



Quota Management for



Version 4.5
Part Number E62393-01

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1 Document Purpose and Scope

This document is intended as a description of Capacity Based Quota Management – a new feature of ETAdirect introduced in version 4.5 to be used by the personnel engaged in quota analysis, planning, workforce management and workload distribution.

The document is up-to-date with version 4.5.12 of ETAdirect.

2 Glossary

The glossary below contains the basic ETAdirect terms used in this document.

Term	Explanation
Activity	Any time-consuming work performed by a resource
API	Application Programming Interface – a particular set of rules and specifications that software programs follow to communicate and interact with each other
Capacity	Workforce possessing the necessary work skills available at a certain moment of time.
Capacity bucket	Bucket used for Quota management
Capacity category	Predefined set of work skills, work skill groups and time slots within which they are considered by the Capacity API
GUI	Graphical User Interface, allowing people to use software by manipulating images rather than by issuing text commands
Historical data	Data of the past periods available in the database or from other sources
Mass Activity	An activity involving 2 or more resources
Other activities	All repeating, mass and shift activities, including those without instances, which are not part of Quota management
Quota	Amount of work that can be accepted for the bucket
Resource	An element in the resource tree representing a defined company asset
Repeating activity	An activity recurring with a predefined frequency in a predefined period
Route	A list of activities assigned to a resource for a specific date, or a list of non-scheduled activities assigned to a resource
Time Slot	1) A fixed service window, defined with a name and label, specifying when certain types of activities can be performed 2) Service Window (if the activity type does not support time slots)
User	1) A person using ETAdirect 2) An entity used for authentication and authorization, allowing people or external software to access ETAdirect
Work Skill	1) An activity that a resource is qualified to perform (resource property) 2) The qualification required to perform an activity (activity property)
Work Zone	The defined geographical area in which a resource can perform an activity

3 Introduction to Capacity and Quota Management

Capacity management is the process of managing the volume of workforce – making sure there are enough field resources with all proper work skills required to perform the anticipated amount and level of work.

Quota Management is a reverse process defining how the work should be allocated across the various work skills and time-slots relative to the field resource availability.

Quota can be defined manually in the 'Quota' screen or as percentage of the available capacity. Quota definition may be based on the historical data using the patterns and trends of the previous periods.

Once Quota is defined, the Capacity Management process may use the Quota values to determine whether the company's resources are sufficient to perform the work. The capacity data (the actual number of minutes available for the work performance) is calculated on the basis of the resources' calendars and is shown per time slot and capacity category. This way, the user can see in real time how many minutes of working time of technicians with certain work skills are available at certain time slot.

As soon as any activities are booked, the capacity required for their performance is subtracted from the available capacity and added to the used capacity. The used capacity is compared to the quota values to make sure that orders for new activities are only accepted when capacity is still available.

The available capacity can also be retrieved by the Capacity Management API to be used in an external CRM system for activities booking.

4 Basis for Capacity and Quota Management

The Capacity and Quota are managed on the basis of several key parameters – work skills and their conditions, capacity categories and time slots. When configured properly, these parameters help determine the available resources with the required work skills at the particular time.

- **Work skills and work skills conditions:** Work skills are client-specific sets of skills assigned to resources, designating their skills and their skill level. When any work skills are assigned to a resource, it means that the resource is qualified to perform such work with a certain skill level.

Work Skills and their levels are assigned to resources manually or via the Resource Management API. Work skills and any required and/or preferable levels are automatically calculated for each activity. Work Skill Conditions are the rules used to perform the calculations. Work skill condition define the activity properties settings requiring certain work skills and their required and preferable levels.

- **Time slots:** Time slots are fixed time intervals specified by beginning and end times with the definition of work skills available and activity types which can be performed during such time intervals.

According to the work skills set for a time slot, the time slot is assigned capacity categories corresponding to the work skills. Alternatively, time slots can be added to other existing capacity categories manually.

- **Capacity categories:** Capacity categories are logical groups of activities joined by common work skills and their levels and time slots. Capacity categories are intended for use in the Quota management as "units" for which quota is defined.

A capacity category consists of one or more work skills with their levels defined, if necessary. Time slots set for a capacity category define the time slots in which the workforce possessing the work skills is available and can be used in capacity and quota management. For example, if a capacity category consists of Install (level 100) and Deinstall (level 50) work skills and is assigned time slots 08-10 and 10-12, this in fact means that activities requiring the Install work skill of level 100 and/or Deinstall work skill of level 50 can be accepted for performance between 08:00 and 12:00. This capacity category will be shown in the corresponding time slot sections of the Quota grid.

4.1 Levels Quota Can Be Defined at

In ETAdirect quota can be defined and managed at the level of day, time slot and capacity category.

The Day Quota:

- restricts the total value of the "Used" capacity for a whole day within the given capacity bucket so that it does not exceed the workforce available on such day
- serves as the basis for the Time Slot quota when it is defined as percentage of the Day quota.

The Time Slot quota will be calculated and recalculated according to the Day quota value

The Time Slot Quota:

- restricts the capacity on the time slot level when the total quota for capacity categories within such time slot exceeds the available resources during such period of time
- serves as the basis for the Capacity Category quota when it is defined as percentage of the Time Slot quota. **The Capacity Category quota will be calculated and recalculated according to the Time Slot quota value**
- simplifies the configuration of capacity buckets where all technicians have the same set of skills, therefore, capacity categories are not necessary

The Capacity Category quota:

- is the basic level of quota management
- restricts the capacity at the capacity category and time slot level

5 Capacity Bucket Configuration

Capacity and Quota management works with buckets which must be defined as capacity buckets to be processed by the Capacity and Quota management.

For a bucket to be included in the Quota management, it has to have 'Quota management' enabled in its 'Resource & Bucket Info' screen (Figure 1).

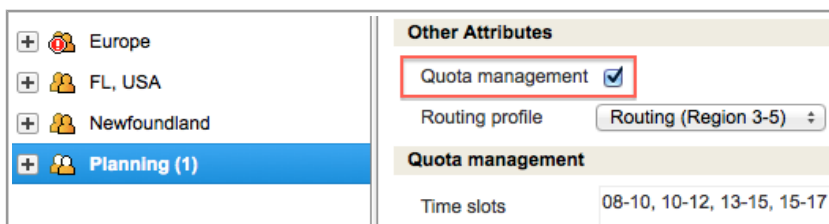


Figure 1: 'Quota management' enabled

The quota-related settings can be defined as part of the capacity bucket settings in the 'Technician/Bucket info' screen. Due to a large number of sub-sections and parameters in the 'Quota Management' section of the 'Resource and Bucket Info' screen, the description of the screen is broken down into sections for easier reference.

5.1 Levels of Quota Definition

Depending on the company policy, the capacity bucket may be configured so that quota is entered or closed on the day, time slot or capacity category level and the maximum capacity is estimated at the day, time slot, capacity category, or work zone level. This section configuration affects the layout of the 'Quota' screen – the columns appearing in the Quota grid (Figure 2).

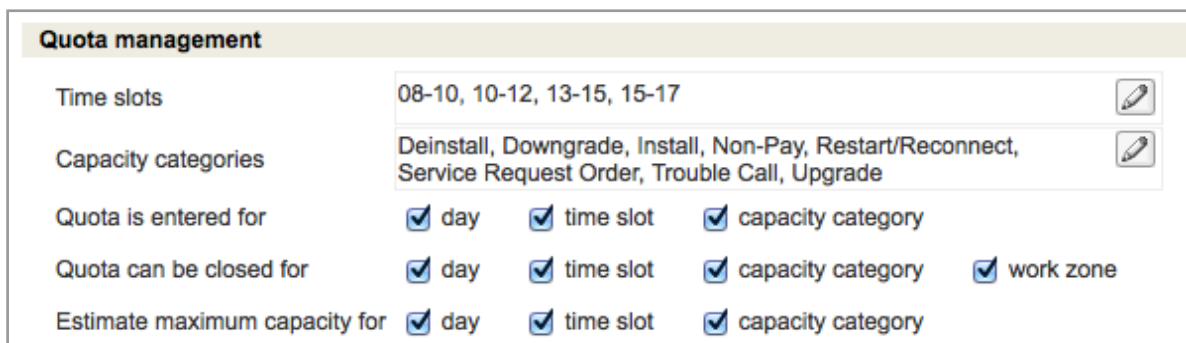


Figure 2: 'Quota management' section of 'Resource & Bucket Info' screen

Field	Description
Time slots	Time slots to be used in the Quota for the selected bucket
Capacity categories	Capacity categories to be used in the Quota for the selected bucket
Quota is entered for: <ul style="list-style-type: none"> day time slot capacity category 	Checkboxes defining the levels on which quota is defined. This selection determines the visibility of the 'Day', 'Time slot' and 'Capacity category' sections of the 'Technician/Bucket Info' screen and of the corresponding sections of the Quota View.
Quota can be closed for: <ul style="list-style-type: none"> day time slot capacity category work zone 	Checkboxes defining the levels on which quota can be closed.
Estimate maximum capacity for: <ul style="list-style-type: none"> day time slot capacity category 	Checkboxes defining the levels for which the maximum capacity should be estimated. Maximum capacity is the maximum number of minutes available for activities booking. ETAdirect checks that the total duration of the

	<p>booked activities (the Used Capacity) plus the total duration of other activities does not exceed the maximum capacity.</p> <p>Maximum capacity is used as the base of quota definition when quota is defined as percentage of the available capacity.</p> <p>The maximum capacity is estimated as follows:</p> <ul style="list-style-type: none"> - day: the maximum capacity is the total working time of technicians in a given capacity bucket on a given day - time slot: the estimated maximum capacity is calculated as the sum of minutes in the period where the time slot interval and the technicians' working hours overlap - capacity category: the estimated maximum capacity is calculated as the sum of minutes in the period where the time slot interval overlaps the working hours of the technicians having such capacity category
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5.2 Settings of Quota Definition at Day Level

The 'Day' section is visible when the 'Quota is entered for' parameter is set for 'day', otherwise it is hidden (Figure 3). This section is intended for configuring the quota management settings at the day level.

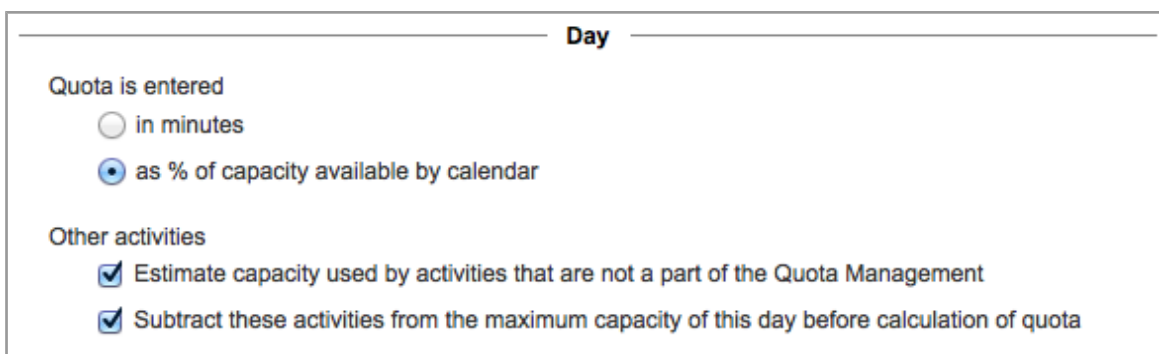



Figure 3: Settings of Quota definition at Day level

Field	Description
Quota is entered: <ul style="list-style-type: none"> • in minutes • as % of capacity available by calendar 	Radio buttons defining the method to be used to define the quota. When 'in minutes' is selected, Quota is to be entered manually as the number of minutes to be used for activities booking. When 'as % of capacity available by calendar' is selected, the user must enter the percentage of the total available capacity to be used for activities booking, and the 'Quota' value in minutes will be calculated automatically.
Other activities: <ul style="list-style-type: none"> • Estimate capacity used by activities that are not a part of the Quota Management • Subtract these activities from the maximum capacity of this day before calculation of quota 	Checkboxes defining whether the system should estimate the capacity used by activities that are not part of the Quota Management and how to use this value. 'Other activities' include all repeating, mass and shift activities already assigned on the selected day. When 'Subtract these activities from the maximum capacity of this day before calculation of quota' is selected, the amount of minutes allocated to other activities is subtracted from the maximum available capacity, and the quota is calculated on the basis of the resulting value. This option is only available when quota is defined

Field	Description
	<p>as percentage of the capacity. When quota is entered in minutes, this option is irrelevant.</p> <p>Note: The 'Subtract these activities from the maximum capacity of this day before calculation of quota' checkbox is not visible in cases when the 'Estimate capacity used by activities that are not a part of the Quota Management' option is disabled.</p> 

5.3 Settings of Quota Definition at Time Slot Level

The 'Time Slot' section is visible when the 'Quota is entered for' parameter is set for 'time slot', otherwise it is hidden. This section is intended for configuring the quota management settings at the time slot level (Figure 4).

