# ActiveMap Web admin manual 3.51.1 (5.51)

**Activemap Computer Systems Design**

**Feb 12, 2026**

# CONTENTS

**ANNOTATION**

This document is intended to provide an overview of the general information, structure, and configuration of the ActiveMap Web Program for individual conditions, requirements, and application areas of the software.

# GENERAL INFORMATION

## 1.1 About the Program

ActiveMap Web (administrator) is the administrative part of the ActiveMap Web program that allows you to add and structure a variety of geographic information, as well as configure access rights to user information and user interface settings.

ActiveMap Web is part of a multi-component web-based ActiveMap system for remote employee management.

ActiveMap is an online system for organizing the interaction between field workers and the dispatcher (task coordinator). The system helps to plan and manage the production work and to operationalize quality control of field services.

Capabilities of ActiveMap:

- Flexible customization to meet the needs of the company.

You can adapt ActiveMap to any business process. A list of work types, steps and deadlines can be set up for each organization cluster.

- Adding tasks and controlling their execution.

The system allows users to add operational and planned tasks, including scheduled tasks on a given template.

- Object inventory.

ActiveMap helps to carry out an inventory of objects: update information on the status of existing objects, identify nonexistent, and to create new ones.

- Control of field employees.

The system helps to control employees with real-time tracking of their location, viewing the history of their movement, and recording the execution of requests.

- Convenient and quick interaction between field employees and work coordinators.

ActiveMap speeds up the process of exchanging results between the field employee and the work coordinator. The coordinator can promptly update task information, which is immediately communicated to the field employee. The coordinator can also quickly return the task to the fieldworker for execution based on the results of the fieldwork.

- Using photo and video fixation materials and GPS data.

The system can verify that tasks were carried out using photos, video recordings, and location data. This avoids the necessity of field inspection of executed orders.

- User rights configuration.

The system enables the configuring of user rights. Each user is assigned a certain role. The role of the system user determines access to the list of tasks, rights to edit and manage these tasks. The roles vary from simple executors to the administrator of the entire system.

- Displaying tasks' objects on a map.

ActiveMap allows users to create tasks based on layer objects with the automatic filling of coordinates and task fields.

- Creating electronic documents.

The system allows users to create reports on the work with tasks and user activity based on the document form of the organization, as well as invoices issued by field employees.

More information about the comprehensive capabilities of the ActiveMap system can be found on the website of the Activemap Computer Systems Design company https://activemap.me/.

## 1.2 System requirements

The Program is created using web technologies, allowing it to run from any personal computer with Internet access. To organize the dispatcher's workplace, a personal computer with technical specifications that meet the following minimum requirements is needed:

- Processor: Intel Core i5,

- Operating system: Windows 10,

- Internet access speed of at least 10 Mbps.

The Program does not require additional installation of third-party software on the workstation. The Program opens using internet browsers such as Internet Explorer, Mozilla Firefox, Opera, Google Chrome, or Microsoft Edge.

# WORKING IN THE PROGRAM

## 2.1 Running the Program

To run the Program, open an Internet browser (Internet Explorer, Mozilla Firefox, Opera, Google Chrome, or Microsoft Edge) and enter the address of the web page of the Program in the address bar. The start window (Fig. 2.1) appears.
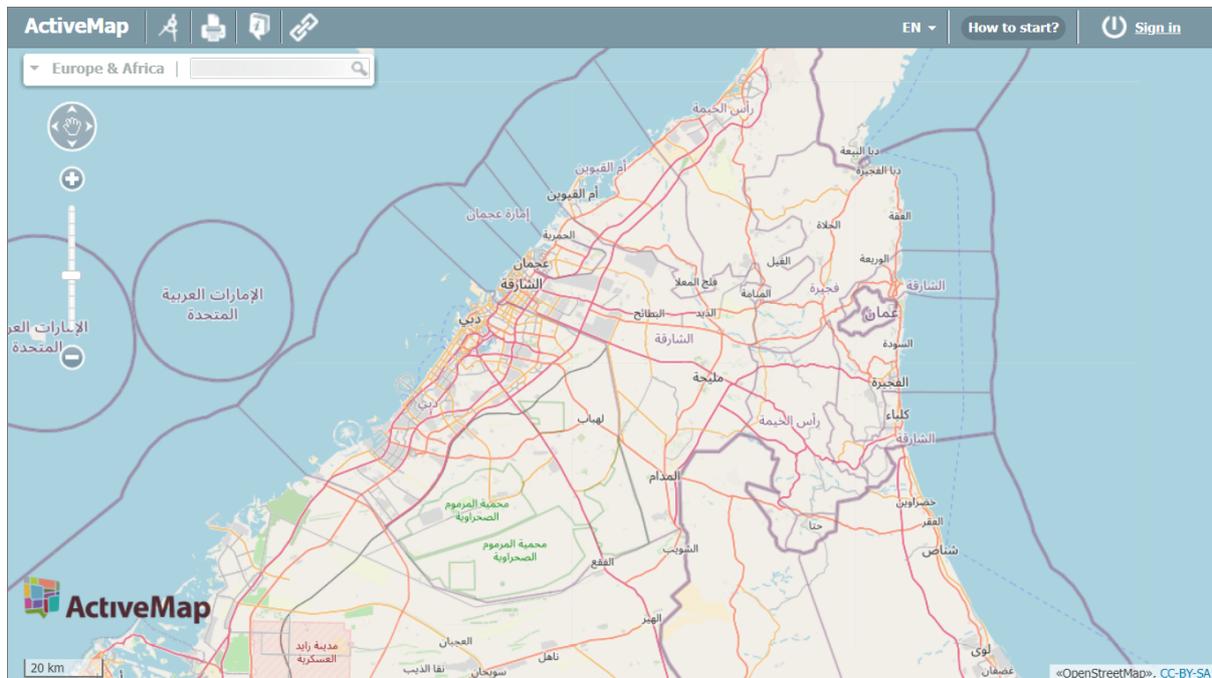


Fig. 2.1: Start window

To log in you need to enter your credentials: login and password. Then the start web page is loaded (Fig. 2.2).
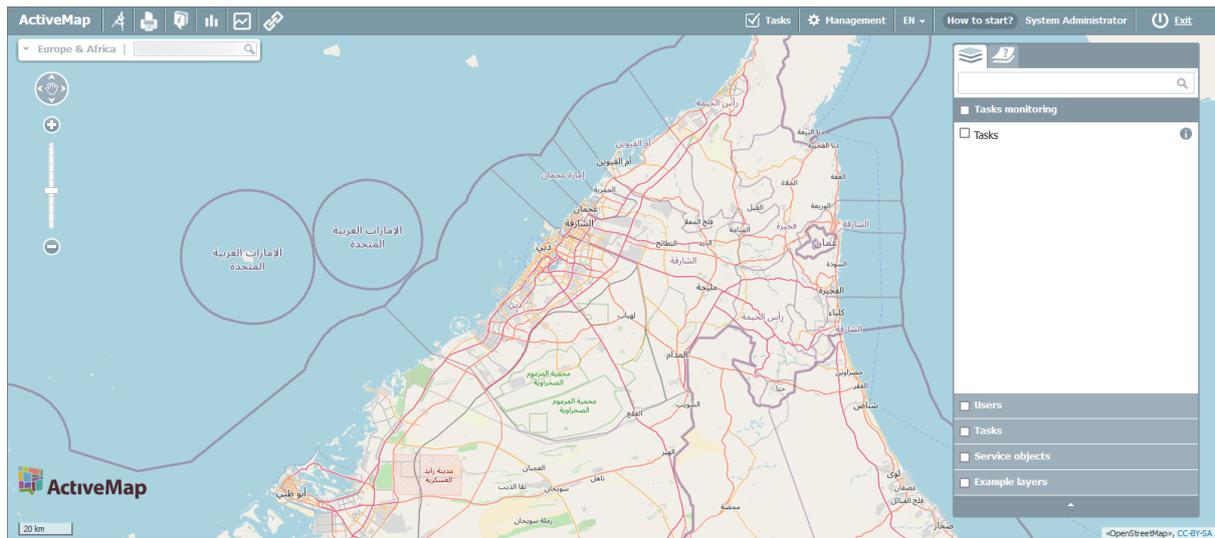
Fig. 2.2: Start page of the program

The main window of the Program contains (Fig. 2.3):

1. Map displaying area

2. Toolbar

3. Basemap controls with a search bar

4. Control panel for thematic layers

5. User panel

6. Scale bar

7. Scale ruler

8. Map navigation panel
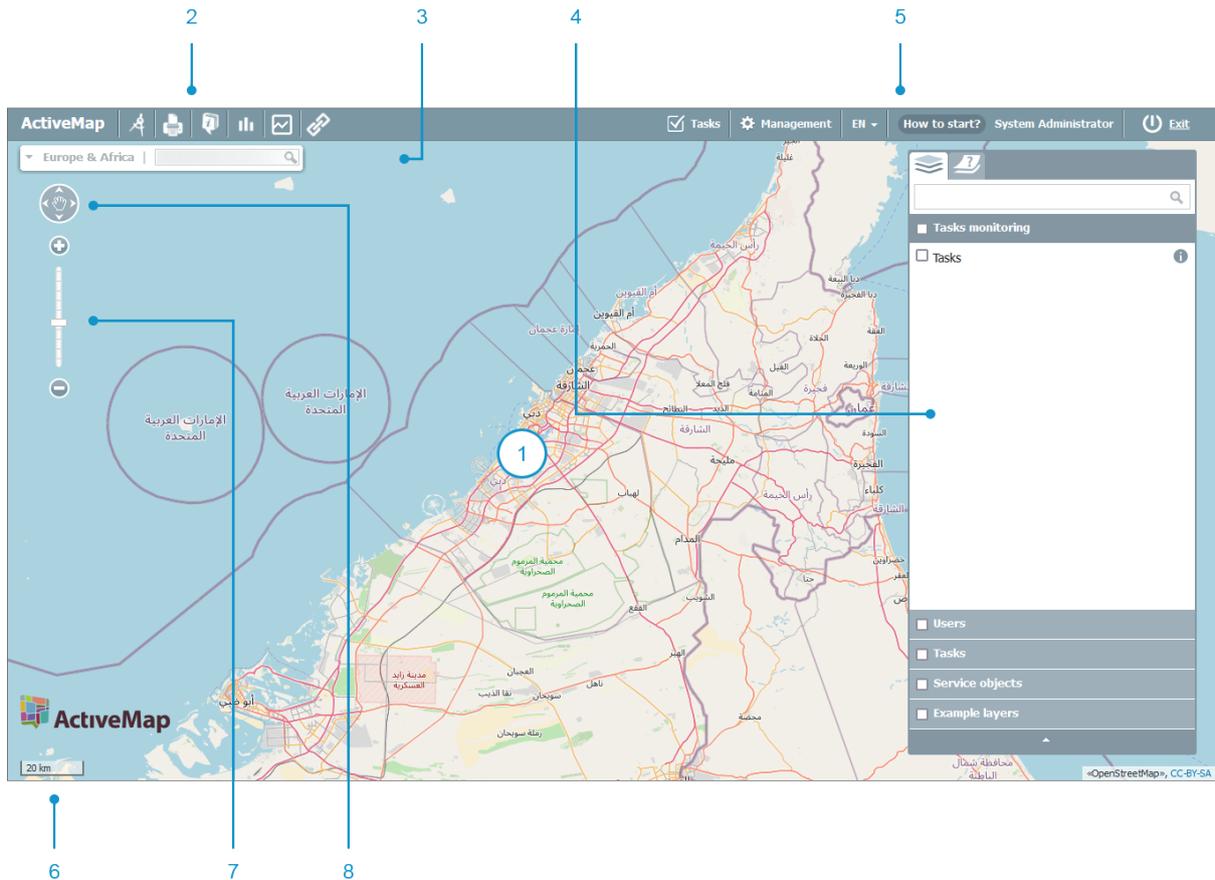
Fig. 2.3: Elements of the main window

Working with administration tools is available in the "Tasks" and "Management" modules. You can access them through the user panel at the top of the main program window (Fig. 2.4).
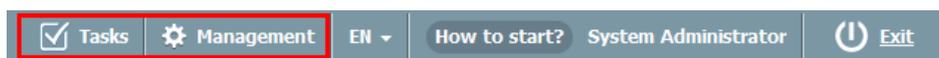


Fig. 2.4: Switching to the "Tasks" and "Management" modules

## 2.2 Tasks module

The task module allows users to work with contracts, create operational and planned tasks in the system.

Operational tasks are created to solve current issues. Planned (scheduled) tasks are created on a date and time specified in the schedule according to a given template.

You can create tasks within the contracts, concluded with an organization, and independently of them. The ability to view, create, and edit contracts and tasks depends on the user's role in the system. User roles are defined by the Organization Administrator or Cluster Administrator.

To go to the tasks module, click "Tasks" (Fig. 2.5) on the user panel of the main page of the geoportal:



Fig. 2.5: Accessing the task module

### 2.2.1 Contracts

#### 2.2.1.1 Contracts in ActiveMap

A contract is an agreement for the provision of services made with an organization or client. Users with the System Administrator or Cluster Administrator permissions can create, edit, and delete contracts. Contracts operate within the cluster. The cluster is selected automatically. When creating a contract, the cluster of the customer organization is used. In another cluster, this contract is not available to users. The System Inspector, Cluster Inspector, Administrator and Inspector of the Assigned Organization have rights to view the contract. Users, who see the task created under the contract, also receive minimal information (id, title).

A contract may include a list of objects and types of work. You can create tasks only within one contract. You cannot add the same tasks to a different contract. However, you can attach multiple tasks and schedules to one contract. If necessary, you can delete a previously selected contract from the task and add a new one. If you delete a contract from the system, the ad hoc tasks created under it and the tasks created under the schedule are preserved (the contract name is displayed in the task), but the schedule itself is deleted.

#### 2.2.1.2 List of contracts

To access the window with contracts in the "Tasks" module, click "Contracts" on the top panel of the page. In the opened window (Fig. 2.6), the System Administrator and System Inspector can see the entire list of contracts entered into the system. The Cluster Administrator and Cluster Inspector can view the cluster contract list. The Organization Administrator and Organization Inspector can see the organization contract list. All other users see the list of contracts for available tasks.

Fig. 2.6: List of contracts

The contracts window has a search by contract number, name, and ID. You can also set up filters by attributes:

- Cluster

- Customer

- Executor

The list of contracts is presented in the form of a table, which includes all the basic information on the contract. For convenience, there is sorting in two directions, which works by clicking the attribute name.

### 2.2.1.3 Creating a contract

Only users with System Administrator or Cluster Administrator permissions can create, edit, and delete contracts. To add a new contract, click "Create". A window opens (Fig. 2.7) with the following fields in the "Main" tab:

- **Name** (mandatory field) — name of the contract;

- **Number** — contract number;

- **Start date** and **Finish date** — the period of the contract, during which the work is performed and tasks are created (if these fields are not filled in, it is impossible to create a scheduled task);

- **Customer** (mandatory field) — the organization that orders the execution of the work (the cluster of this organization is assigned to the contract);

- **Executor** (mandatory field) — the organization, executing the contract, to which tasks are automatically assigned when this contract is selected;

- **Grant task creation to executor** toggle (disabled by default) – if it is disabled, users are not able to select this contract when creating a task;

- **Description** — a comment to the contract.



Fig. 2.7: Creating a contract

You can add types of work to the contract and specify the list of objects for which to perform work. To do this, click "Add" in the "Groups of objects and types of work" tab. The block of selecting objects and types of work is added. Click "Change" to add a value. When changing an object, a window opens where you have to select the layer (or table) and objects. For convenience, the window has a search line and the ability to select all or individual objects (Fig. 2.8).

Fig. 2.8: Linking a contract to objects

When you change the type of work, a window opens for selecting the required types of work. For convenience, there is a search line, the ability to select types of work, and a filter to display all types of work or only selected ones (Fig. 2.9).



Fig. 2.9: Linking a contract to work types

After saving the contract data, you can create tasks only for the selected types of work and objects during the specified contract period. You can create several groups of objects and types of work within one contract. The Program also checks whether the selected types of work are available to the assigned organization. If the organization has no rights, the contract is not saved, as this can cause errors in the creation of tasks in the future. When selecting an object that has a connection to an organization/cluster, the task must be created in the specified organization. If this organization has no rights to the selected type of work, the contract is not saved.

After entering all the data for the contract, click "Create". The contract becomes available for attaching to tasks in the ActiveMap system software products: ActiveMap Web, ActiveMap Desktop, ActiveMap Mobile.

#### 2.2.1.4 Contract management

To edit a contract, select it and click "Edit". A window similar to the creation window opens, where you can make and save edits.

When changing the customer, the new customer organization must be in the same cluster as the organization executing the contract. When changing the executor, for example, when transferring work from a contractor to a subcontractor, the previous contract executor will see previously created tasks, but not the schedule runs that created them. Conversely, the new executor will not see previously created tasks, but will see the runs that created them.

To delete a contract, select it and click "Delete". When a contract is deleted, the operational tasks created under it and the tasks created according to the schedule are preserved (the name of the contract is displayed in the task), the schedule itself is deleted.

### 2.2.2 Task map

To switch to the task map window, click the "Map" button on the top panel of the task module page. In the opened window, you will see a map with tasks that have coordinates (Fig. 2.10).
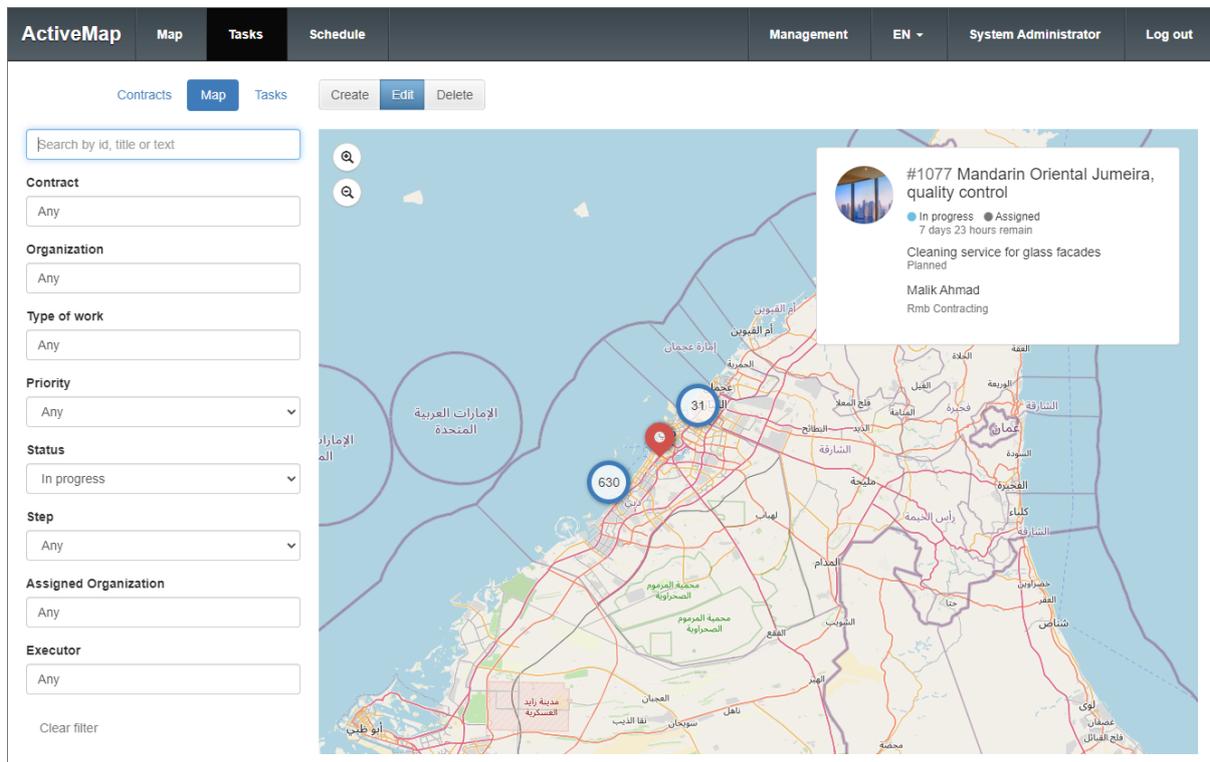


Fig. 2.10: Map of tasks with coordinates

Clustering is used when displaying icons on the map. Clustering is the display of a group of point layer objects located nearby with a single mark on the map (more about clustering in

*Editing a layer* (page 125) section). The circle indicates the number of tasks grouped into the cluster.

Clicking on a task cluster on the map automatically zooms in to the boundaries covering all tasks in the selected cluster (Fig. 2.11).
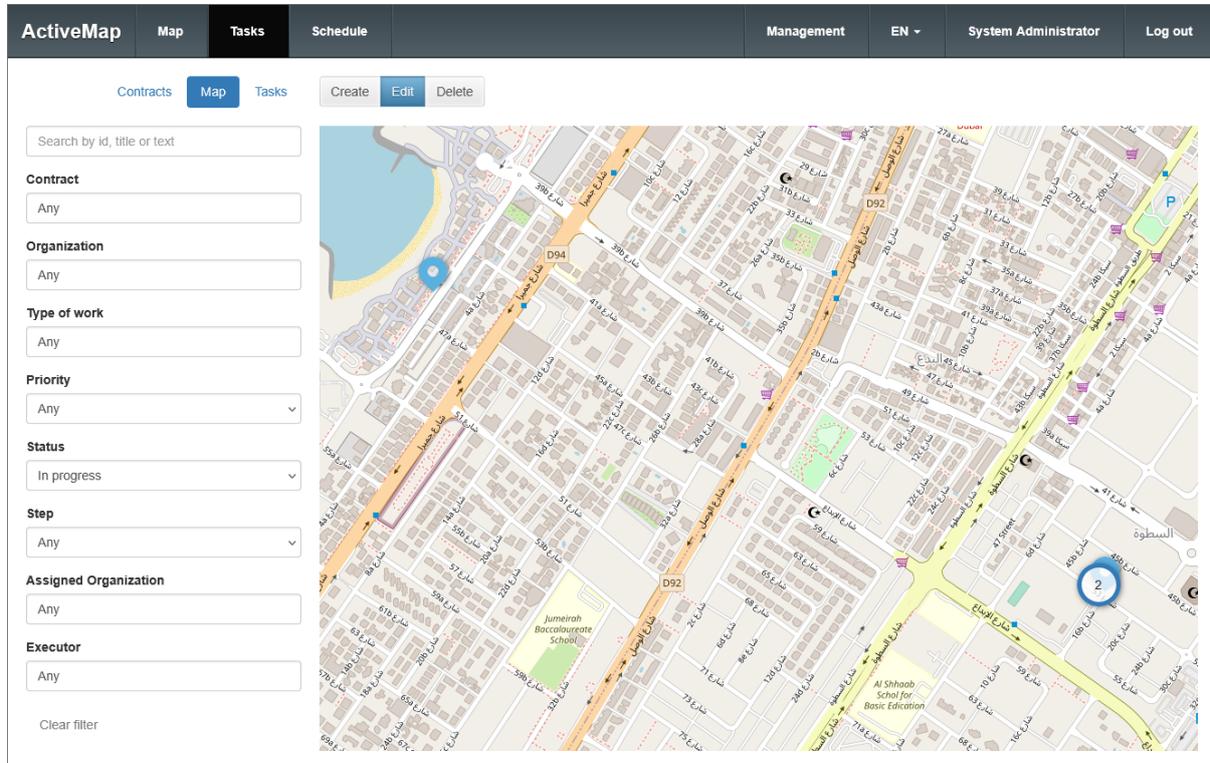


Fig. 2.11: Zooming in on a task cluster on the map

The tasks within a cluster may be located too close to each other or even at the same point. For example, when several tasks have the same coordinates or are almost indistinguishable on the current scale. In this case, clicking on the cluster opens a list of tasks in a separate window (Fig. 2.12).

Fig. 2.12: List of cluster tasks with the same coordinates

The color of the task icon depends on its current status:

- In progress – blue;

- Completed – green;

- Rejected – gray.

The colors are fixed and you cannot edit them.

You can select a task on the map and view detailed information about it. When clicked, the task icon turns red. The task card displays the following information:

- ID

- Title

- Status

- Step

- Deadline

- Type of work

- Priority

- Assigned organization

- Executor

If the task was created by a schedule, the schedule name is also displayed. You can switch to the schedule or template editing mode (Fig. 2.13).
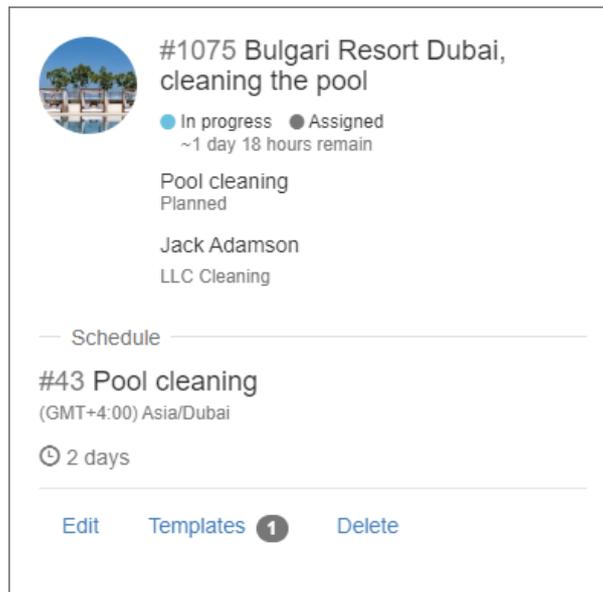
Fig. 2.13: Task information on the map

To the left of the map there is a filter area for selecting tasks based on various parameters:

- Search by Id, title or text;

- Contract (if you have access);

- Organization;

- Type of work;

- Priority;

- Status;

- Step;

- Assigned organization;

- Executor.

To search for a task, enter part of its number, name, or description. To filter tasks by status, type of work, step, priority, organization, performing organization, or executor, select values from the dropdown list. After entering and selecting all filtering parameters, the map displays tasks that meet the specified criteria.

### 2.2.2.1 Creating an operational task

To generate a new operational task, click the "Create" button. A window opens with "Main" and "Files" tabs (Fig. 2.14).

Fig. 2.14: New task creating window

The "Main" tab displays a map to specify the location of the object and fields to fill in the task characteristics.

To mark the location of the task object on the map, zoom in to the area of interest using and buttons and/or mouse and click on the map. You can also enter the address of the object in the search field. The search results are displayed as a list. When you hover over each of them, the Program moves to the specified address on the map (Fig. 2.15). If the task is not bound to a specific location, the geolocation can be omitted.
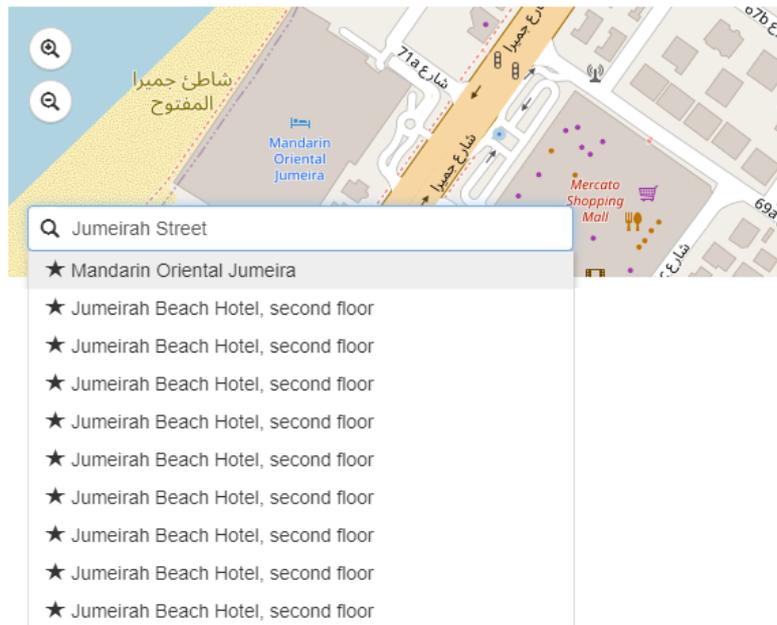
Fig. 2.15: Search for object address on the map

You can link a task to an object. To do this, click "Select an object" above the map. Choose the object layer in the left part of the opened window in the "Layers" tab. After that, objects of this layer are displayed in the "Objects" tab in the right part of the window. You can use the search line in each of the tabs. Select an object in the list and click "Select" (Fig. 2.16).
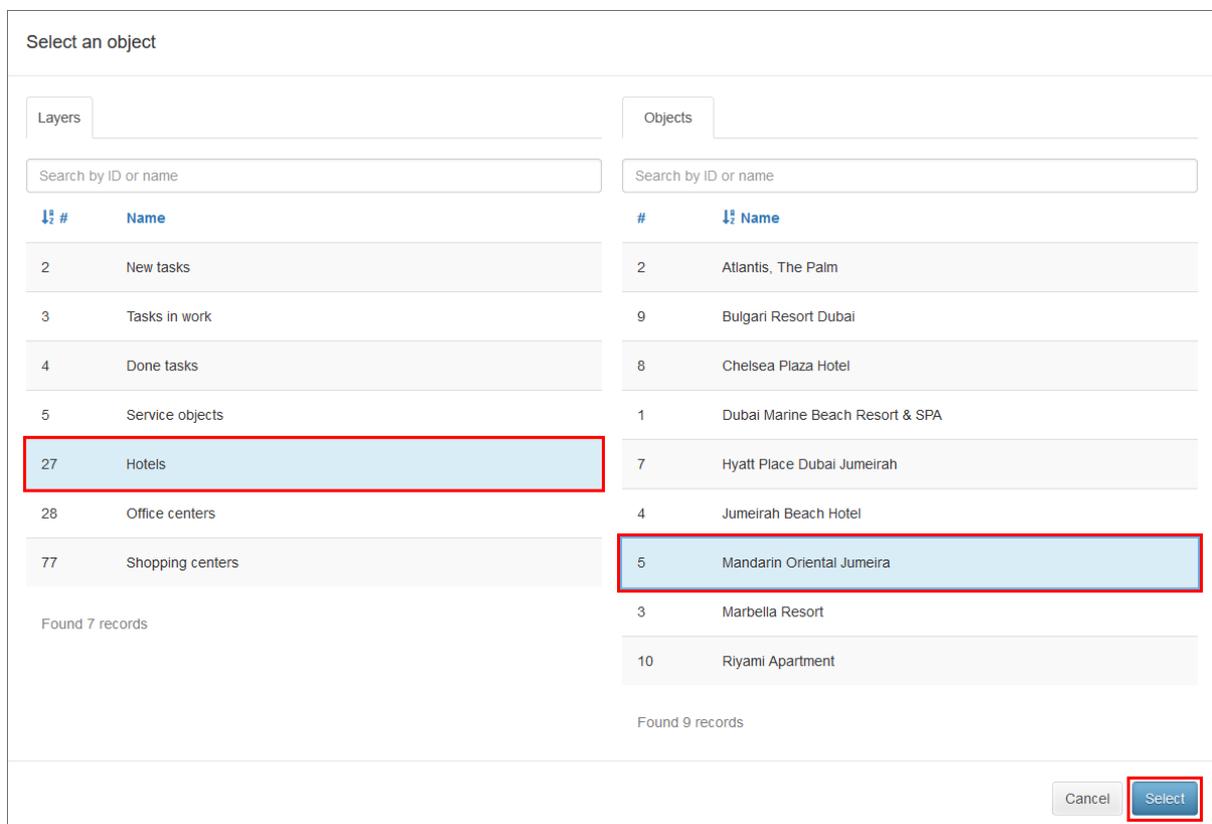


Fig. 2.16: Object selection window

The selected object is displayed on the map in the task window, the task fields are filled in according to the configured mapping. You can edit filled fields and enter values into empty fields (mandatory fields are marked with an asterisk) (Fig. 2.17):



Fig. 2.17: Task creation window with the selected object and filled fields

- **Title** – a brief description of the problem/goal of the task (mandatory field).

- **Contract** – the contract under which the work is carried out.

- **Organization** – the organization on whose behalf the task is created (mandatory field). This field is available to the System Administrator, System Inspector, Cluster Administrator, and Cluster Inspector.

- **Type of work** – the type of work assigned to the task (mandatory field). It can be linked to a user's role and organization. If the role has access to the type of work but the organization does not, you cannot assign the task to a user from that organization. If only one type of work is available for an organization, the system automatically selects it in this field.

- **Priority** – a characteristic of the urgency of the task. You can choose from the list: planned, unplanned, additional, etc.

- **Assigned organization** – the organization to which the task is assigned for execution. When you select a contract, the system automatically fills in the field with the value specified in the contract. When you select an organization, it uses the value from the organization card.

- **Executor** – the user responsible for performing the task.

- **Description** – a detailed description of the task.

- **Until** – the date and time by which the task should be completed.

- **Custom fields** – additional fields of different formats previously created and linked to a specific type of work.

If there are composite fields among the custom fields, the task creation window displays the specified minimum number of nested fields of the composite field and the "Add" button (Fig. 2.18). You can add nested fields up to the maximum number set in the settings and delete them down to the minimum. Once the threshold values are reached, the "Add" button becomes inactive. If both the minimum and maximum number of instances for a field are set to 1, you cannot add or remove nested fields. These rules apply to composite fields at both the first and second levels.

Fig. 2.18: Filling in composite fields in the task creation window

If the task has a custom field of the "File" format, you can attach files to the task by clicking the corresponding button under the field name (Fig. 2.19).

Fig. 2.19: Adding a file to a custom field in the task creation window

Icons indicate which file types (one or more) are available for upload: photo, video, audio, signature, QR-code, or document (for other file types). If the photo added to the custom field was the first one, it becomes the main one. Changing the allowed file types does not affect already uploaded files, but applies to new uploads.

The number and size of attached files cannot exceed the set minimum and maximum values. If no minimum and maximum values are set, you can add any number of files of any size. Changes to the minimum and maximum values do not affect existing tasks, but apply to newly created ones.

In addition to using the custom field, you can also attach files to a task in the "Files" tab (Fig. 2.20). These can be photos, videos, audio recordings, or text files.
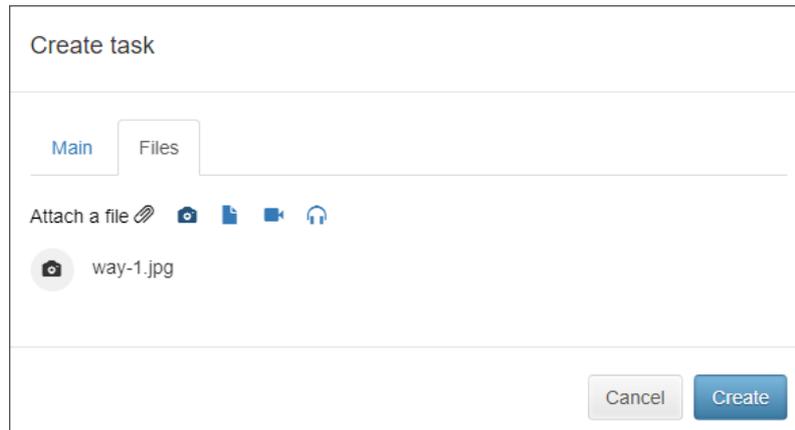


Fig. 2.20: Adding files to a new task in the "Files" tab

#### 2.2.2.2 Editing a task

The ability to edit task fields depends on the role of the user. To edit a task, click on its icon and then click "Edit" at the top of the window. The task opens in the edit mode. Here you can fill in/modify the available fields (Fig. 2.21).
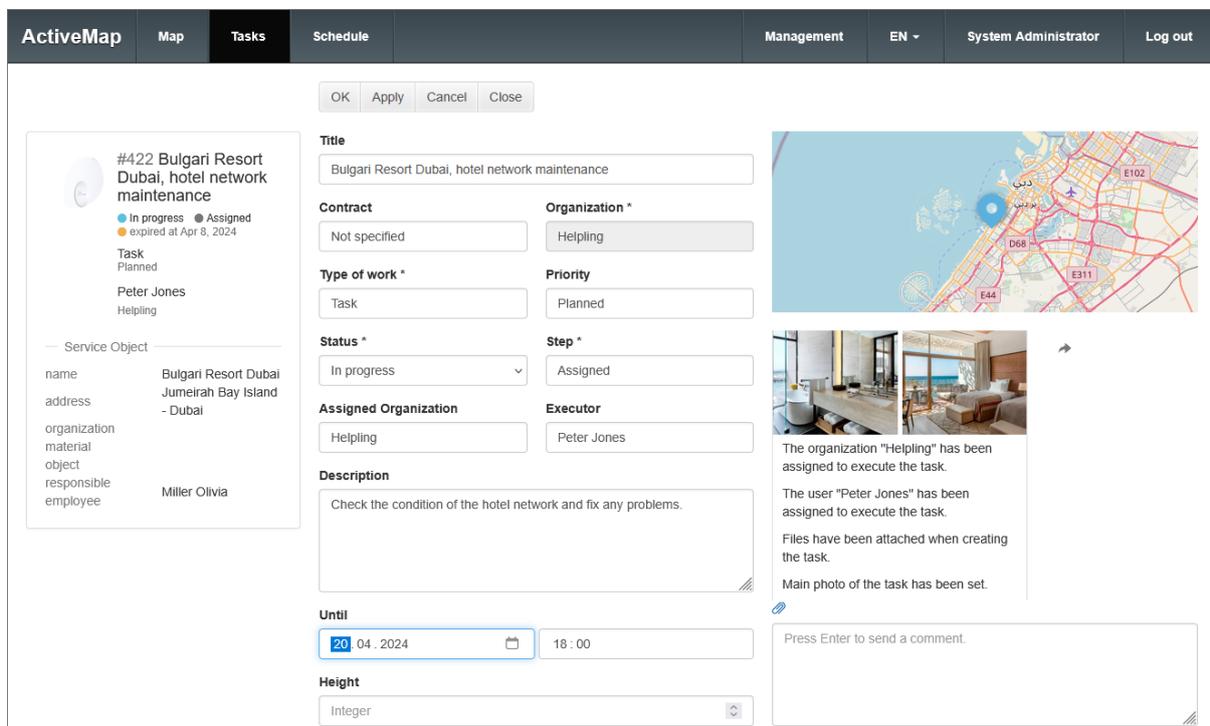


Fig. 2.21: Task editing window

You can attach new files to a task. Click the  icon on the right side of the window, select the file type, and press Enter to submit a comment (Fig. 2.22).

Fig. 2.22: Adding new files to an existing task

You can also add new files to the custom fields of the "File" format ([Fig. 2.23](#)). For more details, see *Creating an operational task* (page 14).



Fig. 2.23: Adding new files to a custom field

The ActiveMap Web interface does not support deleting files attached to a task unless they

are linked to a specific custom field. However, users can delete these files in other system applications, such as ActiveMap Desktop or ActiveMap Mobile.

To delete a file from a custom field, click on the preview and check if a trash bin icon appears instead of it (Fig. 2.24). Then, click the "OK" or "Apply" button. This action removes the selected file from the custom field.
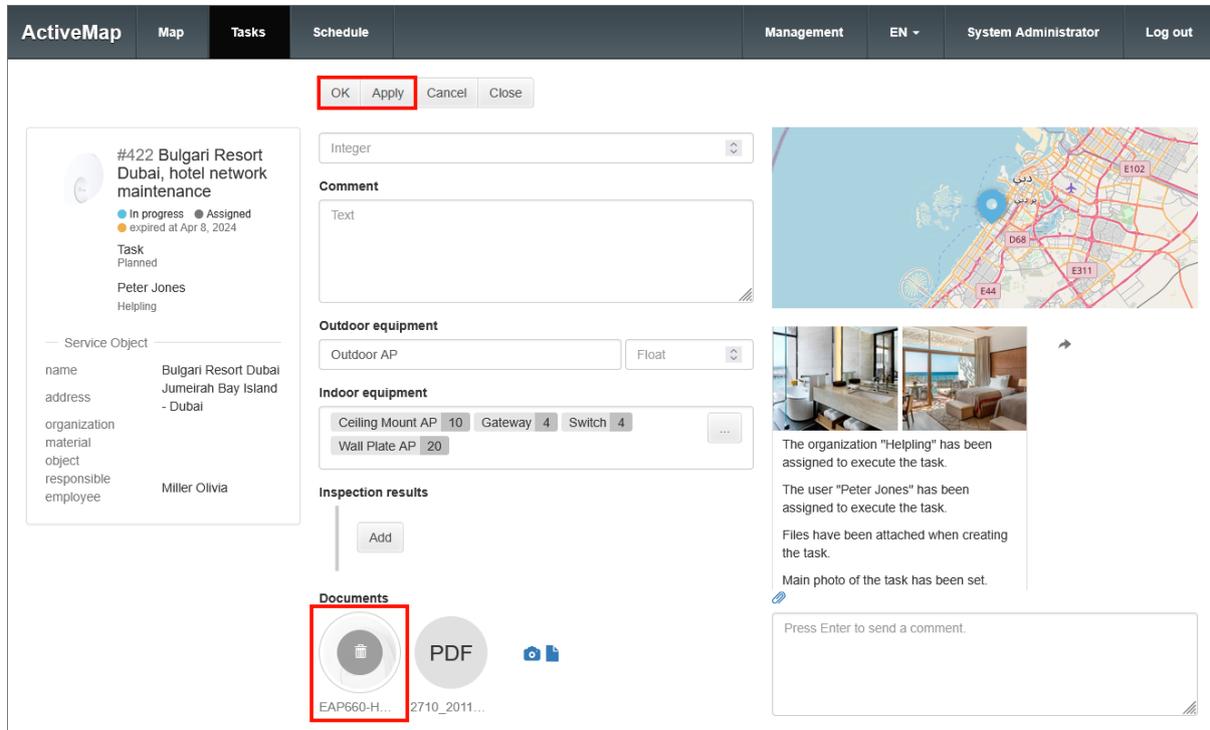


Fig. 2.24: Deleting an attached file from a custom field

After making the changes, click one of the buttons located at the top of the editing window:

- "OK" – save changes and go to the list of tasks.

- "Apply" – save changes without closing the editing window.

- "Cancel" – cancel all changes made before saving.

- "Close" – close the editing window (changes are not saved if they are not saved before closing).

When saving the changes made in the "File" format field, the system checks the type, number, and size of newly entered files. If any condition is not met, the system displays a corresponding message and does not save the changes.

If the task is not editable, only the "Close" button is active.

### 2.2.2.3 Deleting a task

To delete an existing task, click on its icon and then click "Delete" at the top of the window. Confirm the action in the pop-up information window (Fig. 2.25).
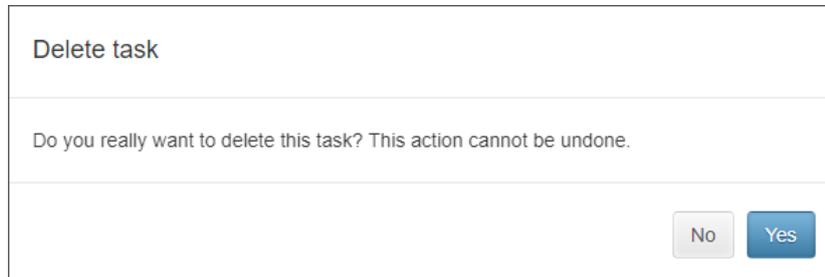


Fig. 2.25: Deleting a task

If the user does not have access to deleting tasks, a "No access rights" message appears.

## 2.2.3 Task list

To access the task list, click "Tasks" on the top panel of the "Tasks" module page. In the window that opens, you can see all the tasks created so far, including tasks without georeferencing (Fig. 2.26).



Fig. 2.26: List of tasks available to the user

Just like in the task map window, you can filter, edit, and delete existing tasks in the task list window, as well as create new operational tasks.

The filter area located to the left of the list of tasks is intended for searching in the general list. After entering and selecting all the filtering parameters, the list displays the tasks that meet the specified criteria.

To create a new operational task, click the "Create" button, fill in the fields in the opened window, and save the changes. Creation of tasks is described in detail in the *Creating an operational task* (page 14) section.

To edit a task, select the required task and click "Edit" at the top of the window or double-click on the task. In the window that opens, make the necessary changes and save them. Editing tasks is described in detail in the *Editing a task* (page 21) section.

To delete an existing task, select it, click "Delete", and confirm your action in the opened window.

### 2.2.4 Schedules

Schedules allow users to generate tasks automatically, based on templates (typical tasks), at a certain time with the required frequency. To go to the section with schedules and task templates, click "Schedule" on the top panel of the page. The schedule window with a calendar opens (Fig. 2.27).



Fig. 2.27: Schedule window with calendar

The window contains the following elements:

1. "Schedules" button – switches to the cards of all available schedules.

2. "Calendar" button – switches to the calendar with schedule launches (the calendar is opened by default when you go to the schedules section).

3. "Runs" button – switches to the cards of schedules with launches for the selected date.

4. "New schedule" button – switches to the schedule creation window.

5. Legend of the status of creating tasks with the ability to turn on/off.

6. Filter panel.

7. Calendar with marked task status.

When you click the "Schedules" button, you switch to the cards of all available schedules. The schedule card displays its name, organization, cluster, contract, launch (task creation) time, and a button taking to the list of templates attached to the schedule ([Fig. 2.28](#)).



Fig. 2.28: Schedule cards

Clicking the "Calendar" button takes you to the calendar with schedule launches. The calendar with the current month is opened by default when switching to the schedules section ([Fig. 2.27](#)). The calendar cells display the number of tasks created by the schedule for the day. Tasks are grouped and color coded by status. The colors of the status are displayed in the legend in the upper right part of the window (completed, in progress, planned, and failed). Click a status name to enable/disable displaying of the corresponding tasks in the calendar. Double-clicking a date in the calendar opens the launches window for that day.

You can go to the same window by clicking the "Runs" button. In the left part of the window, there is a smaller version of the calendar with task status marks ([Fig. 2.29](#)).

Fig. 2.29: Launches for the selected date

The schedule cards with launches for that day are placed to the right of the calendar. The schedule card displays the following information:

- Title.

- Organization, cluster, or contract (if any).

- Time zone.

- Deadline.

- Buttons for editing, going to the list of templates attached to the schedule, and deleting.

- Creation time and number of created tasks with status markings. Clicking on a creation time in the card takes you to the task templates created at that time (Fig. 2.30). You can edit or delete these templates.

Fig. 2.30: Task templates

Creating and editing schedules and task templates are available for the following roles:

- System Administrator

- Cluster Administrator

- Organization Administrator

Depending on the scope and the role of the user creating the schedule, schedules are divided into 3 types:

- Global (system-wide), created and edited by the System Administrator;

- Cluster level, created and edited by both the System Administrator and the Cluster Administrator;

- Organization level, created and edited by the System Administrator, the Cluster Administrator, and the Organization Administrator.

### 2.2.4.1 Creating a schedule

To create a new schedule, click the "+ Create schedule" on the top panel of the window.

In the form that opens (Fig. 2.31), enter the following information:

- Name of the schedule;

- Time zone;

- Deadline;

- Cluster, contract, or organization (you can leave the field blank or specify only one of these parameters);

- Start date;

- Finish date.



Fig. 2.31: Schedule creation window

If the time zone is not selected, the schedule defaults to the organization's cluster time zone. Global schedules must also be linked to a reference system, so they default to the server's time zone. Thus, each schedule has its own time zone, relative to which the start dates and times are set.

The System Administrator can leave the "Cluster," "Contract," and "Organization" fields blank. In this case, the schedule will be global, valid in all organization clusters. The System Administrator and Cluster Administrator can select the schedule's cluster. In this case, the "Contract" and "Organization" fields will be unavailable. The schedule will be cluster-specific, valid within the specified cluster. The System Administrator, Cluster Administrator, and Organization Administrator can select the organization within which the schedule will apply. In this case, the "Cluster" and "Contract" fields will be unavailable.

If you specify a contract with an expiration date when creating a schedule, the finish date is

applied to the schedule. In this case, there is no need to specify the start and finish date and time of the schedule, since the contract expiration date has a higher priority. If the schedule is attached to a contract, its expiration date is automatically synchronized with the contract whenever the dates in the contract change. If the schedule has an expiration date, but the associated contract does not, synchronization does not occur.

Afterward, you should add the start time and configure the schedule's recurrence, excluding weekends if needed. To set the start time, go to the "Weekdays" tab, click "Add", and specify the task creation time. You can add multiple runs (Fig. 2.32).



Fig. 2.32: Adding a schedule start time

Next, you should define the days on which tasks will be created. The system provides several options for scheduling: weekly, monthly, yearly, or any dates. If the dates are set outside the schedule validity period, the tasks will not be created on these dates.

If you select the "Weekly" option, a list opens where you can select the days of the week on which tasks will be created during the validity period of the schedule (Fig. 2.33).

Fig. 2.33: Activation of weekly schedule runs

Selecting the "Monthly" option opens the calendar for the month. Mark the dates to run the schedule (Fig. 2.34). Tasks will be created on the specified dates monthly for the duration of the schedule.



Fig. 2.34: Activation of monthly schedule runs

Selecting the "Yearly" option opens a calendar for the year. Mark the dates to run the schedule (Fig. 2.35). Tasks will be created on the specified dates every year for the duration of the

schedule.



Fig. 2.35: Activation of yearly schedule runs

Selecting the "Any dates" option opens a calendar for the current year. Mark specific dates to run the schedule (Fig. 2.36). You cannot select dates prior to the current day. Tasks will be created on the specified dates for the duration of the schedule.



Fig. 2.36: Activation of schedule runs on specific dates

If the dates in different tabs overlap (for example, Monday and the 1st day), the system will

create a single task without duplication.

You can set non-working days when it is unnecessary to create schedule tasks. For example, a holiday or vacation of an assigned employee. To do this, switch to the "Holidays" tab after determining the periodicity of creating tasks. Similar to the working days, choose the appropriate tab and mark the non-working days (Fig. 2.37). You can also set non-working days in an already created schedule. In this case, the system removes the start time of tasks on the specified days.



Fig. 2.37: Setting non-working days

To view all task creation dates in the calendar before saving the schedule, click the "Preview" button. The calendar window opens, showing all dates when tasks will be created. Non-working days are highlighted in purple (Fig. 2.38).
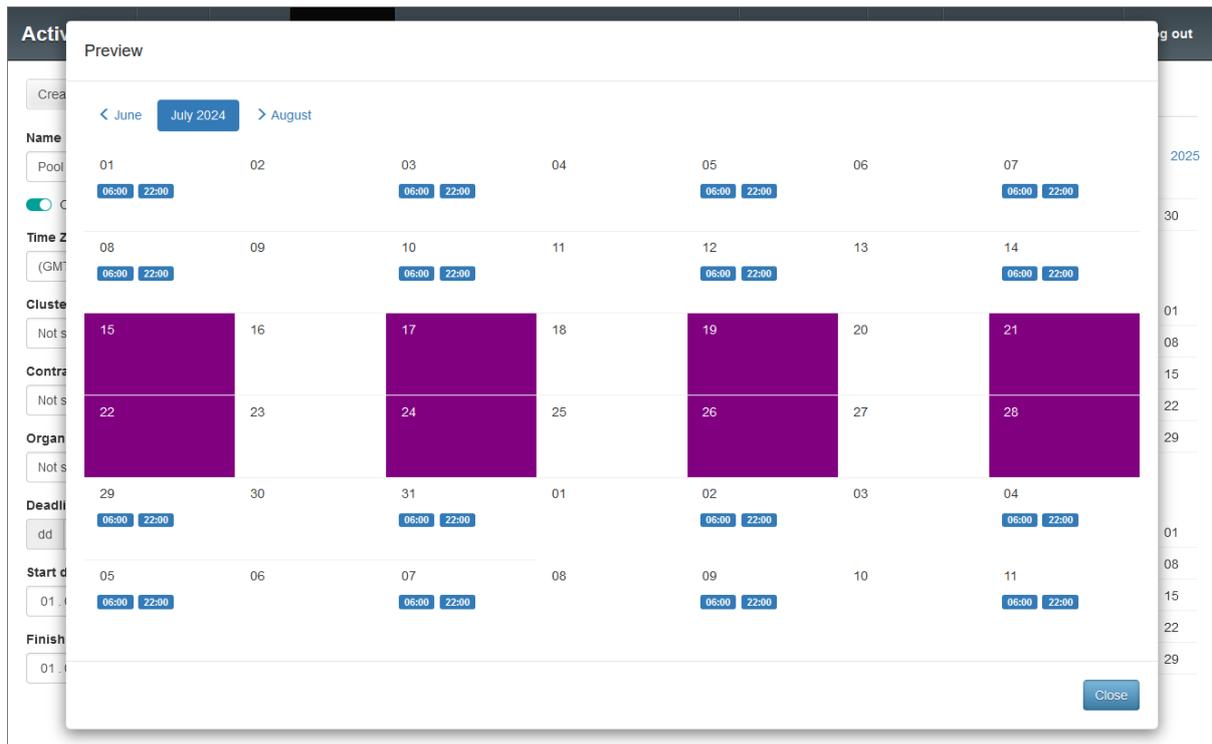
Fig. 2.38: Schedule preview

You can temporarily deactivate the created schedule or its individual runs with the "On" toggle switch and the toggle switches next to the launch times.

After entering all the data, click the "Create" button. If the creation is successful, the schedule card opens, where you should create task templates. The schedule cannot start if there are no templates attached to it.

### 2.2.4.2 Task templates

Task templates are sample tasks that are created according to a schedule.

### 2.2.4.2.1 Creating a task template

To create a task template, click the "New template" button, fill in the form, and click "Create"
(Fig. 2.39).



Fig. 2.39: Template creation window

When selecting a contract in the task template, the "Assigned Organization" field is automatically filled in with the value specified in the contract. When selecting the creator organization, the "Organization" field is automatically filled with the value specified in the organization card. When creating a template, the "Priority" field is automatically set to the first value from the list if all available priorities are either global or from the same cluster.

If the schedule was created under a contract that specifies objects, you cannot create a task or template based on the contract without one of this objects.

To add a task template to an existing schedule, go to its card in the "Schedules" tab and click "Templates" (Fig. 2.40).

Fig. 2.40: Navigating to templates from the schedule card

In the opened window, click the "New template" button. Perform the same actions as when creating the first template.

#### 2.2.4.2.2 Editing a task template

To change the data of a template, click "Edit template" on the template card (Fig. 2.41).



Fig. 2.41: Template editing

The task template card form opens where you can make changes and save them.

If a type of work, priority, organization, assigned organization, or assigned executor used in a template is deleted from the system, a red marker appears next to the deleted value in the template card (Fig. 2.42).
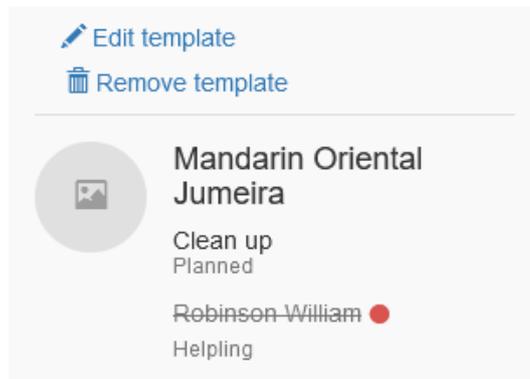
Fig. 2.42: Deleted value marker in the template card

Tasks based on this template will not be created until the deleted value is replaced with an existing one in the template.

#### 2.2.4.2.3 Deleting a task template

To delete a task template, click "Remove template" on the task template card (Fig. 2.43).



Fig. 2.43: Template deletion

### 2.2.4.3 Schedule editing

To make changes, select the schedule card in the general list of schedules, in the calendar, in the list of launches, or in the task card created according to the schedule and click "Edit" (Fig. 2.44).

Fig. 2.44: Edit button in the schedule card

This opens the schedule editing window. Here you can change its name, due date, add a new start time, configure, disable or delete the current start time (Fig. 2.45).



Fig. 2.45: Schedule editing window

#### 2.2.4.4 Deleting a schedule

To delete a schedule, select the schedule card (in the general list of schedules, in the calendar, in the list of runs, or in the card of a task created by the schedule) and click "Delete" (Fig. 2.46).



Fig. 2.46: Delete button in the schedule card

Next, you should confirm your actions (Fig. 2.47).



Fig. 2.47: Confirming schedule deletion

After deleting a schedule, all tasks created according to it will remain in the system. The new ones will not be created. The schedule record will remain in the task cards created by the deleted schedule without the ability to navigate to it.

To stop the creation of tasks by a schedule, you can disable the "On" toggle or the time toggles of all runs through the edit form instead of deleting the schedule completely.

### 2.2.4.5 Restarting a schedule

If a task has not been created according to the schedule for some reason (for example, due to a mismatch of work type, organization, or executor), you can restart the template creation. To do this, click the "Runs" button, select a date and go to the schedule card. Make changes to the template and click "Restart" (Fig. 2.48). The ability to restart the schedule is determined by the role of the user.

However, changing the object in this way is not possible (changes on the server are not saved). To change the object, you have to create a new template.



Fig. 2.48: Restart from the schedule card

## 2.3 Management module

The management module is intended for configuring and managing data and system elements: layers, tasks, reports, users, organizations, etc. Only authorized users with certain access rights can work with it.

The main management tools include:

- Exporting, loading, and indexing data;

- Adding, deleting, and editing system elements (tasks, reports, users, and organizations);

- Configuring access rights to the user information.

Fig. 2.49: Management module

The management module is divided into the following areas ([Fig. 2.49](#)):

1. User panel – contains buttons to access help and map, change program language, and exit the system.

2. Navigation panel of functional blocks – contains the main system management tools.

3. Tab bar – contains information and a set of buttons to manage in each tab.

4. Search string and filter – allows searching for system elements.

5. Administration area – displays selected elements and their components.

### 2.3.1 Administration area

#### 2.3.1.1 Table sorting

All information about the main system elements (users, organizations, layers, etc.) is presented in the corresponding tabs in a tabular form. Using these tables, you can sort the available data.

To organize information about a particular element of the system, go to the tab with that element and click the title of the column by which the sorting should be done. When you click again on the column header, the sorting is done in reverse order.

### 2.3.1.2 Search string and filter

A search string [ ] is available on the right side of the page.

To search for an element, enter part of its name in the search string, after which all elements that correspond to the entered query are displayed in the administration area. The search is performed on all elements of the system.

In addition, you can use the filter located below the search string to select data according to specified search criteria. To get the most accurate search results, use the search string and filter at the same time (where both tools are available at once).

### 2.3.1.3 Adding a new element

To add a new element, go to the section of interest and click [ + Create ]. The appropriate rights are required to add new elements. When you click this button, a new window opens, where you have to fill in the required fields and click [ ✔ Save and exit ]. To cancel adding a new element, click [ ✖ Cancel ].

### 2.3.1.4 Editing an element

To change the data about a certain element, go to the section of interest. Then put the cursor on the element name and click the edit sign [ ✎ ] on the right side of the selected row. The edit sign [ ✎ ] appears only after hovering over the row with the element name.

Clicking it opens a form where you can enter new information about the selected element and click [ ✔ Save and exit ]. To cancel editing the element, click [ ✖ Cancel ]. In addition, you can open the editing form by double-clicking the row with the element name.

### 2.3.1.5 Deleting an element

To delete a specific element, go to the section of interest. Then hover over the row with the name of this element and click the delete sign [ 🗑 ] on the right side of the selected row. The delete sign [ 🗑 ] appears only after hovering over the row with the element name. Clicking it opens a dialog box confirming the deletion of the element. To delete the element from the system, click [ OK ]. To cancel the deletion, click the [ ✖ Cancel ] button.

To delete multiple elements, place the mouse cursor on the rows with these elements and select the checkboxes next to their names. After that, the

[🗑 Delete] button becomes available in the lower part of the administration area. When you click it, a dialog box opens, confirming deleting the selected elements.

---

**Note:** When you try to delete your user or organization, the message appears in the administration area informing you that deletion is not possible.

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### 2.3.1.6 Data export

The [➡ Export] button is required to export data as a separate Excel file (if you have the appropriate rights). If you use the search string and then click

[➡ Export], the downloaded Excel file contains information only about the found elements.

### 2.3.2 User panel

The user panel consists of the following elements (Fig. 2.50):

- "Help" – redirects from the main system page to the page with manuals.

- "Map" – navigates to the main system page.

- "Interface language" – switches the interface to one of the available languages.

- "User name" – opens a page for editing personal data.

- "Exit" – logs out of the user's account.



