

When the Routing Plan run has been completed, the results window is displayed.

Technician used	20	Routing run time	3 sec
	52	To she ili suo	
Routed activities	16	Technitians	32
5% of available activities. 5% W/SEA overque		Activities	62
Ion-Routed activities	46		
Assignment would cause missing ETA	46	Saving	6
Average working time	6 h 27 min	Working time optimization sa	avings \$7,549
34% vs baseline		Overtime optimization saving	gs -\$432
Average overtime 242% vs baseline	46 min	Travel time optimization sav	ings -\$494
Average travel time	3 h 9 min		
Average down time	3 min	Total Savings \$6	,624
Resource utilization	73%		
		POLLBA	

Figure 18: Manual Routing results window

The manual Routing results window shows the following data:

- **Technicians used** (the total number of resources to which activities have been assigned)
- Routed activities (the total number of activities assigned by Routing). This section also
 includes the percentage of the assigned activities in the total number of activities in the bucket



and the percentage of activities assigned with SLA overdue

- Non-Routed activities (the total number of activities not assigned by Routing in the current run with their breakdown by non-routing reasons)
- Rejected activities (the number of activities which could never be assigned in the current conditions and the reasons for their non-assignment. For example, if some activities cannot be assigned as no resource in the selected bucket meets all their requirements, such activities will be rejected). The number of rejected activities is included in the total number of non-routed activities
- Average working time (the average time resources spend on performing activities in a working day and its ratio against the baseline figure)
- Average overtime (the average overtime created as the result of the Routing run and its ratio against the baseline figure)
- Average travel time (the average travel to be performed by resources as the result of the Routing run and its ratio against the baseline figure)
- Average down time (the average idle time created as the result of the Routing run and its ratio against the baseline figure)
- **Resource utilization** (efficiency of resources working time use in per cent)
- **Routing run time** (time in which the Routing run was completed)
- Technicians (total number of resources in the bucket)
- Activities (total number of activities in the bucket)
- **Savings** (financial savings achieved by the Routing run) broken down into:
 - Working time optimization savings (savings achieved as the result of resources' working time increase)
 - Overtime optimization savings (savings achieved as the result of overtime reduction)
 - Travel time optimization savings (savings achieved as the result of travel time reduction)

The '**Total savings**' figure is the sum of 'Working time optimization savings', 'Overtime optimization savings' and 'Travel time optimization savings'.

Upon the Routing run completion, its results are immediately applied, that is, the activities are placed in the resources' routes. If needed, the Routing run results can be rejected by clicking 'Rollback' (the activities will be returned to the bucket). The 'Rollback' action is similar to that of the 'Rollback' action link of the 'Routing execution log' on the 'Routing' screen.



Routing Visualization

F	Routing execution log							
							1-9 of 9	
		ID	Routing run +	Resources	Activities	Result	Actions	
		102439	Plan that runs often(2) at 09/25/14 03:27 AM - 03:44 AM by Routing	16 of 16	Assigned: 28 of 252 Left in bucket: unacceptable overtime: 201 too expensive: 23 Unassigned, moved to bucket, and made non-scheduled: 16 Reassigned to another resource: 13 Reordered: 31 of 112	succeeded Completed with reoptimization	Rollback Report	
		102426	Plan that runs often(2) at 09/25/14 03:12 AM - 03:17 AM by Routing	16 of 16	Assigned: 0 of 252	succeeded Completed with reoptimization		

Figure 19: 'Rollback' action link in 'Routing execution log'

5.2 Automatic Routing Run

Automatic Routing runs require no user actions to start. When a Routing Plan is run automatically, no popup windows appear. The 'Routing Plans' block on the 'Smart Routing' screen shows the number of currently running Routing Plans and they are also shown in the 'Running' status in the Routing execution log. Clicking the line of a running Routing Plan opens the 'Automatic Routing' window with the behavior and functionality similar to that of the 'Manual Routing' window described above.