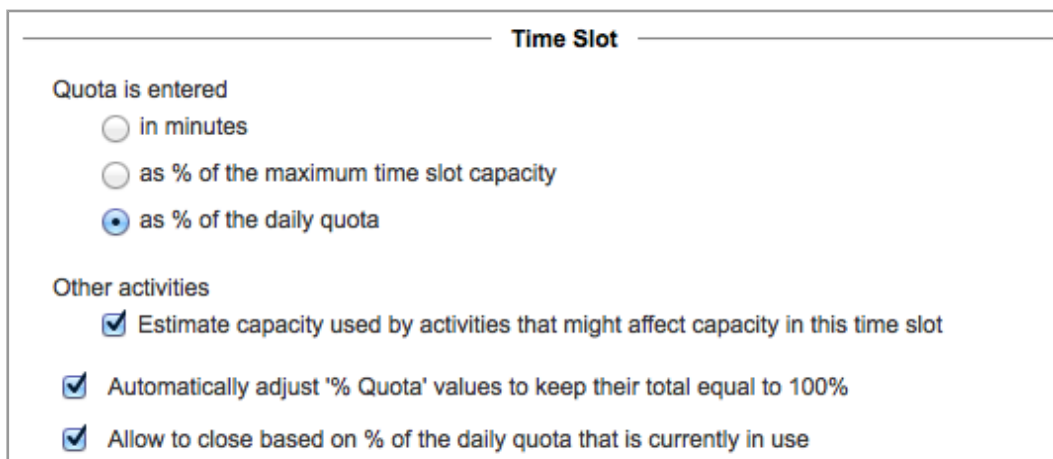


Figure 4: Settings of Quota definition at Time Slot level

Field	Description
<p>Quota is entered:</p> <ul style="list-style-type: none"> • in minutes • as % of the maximum time slot capacity • as % of the daily quota 	<p>Radio buttons defining the method to be used to define the quota. When 'in minutes' is selected, Quota is to be entered manually as the number of minutes to be used for activities booking.</p> <p>When 'as % of the maximum time slot capacity' is selected, the quota is defined as percentage of the maximum capacity at the time slot level. The user must enter the required percentage, and the quota will be calculated automatically. The option is only available if the maximum capacity is estimated on this level.</p> <p>When 'as % of the daily quota' is selected, the quota at the time slot level is calculated as percentage of the quota defined at the day level. The user must enter the required percentage, and the quota for each time slot will be calculated automatically. This option is visible when the day level quota is in use.</p>
<p>Other activities:</p>	<p>Checkboxes defining whether the system should estimate the</p>

Field	Description
<ul style="list-style-type: none"> Estimate capacity used by activities that that might affect capacity in this time slot Subtract these activities from the maximum time slot capacity before calculation of quota 	<p>capacity used by activities that are not part of the Quota Management and how to use this value. 'Other activities' include all repeating, mass and shift activities already assigned to the selected time slot.</p> <p>The second item is only visible if quota is based on the maximum capacity estimated at this level. Also, this functionality depends on the method used to estimate the maximum capacity (the 'Estimate maximum capacity for' option). Therefore, it is not available when the maximum capacity is not calculated.</p> <p>Calculation method</p>
Automatically adjust '% Quota' values to keep their total equal to 100%	<p>Checkbox defining if the total sum of the '% Quota' values should always be equal to 100%. It is only visible if the 'as % of the daily quota' option is selected.</p> <p>When this option is selected, changes to the '% Quota' value of any time slot will cause '% Quota' values for other time slots to change proportionally, so that their sum is always equal to 100%.</p>
Allow to close based on % of the daily quota that is currently in use	<p>Checkbox defining whether the system should allow to stop booking activities belonging to the selected time slot on the basis of the percentage of the daily quota that is currently in use. This restriction works in addition to the quota.</p> <p>It is only visible if the day level quota is in use.</p>

5.4 Settings of Quota Definition at Capacity Category Level

The 'Capacity category' section is visible when the 'Quota is entered for' parameter is set for 'capacity category', otherwise it is hidden. This section is intended for configuring the quota management settings at the capacity category level (Figure 5).

Capacity category

Quota is entered

in minutes

as % of the maximum capacity available in this category

as % of time slot quota

Estimate quota based on historical data

Historical values to be used

Quota %

Used quota %

Process historical data (same weekdays) for period of

one week

one month

two months

Automatically adjust '% Quota' values to keep their total equal to 100%

Allow to close based on % of the time slot quota that is currently in use

Figure 5: Settings for Quota definition at Capacity Category level

Name	Description
Quota is entered:	Radio buttons defining the method to be used for defining the

Name	Description
<ul style="list-style-type: none"> • in minutes • as % of the maximum capacity available in this category • as % of the time slot quota 	quota. The 'as % of the time slot quota' option is only available if the time slot level quota is in use.
Estimate quota based on historical data	Checkbox defining if the system should estimate the '% Quota' values on the basis of the historical data. It is only available if the quota is defined 'as % of the time slot quota'. Calculation data
Historical values to be used: <ul style="list-style-type: none"> • Quota % • Used quota % 	Radio buttons defining if the 'Quota %' or 'Used quota %' values should be processed. This section is only visible if the 'Estimate quota based on historical data' option is selected.
Process historical data (same weekdays) for period of: <ul style="list-style-type: none"> • one week • one month • two months 	Radio buttons defining the length of the historical period to be analyzed. This section is only visible if the 'Estimate quota based on historical data' option is selected.
Automatically adjust '% Quota' values to keep their total equal to 100%	Checkbox defining if the total sum of the '% Quota' values within the same time slot should always be equal to 100%. It is only visible if the 'as % of the time slot quota' option is selected.
Allow to close based on % of the time slot quota that is currently in use	Checkbox defining whether the system should allow to stop booking activities belonging to the selected capacity category on the basis of percentage of the time slot quota that is currently in use. This restriction works in addition to the quota. This option is only visible if the capacity category level quota is in use.

6 Quota View

The 'Quota Management' functionality can be accessed by selecting 'Quota' in the 'Dispatch' main menu item (Figure 6).

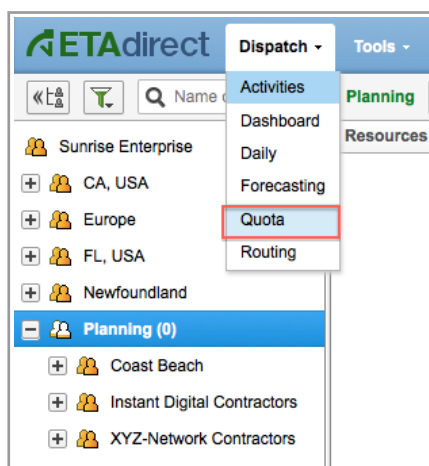


Figure 6: 'Quota' selection from main menu

The Quota screen includes the Resource Tree and the Quota grid (Figure 7).

		Friday, January 24th, 2014							
Time slot	Capacity categories	Max available	% Quota	Quota	Booked activities	Used	Used quota %	Status	Close time
08-10		11040	64%	18671	213	11582	62.03%	✗	05:41 AM
	Install	10440	71%	13256	18	723	5.45%	✗	
	Trouble Call	10320	14.5%	2707	17	636	23.49%	✗	
	Upgrade	10920	14.5%	2707	178	10223	377.65%	✗	
	Total	31680		18670	213	11582			
10-12		11040	12%	3501	191	8465	241.79%	✓	
	Install	10440	43%	1505	20	895	59.47%	✓	10 AM
	Trouble Call	10320	28.5%	998	48	1895	189.88%	✓	
	Upgrade	10920	28.5%	998	120	5511	552.2%	✓	
	Total	31680		3501	188	8301			

Figure 7: Quota screen overview

In order to view the Quota for a certain bucket, that bucket needs to be selected in the Resource Tree. The Resource Tree can be displayed by clicking or hidden by clicking . The buckets are arranged in the hierarchical structure with the root resource on top. When there are no capacity buckets in the system, the screen will show the 'Unable to get capacity data' message and no Resource Tree will be displayed.

6.1 Quota Views

Because of significant number of parameters which can be shown at the same time on each of the levels, the Quota View provides separate tables for the 'day', 'time slot', and 'capacity category' parameters. The Quota level can be selected from the drop-down list in the 'View' filter (Figure 8).

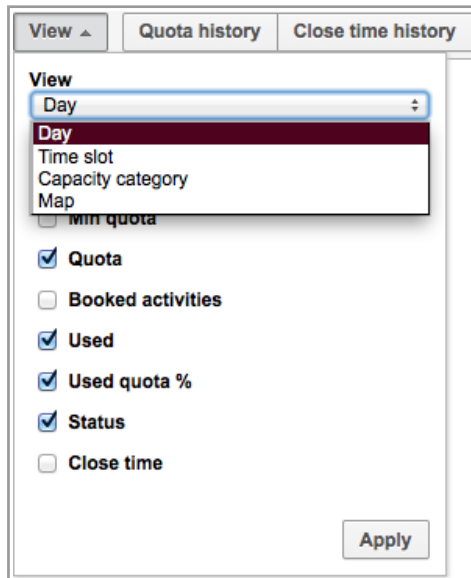


Figure 8: Quota level selection

The period for which Quota is to be displayed and managed can be selected in the Calendar at the top of the screen.

The calendar in the Quota View offers four options to view the quotas - 'Day', 'Week', 'Month' and 'Custom' (Figure 9).

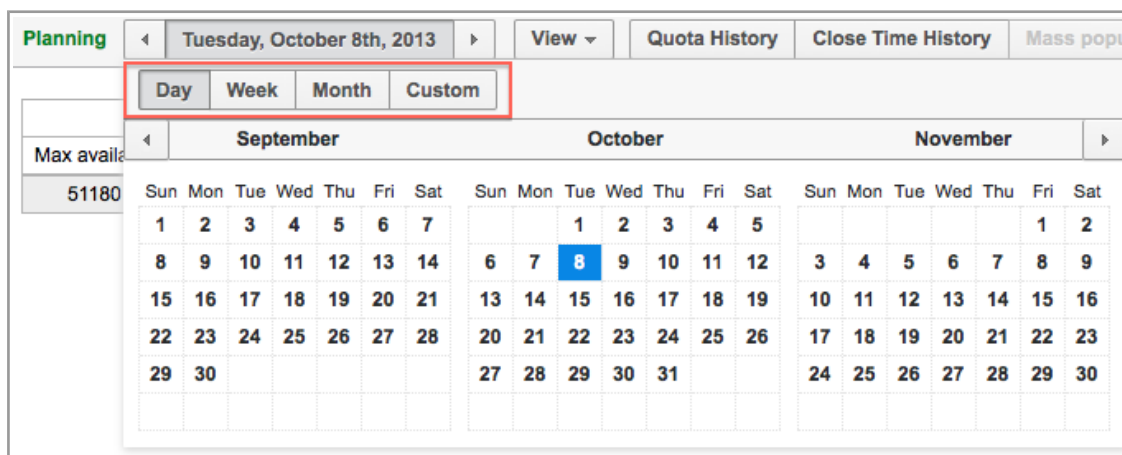


Figure 9: Quota View calendar

When 'Day', 'Week' or 'Month' is chosen, the quota is displayed and can be managed for the selected day, week or month, respectively, starting from the date selected in the calendar. The 'Custom' option allows to select and view individual days in the calendar. For example, if the company situation requires quota processing for Mondays and Thursdays only or for the first 10 days of a month, this can be achieved by using the 'Custom' calendar option. When the 'Custom' option is activated, the days are selected by clicking the dates directly in the calendar.

At the same time the Quota screen displays the quota values at the selected level (day, time slot or capacity category).

6.1.1 Day Quota

The Day Quota table provides an overview of the capacity situation for a day and allows to restrict the 'Used' capacity value so that it does not exceed the workforce available on the selected day (Figure 10).

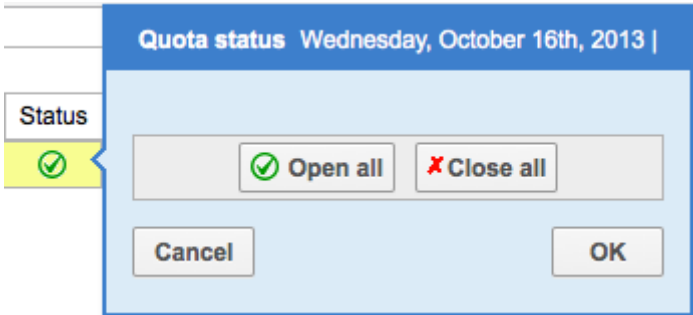
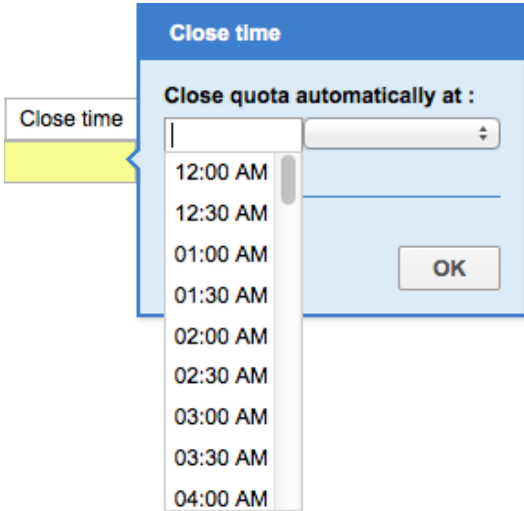
Planning	Wednesday, January 15th, 2014	View	Quota history	Close time history	Mass populate				
Wednesday, January 15th, 2014									
Max available	Other activities	% Quota	Min quota	Quota	Booked activities	Used	Used quota %	Status	Close time
51180		80%	40944	40944	711	36146	88.28%	✓	03 AM
						<input type="button" value="Discard changes"/> <input type="button" value="Save"/>			

Figure 10: Day Quota table

Day level quota parameters:

Name	Description
Max available	The maximum capacity available by the calendar which is calculated as the sum of the technicians' working time in the selected capacity bucket on the selected day. This value serves as the base for quota when quota is defined as percentage of the available capacity. The 'Max available' column is hidden when 'Estimate maximum capacity for' is disabled at the day level in the capacity bucket configuration. The 'Max available' value is recalculated on a periodical basis according to the settings in 'Business rules'.