Fig. 2.50: User panel

### 2.3.3 Navigation panel of functional blocks

The navigation panel has the following functional blocks:

- "Management" – management of organizations, users, and their parameters (*"Management" block* (page 44));

- "Tasks" – management of task parameters (*"Tasks" block* (page 76));

- "Layers" – management of layers, layer groups, and their parameters (*"Layers and tables" block* (page 106));

- "Rights for layers" – management of rights for layers and groups of layers (*"Rights for layers" block* (page 151));

- "Reports" – viewing the list of reports and managing rights to reports (*"Reports" block* (page 155));

- "Datastores" – viewing and creating storages (*"Datastores" block* (page 161));

- "Settings" – viewing and creating system settings (*"Settings" block* (page 164));

- "System" – editing global and language settings of the system, activating licenses (*"System" block* (page 318)).

### 2.3.3.1 "Management" block

In the "Management" block, you can access detailed information about system users, roles, organizations, and clusters. When navigating to the tabs in the block, the following control elements become available: table sorting, search bar, filters, adding a new entry, editing an entry, deleting an entry, and exporting data.

### 2.3.3.1.1 "Users" tab

The "Users" tab contains information about registered users in the system, roles, and organizations, and includes second level tabs (Fig. 2.51):

- "Users"

- "User types"

- "User tags"

- "Invites"

- "LDAP"



Fig. 2.51: "Users" tab

---

## Users

Basic information about system users is presented in the form of a table with the following columns (Fig. 2.51, Fig. 2.52):

- "Full name" – full name of the user;

- "Login" – username used to log in to the system;

- "Role" – user's role in the system;

- "Main organization" – user's affiliation with the organization;

- "Last authorization" – user authorization time in the system applications;

- "Tracking" – management of the user's monitoring function (enabling the tracking of the user's movements when using ActiveMap Mobile).

If the organization's name is longer than 70 characters, the "Main organization" column shows the shortened name. Hover over it to see the full name (Fig. 2.52).



Fig. 2.52: "Users" tab, displaying both the shortened and full names of the organization

If the license information for the number of users has been entered into the system, this tab also displays the information about the maximum number of users available according to the obtained license in the upper right corner. Deleted, blocked, and system users are not taken into account.

### Creating a new user

To add a new user to the system, click ![+ Create]. A form (Fig. 2.53) opens in the administration area, where you have to:

- Fill in the personal data of the user (name, login, password, user type, e-mail, phone number, address, and passport).

- Define the user's role in the system (for more information about roles in the system, see *"Roles" tab* (page 58)).

- Enable/disable the geoposition monitoring.

- Select the main organization for all roles except System Administrator and System Inspector. Cluster Administrator and Cluster Inspector can leave the main organization field blank.

- Select one or more additional organizations (for all roles except System Administrator and System Inspector).

- Select one or more clusters (when creating users with the Cluster Administrator and Cluster Inspector roles).

- Enable/disable the authorization via LDAP (single authorization system).

- Enable/disable the integration with GIS editor.

- Add an avatar (file in *.jpg format).

- Add user tags (for more information about user tags, see *User tags* (page 52)).

- Specify the account expiration date, after which it will be blocked.

Fig. 2.53: User adding window

The "Full name" field is mandatory for all user roles. Mandatory fields are marked with an asterisk.

If you leave the remaining optional fields empty, they are automatically filled with default values after clicking [Save and exit] (except for tags and personal data: email, phone numbers, address, and passport details). If you do not specify the account expiration date, it becomes open-ended.

During the simplified creation of a user, an account with the "Executor" role, "Person" type is generated. The login is automatically filled in based on the entered full name. Monitoring is disabled by default. This user is granted access to layers that have the "default rights" setting activated, the layer cluster is not set or match the user's organization cluster. The main organization is automatically filled with the value of the creator's main organization (if the creator is not the System Administrator).

Membership in main and additional organizations allows users of all roles to see the tasks and objects within the layers permitted to the speci-

fied organization. Organization administrators can manage all the added organizations (both main and additional). Selection of additional organizations automatically adds their clusters. The user can see all organizations and users of available clusters. Rights to layers are assigned to each user individually. System and cluster administrators can change the cluster of available layers/data tables.

When creating a user, you can leave the password field empty, and it is automatically generated. In this case, after creating the account, you should generate an invitation and send it to the user. You can set the requirements for password complexity in the system settings (for more information, see *Password Policy* (page 314)).

### Importing users

The system supports bulk import of users from Excel files. To upload new users, click ← Import in the lower right corner. A window opens with the following actions (Fig. 2.54):

- "Upload file" – imports an Excel file containing information about users in the form of a table with the structure set in the template.

- "Download template" – exports an Excel template with the structure required for correct import.

- "Cancel" – exits the import window.
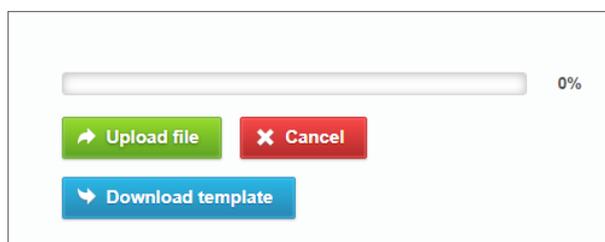


Fig. 2.54: Import users

To get a template for import, click **→ Download template**. Fill in the downloaded file with user data. After saving and closing the file, return to the import page and click **→ Upload file**.

If the file content is not suitable for import (required fields are not filled in, etc.), the system displays an error message. If you try to import users that already exist in the system, you also receive an error message. After successful import, the new users specified in the file appear in the system.

### Exporting users

To export information about users, click **Export** in the lower right corner. A window opens for selecting a directory to save the users.xlsx Excel file. This file contains information about users in the form of a table with the following fields:

- ID
- Full name
- Login
- Role
- User type
- Organization
- Cluster
- Additional organizations
- Tracking
- User tags
- E-mail
- Phone
- Address
- Passport

### Editing user information

In the "Users" tab you can bulk add or remove tags to users. To do this, select users by ticking the appropriate checkboxes, then click **Tags** at the bottom of the screen. A window (Fig. 2.55) opens, where you can select tags to add/remove from the drop-down lists.
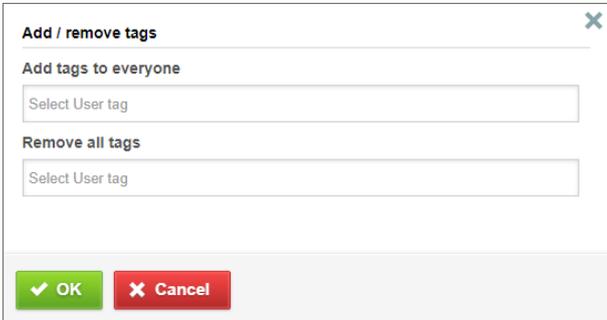


Fig. 2.55: Bulk adding and removing user tags

To modify user information, click [pencil icon] or double-click the row with the name of the selected user. A form similar to the adding form opens in the administration area. Here you can fill in/modify the fields with the user information (Fig. 2.56).
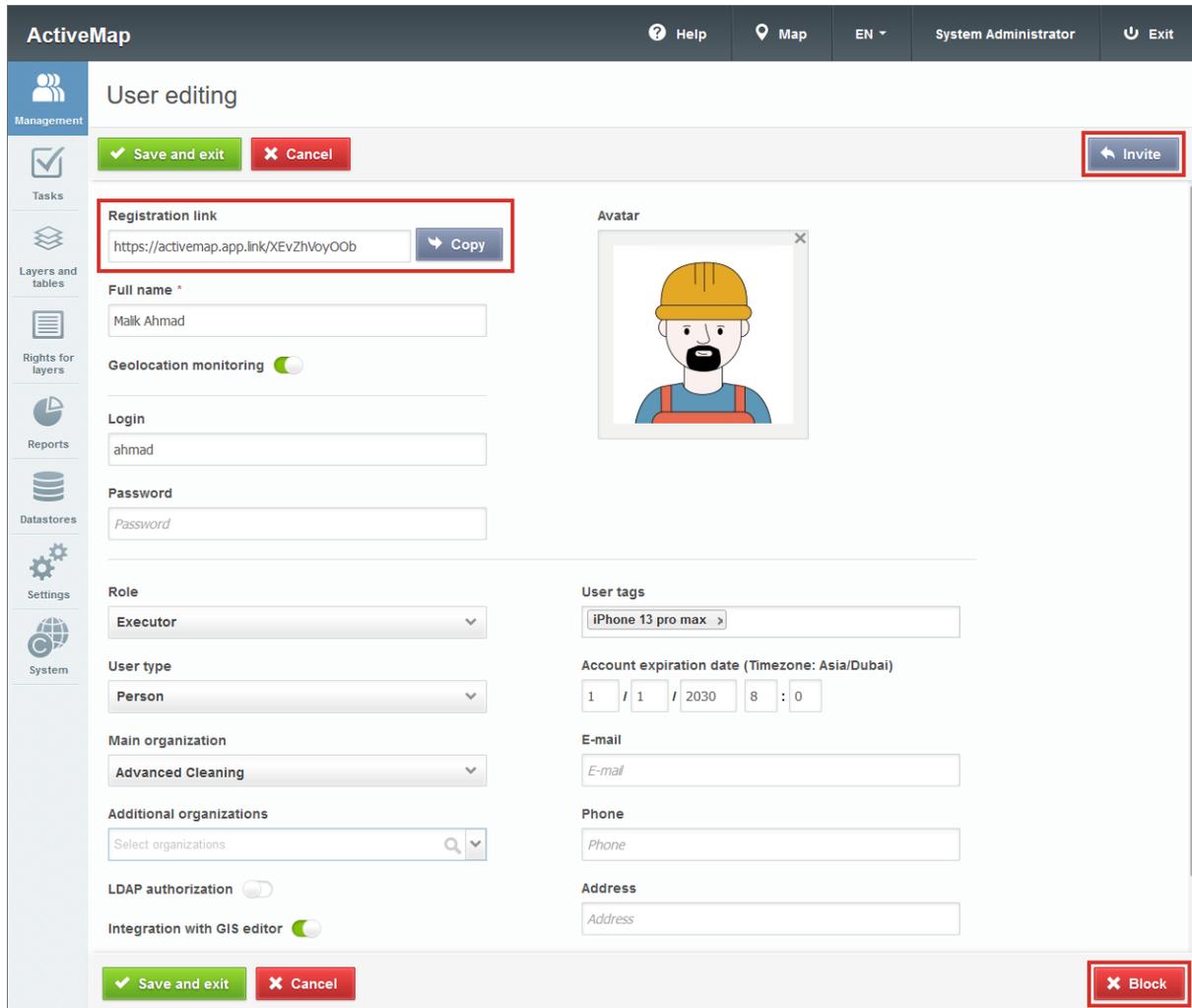


Fig. 2.56: User editing window

Additionally, the editing form includes:

- [Block button] – closing the user's access to the System.

- [Invite button] – generating a new invitation for the user.

- The last active invitation link to the System with a copy button.

If a Cluster Administrator or Inspector deletes a cluster, all organizations of this cluster becomes unavailable to them. However, it is not possible to delete the cluster of the main organization.

### Deleting users

In the "Users" tab, you can delete one or several users at the same time.

To delete one user, click [icon] on the right side of the user line. To delete several users at the same time, select the checkboxes near user names and click [Delete] at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

### Searching for users

You can use the search bar to find users by their name or login. To find a user by organization, cluster, role, type, tag, login, LDAP authentication status, and lock status, use the filter located below the search bar.

### User types

The tab contains a table with information about user types (Fig. 2.57).
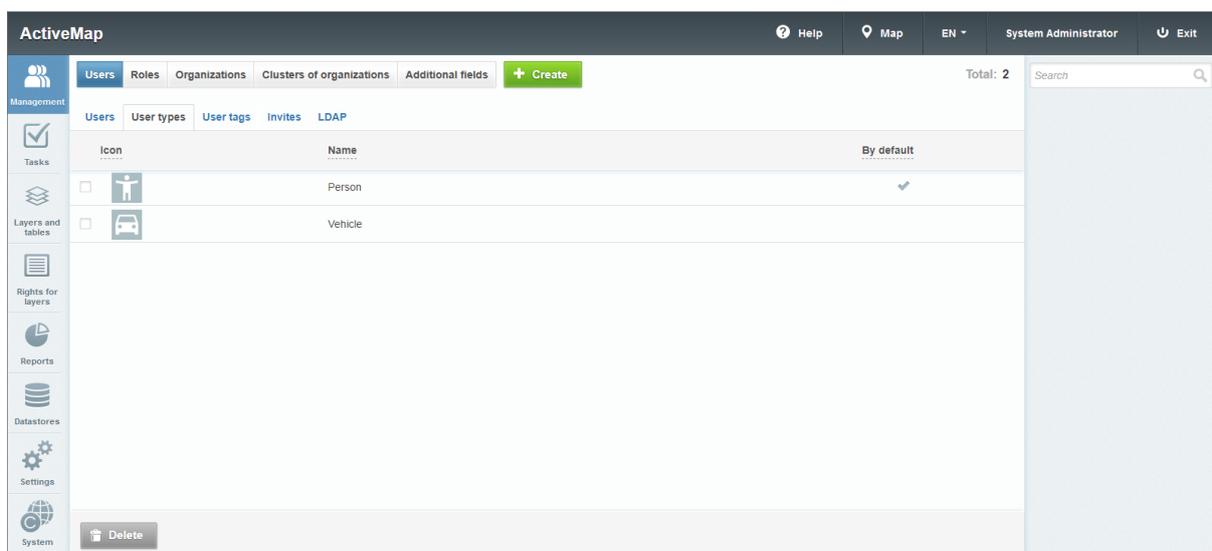


Fig. 2.57: "User Types" tab

There are two user types that are automatically available in the system: "Vehicle" and "Person". "Person" is always the default type and you cannot delete it. Any other user type cannot be the default.

You can also create other types. To do this, click [+ Create] at the top of the screen. A window opens (Fig. 2.58), where you should set the type name, add an icon, and specify whether to display the avatar and initials of the user on the map.

Fig. 2.58: Creating a user type

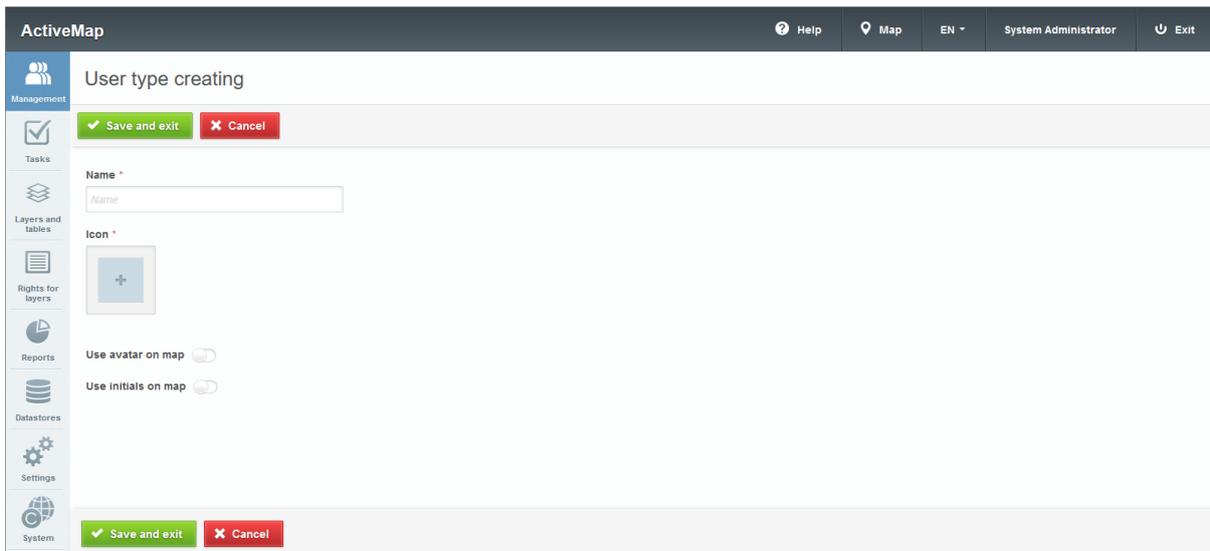The name and the icon are mandatory. If both "Use avatar on map" and "Use initials on map" toggle switches are disabled, the icon is displayed on the map. If both toggle switches are enabled, then the avatar has priority (if any), then the initials, then the icon.

To edit the user type, hover over the type row and click ![pencil icon]. A window similar to the creation window opens, allowing you to enter or modify the information.

To delete one user type, click ![trash icon] on the right side of the row. To delete multiple user types at once, check the corresponding rows and click

![Delete button] at the bottom of the screen. See *Deleting an element* (page 42) for more information about deleting system elements.

### User tags

The tab contains a list of user tags with colors and names of tags (Fig. 2.59). Tags are used to display information about the user, in addition to the information provided by the system. For example, the user's phone model.
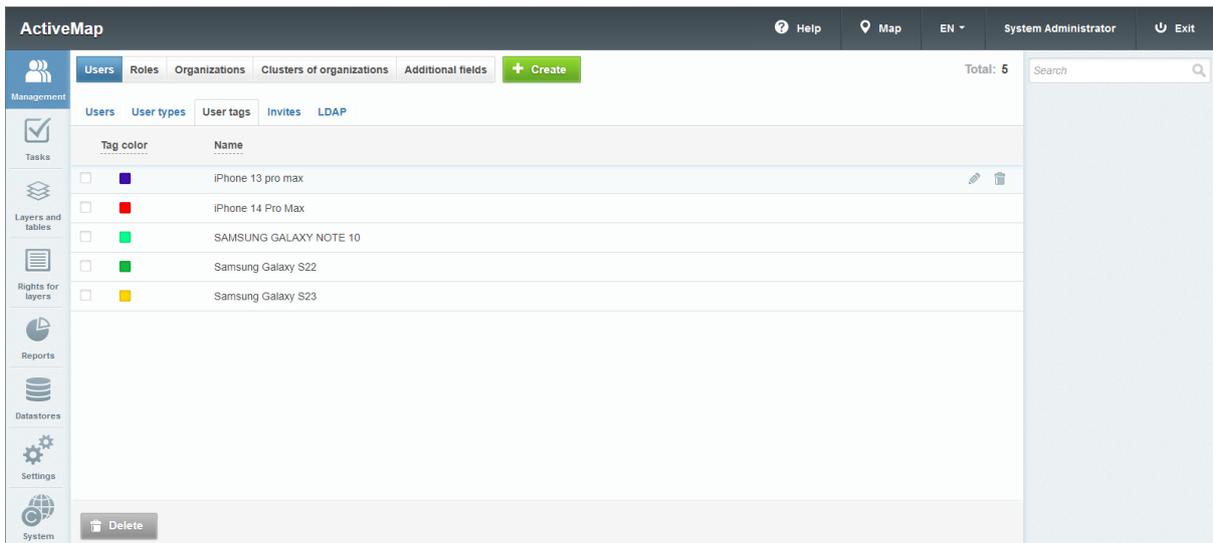
Fig. 2.59: "User tags" tab

To add a new tag, click [ **+ Create** ] and fill in the "Name" and "Tag color" fields. Both fields are required (Fig. 2.60).
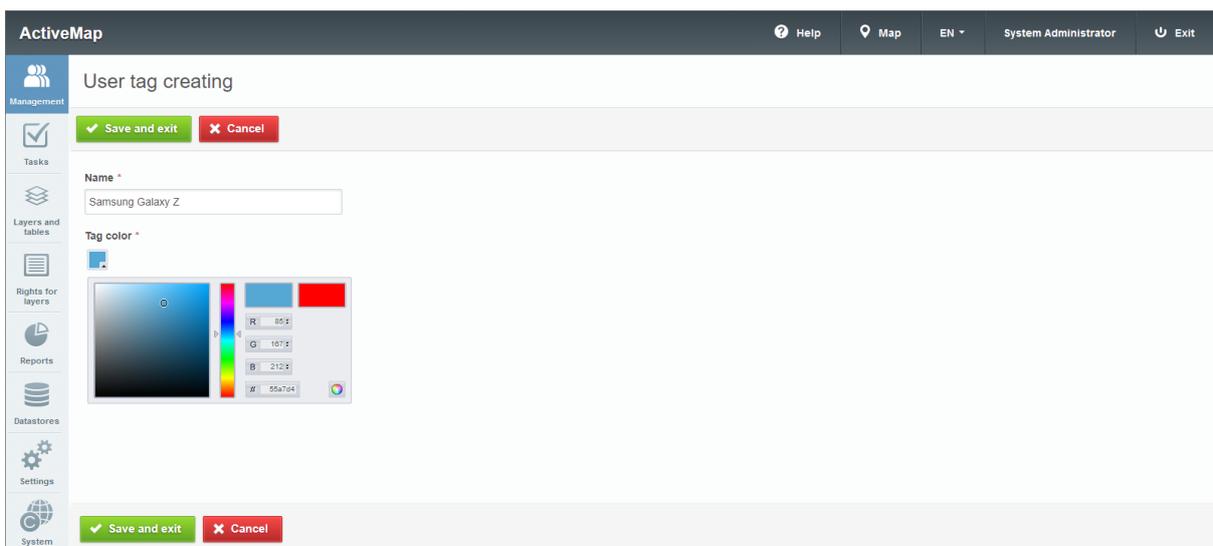


Fig. 2.60: Adding a user tag

After specifying the user's tag in the "Users" tab in the "User tags" field, it appears in the user's card (Fig. 2.61)
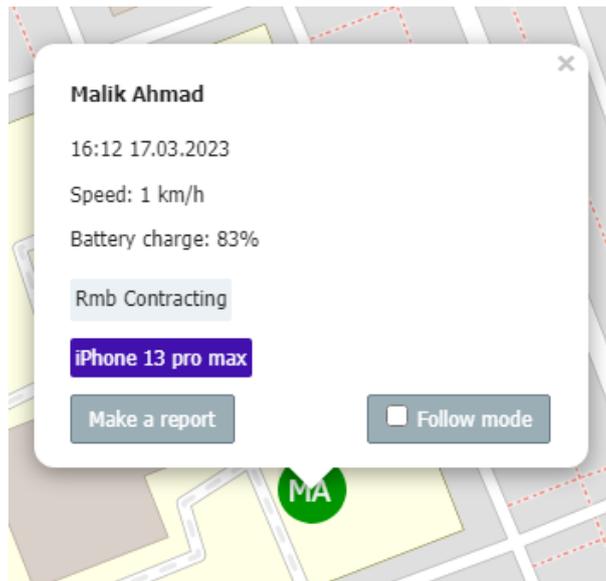
Fig. 2.61: Example of applying a user tag

To edit a user tag, click ✎ on the right side of the tag row. A window similar to the creation window opens, allowing you to modify the tag name and color.

To delete one tag, click 🗑 on the right side of the label row. To delete multiple tags at once, select the corresponding rows and click 🗑 **Delete** at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

### Invites

This tab is used to generate links that allow users to log in the ActiveMap Mobile application without entering the server address, login, and password. Information about created invitations is presented in a table. To sort the data, click the corresponding column header. To search for specific invitations, use the search bar or filter.

To create a new invitation, click ✚ **Create**. A window opens (Fig. 2.62), where you have to fill in:

- Full name of the user to whom you want to send this link (you can select it from the drop-down list using the search string).

- Link expiration date (you can left it blank for an indefinite link).

- Maximum number of authentication attempts (after exceeding the specified number, the link becomes inactive).
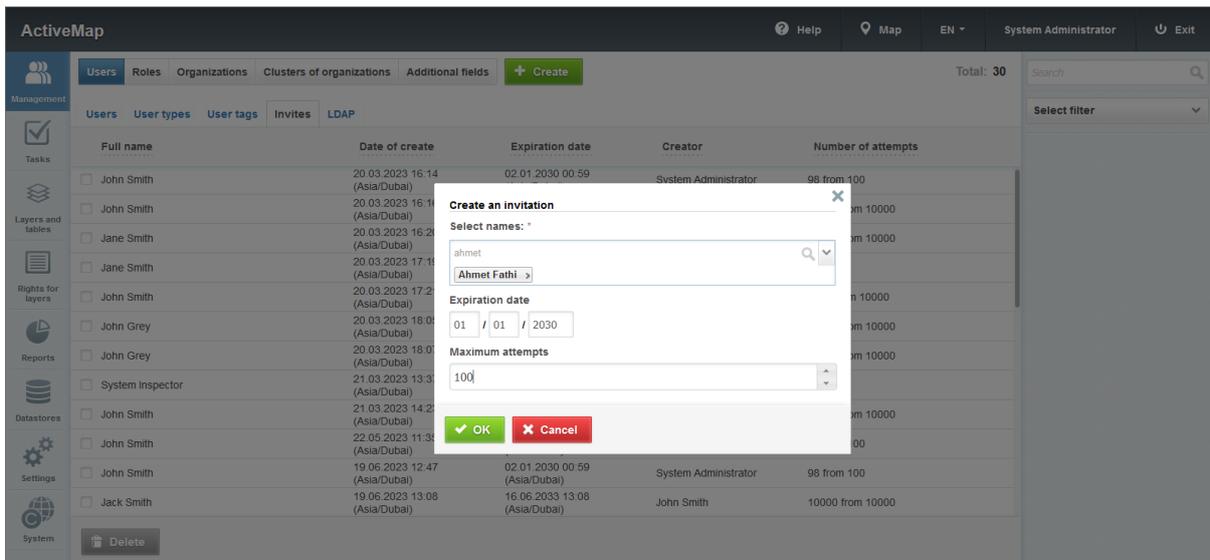
Fig. 2.62: Invitation creation window

Clicking  shows you basic information about the generated invitation with an option to copy this link (Fig. 2.63).
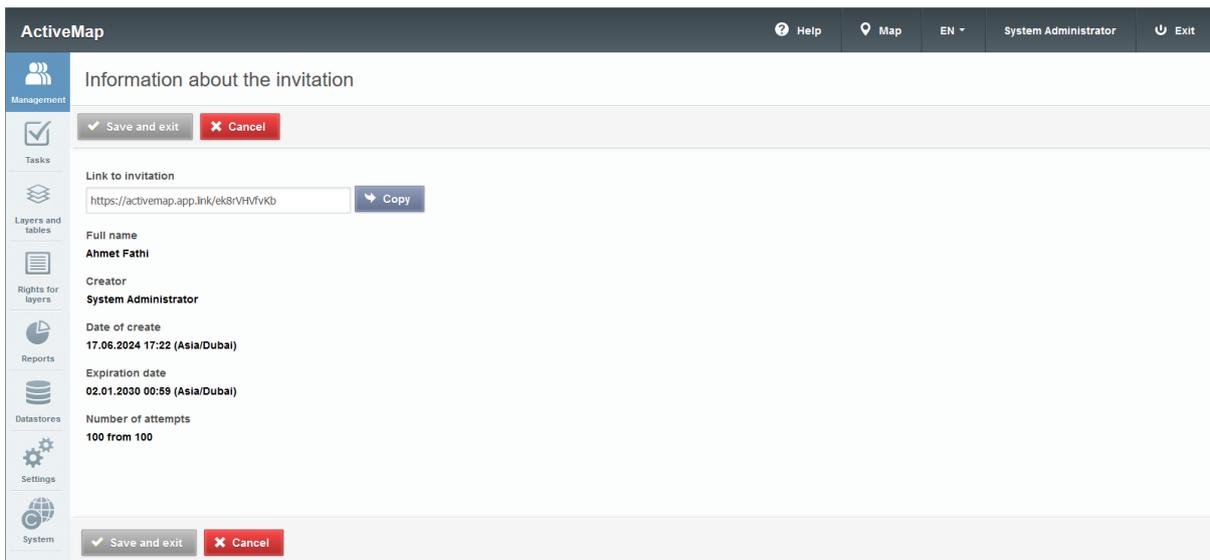


Fig. 2.63: Invitation information

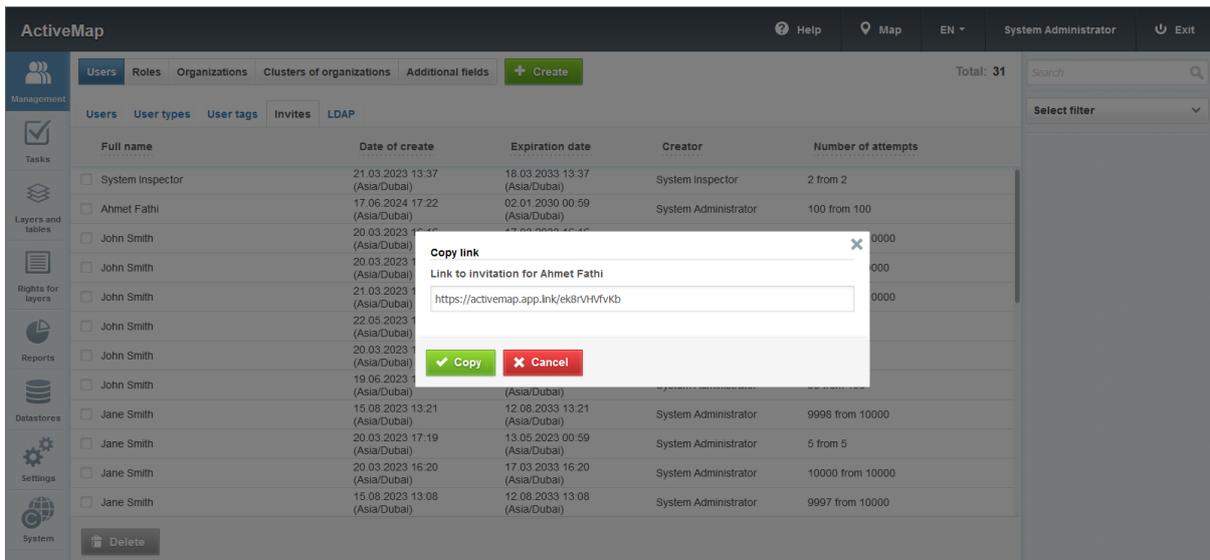Clicking  opens a window where you can also copy the link (Fig. 2.64).

Fig. 2.64: Invitation link

You can send the link to the end user via familiar messenger.

Clicking  deletes the created invitation from the list. You can also delete an invitation by selecting the corresponding row and clicking the  button. If the invitation has been deleted and the user has not yet clicked on the link, you need to create a new invitation and re-send the link to the user. You can also create the invitation from a user's profile by clicking  and entering the necessary details in the opened window (Fig. 2.65). Copy and send the created invitation to the end-user.
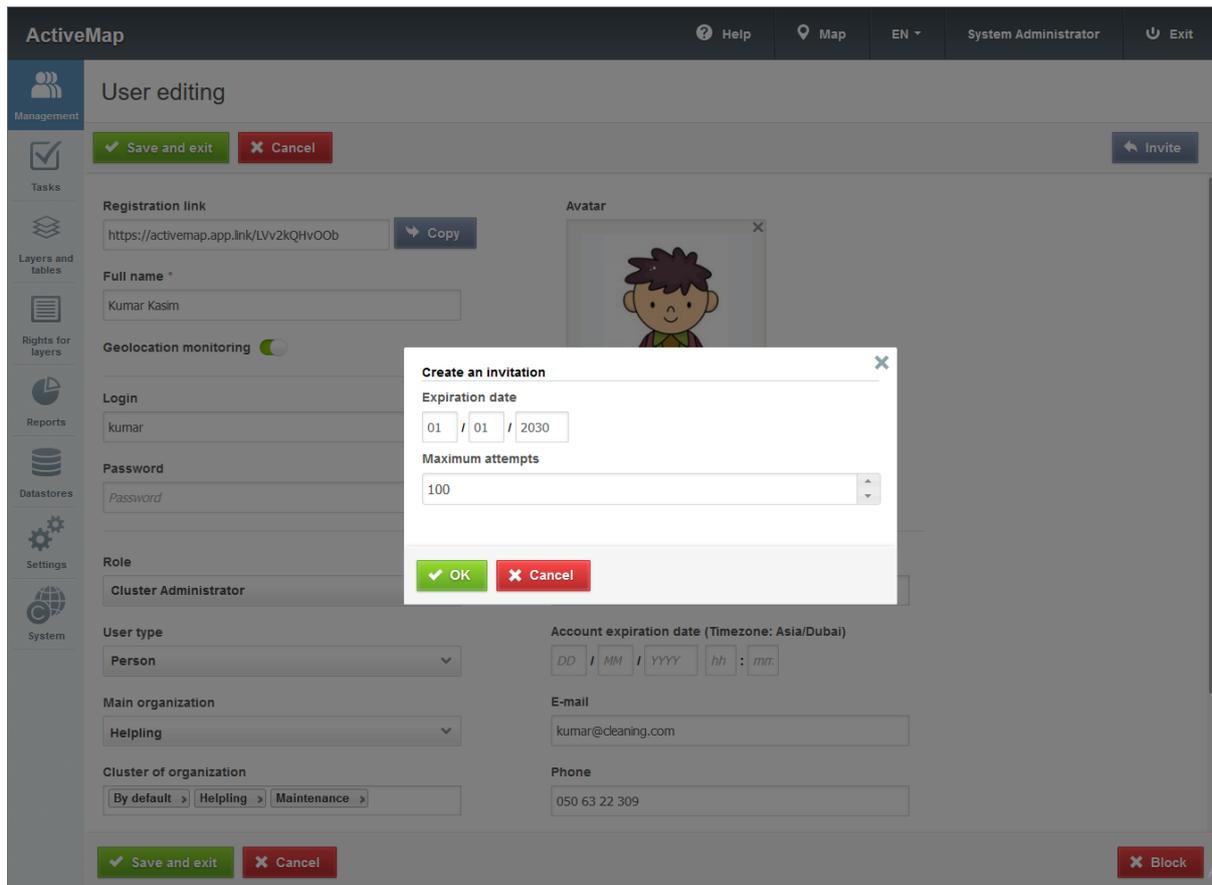
Fig. 2.65: Creating an invitation from a user profile

## LDAP

LDAP is an open protocol used to store and retrieve data from a hierarchically structured directory. It is typically used to store information about an organization, its assets, and users. It is a unified authorization system through which all software products work that are used in the organization. The ActiveMap system supports the LDAP protocol by enabling the "Authorize via LDAP" toggle switch in the user settings. The "LDAP" tab (Fig. 2.66) provides settings for integration of ActiveMap with LDAP. By default, the LDAP integration is disabled. If the integration with LDAP is required, fill the configuration fields with data provided by the organization.

Fig. 2.66: Default LDAP configuration

### 2.3.3.1.2 "Roles" tab

The "Roles" tab displays a list of roles in the system (Fig. 2.67). They are assigned by administrators when creating user accounts. Roles differ from each other in the set of actions that users can perform.
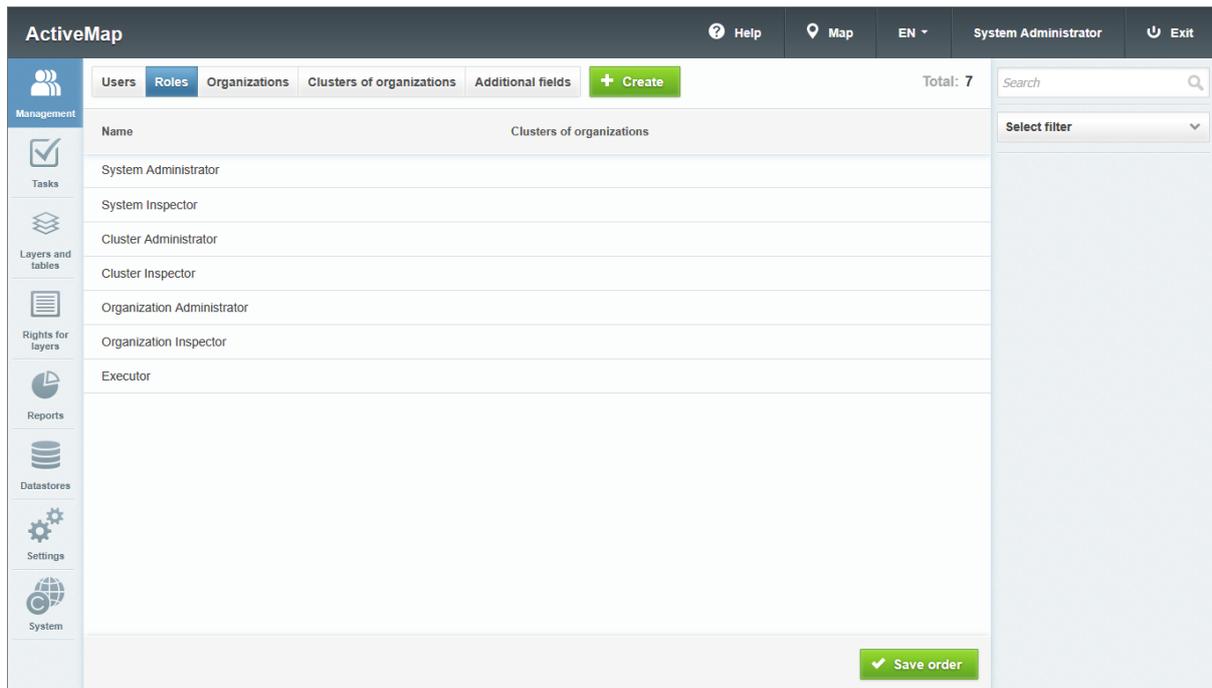
Fig. 2.67: "Roles" tab

There are several preset user roles in the ActiveMap system:

- The **"System Administrator"** is responsible for system configuration and administration. This involves managing clusters, organizations, users of all roles, contracts, layers and tables; granting access rights to layers and reports; managing tasks. Managing includes creating, editing and deleting.

- The **"Cluster Administrator"** is responsible for administering one or more specified clusters. This involves managing organizations and users, layers and tables; granting access rights to layers and reports; managing tasks within the specified clusters. Managing includes creating, editing and deleting.

- The **"Organization Administrator"** is responsible for administering the organization. This involves managing users, layers and tables; granting access rights to layers and reports; managing tasks within the organization. Managing includes creating, editing and deleting.

- The **"System Inspector"** is responsible for managing tasks across all clusters. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.

- The **"Cluster Inspector"** is responsible for managing tasks within one or more specified clusters and can create new layers and tables, as well as edit or delete available ones. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.
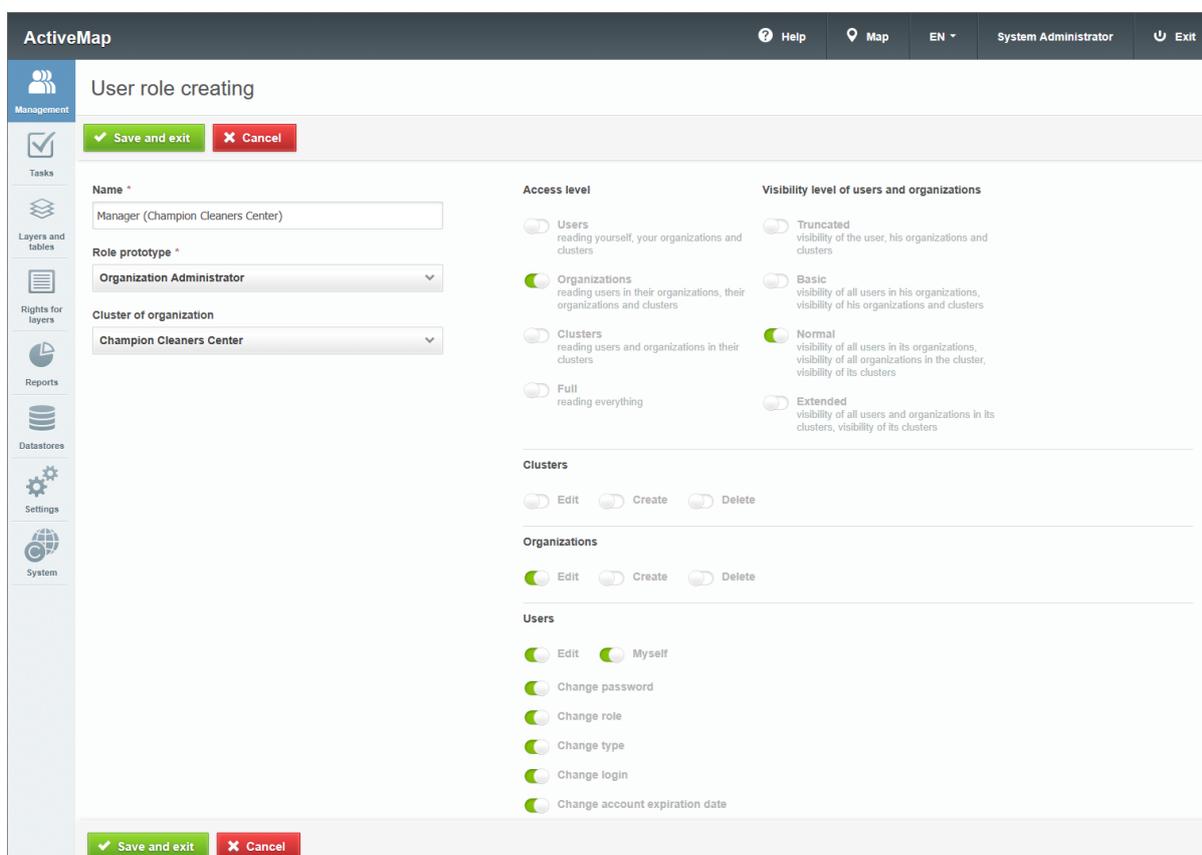
- The **"Organization Inspector"** is responsible for managing tasks

within the organization and can create new layers and tables, as well as edit or delete available ones. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.

- The **"Executor"** is responsible for executing assigned tasks and can create new tasks, layers, and tables, as well as edit or delete available layers and tables.

In addition to using the preset roles, you can create custom ones.

Roles can be either global or cluster-specific. Global roles are visible to all users. Cluster roles are visible to users with the System Administrator and System Inspector roles, as well as to users included in the role cluster. Only the System Administrator can create, edit, and delete global roles. Both the System Administrator and the Administrator of corresponding cluster can manage cluster-specific roles. Users can receive cluster-specific roles only if they belong to the corresponding cluster. Users with cluster roles cannot join any other cluster.

To create a new role, click the ![Create] button and fill in the mandatory fields (Fig. 2.68):

- Name;

- Role prototype ("Organization Administrator" or "Executor").



Fig. 2.68: Creating a new role

The selected prototype determines the list of rights available to the new role. You can see this list in the current window. You cannot edit this rights except for the right to create tasks (Fig. 2.69).
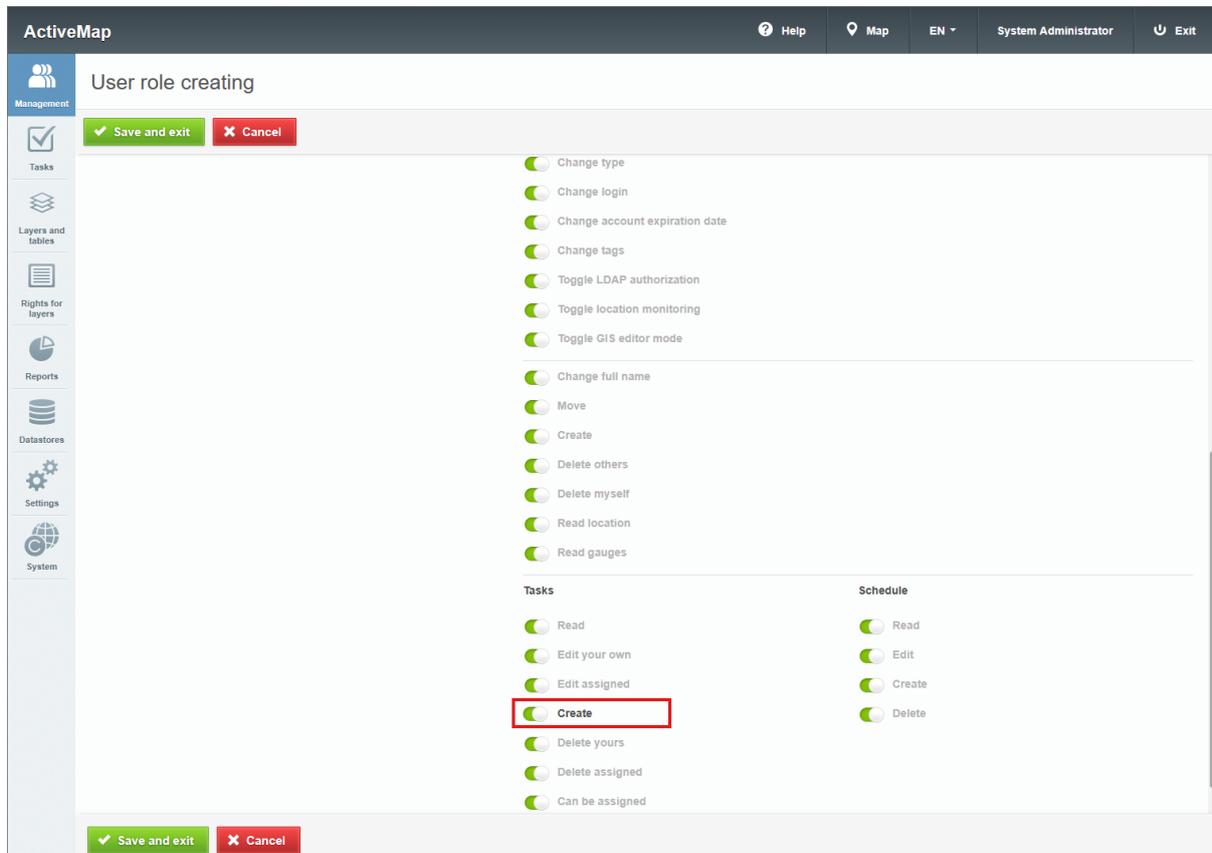


Fig. 2.69: New role creation window, right to create tasks

You can optionally link the role to a cluster from the dropdown list or leave it unlinked. Click ![Save and exit] to complete the creation.

To edit a role, hover over its row and click the role name, or click ![pencil icon]. The role editing window opens (Fig. 2.70).
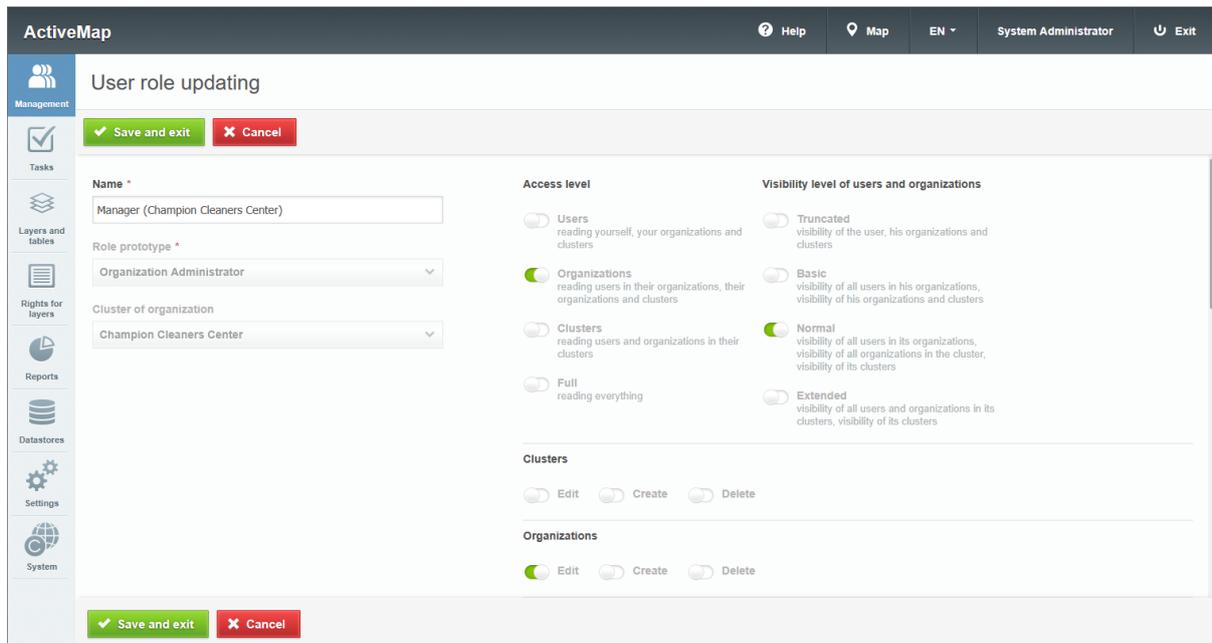
Fig. 2.70: Role editing window

For both preset and custom roles, you can only change the role name and enable or disable the ability to create tasks. After making changes, click the confirmation button ![Save and exit]. Click the ![Cancel] if you do not want to save the changes. To change the order of roles, drag the role row up or down and click ![Save order].

Unlike predefined roles, users can delete custom roles. However, only the System Administrators can delete global custom roles. Both the System Administrator and the Administrator of corresponding cluster can delete cluster-specific roles. Before deleting a role, make sure that no users are assigned to it. If a user still holds the role, the system shows a warning and cancels the deletion.

To delete a custom role, hover over the role row, click the ![trash] button, and confirm the deletion.

When you delete a cluster, the system treats its roles as deleted too. Users with such roles cannot log into the system. The system blocks task assignments to these users, stops tracking their location, and disables push and email notifications. However, it still counts affected users in statistics and displays these roles in the list of roles.

### 2.3.3.1.3 "Organizations" tab

When switching to the "Organizations" tab, you can view a list of all existing organizations in the system and their parameters (Fig. 2.71):

- "Name" – name of the organization (mandatory field).

- "Cluster of the organization" – an association of several organizations for operational monitoring of the work of departments. For more information about the clusters, see *"Clusters of organizations" tab* (page 69).

- "Client organization" – an indication of whether the organization is a client. Client organization is an association of users who send their requests through a mobile application, monitor the status of their execution, have the ability to rate the work done, but have limited rights when working in the system.

- "Users" – number of users in the organization.



Fig. 2.71: "Organizations" tab

### Adding a new organization

To add a new organization to the system, click [+ Create] at the top of the window. A window with fields to fill in (Fig. 2.72) opens in the administration area:

- **Name**;

- **Cluster of organization**;

- **Client Organization** toggle switch;

- **Default implementing organization** – automatically assigned organization (it must belong to the cluster of the creator's organization);

- **Integration with GIS editor by default** (available only for the administrative roles);

  If the System administrator enables this feature for the organization, then all its users created by the Cluster Administrator have integration with the GIS editor by default. If the System administrator adds users, he/she must enable this setting separately for each employee. When activating the integration, the user should enter the password to work in the desktop editor. If integration is not enabled, users are not created in the database and, accordingly, unable to work in the desktop editor. If integration is enabled for the organization, then all users are created for MapEditor and granted rights to layers and tables. If integration is disabled while editing the organization card, all users are removed from the database.

- **Maximum number of users**;

- **E-mail**;

- **Phone**;

- **Legal name**;

- Organization data (address, fax, TIN, VAT-ID, bank account, bank, correspondent account, SWIFT, BIC, name of the head, and name of the accountant);

- **About** (a field to enter information in any form);

- Logo, stamp, signature of the head, and signature of the accountant.

To add a logo, stamp, and signatures, click "+" and select the photo.

Fig. 2.72: Creating organization

In addition to the main fields, the organization creation form may contain custom fields. You can configure them in the "Custom fields" tab of the "Management" block. For more information on configuring custom fields of an organization, see the *"Additional fields" tab* (page 72) section. The custom fields can be either global or local, available within a specific cluster.

To the right of the input fields there is a "Visible area" – the boundaries of the map visible to organization users when they log in. The administrator can use the scale bar to zoom in or out of the map, as well as move the map by pressing the left mouse button. After selecting the necessary view, click "Apply" to save the new map boundaries.

If there are no mandatory fields, it is enough to fill in the name and click the **✔ Save and exit** button to add a new organization to the system. If you leave the remaining fields empty, they are automatically filled with default values (except for e-mail, phone number, legal name, and other organization data). You can manually change the automatically assigned data storage, marked as default in the system, in the database. The visible area and the cluster match the main organization of the Cluster Administrator, or the default value if the organization is created by the System Administrator. This organization is automatically granted access to work types (global and/or local) with activated "For

all organizations" option.

### Importing organizations

The system supports bulk import of organizations from an Excel file.

Clicking ▲ Import opens a window with the following buttons (Fig. 2.73):

- "Upload file" – import an Excel file containing information about organizations with the structure specified in the template.

- "Download template" – export an Excel template with the structure required for correct import.
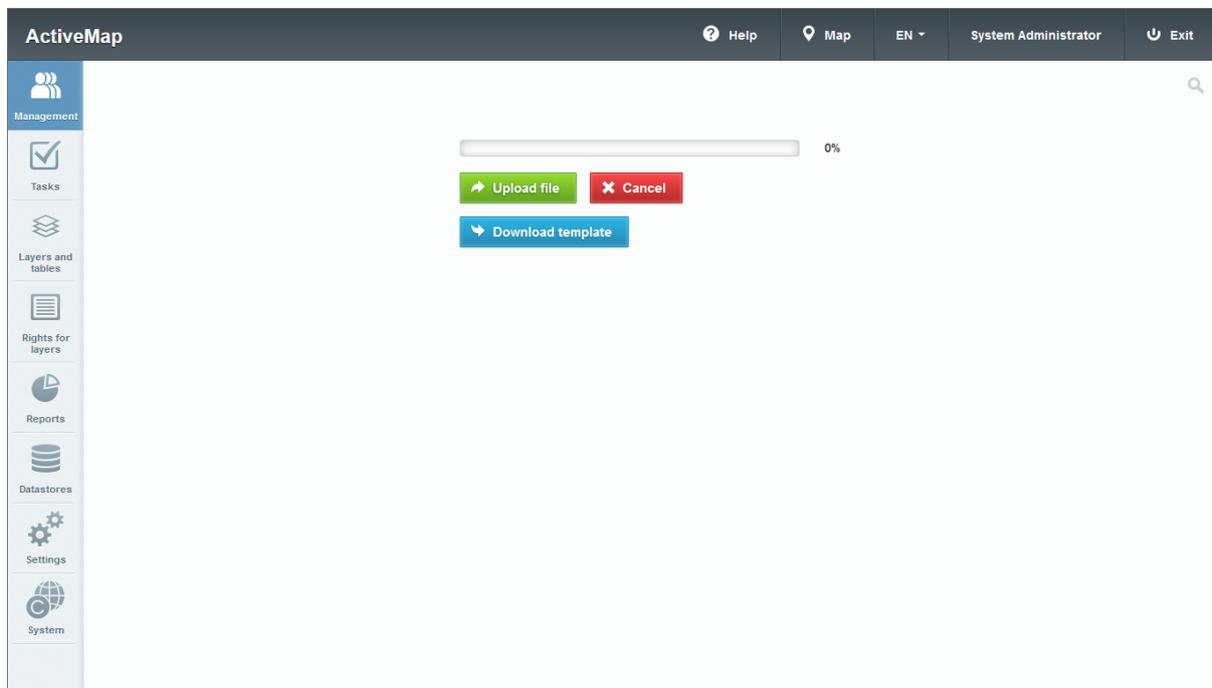
- "Cancel" – exit the import window.



Fig. 2.73: Window for importing organizations

To get a sample file for import, click ➜ Download template . Fill the downloaded file with organization data (Fig. 2.74).

Fig. 2.74: Example of an Excel file with imported organizations

When entering data, letters and other symbols (punctuation marks and special characters) are not allowed in integer fields such as "TIN", "Bank account", etc. After saving and closing the file, return to the import page and click the [Upload file] button. If all data is entered correctly, the new organizations will appear at the end of the general organization list.

## Exporting organizations

To export organization information, click the [Export] button in the lower right corner. A window opens for selecting a directory to save the organizations.xlsx file. This file contains organization information in a table format, including both main and custom fields.

## Editing an organization

Clicking [✎] (or double-clicking the selected organization row) opens a form where you can fill in/change the fields with the information about the organization. You cannot change the cluster after creating the organization.

In this form you can get a link to register users in the mobile application ActiveMap Mobile or copy/delete it if it was generated earlier (Fig. 2.75). If you delete a link when editing an organization, it still works.

Fig. 2.75: Editing an organization

After receiving a link, the employee opens it on a mobile device and registers by the phone number. Thus, an account with the "Executor" role and "Person" type is created in the system, the login is automatically generated based on the entered phone number, monitoring is disabled by default. This user is granted access to the layers for which the "default rights" setting is activated, the layer cluster is not specified, or matching the user's organization cluster.

### Deleting an organization

To delete an organization, click  on the right side of the row. To delete several organizations at once, select the corresponding rows and click  at the bottom of the screen. For more information about deleting system items, see *Deleting an element* (page 42).

When you try to delete your own organization, a dialog box appears, informing that such deletion is not possible.

### Searching for an organization

In the "Organizations" tab, you can use the search bar to search by name and the filter to select client organizations or individual clusters.

#### 2.3.3.1.4 "Clusters of organizations" tab

"Clusters of organizations" tab contains information about the grouping of organizations into clusters and about time zones (Fig. 2.76). Before being set by the administrator, all organizations are located in the "Default" cluster.



Fig. 2.76: "Clusters of organizations" tab

### Adding a new organization cluster

To add a new cluster, click ![+ Create]. A window opens in the administration area where you have to fill in the name of the cluster and select the time zone from the drop-down list (Fig. 2.77). You can use the search bar when selecting a time zone. The time zone is set only when the cluster is created. There is no possibility to change it later.

You can activate "Use your list of steps" setting to make the cluster isolated and create separate steps for it. The setting can only be activated when creating a cluster. You cannot add or disable it later. An isolated cluster does not have access to global steps, so it is necessary to create its own steps, otherwise tasks cannot be created. For more information about creating steps, see *"Steps" tab* (page 86).

After creating a cluster, it becomes available for selection in the organization creation/editing form.



Fig. 2.77: Adding an organization cluster

### Exporting organization clusters

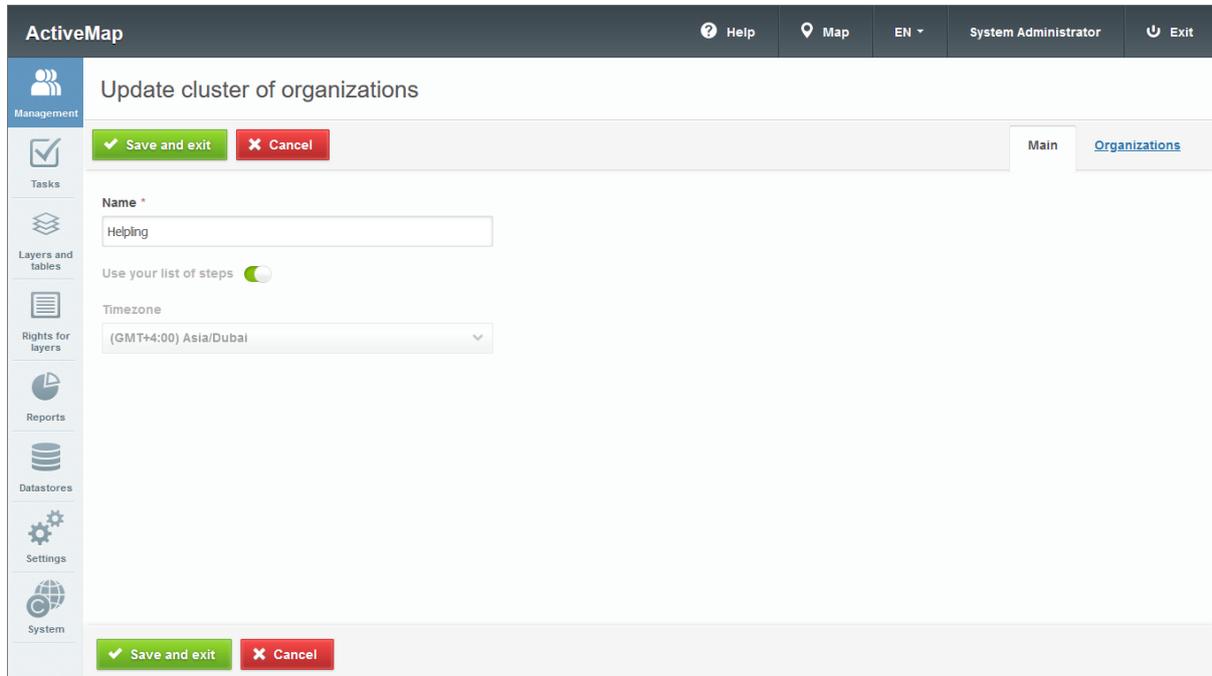To export information about organization clusters, click the
Export button in the lower right corner. A window opens for selecting a directory to save the clusters.xlsx. This file contains cluster information in the form of a table with the following fields:

- Id

- Name

- Default

- Creation date

- Creator

- Time zone

### Editing an organization cluster

In the "Clusters of organizations" tab, you can edit information about

the organizations of the system. Clicking  (or double-clicking on the cluster) opens the "Main" tab, where you can change the name of the organization cluster (Fig. 2.78).