Figure 20: 'Automatic Routing' window

6 Routing Execution Log

The Routing execution log is organized as a table with the following columns:

- Time (time of the Routing run. When this column shows only the time, the Routing run belongs to the current day. When both date and time are shown, the Routing run belongs to a day in the past)
- Bucket (bucket from which activities are assigned)



- Routing Plan (name of the Routing Plan)
- **Type** (automatic (🕙) or manual (🛈))
- Activities (number of assigned activities (for 'Completed' Routing Plans) or the number of activities in the bucket (for Routing Plans of other statuses))
- Technicians (number of resources to which activities have been assigned (for 'Completed' Routing Plans) or the number of technicians under the bucket (for Routing Plans of other statuses))
- **State** (Routing Plan run status)

The following Routing Plan statuses are available:

- **Scheduled** (Routing Plan to be run according to the schedule)
- **Completed** (finished Routing Plan)
- Running (Routing Plan run currently in progress)
- Rolled back (Routing Plan run the results of which were not accepted by the user.
 When a Routing Plan run is rolled back, all activities are returned to the bucket and can be assigned again in the next Routing Plan run)
- **Stopped** (Routing Plan run interrupted manually)
- Skipped (finished Routing Plan run in which no activities were assigned, for example, due to absence of activities in the bucket)
- **Failed** (Routing Plan run in which no server response was received)

Time	Bucket	Routing Plan	Туре	Activities	Technicians	State
00:49	IRVING	Plan that runs often	Ð	15	36	Scheduled
00:48	SANTA FE	Plan that runs often	Ð	2	76	Scheduled
00:48	DALLAS	Morning Mon,Wed,Fri	۲	37	16	Completed
00:47	FREEPORT	Plan that runs often	Ð	108	24	Running
00:47	TEXAS CITY	Plan that runs often	۲	0	80	Skipped
00:46	QUITMAN	Plan that runs often	Ð	0	65	Completed
00:46	EUREKA	Morning Mon,Wed,Fri	۲	37	20	Completed
00:46	ODESSA	Plan that runs often	Ð	0	57	Completed

Figure 21: Routing execution log

Clicking a Routing Plan line opens its status window. Different windows are displayed for Routing Plan runs of different statuses:



Scheduled (the window contains the bucket name, the Routing run status (scheduled) and _ the date and time for which the Routing run is scheduled)

Automatic Routing: Pl	an that runs often		
Bucket name:	DALLAS		
Routing run status:	scheduled		
Routing run scheduled	i on: 2014-10-16 07:03:00		

Figure 22: Scheduled Routing Plan status window

Completed (the window contains the Routing run results and the 'Rollback' button to return _ activities to the bucket if needed)

Manual Routing: Evening for tomorrow - ID41380 ×						
Technician used	32	Routing run time	3 sec			
Routed activities 25% of available acitvities. 0% w/SLA overdue	16	Technitians	32			
Non-Routed activities Assignment would cause missing ETA	46	Savings				
Average working time 134% vs baseline	6 h 27 min	Working time optimization saving	\$ \$7,549			
Average overtime 242% vs baseline	46 min	Travel time optimization savings	-\$432 -\$494			
Average travel time	3 h 9 min					
Average down time	3 min	Total \$6,6	24			
Resource utilization	73%					
		ROLLBACK				

Figure 23: Completed Routing Plan status window



Running (the window contains the Routing run statistics and the 'Stop' button to interrupt the process)

Automatic Routing: Plan that runs often - ID41405 ×				
	Routing run time	2 min 13 sec		
	Technitians	32		
	Activities	46		
guilt .	Current Cluster Average	ge Savings		
	Working time optimization savin	gs \$0		
	Overtime optimization savings	\$0		
	Travel time optimization savings	₃ \$ 0		
UNE WEON LEAST OF A STATE	Total Savings			
	STOP			

Figure 24: Running Routing Plan status window

 Rolled back (the window contains the bucket name, the Routing run status (rolled back) and the Routing run start and end date and time)

Manual Routing: Bulk Routing - ID27022			
Bucket name:	My bucket		
Routing run status:	Rolled back		
Routing run start time:	2014-11-28 06:54:00		
Routing run end time	2014-11-28 06:54:00		

Figure 25: Rolled back Routing Plan status window

 Stopped (the window contains the bucket name, the Routing run status (stopped) and the Routing run start and end date and time)



Automatic Routing: Plan that runs often - ID41436		
Automatic Routing: Plan Bucket name: Routing run status: Routing run start time: Routing run end time	that runs often - ID41436 DALLAS stopped 2014-10-16 06:14:00 2014-10-16 06:18:00	×

Figure 26: Stopped Routing Plan status window

Skipped (the window contains the bucket name, the Routing run status (skipped), the description of the reason why the Routing Plan has been skipped and the Routing run start and end date and time)



Figure 27: Skipped Routing Plan status window

Failed (the window contains the bucket name, the Routing run status (failed), the description of the reason why the Routing Plan has failed and the Routing run start and end date and time)



Figure 28: Failed Routing Plan status window