Other activities	The capacity allocated to activities that are not part of capacity management (mass, repeating and shift activities). The 'Other activities' column is only shown when the 'Estimate capacity used by activities that are not a part of the Quota Management' is set in the capacity bucket configuration. The 'Other activities' value is recalculated on a periodical basis according to the settings in 'Business rules'.																																				
% Quota	Percentage of the maximum capacity available for activities booking. The '% Quota' value is to be entered manually by the user. The '% Quota' value is restricted to the interval of 0-999.99. The '% Quota' column is only visible when 'Quota is entered' parameter is set to 'as % of capacity available by calendar' in the capacity bucket configuration. '% Quota' affects the value of the 'Quota' column.																																				
Min quota	The minimum allowed value of the quota to be entered manually by the user. The valid range for the 'Min quota' value is 0-16,777,215. The 'Min quota' parameter is only used when quota is defined as percentage of the capacity and is intended for situations when the calculated quota value might be less than the duration of a single activity. In this case, the 'Min quota' value is used instead of the calculated quota value, as otherwise quota calculation has no practical purpose. The 'Min quota' column is only visible when 'Quota is entered' parameter is set to 'as % of capacity available by calendar' in the capacity bucket configuration.																																				
Quota	<p>The quota for activities booking on the selected day which can be either entered manually or calculated as percentage of the available capacity. The valid range for the 'Quota' value is 0-16,777,215. Depending on the settings of the 'Quota is entered' parameter in the capacity bucket configuration, the 'Quota' cell can be editable (when quota is entered in minutes) or non-editable (when quota is entered as % of capacity available by calendar).</p> <p>Examples:</p> <p>Quota entered in minutes (manually):</p> <table border="1"> <thead> <tr> <th colspan="6">Wednesday, October 16th, 2013</th> </tr> <tr> <th>Max available</th> <th>Other activities</th> <th>Quota</th> <th>Booked activities</th> <th>Used</th> <th>Used quota %</th> </tr> </thead> <tbody> <tr> <td>51180</td> <td>60</td> <td>49220</td> <td>712</td> <td>36283</td> <td>73.72%</td> </tr> </tbody> </table> <p>Here the 'Quota' cell is editable and allows entering the quota in minutes. The 'Max available' and 'Other activities' values do not affect the 'Quota' value directly.</p> <p>Quota entered as % of capacity available by calendar:</p> <table border="1"> <thead> <tr> <th colspan="6">Wednesday, October 16th, 2013</th> </tr> <tr> <th>Max available</th> <th>Other activities</th> <th>% Quota</th> <th>Min quota</th> <th>Quota</th> <th>Booked activities</th> </tr> </thead> <tbody> <tr> <td>51180</td> <td>60</td> <td>100%</td> <td></td> <td>51120</td> <td>712</td> </tr> </tbody> </table> <p>In this case the user is to enter the '% Quota', and the 'Quota' value will be calculated automatically. The 'Quota' cell is non-editable. In this example the 'Subtract these activities [other activities] from the maximum capacity of this day before calculation of quota' option is enabled, and the 'Other activities' value (60) is subtracted from 'Max available' (51180) resulting in 100% quota of 51120.</p>	Wednesday, October 16th, 2013						Max available	Other activities	Quota	Booked activities	Used	Used quota %	51180	60	49220	712	36283	73.72%	Wednesday, October 16th, 2013						Max available	Other activities	% Quota	Min quota	Quota	Booked activities	51180	60	100%		51120	712
Wednesday, October 16th, 2013																																					
Max available	Other activities	Quota	Booked activities	Used	Used quota %																																
51180	60	49220	712	36283	73.72%																																
Wednesday, October 16th, 2013																																					
Max available	Other activities	% Quota	Min quota	Quota	Booked activities																																
51180	60	100%		51120	712																																
Booked activities	Number of activities already booked in the selected bucket for the selected day. This value is recalculated immediately when any activities are added, rescheduled or canceled.																																				
Used	The total duration of the activities already booked in the selected bucket for the selected day. This value includes the activities duration and travel time																																				

	<p>and is recalculated immediately when any activities are added, rescheduled or canceled.</p>
<p>Used quota %</p>	<p>The percentage of the day quota used by the booked activities (the ratio of 'Used' to 'Quota'). The method of quota definition (manual or as percentage of capacity) has no effect on this value.</p>
<p>Status</p>	<p>Open or closed status of quota for the selected day. Clicking in this cell allows manual immediate opening or closing the quota for the entire day.</p>  <p>Closing or opening of quota at the day level will close or open quota at the lower levels (time slot and capacity category).</p>
<p>Close time</p>	<p>Time when the quota is to be closed automatically for the entire day. Clicking this cell allows manual setting or changing the close time for the day. At the selected time the value of the 'Status' cell is changed to 'Closed'.</p>  <p>Setting the close time at the day level will cause quota to close at the lower levels (time slot and capacity category) at the same time. If a different close time has been set at a lower level, quota will be closed at whichever moment is earlier.</p> <p>For the description of quota closing day selection please refer to the dedicated section.</p>

6.1.1.1 Day Level Filters

The contents of the quota grid can be filtered by selecting the desired elements in the 'View' window.

The checkboxes define which columns are to be displayed in the Quota grid. However, the list of available columns varies depending on the selected method of quota definition and other capacity bucket settings. The filter contains only the columns relevant to the selected method and configuration

(Figures 11-12).

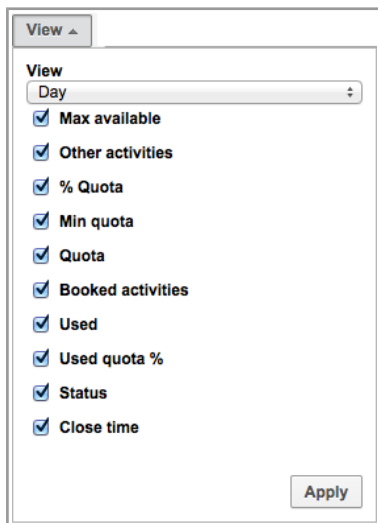


Figure 11: Filter options for quota entered 'as % of capacity available by calendar'

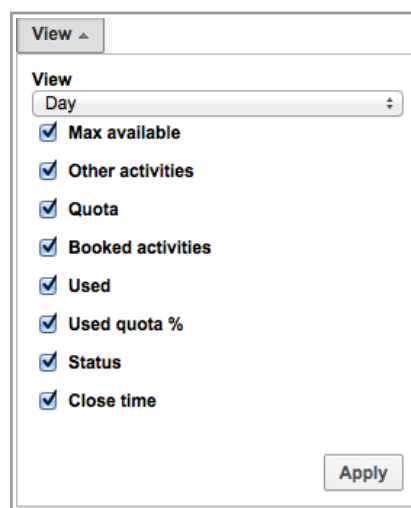


Figure 12: Filter options for quota entered 'in minutes'

6.1.2 Time Slot Quota

The Time Slot Quota table provides an overview of the capacity situation per time slot and allows to restrict the capacity for a particular time slot if the total quota of the capacity categories within such time slot may exceed the resources available in such period (Figure 13).

Planning < Wednesday, January 15th, 2014 > View ▾ Quota history Close time history Mass populate											
Wednesday, January 15th, 2014											
Time slot	Max available	Other activities	% Quota	Min quota	Quota	Booked activities	Used	Used quota %	% to stop booking at	Status	Close time
Day	51180		93%	47400	47597	711	36146	75.94%		✓	
08-10	11040		14.67%		6982	213	11582	165.88%		✗	Jan 10, 03:54 AM
10-12	11040		56%		26654	191	8465	31.76%		✓	
13-15	11640		14.67%		6982	237	12923	185.09%		✓	
15-17	11640		14.67%		6982	70	3176	45.49%		✓	
Total	45360				47600	711	36146				

Figure 13: Time Slot Quota table

Time Slot level quota parameters:

Name	Description
Max available	The maximum capacity available by the calendar which is calculated as the sum of the technicians' working time in the selected capacity bucket in the selected time slot. This value serves as the base for quota when quota is defined as percentage of the available capacity. The 'Max available' column is hidden when 'Estimate maximum capacity for' is disabled both at the day and time slot level in the capacity bucket configuration. If this option is disabled at the time slot level only, the 'Max available' column is visible, but its values are not calculated. The 'Max available' value is recalculated on a periodical basis according to the 'Business rules' settings.
Other activities	The capacity allocated to activities that are not part of capacity management

	<p>(mass, repeating and shift activities). The 'Other activities' column is shown when the 'Estimate capacity used by activities that might affect capacity in this time slot' is set at the day and time slot level in the capacity bucket configuration, otherwise it is hidden. However, if this option is disabled only the time slot level, the column is visible but its values are not calculated. The 'Other activities' value is recalculated on a periodical basis according to the 'Business rules' settings.</p>																																																							
<p>% Quota</p>	<p>Percentage of the day or time slot quota (depending on the capacity bucket configuration settings) available for booking of activities in the selected time slot.</p> <p>When quota is entered in minutes (according to the capacity bucket configuration), the '% Quota' value is non-editable by the user and is calculated as percentage of the total quota allocated to a time slot. The percentage is adjusted in proportion to the quota values, so that the total sum of all time slots is 100%.</p> <p>When quota is entered 'as % of the maximum time slot capacity' (according to the capacity bucket configuration), the '% Quota' value is to be entered by the user. This value affects the 'Quota' value which is calculated as the percentage of the 'Max available' value for the selected time slot. The '% Quota' value is restricted to the interval of 0-999.99.</p> <p>When quota is entered 'as % of the daily quota' (according to the capacity bucket configuration), the '% Quota' value value is to be entered by the user. This value affects the 'Quota' value which is calculated as the percentage of the 'Quota' value for the day.</p>																																																							
<p>Min quota</p>	<p>The minimum allowed value of the quota to be entered manually by the user. The valid range for the 'Min quota' value is 0-16,777,215. The 'Min quota' parameter is only used when quota is defined as percentage of the time slot capacity or daily quota and is intended for situations when the calculated quota value might be less than the duration of a single activity. In this case, the 'Min quota' value is used instead of the calculated quota value, as otherwise quota calculation has no practical purpose. The 'Min quota' column is only visible when 'Quota is entered' parameter is set to 'as % of the maximum time slot capacity' or 'as % of the daily quota' in the capacity bucket configuration.</p>																																																							
<p>Quota</p>	<p>The quota for booking of activities having the selected time slot. The valid range for the 'Quota' value is 0-16,777,215. Depending on the settings of the 'Quota is entered' parameter in the capacity bucket configuration, the 'Quota' cell can be editable (when quota is entered in minutes) or non-editable (when quota is entered 'as % of the maximum time slot capacity' or 'as % of the daily quota').</p> <p>Depending on the methods of quota definition, the following three cases are possible:</p> <p>Examples:</p> <p>Quota entered in minutes (manually):</p> <table border="1"> <thead> <tr> <th rowspan="2">Time Slot</th> <th colspan="6">Wednesday, October 16th, 2013</th> </tr> <tr> <th>Max available</th> <th>Other activities</th> <th>% Quota</th> <th>Quota</th> <th>Booked activities</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>Day</td> <td>51180</td> <td>60</td> <td></td> <td>51120</td> <td>712</td> <td>36283</td> </tr> <tr> <td>08-10</td> <td>11040</td> <td>24</td> <td>23.97%</td> <td>12200</td> <td>200</td> <td>9580</td> </tr> <tr> <td>10-12</td> <td>11040</td> <td>16</td> <td>21.61%</td> <td>11000</td> <td>190</td> <td>9608</td> </tr> <tr> <td>13-15</td> <td>11640</td> <td>2</td> <td>26.92%</td> <td>13700</td> <td>235</td> <td>12554</td> </tr> <tr> <td>15-17</td> <td>11640</td> <td></td> <td>27.5%</td> <td>14000</td> <td>70</td> <td>3688</td> </tr> <tr> <td>Total</td> <td>45360</td> <td>42</td> <td></td> <td>50900</td> <td>695</td> <td>35430</td> </tr> </tbody> </table> <p>Here the 'Quota' cells are editable and allow entering the quota in minutes. The 'Max available' and 'Other activities' values do not affect the 'Quota'</p>	Time Slot	Wednesday, October 16th, 2013						Max available	Other activities	% Quota	Quota	Booked activities	Used	Day	51180	60		51120	712	36283	08-10	11040	24	23.97%	12200	200	9580	10-12	11040	16	21.61%	11000	190	9608	13-15	11640	2	26.92%	13700	235	12554	15-17	11640		27.5%	14000	70	3688	Total	45360	42		50900	695	35430
Time Slot	Wednesday, October 16th, 2013																																																							
	Max available	Other activities	% Quota	Quota	Booked activities	Used																																																		
Day	51180	60		51120	712	36283																																																		
08-10	11040	24	23.97%	12200	200	9580																																																		
10-12	11040	16	21.61%	11000	190	9608																																																		
13-15	11640	2	26.92%	13700	235	12554																																																		
15-17	11640		27.5%	14000	70	3688																																																		
Total	45360	42		50900	695	35430																																																		

values directly. The '% Quota' values are calculated automatically in proportion to the 'Quota' values so that their total equals 100%.