Fig. 2.78: Editing the cluster name

The "Organizations" tab displays a list of cluster organizations (Fig. 2.79). From this list you can go to the organization editing window.
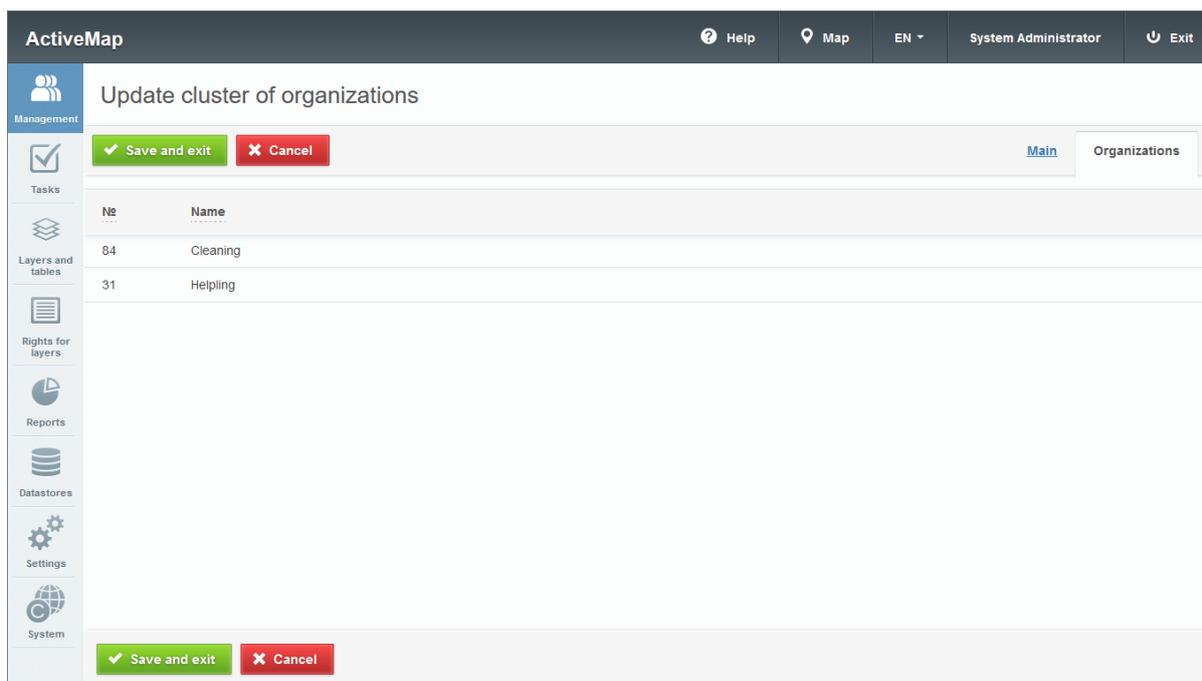
Fig. 2.79: List of cluster organizations

### Deleting organization clusters

To delete one cluster of organizations, click  on the right side of the row. To delete several organization clusters at once, check the corresponding rows and click the  button at the bottom of the screen. For more information on deleting system items, see *Deleting an element* (page 42).

You cannot delete a cluster while there are users in it. You also cannot delete the "Default" organization cluster.

### Searching for organization clusters

In the "Organization clusters" tab, you can use the search bar to find clusters by name.

### 2.3.3.1.5 "Additional fields" tab

The "Additional fields" tab contains a list of custom fields for extended organization descriptions. These fields are used to add user-defined data to the organization creation form. Information about additional fields is presented in the form of a table with the following columns (Fig. 2.80):

- "Name",

- "Type",

- "Cluster of organization",

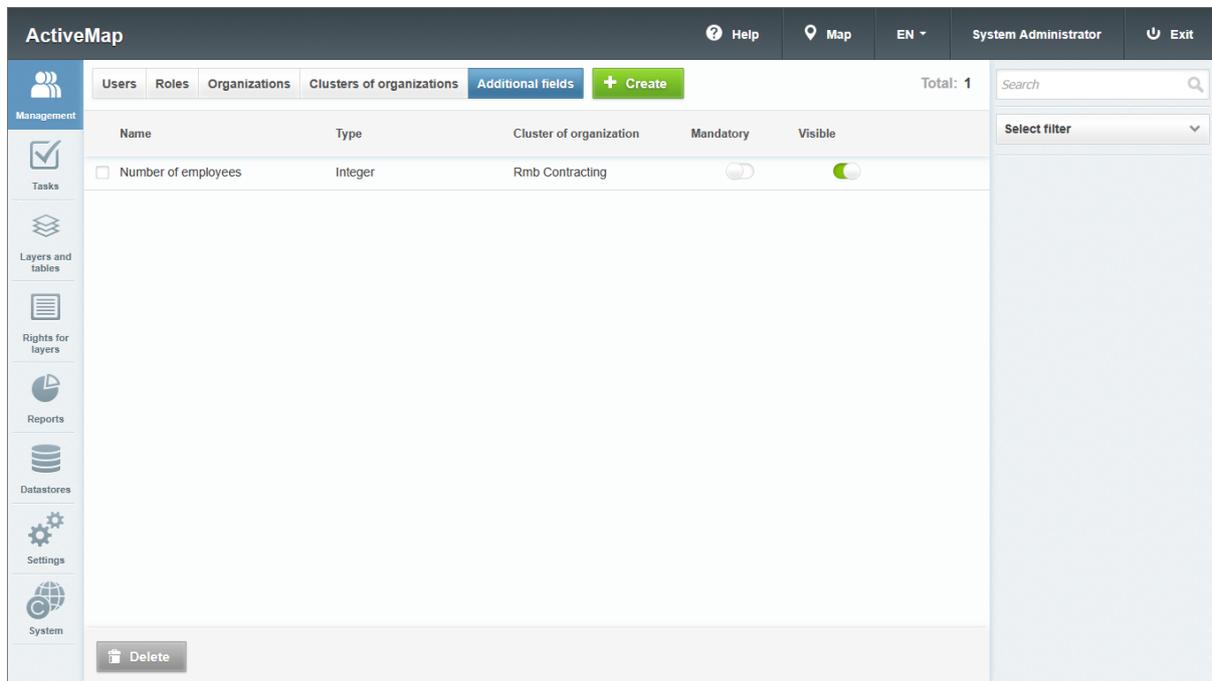- "Mandatory" toggle switch,

- "Visible" toggle switch.



Fig. 2.80: "Additional fields" tab

To display this tab in the interface, enable the "Whether to display additional fields in the Administration section" setting (for more information, see *"Rights for layers" block* (page 151)). Only the System administrator can create, edit, and delete additional organization fields.

## Creating an additional field

To create a new field, click . A window opens in the administration area containing the following fields (Fig. 2.81):

- "Name" (required);

- "Cluster of organization";

- "Field type" (required):

  – String – a short text;

  – Text – an extended text;

  – Integer – an integer;

  – Real number – a real numeric value;

  – Date – date (day-month-year);

  – Condition – a choice from true and false options;

- List – a format with the possibility of specifying a list of options;

- Phone number – a format with the possibility of calling a specified number from the task window;

- Data Objects – links to objects of layers, data tables or reference tables (dictionaries);

- "Default value" – automatically filled field value;

- "Mandatory" toggle switch – toggle switch for mandatory filling of the created field;

- "Visible" toggle switch – toggle switch for visibility of the created field for users (automatically enabled when the "Mandatory" is turned on).



Fig. 2.81: Creating an additional organization field

The list of fields may vary depending on the selected type. After making changes, click . The field will appear in the organization card of the specified cluster.

### Editing additional fields

Click  (or double-click the field name) to open the editing window (Fig. 2.82).

Fig. 2.82: Editing an additional field

In this window, you can change all the parameters except for the organization cluster and field type. Click ![Save and exit] to save changes.

You can also change the mandatory and visibility parameters in the "Additional fields" tab using the toggle switches, without opening the edit window.

### Deleting additional fields

To delete one additional field, click ![trash icon] on the right side of the row. To delete several fields at once, check the corresponding rows and click ![Delete] at the bottom of the screen. For more details on deleting system elements, see the *Deleting an element* (page 42) section.

### Searching for additional fields

In the "Additional fields" tab, you can use the search bar to find fields by name. To search by field type, cluster, or the mandatory or visible status, use the filter located below the search bar.

### 2.3.3.2 "Tasks" block

You can manage task parameters in the "Tasks" block (Fig. 2.83).



Fig. 2.83: "Tasks" block

The following sections are located at the top of the window for management:

- "Types of work"
- "Steps"
- "Priorities"
- "Fields"
- "File Labels"
- "Roles and Rights"
- "Plugins and Webhooks"

Types of work, their groups, steps, priorities, and plugins can be local (associated with a specific cluster) or global (without association). Only the System Administrator can manage global entities. The System Administrator and Cluster Administrator can manage local entities. Local entities are not visible to users outside the specified cluster.

By default, when you go to the "Tasks" block, the "Types of work" tab opens.

#### 2.3.3.2.1 "Types of work" tab

There are two subsections in this tab: "Types of work" and "Work type groups".

Users outside the specified cluster cannot see local types of work. You can associate local types only with organizations within their cluster. If the "For all organizations" toggle is turned on, then they are available to all organizations in that cluster. You can include local types of work only in local groups.

You can associate global type of works with any organization. If the "For all organizations" toggle is turned on, then the types of work are available to all organizations in all clusters of the system. You can include global types of work only in global groups.

Only the System Administrator can manage global entities. The System Administrator and Cluster Administrator can manage local entities. The Cluster Administrator can edit a global types of work only when associating or disassociating organizations within the cluster (when the "for all" mode is not enabled).

#### "Types of work" subsection

This subsection contains a list of existing types of work (Fig. 2.83).

To add a new type of work, click "Create". A window opens with fields to fill in (Fig. 2.92, Fig. 2.93):

- **Name** – name of the type of work.

- **Cluster** – organization cluster to which this type of work is linked. If the cluster is not specified, the type of work is available for all organizations.

- **Type group** – group of works to which this type belongs.

- **Deadline** – time required to complete the task (defined by the task description for this type of work).

- **Deadline setting point** – time from which the deadline is counted:

  - "when creating a task" – at the time the task is created in the system;

  - "when assigning a task" – when the task is assigned to a specific executor.

- **Icon** – task icon, which is displayed in the task list in the ActiveMap Mobile and ActiveMap Desktop applications.

In addition to the main fields, the window contains the following tabs:

1. **Fields**

Use this tab to customize the list of fields displayed in the task card when selecting this type of work. Here you can view, create, and edit fields, as well as configure visibility for user roles (Fig. 2.84).
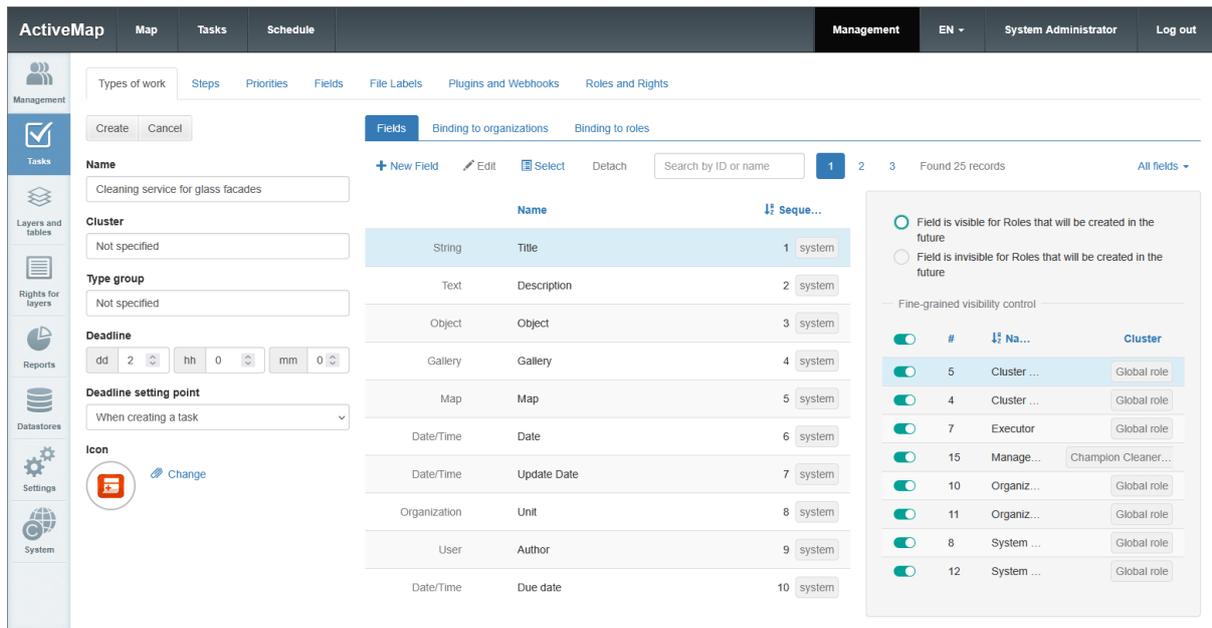
Fig. 2.84: Work type creation window, "Fields" tab

You can adjust the display of fields in the list using the filter. Select one of the following values on the right side of the window: "All fields", "Non-system fields," or "Only system fields" (Fig. 2.85).
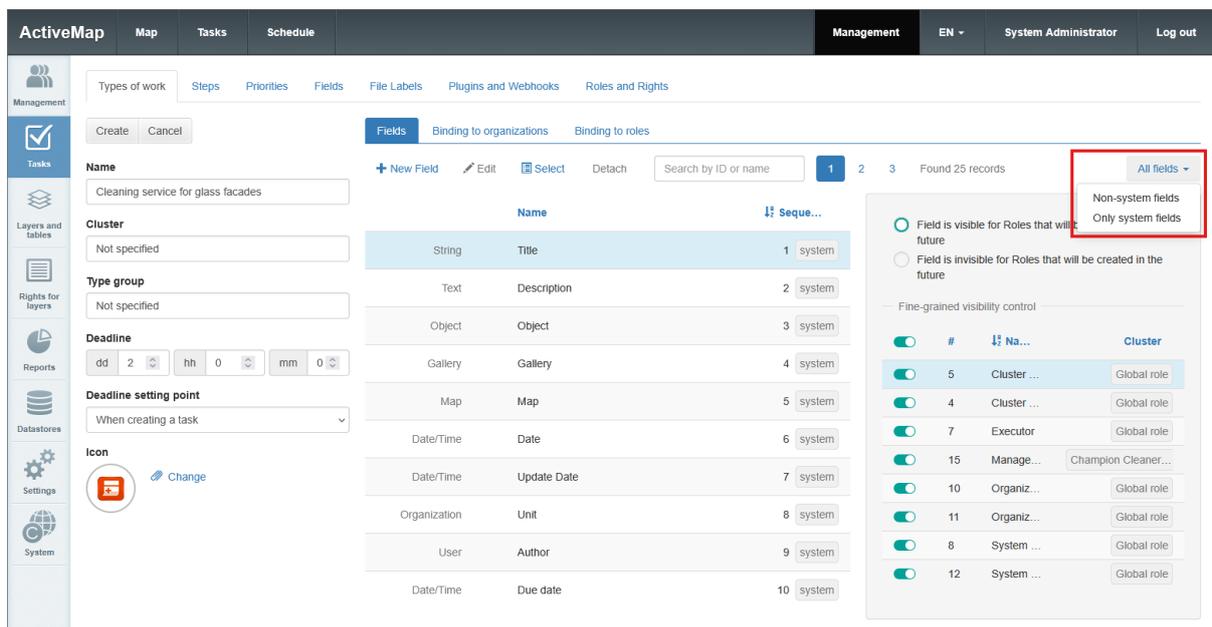


Fig. 2.85: Work type creation window, field filter

By default, the work type creation window displays system fields and custom fields available for all types of work. In this list, you can see the data format (for system and custom fields) and identifier (for custom fields) next to the field name (Fig. 2.86).
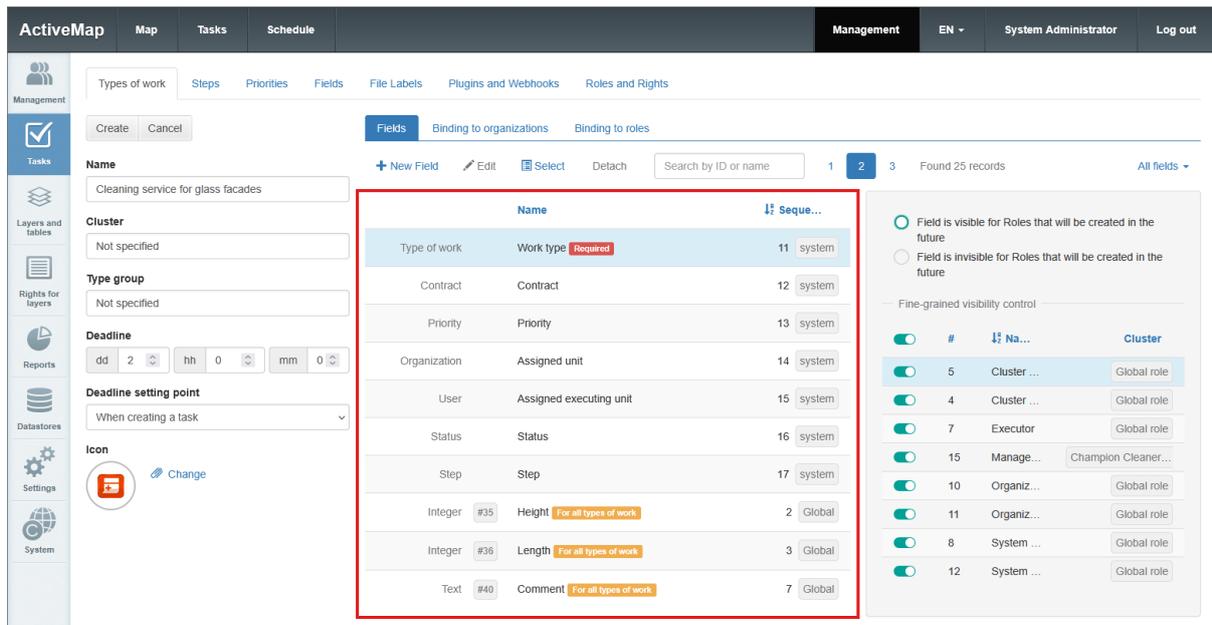
Fig. 2.86: Work type creation window, list of system and custom fields available for all types of work

You can expand this list by creating new fields or selecting previously created fields linked to other types of work. To create a field, click "+ New Field" and fill in the following information in the opened window (Fig. 2.87):
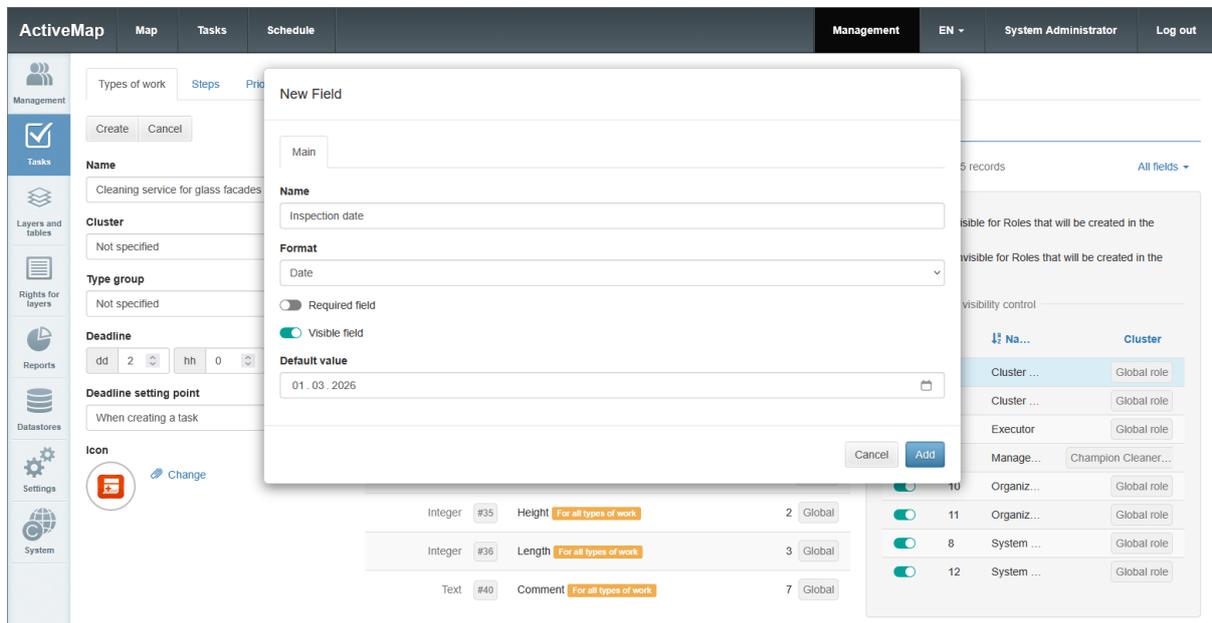


Fig. 2.87: "New Field" window in the work type creation window

- **Name** – name of the field;

- **Format** – data format of the field:

    – String – a short text;

    – Text – an extended text;

- Integer number – an integer;

- Real number – a real numeric value;

- Date and Time – date (day-month-year) and time (hours-minutes);

- Date only – date (day-month-year);

- Logical value – a choice from true and false options;

- Composite – a format that contains one or more nested fields and supports the creation of multiple field instances in a task card;

- Selection from the list – a format with the possibility of specifying a list of options;

- Phone number – a format with the possibility of calling a specified number from the task window;

- Barcode – a numeric decoding of barcode;

- Geometry – a format that contains information about the type of geometry (point, line, polygon) and coordinates of one or several objects;

- Data Objects – links to objects of layers, data tables or reference tables (dictionaries);

- File – a format for adding files.

- Integration – a field equivalent to a text field that is not displayed in the client applications of the system, except for ActiveMap Mobile (without editing rights). An integration field cannot be mandatory.

- **Required field** – toggle switch for mandatory filling of the created field;

- **Visible field** – toggle switch for visibility of the created field for users;

- **Default value** – automatically filled field value;

The list of fields may vary depending on the selected format:

- For fields with the "String", "Text", "Integer number", or "Real number" format you can enter the "Regular expression". It is a pattern string that sets a template for a custom field.

- For text format fields (of "String" and "Text" type) you can specify the minimum and maximum length of the field.

- For composite fields, you must specify the minimum and maximum number of instances the user can add to the task card. A composite field cannot be mandatory. You cannot set a default value for it. You must create nested fields for the composite field in the corresponding tab.

- For fields of the "Selection from the list" format you must specify the possible values.

- For the "File" format, you must specify one or more acceptable types: "Photo", "Video", "Sound", "Signature", "QR-code", or "Any file" (for other file types). By default, the "Photo" type is selected. You can set the minimum and maximum number of attached files, the minimum and maximum size in bytes, and enable automatic application of a default sticker. You cannot set a default field value.

After entering the required information, click "Add" to complete field creation. The created field appears in the list (Fig. 2.88).



Fig. 2.88: Work type creation window, new custom field in the list

You can add fields that were previously created in the system and assigned to other work types to the task card for this type of work. To do this, click "Select". A list of available fields appears in the window that opens. In the "All" tab, find the required fields and enable the toggles next to their names. For convenience, you can use the search bar. After enabling the fields, click "Select" (Fig. 2.89). The selected fields will be displayed in the list.
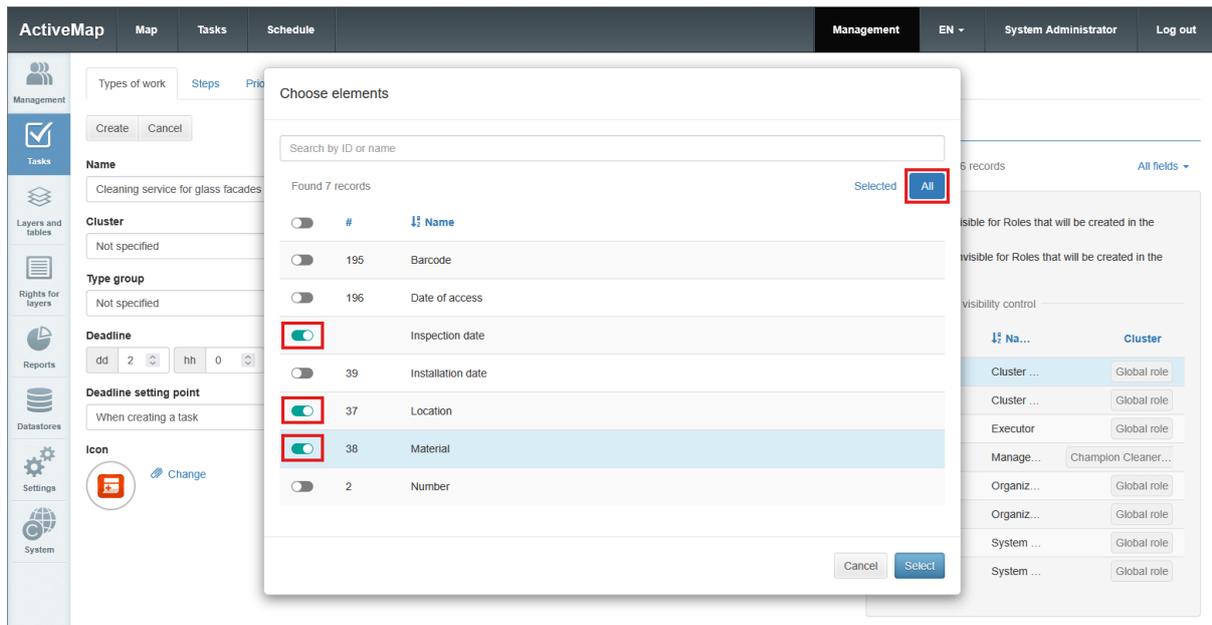
Fig. 2.89: Work type creation window, selecting fields linked to other types of work

You can configure visibility for different user roles for each field in the list. To hide a field for the type of work, select it in the list and then open the visibility settings. For future roles, choose one of the following options:

- Field is visible for roles that will be created in the future (selected by default).

- Field is invisible for roles that will be created in the future.

Set the field visibility for existing roles using the general toggle switch or individually for each role (Fig. 2.90).
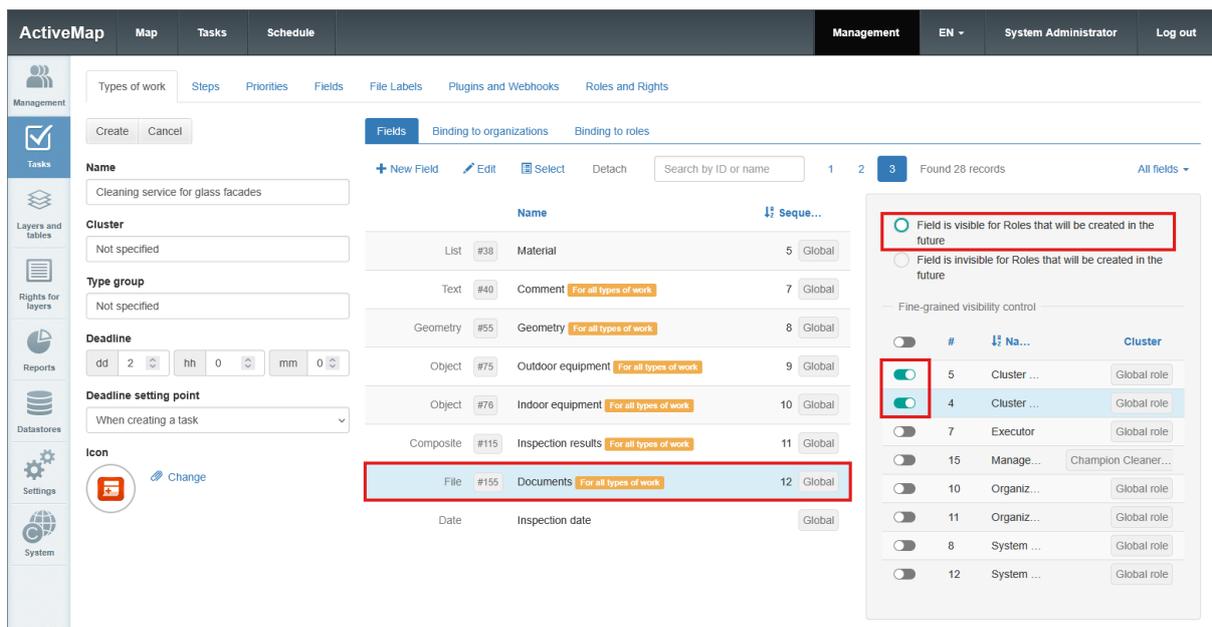


Fig. 2.90: Work type creation window, setting field visibility for roles

Unlike system fields, you can edit and remove custom fields from the task card.

To edit a field, click "Edit", make your changes, and click "Apply" (Fig. 2.91). If the "For all types of work" option is enabled for a field, the changes are applied to all types of work.
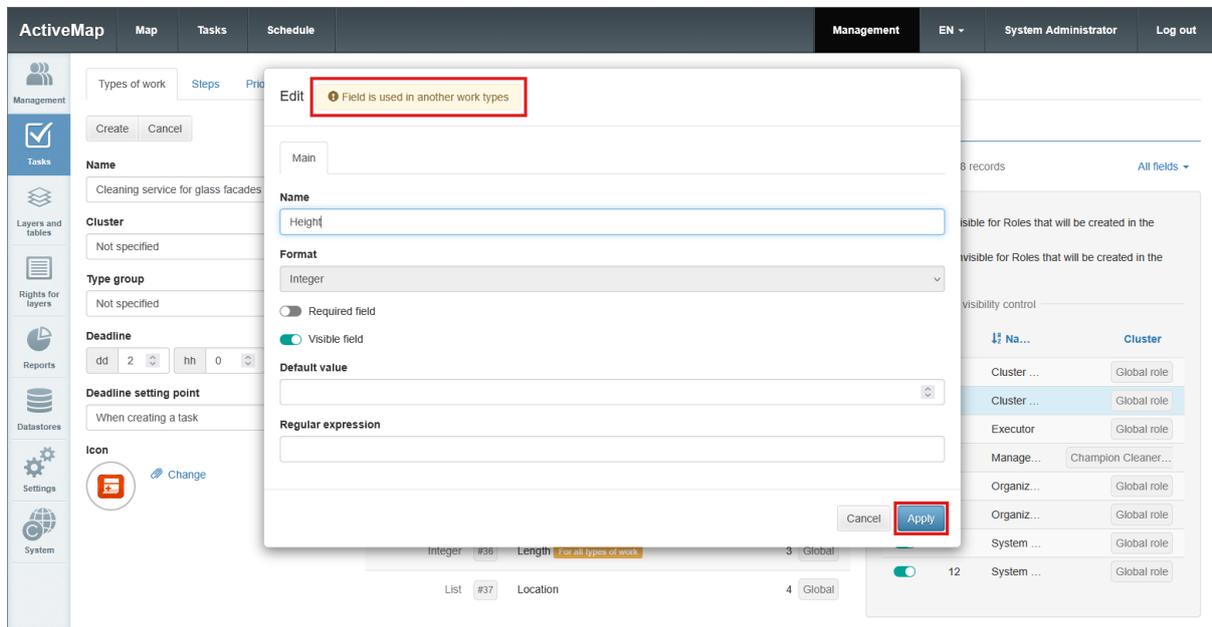


Fig. 2.91: Work type creation window, editing a custom field

To remove a custom field from the list, select it and click "Remove".

2. **Binding to organizations** (Fig. 2.92):

This tab allows you to configure the visibility of the work type for different organizations (Fig. 2.92):

- **For all organizations** toggle switch – makes the type of work available for all organizations in the system (for global types of work) or within the cluster (for local types of work);

- Toggle switches with the names of individual organizations – make the type of work available for the selected organizations.
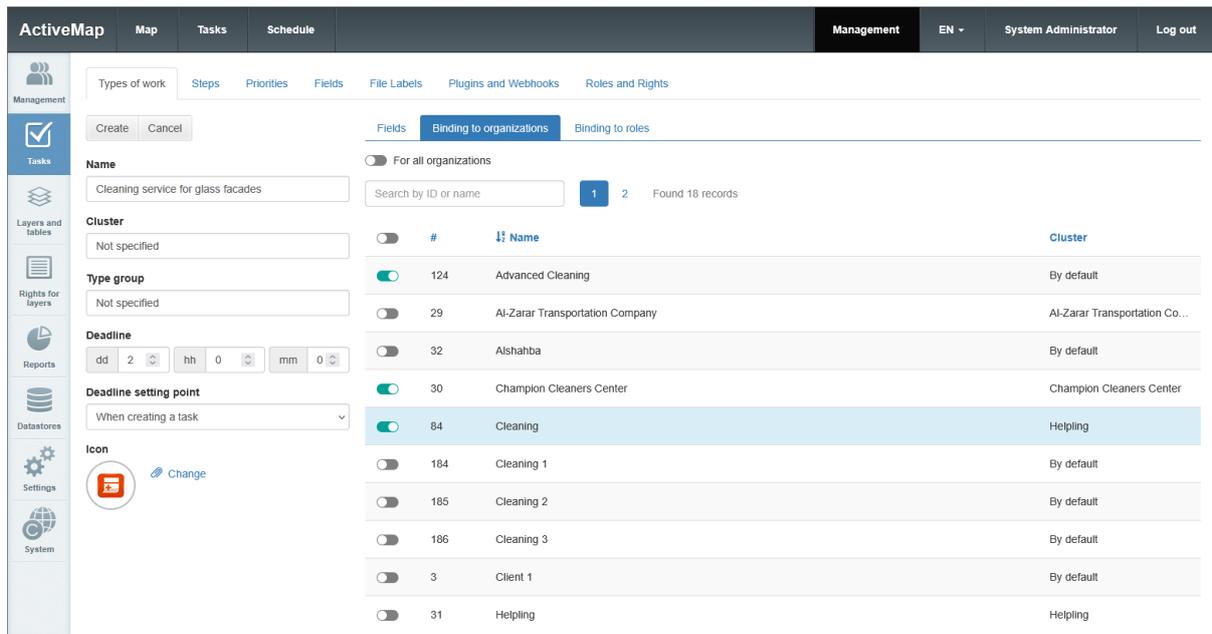
Fig. 2.92: Work type creation window, "Binding to organizations" tab

3. **Binding to roles**

In this tab, you can configure the visibility of work types for different user roles ([Fig. 2.93](#)):

- **For all roles** toggle switch – makes the work type available for all roles in the system (for global types of work) or within the cluster (for local types of work);

- Toggle switches with the names of individual roles – make the type of work available for the selected roles.
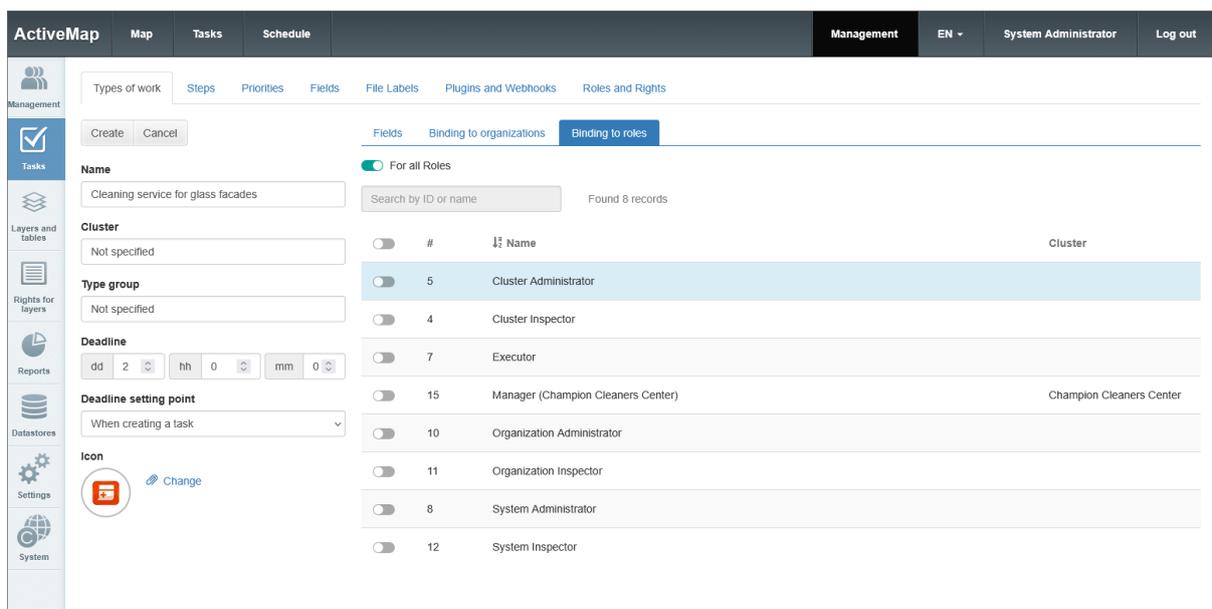


Fig. 2.93: Work type creation window, "Binding to roles" tab

After filling in all the parameters, click the "Create" button to complete

the creation. The created type of work will be displayed in the general list.

To edit a type of work, select the row with the required type and click "Edit". A window similar to creating types of work opens, where you can change the field values and links to organizations and roles.

To delete an existing type of work, select the required type and click "Delete". Confirm the deletion by clicking "Yes" or cancel it by clicking "No" in the dialog window.

### "Work type groups" subsection

The "Work type groups" subsection contains a list of existing groups (Fig. 2.94). Work type groups allow you to visually group objects in the ActiveMap Mobile and ActiveMap Desktop applications.



Fig. 2.94: Work type groups

To add a new work type group, click "Create". A window opens asking you to enter a name for the group. After that, the group becomes available in the corresponding field when creating the work type.

To edit a group of work types, select the group in the list and click "Edit". A window similar to the creation window opens, where you can change the name of the group.

To delete a group of work types, select it in the list and click "Delete".

### 2.3.3.2.2  "Steps" tab

This tab displays a list of existing work steps (Fig. 2.95).



Fig. 2.95: "Steps" tab

Local (cluster-specific) and global (unrestricted) steps of work are distinguished. Steps can be sorted within the group. The System Administrator can sort any group. The Cluster Administrator can sort only local steps in the cluster.

To add a new step, click "Create". A window opens, where you have to fill in the following fields (Fig. 2.96):

- **Name** – name of the work step.

- **Cluster** – belonging to a cluster of organizations. If no cluster is specified, the step is available for all organizations.

- **Color** – color of step displaying in the list of tasks (specified as RGB code).

- **Visible** toggle switch – visibility of the step being created.

- **Default Step** toggle switch – automatically setting at task creation.

- **Step of a closed task** toggle switch – passing to this step means that the task is closed.

Fig. 2.96: Creating a step

To edit an existing step, select it and click "Edit". A new window opens where you can edit the values in the fields mentioned above.

You can set the order of displaying steps in the system. To do this, select the appropriate cluster (if you plan to change the order within an isolated cluster) and click "Change Order". Drag the step to a new position in the list and save the changes.

To delete a step, select it and click "Delete". Confirm the deletion by clicking "Yes" or cancel it by clicking "No" in the dialog box.

Only the System Administrator can create, modify, and delete a global step. The System Administrator and Administrator of the corresponding cluster can create a local step. Administrators can only create a local step within an isolated cluster (when "Use your list of steps" setting is activated). To create a local step, select the corresponding cluster from the drop-down list. A list of local steps of the selected cluster is displayed. When creating a new step, name of the selected cluster is filled in automatically. Then you have to enter a new value and save the changes. The created step is available only within the selected cluster.

If the cluster does not have steps and the first one is created, it is automatically assigned the "default" value. You cannot delete the "default" step. If another step is marked as "default", the mark in the checkbox of the previous step is automatically removed. The first non-"default", non-closing step is considered as the "assigned" step. If there is no such step, the step does not change when you change the executor. If a task is created or edited within an isolated cluster, you can use only the local steps of that cluster. You can use only global steps within a regular cluster. Global steps are not available to an isolated cluster. When creating such a cluster, it is mandatory to create the steps for it, otherwise tasks cannot be created.

### 2.3.3.2.3 "Priorities" tab

This tab displays a list of existing work priorities (Fig. 2.97). Priorities allow you to group the types of work by importance.



Fig. 2.97: "Priorities" tab

To add a new priority, click "Create". Specify the name and, if necessary, the cluster of the new priority. Local priority is available only within the selected cluster. Id and serial number are assigned automatically (Fig. 2.98). You can also upload a custom icon or leave the default one.



Fig. 2.98: Creating a priority

To edit an existing priority, select it and click "Edit". This opens a window where you can change the name of the selected priority. To delete an existing priority, select it and click "Delete". A dialog box opens, where you should confirm the deletion by clicking "Yes" or cancel it by clicking "No".

### 2.3.3.2.4 "Fields" tab

This tab displays a list of task fields (Fig. 2.99).



| # | Name | Format | Default value | For all type... | Required field | Visible field | Fields group | Cluster | Sequence n... |
|---|------|--------|---------------|-----------------|----------------|---------------|--------------|---------|---------------|
|  | Assigned executi... | User |  | ✓ |  | ✓ |  |  | 15 |
|  | Assigned unit | Organization |  | ✓ |  | ✓ |  |  | 14 |
| 195 | Barcode | Bar code |  |  |  | ✓ |  |  | 17 |
| 40 | Comment | Text |  | ✓ |  | ✓ |  |  | 7 |
|  | Contract | Contract |  | ✓ |  | ✓ |  |  | 12 |
|  | Date | Date and Time |  | ✓ |  | ✓ |  |  | 6 |
| 196 | Date of access | Date only |  |  |  | ✓ |  |  | 18 |
|  | Description | Text |  | ✓ |  | ✓ |  |  | 2 |
| 155 | Documents | File |  | ✓ |  | ✓ |  |  | 12 |
|  | Due date | Date and Time |  | ✓ |  | ✓ |  |  | 10 |

Fig. 2.99: "Fields" tab

The fields are divided into two categories: main and custom.

### Main fields

Main fields are global basic fields that are present in the task card by default in all clusters of the system. You cannot delete main fields from the system. You can only hide them in the task form. Main fields include:

- Title,
- Description,
- Map,
- Gallery,
- Step,
- Status,
- Assigned unit,
- Assigned executing unit,

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- Priority,

- Contract,

- Work type,

- Due date,

- Object,

- Author (the user who created the task),

- Unit (the organization who created the task),

- Update Date,

- Date (creation date).

To change the visibility of the main field, select it with a single left-click and click "Edit". In the "Binding to type of work" tab, select the type from the list and go to the "Field visibility management" panel on the right side of the screen. Here you can enable/disable the display of the field for different user roles for the selected type of work using the toggle switches. You cannot change the other characteristics of the main fields. After making changes, click "Save" (Fig. 2.100).



Fig. 2.100: Editing the visibility of the main task field

## Custom fields

Use custom fields to add user-defined fields to the task creation form. You can attach such fields to a certain type of work. For example, for types of work that involve the interaction with a client by a field specialist, you can create a field in the format of "Phone number" to enter the client's phone number.

Custom fields can be local (with binding to a particular cluster) and global (without binding). Only the System Administrator can manage global entities. The System Administrator and Cluster Administrator can manage local entities. There is an exception – the Cluster Administrator can edit a global custom field (if "for all" mode is not enabled), while only attaching or detaching local types of work of this cluster.

You can set the order of displaying custom fields in the system. Fields are sorted only within the group. The System Administrator can sort any groups. The Cluster Administrator can sort only local fields within the cluster. To do this, select a group of fields and click "Change Order" (Fig. 2.101).



Fig. 2.101: Selecting a group of custom fields to reorder

Use  and  to set the order of the custom fields in the task and click "Apply" (Fig. 2.102). The fields are sorted by the "Order" field within the group. If the task has both global and local fields, the global fields are displayed first, and then the local fields in the order specified in the system.

Fig. 2.102: Changing the order of displaying custom fields within a group

The list of custom fields can span multiple pages. Clicking "Change Order" automatically returns the user to the first page, regardless of the current viewing position.

To add a new custom field, click "Create". A window opens with fields to fill in (Fig. 2.103).



Fig. 2.103: Creating a custom field, "Main" and "Binding to type of work" tabs

**"Main" tab:**

- **Name** – name of the field;

- **Cluster** – cluster of organizations;

- **Format** – data format of the field, select one of the following values:

  - String – a short text;

  - Text – an extended text;

  - Integer number – an integer;

  - Real number – a real numeric value;

  - Date and Time – date (day-month-year) and time (hours-minutes);

  - Date only – date (day-month-year);

  - Logical value – a choice from true and false options;

  - Composite – a format that contains one or more nested fields and supports the creation of multiple field instances in a task card;

  - Selection from the list – a format with the possibility of specifying a list of options;

  - Phone number – a format with the possibility of calling a specified number from the task window;

  - Barcode – a numeric decoding of barcode;

  - Geometry – a format that contains information about the type of geometry (point, line, polygon) and coordinates of one or several objects;

  - Data Objects – links to objects of layers, data tables or reference tables (dictionaries);

  - File – a format for adding files.

  - Integration – a field equivalent to a text field that is not displayed in the client applications of the system, except for ActiveMap Mobile (without editing rights). An integration field cannot be mandatory.

- **Required field** – toggle switch for mandatory filling of the created field;

- **Visible field** – toggle switch for visibility of the created field for users;

- **Default value** – automatically filled field value;

- **Fields group** – a set of custom fields.

The list of fields may vary depending on the selected format:

- For fields with the "String", "Text", "Integer number", or "Real number" format you can enter the "Regular expression". It is a pattern string that sets a template for a custom field.

- For text format fields (of "String" and "Text" type) you can specify the minimum and maximum length of the field.

- For composite fields, you must specify the minimum and maximum number of instances the user can add to the task card. A composite field cannot be mandatory. You cannot set a default value for it. You must create nested fields for the composite field in the corresponding tab.

- For fields of the "Selection from the list" format you must specify the possible values.

- For the "File" format, you must specify one or more acceptable types: "Photo", "Video", "Sound", "Signature", "QR-code", or "Any file" (for other file types). By default, the "Photo" type is selected. You can set the minimum and maximum number of attached files, the minimum and maximum size in bytes, and enable automatic application of a default sticker. You cannot set a default field value.

**"Binding to type of work" tab:**

- **For all types of work** toggle switch makes the field available for all types of work in the system (global custom fields) or within a cluster (local custom fields).

- **Field visibility management** panel allows you to configure the field's display for the selected type of work and specified roles. Activating the "Visible by default" toggle makes this field available for all newly created roles.

**"Nested Fields" tab**

This tab appears when you select the "Composite" format. It allows you to create and edit nested fields (Fig. 2.104).
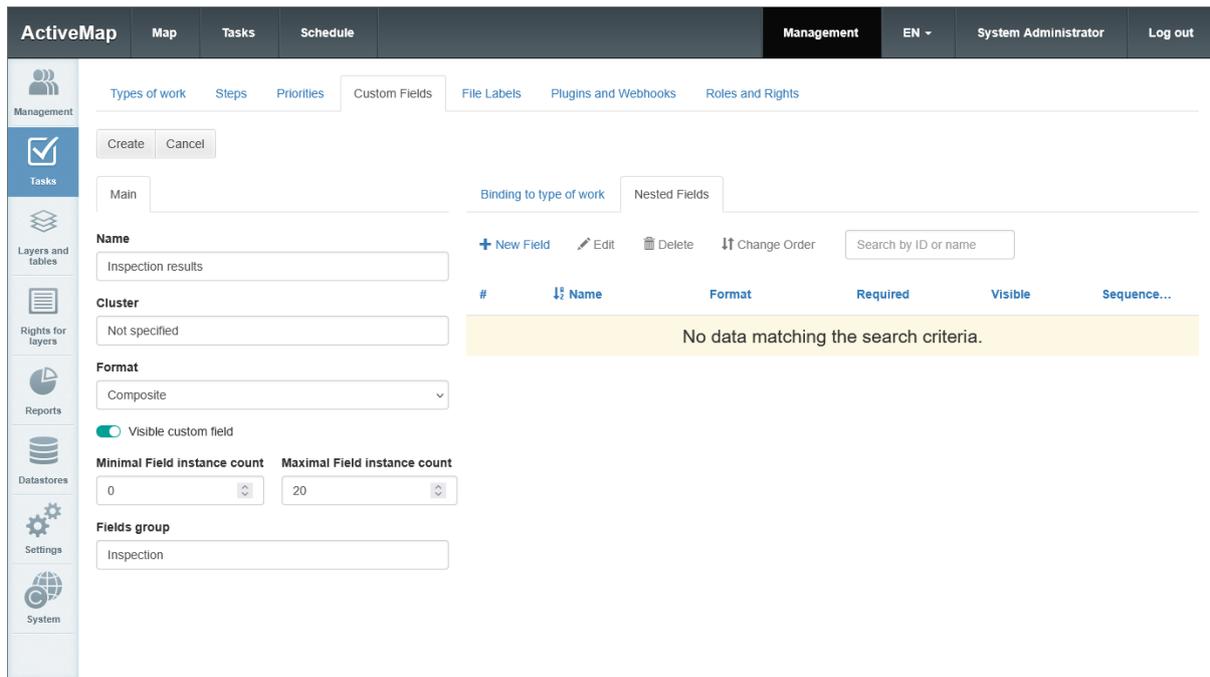
Fig. 2.104: Creating a composite field, "Nested Fields" tab

A composite field can consist of one or more nested fields. You can make a field nested only when creating a composite field. You cannot change the nesting or relink it to another composite field. To add a nested field, click "+ New Field". In the window that opens, fill in the fields (Fig. 2.105):

- **Name** – name of the field.

- **Format** – data format of the field:

    - String – a short text;

    - Text – an extended text;

    - Integer number – an integer;

    - Real number – a real numeric value;

    - Date and Time – date (day-month-year) and time (hours-minutes);

    - Date only – date (day-month-year);

    - Logical value – a choice from true and false options;

    - Composite – a format that contains one or more nested fields and supports the creation of multiple field instances in a task card;

    - Selection from the list – a format with the possibility of specifying a list of options;

    - Phone number – a format with the possibility of calling a specified number from the task window;

    - Barcode – a numeric decoding of barcode;

- Geometry – a format that contains information about the type of geometry (point, line, polygon) and coordinates of one or several objects;

- Data Objects – links to objects of layers, data tables or reference table (dictionaries);

- File – a format for adding files.

- Integration – a field equivalent to a text field that is not displayed in the client applications of the system. An integration field cannot be mandatory.

- **Required field** – toggle switch for mandatory filling of the created field.

- **Visible field** – toggle switch for visibility of the created field for users.

- **Default value** – automatically filled field value.

The list of fields may vary depending on the selected format.



Fig. 2.105: Creating a nested field

You cannot assign nested fields to any group or link to a specific type of work. Nested fields cannot exist in the system without being linked to a composite field. You can sort the nested fields, by specifying the order in which they are displayed in the task card (Fig. 2.106).

Fig. 2.106: Sorting nested fields

**"File Labels" tab**

This tab appears when you select the "File" format. It allows you to set an additional filter for labels (stickers) that can be attached to files in this field (Fig. 2.107). The primary filter links labels to the task type. The "No constraints on stickers for files in this field" toggle switch controls additional filters. If the toggle switch is enabled, there are no additional filters. If it is disabled, only labels activated in the list can be attached to this field. The list displays only the labels available for this field.

If the "Apply sticker automatically if single" toggle switch is enabled and only one label is available for the field (based on the task type and file field sticker restrictions), the server automatically attaches the label (sticker) to new files added to the field.
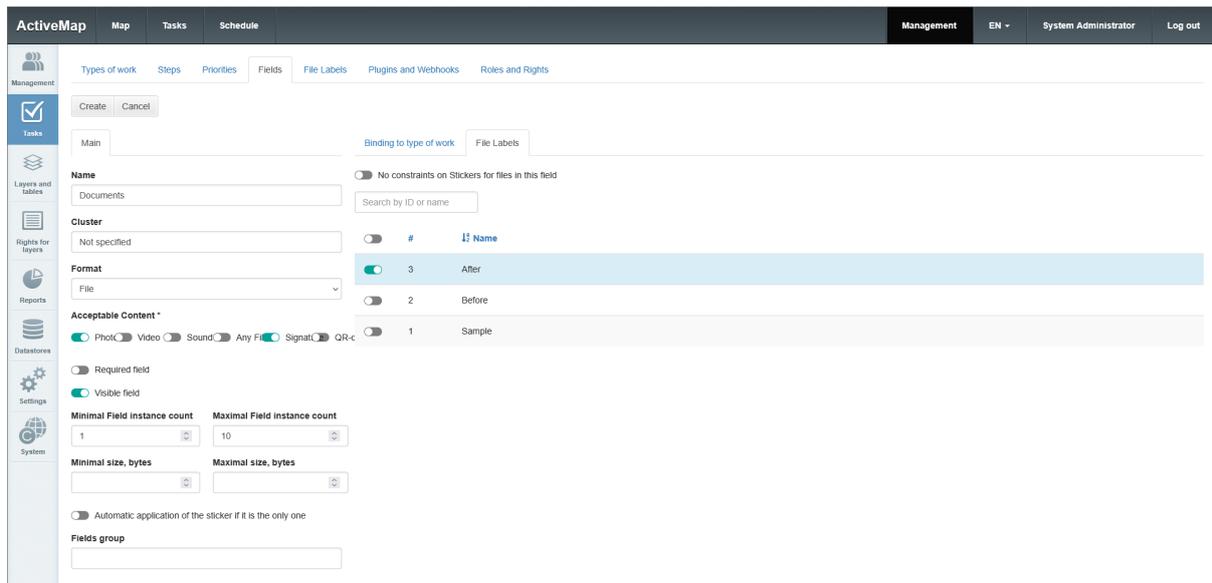
Fig. 2.107: Creating a "File" field, "File Labels" tab

To edit an existing custom field, select it and click "Edit". A window opens where you can change the values of the fields mentioned above. Changing the number of composite field instances (increasing the minimum or decreasing the maximum) does not remove extra field instances in already created tasks but affects newly created ones.

To delete an existing custom field, select it and click "Delete". Confirm or cancel the deletion in the dialog box.

### 2.3.3.2.5 "File Labels" tab

This tab displays a list of existing stickers – file labels (Fig. 2.108). They are used to mark photos when creating and editing tasks. For example, these could be "Before" and "After" labels to indicate photos showing progress in ongoing work.

Fig. 2.108: "File Labels" tab

Stickers can be local (linked to a specific cluster) or global (not linked). Only the System Administrator can manage global entities. The System Administrator and Cluster Administrator can manage local entities. There is an exception – the Cluster Administrator can edit the global sticker (when "for all" mode is not enabled), while only attaching or detaching local types of work of the cluster.

To add a new label, click "Create". A window opens with fields to fill in (Fig. 2.109):

"Main" tab:

- **Name** – name of the label,

- **Description** – brief description of the label.

"Binding to types of work" tab:

- **For all types of work** toggle switch – makes sticker available for all types of work in the system (global sticker) or within the cluster (local sticker).

- Toggle switches with the names of individual organizations – make the sticker available for selected types of work.
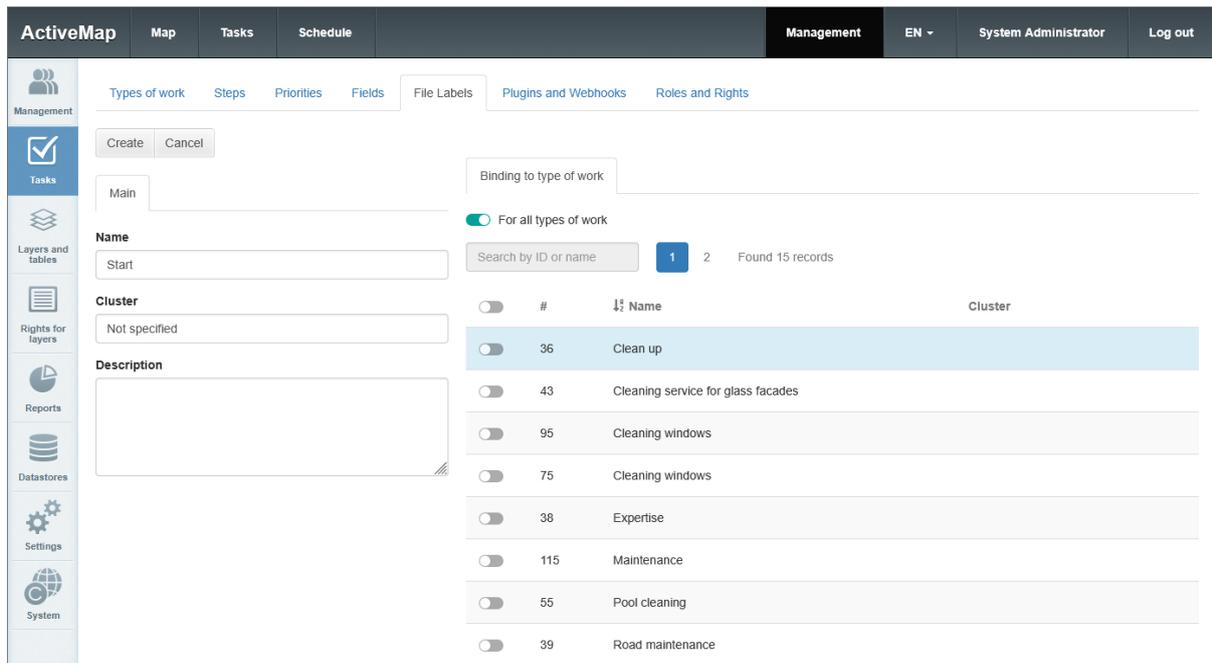
Fig. 2.109: Creating a label for files

To edit an existing label, select it and click "Edit". A window opens where you can change the values of the fields mentioned above. To delete an existing label, select the row of the desired label and click "Delete". In the dialog box that appears, confirm deletion by clicking "Yes" or cancel it by clicking "No".

### 2.3.3.2.6 "Plugins and Webhooks" tab

This tab displays existing plugins and webhook destination servers (Fig. 2.110). Plugins are scripts written in Python. They are used to automate actions with tasks, comments, and users and further adapt the system to operating peculiarities, e.g., for automatic:

- Creation of new tasks after the occurrence of certain conditions in the performed task;

- Transferring tasks to another status or step when attaching a certain number of files or filling in the specified fields;

- Adding a comment on any change in the task;

- Attaching files to the task and stickers to files;

- Setting the main photo of the task;

- Assigning a task when creating a new user.

Fig. 2.110: "Plugins and Webhooks" tab

Scripts and webhook destination servers can be local (bound to a specific cluster) and global (unbound). You can specify a cluster when creating a script/destination server but cannot change or delete it from the script/destination server. If the script is local, you can specify only a global server or a local server of the same cluster. If the script is global, you can specify any script. Priorities and types of work can be specified both local in relation to its cluster and global. Local scripts are applied to tasks and comments only in their own cluster. Only System Administrator can create, edit, and delete global and local scripts.

### "Plugins and Webhooks" subsection

To add a new plugin, go to the corresponding subsection and click "Create". The plugin creation window opens (Fig. 2.111).
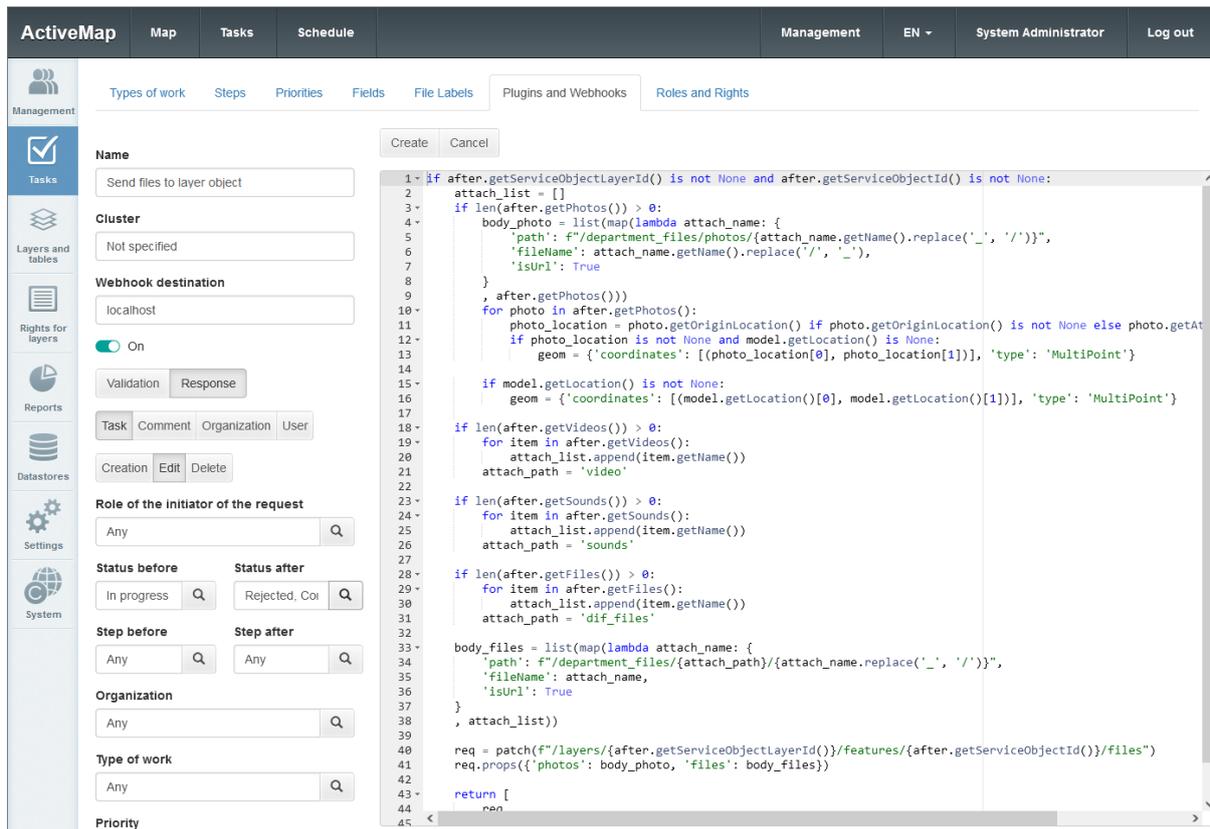
Fig. 2.111: Plugin creation

In the left part of the opened window, configure the parameters: fill in the "Name" and "Description" fields, specify the cluster if necessary, switch the "Enabled" toggle to the desired position.

Select the values of the following fields:

- **Type** – type of plugin (validation or reaction).

Validation is performed before saving, reaction – after saving the task in the database.

Validation allows checking the correctness of a task when creating/editing it, performing certain actions when creating/editing/deleting users. The validator plugin should return one of three possible values:

- *valid()* – everything is correct, you can save it.

- *invalid()* – error, you cannot save it.

- *invalid(String error)* – error, you cannot save it, show the given error message.

Reaction allows you to send a request for another operation on the same task or several such requests in response to a successful operation on the task. For example, in response to attaching new files to a task, send a request to change the custom field in the same task that stores the number of files. The request is executed in a separate thread from the reaction. In reaction you can specify the user on behalf of whom the request to create/edit the task is executed. If the reaction has an attached

server and generates a relative request, the request is sent to the attached server (the request is ignored if the server is turned off or removed).

Webhooks are the special kind of reaction. This is an automated launch of http requests in response to operations on entities (tasks or comments). Unlike regular reactions, you can write webhooks both for tasks and comments. For webhooks on tasks, operations for creating/editing/deleting tasks are available. Only the operation of creating a comment is available for webhooks on comments. To send a request, the reaction should return the result of executing one of the special functions:

- *return post(url)*

- *return patch(url)*

- *return put(url)*

- *return delete(url)*

- *return get(url)*

- **Model** – the entity on which the operation is performed (task, comment, organization, or user).

- **Operation** – the operation that triggers the plugin (creation/editing/deletion for tasks, creation for comments).

Depending on the selected type, model, and type of operation, the following fields are displayed:

Validation when creating/deleting a task:

- **Subject Role** – user roles that can use the plugin;

- **Organization** – task-creating organizations that have access to the plugin;

- **Type of work** – types of work for which the plugin works;

- **Priority** – priorities for which the plugin works.

Validation when editing a task:

- **Subject Role** – user roles that can use the plugin;

- **Status before** – task statuses for which the plugin works;

- **Status after** – the status to which tasks are transferred after the plugin is triggered;

- **Step before** – steps of task execution for which the plugin works;

- **Step after** – the step to which tasks are transferred after the plugin is triggered;

- **Organization** – task-creating organizations that have access to the plugin;

- **Type of work** – types of work for which the plugin works;

- **Priority** – priorities for which the plugin works.

Validation when creating a comment:

- **Subject Role** – users with which role can use the plugin.

In all of the above fields, you can select multiple values. "Destination server" can be added to this list of fields – the address of the server to which relative requests are sent.

The field on the right should be filled with a Python script. Roles, statuses, before/after steps, organizations, types of work, and priorities can be specified directly in the script in more complex combinations than can be enabled by turning toggles in the left part of the window. If these field values are mentioned in the script, default values ("any") can be left for them in the left part.

You can see script examples in the *Plugin script examples* (page 348) section.

After filling in all the required fields, click "Create". The created plugin appears in the general list of plugins. If necessary, you can edit or delete each plugin in the list.

### "Webhook destinations" subsection

Destination servers are needed for grouping webhooks and for the fast change of the destination server. For example, if you have 5-10 webhooks and their API entry point has changed, you have to change only the destination server address. If the reaction has an attached server and generates a relative request, the request is sent to the attached server (the request is ignored if the server is turned off or removed).

To add a new server, go to the appropriate subsection and click "Create". In the window that opens, fill in the "Name", "Cluster" (if necessary), and "URL" fields, switch the "Enabled" toggle to the desired position (Fig. 2.112).

Fig. 2.112: Creating a destination server

The created server appears in the general list of webhook destination servers (Fig. 2.113). If necessary, you can edit or delete the server data in the list (except for the cluster). You can set the cluster when the destination server is created, but you cannot change or delete it.



Fig. 2.113: List of webhook destination servers

### 2.3.3.2.7 "Roles and Rights" tab

This section allows you to view the permissions of users with different roles (Fig. 2.114). For a detailed description of the possible roles, see *"Roles" tab* (page 58).



Fig. 2.114: "Roles and Rights" tab

To view the rights of a specific role, select it in the "Role" window. The list on the right side of the screen displays the permissions for that role. To view roles that have a specific permission, select them in the "Privilege" window. The result is displayed in the list on the right side of the screen. "Clear Filter" button resets the role and permission selection. As a result, all roles and all rights are displayed in the list.

### 2.3.3.3 "Layers and tables" block

The "Layers and tables" block is intended for working with cartographic layers of the system, tables, and their groups. If you switch to the "Layers", "Groups", "Tables", or "Icons" tabs, you get access to the following controls: sorting of tables, search bar, adding new records, editing records, deleting records, and exporting data (Fig. 2.115).

Fig. 2.115: "Layers" block

### 2.3.3.3.1 "Layers" tab

In the "Layers" tab you can view detailed information about the system layers, create, or load new layers. A layer is a visual representation of a set of geographic data on any digital map.

When you switch to the "Layers" tab in the administration window, a table with the following columns becomes available (Fig. 2.115):

- "Type" – geometry type (point, line, polygon, or raster) that determines how the layer object appears on the map;

- "Name" – name of the layer in the interface;

- "System name" – name of the layer in the database;

- "Group" – belonging to a certain group of the system;

- "Cluster of organizations" – an association of several organizations for operational monitoring of the work of departments (for more information about clusters, see *"Clusters of organizations" tab* (page 69)).

In the "Layers" tab you can use search strings and filters (by group, data store, geometry type, belonging to raster layers, by object and cluster), tools for creating new layers, and editing/deleting the existing ones.

### Creating a new layer

To create a new layer in the system, click ![Create]. The layer creation window opens, containing the following tabs:

- "Main"

- "Attributes"

- "Tasks' objects"

- "Default rights"

Additionally, there may be a "Metadata" tab.

**"Main" tab**

The first tab that opens is the "Main" tab, where you have to fill in the following fields (Fig. 2.116):

- **Layer cluster** – belonging to the cluster of organizations. Cluster selection is available when creating a layer as a System Administrator. When creating a layer as an Cluster Administrator, affiliation with the cluster is automatically determined.

- **Name** – name of the layer in the interface.

- **System name** – name of the layer in the database. It should consist of letters from the Latin alphabet, without spaces or special characters. It is generated automatically when entering information in the "Name" field. If a non-Latin script title is entered in the "Name" field, transliteration is used. If you are not satisfied with the received name, you can enter your own version in this field. Automatic input does not work if you first fill in the "System name" and then the usual "Name". Unlike the name, you cannot edit the system name after the layer has been created.

- **Group** – group of layers in which the layer is displayed.

- **Datastore** – database in which the layer is stored.

- **Geometry type** – point, line, or polygon.

- **Layer protocol**:

  - WMS – providing information in the form of a geographically referenced images;

  - WFS – providing information in the form of geospatial data.

- **Projection** – code of one of the common geographic projections.

- **Use for search** – indexing the layer to search for its objects.

- **Turn on history for objects** – logging the history of data changes.

- **Style** – description of the layer display properties on the screen (color, size, transparency, and other properties of the layer objects and their labels).

- **Can edit the style** – the ability to switch between styles of different complexity (basic, simple, and advanced) during further layer editing.



Fig. 2.116: Creating a layer

When creating and editing a layer, you can select one of the following styles:

- **Basic** – default style (point, line, or polygon).

- **Simple** – style, where you can select an attribute for the caption and set its color, background, transparency and size (Fig. 2.117).

Fig. 2.117: Simple layer style

If you select the simple style and the point geometry type, you can set the form of displaying points for each object (circle, triangle, or square) or choose a style with an icon. You can set the background color and icon size and outline the shape. If you use the style with icon, you should select one of the icons from the drop-down list and specify its size. The system also supports loading your own icons (more details in *"Icons" tab* (page 142)).

If you select the line as the geometry type, you can set the background color and line thickness. To set a color for the stroke, select the appropriate stroke option.

If you select polygon as the geometry type, you can set not only the colors and sizes for the stroke, but also the background transparency.

- **Advanced** – a style generated using the GeoCSS language with support for filters and a legend. When you select this style, a separate form with a code (Fig. 2.118) appears to the right of the input fields. See *Attachment 2. Examples of advanced layer styles*

(page 349) for examples of extended styles. For more details on the rules for creating geocss styles, see https://docs.geoserver.org/stable/en/user/styling/workshop/css/css.html.
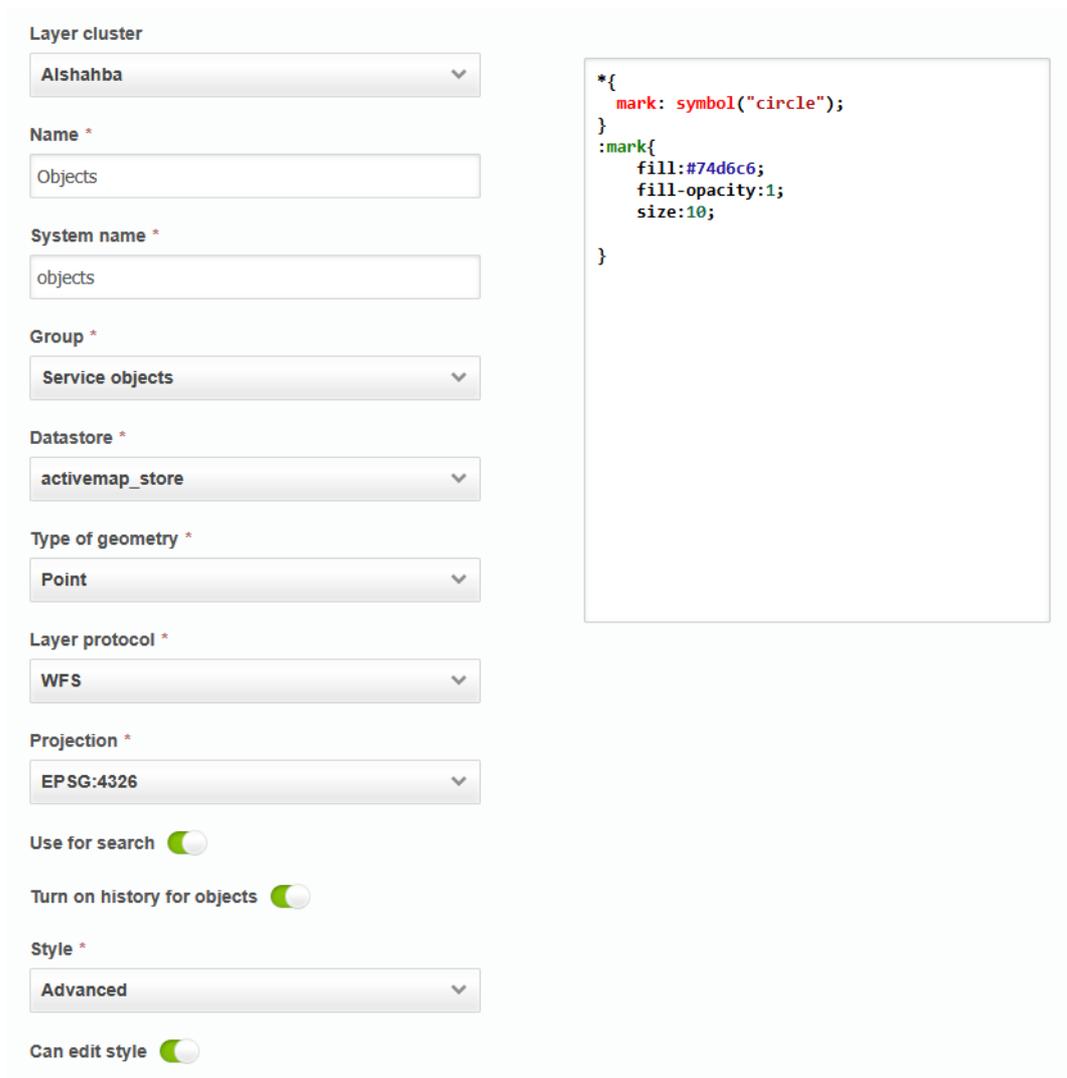


Fig. 2.118: Advanced layer style

**"Attributes" tab**

To add new attributes, fill in the "Name" and "Type" fields and click  (Fig. 2.119).

Fig. 2.119: Adding layer attribute data

The following types of attribute fields are supported:

- String – a text field;

- Integer – an integer field;

- Big integer – a numeric type that makes it possible to work with integers of arbitrary length;

- Boolean – a choice of true and false;

- Float – a field with a real numeric value;

- Date – selection of date from the calendar (day-month-year);

- Date and time – selection of date (day-month-year) and time (hours-minutes);

- Dictionary – selection from a list of values from the specified reference table (dictionary);

- Data table – selection from a list of values from the specified data table;

- Layers – selection from a list of objects from the specified layer;

- Cluster connection – single cluster selection from the list of available ones;

- Cluster connection (array) – multiple cluster selection from the list of available ones;

- Organization connection – single organization selection from the list of available ones;

- Organization connection (array) – multiple organization selection from the list of available ones;

- User connection – single user selection from the list of available ones;

- User connection (array) – multiple user selection from the list of available ones;

- User role connection (array) – multiple user role selection from the list of available ones;

- Work type connection – single work type selection from the list of available ones;

- Work type connection (array) – multiple work type selection from the list of available ones;

- Priority connection – single priority selection from the list of available ones;

- Priority connection (array) – multiple priority selection from the list of available ones;

- RFID tag – a text field for storing information obtained by scanning the tag in the ActiveMap Mobile Android mobile application.

After creating an attribute, a table with the name, system name, and attribute type opens in the administration area. The system name is automatically assigned to the attribute based on transliteration of the entered name or based on the type for the following attribute types:

- Cluster connection – sys_clr_id

- Cluster connection (array) – sys_clr_ids

- Organization connection – sys_org_id

- Organization connection (array) – sys_org_ids

- User connection – sys_usr_id

- User connection (array) – sys_usr_ids

- User role connection (array) – sys_role_ids

- Work type connection – sys_typ_id

- Work type connection (array) – sys_typ_ids

- Priority connection – sys_prt_id

- Priority connection (array) – sys_prt_ids

If there are several fields in a layer with one of the specified types, then {current date} is automatically added at the end of the system attribute name.

New attribute appears in the first line of the table (Fig. 2.119). The following actions are available to the administrator:

- changing the attribute's name;

- defining additional parameters of the attribute:

– "Title" – clicking on the line makes an attribute the title or part of the title of the object's card displayed when you click on the object on the map.

– "Subtitle" – clicking on the line makes an attribute the subtitle or part of the subtitle of the object's card displayed when you click on the object on the map.

– "For search" – toggle switch to use an attribute for search.

– "Show" – toggle switch for showing attribute for users.

– "Edit" – toggle switch for attribute editing availability.

You can configure the availability of an attribute for viewing and editing globally for all roles using the toggle, or individually by clicking the "Settings for roles" line. A window opens where you can enable or disable the visibility or editability of the attribute for future and existing roles. You can filter existing roles by cluster, prototype, and role name. Enable or disable all filtered roles, or select the required roles manually and click **OK** to save the settings (Fig. 2.120).
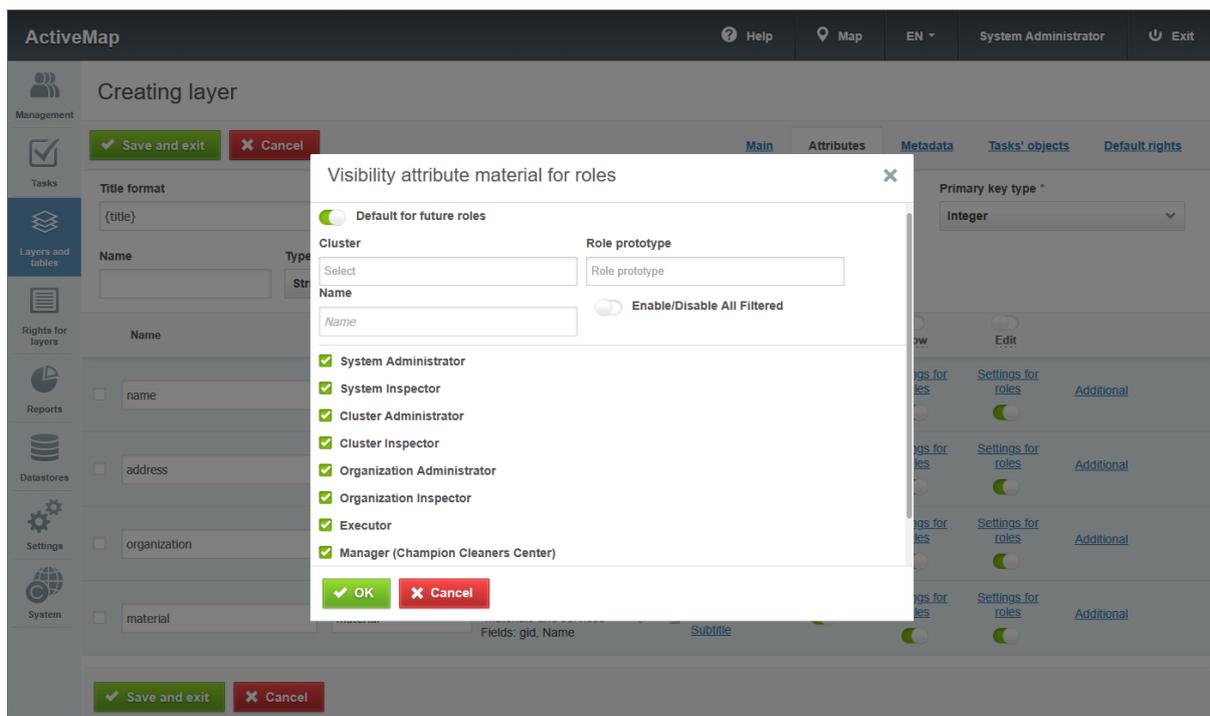


Fig. 2.120: Configuring attribute visibility for individual roles

If an attribute forms part of the title, you cannot hide it. System administrators and inspectors can view all attributes unless the display of an attribute is globally disabled. If an attribute is not visible to a particular role, the system excludes it from data queries and searches. However, if a role does not have rights to view an attribute but has rights to edit it, the attribute becomes available only when creating or editing an object and does not appear in the list.

To see two more parameters, click "Additional" (Fig. 2.121):

- "HTML escape" – toggle switch to interpret the attribute as HTML content (expands the possibilities of filling in attribute fields, for example, their content can be a link or a formatted text).

- "View in pop-up window" – toggle switch to display the attribute in the object's card that is displayed when you click on the object on the map.
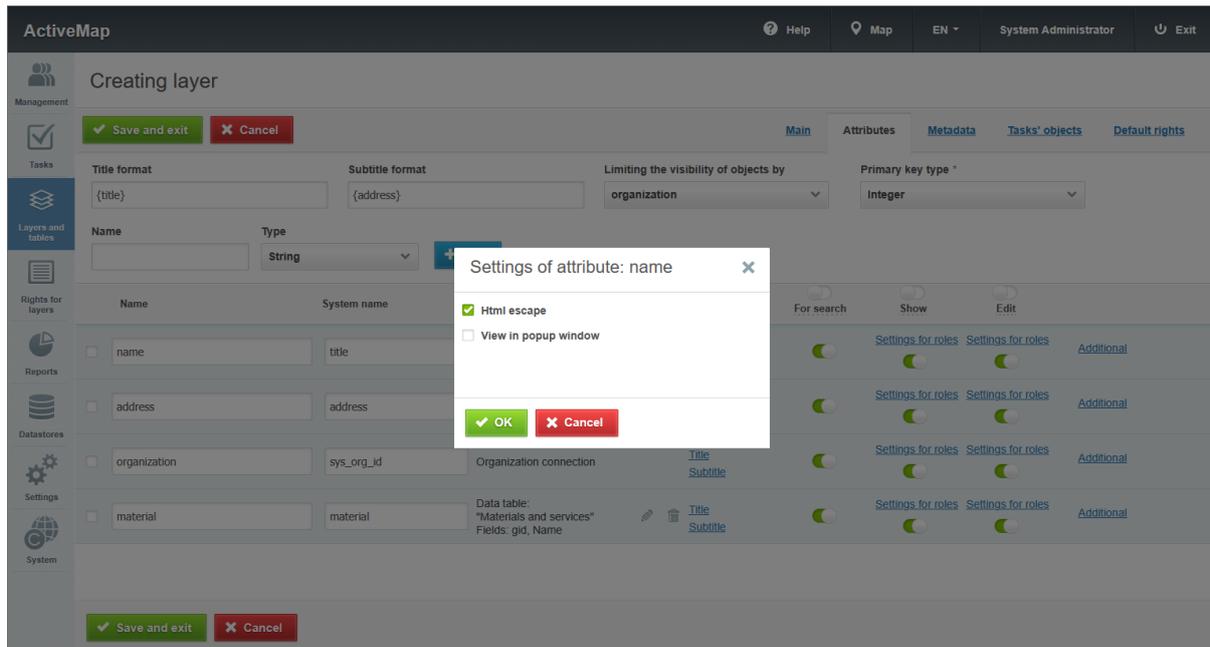


Fig. 2.121: Additional attribute parameters

To add the next attribute, fill in the form with fields again and click

.

You can change the availability of all layer attributes for searching, viewing, and editing at once using the "For search", "Show", and "Edit" toggles in the table header.

To facilitate the process of filling the created attribute fields and to filter objects on the map by attribute values, you can set the link to a reference table, to a data table, or other thematic layers. To do this, create a table in the "Tables" tab of the "Layers" block (*"Tables" tab* (page 132)) and select "Reference table (dictionary)" or "Data Table" as the field type of the current layer. To link to a thematic layer, select the "Layers" type and select the thematic layer. A drop-down list with the names of available tables appears to the right of the field type. After selecting a particular table, specify the "Value Field" with "integer" data type (the source field for the link) and the "Name Field" with "String" data type (the field that stores the names of the elements) (Fig. 2.122).
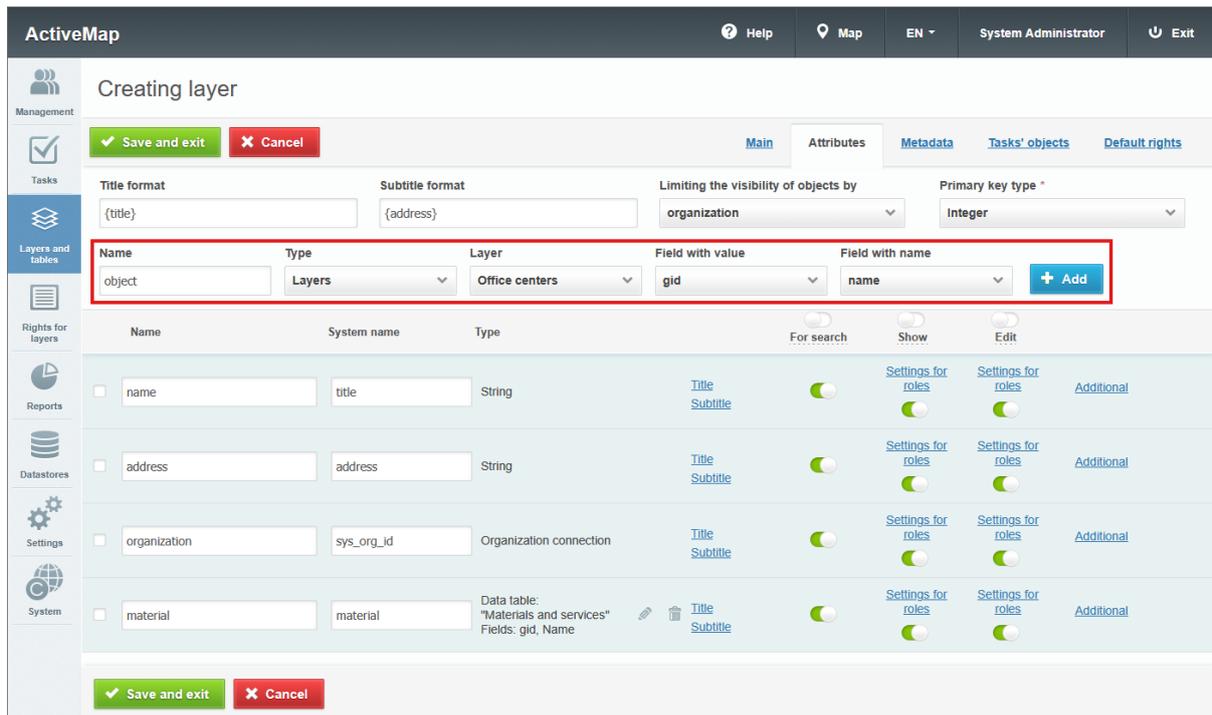
Fig. 2.122: Attaching a reference table to the layer field

After attaching a reference or data table (Fig. 2.123) you can select one of the values from the drop-down list instead of entering an attribute value when creating new layer objects and when filtering.
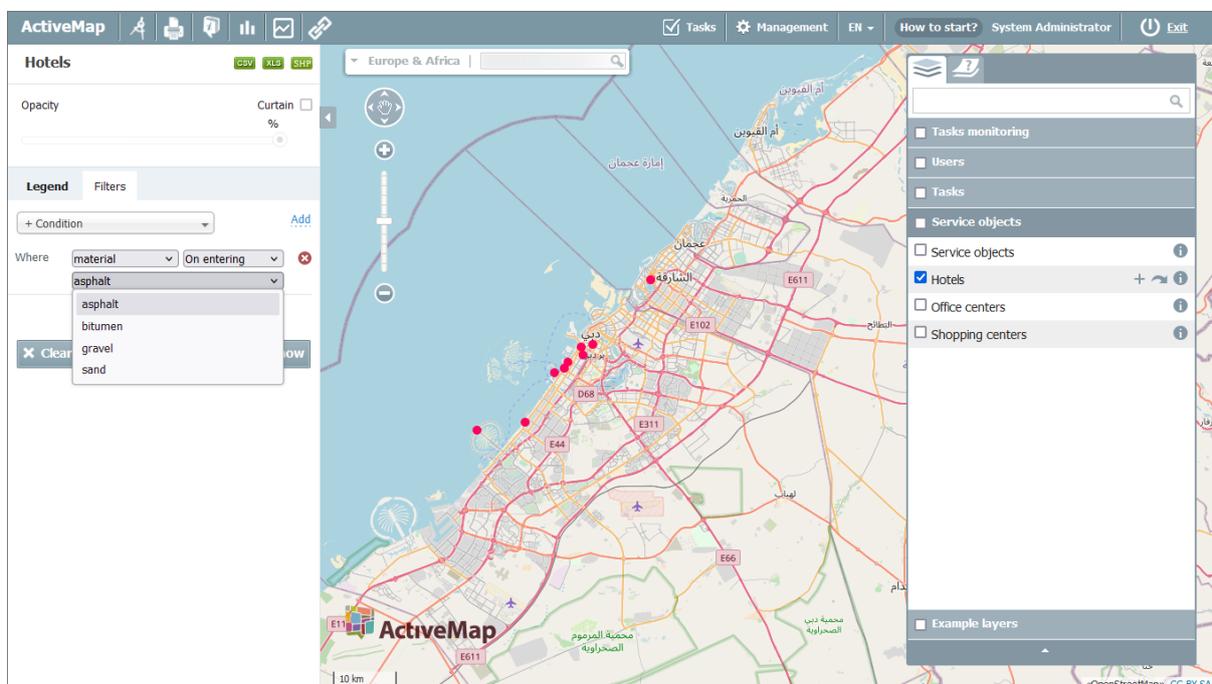


Fig. 2.123: Using reference table to filter layer objects

Fields with "Cluster connection", "Cluster connection (array)", "Organization connection", "Organization connection (array)", "User con-

nection", "User connection (array)", "User role connection (array)", "Work type connection", "Work type connection (array)", "Priority connection", and "Priority connection (array)" types allow you to connect system reference tables (dictionaries). System dictionaries are generated automatically based on data entered into the system.

After creating all the necessary attributes, you can fill in the fields at the top of the window:

- "Title format" and "Subtitle format"

  You can form the title/subtitle using a mask for the layer from one or several attributes. To set up a new mask, click "Title" or "Subtitle" on the desired attribute. You can add a brief explanation for better perception (Fig. 2.124).

| Title format | Subtitle format |
| --- | --- |
| {name} | {address} |

Fig. 2.124: Example of setting a title and subtitle mask

- "Limiting the visibility of objects by"

  You can limit the visibility of objects of the same layer for different clusters, organizations, and users in the system. To do this, you have to:

  1. Create a field with one of the following data types: "Organization connection", "Organization connection (array)", "Cluster connection", "Cluster connection (array)", "User connection" or "User connection (array)".

  2. Select its name from the drop-down list in the "Limit the visibility of objects by" field at the top of the window.

  3. After saving the layer attribute structure, fill the connection field with values by selecting from the drop-down list.

  Objects of this layer are visible only for the users of clusters (or organizations) specified in this field or for the users listed in the "User connection" or "User connection (array)" field.

  Users with "System Administrator" and "System Inspector" roles can leave the system filter field empty when creating an object and the object becomes available to all users. For other users, the field is filled by default with the name of the main organization or main cluster of the user. The object is accessible only to users of this organization or cluster.

- "Primary key type"

  When creating a layer, you can select the primary key type: integer or big integer. You cannot change this setting after the layer is created.

**"Metadata" tab**

In this tab, you can fill in fields with general information about the layer (Fig. 2.125). Some of the fields may be mandatory.



Fig. 2.125: Filling in layer metadata fields

The system displays this tab in the layer creation window only if metadata fields have been created in advance (for more information, see *"Metadata" tab* (page 144)). The list of metadata fields is the same for all layers and tables in the system. By default, the list of metadata fields is empty, and the "Metadata" tab does not appear in the layer creation window.

**"Tasks' objects" tab**

In this tab, you can set the mapping between the fields of this layer and the fields of tasks that are created based on the layer objects (Fig. 2.126). This means that when creating tasks linked to objects, all or part of the task fields are automatically filled with data from the associated object. The mapping determines which fields are filled in.
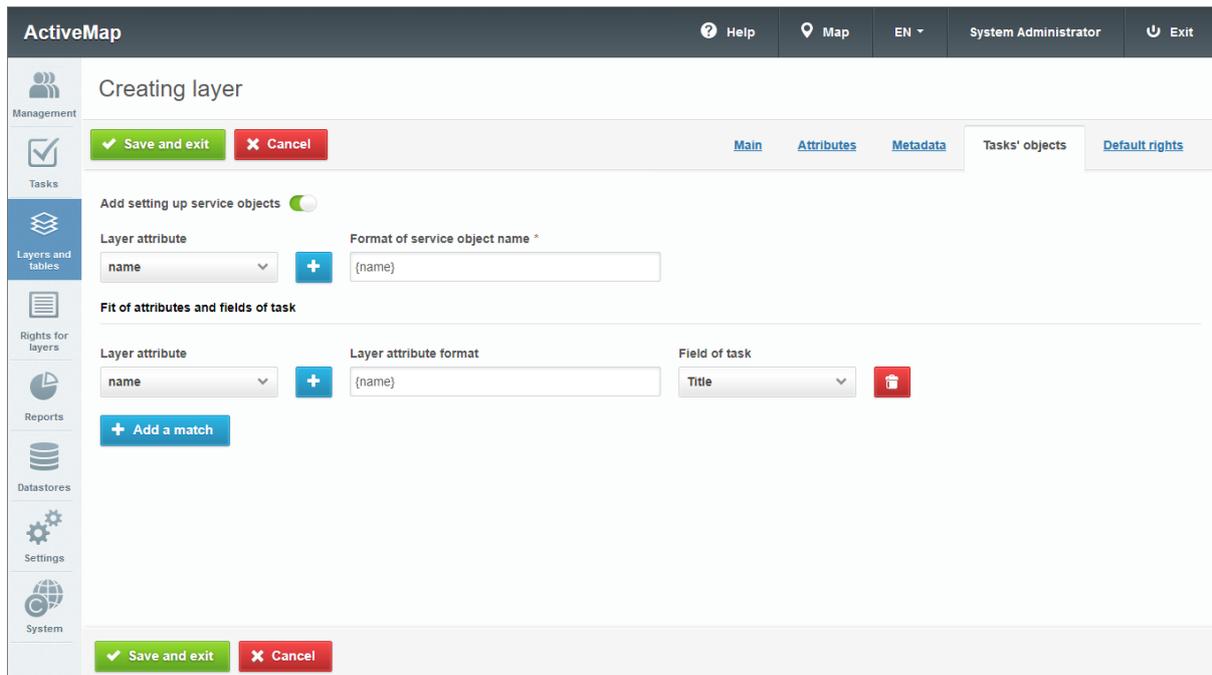
Fig. 2.126: "Tasks' objects" tab

To use layer objects as tasks' objects, users must have the appropriate rights. They are configured in the "Rights for layers" block (for more details, see *"Rights for layers" block* (page 151)). Depending on the settings, some users can use the layer as a layer with tasks' objects, while others only as a regular layer.

To configure tasks' objects, enable the corresponding toggle switch. Then select an attribute for the object name from the layer fields and click . Name format is based on its mask. The name can consist of several attributes. To do this, create an appropriate mask by adding new attributes.

To set the mapping of layer attributes and task fields, click . Select the layer attribute and the task field from the drop-down lists. You can use the search bar to make your selection. The attribute format can include several layer fields. You can also add an explanation to this line to help you understand the information in the tasks. To delete the mapping, click  next to matching.

**"Default rights" tab**

In this tab you can set the default rights for viewing, creating, updating, deleting, and exporting layer objects, managing the layer, and using layer objects as task objects. To set the rights, select the options from the drop-down lists:

- "All Roles" – granting rights to all roles;

- "Role" – selecting roles to set rights for;

- "Multiple organizations" – selecting all client organizations or all non-client organizations, or all regardless of this criterion;

- "Organization" – selecting the organization to set rights for.

After selecting the parameters, click ![Add]. A new row appears in the table below. Set the necessary rights using the following toggle switches:

- Tasks' objects

- Read

- Create objects

- Update objects

- Delete objects

- Management

- Export objects



Fig. 2.127: "Default rights" tab

For more information about the rights, see *"Rights for layers" block* (page 151).

### Uploading a layer

To upload a layer into the system, click [⬆ Upload] at the top of the "Layers" tab. A pop-up window appears where you can select a layer from the computer. You can upload archived vector shape files in zip format and georeferenced raster images in GeoTIFF format.

Layer uploading includes the following steps:

1. Preliminary import;

2. Setting layer parameters;

3. Creating a layer in the system based on the imported data.

Preliminary import starts immediately after selecting a file to upload. You can see the import progress in the current window (Fig. 2.128).
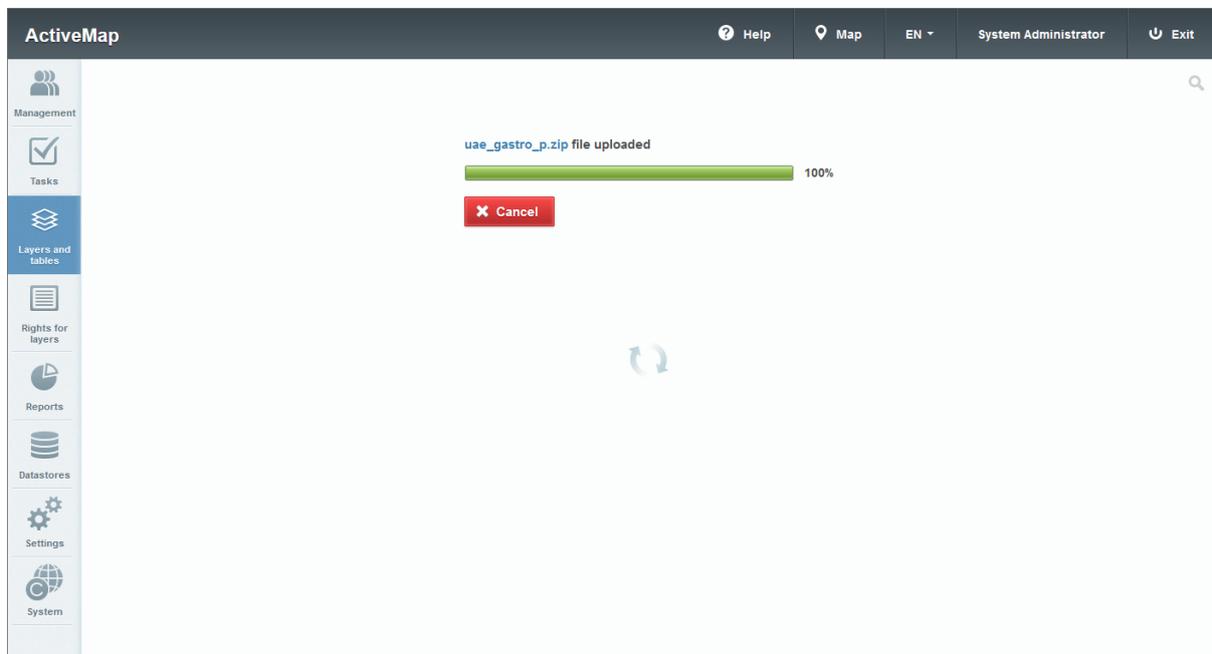


Fig. 2.128: Progress of preliminary layer import

## Uploading vector layers

After the preliminary import, the same window opens as when creating a layer (Fig. 2.129). In the "Main" tab, the geometry type is automatically determined. You have to fill in the remaining fields.



Fig. 2.129: Main parameters of the uploaded vector layer

The "Attributes" tab shows the attribute fields of the imported layer (Fig. 2.130). You cannot delete them at this step before creating a layer. You can only configure their display parameters and add new fields if necessary. New fields will be empty. You can fill them after creating a layer in the system.

Fig. 2.130: Attributes of the uploaded vector layer

When importing a layer from a shapefile, the system automatically identifies some attribute types if the attribute field name starts with the following words:

- sys_clr_id – "Cluster connection" type;

- sys_clr_ids – "Cluster connection (array)" type;

- sys_org_id – "Organization connection" type;

- sys_org_ids – "Organization connection (array)" type;

- sys_usr_id – "User connection" type;

- sys_usr_ids – "User connection (array)" type;

- sys_usr_ids – "User role connection (array)" type;

- sys_typ_id – "Work type connection" type;

- sys_typ_ids – "Work type connection (array)" type;

- sys_prt_id – "Priority connection" type;

- sys_prt_ids – "Priority connection (array)" type.

Setting up tasks' objects and default rights is done in the same way as when creating a layer. After setting all the parameters, click ![Save and exit] to complete the import and create a new layer in the system, or click ![Cancel] to cancel the import.

The stages of creating a vector layer are displayed in the information window (Fig. 2.131).
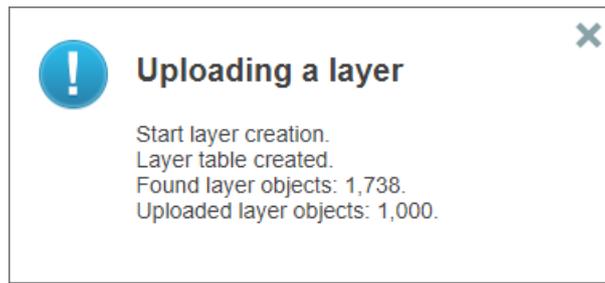
Fig. 2.131: Stages of vector layer creation

### Uploading raster layers

Before uploading raster images, it is recommended to compress the
GeoTIFF file (LZW compression) and build pyramids for it. You can
do it using the tools of the GDAL library (https://gdal.org/). After the
preliminary import is completed, the layer creation window opens (Fig.
2.132).



Fig. 2.132: Main parameters of the uploaded raster layer

In the "Main" tab, the layer display protocol (WMS) and the EPSG pro-
jection code are automatically determined. You have to fill in the fol-
lowing fields:

- Layer cluster

- Name

- System name

- Group

You can enable transparency display for different parts of the raster using the following flags:

- Transparent overlay color

- Transparent background color

As a rule, they are used for raster schemes and drawings.

The default rights are set up in the same way as when creating a layer.

After setting all the parameters, click ✔ Save and exit to complete the import and create a new layer in the system or ✖ Cancel to cancel the import. The stages of creating a raster layer are displayed in the information window, as when loading a vector layer.

### Editing a layer

To edit a layer, click 🖉 or double-click on the row with the selected layer name. A form (similar to the add form) opens in the administration area. Here you can fill in/change the fields of the layer and set up the default rights (Fig. 2.133).
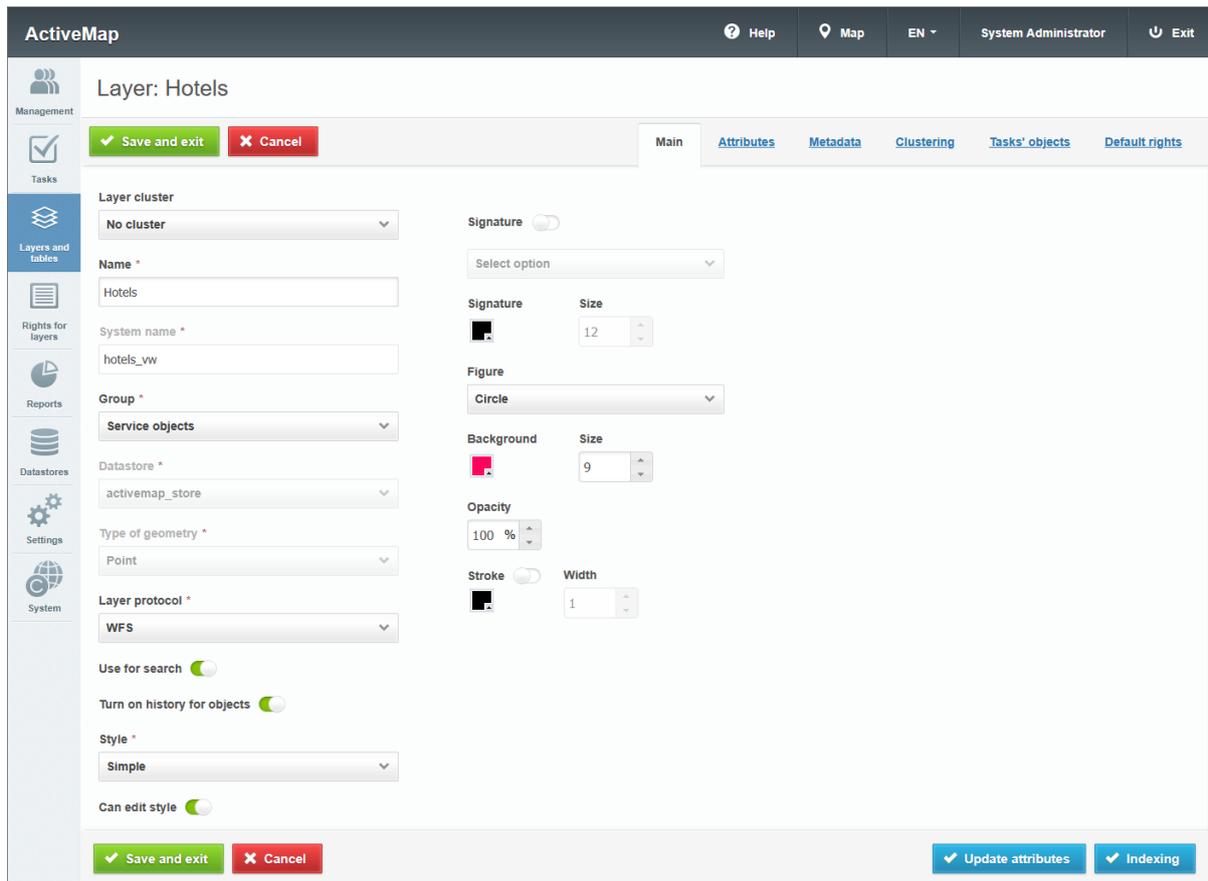
Fig. 2.133: Layer editing window

When you change cluster membership, users in the new cluster are automatically granted rights to the layer, configured by default. Users in the previous cluster retain their rights to the layers and can edit them if necessary.

To change information about layer attributes, switch to the "Attributes" tab in the layer editing window (Fig. 2.134).

Fig. 2.134: Editing layer attributes

Here you can see the fields for adding and editing attributes. You can also change the display order of attributes by moving the attribute rows up or down relative to each other.

To edit the relationships between tables, you should:

1. Click the ✎ button in the link attribute line.

2. In the window that opens, set a new relationship for this attribute by selecting values from the drop-down lists (Fig. 2.135).
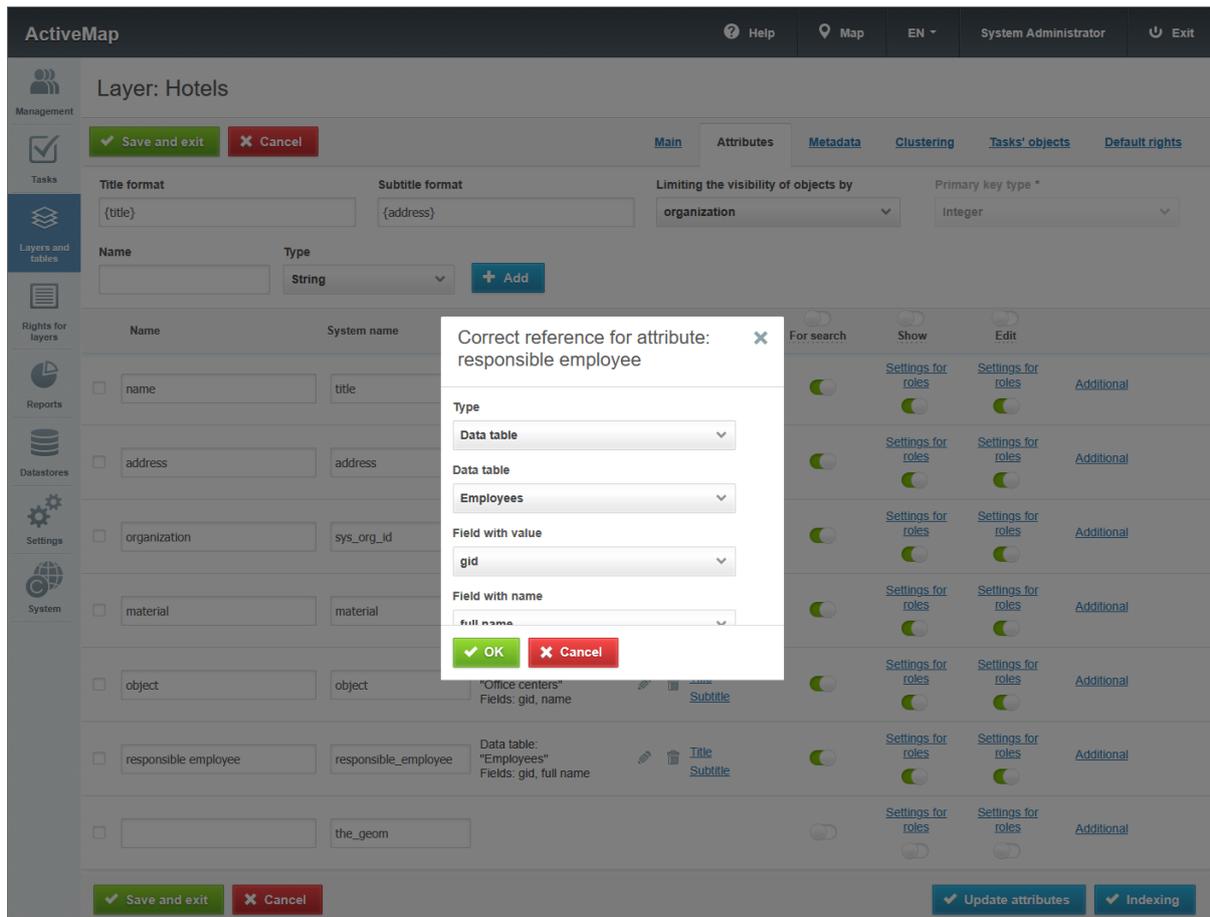
Fig. 2.135: Changing the relationship for an attribute

3. Save changes by clicking .

You can see the established relationship in the layer card. After selecting a new linked table, value field, or name field, this field will be automatically filled with new values.

To delete the attribute's relationship with a directory or table, click the

 button in the "Type" column of the link attribute line and confirm your actions in the opened window (Fig. 2.136).
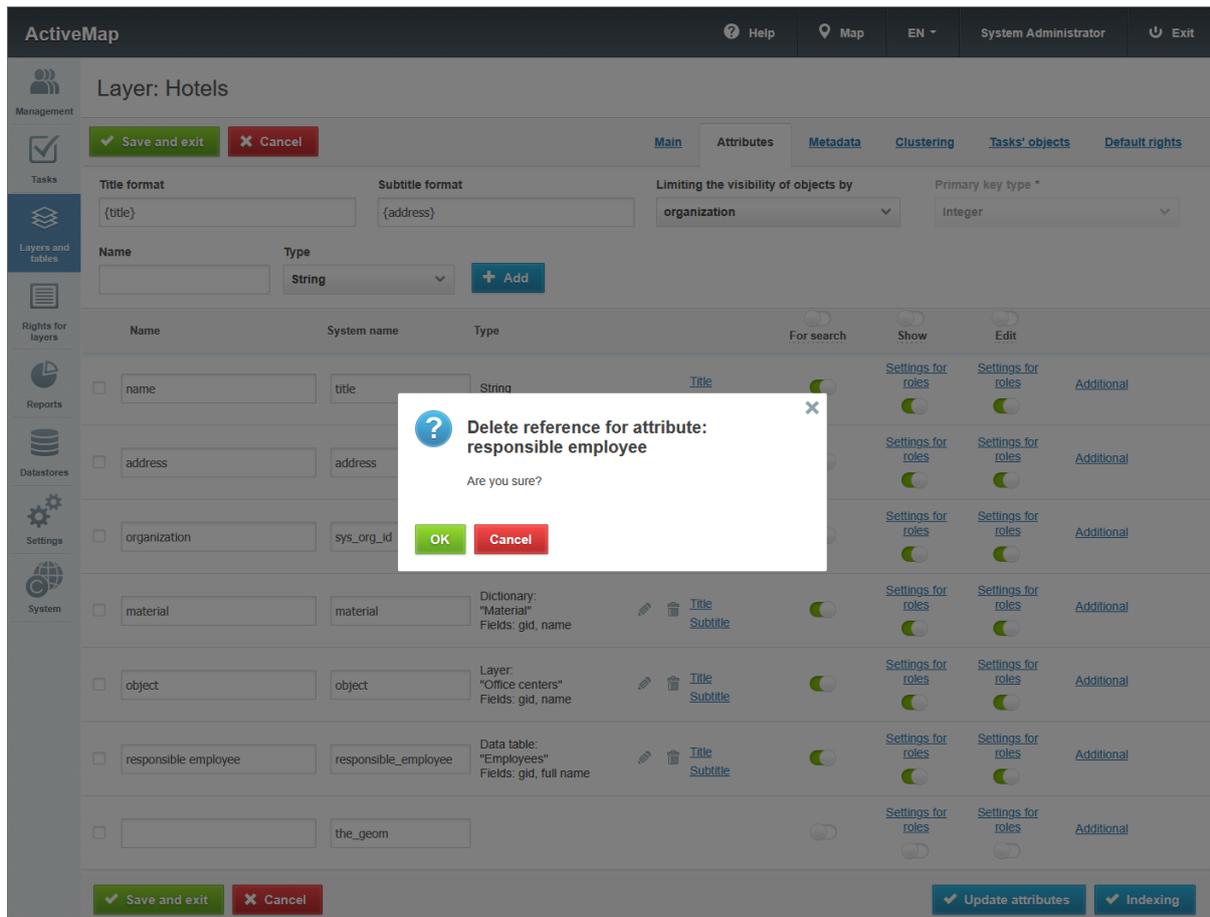
Fig. 2.136: Confirming the deletion of an attribute's relationship

To completely remove the attribute, click  on the right side of the line.

In the editing window, the "Update attributes"  and "Indexing"  buttons become available to the administrator. The  button allows you to reset the cache when adding attributes to a layer and reload them from the database. Clicking  generates a full update of the information about the selected layer. The administrator can use this button if new information has been added and is temporarily absent in the search results.

To save the changes made, click . To cancel editing the layer, click .

When editing a point layer (i.e., a layer with the "Point" geometry type), the "Clustering" tab appears in the administration area in addition to the "Main" and "Attributes" tabs.

Clustering is the display of a group of point layer objects located nearby with a single mark on the map. Clustering is possible only for point layers with the WFS display method. The amount of objects grouped into a cluster is displayed as a number. The proximity of objects to be included in the cluster is calculated based on the scale.

When you switch to the "Clustering" tab in the editing window, a form opens. Here you can enable clustering, set the maximum zoom level, and create a new cluster (Fig. 2.137). Here you can see the graphs with the following headers: object count, icon, and label color.
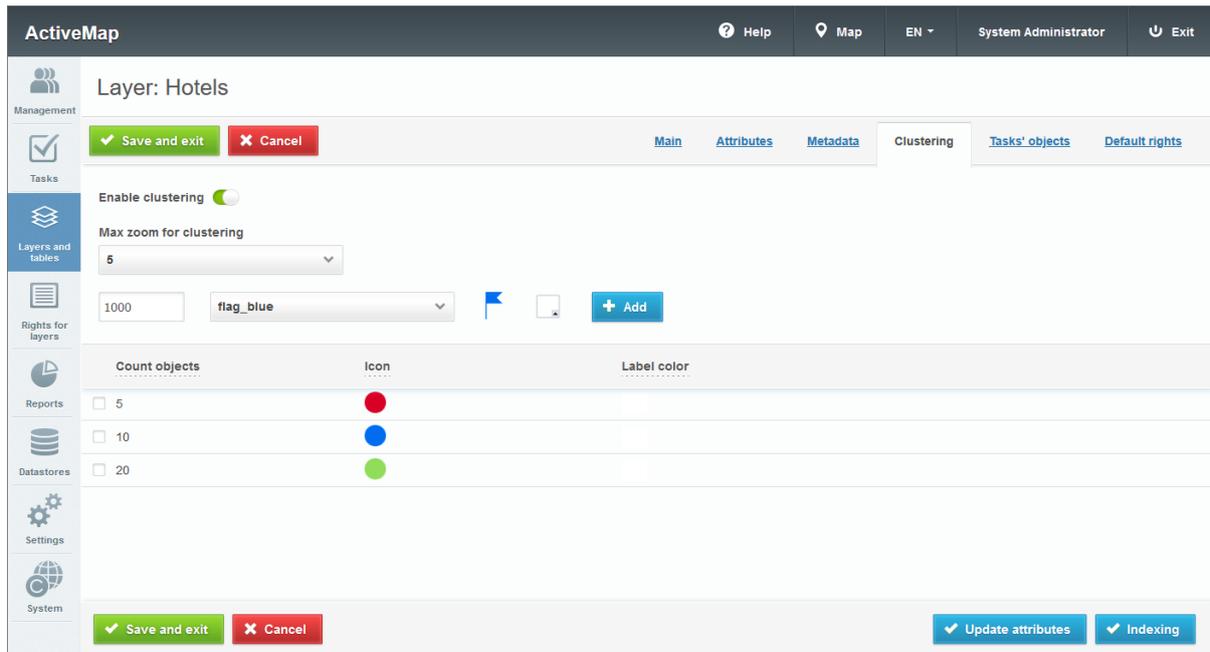


Fig. 2.137: Layer clustering settings

To add a new cluster, specify in the input field the number of objects contained in this cluster. Select the image displayed on the map, set the label color, and click .

The "Object count" column shows the range of the number of objects that corresponds to a specific cluster. If the number 5 is next to the first cluster, 10 is next to the second, and 15 is next to the third (as shown in Fig. 2.137), it means that up to 5 objects fall into the first cluster, from 6 to 10 in the second, and from 11 to 15 in the third. If the third cluster with 15 objects is the last in the list, then there will be no finite number of objects for it.

The "Icon" column stores cluster images that become available when viewing the map. The "Label color" column displays the color used for the caption on the map.

Editing data in the "Metadata", "Tasks' objects", and "Default rights" tabs is done in the same way as when creating a layer.

### Searching for a layer

You can work with the search bar and filters in the "Layers" tab. There are filters by group, geometry type, layer type (raster/vector), objects, and clusters.

For example, when choosing the filter "By geometry type", a form appears where you have to select one of the types (point, line, or polygon) from the drop-down list to filter out layers. After that, layers with the selected geometry type appear in the administration area.

To clear the filtering results, click "Clear all".

### Deleting a layer

To delete a layer, click 🗑 on the right side of the layer row. To delete multiple layers at once, select the corresponding rows and click 🗑 **Delete** at the bottom of the screen. The delete confirmation window appears with a choice of layer deletion modes: "Remove from geoportal", "Remove from geoserver", and "Remove from database" (Fig. 2.138). You can choose multiple options. To completely delete a layer, select all 3 items. Click **OK** to confirm the deletion. Click ✕ **Cancel** to cancel.



Fig. 2.138: Layer deletion confirmation

### "Tables" tab

The "Tables" tab contains information about data tables and reference tables (dictionaries) of the system. Data tables and reference tables, unlike layers, do not contain spatial information about the location of objects such as geometry or coordinates of objects.

Reference tables and associated data tables are used to solve the following tasks:

- Simplification of filling attribute fields. With linked reference or data table, users can select the value of the attribute field from the suggested variants instead of entering it manually.

- Filtering layer objects on the map.

- Creation of thematic maps based on reference tables.

- Applying style according to the reference table.