Quota entered as % of the maximum time slot capacity:

Time Slot	Wednesday, October 16th					
	Max available	Other activities	% Quota	Quota	Booked activities	Used
Day	51180	60		51120	712	36283
08-10	11040	24	100%	11016	200	9580
10-12	11040	16	95%	10472	190	9608
13-15	11640	2	100%	11638	235	12554
15-17	11640		81%	9428	70	3688
Total	45360	42		42554	695	35430

In this case the user is to enter the '% Quota', and the 'Quota' value will be calculated automatically on the basis of the 'Max available' values of the corresponding time slots. 'Quota' cells are non-editable. In this example the 'Subtract these activities [other activities] from the maximum time slot capacity before calculation of quota' option is enabled, and the 'Other activities' value (24) for time slot '08-10' is subtracted from 'Max available' (11040) resulting in 100% quota of 11016.

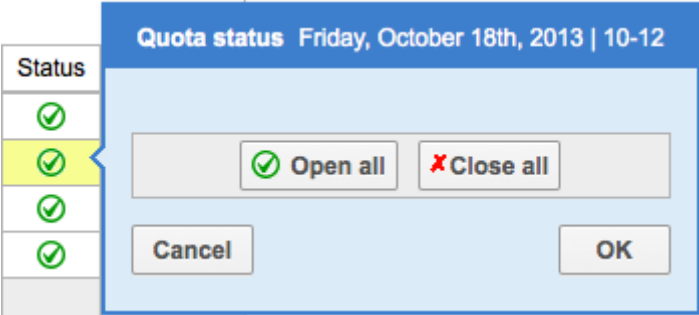
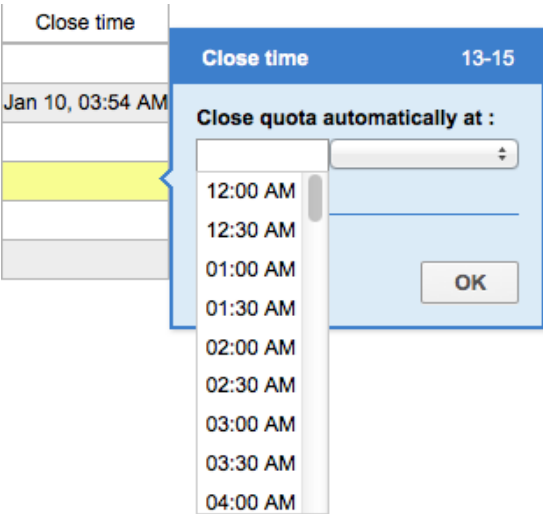
Quota entered as % of the daily quota:

Time Slot	Wednesday, October 16th					
	Max available	Other activities	% Quota	Quota	Booked activities	Used
Day	51180	60		51120	712	36283
08-10	11040		15%	7668	200	9580
10-12	11040		25%	12780	190	9608
13-15	11640		35%	17892	235	12554
15-17	11640		25%	12780	70	3688
Total	45360			51120	695	35430

When this option is selected, the user is to enter the '% Quota', and the 'Quota' value will be calculated automatically on the basis of the 'Quota' value for the day. 'Quota' cells for time slots are non-editable.

Booked activities Number of activities already booked in the selected bucket for the selected time slot. This value is recalculated immediately when any activities are added, rescheduled or canceled.

Used The total duration of the activities already booked in the selected bucket for the selected time slot. This value includes the activities duration and travel time and is recalculated immediately when any activities are added, rescheduled or canceled.

Used quota %	The percentage of the time slot quota used by the booked activities (the ratio of 'Used' to 'Quota'). The method of quota definition (manual or as percentage of capacity) has no effect on this value.
% to stop booking at	Percentage of the used day quota at which no more activities are to be booked for the selected time slot. This value is to be entered manually by the user. The '% to stop booking at' value is restricted to the interval of 0-999.99. The value of this parameter does not in fact change the 'Quota status'. This parameter is used for the Capacity API – when the set percentage has been reached, the 'get_capacity' function will no longer return quota for the time slot.
Status	<p>Open or closed status of quota for the selected time slot. Clicking in this cell allows manual immediate opening or closing the quota for the entire time slot.</p>  <p>Closing or opening of quota at the time slot will close or open quota at the lower level (capacity category).</p>
Close time	<p>Time when the quota is to be closed automatically for the selected time slot. Clicking this cell allows manual setting or changing the close time for the time slot. At the selected time the value of the 'Status' cell is changed to 'Closed'.</p>  <p>Setting the close time at the time slot level will cause quota to close at the</p>

	capacity category level at the same time. If a different close time has been set for a capacity category, quota will be closed at whichever moment is earlier. For the description of quota closing day selection please refer to the dedicated section .
--	--

6.1.2.1 Time Slot Level Filters

The contents of the quota grid can be filtered by selecting the desired elements in the 'View' window.

At the Time Slot level the Quota View can be restricted to show only one time slot by selecting the desired value from the 'Time Slot' drop-down list (Figure 14).

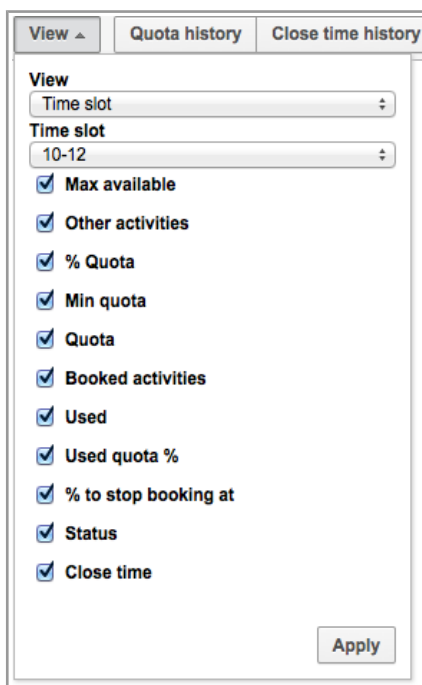


Figure 14: Filter options for Time Slot quota level

6.1.3 Capacity Category Quota Level

The Quota definition at the Capacity Category level which has been in use in the earlier versions of ETAdirect, is used to define the Quota for certain combinations of capacity categories and time slots. A bucket must be assigned capacity categories for the Quota management (Figure 15).

Wednesday, January 15th, 2014															
Time slot	Capacity categories	Max available	Other activities	Weight	Estimated quota %	% Quota	Min quota	Plan	Quota	Booked activities	Used	Used quota %	% to stop booking at	Status	Close time
08-10		11040								213	11582			✗	Jan 10, 03:54 AM
Install		10440			28.5%		3588			18	723		48%	✗	Jan 10, 07 AM
Trouble Call		10320			28.5%		897			17	636			✗	
Upgrade		10920			43%		4400			178	10223			✗	
Total		31680								213	11582				
10-12		11040								191	8465			✓	
Install		10440			76%	9600	5388	9600		20	895	9.32%	54%	✗	Jan 10, 10 AM
Trouble Call		10320			12%		890			48	1895			✓	
Upgrade		10920			12%		4400			120	5511			✓	
Total		31680						9600		188	8301				

Figure 15: Capacity Category Quota table

Capacity Category level quota parameters:

Name	Description
Max available	The maximum capacity available by the calendar which is calculated as the sum of the technicians' working time in the selected capacity bucket in the combination of the selected capacity category and time slot. This value serves as the base for quota when quota is defined as percentage of the available capacity. The 'Max available' column is hidden when 'Estimate maximum capacity for' is disabled both at the time slot and capacity category level in the capacity bucket configuration. If this option is disabled at the capacity category level only, the 'Max available' column is visible, but its values are not calculated. The 'Max available' value is recalculated on a periodical basis according to the 'Business Rules' settings.
% Quota	<p>Percentage of the time slot or capacity category quota (depending on the capacity bucket configuration settings) available for booking of activities in the selected capacity category.</p> <p>When quota is entered in minutes (according to the capacity bucket configuration), the '% Quota' value is non-editable by the user and is calculated as percentage of the time slot quota allocated to a capacity category on the basis of the number of minutes entered in the 'Quota' column. The percentage is adjusted in proportion to the quota values, so that the total sum of all time slots is 100%.</p> <p>When quota is entered 'as % of the maximum capacity available in this category' (according to the capacity bucket configuration), the '% Quota' value is to be entered by the user. This value affects the 'Quota' value which is calculated as the percentage of the 'Max available' value for the selected capacity category and time slot. The '% Quota' value is restricted to the interval of 0-999.99.</p> <p>When quota is entered 'as % of time slot quota' (according to the capacity bucket configuration), the '% Quota' value is to be entered by the user. This value affects the 'Quota' value which is calculated as the percentage of the 'Quota' value for the time slot.</p>
Min quota	The minimum allowed value of the quota to be entered manually by the user. The valid range for the 'Min quota' value is 0-16,777,215. The 'Min quota' parameter is only used when quota is defined as percentage of the capacity in a category or time slot quota and is intended for situations when the calculated quota value might be less than the duration of a single activity. In this case, the 'Min quota' value is used instead of the calculated quota value, as otherwise quota calculation has no practical purpose.
Plan	The 'Plan' values taken from the 'Forecasting' screen, when Plan is calculated in Forecasting and 'Show Plan Column' is enabled in the 'Display' screen.
Quota	The quota for booking of activities having the selected capacity category. The

valid range for the 'Quota' value is 0-16,777,215. Depending on the settings of the 'Quota is entered' parameter in the capacity bucket configuration, the 'Quota' cell can be editable (when quota is entered in minutes) or non-editable (when quota is entered 'as % of the maximum capacity available in this category' or 'as % of the time slot quota').

Depending on the methods of quota definition, the following three cases are possible:

Examples:

Quota entered in minutes (manually):

Time Slot Capacity Categories	Friday, October 18th, 2013					
	Max available	% Quota	Quota	Booked activities	Used	Used quota %
10-12	11040	25%	12780	191	8465	66.24%
Install	10440	9.84%	1067	20	895	83.88%
Trouble Call	10440	20.78%	2254	48	1895	84.07%
Upgrade	11040	69.39%	7527	120	5511	73.22%
Total	31920		10848	188	8301	
13-15	11640	35%	17892	237	12923	72.23%
Install	11040	46.7%	5229	44	2276	43.53%
Trouble Call	11040	25.94%	2905	86	4733	162.93%
Upgrade	11640	27.36%	3063	77	4057	132.45%
Total	33720		11197	207	11066	

Here the 'Quota' cells are editable and allow entering the quota in minutes. The 'Max available' values do not affect the 'Quota' values directly. The '% Quota' values are calculated automatically in proportion to the 'Quota' values so that their total equals 100%.

Quota entered as % of the maximum capacity available in this category:

Time Slot Capacity Categories	Friday, October 18th, 2013					
	Max available	% Quota	Quota	Booked activities	Used	Used quota %
10-12	11040	25%	12780	191	8465	66.24%
Install	10440	84%	8769	20	895	10.21%
Trouble Call	10440	76%	7934	48	1895	23.88%
Upgrade	11040	90%	9936	120	5511	55.46%
Total	31920		26639	188	8301	
13-15	11640	35%	17892	237	12923	72.23%
Install	11040	75%	8280	44	2276	27.49%
Trouble Call	11040	80%	8832	86	4733	53.59%
Upgrade	11640	68%	7915	77	4057	51.26%
Total	33720		25027	207	11066	

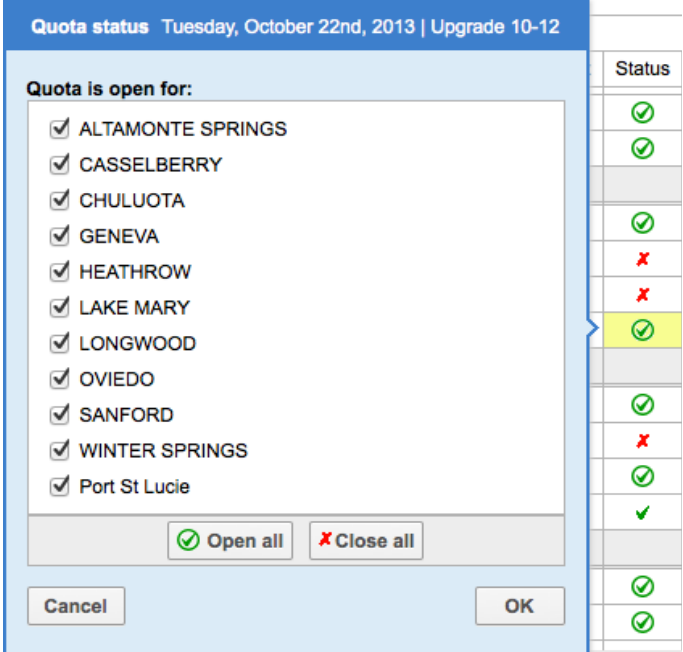
In this case the user is to enter the '% Quota', and the 'Quota' value will be calculated automatically on the basis of the 'Max available' values of the corresponding capacity categories. 'Quota' cells are non-editable.