When switching to the "Tables" tab, a table with the following columns becomes available (Fig. 2.139):

- "Title" – name of the table in the interface;

- "name in DB" – name of the table in the database (consisting of the letters of the Latin alphabet, transliteration of the "Title" field by default);

- "Table type" ("Data table" or "Dictionary" ("Reference table"));

- "Cluster of organization" – name of the organization cluster to which the table belongs.
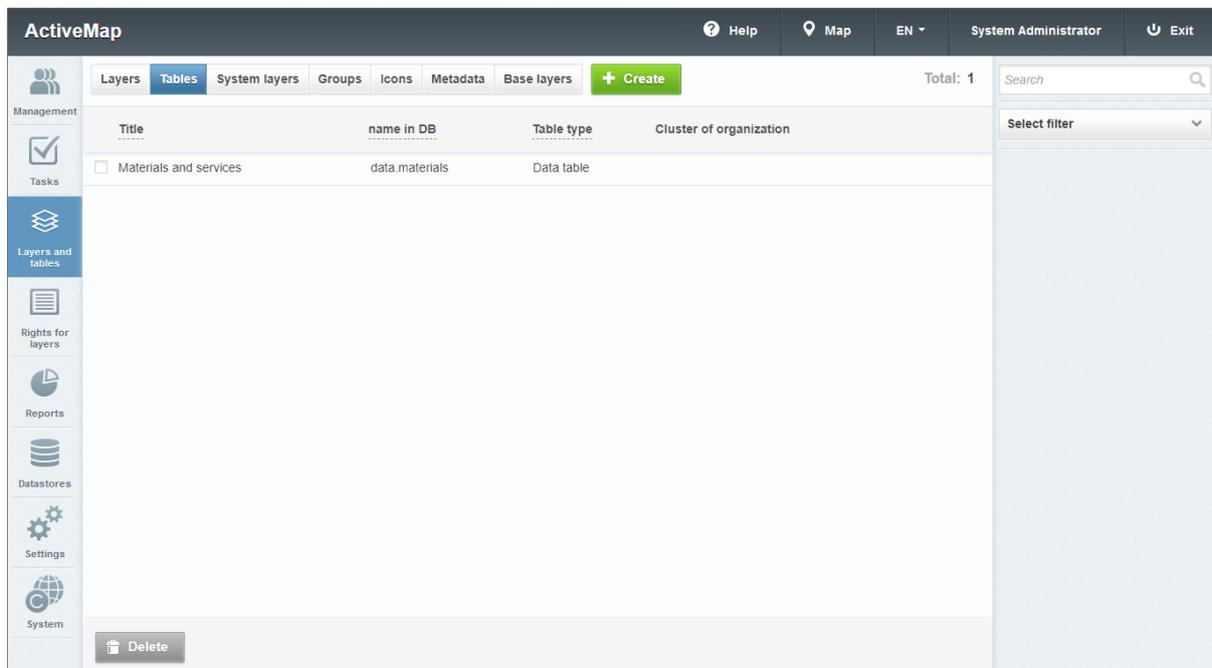


Fig. 2.139: "Tables" tab

To add a new table, click **+ Create** at the top of the window. The "Main" tab appears, similar to the layer creation form (Fig. 2.140).
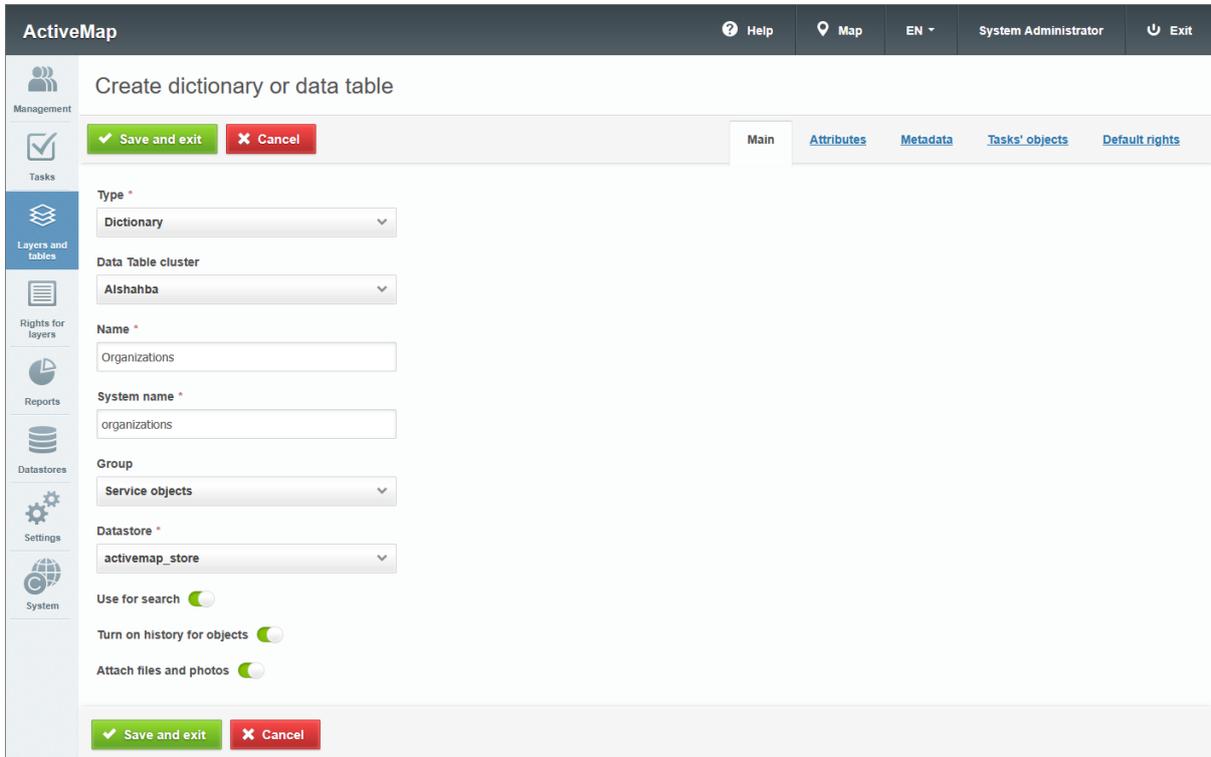


Fig. 2.140: Creating a table

Fill in the following fields:

- **Type** – type of the table (reference table (dictionary) or data table).

- **Data table cluster** – belonging to the cluster of organizations. Cluster selection is available when creating a table under the role of a System Administrator or a Cluster Administrator managing multiple clusters. When creating a table under the Organization Administrator role, the cluster belonging is determined automatically.

- **Name** – name of the table in the interface.

- **System name** – name of the table in the database, consisting of the letters of the Latin alphabet, without spaces and special characters. It is formed automatically when entering information in the "Name" field. If you enter a non-latin title in the "Name" field, the transliteration is used. If you are not satisfied with the received name, you can enter your own variant in this field. Automatic entry does not work if you fill in the "System name" first, and then the usual "Name". Unlike the name, you cannot edit the system name after the table is created.

- **Group** – the group in which the table is displayed.

- **Datastore** – the database in which the table is stored.

You can enable the following toggles:

- **Use for search** – includes table data in the full-text search in the ActiveMap Desktop application. It is enabled automatically when activating the "Tasks' objects" setting.

- **Turn on history for objects** – logs data modification history.

- **Attach files and photos** – enables the ability to attach files and photos to the layer objects.

The "Attributes", "Metadata", "Tasks' objects" and "Default rights" tabs are filled in similarly to the tabs of the same name in the layer creation form (section *Creating a new layer* (page 108)).

In order to link a data table or reference table (dictionary) to another table, the attributes must include a source field with integer values ("id" or "gid") and a value field with element names (Fig. 2.141). The values in the source field for the link must be unique.



Fig. 2.141: Reference table (dictionary) attributes

After entering all the necessary information, click ✔ **Save and exit**.

To modify a table, click ✎ on the right side of the corresponding line. A window similar to the table creation window opens, where you can modify data, add new entries, and change the display order of attributes.

If you activate the "Tasks' objects" setting when editing a table, a full-text search of table data in ActiveMap Desktop will not be enabled automatically, as when creating a layer. In this case, you have to activate the search manually, if necessary.

When changing the cluster membership, default permissions for the ta-

ble are automatically granted to the users of the new cluster. Permissions for the table for users of the previous cluster are saved. You can edit them, if necessary.

To delete a table, click ![trash icon] on the right side of the corresponding line. To delete multiple tables at once, check the corresponding lines and click [🗑 Delete] at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

#### 2.3.3.3.2 "System layers" tab

The "System layers" tab displays system-created layers (Fig. 2.142). Usually, there are two layers: "Users" and "Tasks".
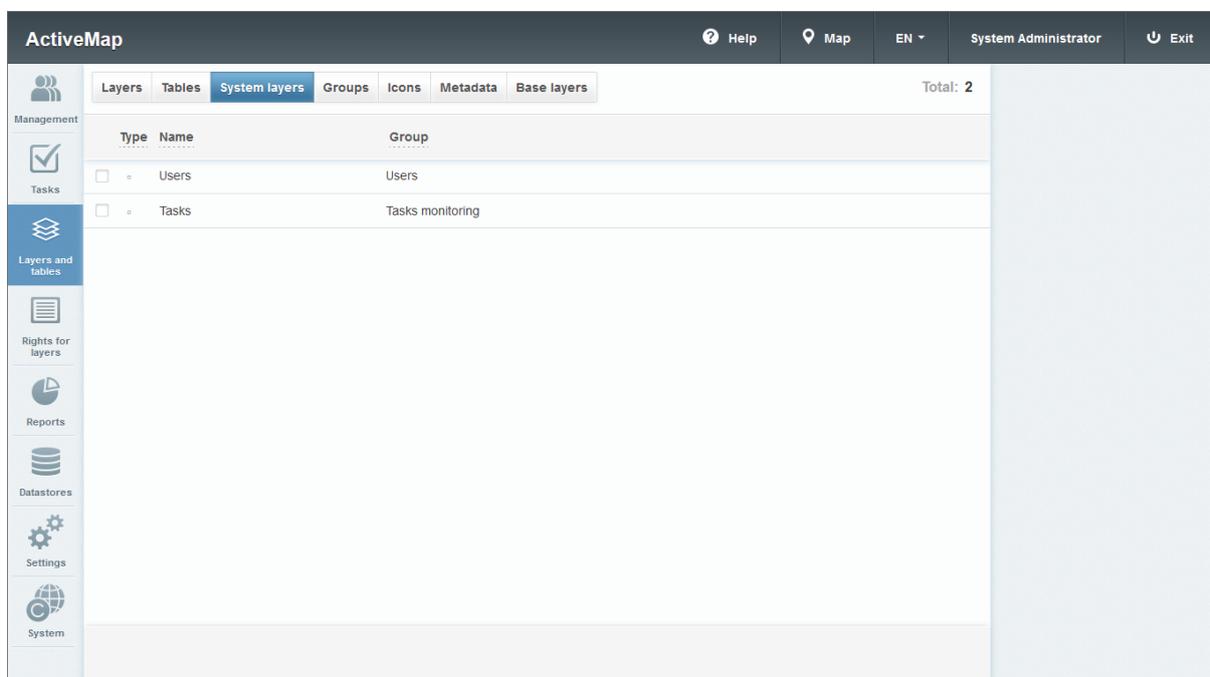


Fig. 2.142: "System layers" tab

Only the System Administrator can edit system layers. Other roles, if they have rights to this layer, can only grant permissions to other users within their cluster or organization. Geographic data for the "Users" layer is taken from the coordinates of ActiveMap system mobile application users. The style for this layer is set programmatically. User icons are color-coded based on the activity interval – the time when the system last received their coordinates (Fig. 2.143).
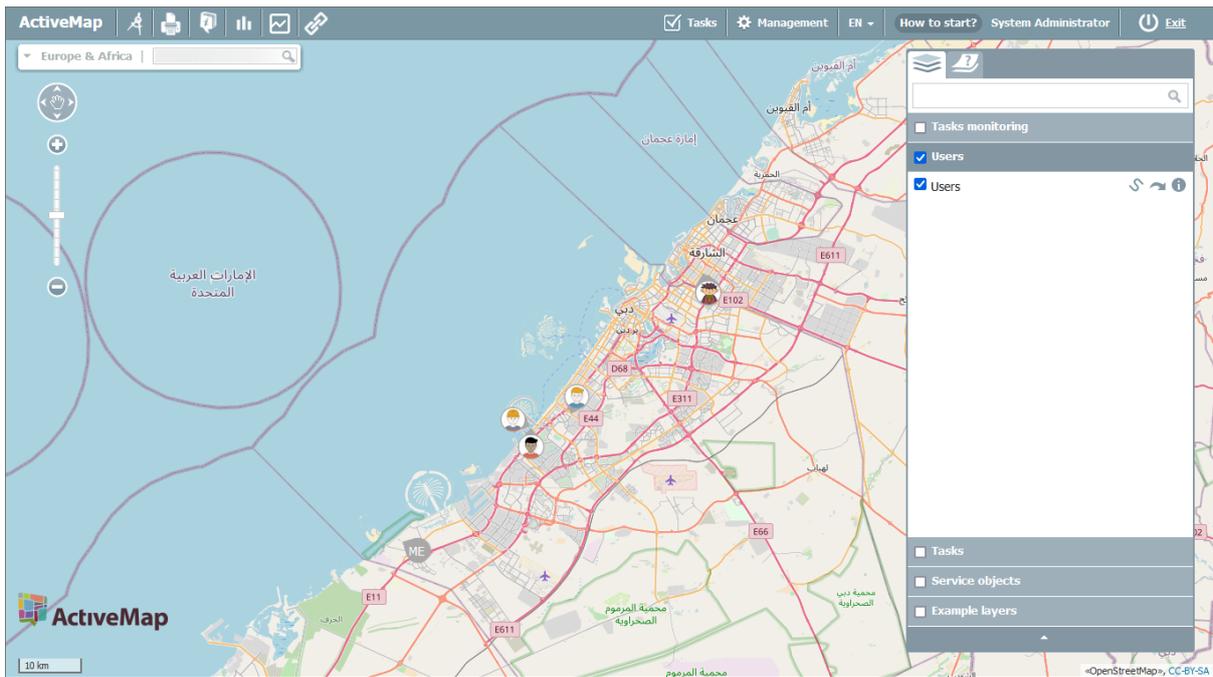
Fig. 2.143: Displaying the "Users" system layer on the map

The System Administrator can set a custom color palette and layer legend elements for the system layer, as well as define default permissions.

To do this, click ![icon] on the right side of the layer row or double-click on the row. The "Main" tab opens, where you can configure the following parameters (Fig. 2.144):

- **Name** – name of the layer.

- **Group** – group of layers in which the system layer is located.

- **Activity intervals of the last coordinates transmitted by users** – time intervals of receiving coordinates. They are divided into three groups by default:

  - Active – coordinates received no more than 15 minutes ago (green color);

  - More than 15 minutes ago – coordinates received from 15 to 60 minutes ago (yellow icon);

  - More than an hour – coordinates received more than an hour ago (red icon).

- **Group name for users outside of defined intervals** – name for the users whose coordinates were last transmitted before the latest time interval (by default, before a day).

- **Group name for users with no information about their location** – name for users whose geolocation is disabled.

You can set your own color for each parameter.

You can also set your own activity intervals. To delete an existing in-

terval, click  to the right of the interval. To create a new interval, click the "Add interval" button at the bottom of the window, fill in the field "Name of interval in the interface", and set the time interval and color of the icon.
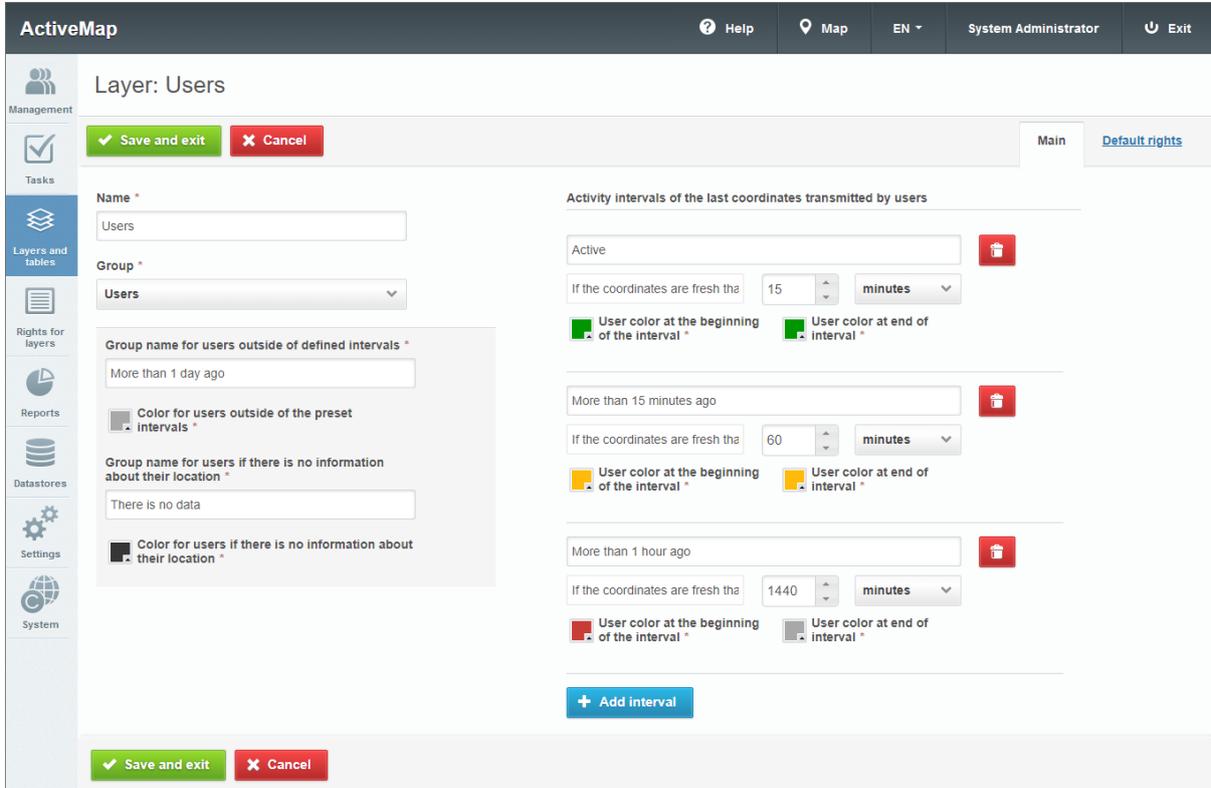


Fig. 2.144: The "Main" tab of the "Users" layer

In the "Metadata" tab, you can fill in the fields with general information about the layer. In the "Default rights" tab you can set the rights to view/edit/manage, as well as to use the layer as a layer with tasks' objects for different user roles in different organizations (Fig. 2.145).
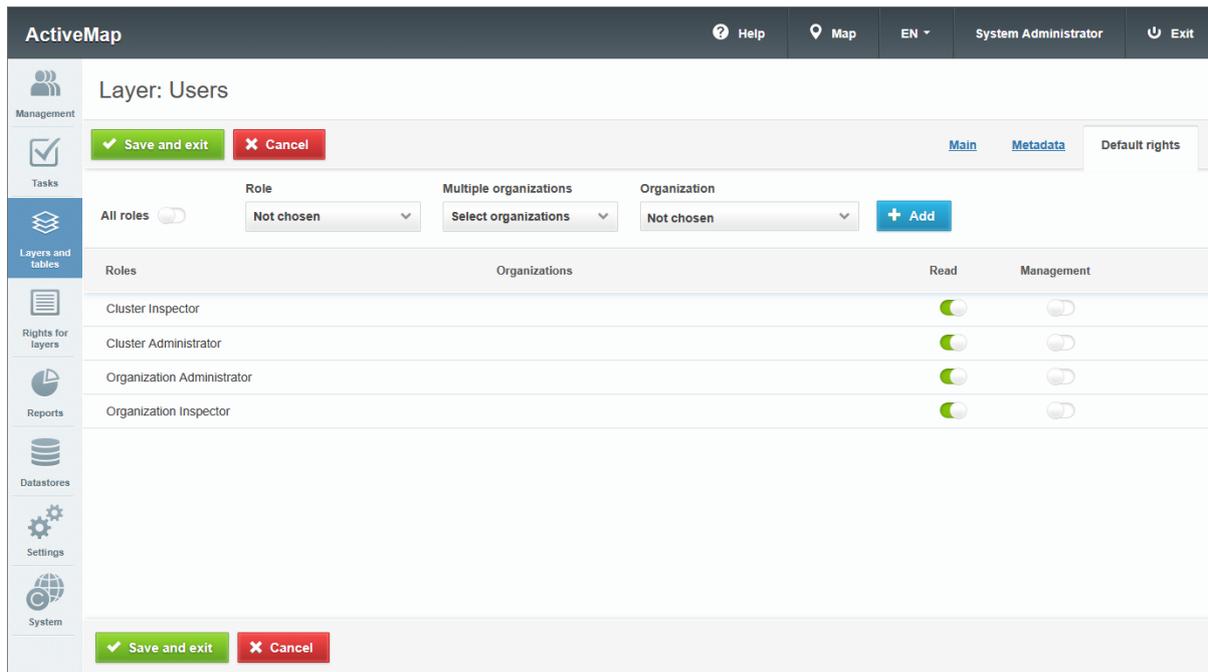
Fig. 2.145: The "Default rights" tab of the "Users" layer

After all the changes have been made, click .

In the "Tasks" layer, tasks with coordinates are displayed on the map using clustering. The icon color depends on the current task status (Fig. 2.146):

- In Progress – blue;

- Completed – green;

- Rejected – gray.
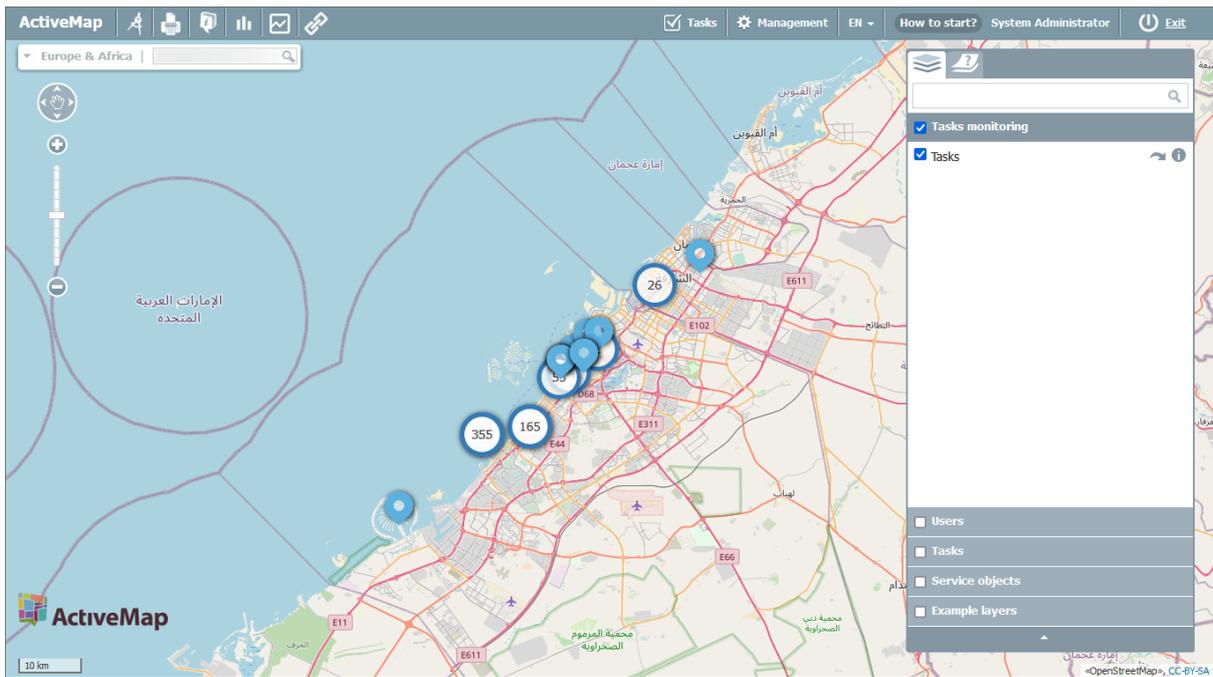
Fig. 2.146: Displaying the "Tasks" system layer on the map

To edit the "Tasks" layer, click [icon] on the right side of the layer row or double-click on the row. The "Main" tab opens, where you can configure the following parameters (Fig. 2.147):

- **Name** – name of the layer.

- **Group** – group of layers in which the system layer is located.

- **Stage color scheme** – colors of icons and legend captions for the specified task statuses. By default, the following stages are set:

  – In Progress – blue;

  – Completed – green;

  – Rejected – gray.

Fig. 2.147: The "Main" tab of the "Tasks" layer

In the "Metadata" tab, you can fill in the fields with general information about the layer. In the "Default rights" tab you can set the rights to view/edit/manage for different user roles in different organizations.

After making all the changes, click ✔ Save and exit.

### 2.3.3.3.3 "Groups" tab

Groups combine layers and tables by thematic or other defined criteria. When you switch to the "Groups" tab in the administration area, a table appears with the following headings (Fig. 2.148):

- "Ordinal number" – place in the list of layer groups on the main page of ActiveMap Web, occupied by the group;

- "System group" – indication that a group contains system layers (by default, "User monitoring" is a system group);

- "Name" – name of the group;

- "Cluster of organizations" – belonging to the cluster of organizations;

- "Layers" – number of layers and tables in the group.
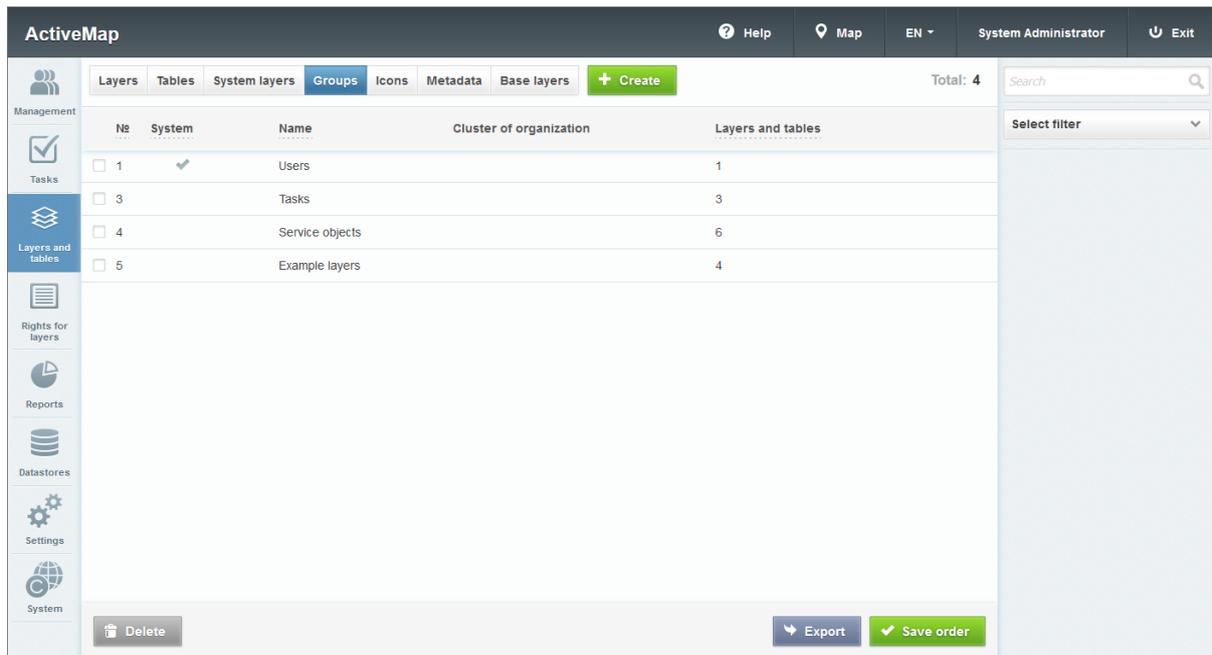
Fig. 2.148: "Groups" tab

In the "Groups" tab, the administrator has access to the "Save order" button ![Save order]. It is used to sort groups alphabetically (or in ascending/descending order of layers) and save the resulting order in the system. Clicking the button automatically changes the sequential numbers (in the "No." column) for the sorted groups.

To rearrange groups, click on a certain group and, without releasing the button, move it to the desired line, and click ![Save order]. When switching to the "Groups" tab, you can use the search bar, as well as tools for creating new groups and editing/deleting existing ones.

In addition, in the "Groups" tab, you can save information about groups to your computer. To do this, click ![Export] and select a directory to save the Excel file. This file contains a table with the names of groups and the number of layers and tables in each group.

### Adding a new group

To add a new group to the system, click at the top of the window. A form opens in which the user can enter the name of the new group.

### Editing a group

When editing a group in the administrative area, a new window opens with the following tabs: "Main", "Layers", and "Tables". In the "Main" tab you can edit the name of the group. When switching to the "Layers" tab, you can view information about the layers belonging to the group (sequential number, name, and system name). In the "Tables" tab, you can view information about the tables belonging to the group (sequential number, name, and system name).

To swap layers or tables, click on a layer/table name and move the layer/table to the desired row without releasing the button.

### Deleting a group

To delete a group, click on the right side of the corresponding row. To delete several groups at once, select the checkboxes of corresponding rows and click at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

### Searching for a group

You can use the search bar to search for groups by their names and filter by clusters in the "Groups" tab.

#### 2.3.3.3.4 "Icons" tab

When switching to the "Icons" tab, you can see a table with the following columns: icon and name (Fig. 2.149). You can use icons when creating styles and adding clustering to the point layers (for more information about clustering, see *Editing a layer* (page 125)).
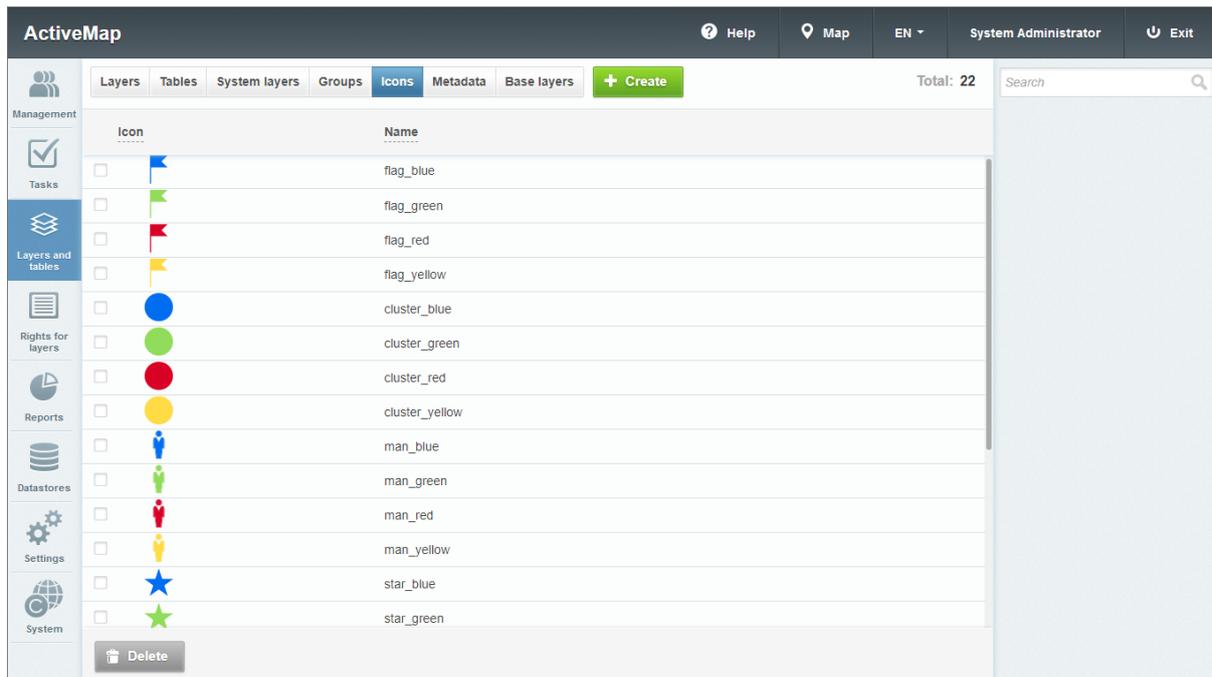
Fig. 2.149: "Icons" tab

The "Icons" tab contains a search bar and tools for adding new icons and editing/deleting existing ones.

### Adding an icon

To add a new icon, click  at the top of the window. A window opens to enter the icon's name and upload the image by clicking on the corresponding upload form.

### Editing an icon

When clicking  (or double-clicking the row with the selected icon), a form opens in the administration window (with the same fields as the form for adding an icon) where you can fill/change the fields with information about the selected icon.

### Deleting an icon

To delete an icon, click ![trash icon] on the right side of the corresponding row. To delete multiple icons at once, select the corresponding rows with checkboxes and click ![Delete button] at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

### Searching for an icon

You can use the search bar to search for images by their names.

### Getting a link

To get a link to an icon, hover over it, right-click, and select "Copy image URL" or "Copy link to image" depending on the browser used. You can use this link when creating an advanced layer style with icons.

#### 2.3.3.3.5 "Metadata" tab

In the "Metadata" tab, you can view the list of fields for entering general information about a layer or table. This list is the same for all layers and tables in the system. By default, the list of metadata fields is empty. If the list contains at least one field, the system adds a "Metadata" tab to the layer or table creation and editing windows, as well as to the layer information panel in the map window.

When switching to the "Metadata" tab, you can see a table with the following columns (Fig. 2.150):

- "Name" – name of the field;

- "Field type" – input data type (string, integer, fraction, list, condition, or date);

- "Default value" – data that is initially specified in the field;

- "Mandatory" – mandatory flag for filling in this field;

- "Visible" – the flag for displaying the field in the "Metadata" tab when creating or editing a layer, as well as in the information window in the client side of the site.
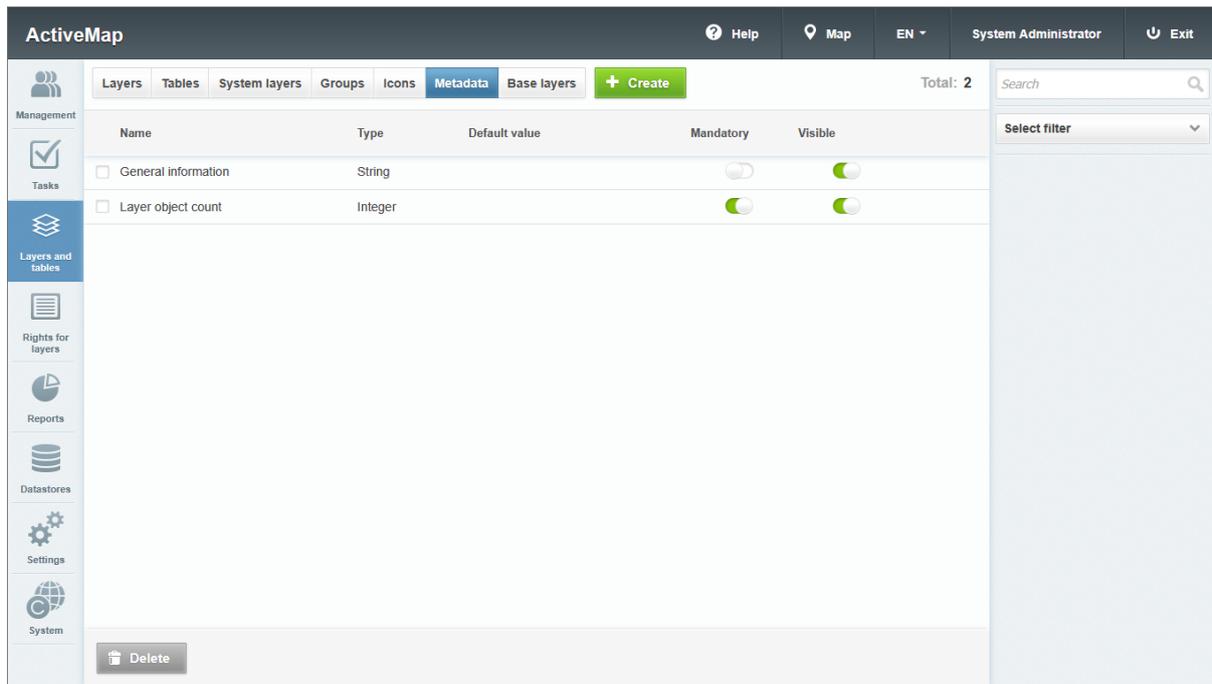
Fig. 2.150: "Metadata" tab

In the "Metadata" tab, you have access to a search bar as well as tools for adding new fields and editing/removing existing ones.

### Adding metadata fields

In the "Metadata" tab, you can add a new field for entering additional

information about the created layer. To do this, click  at the top of the window. A field creation window opens. Fill in the suggested fields (Fig. 2.151).

Fig. 2.151: Adding metadata

### Editing metadata fields

To edit the information, click ![pencil icon] or double-click on the row with the name of the selected field. A form similar to the creation form opens, where you can modify the information about the additional fields of interest.

### Deleting metadata fields

To delete a field, click ![trash icon] in the right part of the corresponding row. To delete multiple fields at the same time, select the corresponding rows

by selecting their checkboxes and click the ![Delete button] button at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* .

**Metadata search fields**

In the "Metadata" tab, you can use the search bar to search for additional fields by their names. In addition, there is a filter located under the search bar to search by criteria such as "Field Type", "Required Field" and "Visible".

### 2.3.3.3.6 "Base layers" tab

A base layer (basemap) is a layer that is the main or primary one in a particular map. Users visualize tasks and thematic layers above the basemap, as well as use it for navigation through a map and getting general information about the area of interest. When switching to the "Base layers" tab, you can see a table of basemaps with the following columns (Fig. 2.152):

- "Type" – a type that determines the basemap access mechanism and its possible parameters;

- "Name" – name of the basemap displayed in the system;

- "URL" – a link to access the basemaps data;

- "Space shot" – a mark indicating that the basemap is interpreted as a satellite image (raster image).



Fig. 2.152: "Base layers" tab

### Adding a basemap

To add a new basemap, click **+ Create** at the top of the window. The basemap creation window opens (Fig. 2.153).



Fig. 2.153: Basemap creation window

Fill in the main fields:

- **Name** – name of the basemap displayed in the system.

- **Type** – a type that determines the basemap access mechanism and its possible parameters. Select one of the types from the drop-down list. A list of additional parameters appears that differ for different types. Some parameters have default values, but you can edit them (Fig. 2.154).

- **Space shot** toggle switch – mark for raster image.

Fig. 2.154: Additional parameters of a basemap

Additional parameters of a basemap:

- **URL** – a link to access the basemaps data.

- **Projection** – the code of one of the commonly used geographic projections.

- **Min zoom** – the minimum supported scale.

- **Max zoom** – the maximum supported scale.

- **Tile size** – the tile length/width in pixels. In map services, a tile is one of many images that a map is divided into. Most map services use square tiles of 256x256 pixels. Tiles are organized in a pyramid. The whole world is divided into several scale levels, each of which is divided into equal squares. Scale numbering starts from zero, with zero scale represented by a single tile and the entire planet shown on it.

- **API key** – an access key for rights-protected third-party organizations, such as Google maps.

- **Attribution** – a link to copyright holders, displayed in the lower right corner of the map.

Mandatory parameters are marked with a red asterisk.

The right part of the creation window contains settings for displaying the basemap in different components of the system: WEB (ActiveMap Web), Android (ActiveMap Mobile Android), IOS (ActiveMap Mobile IOS), Desktop (ActiveMap Desktop), and Desktop Cross-Platform (ActiveMap Desktop Cross-Platform).

You can enable the following toggle switches for each component:

- **Show** – displays the basemap in the dropdown lists with the ability to replace the main basemap with this one.

- **There's a native class**.

- **Main** – displays the basemap by default.

### Editing a basemap

To edit the parameters of a basemap, click  in the right part of the row of the selected basemap. A form similar to the creation form opens, where you can modify the information about the base map.

### Deleting a basemap

To delete a basemap, click  in the right part of the corresponding row. To delete multiple basemaps simultaneously, select the corresponding rows and click the  button at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* .

### Searching for a basemap

To find a basemap by its name, you can use the search bar. Under the search bar there is a filter, that allows you to find:

- Main map for a specific system component,

- Basemaps available in specific system components,

- Basemaps of a certain type,

- Space image basemaps.

If you select the "Space image" option and then uncheck it, all the basemaps that are not satellite images will be displayed.

### 2.3.3.4 "Rights for layers" block

Access control is the process of granting users the necessary permissions to access system tables.

A user can receive the following rights:

- Tasks' objects – using layer or table objects for creating tasks linked to them with automatic filling of task fields according to the configured mapping (matching of layer or table attribute and task field).

- Read – viewing layer or table data in all software packages of the system.

- Create objects – adding new objects to a layer or table.

- Update objects – editing existing objects in a layer or table.

- Delete objects – deleting objects from a layer or table.

- Management – changing the structure of tables, layer styles, and other characteristics, deleting layers and tables.

- Export objects – exporting layers and tables.

To search for rights, you can use the search string or the filter panel.

### 2.3.3.4.1 "Access control" tab

In the "Access control" tab, you can view the list of rights, available to the users of the system (Fig. 2.155). When switching to this tab, a table with the following columns becomes available:

- "User" – user name (the user's organization cluster is displayed below the name).

- "Layer" – name of the layer for access (the layer group is displayed below the name).

- "Tasks' objects" – toggle switch for granting the right to use layer objects as task objects.

- "Read" – toggle switch for granting the right to view the layer.

- "Create objects" – toggle switch for granting the right to add new objects to a layer.

- "Update objects" – toggle switch for granting the right to edit existing objects in a layer.

- "Delete objects" – toggle switch for granting the right to delete objects from a layer.

- "Management" – toggle switch for granting the right to change the layer structure, style, and other characteristics.

- "Export Objects" – toggle switch for granting the right to export the layer from the system.

Fig. 2.155: "Access control" tab

The same layer can operate as a service (a layer with tasks' objects) for some users and as an ordinary layer for others. Raster layers and system vector layers cannot be used as layers with tasks' objects.

If users have rights to "Tasks' objects" but no other rights, access is limited to viewing service objects within the task card. Full access to all layer data is not available. They cannot select a service object when creating a task and use the objects from this layer to fill in custom fields of the "Data objects" format. Such a layer is not available in the list or on the map.

If users have rights to "Tasks' objects" and "Read", they can see all layer objects, select a service object, and fill in the custom field of the "Data objects" format associated with this layer when creating a task.

If users have rights to "Tasks' objects" and "Update objects", they can edit objects, but only within the task card.

When enabling the toggle switch in the column header, the corresponding right is granted to all users currently displayed in the administration area. Thus, you can use a filter to select users by any parameter and grant them all rights at the same time. Similarly, permissions can be revoked by enabling the toggle switch in the row for a specific layer, or by enabling the toggle switch in the column header for user categories. After enabling the toggle switch in the column header, the system asks to confirm the action.

To sort the rows alphabetically or by the toggle's on/off status, click the corresponding column header. Click it again to reverse the sorting order.

The "New tasks", "Tasks in work", and "Done tasks" layer rows do

not have the "Create objects", "Update objects", "Delete objects", and "Management" toggle switches. This is explained by the fact that the system automatically enters objects into these layers on the basis of tasks. Users are not allowed to enter objects in this layers.

Clicking  opens a window for selecting a directory for saving the accesses.xlsx Excel file. The structure of this file repeats the structure of the table in the current tab. Field sorting is not preserved during export, but if you apply a filter before export, only selected rows are exported.

### 2.3.3.4.2 "Copy access" tab

In the "Copy access" tab, you can copy user rights (Fig. 2.156).



Fig. 2.156: "Copy access" tab

To do this, select a user for whom you want to copy the rights and click . In the window that opens, select the cluster and then the user whose rights you want to copy (Fig. 2.157).
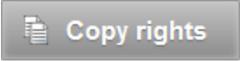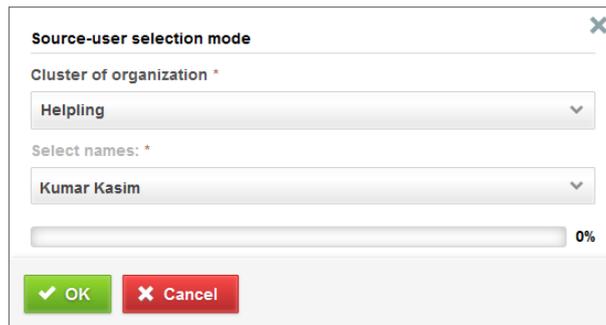
Fig. 2.157: User selection window for rights source

### 2.3.3.4.3 "Access for groups" tab

In the "Access for groups" tab, you can grant organizations the rights for groups of tables and layers by enabling the "Access" toggle switch in the line of the desired group (Fig. 2.158). You can select a specific group, organization, user, or cluster group with a filter for convenience.
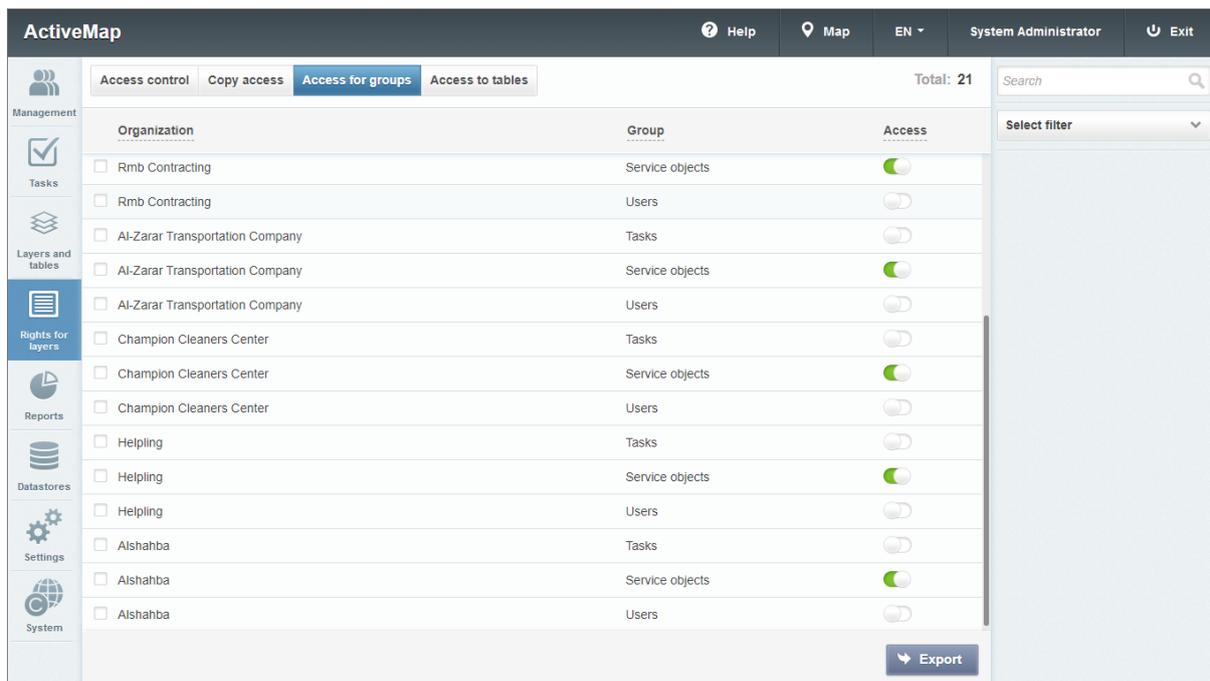


Fig. 2.158: "Access for groups" tab

You can save the table of organizations with the rights granted to them for groups to a computer. To do this, click . A window for selecting a directory for saving the groups.xlsx Excel file opens.

### 2.3.3.4.4 "Access to tables" tab

In the "Access to tables" tab, you can grant users the rights to tables similar to rights to layers in the "Access control" tab (Fig. 2.159). You can filter a specific organization, user, user cluster, or cluster of data tables and select users with appropriate rights.



Fig. 2.159: "Access to tables" tab

### 2.3.3.5 "Reports" block

In the "Reports" block, you can manage report templates JasperReports[1] displayed in the system (Fig. 2.160).

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[1] https://ru.wikipedia.org/wiki/JasperReports
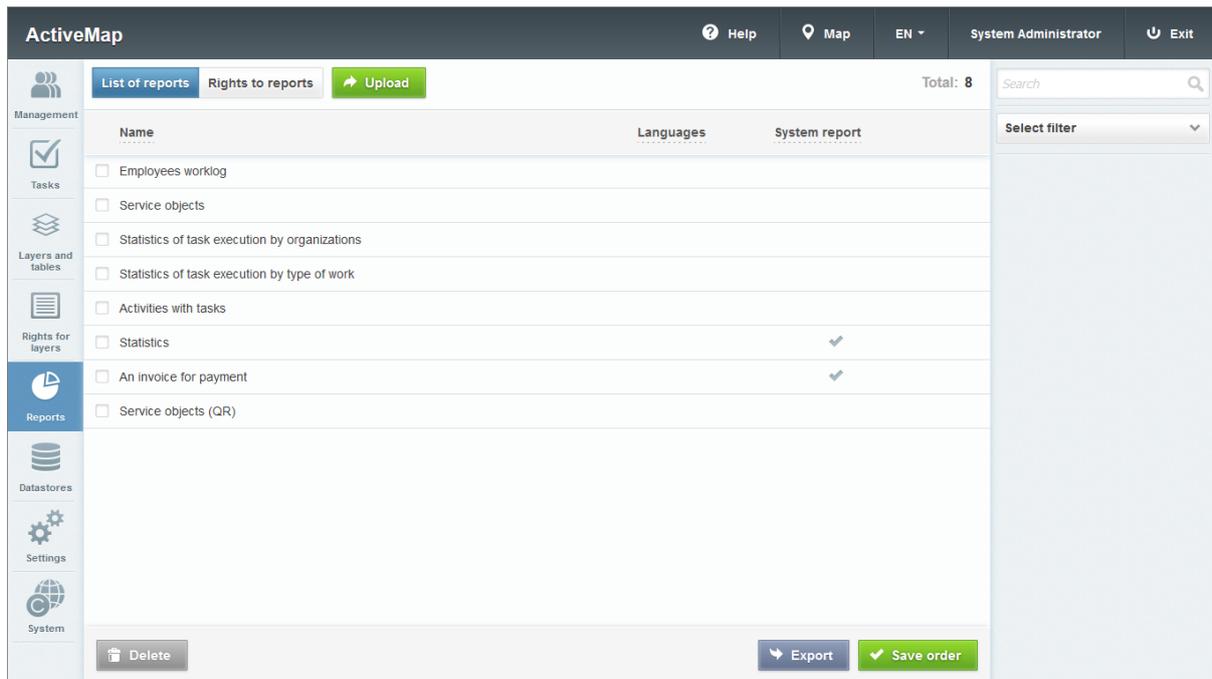
Fig. 2.160: "Reports" block

### 2.3.3.5.1 "List of reports" tab

In the "List of reports" tab, you can view all system reports, upload new ones, and edit/delete existing ones.

In this tab you can also change and save the order in which the reports are displayed in the system. Using the ⟶ Export button, you can export the Excel file jreports.xlsx containing information about the reports and the fields they contain.

#### Uploading a report

To add a report to the system, click ⟶ Upload at the top of the window. A pop-up window opens to select a report from your computer. You can upload the files in jrxml format.

After successfully uploading the report to the system, the report creation window opens (Fig. 2.161). Fill in the following fields in the "Main" tab:

- **Name** – the name under which the report is displayed in the system.

- **Data storage** – selection from the list of available databases.

- **Preferred report format** – selection of the format in which the report is created by default (when creating the report, you can choose another format: PDF, Word, RTF).

- **Report description** – the description that accompanies the report in the system.

- **Report type** – selection of the report type: general, by tasks, or by the layer. A general report is generated for all types of work and tasks in the system. Report by tasks allows you to set a particular type of work. Report by the layer allows you to specify the thematic layer for which the report is generated.

- **Languages for which the report is available** – selection of the system language(s) for which the report is displayed when switched to. The list of available languages corresponds to those activated in the "System" block. If the language is not set, then the report is available for all languages. The System Administrator can see the entire list of reports for easy management in the "Administration" mode.

- **System Report** toggle switch – marks the system reports.

- **Report parameters**:

- "Parameter name" – name of the parameter.

- "Mandatory" – toggle switch for the parameter that is mandatory to fill in for report generation.

- "System" – toggle switch for internal use. The parameter is not displayed in the generated report.

- "Combine with next in the period" – toggle switch combining parameters in the "from-to" period and automatically filling in parameters with a date type when selecting a standard period (today, yesterday, this week, etc.).

- "Parameter description" – description of the properties and usage of the parameter.

- group of parameters: "Start date", "Sign", "Days", "Hours", "Minutes and seconds" – creating a default date displayed when filling in report parameters (it can be changed).

Fig. 2.161: Creating a report

In the "Default rights" tab you can set the rights to view/manage the report. The same logic is implemented here as for granting default rights to layers (for more information, see *Creating a new layer* (page 108)).

### Editing a report

Clicking  (or double-clicking on a row with a selected report) opens a form similar to the creation form, where you can fill in/edit the fields with information about the selected report (Fig. 2.162). The following buttons become available while editing:

 – reload the original jrxml report file.

 – export the created report template in jrxml format.

---

Fig. 2.162: Editing a report

### Deleting a report

To delete a report, click  on the right side of the corresponding row. To delete several reports at the same time, check the corresponding lines and click  at the bottom of the screen. See *Deleting an element* (page 42) for more information about deleting system items.

## Searching for a report

In the "Report List" tab, you can use the search bar to search for reports by their names.

### 2.3.3.5.2 "Rights to reports" tab

When switching to the "Rights to reports" tab in the administration area, the following columns appear:

- "User" – user's full name;

- "Report" – name of the report;

- "Read" – toggle switch indicating whether this report is available to the selected user for viewing in the information window;

- "Edit" – toggle switch indicating whether this report is available to the selected user for management.



Fig. 2.163: "Rights to reports" tab

Using the ![Export] button, you can export an Excel file accesses.xlsx containing information about users and their rights to reports.

### Search for rights to reports

When switching to the "Rights to reports" tab, you can use the search bar to search for reports by their names and a filter selected from the drop-down list for searching by the user's full name, report name, main organization, user cluster, role, and rights to view and delete reports.

#### 2.3.3.6 "Datastores" block

In the "Datastores" block, you can view detailed information about databases presented in a table with the following columns: name, host, database, by default (Fig. 2.164).



Fig. 2.164: "Datastores" block

A mark next to the storage name in the "Default" box means that when you create or load a layer (report), the system automatically moves the layer (report) to the default storage (when you do not select a specific data store from the presented list).

To export data about datastores, click [Export]. A window for selecting a directory opens to save the "datastores.xlsx" Excel file on the computer. The exported table contains the following data: name, host, port, datastore, and data schema.

#### 2.3.3.6.1 Adding a new datastore

To add a new datastore to the system, click ![+ Create] at the top of the window. Fill in the following fields in the opened window (Fig. 2.165):

- **Name** – datastore name,

- **Host** – server address,

- **Port** – port for database connection,

- **Login** – login for access to the datastore,

- **Password** – password for access to the datastore,

- **Database** – name of the database in which the datastore is created,

- **Data scheme** – element of the data storage structure.



Fig. 2.165: Adding a new datastore

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### 2.3.3.6.2 Editing a datastore

To edit datastore information, click ![pencil icon] (or double-click the row with the selected data store). A form appears in the administration area with the same fields as in the add form. Here you can fill in/change the fields of interest with information about the selected datastore. The administrator has access to all fields for editing, except for the "Name" field.

### 2.3.3.6.3 Deleting a datastore

To delete data store, click ![trash icon] on the right side of the corresponding row. To delete several data stores at once, check the corresponding rows and click ![Delete button] at the bottom of the screen. For more information about deleting system elements, see *Deleting an element* (page 42).

### 2.3.3.6.4 Layer publishing

To publish a layer in the system, hover over the row with the datastore name and click the "Available tables" button ![icon]. A new window opens where you can view the full list of available datastore layers and their geometry types (Fig. 2.166).

In addition, you can view which layers are available for publishing and which ones are already published. For published layers, the "Published" column has a checkmark, and to the right of the names of unpublished layers, there is a "Publish" button.
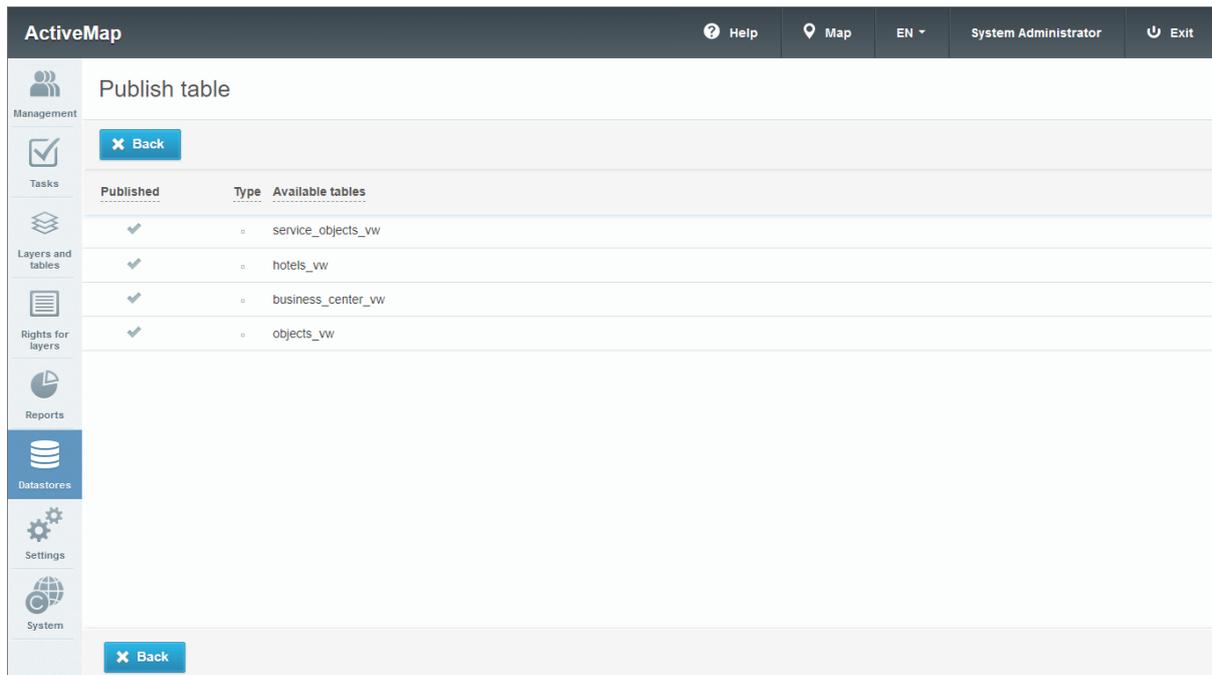
Fig. 2.166: Available tables in the datastore

Clicking "Publish" takes you to the window for editing the selected layer. In this window, you have to select a group for publishing the layer, define its style, change its name, and, if necessary, add new attributes (in the "Attributes" tab) and additional fields (in the "Additional" tab).

To publish a layer in the system, fill in the required input fields and click

✔ **Save and exit** . To cancel publication, click ✖ **Cancel** .
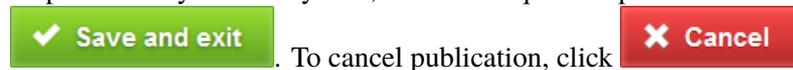
### 2.3.3.6.5 Searching for datastores

In the "Datastores" block, you can use the search bar to search for a datastore by its name, database name, or host name. In addition, you can search using the "From infrastructure" filter, which allows users to find datastores that work with the MapEditor program.

### 2.3.3.7 "Settings" block

> **Danger:** Developers verified the values of the existing settings during debugging. Changes in this block may cause the system to malfunction or stop working.

In the "Settings" block, you can configure various elements of the system (Fig. 2.167).
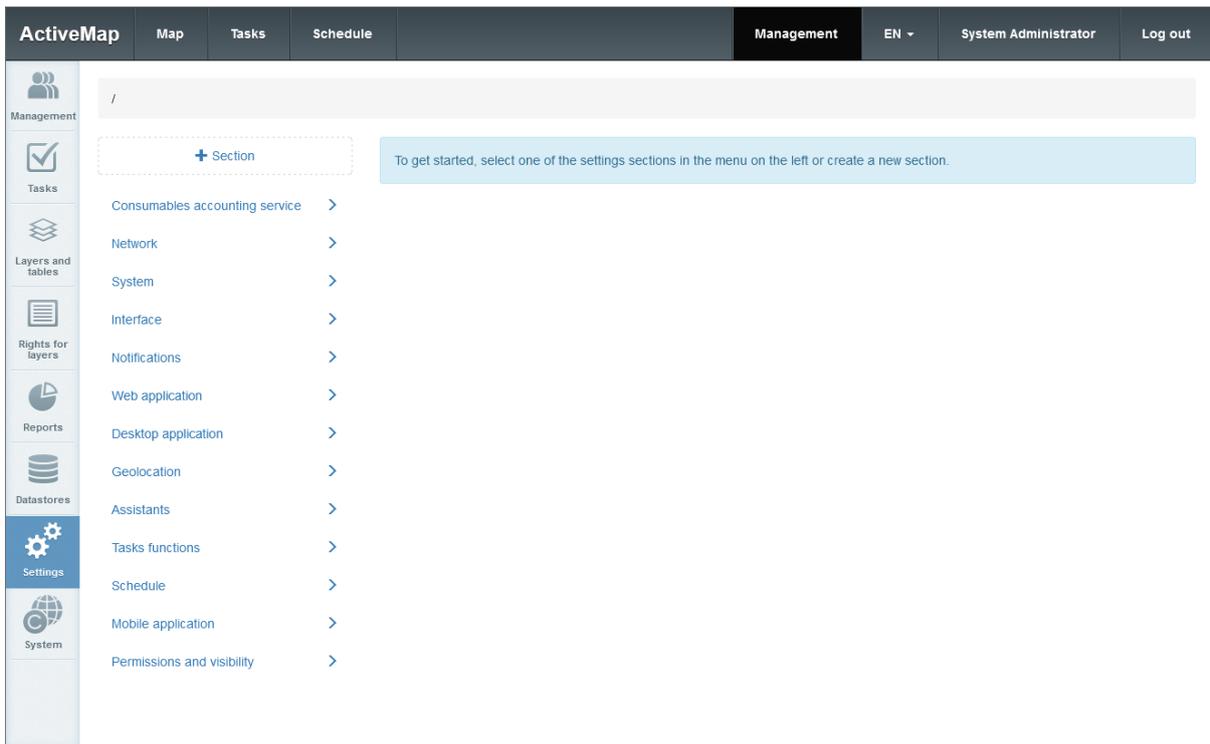
Fig. 2.167: "Settings" block

They are divided into thematic sections. Each section contains folders and subfolders with settings and their values (Fig. 2.168).
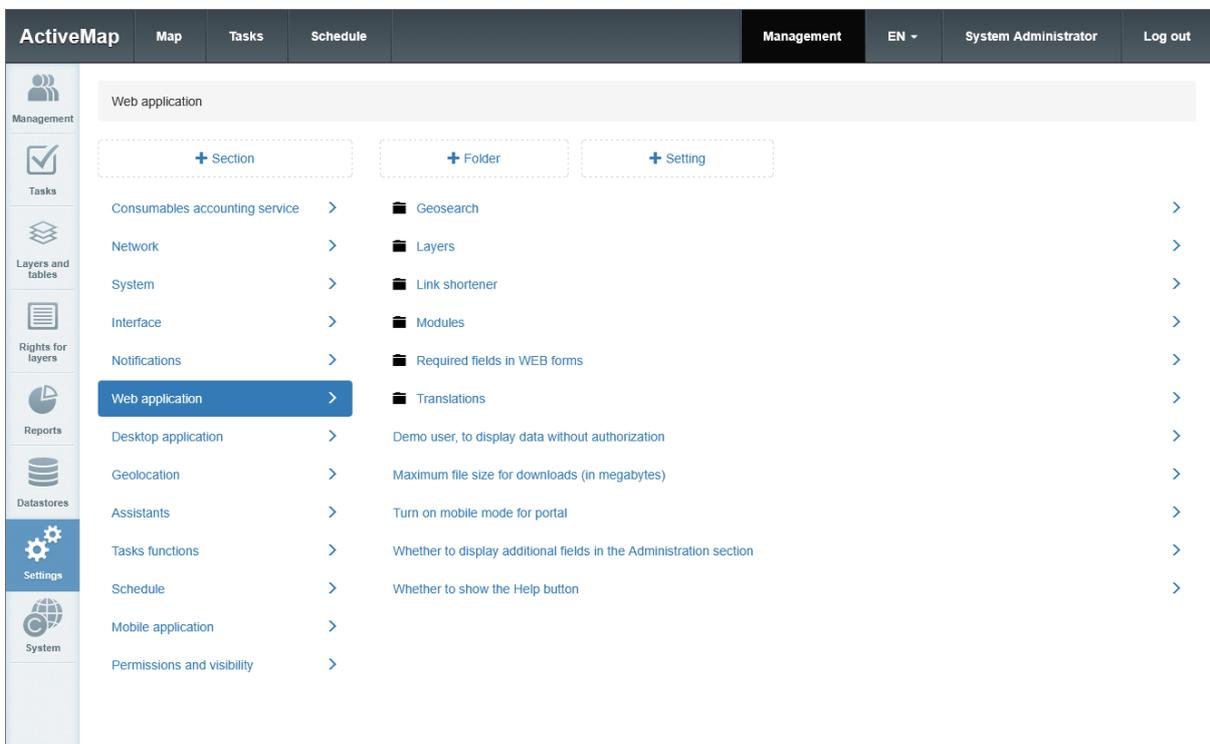


Fig. 2.168: Structure of the "Settings" block

Editing and deleting the default settings values is not available.

To add a new setting to an element of the system, select the appropriate section, then click the "+ Settings" button. A form opens with fields to fill in (Fig. 2.169):

- "Key" – name in the system in Latin alphabet characters;

- "Name" – name in the interface;

- "Type" – data type (string, integer number, logical value, or real number).
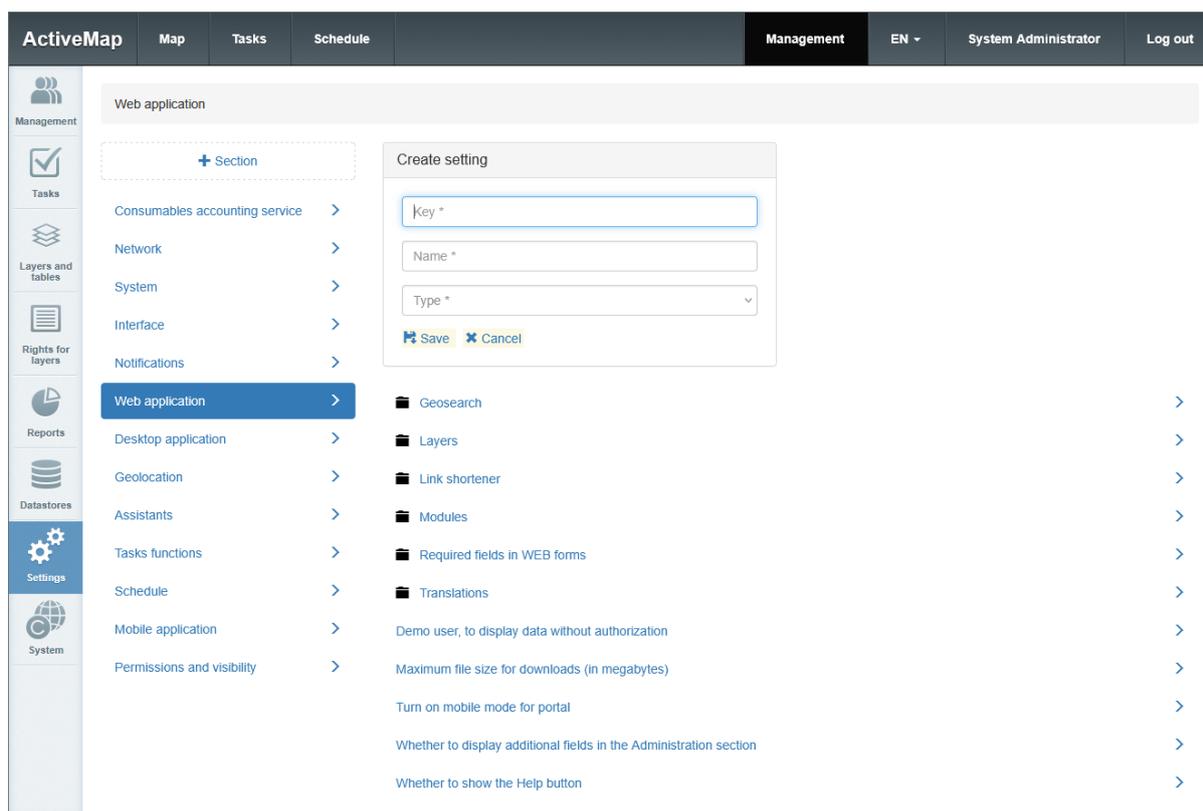


Fig. 2.169: Creating the setting

To set a new value for the setting, select the setting and click "+Value". A window opens with fields to be filled in (Fig. 2.170):

- "Value" – value the setting is equal to in the system (depends on the data type specified when creating the setting);

- "Organization" – organizations to which this setting is applied;

- "User" – users to whom the setting is applied;

- "Role" – user roles to which the setting is applied;

- "State" – statuses of the task to which the setting is applied.
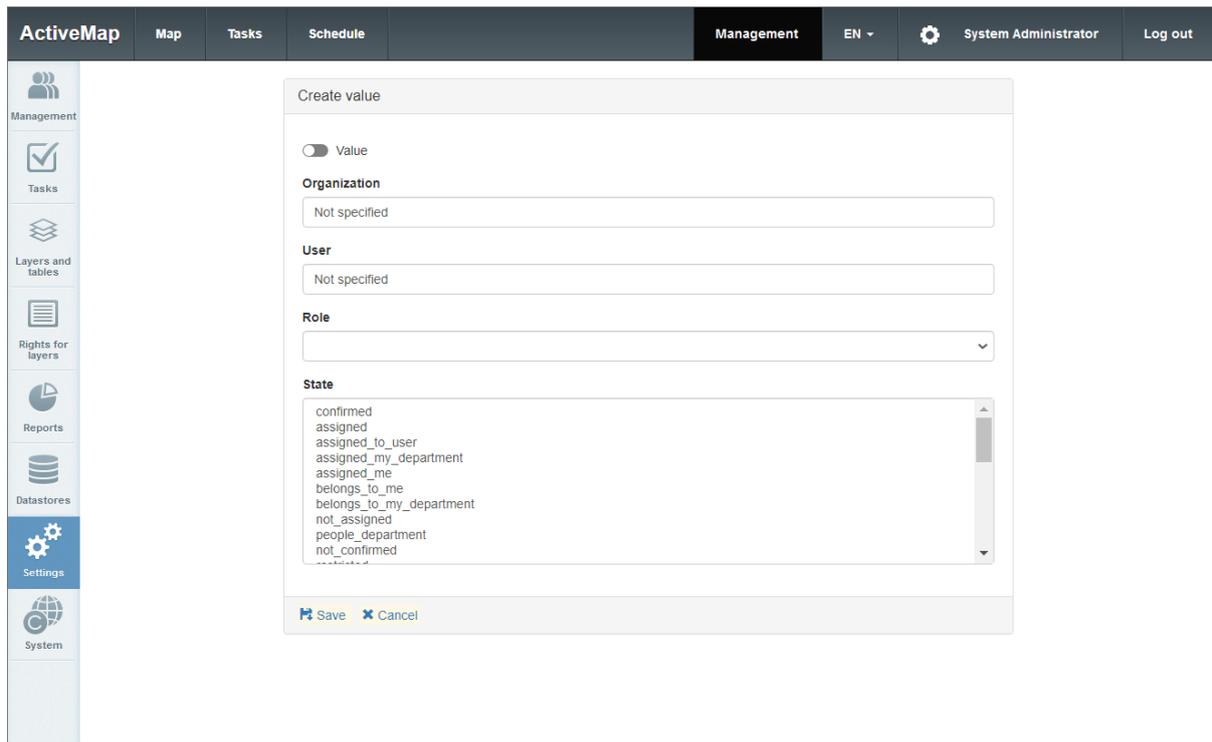
Fig. 2.170: Adding a value

**Attention:** The setting can be specified either for a particular user or for a role in the system. If the "Organization", "User", and "Role" fields are not filled in, the setting is available to all users of the system.

To edit the added value, click . Make the changes in the opened window and click "Save". To delete the added value, click . Confirm or cancel the deletion in the dialog box.

### 2.3.3.7.1 "Consumables accounting service" section

To use the method of calculating the cost of work online, configure the "Invoice" module in the application. This section allows users to add settings to this module (Fig. 2.171). You can set a new value by selecting the setting, then clicking "+ Value". In the window that opens, enter the required name and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
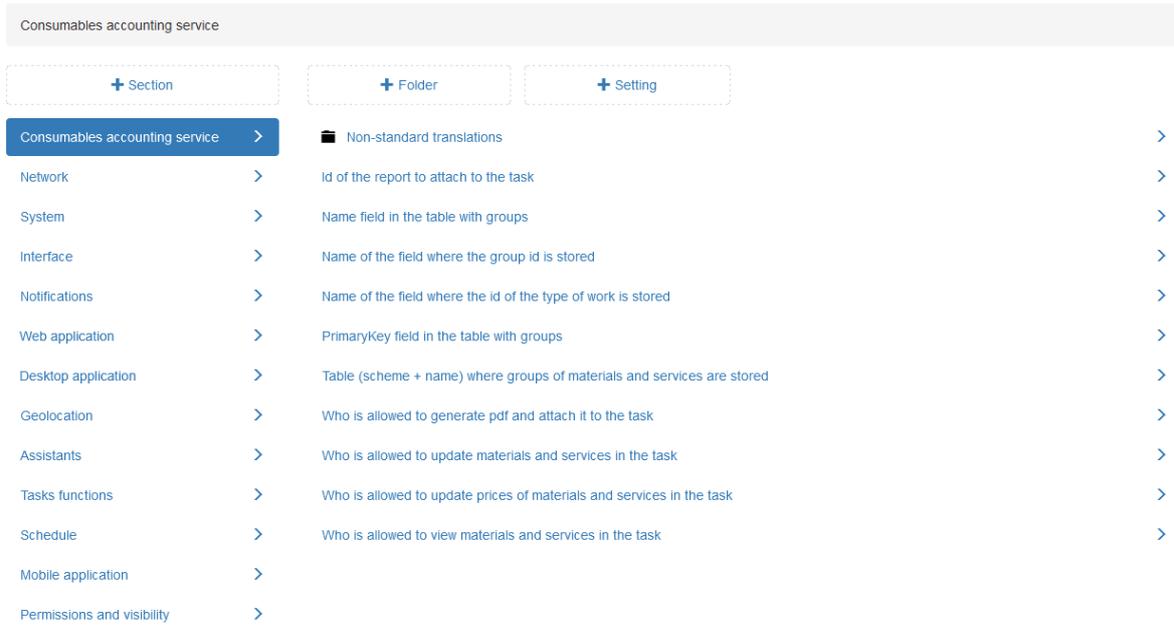
Fig. 2.171: "Consumables accounting service" section

## Non-standard translations

In this folder, you can rename fields of the module. Select a language from the list presented, then click "+ Setting". Enter the appropriate values in the opened window (Fig. 2.172):

- "Key" – key in the system to be renamed;

- "Name" – name of the field to be renamed;

- "Type" – data type (in this case, a string).



Fig. 2.172: Changing the field name

Next, set a new value for this setting (Fig. 2.173). Restart the service to apply the new value.
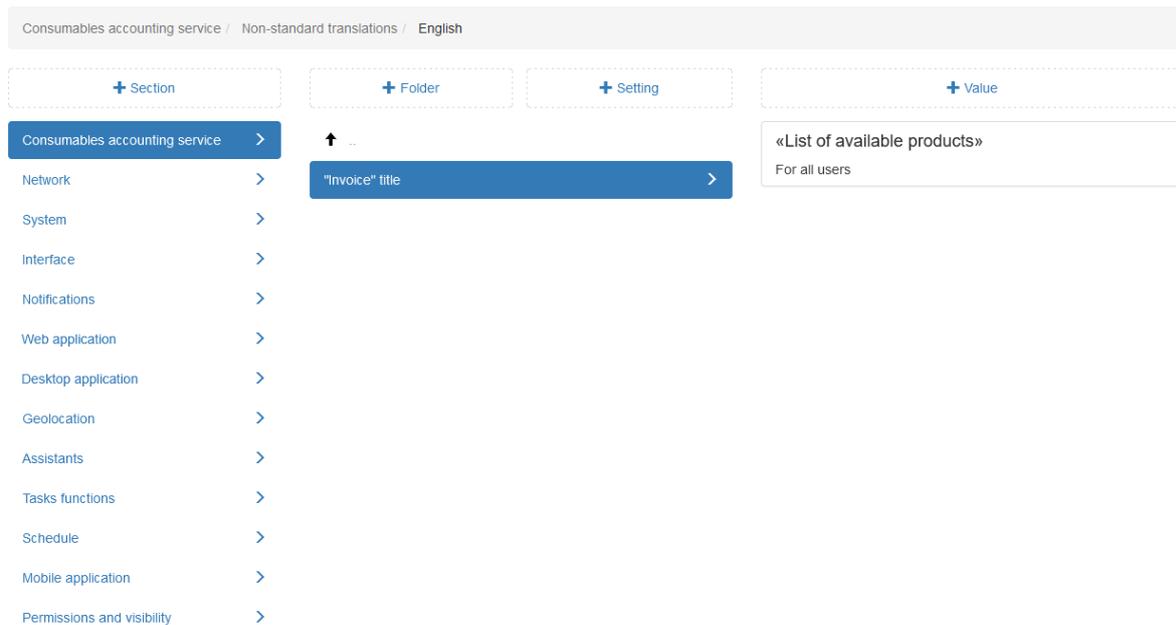
Fig. 2.173: Adding a new value

### Id of the report to attach to the task

This setting displays the ID of an existing report in the system, which is loaded when an invoice is generated in the task card in PDF format. By default, the system uses a report with ID 343 (Fig. 2.174). Restart the service to apply the new value.
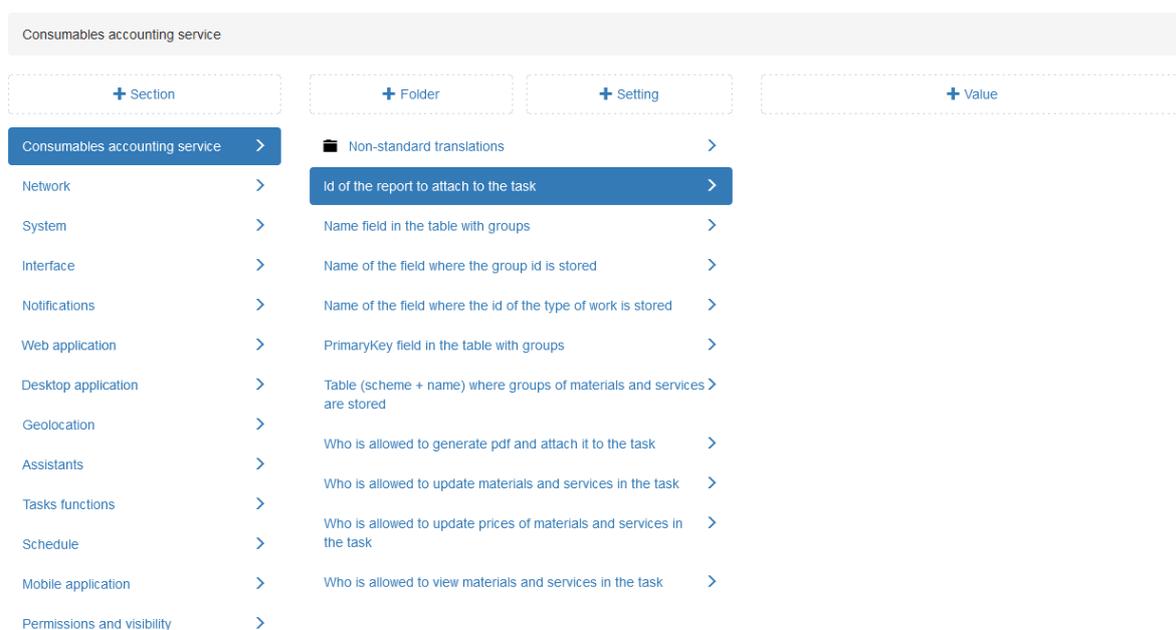


Fig. 2.174: Specifying the report ID

### Name of the field where the group id is stored

To add a filter by material and service groups in the ActiveMap Mobile application, create a table with material and service groups, for example, "Group of materials". Then add this reference table (dictionary) to "Materials and services" table. The field should have **sys_group_id** database name (Fig. 2.175), as it is recognized in the database by default.
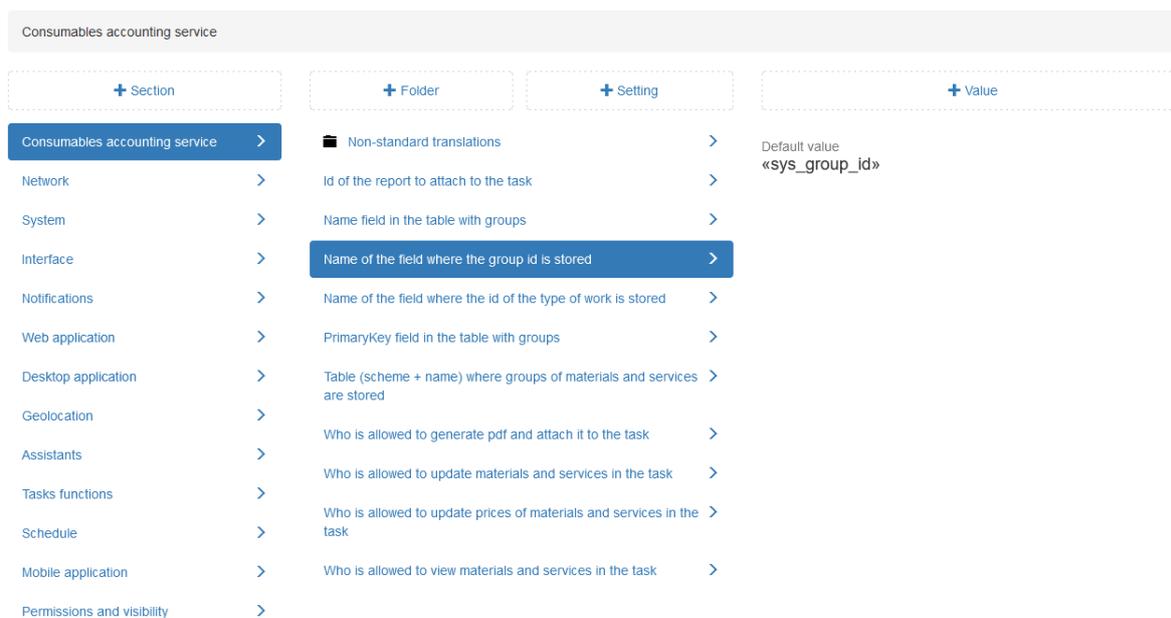


Fig. 2.175: The name of the field where the group ID is stored

Next, fill in the **Table (scheme + name) where groups of materials and services are stored** setting, specifying where the group of materials and services is stored (Fig. 2.176).

Fig. 2.176: Table where material and service groups are stored

In the **PrimaryKey field in the table with groups**, add a new value, for example gid (Fig. 2.177).



Fig. 2.177: PrimaryKey field in the table with groups

In the **Name field in the table with groups** setting, specify the name of the field where the group names from the material group table are stored (Fig. 2.178).
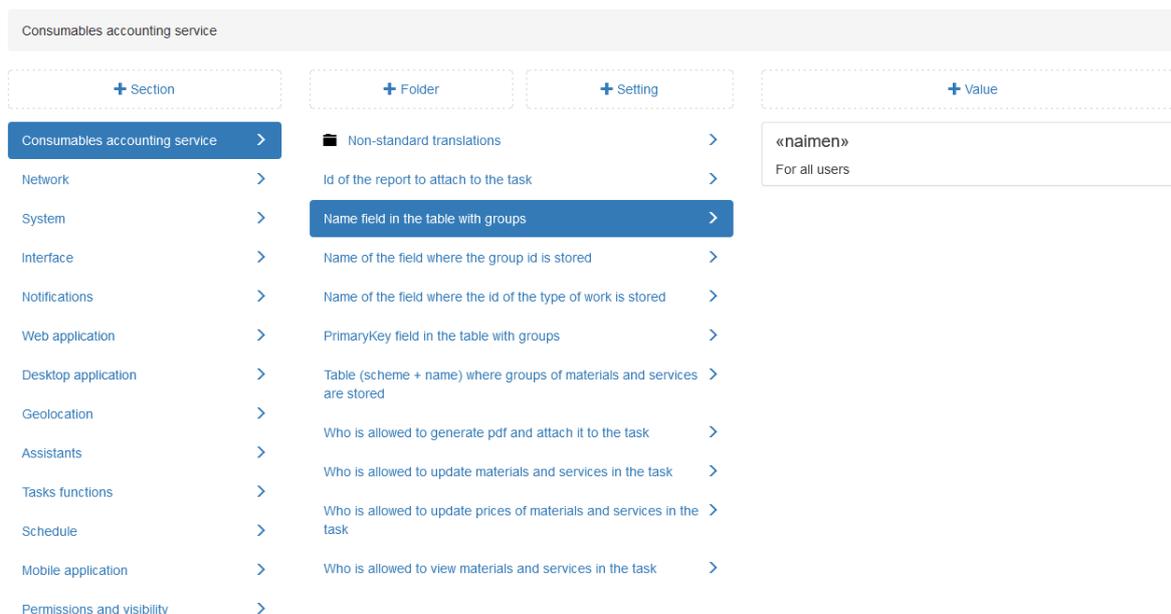
Fig. 2.178: Name field in the table with groups

Next go to the MapEditor or ActiveMap Desktop desktop application and fill in the newly created reference table, adding the appropriate groups, and then the "Materials and services" table with the appropriate values. Restart the service to apply the new setting.

### Name of the field where the id of the type of work is stored

To add a filter by types of work in the "Invoice" module of the ActiveMap Mobile application, define the name of the attribute in the table with materials and services where the work type ID is stored. The default name is **sys_type_id** (Fig. 2.179). Next, add the corresponding attribute to the table with materials and services ("Integer" field type). Then open the table management in the MapEditor desktop application and select the "Materials and services" table. Fill in the **sys_type_id** field by specifying the IDs of the necessary work types. Restart the service to apply the new value.

Fig. 2.179: Name of the field where the id of the work type is stored

### Who is allowed to generate pdf and attach it to the task

This setting allows users to generate a PDF invoice and attach it to the task (Fig. 2.180). However, the specified user must first be granted rights to the corresponding report. Otherwise, it is not possible to generate an invoice.



Fig. 2.180: Providing access to generate an invoice

### Who is allowed to update materials and services in the task

This setting allows you to grant the right to edit an invoice (add materials, change the quantity) and save the changes made within the task. However, this setting does not allow you to generate an invoice within the task (Fig. 2.181).



Fig. 2.181: Granting access to edit an invoice

### Who is allowed to update prices of materials and services in the task

This setting allows you to specify the roles or users who can change prices of materials and services in the invoice within the current task (Fig. 2.182).
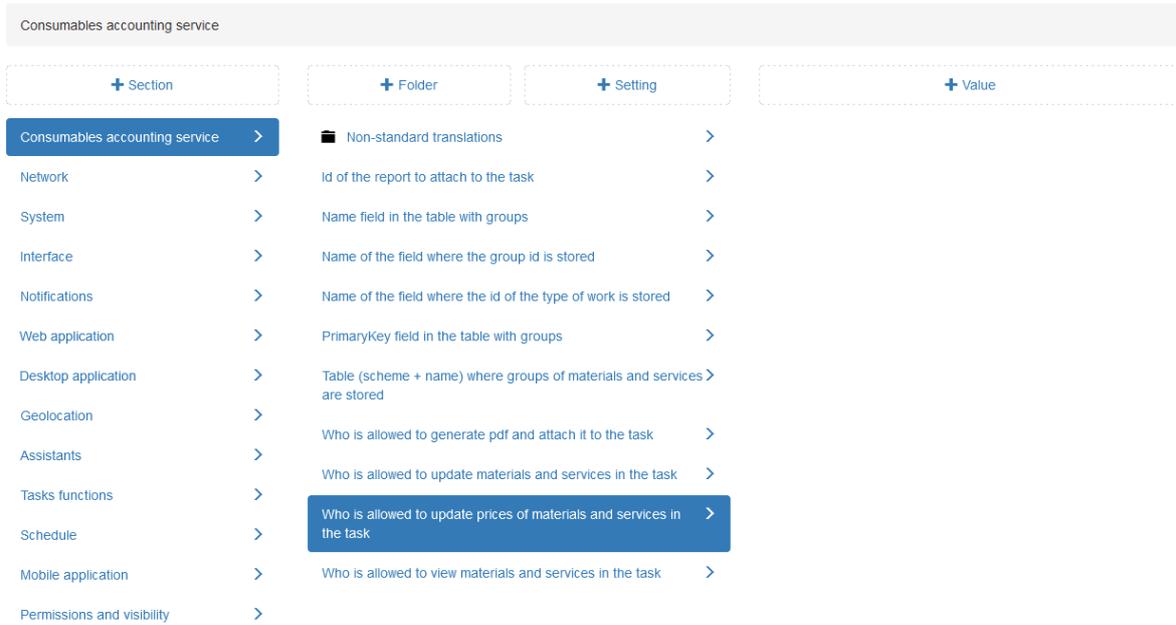
Fig. 2.182: Granting access to edit the invoice

### Who is allowed to view materials and services in the task

This setting allows you to specify users who can view an invoice generated by another user (:Fig. 2.183).
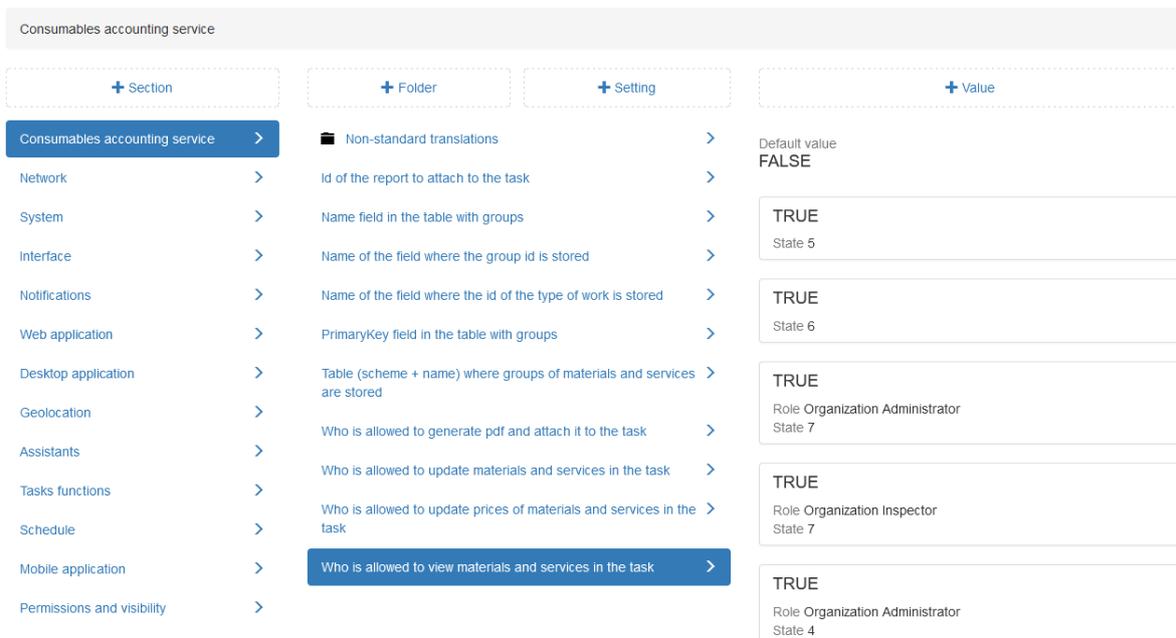


Fig. 2.183: Providing access to view an invoice

### 2.3.3.7.2 "Network" section

In this section, you can add a public server that is automatically displayed when logging into the mobile application. In this case, you do not need to enter the address manually. Click on the server and proceed to enter the login and password (Fig. 2.184). If necessary, you can set a new value by selecting the setting and then clicking "+Value". In the opened window, turn on/off the toggle switch or enter the required name, and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
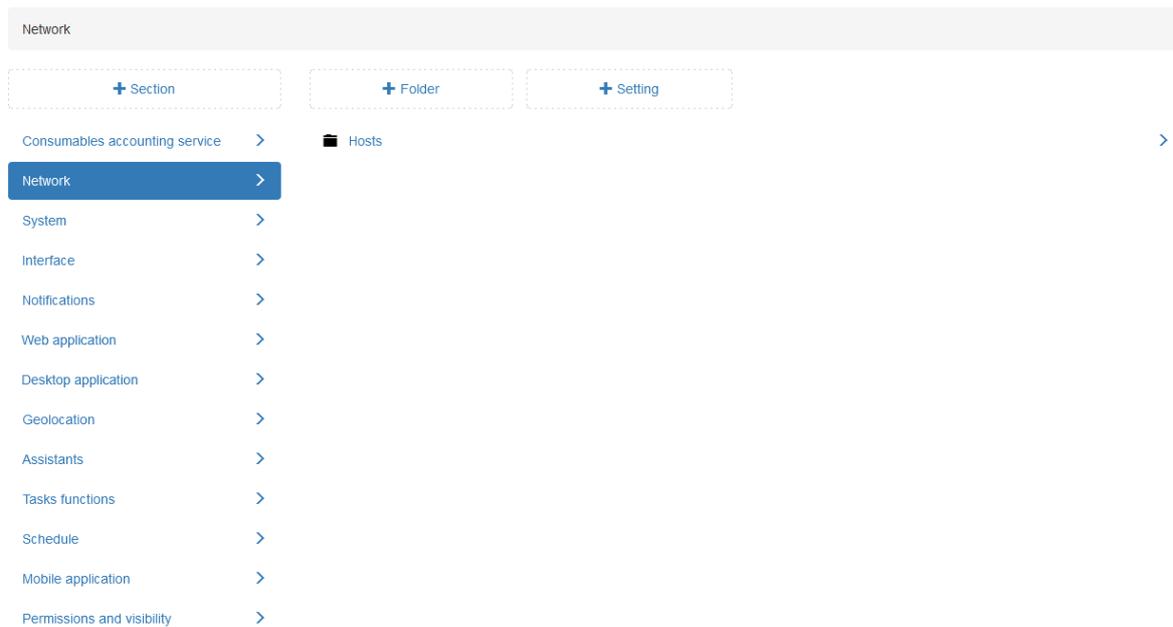


Fig. 2.184: "Network" section

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**Attention:** The setting works only if the server address is registered in the mobile application.

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### Hosts

To add a public server, add the following settings in this folder by clicking "+ Setting" and entering the corresponding names:

- Use SSL (key – is_secure, data type – boolean) (Fig. 2.185);

- Server name (key – label, data type string) (Fig. 2.186);

- Host (key – host, data – type string) (Fig. 2.187).
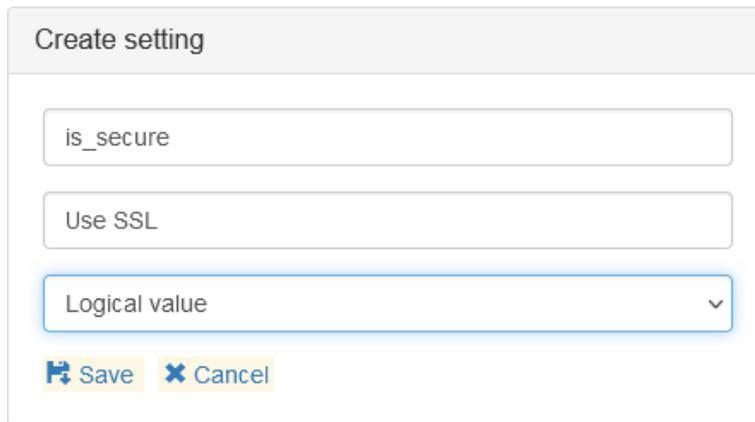
Fig. 2.185: Use SSL
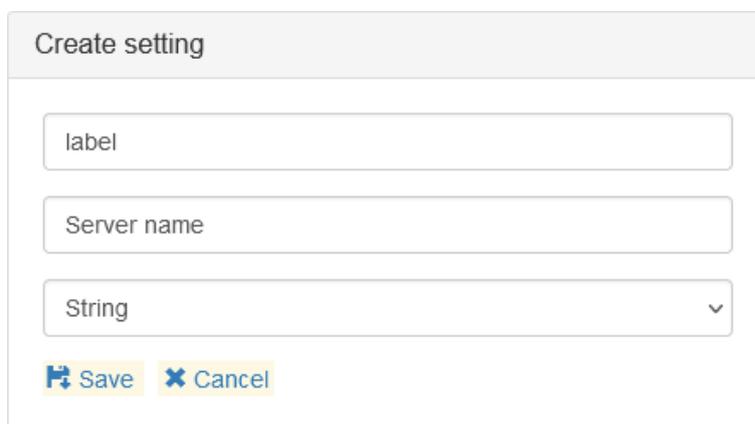


Fig. 2.186: Server name



Fig. 2.187: Host

Next, set the corresponding value for each setting by selecting it from the list (Fig. 2.188).
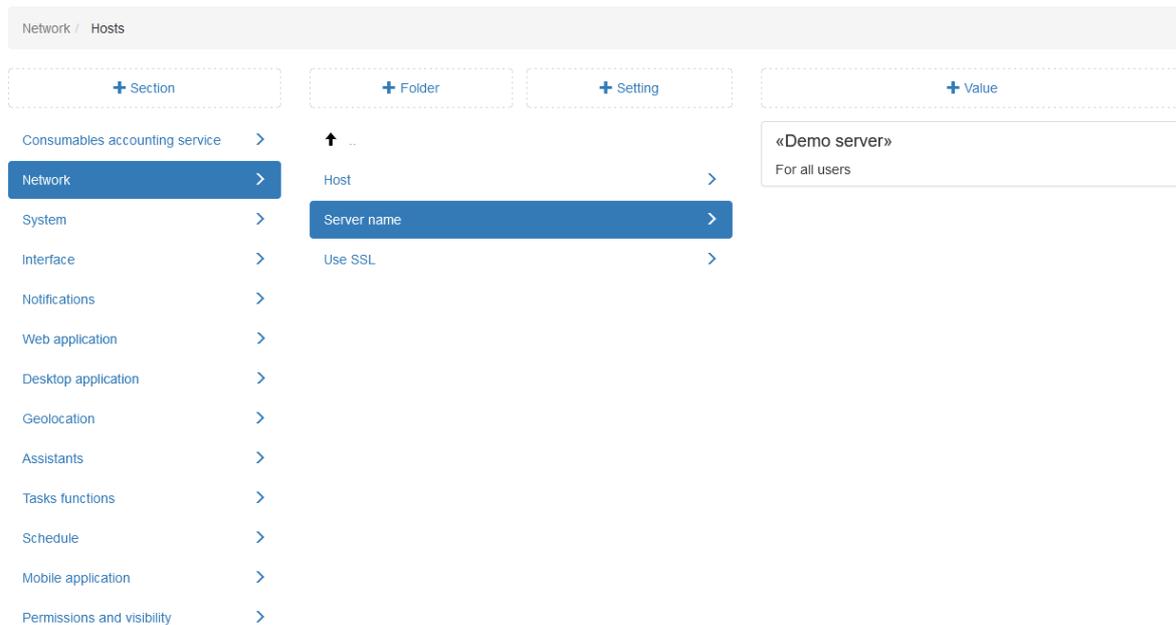
Fig. 2.188: Name of the demo server

### 2.3.3.7.3 "System" section

This section contains additional settings for the Cerebellum (Fig. 2.189).
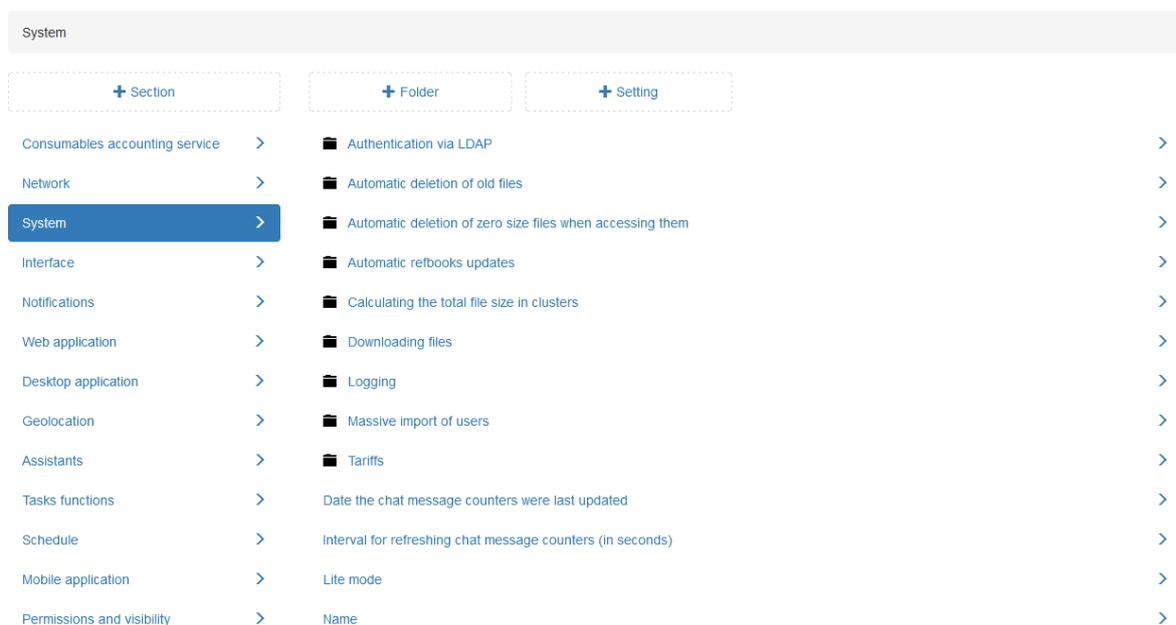


Fig. 2.189: "System" section

## Authentication via LDAP

The system has a setting for integration with LDAP. LDAP is a single authorization system used by all software products in an organization. By default, LDAP is disabled.

To connect user authorization via LDAP, set the appropriate values in the **"Host"** and **"Port"** settings. Next, fill in **"Administrator login"** and **"Administrator password"** by entering the LDAP user data under which authorization and search of other users is performed (Fig. 2.190).
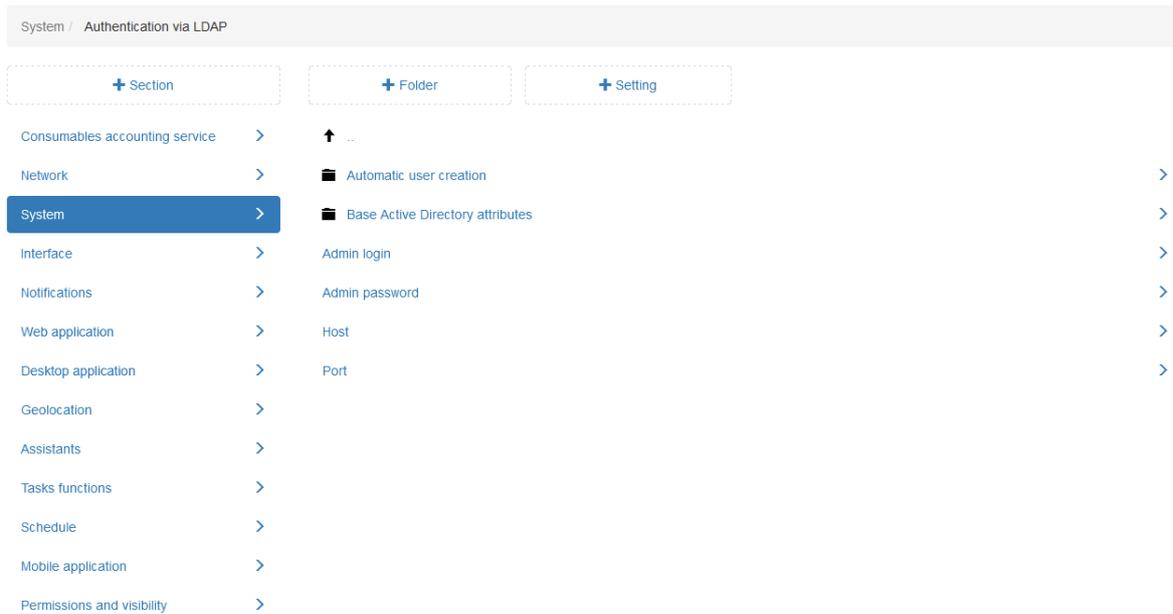


Fig. 2.190: Authentication via LDAP

## Automatic user creation

The system has a setting for automatic creation of a new user if this user account exists in the Microsoft Active Directory. Users are created in one organization with the role of "Executor". Later, the administrator can transfer the data of these users to the necessary organization and change their role in the system (Fig. 2.191).
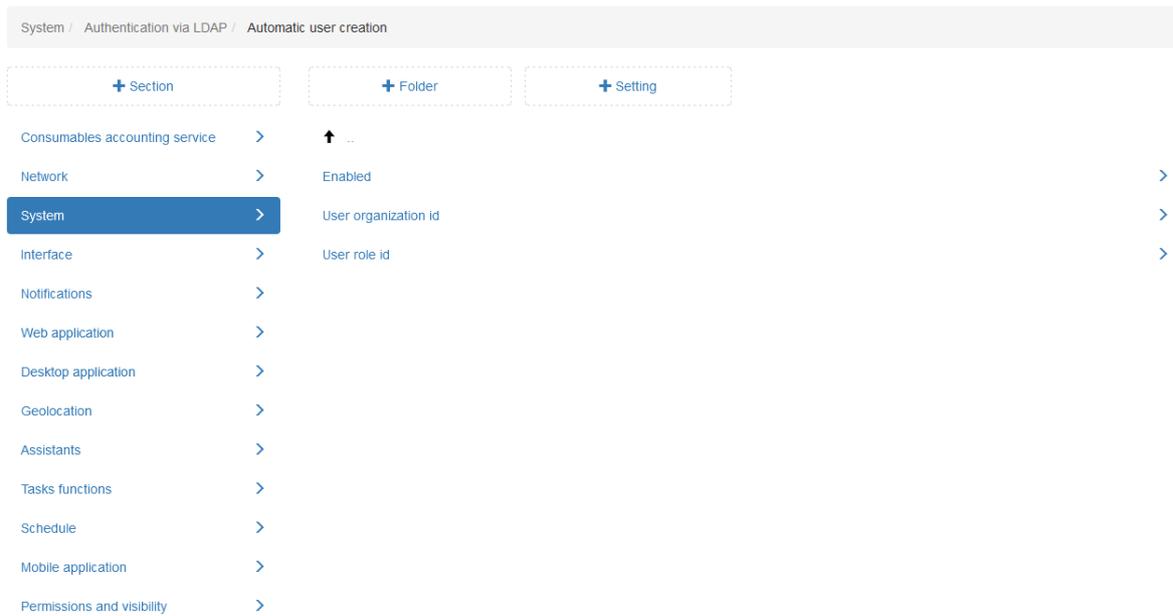
Fig. 2.191: Automatic user creation

### Base Active Directory attributes

In this folder, the administrator should register the correspondence of the standard fields of the ActiveMap system user and LDAP fields (Fig. 2.192).
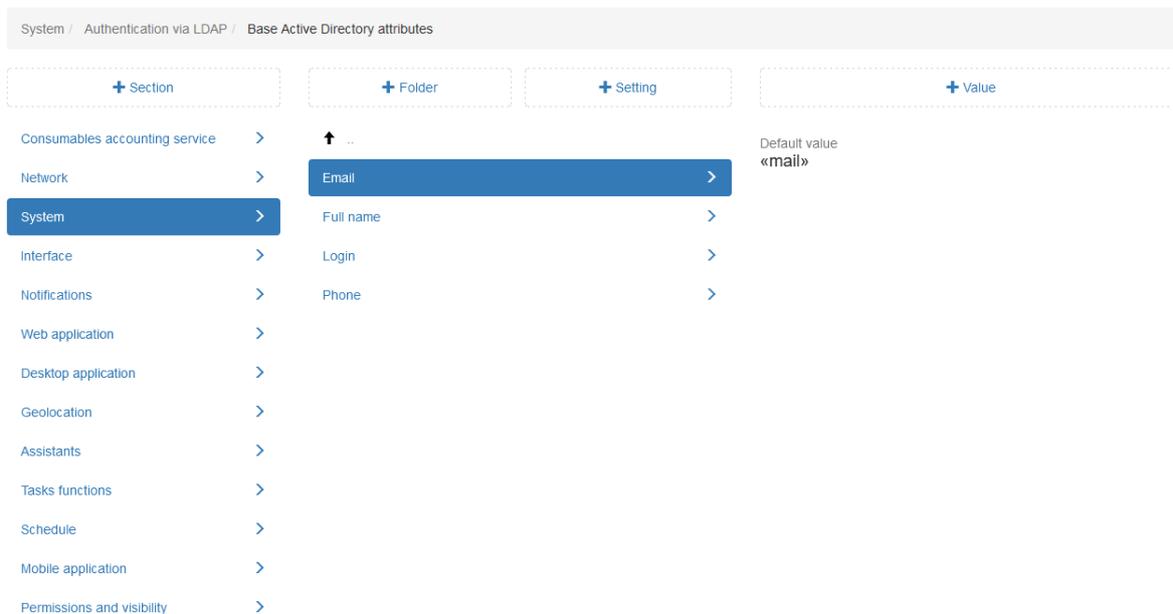


Fig. 2.192: Base Active Directory attributes

## Automatic deletion of old files

The system has a limit on the maximum total volume of task files. This includes all files, for which there are records in the database, including logically deleted files, template task files, and others. Cerebellum receives information from the database about files to be deleted and cleans them at the specified time, if necessary. Files to be deleted are stored in the following order:

- Deleted files,

- Files of deleted tasks,

- Files of tasks not in the "In Progress" step.

Cerebellum periodically checks whether the volume of files exceeds the limit on the total volume. If it exceeds the limit, files are retrieved for deletion in the specified order. This setting is disabled by default (Fig. 2.193).



Fig. 2.193: Automatic deletion of old files

**Allow to delete files in tasks only with the following priorities**

In this setting, you can specify the IDs of the task priorities where files should be deleted (Fig. 2.194). You can specify priorities using identifiers (IDs) separated by commas.
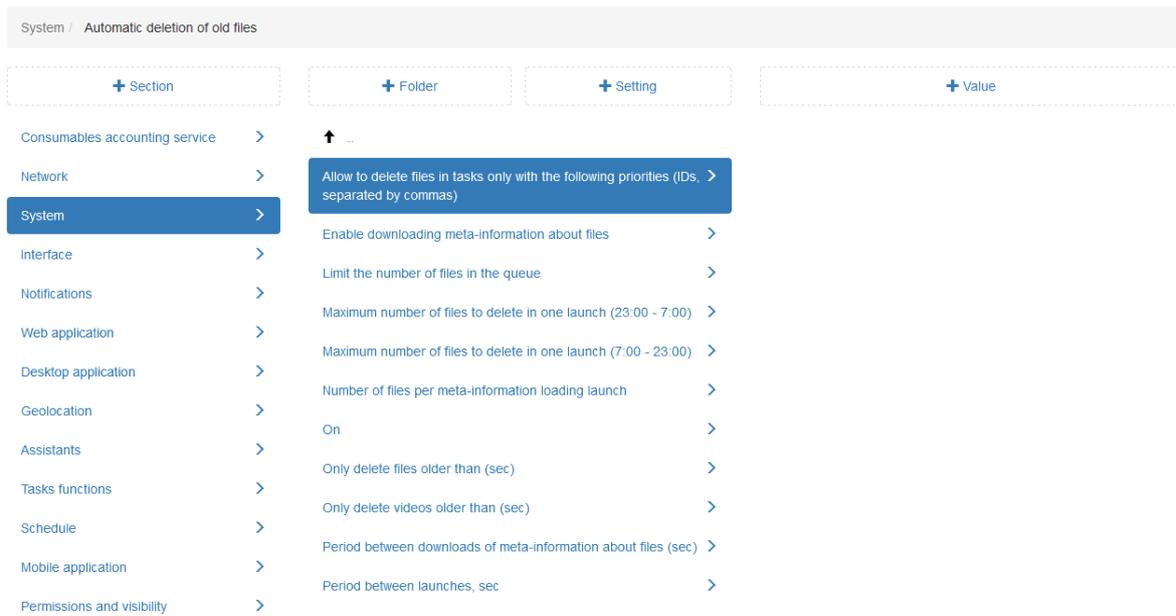
Fig. 2.194: Allow to delete files in tasks only with the following priorities

### Enable downloading meta-information about files

This setting enables downloading metadata about files that are to be deleted. Metadata can include various file attributes such as name, size, creation date, etc. By default, this setting is disabled (Fig. 2.195).
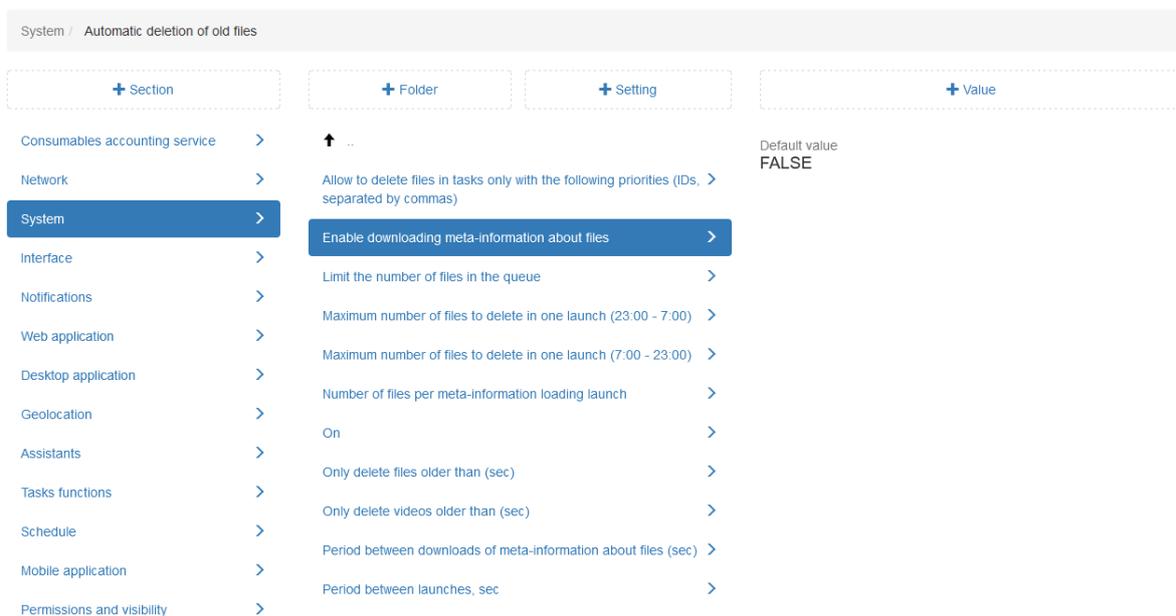


Fig. 2.195: Enable loading file metadata

### Limit the number of files in the queue

Here you can set the maximum number of files that can be queued for deletion. When files are added to the queue, the auto-deleter gradually

deletes them according to the set parameters. The default is 10000 files
(Fig. 2.196).



Fig. 2.196: Limit on the number of files in the queue

### Maximum number of files to delete in one launch (7:00 – 23:00)

The setting specifies a limit on the number of files that can be deleted at
one time in the specified time interval. For example, if the value is set
to 50, the auto-deleter deletes no more than 50 files within the specified
time period. The default is 1 file (Fig. 2.197).



Fig. 2.197: Maximum number of files to delete in one launch (7:00 – 23:00)

**Maximum number of files to delete in one launch (23:00 – 7:00)**

The setting specifies a limit on the number of files that can be deleted at one time during the specified time interval. For example, if the value is set to 50, the auto-deleter deletes no more than 50 files within the specified time period. The default is 1 file (Fig. 2.198).



Fig. 2.198: Maximum number of files to delete in one launch (23:00 – 7:00)

**Number of files per meta-information loading launch**

This setting determines the number of files for which metadata is requested in each upload cycle. For example, if set to 100, the auto-deleter requests metadata about 100 files per operation. The default is 1000 files (Fig. 2.199).

Fig. 2.199: Number of files per meta-information loading launch

**Delete files only older than (sec)**

The setting specifies the storage time for task files (in seconds). If files have been stored for longer than the specified time, they are automatically deleted. The default is 180 days (Fig. 2.200).



Fig. 2.200: Delete files only older than (sec)

**Delete videos only older than (sec)**

The setting specifies the storage time for the task video files (in seconds). If a video has been stored for longer than the specified time, it is

automatically deleted. The default setting is 45 days (Fig. 2.201).



Fig. 2.201: Delete videos only older than (sec)

**Period between downloads of meta-information about files (sec)**

This setting determines the time interval (in seconds) after which the auto-deleter downloads file meta-information. For example, if the value is set to 3600, then the meta-information is loaded every hour. The default is 300 seconds (Fig. 2.202).



Fig. 2.202: Period between downloads of meta-information about files

**Period between launches**

The setting determines the time interval (in seconds) between successive launches of the auto-deleter. For example, if the value is set to 3600, the auto-deleter runs every hour. The default is 1 second (Fig. 2.203).



Fig. 2.203: Period between launches

## Automatic deletion of zero size files when accessing them

When a file is deleted, information about it may remain in the database. Storing such information increases the storage space used. Use this setting to delete such empty records. The setting is disabled by default (Fig. 2.204).

Fig. 2.204: Automatic deletion of zero size files when accessing them

## Automatic refbooks updates

This folder contains system settings responsible for updating data in reference tables and types of work (Fig. 2.205).
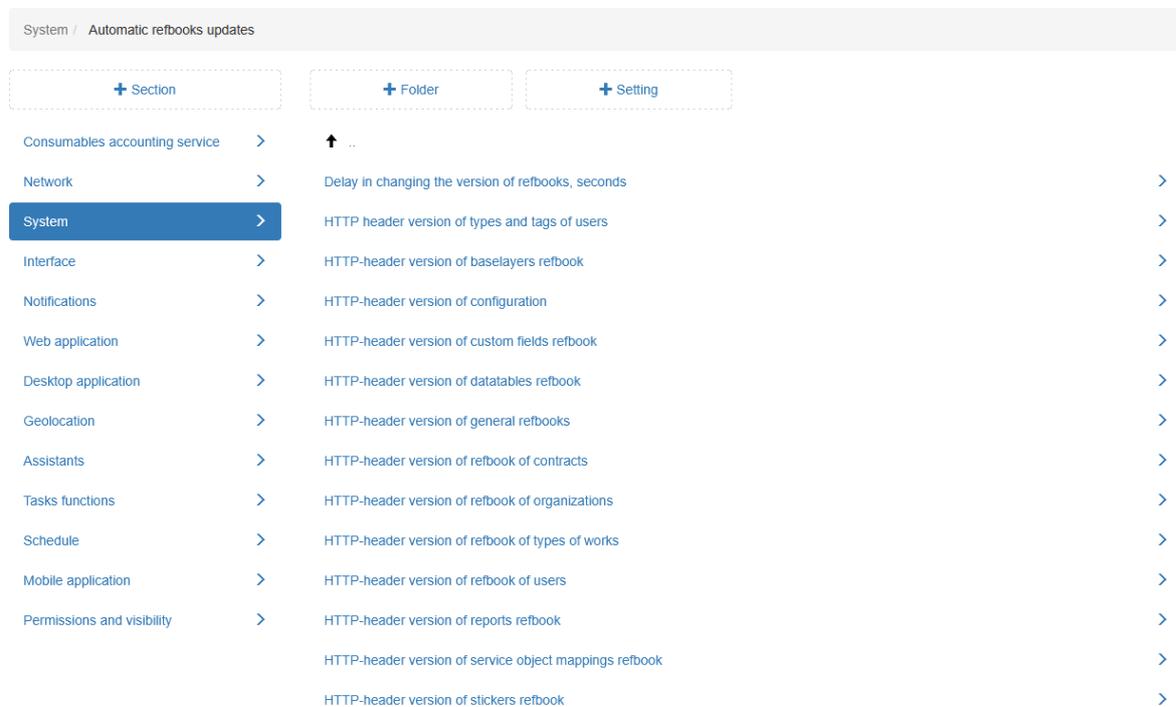


Fig. 2.205: Automatic updating of reference tables

**Delay in changing the version of refbooks, seconds**

When adding a value to a reference table (work type, priority, custom field, etc.), the system can automatically update data in the applications. This setting specifies, how often (in seconds) the system sends data to all applications (Fig. 2.206). In this case, the user does not need to update the data manually to get the actual values.