Quota entered as % of time slot quota:

Time Slot Capacity Categories	Friday, October 18th, 2013					
	Max available	% Quota	Quota	Booked activities	Used	Used quota %
10-12	11040	25%	12780	191	8465	66.24%
Install	10440	35%	4473	20	895	20.01%
Trouble Call	10440	25%	3195	48	1895	59.31%
Upgrade	11040	40%	5112	120	5511	107.81%
Total	31920		12780	188	8301	
13-15	11640	35%	17892	237	12923	72.23%
Install	11040	40%	7156	44	2276	31.81%
Trouble Call	11040	25%	4473	86	4733	105.81%
Upgrade	11640	35%	6262	77	4057	64.79%
Total	33720		17891	207	11066	

When this option is selected, the user is to enter the '% Quota', and the 'Quota' value will be calculated automatically on the basis of the 'Quota' value for the time slot. 'Quota' cells are non-editable.

Booked activities	Number of activities already booked in the selected bucket for the selected combination of time slot and capacity category. This value is recalculated immediately when any activities are added, rescheduled or canceled.
Used	The total duration of the activities already booked in the selected bucket for the selected combination of time slot and capacity category. This value includes the activities duration and travel time and is recalculated immediately when any activities are added, rescheduled or canceled.
Used quota %	The percentage of the capacity category quota used by the booked activities (the ratio of 'Used' to 'Quota'). The method of quota definition (manual or as percentage of capacity) has no effect on this value.
% to stop booking at	Percentage of the used time slot quota at which no more activities are to be booked for the selected capacity category. This value is to be entered manually by the user. The '% to stop booking at' value is restricted to the interval of 0-999.99. The value of this parameter does not in fact change the 'Quota status'. This parameter is used for the Capacity API – when the set percentage has been reached, the 'get_capacity' function will no longer return quota for the capacity category in the selected time slot.
Weight	Weight of the selected capacity category calculated on the basis of historical data. This column is visible when the 'Estimate quota based on historical data' option is enabled at the capacity category level. The weight value is represented as percentage. Depending on the capacity bucket configuration, the weight is calculated as the relation of either '% Quota' or 'Used quota %' to the 'Max available' value on the same weekday(s) in the past for the selected period (one week, one month or two months). 'Weight' is used as a prediction tool to calculate the 'Estimated quota %' value based on historical data.
Estimated quota %	Percentage of the time slot quota expected to be allocated for booking of activities having the selected capacity category. This value is calculated as the product of Weight and the 'Max available' value for the selected capacity category and time slot. 'Estimated quota %' is quota forecast calculated on the basis of historical data (quota used or set for the same weekday(s) in the historical period of one week, one month or two months). The 'Estimated quota %' value is used for information and reference in determining quota for future periods.

<p>Status</p>	<p>Open or closed status of quota for the selected capacity category and time slot. Clicking in this cell allows manual immediate opening or closing the quota.</p>  <p>At the Capacity Category level quota can be opened or closed per individual work zones by selecting the corresponding checkboxes or for the entire capacity category in the selected time slot by clicking 'Open all' or 'Close all'.</p> <p>Note: Deactivated work zones are not shown in the work zones list.</p>
<p>Close time</p>	<p>Time when the quota is to be closed automatically for the selected capacity category and time slot. Clicking this cell allows manual setting or changing the close time. At the selected time the value of the 'Status' cell is changed to 'Closed'.</p>

'Close Time' can be set per individual work zone by selecting the corresponding field or for the entire capacity category in the selected time slot by entering the close time value in the 'Close quota automatically by work zone at:' field.

If different 'Close time' is set for the capacity category and a work zone, the close time value defined at the work zone level has priority over the close time set at the level of capacity category.

For the description of quota closing day selection please refer to the dedicated [section](#).

Note: Deactivated work zones are not shown in the work zones list.

6.1.3.1 Capacity Category Level Filters

The contents of the quota grid can be filtered by selecting the desired elements in the 'View' window.

At the Capacity Category level the Quota View can be restricted to show only one time slot and/or one capacity category by selecting the desired values from the 'Time Slot' and 'Category' drop-down lists.

The checkboxes define which columns are to be displayed in the Quota grid. However, the list of available columns varies depending on the selected method of quota definition and other capacity bucket settings. The filter contains only the columns relevant to the selected method and configuration (Figures 16-17).

The screenshot shows a web interface with three tabs: 'View', 'Quota history', and 'Close time histor'. The 'View' tab is active. It contains three dropdown menus: 'Capacity category' (with a downward arrow), 'Category' (with an asterisk and a downward arrow), and 'Time slot' (with an asterisk and a downward arrow). Below these are 15 checkboxes, all of which are checked. The checkboxes are: Max available, Other activities, % Quota, Min quota, Plan, Quota, Booked activities, Used, Used quota %, % to stop booking at, Status, and Close time. An 'Apply' button is located at the bottom right of the form.

Figure 16: Filter options for quota entered 'in minutes and 'as % of the maximum capacity available in this category'

The screenshot shows a web interface with three tabs: 'View', 'Quota history', and 'Close time histor'. The 'View' tab is active. It contains three dropdown menus: 'Capacity category' (with a downward arrow), 'Category' (with an asterisk and a downward arrow), and 'Time slot' (with an asterisk and a downward arrow). Below these are 15 checkboxes, all of which are checked. The checkboxes are: Max available, Other activities, Weight, Estimated quota %, % Quota, Min quota, Plan, Quota, Booked activities, Used, Used quota %, % to stop booking at, Status, and Close time. An 'Apply' button is located at the bottom right of the form.

Figure 17: Filter options for quota entered 'as % of time slot quota'

6.2 Quota Map View

In order to enhance the usability and visual clarity of the Quota data, the Quota screen is supported by the Map view (Figure 18).

The Map view displays the work zones defined in the system and their quota status.

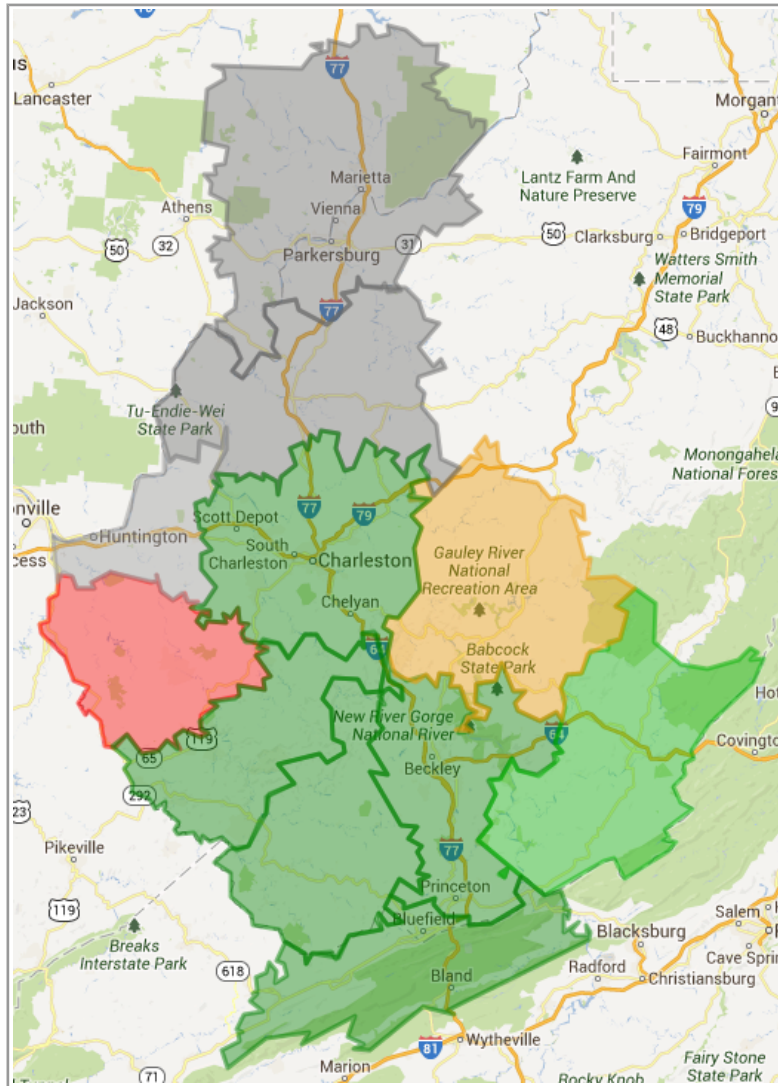


Figure 18: Quota Map View

The Map view is accessed by clicking the 'Map' option in the 'View' filter (Figure 19).

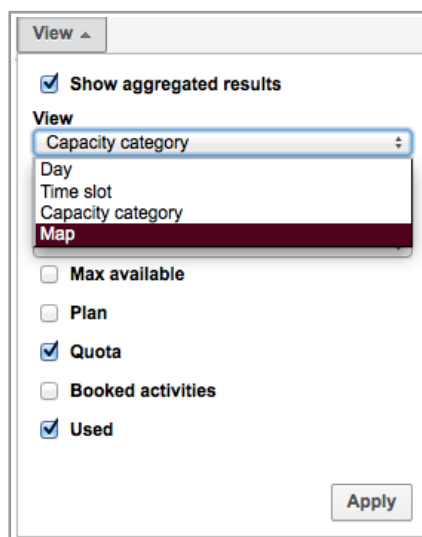


Figure 19: Map View selection

When the Map View is selected, the Map opens already focused on the work zones of the selected capacity bucket.

The work zones displayed on the Map are shown in different colors depending on the corresponding quota status and aggregated used quota %:

- quota closed with no activities – light gray
- quota closed with activities – gray
- quota open with no activities – light green
- quota open less than 90% – green
- quota open more than 90% – yellow
- quota open with more than 100% – red

The percent value mentioned above is calculated as the ratio of the aggregated 'Used' to aggregated 'Quota' values for the lowest level of quota definition (as defined in the 'Resource Info' screen).

Upon clicking on a work zone on the map, the hint will appear which indicates the name and ID of the work zone selected (Figure 20).

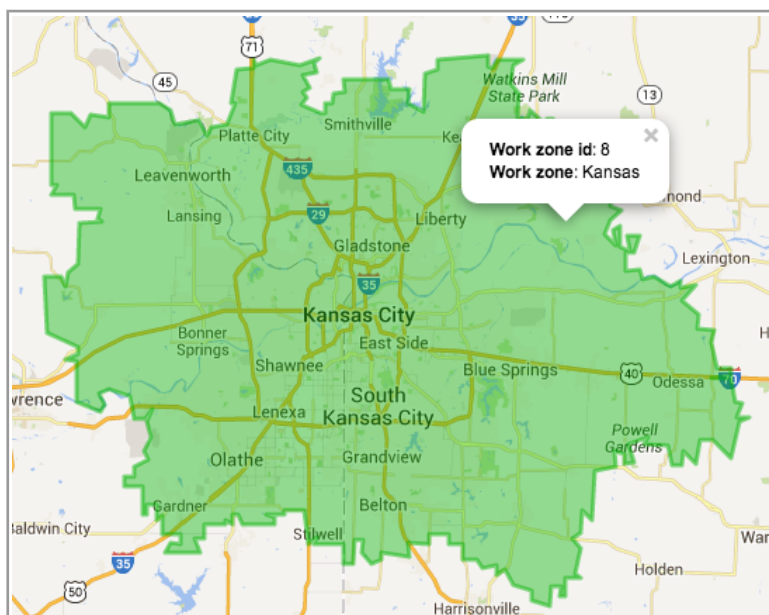


Figure 20: Work zone hint on Map View

The Map view access is controlled by a special permission (Manage → Quota → Map) (Figure 21).

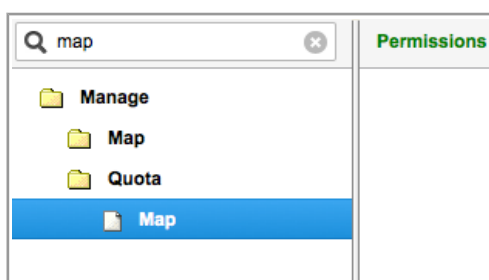


Figure 21: 'Map' permission

6.3 Quota Closing 'N' Days before

The Quota Management functionality supports closing the quota not only at the specified time, but also the specified number of days before. Depending on the company's requirements, quota for certain combinations of time slot, capacity category and work zone can be closed certain number of days before.