Fig. 2.206: Delay in changing the version of reference tables, seconds

## Calculating the total file size in clusters

The setting allows you to set the maximum size of the disk space change list per cluster. It specifies how many changes per cluster should be skipped before making an update when calculating the total file size in clusters. The default is 5000 changes (Fig. 2.207).
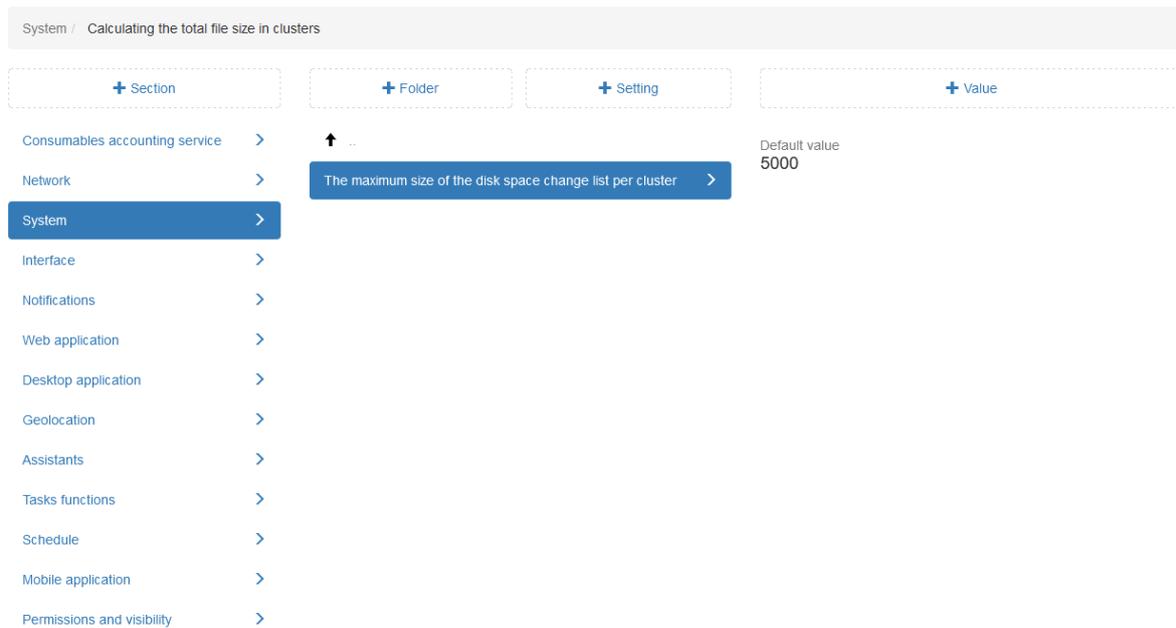
Fig. 2.207: Configuring the maximum size of the disk space change list per cluster

### Downloading files

When connecting an external server for data storage, you can specify the storage location for each directory in this setting. After that, this directory is created on the server, and the files are stored in the specified location (Fig. 2.208).
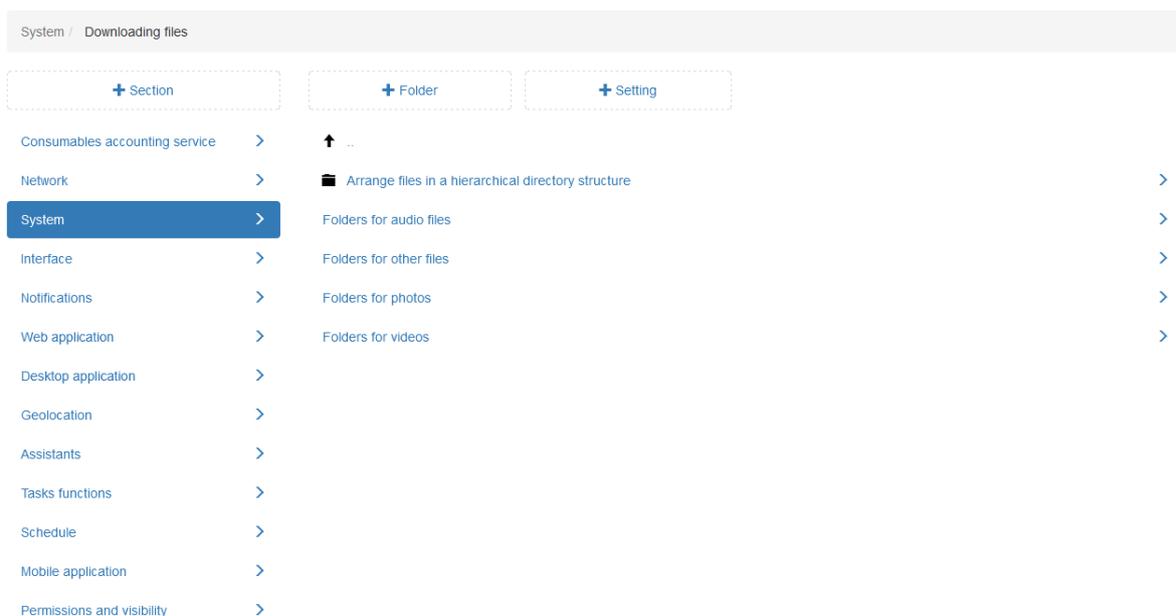


Fig. 2.208: Downloading files

### Keys

This setting allows you to register access keys for basemaps protected by third-party organization rights for use in different applications of the System ([Fig. 2.209](#)).



| System / Keys |
|---|

| + Section | + Folder | + Setting |
|---|---|---|

| Consumables accounting service | > |
| Network | > |
| System | > |
| Interface | > |
| Notifications | > |
| Web application | > |
| Desktop application | > |
| Geolocation | > |
| Assistants | > |
| Tasks functions | > |
| Schedule | > |
| Mobile application | > |
| Permissions and visibility | > |
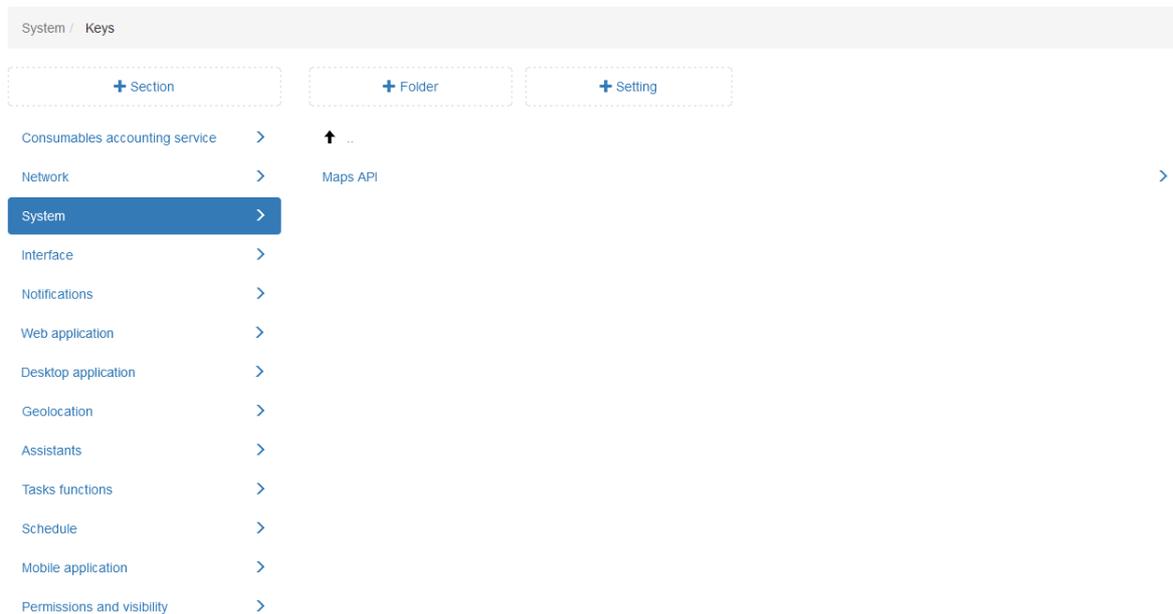
Fig. 2.209: API key setting

### Logging

The setting allows you to automatically record in chronological order the events that occur with the task (creation, commenting). This setting is enabled by default ([Fig. 2.210](#)).
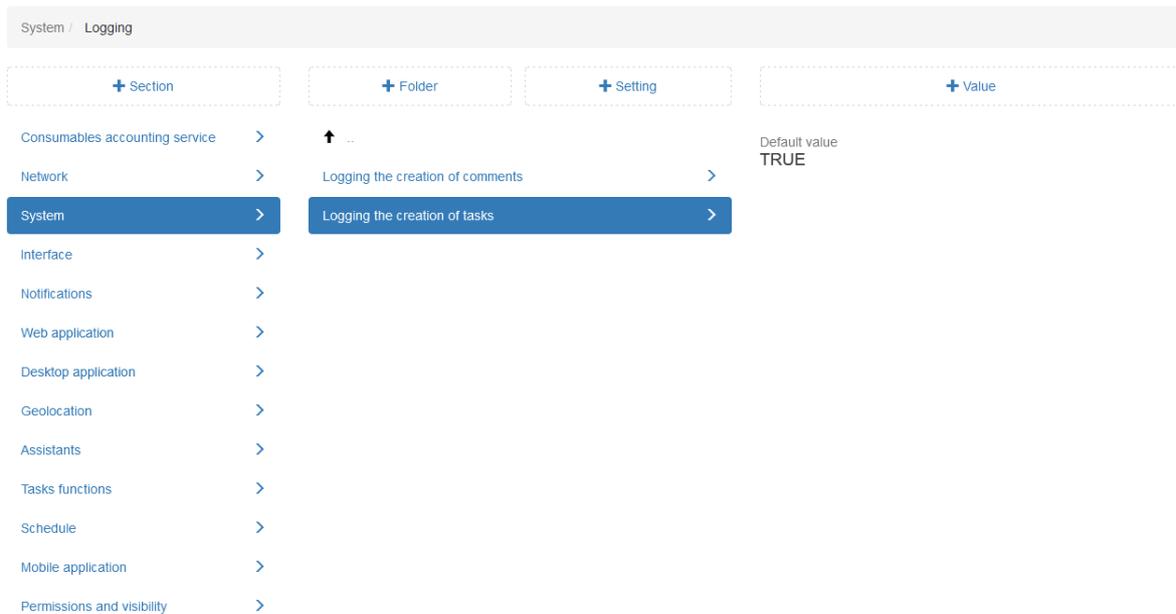
Fig. 2.210: Logging

## Massive import of users

The setting allows you to set the maximum number of users imported into the system in a single request. The default is 1000 users (Fig. 2.211).
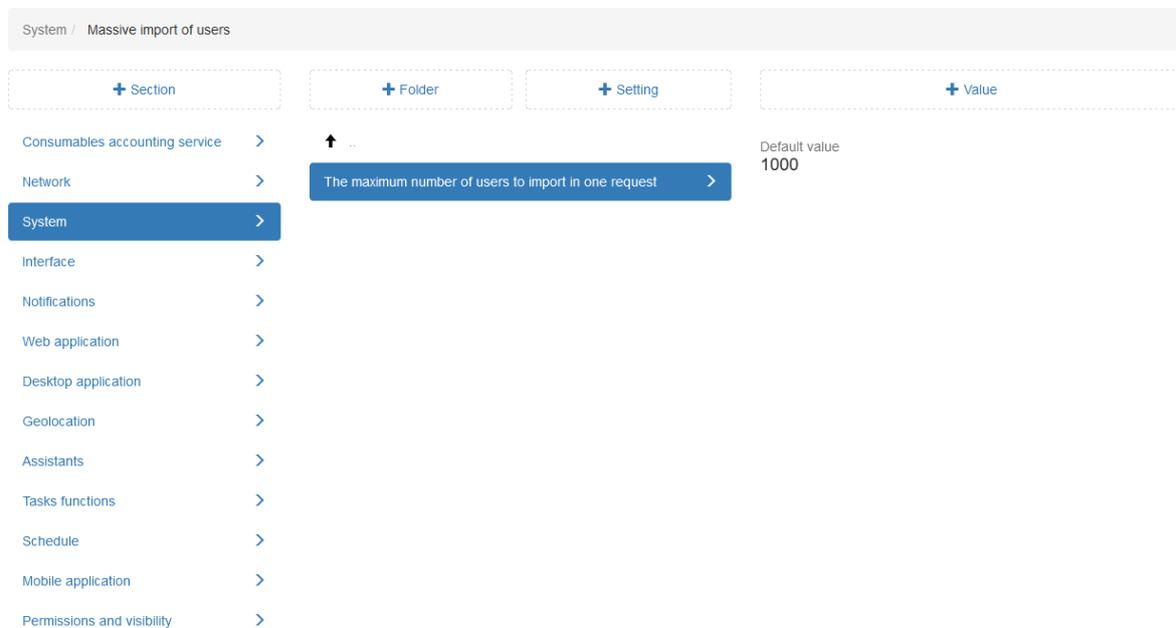


Fig. 2.211: Setting the maximum number of users to import in one request

### Date the chat message counters were last updated

Engineering setting. This value is for developer use only during debugging.

### Interval for refreshing chat message counters

Engineering setting. This value is for developer use only during debugging.

### Lite mode

This setting allows using the system without providing a dedicated server for each organization. By default, this setting is disabled.

### 2.3.3.7.4 "Interface" section

This section allows the administrator to customize individual interface elements across system applications. In the "Fields" folder, you can configure (Fig. 2.212):

- display of the main fields in the task card,
- photo display in the mobile application,
- task rating display in both mobile and desktop applications.
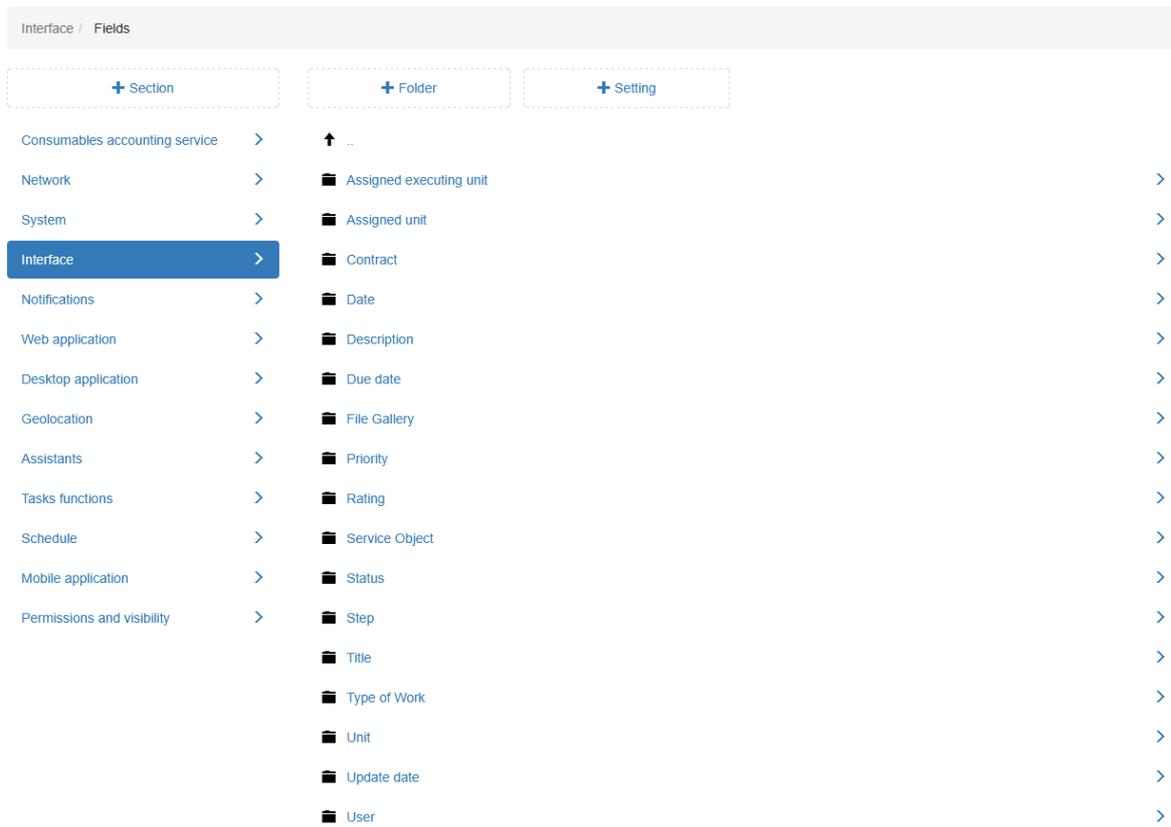
Fig. 2.212: "Fields" folder of the "Interface" section

## Displaying the main fields in the task card

The "Fields" folder contains subfolders with the names of the main task fields:

- Assigned executing unit,
- Assigned unit,
- Contract,
- Date,
- Description,
- Due date,
- Priority,
- Service Object,
- Status,
- Step,
- Title,
- Type of Work,
- Unit,

- Update date,

- User.

In each subfolder, you can configure the display of the field separately for the organization, user, or role. If necessary, you can set a new value for each setting in this folder by selecting it and clicking "+ Value". Turn on/off the toggle switch or enter a new value and then fill in the remaining fields: organization, user, role, status. For more information about the process of adding a new value, see *"Settings" block* (page 164).

**Visible**

In the "Visible" setting, you can disable the display of a field in the task card (Fig. 2.213). The setting is available in all folders with the names of the main task fields. By default, the system displays all listed fields in a task card.
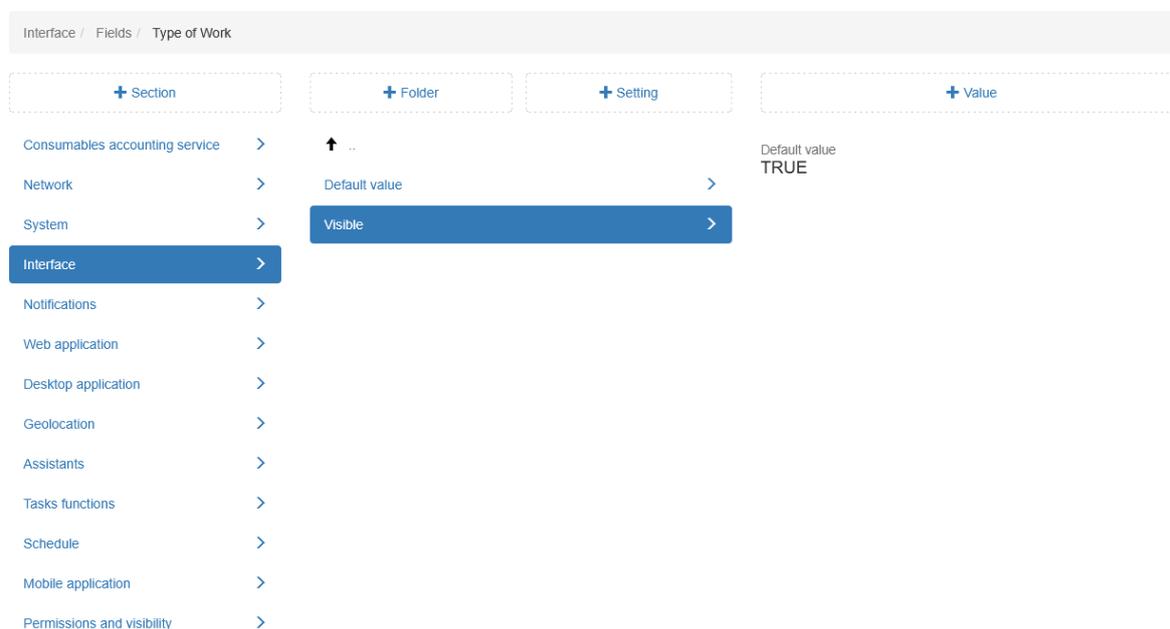


Fig. 2.213: Visibility setting for the "Type of Work" field

**Default value**

You can specify default values for the "Type of Work" and "Priority" fields. When someone creates a task under a specified organization, user, or role, the system automatically fills in these fields in the task card with the configured default values. To set this up, enter the ID of the relevant type of work or priority in the "Value" field (Fig. 2.214). You can find the ID in the "Tasks" section of the navigation panel of functional blocks (Fig. 2.215).

Fig. 2.214: Setting a default value for the "Type of Work" field



Fig. 2.215: Work type ID

### File Gallery

This folder contains settings for working with photos in the ActiveMap Mobile (Fig. 2.216). If necessary, you can set a new value for each setting in this folder by selecting it and clicking "+ Value". Turn on/off the toggle switch or enter a new value and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
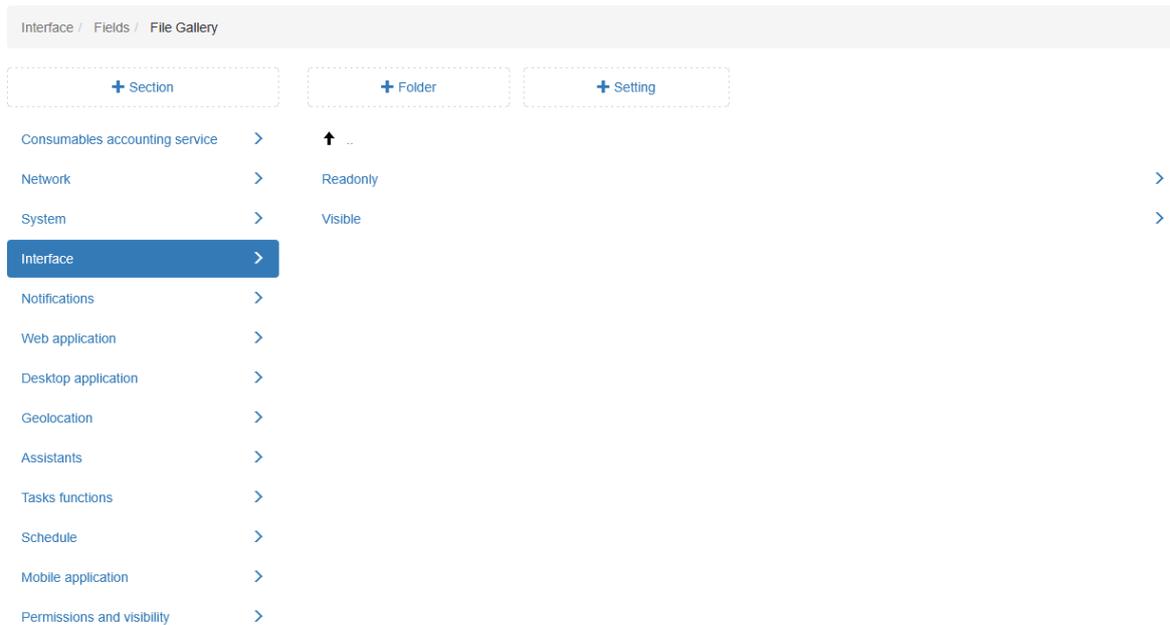


Fig. 2.216: File gallery

#### Readonly

In the "Readonly" setting, you can enable the ability to view added photos without editing them in the "All files" section (Fig. 2.217). By default, this setting is disabled.
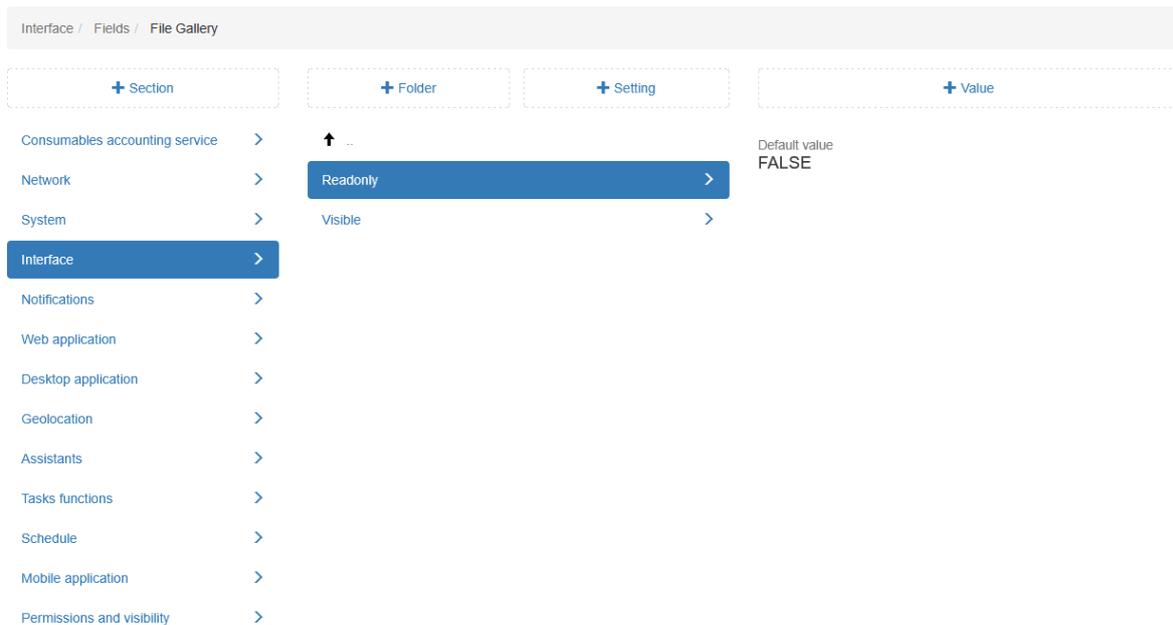
Fig. 2.217: Photo editability setting

**Visible**

In the "Visible" setting, you can switch off the display of added photos in the "All files" section (Fig. 2.218). By default, this setting is enabled. If it is turned off, photos will not appear in the general section of the task card in the ActiveMap Mobile.
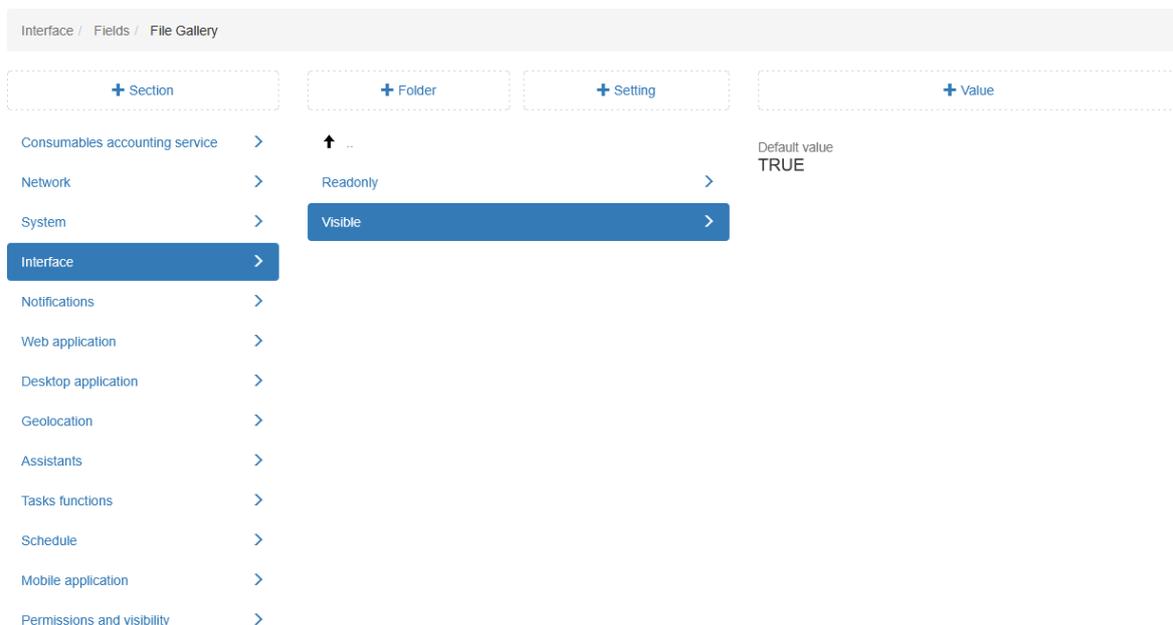


Fig. 2.218: Photo visibility setting

## Rating

This folder contains settings for the display of task ratings (Fig. 2.219). Users set ratings in a simplified version of the mobile application. You can also view them in the ActiveMap Desktop. If necessary, you can set a new value for each setting in this folder by selecting it and clicking "+ Value". Turn on/off the toggle switch or enter a new value and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
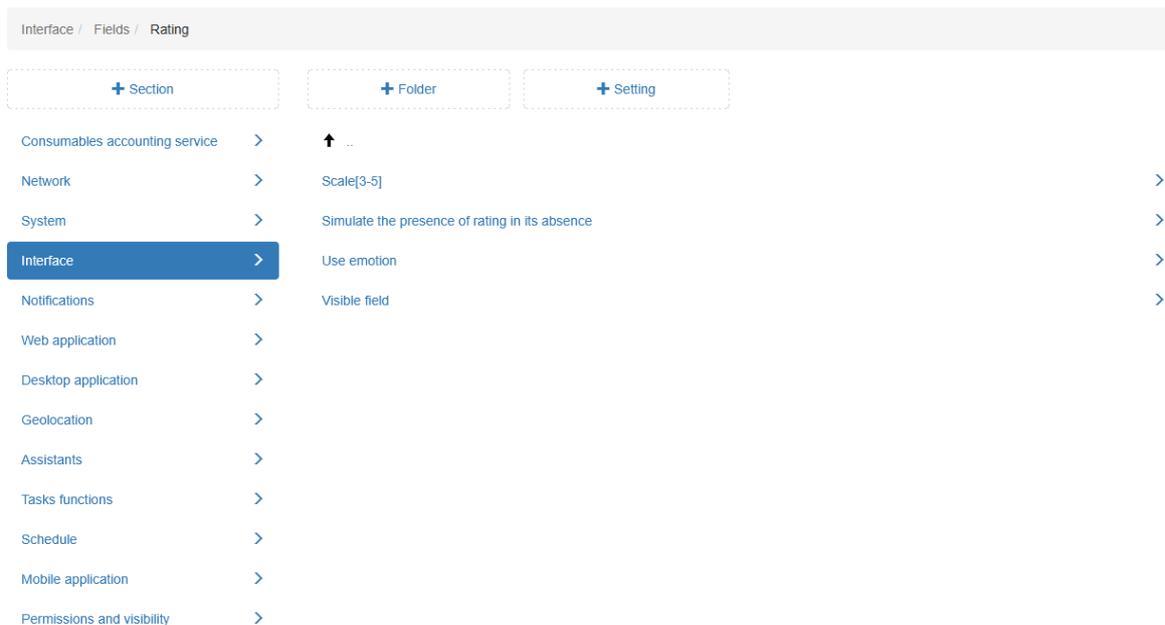


Fig. 2.219: Task rating settings

### Scale [3-5]

The system allows you to set a scale (from 3 to 5) for rating completed tasks. By default, a 4-point system is set to display ratings in the ActiveMap Desktop (Fig. 2.220).
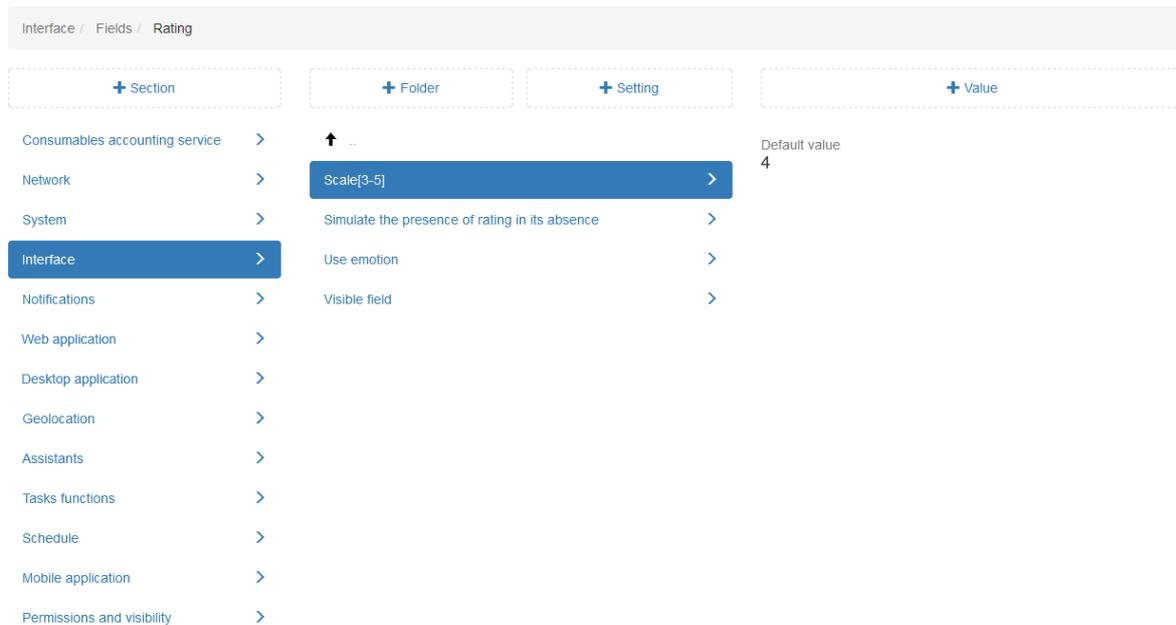
Fig. 2.220: Scale [3-5]

**Simulate the presence of rating in its absence**

This setting is a system setting that allows you to avoid errors when there is no set rating in the task.

**Use emotion**

This setting allows using emojis to display ratings in the ActiveMap Desktop. This setting is enabled by default (Fig. 2.221). With the toggle turned off, users see the scores in the ActiveMap Desktop in the form of stars, not emoji.
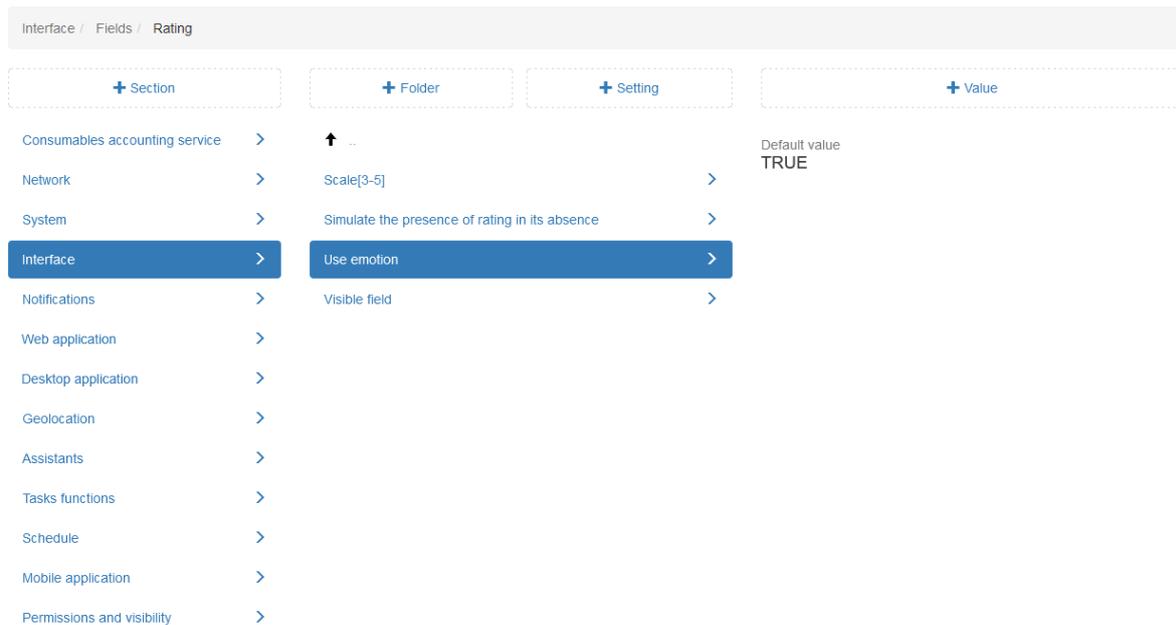
Fig. 2.221: Using emoji

**Visible field**

In this setting, you can enable the visibility of the rating in the ActiveMap Desktop. By default, this setting is disabled (Fig. 2.366).
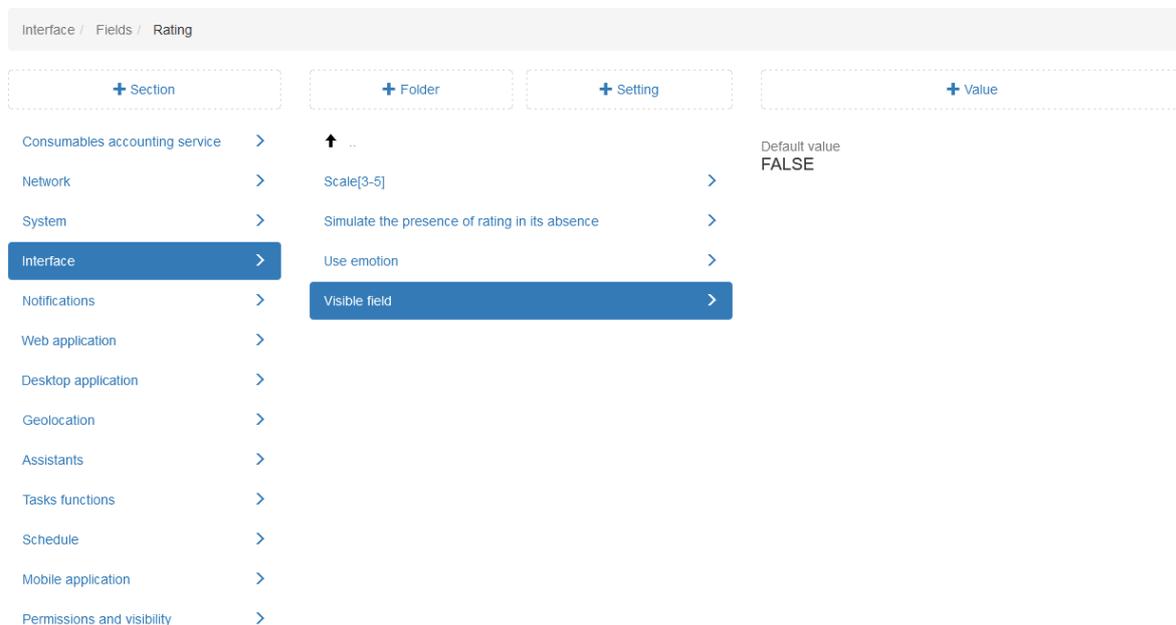


Fig. 2.222: Setting the visibility of the rating

### 2.3.3.7.5 "Notifications" section

This section allows configuring PUSH notifications and webhooks (Fig. 2.223). You can set a new value by selecting the setting and then clicking "+ Value". In the window that opens, enable/disable the toggle switch or enter a value, then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
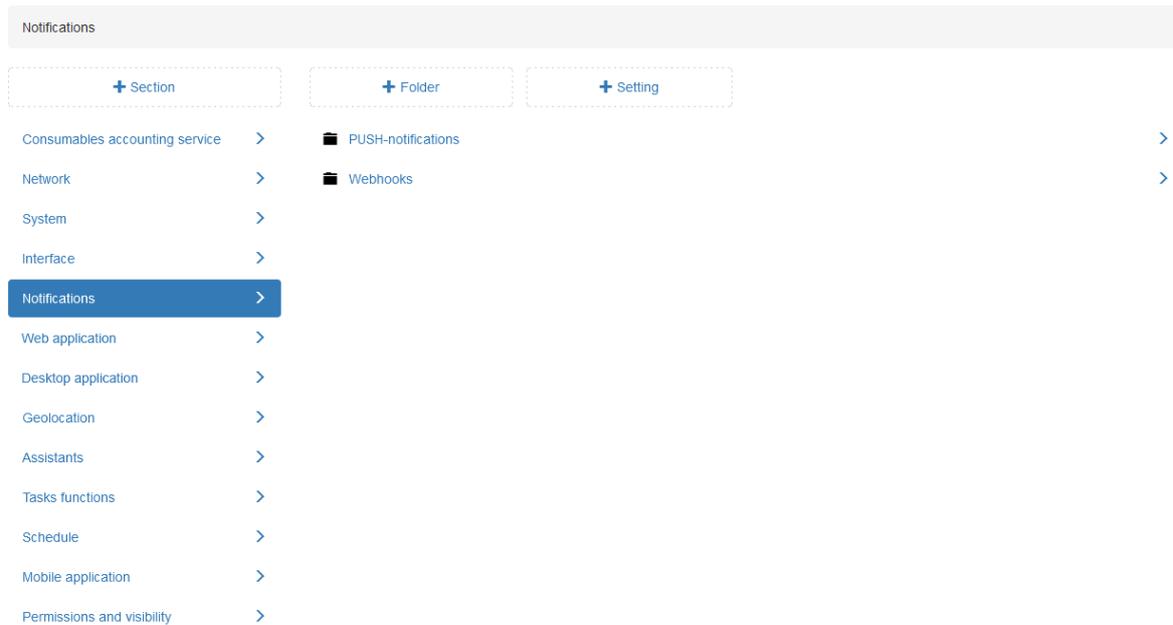


Fig. 2.223: "Notifications" section

### PUSH-notifications

In this setting administrator sets PUSH-notifications for such actions as creating, changing, deleting tasks, adding comments, etc. (Fig. 2.224).
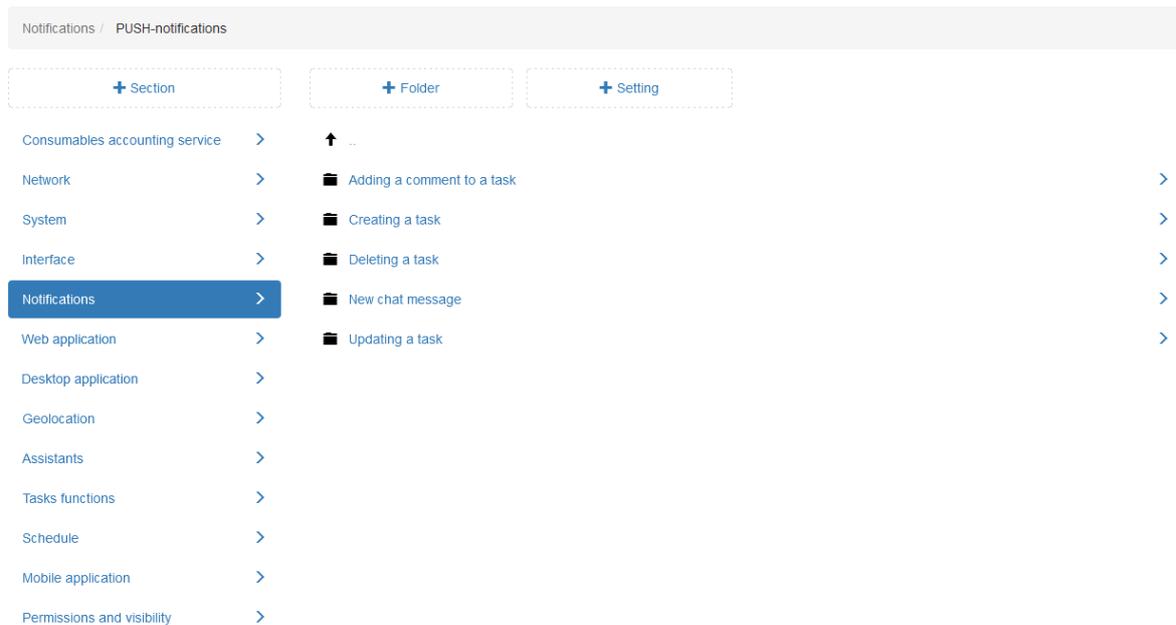
Fig. 2.224: PUSH-notifications

PUSH-notifications for each of the presented actions are configured for user roles (Fig. 2.225).
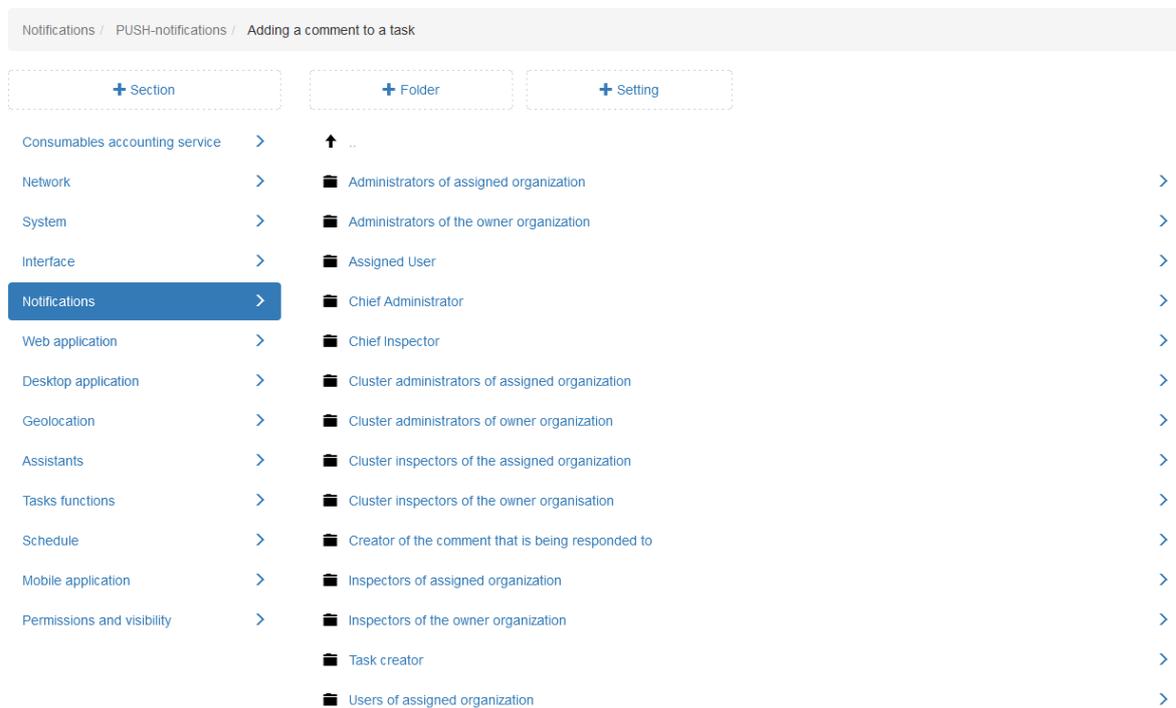


Fig. 2.225: PUSH-notifications configured for user roles

**Webhooks**

This setting specifies how many requests can be sent simultaneously to the server with the selected data transfer protocol. The default is 10 requests (Fig. 2.226).



Fig. 2.226: Maximum number of simultaneous requests per server

### 2.3.3.7.6 "Desktop application" section

In this section, you can configure additional options to work in the ActiveMap Desktop (Fig. 2.227). You can set a new value by selecting the setting and clicking "+ Value". In the window that opens, enable/disable the toggle switch or enter the desired name and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
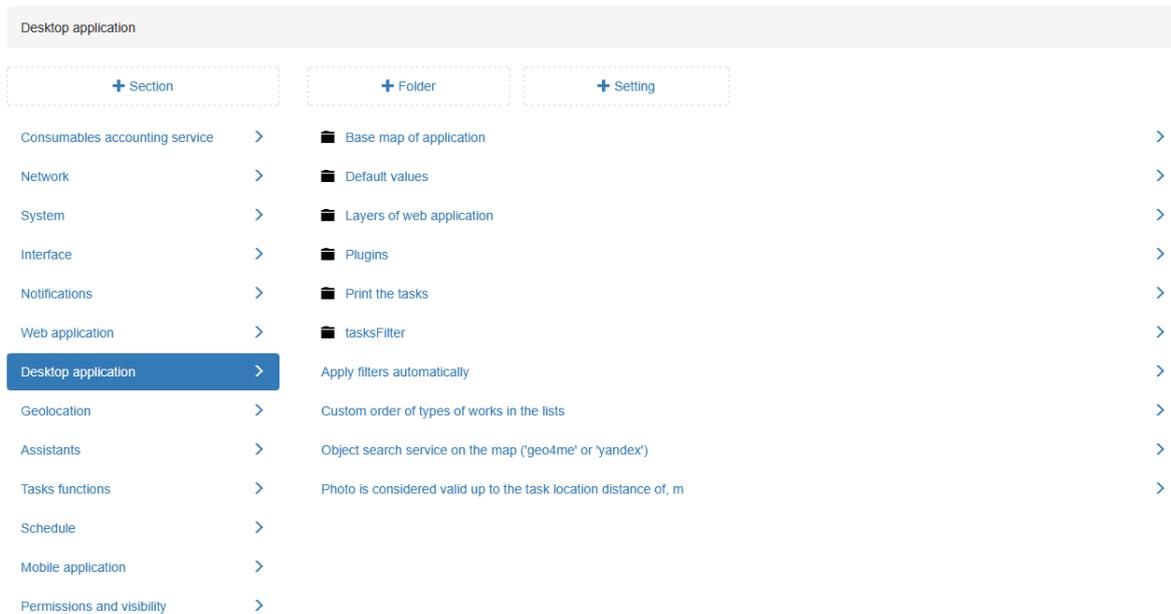
Fig. 2.227: "Desktop application" section

## Basemap of application

The setting allows adding a map as a base layer to work in the ActiveMap Desktop.

**Name of the folder for the cache**

The setting allows setting a new folder to store the map cache to work in the ActiveMap Desktop.

**Projection of basemap**

In this setting, you can enter the projection for the map's base layer (in PROJ.4 format).

**URL of TMS-service**

In this setting, you can enter the URL of the TMS service to specify the map as the base layer (Fig. 2.228).

Fig. 2.228: Application basemap

## Default values

You can specify values that are automatically filled in when tasks are created in the ActiveMap Desktop (Fig. 2.229). Thus, after adding a value, the user does not need to fill in these fields manually when creating a task. They are filled in automatically.
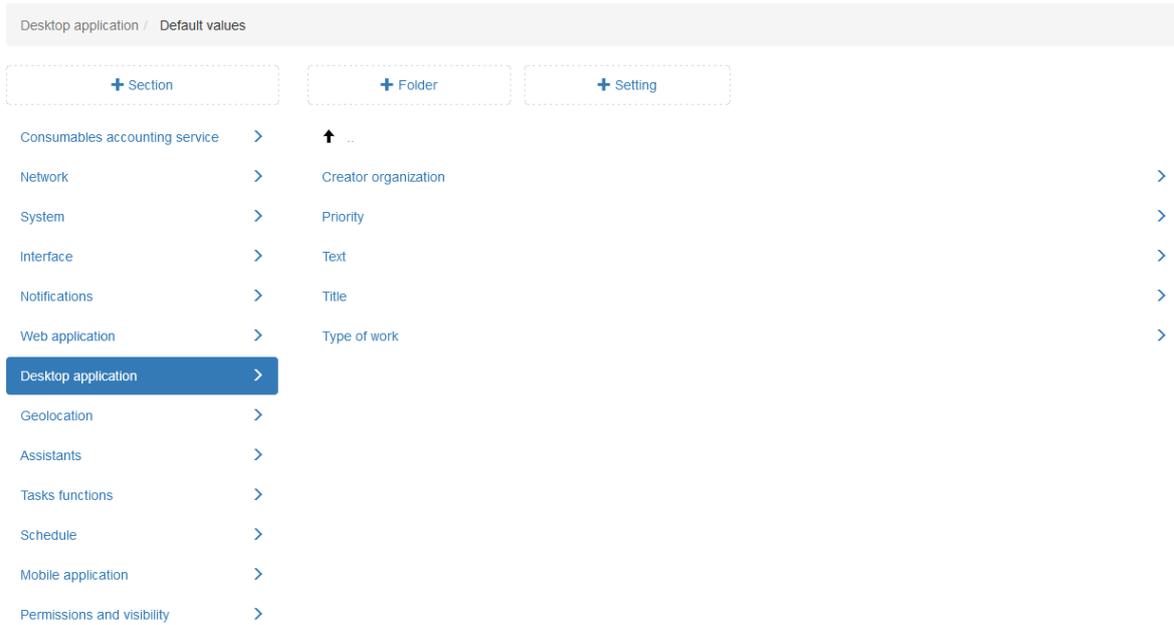
Fig. 2.229: Default values

## Layers of web application

This setting allows you to specify the comma-separated IDs of the layers that are displayed by default on the task map window (Fig. 2.230).
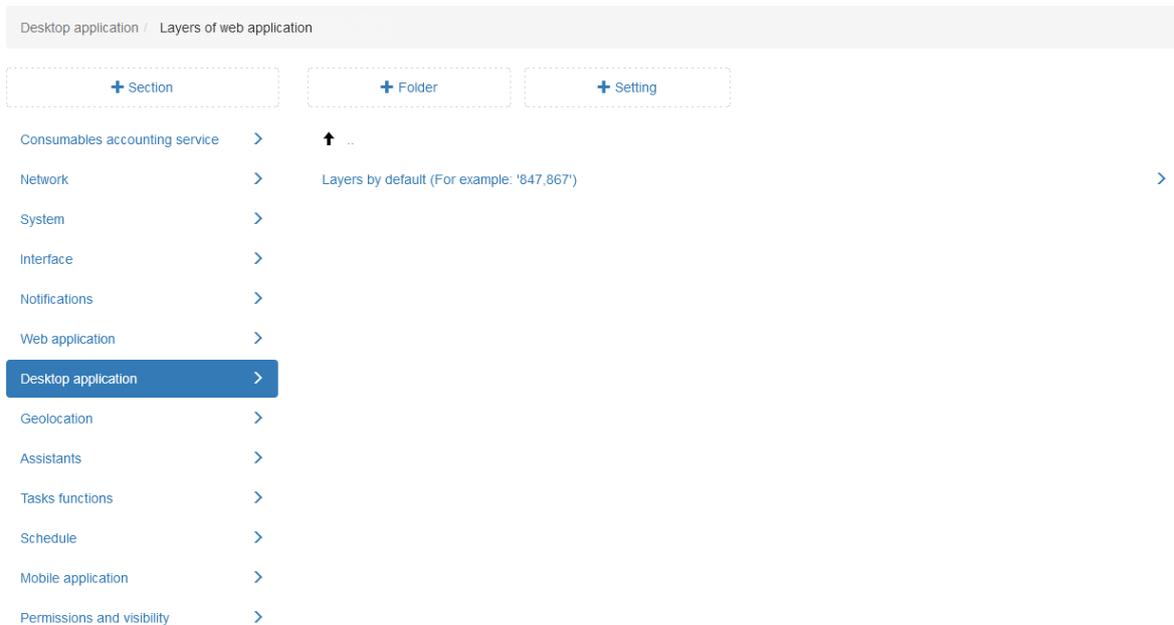


Fig. 2.230: Default values

## Plugins

In this folder, you can connect additional plugins for working in the ActiveMap Desktop desktop application.

To connect a new plugin, you should follow these steps:

1. Check if there is a "Plugins" folder within the "Desktop" section. If it doesn't exist, you need to create it with these parameters:

- "key" field: "plugins"

- "name"field: "Plugins"

2. Add a new setting named "Plugin name" and set its value to the name of the plugin you want to add (Fig. 2.231).

Setting parameters:

- "key" field: "name"

- "name" field: "Plugin name"

- "type" field: "String"
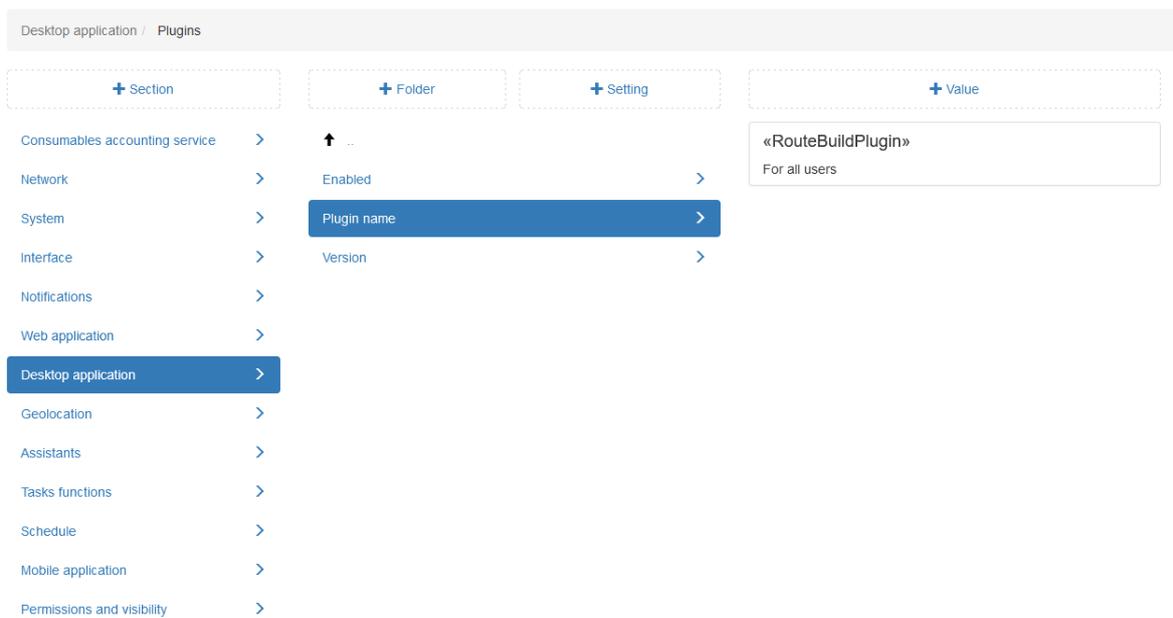


Fig. 2.231: Plugin name setting

3. Create an "Enabled" setting to control whether the plugin should be downloaded and activated. Assign a value to this setting, which can be either "True" to enable the plugin or "False" to disable it. By default, it is set to "False" if no value is provided.

Setting parameters:

- "key" field: "enabledPlugin"

- "name" field: "Enabled"

- "type" field: "Logical value"
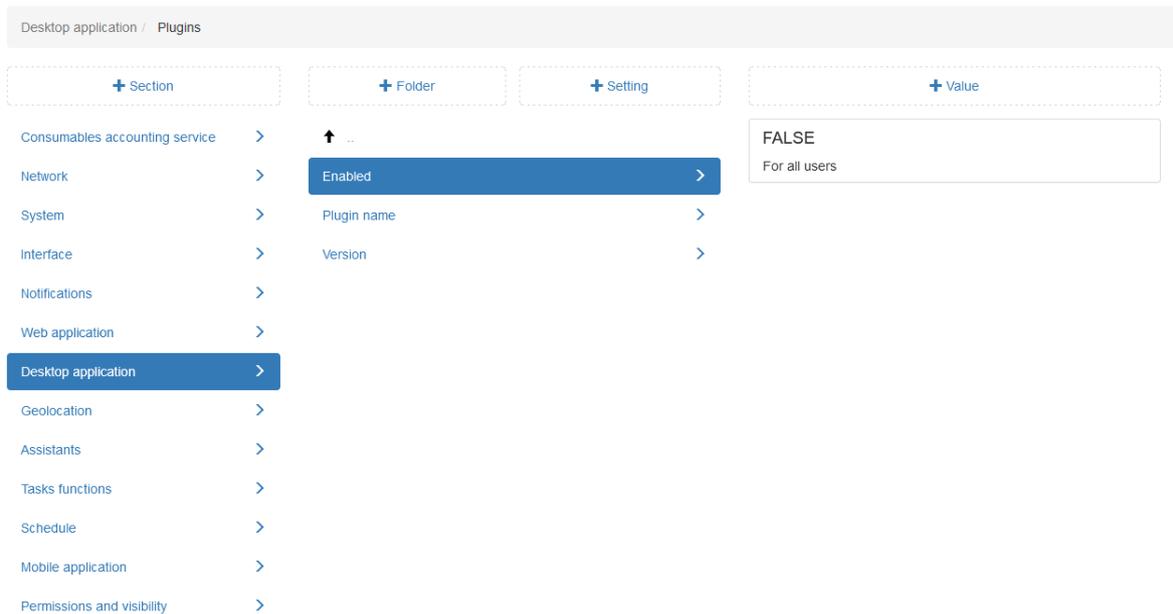


Fig. 2.232: Setting for enabling the plugin

4. Add a "Version" setting to specify the version number of the plugin and enter its value (Fig. 2.233). If you leave it blank, the latest version of the plugin will be used.

Setting parameters:

- "key" field: "version"

- "title" field: "Version"

- "type" field: "String"

Fig. 2.233: Plugin version setting

### Print the tasks

The setting allows you to optionally hide the map when printing tasks in the ActiveMap Desktop (Fig. 2.234).



Fig. 2.234: Printing a task

### tasksFilter

In this folder, you can configure the task filters in the ActiveMap Desktop application.