For this purpose the 'Close time' popup window at all quota levels has a drop-down list from which the user can select number of days to close the quota before the selected day or time slot. The list has the following options (Figure 22):

- the same day (quota is closed on the actual day)
- 1 day before
- 2 days before
- 3 days before
- 4 days before
- 5 days before

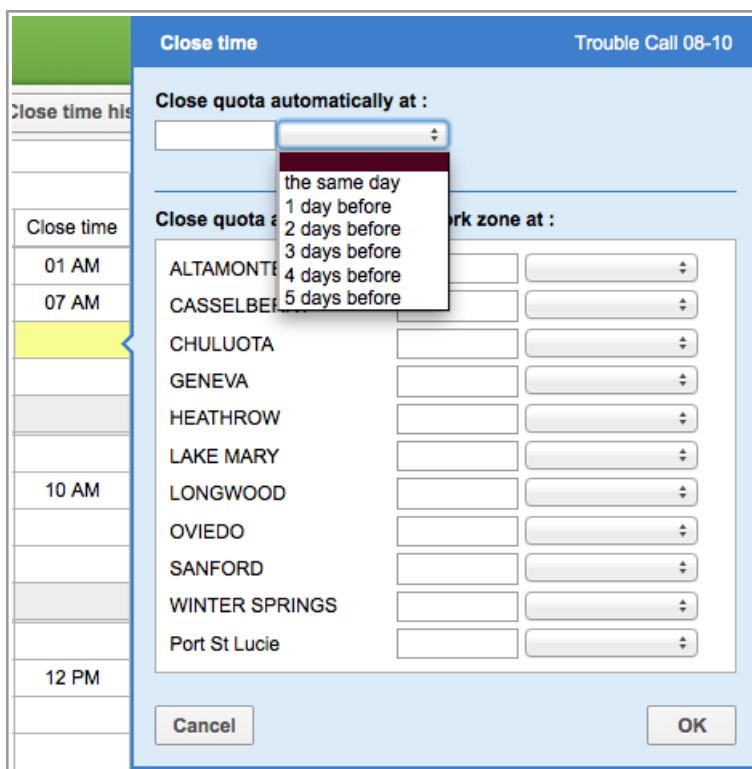


Figure 22: Quota close day selection

The same option is available for individual work zones at the 'Capacity Category' level (Figure 23).

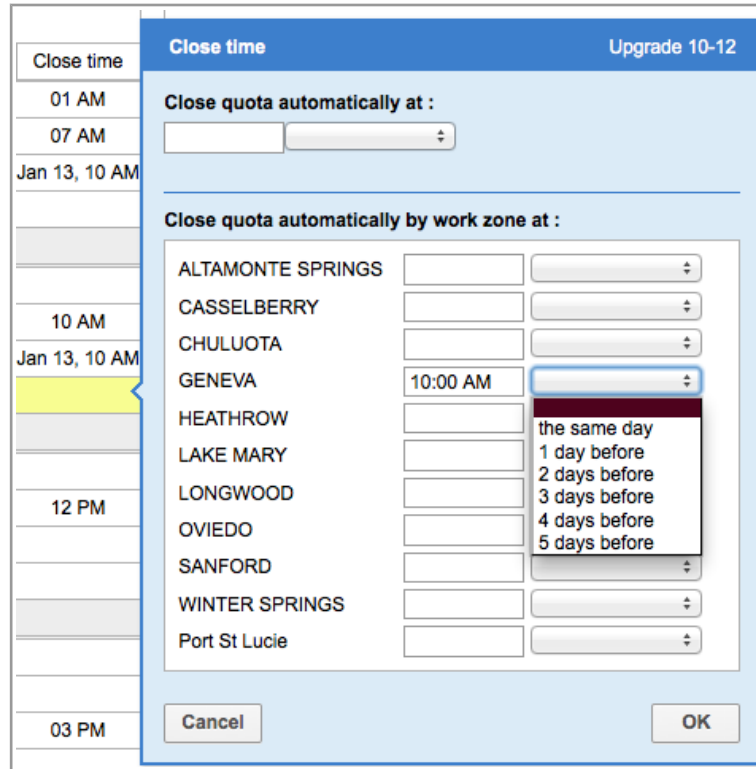


Figure 23: Quota close time selection for individual work zone

When quota is closed several days before, the corresponding cell in the 'Close time' column will contain both the close time and the date when the quota is to be closed (Figure 24).

Time slot Capacity categories	Wednesday, January 15th, 2014				
	Quota	Used	% to stop booking at	Status	Close time
08-10		54		✓	01 AM
Install		54		✓	07 AM
Trouble Call				✓	Jan 13, 10 AM
Upgrade				✓	
Total		54			

Figure 24: Quota close date and time

6.4 Multi-Bucket Mode

The Quota Management functionality has been enhanced by adding the multi-bucket mode which allows viewing the data of all active child buckets in the same quota grid. When the company structure includes parent and child buckets, with the multi-bucket functionality implemented, the user is able to select the parent resource and view the aggregated data for all its active child resources.

For this purpose the 'View' window now contains the 'Show aggregated results' checkbox (Figure 25). Disabling of this option enables multi-bucket display.

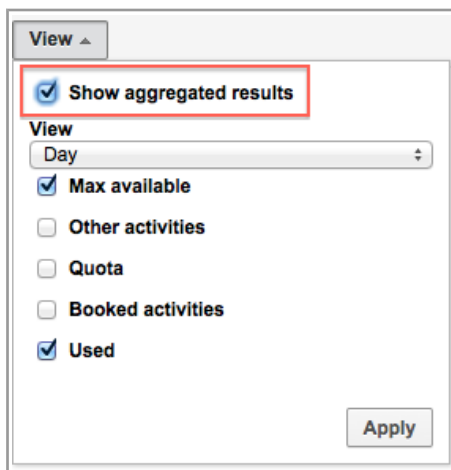


Figure 25: 'Show aggregated results' option in 'View' filter

When the multi-bucket mode is switched on, a new column, 'Capacity bucket', is added to the quota grid where the active child buckets of the selected parent bucket are listed. The quota grid shows the data for each bucket in separate lines (Figure 26).

Sunrise Enterprise						
		Wednesday, October 23rd, 2013		View		
Capacity bucket	Time slot Capacity categories	Wednesday, October 23rd, 2013				
		Quota	Used	Used quota %	Status	Close time
test bucket	08-10	3500	69	1.97%	✓	
	Install				✓	
	Trouble Call				✓	
	Upgrade		69		✓	
	Total		69			
Planning	08-10		11582		✓	
	Install	1350	723	53.56%	✓	07 AM
	Trouble Call	4200	636	15.14%	✓	
	Upgrade	9755	10223	104.8%	✓	
	Total	15305	11582			

Figure 26: Multi-bucket view

6.5 Quota History

The Quota History stores data on any changes performed to the Quota screen. The Quota History functionality allows viewing the quota history with different filters applied, when necessary, as well as exporting the Quota History in the file format selected as the 'Default export format' in the 'My Display' settings (Figure 27).

Date	Time Slot	Capacity Category	Work zone	Action	Action Time	Quota	% Quota	Min quota	% to stop booking at	User
10/10/13	08-10	Trouble Call		Change	10/10/13 05:04 AM	-	-	-	83	Admin
10/10/13	10-12	Upgrade	LONGWOOD	Open	10/10/13 05:02 AM	-	-	-	-	Admin
10/10/13	10-12	Upgrade	GENEVA	Close	10/10/13 05:02 AM	-	-	-	-	Admin
10/10/13	10-12	Upgrade	ALTAMONTE SPRINGS	Open	10/10/13 05:02 AM	-	-	-	-	Admin
10/10/13	10-12	Upgrade	SANFORD	Open	10/10/13 05:02 AM	-	-	-	-	Admin
10/10/13	10-12	Upgrade	LAKE MARY	Open	10/10/13 05:02 AM	-	-	-	-	Admin
10/10/13	10-12	Upgrade	CHULUOTA	Close	10/10/13 05:02 AM	-	-	-	-	Admin
					10/10/13 05:02					

Figure 27: 'Quota History' window

The Quota History displays the data organized in the columns as follows:

Date – date of the action.

Time Slot – time slot to which the changes apply. The values in the 'Time Slot' column can be filtered by selecting or deselecting some or all of the time slots used in Quota Management.

Capacity Category – capacity category to which the changes apply. The values in the 'Capacity Category' column can be filtered by selecting or deselecting some or all of the capacity categories used in Quota Management.

Work zone – work zone to which the changes apply. The values in the 'Work zone' column can be filtered by selecting or deselecting some or all of the time zones used in Quota Management.

Action – action performed in the Quota Management screen. The values in the 'Action' column can be filtered by selecting or deselecting some or all of the following options:

- Change – changes to the values of the 'Quota', '% Quota', 'Min quota', '% to stop booking at' cells on any Quota level
- Close – Quota closing for any day, time slot, capacity category or work zone
- Open – Quota opening for any day, time slot, capacity category or work zone
- Remove work zone specific settings – quota opening or closing for particular work zones

Action time – time of the action performed in the Quota Management screen. The values in the 'Action time' column are shown in the time zone of the selected capacity bucket. The values in the 'Action time' column can be filtered to display the actions performed within the last 4 hours, last 8 hours, last day or last 2 days. Additionally, sorting in the ascending or descending order is possible.

% Quota, Min quota – these columns are only shown when the Quota is defined as percent of the available capacity according to the configuration of the capacity bucket. They show the corresponding

values.

Quota – changes to the Quota values.

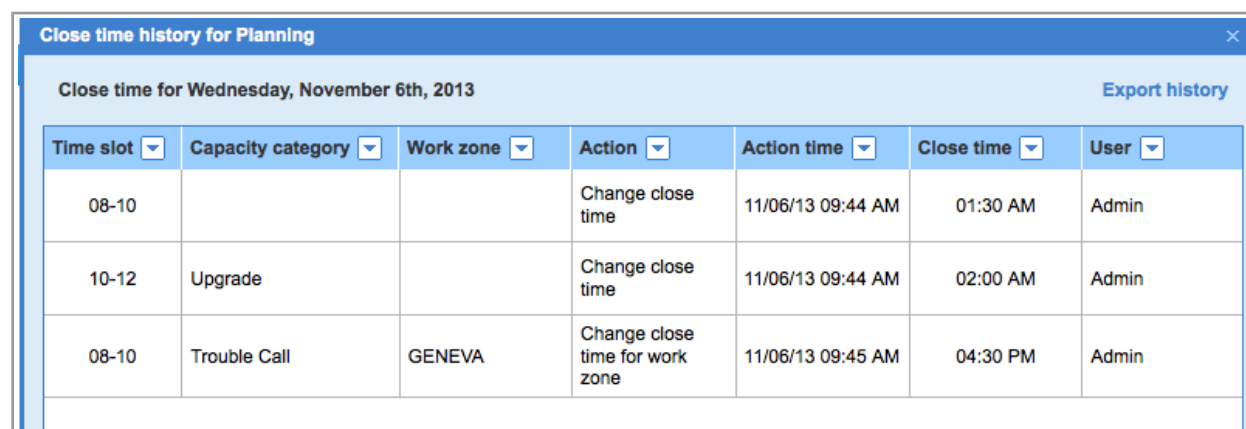
% to stop booking at – this column is only shown when the '% to stop booking at' option is enabled at the Time Slot or Capacity Category level according to the configuration of the capacity bucket.

User – user which made changes to the quota. The values in the 'User' column can be filtered by selecting or deselecting some or all of the user names. Additionally, alphabetical sorting in the ascending or descending order is possible. When a change has been performed automatically according to the settings (for example, automatic closing of the quota at the predefined time), the 'User' column will contain no value for such change.

Note: 'Quota history' is not available in the multi-bucket mode.

6.6 Close Time History

Changes related to quota close time are shown in the 'Close Time History' (Figure 28). The Close Time History functionality allows viewing the close time history with different filters applied, when necessary, as well as exporting the Close Time History in the file format selected as the 'Default export format' in the 'My Display' settings.



Time slot	Capacity category	Work zone	Action	Action time	Close time	User
08-10			Change close time	11/06/13 09:44 AM	01:30 AM	Admin
10-12	Upgrade		Change close time	11/06/13 09:44 AM	02:00 AM	Admin
08-10	Trouble Call	GENEVA	Change close time for work zone	11/06/13 09:45 AM	04:30 PM	Admin

Figure 28: Close Time History

The Close Time History displays the data organized in the columns as follows:

Time Slot – time slot for which close time was changed. The values in the 'Time Slot' column can be filtered by selecting or deselecting some or all of the time slots used in Quota Management.

Capacity Category – capacity category for which close time was changed. The values in the 'Capacity Category' column can be filtered by selecting or deselecting some or all of the capacity categories used in Quota Management.

Work zone – work zone for which close time was changed. The values in the 'Work Zone' column can be filtered by selecting or deselecting some or all of the work zones for which close time was changed.

Action – action performed to the close time. The values in the 'Action' column can be filtered by selecting or deselecting some or all of the following options:

- Change close time – changes to the close time on any Quota level

- Change close time for work zone – changes to the close time of individual work zones

Action time – time of the action performed to the close time. The values in the 'Action time' column are shown in the time zone of the selected capacity bucket. The values in the 'Action time' column can be filtered to display the actions performed within the last 4 hours, last 8 hours, last day or last 2 days. Additionally, sorting in the ascending or descending order is possible.

Close Time – resulting value of close time. The values in the 'Close time' column can be filtered to display changes made within any 2-hour period of the day by selecting some or all of the options. Additionally, sorting in the ascending or descending order is possible.

User – user which made changes to the quota. The values in the 'User' column can be filtered by selecting or deselecting some or all of the user names. Additionally, alphabetical sorting in the ascending or descending order is possible. When a change has been performed automatically according to the settings (for example, automated closing of the quota at the predefined time), the 'User' column will contain no value for such change.

6.7 'Mass Populate' Functionality

'Mass populate' has replaced the previously existing 'Automatic fill' functionality (Figure 29). This name better describes the actual nature of the operation which is, in fact, completely manual.

This functionality is intended to fill multiple future quota cells using historical data. Such estimation can be made either on the basis of the quota of the previous periods or the actual quota used.

Figure 29: 'Mass populate' window

The fields populated with the 'Mass populate' function differ depending on the quota level. Below is the complete list of fields used in 'Mass populate':

Day

- Quota
- Min quota
- % Quota

- Status
- 'Locked' flag

Time slot

- Quota
- Min quota
- % Quota
- % to stop booking at
- Status
- 'Locked' flag

Capacity category

- Quota
- Min quota
- % Quota
- % to stop booking at
- Status
- 'Locked' flag

Work zone

- Status

The actual fields available in the 'Field' drop-down list of the 'Mass populate' window depend on the capacity bucket configuration at the specific quota level. For example, if for the 'Time slot' level quota is set to be entered 'in minutes', the 'Field' list will contain 4 options – 'Quota', '% to stop booking at', 'status' and 'Locked' flag' (Figure 30). This means that in such bucket configuration only these 4 fields can be mass-populated.

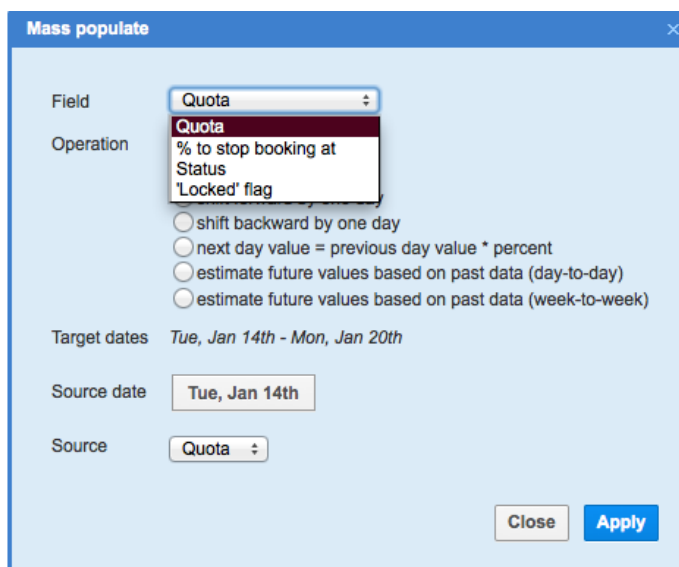


Figure 30: 'Field' options for 'Time slot' quota level with quota entered in minutes

The 'Operation' selector allows choosing the operation to be performed to mass-populate the selected field.

The following table contains the complete list of operations that can be performed. Availability of a particular operation depends on the selected field.

Operation	Fields	Parameters	Description
copy day-to-day	All	date to be copied	<p>This operation allows to copy values of the given field from one day to one or multiple days.</p> <p>Note: there is no restriction on the day that can be used as the source of data for this operation. It can belong either to past or to future.</p>
copy week-to-week	All	week to be copied	<p>This operation allows to copy values of the given field from one week to one or multiple weeks. The values are copied between the same days of week ('Monday' to 'Monday', 'Tuesday' to 'Tuesday', etc.). This option is only allowed if one or several whole weeks are shown in the Quota View.</p> <p>Note: there is no restriction on the week that can be used as the source of data for this operation. It can belong either to past or to future. The corresponding calendar control allows to select the week by clicking any day of this week. The week is represented by its first day (based on the corresponding configuration).</p>
shift forward by one day	All	None	<p>This operation shifts values of the given field one day forward.</p> <p>The corresponding option is only available if a continuous interval of days is selected on the Quota view.</p> <p>Note: there is a common rule that requires that a 'Mass-populate' operation should update all dates that are currently selected on the Quota view. Therefore, in case of the shift forward operation, the value of the first selected/visible date is updated with the value from the previous day (which is invisible).</p> <p>If the view contains both past and future days, the future date will be the first one to be updated. It is updated with the value from the latest past date.</p>
shift backward by one day	All	None	<p>This operation shifts values of the given field one day backward. Please note that it is mainly intended to "rollback" results of a previous forward shift.</p> <p>The corresponding option is only available if a continuous interval of days is selected on the Quota view.</p> <p>Note: there is a common rule that requires that a 'Mass-populate' operation should update all dates that are currently selected on the Quota view. Therefore, in case of the shift backward operation, the value of the last selected/visible date is updated with the value from the next day (which is invisible).</p>
<u>next day value = previous day</u>	<ul style="list-style-type: none"> • % to stop booking at: 	percent	As well as the shift forward/backward operations, this operation is only available

value * percent	<ul style="list-style-type: none"> Quota Min quota % Quota 		<p>if a continuous interval of days is selected on the Quota view.</p> <p>In this case, it takes the value of the given field from the day before the first selected one and, on its basis, calculates values of this field for all other next days. The value for the next day is calculated as the value of the previous day multiplied by the specified percent.</p>
use estimation	% Quota (category)	None	This operation copies values from the 'Estimated % quota' field to the '% Quota' ones.
estimate future values based on past data (day-to-day)	Quota	<ul style="list-style-type: none"> number of previous days field to be used: 'Quota' or 'Used' 	This operation allows to estimate values of the given field for one or several future days using the linear extrapolation algorithm. The maximum number of source days is limited to 1000.
estimate future values based on past data (week-to-week)	Quota	<ul style="list-style-type: none"> number of previous weeks field to be used: 'Quota' or 'Used' 	<p>This operation allows to estimate values of the given field for one or several future weeks using the linear extrapolation algorithm.</p> <p>A separate extrapolation trend is created for each day of week (Monday, Tuesday, etc.).</p> <p>The maximum number of source weeks is limited to 150.</p> <p>Note: this option is only allowed if one or several whole weeks are shown in the Quota View.</p>
close all	Status	None	<p>This operation allows to close all currently visible quota cells simultaneously.</p> <p>The option is available on all Quota levels – day, time slot, and capacity category.</p>
open all	Status	None	<p>This operation allows to open all currently visible quota cells simultaneously.</p> <p>The option is available on all Quota levels – day, time slot, and capacity category.</p>
close work zone	Status	work zone to be closed	<p>This operation allows to close the selected work zone for multiple days, time slots, or capacity categories at the same time.</p> <p>The deactivated work zones are not available for selection.</p> <p>Note: this option is only available on the capacity category level.</p>
open work zone	Status	work zone to be opened	<p>This operation allows to open the selected work zone for multiple days, time slots or capacity categories at the same time.</p> <p>The deactivated work zones are not available for selection.</p> <p>Note: this option is only available on the capacity category level.</p>

Please also note that all these operations ignore the 'Locked' flag.

The 'Target dates' field is used to define the dates on which the fields are to be mass-populated. The

range depends on the 'Calendar' selection.

'Source date' contains the date or the range of dates to be used as the source for mass-populating the selected field.

'Source' is the field the values of which are to be used as the source for mass-populating. The available source field(s) depend on the capacity bucket configuration at the corresponding level and on the 'Field' selection.

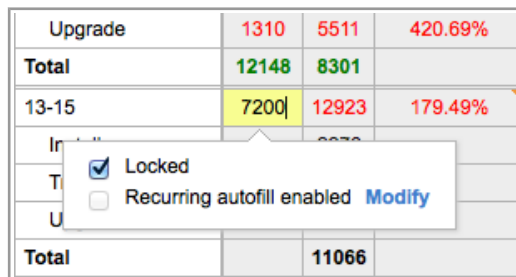
Note: the 'Mass populate' operation only updates the values on the Quota View, it does not update the database. The values updated by 'Mass populate' are marked with 'changed' indicators. To apply the changes the user must click 'Save'.

Access to the 'Mass populate' functionality is controlled by the 'Mass populate' permission. If the permission is set to ReadOnly, the 'Mass populate' button is not displayed in the Quota screen.

6.8 Auto-Adjustment Locking

A Quota cell can be locked for automatic adjustment if the actual situation so requires. If a cell is locked, it can only be changed directly by the user, but no changes of other cells will have any effect on the locked cell value.

A cell can be locked by means of the 'Locked' checkbox in the hint appearing on a click in the cell (Figure 31).

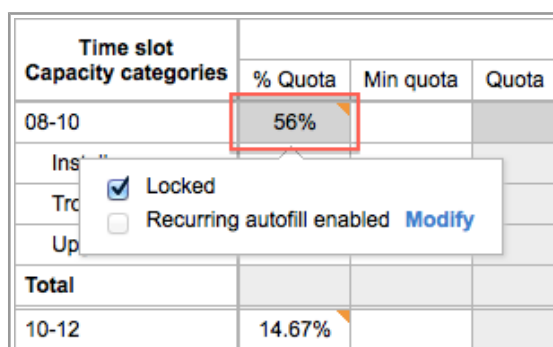


Upgrade	1310	5511	420.69%
Total	12148	8301	
13-15	7200	12923	179.49%
In...		8878	
T...			
U...			
Total		11066	

Context menu options:
 Locked
 Recurring autofill enabled
[Modify](#)

Figure 31: 'Locked' checkbox

Once a cell is locked, it is shown on a dark-gray background (Figure 32). If the locked cell is the 'Total' cell, changes of the Quota cells are distributed proportionally among other cells keeping the 'Total' unchanged. If all other cells are locked, the newly entered value is changed to the closest possible or remains unchanged.



Time slot	% Quota	Min quota	Quota
08-10	56%		
In...			
T...			
Up...			
Total			
10-12	14.67%		

Context menu options:
 Locked
 Recurring autofill enabled
[Modify](#)

Figure 32: Locked cell

6.9 'Recurring Autofill' Functionality

The 'Recurring Autofill' functionality is intended to avoid manual operations related to recurrent mass adjustments of quota parameters. The idea behind it is the same as for the 'Mass populate' functionality, except the quota grid cells are populated automatically according to the settings.

The 'Recurring Autofill' functionality allows to define or modify the rules of cells populating. Each rule is unique for each combination of:

- field, time slot and capacity category at the Capacity Category level
- field and time slot level at the Time Slot level
- field at the Day level

The 'Recurring Autofill' functionality is accessible as a popup window opened from the hint in a Quota cell (Figure 33).

Total		11582				
10-12		8465			✓	
Install		895			✓	10 AM
Trouble Call		1895			✓	
U		5544			✓	
Total						
13-1					✓	
Install		2276			✓	12 PM

Locked
 Recurring autofill enabled [Modify](#)

Figure 33: 'Recurring autofill' option in cell hint

The hint contains the 'Recurring autofill enabled' checkbox enabling or disabling the functionality and the 'Modify' link allowing to set or modify the recurring autofill rules. Clicking 'Modify' opens the 'Recurring Autofill' window (Figure 34).

Recurring Autofill [Close]

Apply: everyday at 12 AM : 00 within 60 minutes

Next run: 01/16/14 12:00 AM

Operation: copy day-to-day

Target dates: 24 days starting from current + 15

Source date: current day + 1

Source: Quota

Autofill enabled:

[Close] [Save]

Figure 34: 'Recurring autofill' window

- 'Apply' – the field defining the schedule of autofill recurrence. Available values: 'Daily' (the operation is repeated daily) or 'every {WEEKDAY}' (the operation is repeated weekly on the

- selected day. This section includes also the field to define the recurring autofill time
- 'Last run', 'Next run' – the last and next recurring autofill runs. These fields are hidden when there is no data to show (no last and/or next recurring autofill runs exist)
- 'Operation' – the operation to be used for recurring autofill
- 'Target dates' – the rule to calculate the dates on which the cells are to be autofilled. The first value indicates the number of days the autofill rule to be applied for. The second value is the offset period (the interval after which the rule is to be applied). In the example above the selected cell will be autofilled for 24 consecutive days starting from 15 days from now. The maximum value of target dates/weeks is 1000 days or 150 weeks, respectively. The maximum value of target date/week offset period is 100
- 'Source date' – the date to be used as the source. The maximum value of source date/weeks is 1000 days or 150 weeks. The value of source date offset period is limited to the range from -1000 to 1000.

Note: If '0' is entered as the value for the target and/or source date offset period, the current day/week will be used as the target and/or source date.

- 'Source' – the value to be used as the source
- 'Autofill enabled' – the checkbox enabling of disabling the 'Recurring Autofill' functionality

The list of operations available in the 'Recurring Autofill' functionality is the same as that for 'Mass populate'. Please refer to the list in the corresponding [section](#).

6.10 Major and Critical Capacity Usage

There are two capacity levels, which make capacity display in different colors, depending on the level. These levels can be configured by going to Company Settings → Display → Quota Settings (Figure 35).

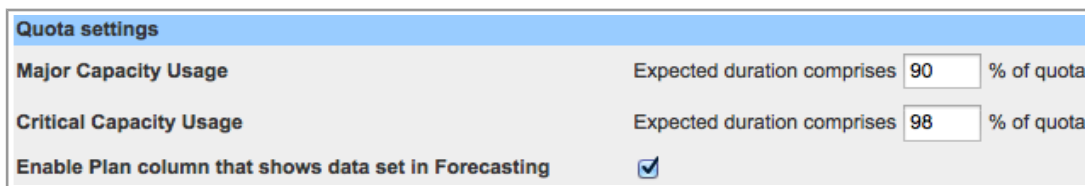


Figure 35: Major and critical capacity usage settings

If Used capacity is less than Major Capacity Usage, capacity is shown in green color.

If Used capacity is more than Major Capacity Usage and less than Critical Capacity Usage at the same time, capacity is shown in brown color.

If Used capacity is more than Critical Capacity Usage and less than Quota value at the same time, capacity is shown in orange color.

If Used capacity is more than Quota value, capacity is shown in red color (Figure 36).

Capacity bucket	Time slot Capacity categories	Wednesday, November 6th, 2013					
		% Quota	Quota	Used	Used quota %	Status	Close time
Planning	08-10	100%	15354	11582	75.43%	✓	
	Install	50%	7677	723	9.42%	✗	20:30
	Trouble Call	25%	3838	636	16.57%	✓	
	Upgrade	25%	3838	10223	266.36%	✓	21:30*
	Total			15353	11582		

Figure 36: Used capacity level colors

7 Resource Capacity Categories Determination

When the maximum available capacity is to be calculated at the capacity category level, the capacity categories per resource should be determined (Figure 37).

A resource is assigned certain work skills with their respective levels. On the other hand, capacity categories existing in the system include work skills for which the minimum required level can be defined, or work skill groups. A resource matches a capacity category if their work skills are equal or greater than those defined for the capacity category. If minimum work skill levels are used, the resource matches the capacity category, if their work skill levels are equal or greater than those defined in the capacity category. When a capacity category includes work skill groups, a resource matches such capacity category if it has at least one of the work skills of the group.

When no work skills are assigned to a capacity category, such capacity category includes all activities with no required work skills. Such activities can be assigned to any resource having any work skills, therefore, to all resources in the system. Consequently, resources with no work skills defined (effectively, having all work skills at the highest level) match all capacity categories in the system.

The resource work skills can be viewed in the 'Resource Info' screen or resource hint.

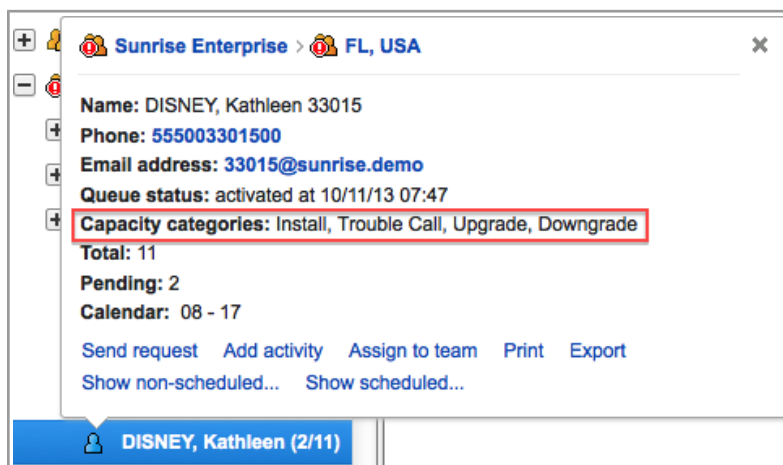


Figure 37: Resource hint showing capacity categories

The capacity categories of resources are recalculated in the following situations:

- on application server start

- on resource cache reload
- on resource work skills modifications
- on the 'Recalculate activities' action performed in the 'Capacity categories' and 'Work skill groups' screens

8 Defining Units of Measurement for Quota

ETAdirect supports the option of choosing the units of measurement to display Quota/Used values.

For this purpose the 'Business Rules' screen now has a special 'Quota management' section (Figure 38).

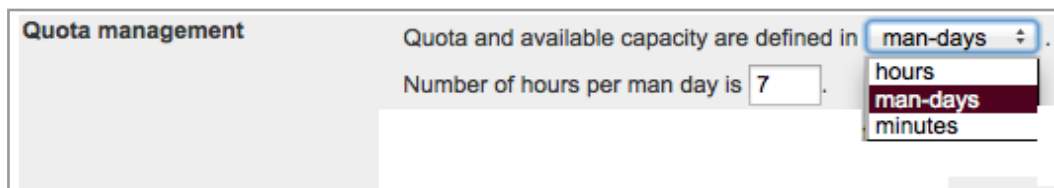


Figure 38: Units of measurement of Quota and Used values

This section allows setting the unit of measurement for quota and capacity. There are three possible options – hours, man-days and minutes. Internally, all values are calculated in minutes anyway, and are converted to the selected unit when the corresponding value is displayed in the Quota View.

When 'man-days' is selected as the unit of measurement, the 'Number of hours per man day is' field appears where the correlation between man-days and hours can be defined. Ultimately, this parameter is used to convert 'man-hours into 'minutes'.

9 Recalculation of Available Capacity and Dependent Quota Values

When the Quota is defined as percentage of the capacity available by calendar, sometimes it requires adjustment. For example, quota recalculation is needed in the following cases:

- new technicians creation
- technicians move between capacity buckets (sub-buckets can also be moved)
- technicians activation/deactivation
- resource tree reorganization (directly in the database) during a product upgrade or an implementation package installation
- change of the set of technician's work skills
- change of the content of an already used work skill group
- change of the set of work skills within a capacity category

To perform the adjustment the system should estimate the capacity available by calendar, process the already booked activities (to calculate the "Other activities" value), and, finally, recalculate the "Quota in minutes" using the defined percentage value.

Quota recalculation is a complex operation and, therefore, it should be performed only once in a predefined time interval. Such interval can be defined as the 'The 'Max available' and 'Other activities'

parameters are automatically recalculated every [] minutes' parameter on the 'Business rules' screen (Figure 39).

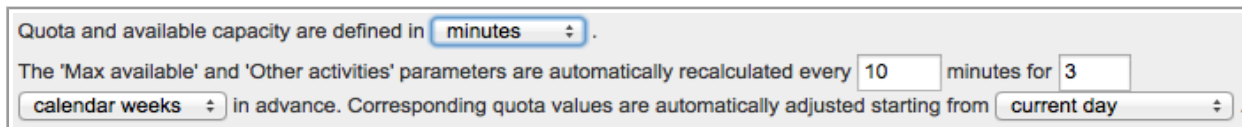


Figure 39: Capacity recalculation settings

The recalculation interval in minutes can be defined in the range of 1 to 1,440. By default, it is set to 10 minutes.

The quota and capacity are recalculated for a predefined future period. The period is defined as the number of days or calendar weeks. The maximum value is 99 days or 15 calendar weeks. The recalculation start day can be selected from among 'current day', 'tomorrow', 'day after tomorrow'.

The 'calendar week' option is processed according to the 'Week starts on' parameter set in the 'Display' screen. If the recalculation period is set to 1 calendar week, the recalculation will be performed for all remaining days of the current week (unless the start day is the week start day) plus all days of the following week. On the contrary, if the recalculation period is set to 7 days, the recalculation will be performed for exactly 7 days.

10 'Start Time' Statistics

The Quota Management now provides a new type of statistics – Start Time. This statistics allows to determine the probability of the activity start within the selected hour. Such prediction can be used for estimating the capacity required for the selected time interval. The approach used in the Start-time statistics is the same as the one used in the Duration and Travel time.

For scheduled activities, the probability is calculated on the basis of the statistics collected for similar records in the past. 'Other' activities (all repeating, mass and shift activities, including those without instances) scheduled for the same day are not taken into account.

The calculation uses the resource key (grouping resources by a certain criterion allowing to collect separate statistics) and the activity key (grouping activities into company-specific logical groups allowing to process such groups separately).

The start-time statistics keys can be defined in 'Company Settings' → 'Statistics parameters' (Figure 40).

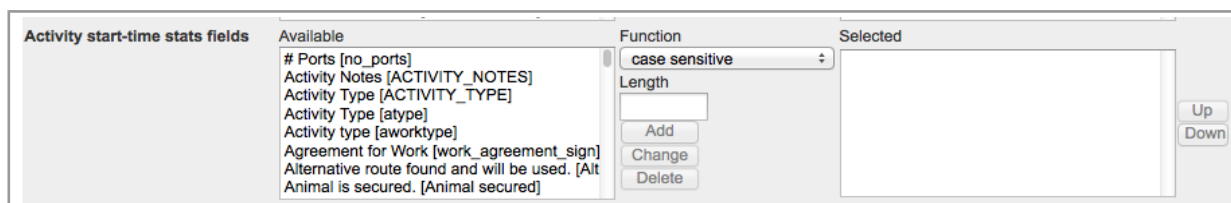


Figure 40: 'Activity start-time stats fields' in 'Statistics Parameters'

All activity custom fields as well as the primary activity fields (activity type, base type, state, city, ZIP, duration) can be used for statistics calculation.

All resource custom fields as well as the primary resource fields (internal ID, external ID and resource type) can be used for statistics calculation (Figure 41).

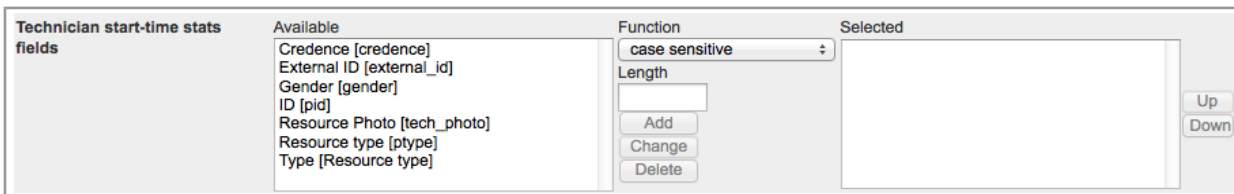


Figure 41: 'Technician start-time stats fields' in 'Statistics Parameters'

11 Calculation Methods

11.1 'Other Activities' Calculation Method

The 'Other activities' parameter is calculated to obtain the following value:

- Maximum capacity - Other activities = Activities that can be booked within this time slot.

The calculated value might include activities that:

- are not part of capacity management
- belong to other time slots

The algorithm performs the following actions for the selected capacity time slot and activity:

- It determines the interval of working hours (including overnight) affected by such capacity time slot. The interval is the same as is used for the 'Maximum capacity' calculation.
- On the other hand, it calculates the expected used capacity for the selected activity using the algorithm estimating its used capacity for a particular hour as an expected value of the probability that this activity will be started within such hour. The result of this step is the expected used capacity calculated on an hourly basis.
- The resulting 'Other activities' value is calculated as the sum of the expected used capacity values for the hours affected by this time slot.

The 'Other activities' value consists of all repeating, mass and shift activities including those without 'instances'. Changes related to the activities with instances are processed immediately, that is, in the same manner as regular booked activities. Activities without instances are processed on a periodical basis. They are handled by the same process which performs periodical recalculation of the 'Max available' and 'Quota' values.

11.2 Quota Calculation on the Basis of Historical Data

The estimation is based on the capacity category 'Weight' coefficients and available workforce.

The 'Weight' coefficients are calculated on the basis of the historical data. These coefficients are normalized on the basis of the workforce that was available on the selected past days. Therefore, they do not depend on the available workforce. The application of these coefficients to the currently available workforce allows to estimate the 'Quota %' values.

The historical data is processed by the Application server on the periodical basis. It checks whether

recalculation is required once every minute. The historical data recalculation produces the capacity category 'Weight' coefficients.

These coefficients are calculated for every day within the last eight full weeks and per valid combination of capacity bucket, time slot, and capacity category. For each such combination, the system calculates two coefficients based on '% Quota' and 'Used quota %'.

The calculation is performed regardless of the values of the 'Historical values to be used' and 'Process historical data (same weekdays) for period of' parameters defined for the bucket. At the same time, the process does not take into account the 'Estimate quota based on historical data' and 'Quota is entered' options. Such approach allows to enable this functionality, change the interval of analysis ('one week', 'one month', 'two months'), or switch between coefficient types ('% Quota' or 'Used quota %') for the existing capacity bucket without having to reprocess the historical data.

Weight calculation formula:

$$\text{Weight} = (\text{Quota} / \text{Total quota}) / \text{Max available \%}$$

OR

$$\text{Weight} = (\text{Used} / \text{Total used}) / \text{Max available \%}$$

where $\text{Max available \%} = \text{Max available (capacity category)} / \text{Max available (time slot)}$

Quota calculation on the basis of historical data produces two fields, 'Weight' and 'Estimated quota %', which correspond to this functionality and can be shown on the 'Quota view' for the current or future day.

The application server periodically recalculates the 'Max available' values and, as the result, adjusts the 'Weight' coefficients for such days.

To adjust the coefficients, it aggregates the 'Weight' coefficients for the number of days defined using the 'Historical values to be used' parameter. A particular day is only included if it belongs to the same week day.

Formula:

$$\text{\% Quota} = \text{Avg. weight} * \text{Max available \%}$$

If the 'Automatically adjust '% Quota' values to keep their total equal to 100%' option is enabled, the calculated 'Quota %' values are normalized.