The "OnlyParentTasks" setting enables automatic application of the "Parent tasks only" filter upon user authorization in the desktop application (Fig. 2.235). Parent tasks are first-level tasks. They may have related child tasks (second-level tasks) or no child tasks at all.
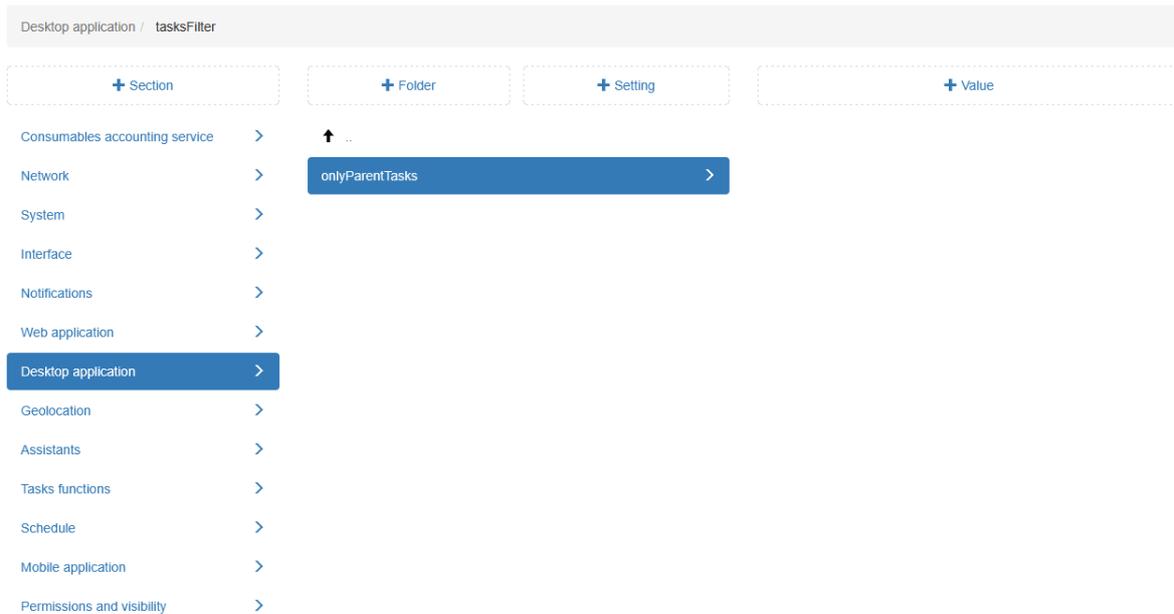


Fig. 2.235: Setting the "Parent tasks only" filter

This filter will be applied as the default filter and will not be reset when you click "Clear". By default, this setting is disabled.

### Apply filters automatically

In this setting, you can enable automatic application of the filter to tasks in the ActiveMap Desktop. This setting is enabled by default (Fig. 2.236). If a value is created with the toggle switch turned off, the user should click "Apply" to apply the filter.

Fig. 2.236: Automatic filter application

## Photo is considered valid up to the task location distance of, m

The setting allows users to specify the radius of the task point. The default radius is 150 meters (Fig. 2.237).



Fig. 2.237: Radius of the task point for taking photos

### 2.3.3.7.7 "Web application" section

This section allows configuring additional options for working in the ActiveMap Web (Fig. 2.238). You can set a new value for each option by selecting it and then clicking "+ Value". Enable/disable the toggle switch or enter a new value in the opened window and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
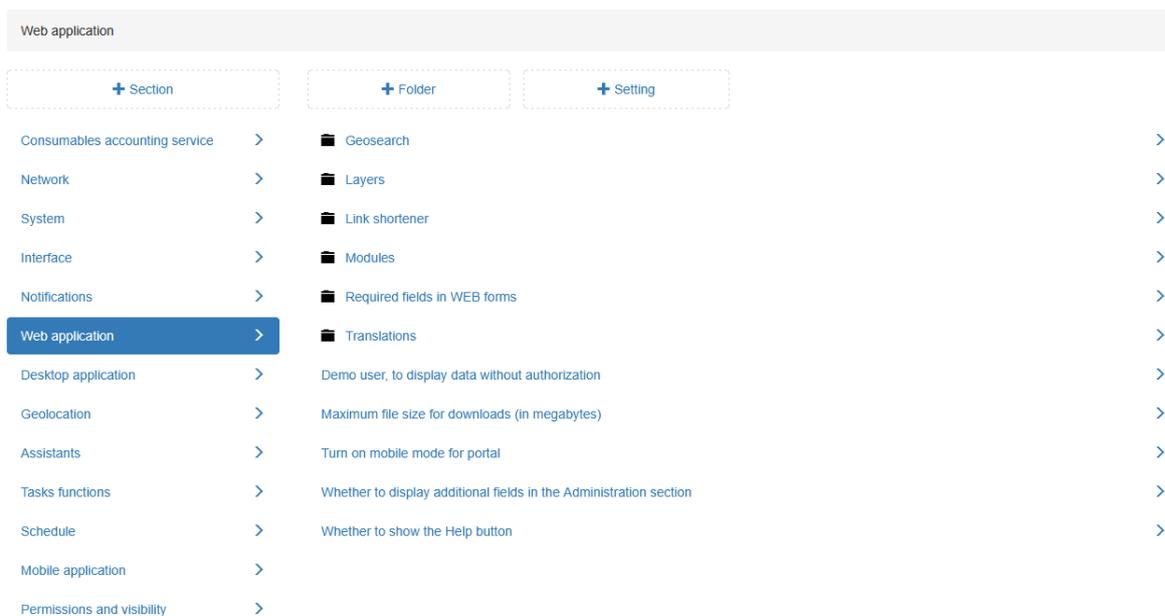


Fig. 2.238: "Web application" section

### Geosearch

The "GeoSearch" folder contains services for geocoding.

**Buffer for reverse geocoding by layers (in meters)**

To search by coordinates in layers, form a small area where the search is performed. Here you can set the buffer in which the search works. The default setting is 50 meters (Fig. 2.239).

Fig. 2.239: Buffer for reverse geocoding

### Limit the search to the transmitted area for Nominatim (GeoCodingNominatim)

This setting defines the limits for searching through Nominatim. If the setting is enabled, the search is carried out only in the area that is transmitted in the request. In particular, when searching in the ActiveMap Web in map mode, this is the area of the map that is currently displayed in the browser. By default, this feature is disabled (Fig. 2.240).



Fig. 2.240: Limit the search to the transmitted area for Nominatim (GeoCodingNominatim)

**Limiting the number of entries in the response for geocoders**

A setting that limits the number of records found in the "Search results" window in "Map" mode. The larger value is set in this setting, the longer it takes to process the request. The default setting is 20 records (Fig. 2.241).
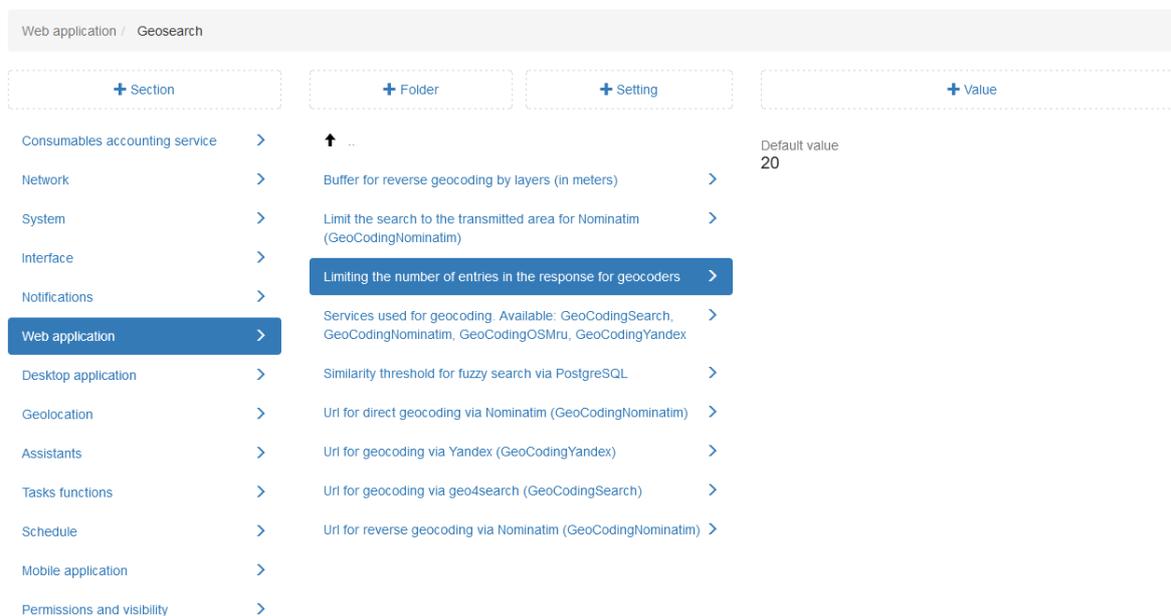


Fig. 2.241: Limiting the number of entries in the response for geocoders

**Services used for geocoding**

The following services are available by default:

- GeoCodingSearch – search.geo.pro;

- GeoCodingNominatim – a service that works through nominatim;

- GeoCodingOSMru – https://openstreetmap.ru/api/search;

- GeoCodingYandex – yandex service (works only with an API key).

The administrator can connect several geocoders for geosearch by sequentially adding several values. When multiple services are used, the search starts with the first one in the list. If nothing is found, the second one is used, and so on (Fig. 2.242).

Fig. 2.242: Services used for geocoding

## Layers

This folder contains additional settings for working with thematic layers
(Fig. 2.243).



Fig. 2.243: Layers

**Importing objects**

In this folder, you can configure the settings for importing service objects from a text file in the ActiveMap Mobile mobile application.

**Maximum number of rows to import**

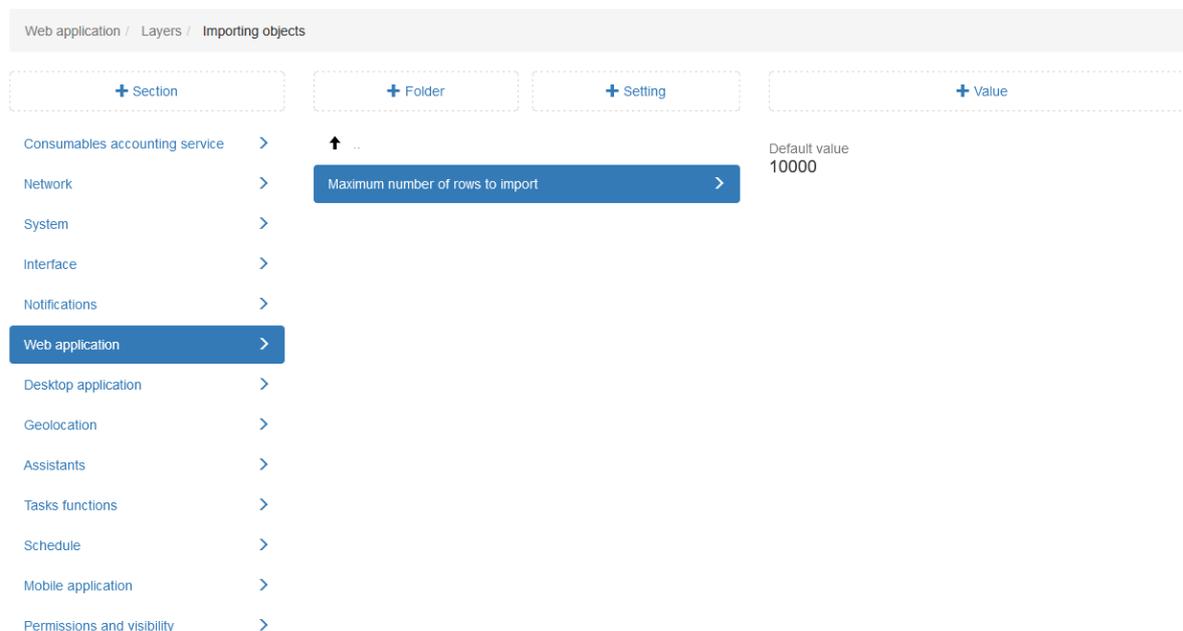This setting specifies a limit on the number of rows that can be loaded at one time. The default setting is 10000 rows (Fig. 2.244).



Fig. 2.244: Maximum number of rows to import

**Always show signatures in the user layer**

In this setting, you can enable automatic display of the user's signature when the "Users" layer is connected in the ActiveMap Web web application. The signature is formed on the basis of the "Name" field in the user card. By default, the setting is disabled (Fig. 2.245).

Fig. 2.245: Enabling user signatures

**Buffer for finding objects in a point**

The setting allows users to set the size of the buffer for getting additional information on objects in the "Map" mode. The default is 200 meters (Fig. 2.246).



Fig. 2.246: Buffer for finding objects in a point

**Clearing the GWC when notified of layer changes**

This setting allows the administrator to disable GeoWebCache deletion when notified of layer changes. By default, the setting is disabled (Fig. 2.247).
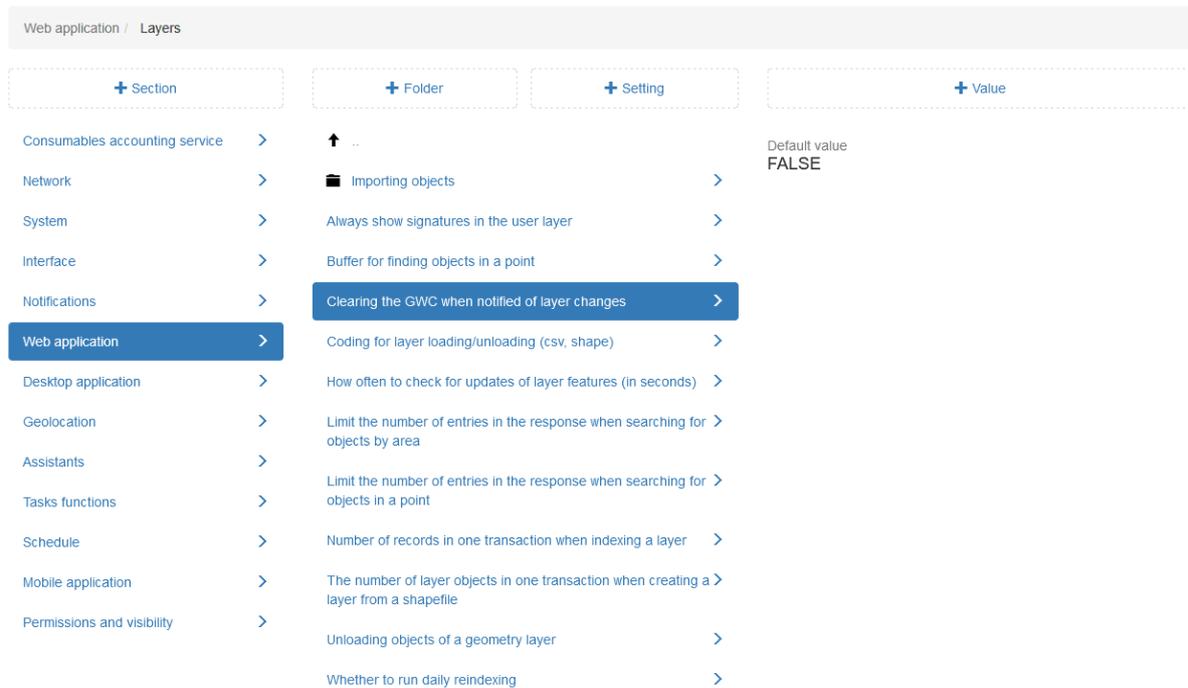


Fig. 2.247: Clearing the GWC when notified of layer changes

**Coding for layer loading/unloading (csv, shape)**

The setting specifies the encoding used to export and import data in .csv and .shape formats. The default encoding is Windows-1251 (Fig. 2.248).

Fig. 2.248: Encoding for layer loading

**How often to check for updates of layer features (in seconds)**

Events about changes to thematic layer objects are collected for the interval specified in this setting (e.g. creation of a new object through the ActiveMap Mobile mobile application). If such changes have accumulated, an event is sent via WebSocket that it is necessary to redraw the corresponding layers in the ActiveMap Web. After that, the new object appears automatically, i.e. there is no need to update the data or reconnect the layer. If there are no changes, no event is sent. The default setting is 15 seconds (Fig. 2.249).

Fig. 2.249: Frequency of checking for layer object updates

**Limit the number of entries in the response when searching for objects by area**

This setting limits the number of records in the "Search results" window when searching for objects using the "Area object list" tool in the "Map" mode. The larger the value specified in this setting, the longer the request is processed. The default setting is 30 records (Fig. 2.250).



Fig. 2.250: Limit the number of entries in the response when searching for objects by area

**Limit the number of entries in the response when searching for objects in a point**

This setting limits the number of entries in the "Search results" window when searching for objects in the "Map" mode. The larger the value set in this setting, the longer the request is processed. The default is 30 entries (Fig. 2.251).
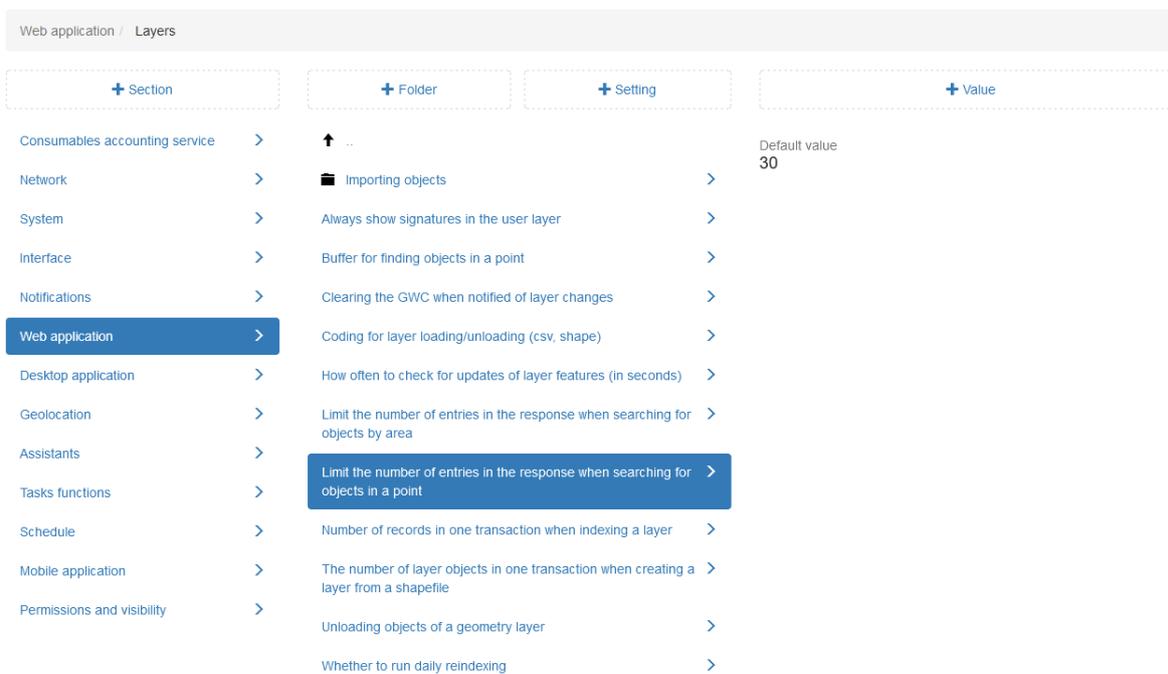


Fig. 2.251: Limit the number of entries in the response when searching for objects in a point

**Number of records in one transaction when indexing a layer**

This setting specifies the number of objects requested at the same time to index the layer. The default is 1000 objects (Fig. 2.252).

Fig. 2.252: Number of records in one transaction when indexing a layer

### The number of layer objects in one transaction when creating a layer from a shapefile

This parameter specifies the number of layer objects in a transaction for loading into the database when importing a layer from a shapefile. The default is 1000 objects (Fig. 2.253).



Fig. 2.253: The number of layer objects in one transaction when creating a layer from a shapefile

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**Unloading objects of a geometry layer**

This setting allows including information about the object geometry in the layer export in the ActiveMap Web. By default, this setting is disabled (Fig. 2.254).
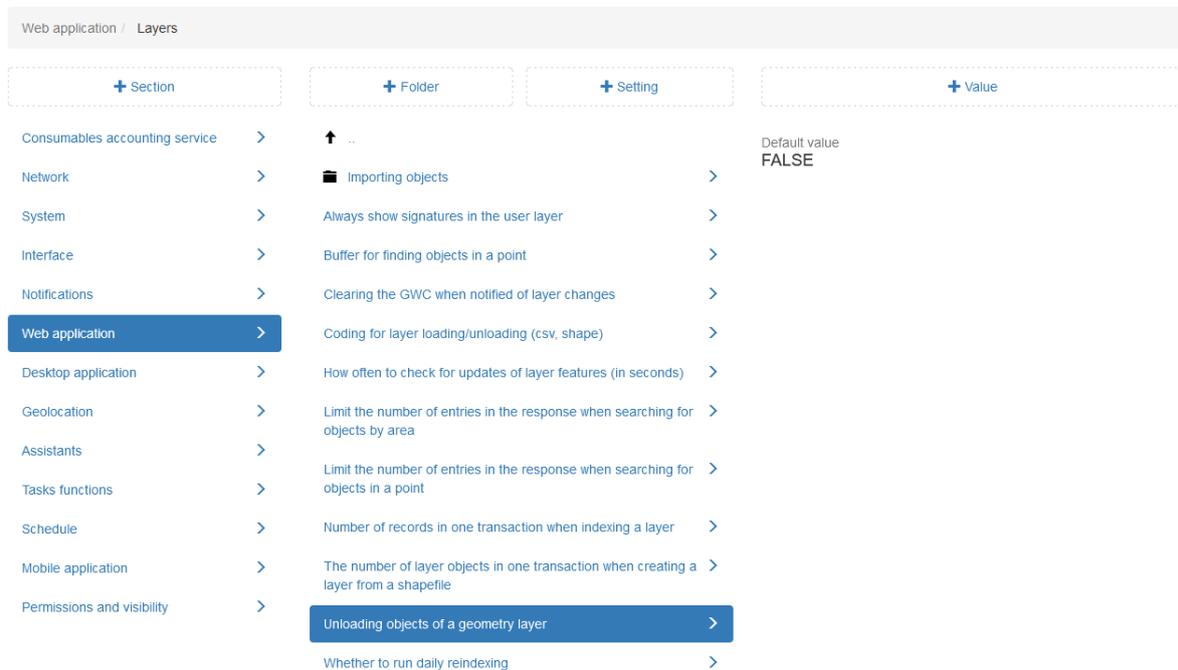


Fig. 2.254: Exporting a layer with object geometry setting

**Whether to run daily reindexing**

If the layer is edited via REST (in ActiveMap Desktop, ActiveMap Web, ActiveMap Mobile), the changes automatically appear in the index. By default, daily layer reindexing is disabled (Fig. 2.255).

Fig. 2.255: Daily layer reindexing setting

## Link shortener

A service that allows you to shorten long links in the "Fixed link" tool when setting map parameters and connecting thematic layers in the ActiveMap Web in the "Map" mode (Fig. 2.256).
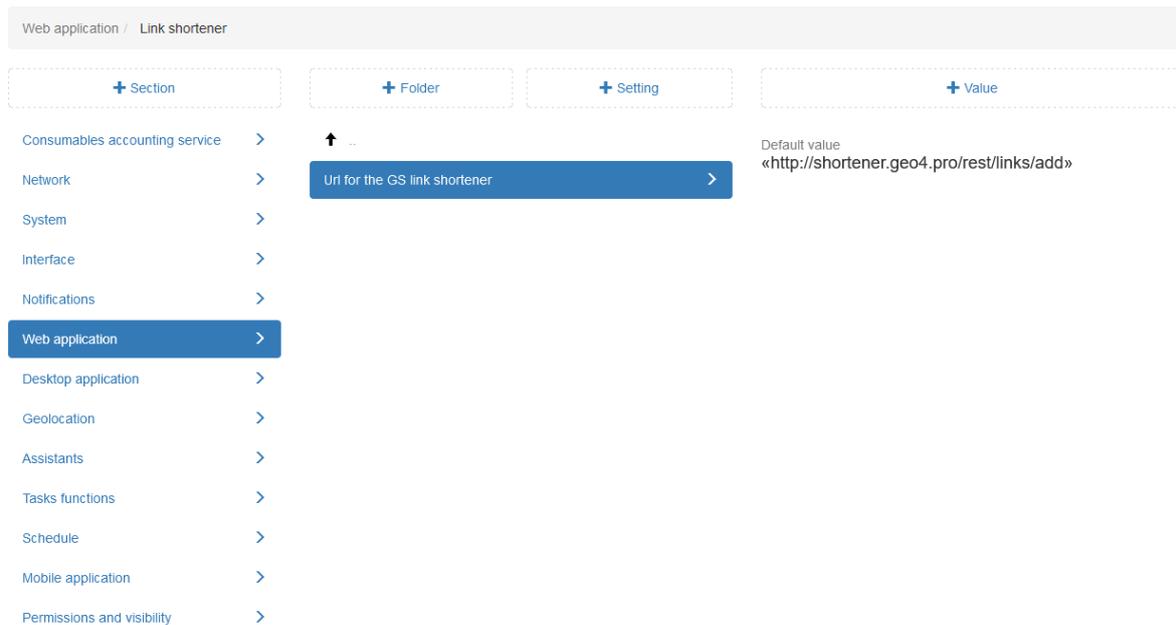
Fig. 2.256: Link shortener

## Modules

**Statistics module** is a report that is generated (updated) after a specified period of time based on the collected data in online mode. This report is available to users in the "Map" mode (Fig. 2.257).
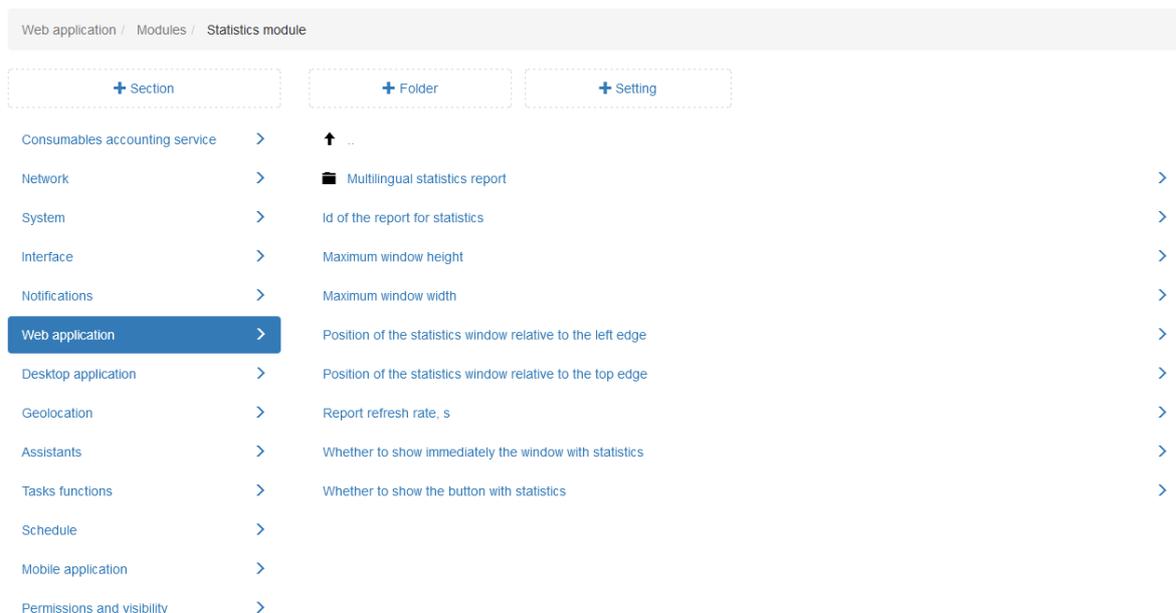


Fig. 2.257: Statistics module

**Multilingual statistics report**

The statistics module supports report generation for different interface languages. In this folder, you can set the required report for the specified language. To add a new language, click the "+ Setting" button and create a new folder. Specify the two-letter language code in the "Key" field and enter the language name in the "Name" field (Fig. 2.258). Next, add a value containing the ID of the required report for this language.
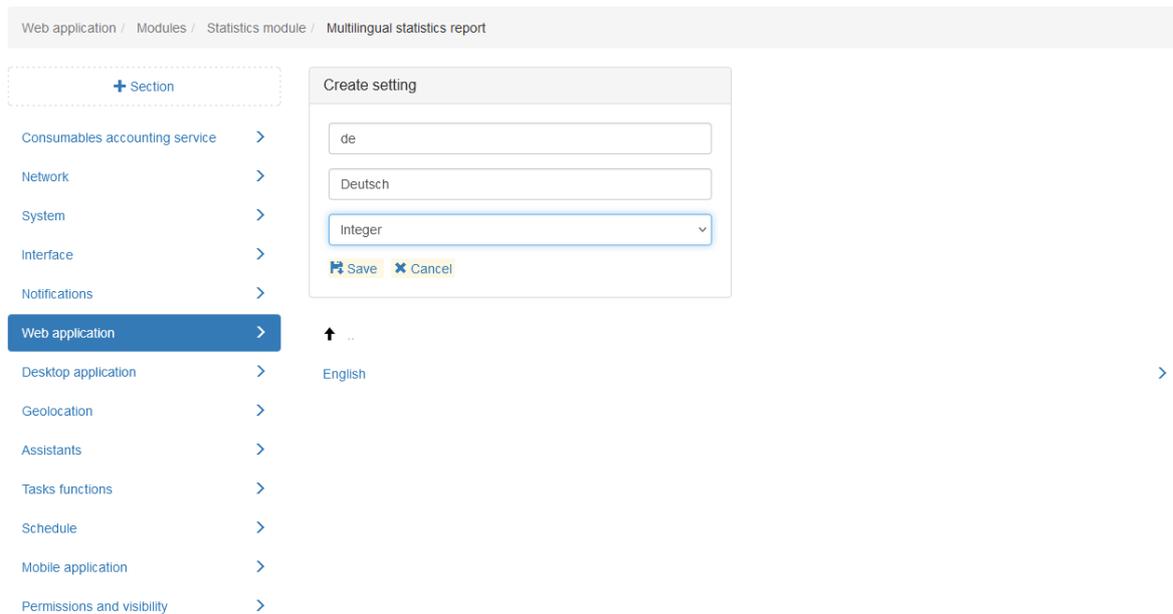


Fig. 2.258: Adding a language

If the language is not set, then the report specified in the "**Id report for statistics**" setting is used by default.

**Id of the report for statistics**

In this setting, you can specify the id of the report, which is used to display the statistics. You can specify different reports for different roles or organizations (Fig. 2.259).

Fig. 2.259: Specifying the report for the Statistics module

## Maximum window height and Maximum window width

By default, the statistics window is optimized for the report content (Fig. 2.260). If necessary, you can change the window size by specifying new values.



Fig. 2.260: Maximum window height

## Position of the statistics window relative to the left edge and Position of the statistics window relative to the top edge

The default location of the statistics popup in the browser is relative to the top and left edges (Fig. 2.261). The administrator can change the window size by specifying new values.



Fig. 2.261: Statistics window location relative to the top

### Report refresh rate

This setting allows you to set the frequency of updating data in online statistics. The default is 180 seconds (Fig. 2.262).

Fig. 2.262: Report update frequency (in seconds)

### Whether to show immediately the window with statistics

When this setting is enabled, a pop-up window with online statistics is automatically displayed in the "Map" mode after authorization in the ActiveMap Web. This feature is disabled by default (Fig. 2.263).



Fig. 2.263: Show statistics window immediately

### Whether to show the button with statistics

This setting allows you to display a button for connecting online statistics in the ActiveMap Web toolbar in the "Map" mode. By default, this feature is disabled (Fig. 2.264).



Fig. 2.264: Show statistics button

### Required fields in WEB forms

In this folder, administrators can define mandatory fields in user and organization creation forms. This setting works in the web application only. The folder contains subfolders "Form of organization" and "Form of user" (Fig. 2.265).
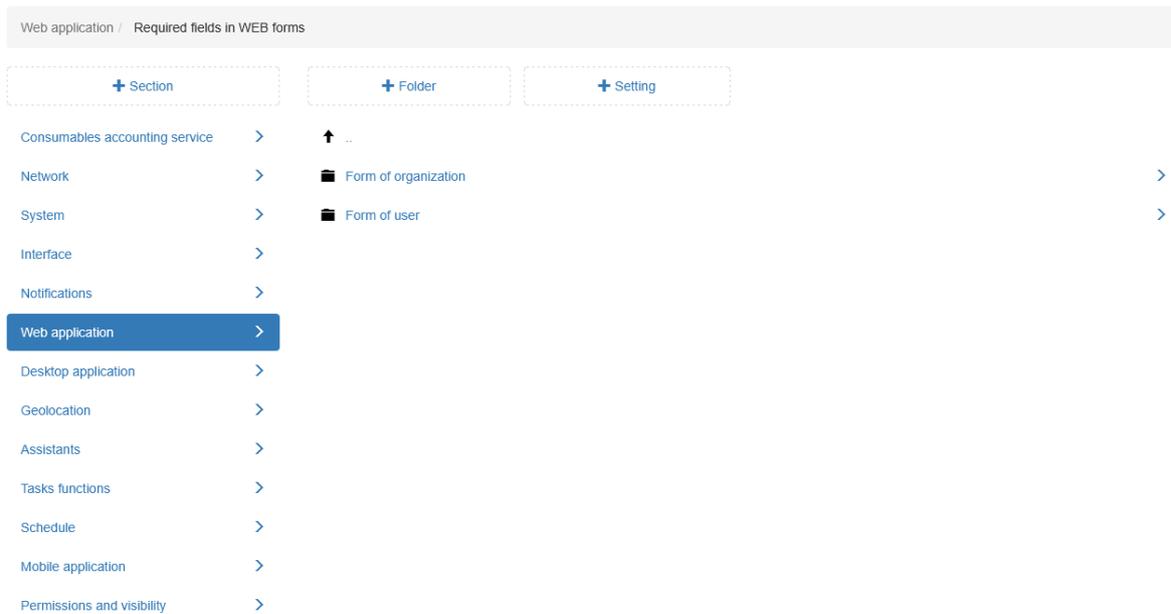
Fig. 2.265: Required fields in WEB-forms

**Form of organization**

The folder contains the list of fields of organization card (Fig. 2.266). By default, all fields are marked as optional. You can make any of these fields mandatory when creating an organization. To do this, select the field and set its value to "TRUE". After that, the system marks the selected field with a red star in the organization creation form, indicating that it is mandatory.

Web application / Required fields in WEB forms / Form of organization

| | | |
|---|---|---|
| **+ Section** | **+ Folder** | **+ Setting** |

| | | |
|---|---|---|
| Consumables accounting service | > | ↑ .. |
| Network | > | About | > |
| System | > | Address | > |
| Interface | > | BIC | > |
| Notifications | > | Bank | > |
| **Web application** | **>** | Bank account | > |
| Desktop application | > | Cluster of organization | > |
| Geolocation | > | Default implementing organization | > |
| Assistants | > | E-mail | > |
| Tasks functions | > | Fax | > |
| Schedule | > | Integration with GIS editor by default | > |
| Mobile application | > | Legal name | > |
| Permissions and visibility | > | Maximum number of users | > |
| | | Name of the accountant | > |
| | | Name of the head | > |
| | | Phone | > |
| | | SWIFT | > |
| | | Tax Nr. | > |
| | | VAT-ID | > |
| | | Correspondent account | > |

Fig. 2.266: Configuring required Fields for organization creation

**Form of user**

The folder contains the list of fields of user card (Fig. 2.267). By default, all fields are marked as optional. You can make any of these fields mandatory when creating a user. To do this, select the field and set its value to "TRUE". After that, the system marks the selected field with a red star in the user creation form, indicating that it is mandatory.
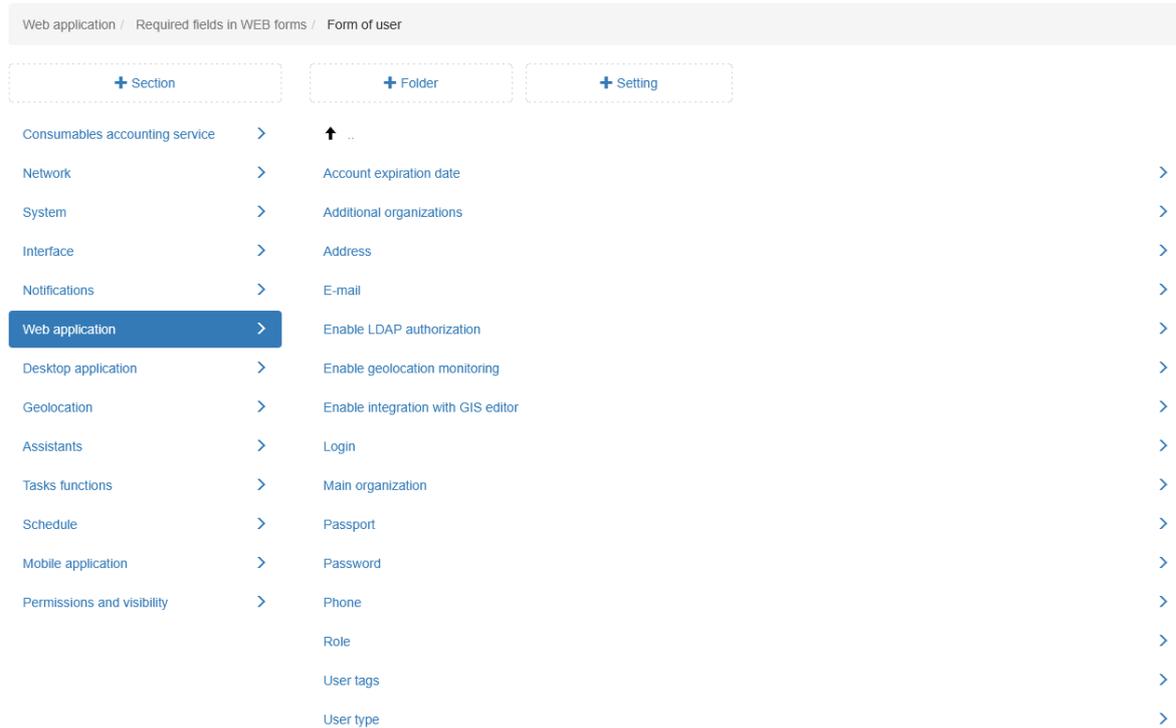
Fig. 2.267: Configuring required Fields for user creation

## Translations

In this folder, you can override the standard translation of phrases in the
ActiveMap Web in the desired language (Fig. 2.268).
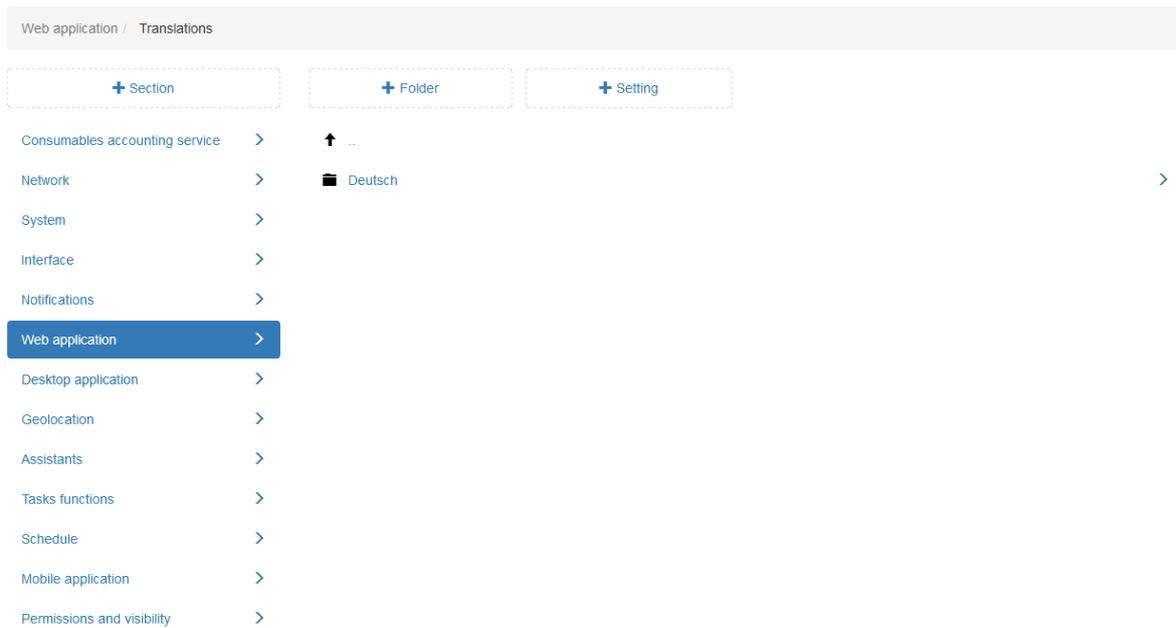
Fig. 2.268: Translations

You can also add another desired language. To do this, create a new folder by clicking "+ Folder". Specify the two-letter language code in the "Key" field and enter the name of the language in the "Title" field (Fig. 2.269).



Fig. 2.269: Adding a new folder

Next, add the setting. Specify the key used by the system for this translation in the "Key" field. In the "Name" field, specify any name that indicates what the translation refers to. Select "String" in the "Type" field (Fig. 2.270).

Fig. 2.270: Adding a new setting

After saving the setting, add a new value for using in this language for translation.

### Demo user to display data without authorization

In this setting, you can set a public user. After that, layers to which the specified user has access are displayed on the portal without authorization (Fig. 2.271).



Fig. 2.271: Public user

### Maximum file size for uploading (in megabytes)

A setting that allows specifying the maximum file size for import in the ActiveMap Web. The default is 2048 megabytes (Fig. 2.272). If the size of the uploaded file exceeds this value, an error message appears and the file is not uploaded.
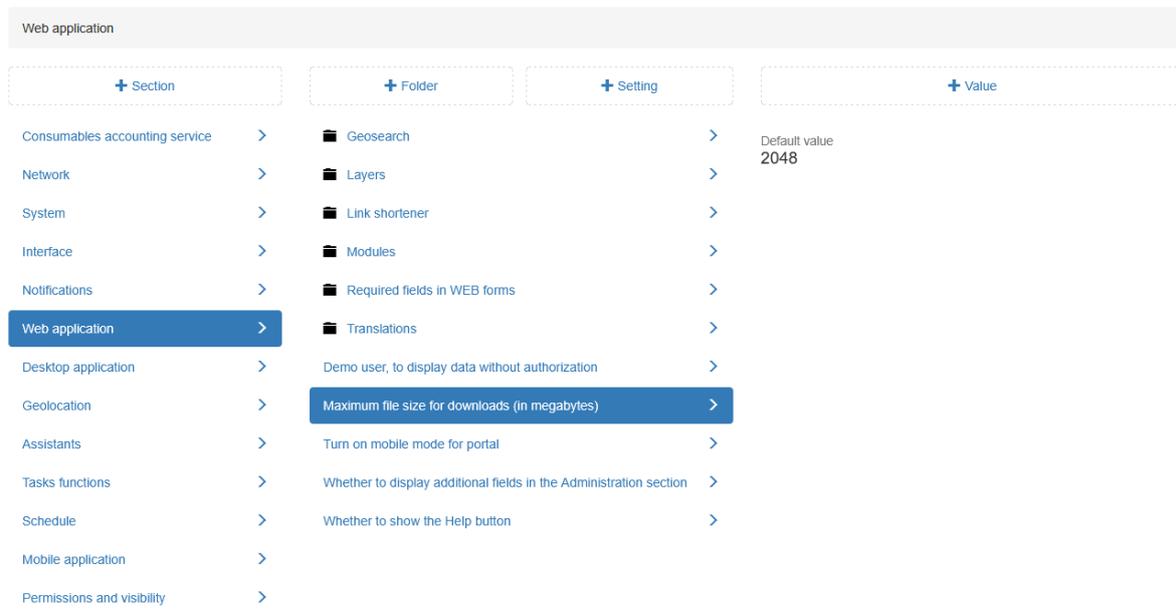
Fig. 2.272: Maximum file size for uploading

### Turn on mobile mode for portal

The setting allows you to disable the display of ActiveMap Web in the mobile mode. This setting is enabled by default (Fig. 2.273).

Fig. 2.273: Enable mobile mode for portal

## Whether to display additional fields in the Administration section

This setting allows you to enable the "Additional fields" tab in the "Management" block (Fig. 2.274). The tab contains a list of additional fields of organization. By default, this setting is disabled.



Fig. 2.274: Enabling additional fields in the "Management" block

### Whether to show the "Help" button

This setting allows hiding the "Help" button in the administration panel. By default, the setting is enabled (Fig. 2.275).
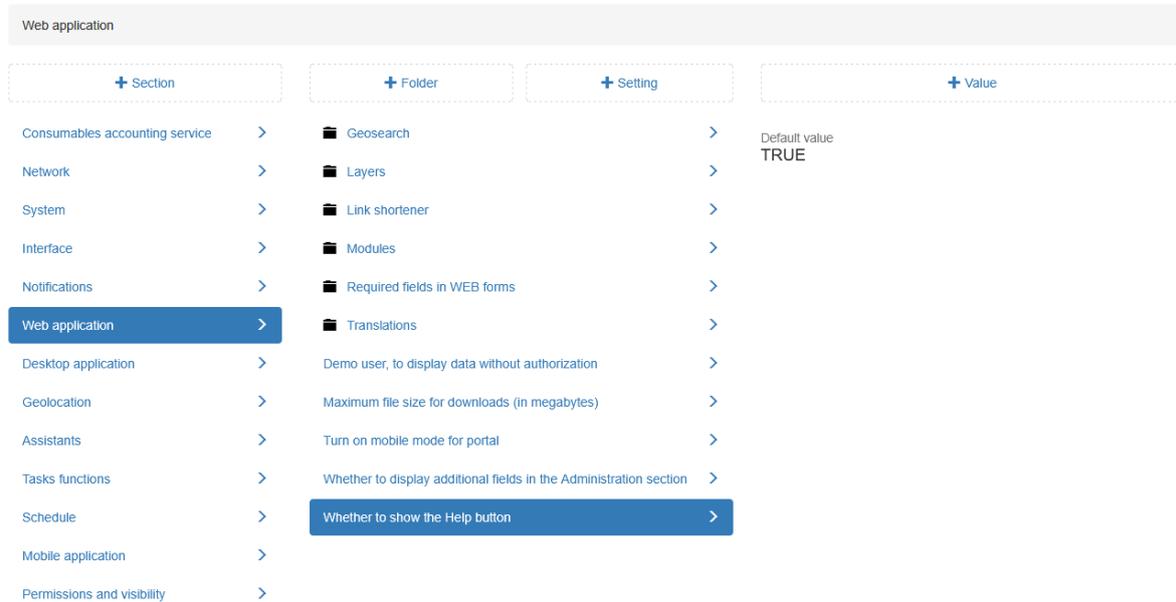


Fig. 2.275: Disabling the "Help" button

#### 2.3.3.7.8 "Geolocation" section

The section presents additional settings for geolocation monitoring in the ActiveMap Mobile (Fig. 2.276). These settings allow you to determine independently which mode is set on the server. You can set a new value by selecting the setting, then clicking "+ Value". In the window that opens, enable/disable the toggle switch or enter the required name and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
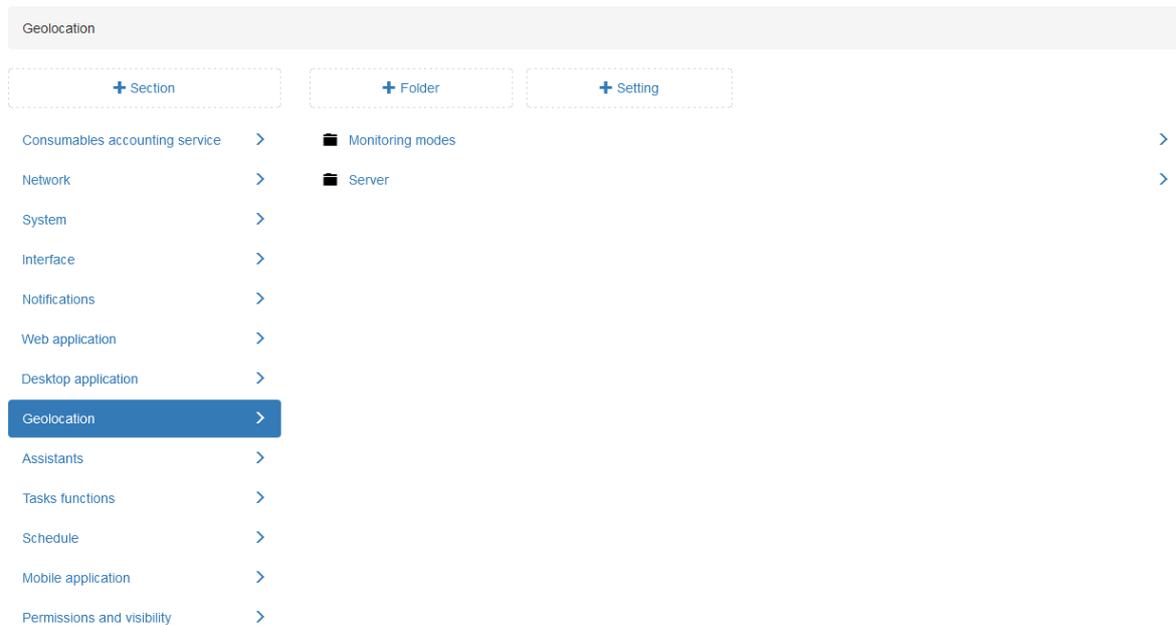
Fig. 2.276: "Geolocation" section

## Monitoring modes

There are 5 monitoring modes for user devices in the mobile application, which differ in location accuracy. In the maximum accuracy mode, the frequency of transmitting location points to the server is increased. In the mode of minimum accuracy, the location of devices is transmitted less frequently. However, this mode saves the battery power of the user's device.

The mode corresponds to the page number next to the operating system of the device, from 0 to 4 (Fig. 2.277):

- 0 – maximum location accuracy

- 4 – minimum location accuracy
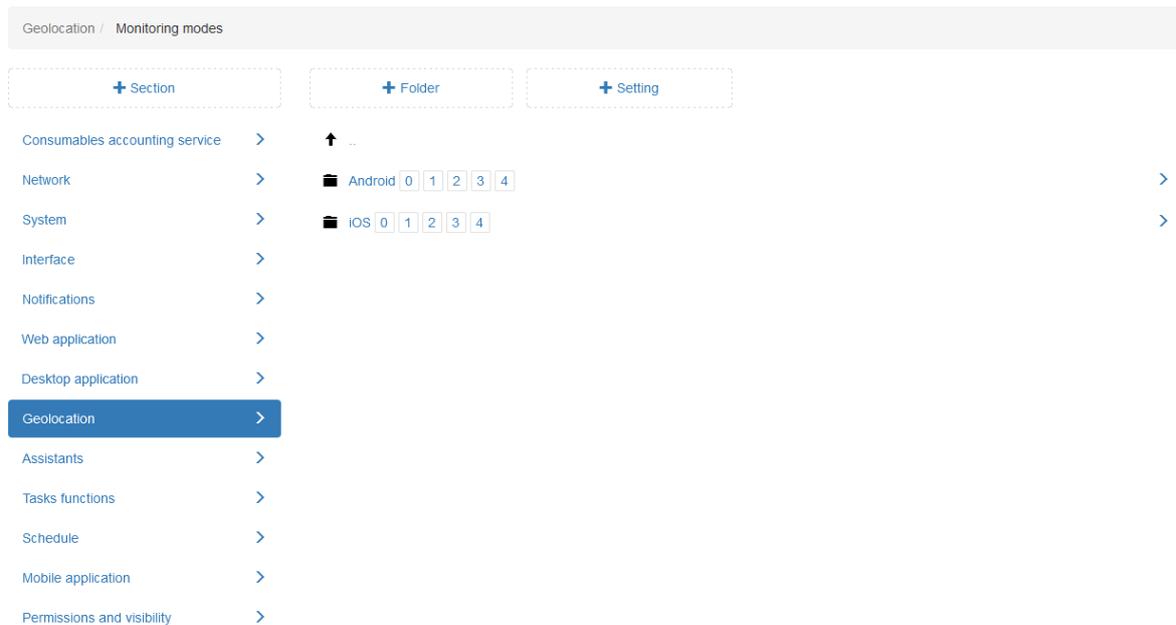
Fig. 2.277: Monitoring modes

Each mode has its own set of settings. To go to the settings of a particular mode, click the page number.

## Android

This folder contains geolocation settings in the ActiveMap Mobile for the Android operating system (Fig. 2.278). After adding a new value to the presented settings, the user needs to update the data in the mobile application.
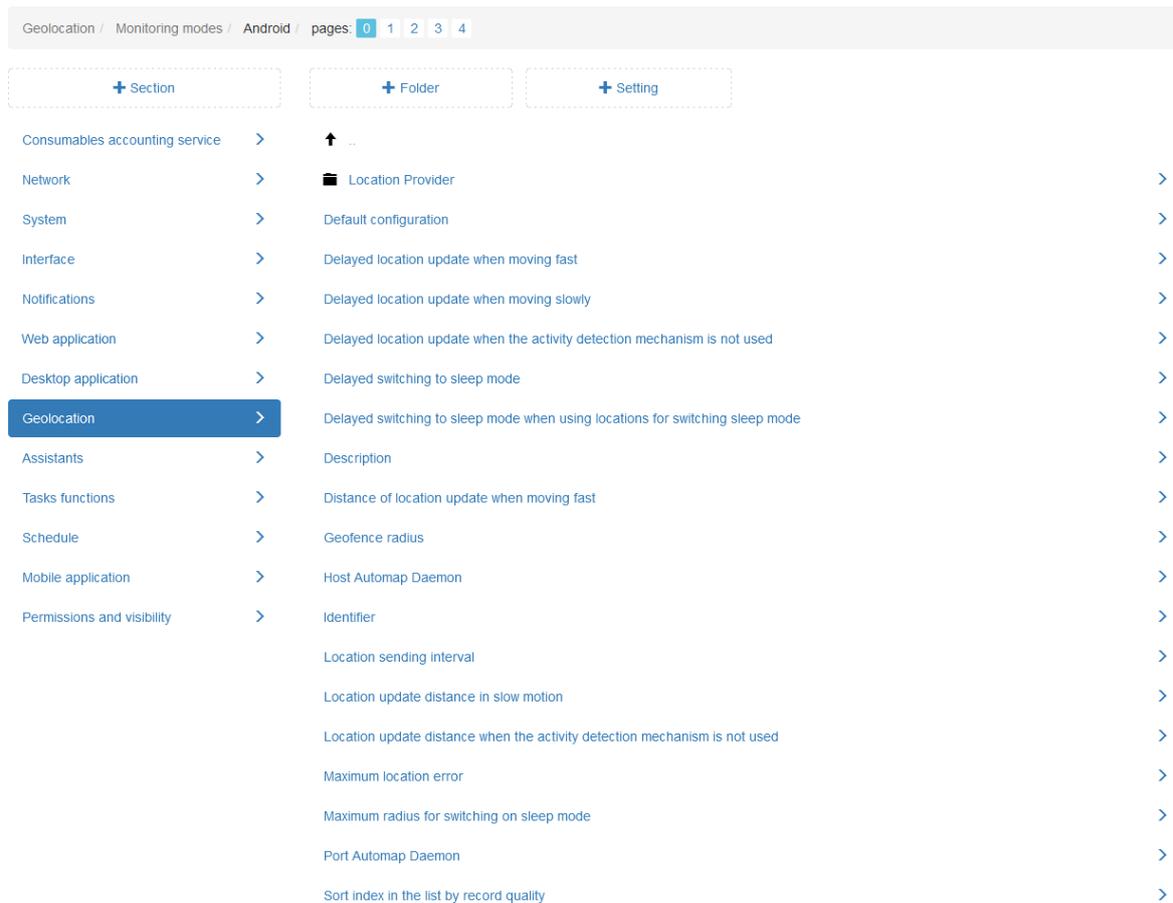
Fig. 2.278: Monitoring mode settings for the Android operating system

**Location Provider**

This setting allows specifying a provider for the "Mark my location" window in the ActiveMap Mobile. The following providers are available:

- Gps (default) – this provider determines the location using satellites. Depending on the conditions, it may take some time to determine the location.

- Network – determines the location based on the availability of a cell tower and Wi-Fi access points. The results are extracted using a network search.

- Passive – the least accurate provider. This provider receives location data when other applications or services request it, without actually requesting locations itself.

**Default configuration**

This setting specifies which of the presented geomonitoring modes is activated on the server.

**Delayed switching to sleep mode**

This setting specifies how many seconds it takes for location monitoring to go into sleep mode when the user is not moving.

**Description**

The setting contains a brief description of the selected monitoring mode.

**Distance of location update when moving fast**

The setting is used to filter location points during fast motion, such as in a car. You can set how many meters the device needs to request the user's location for a given type of movement.

**Identifier**

The setting specifies the ID of the selected mode of user location monitoring. The setting is used for the geolocation tracking service. There are 5 geolocation monitoring modes. Based on this index, they are sorted in the interface of the mobile application.

**Location sending interval**

This setting specifies how often (in seconds) the user's location points are sent to the server.

**Location update distance in slow motion**

The setting is used to filter location points when moving slowly, such as when walking. You can set how many meters the device needs to request the user's location for a given type of movement.

**Maximum location error**

The setting specifies the allowable coordinate error. If the coordinate exceeds this error, then it is not taken into account.

The **Port AutoMap Daemon** and **Host AutoMap Daemon** settings specify the address and port for connecting to the server.

**Title**

This setting displays the name of the selected user location monitoring mode.

### iOS

This folder contains geolocation settings in the ActiveMap Mobile for the iOS operating system. After adding a new value to the presented settings, the user needs to restart the mobile application.

## Modules

### Using GPS monitoring

This setting specifies that location determination on iOS devices is also done via GPS. This setting is enabled by default (Fig. 2.279).
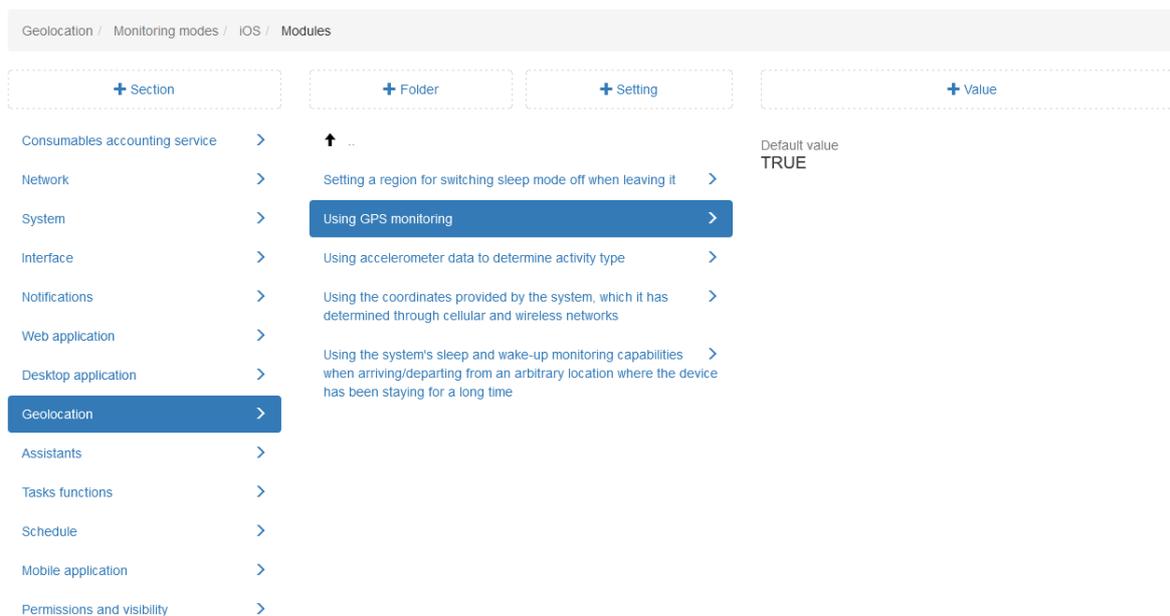


Fig. 2.279: Using GPS monitoring

### Using accelerometer data to determine activity type

In this setting, you can enable using the accelerometer in the mobile device, which improves the quality of the transmitted data (Fig. 2.280). Connecting this sensor also provides information about speed and direction of movement. However, using mobile device sensors involves increased battery consumption.
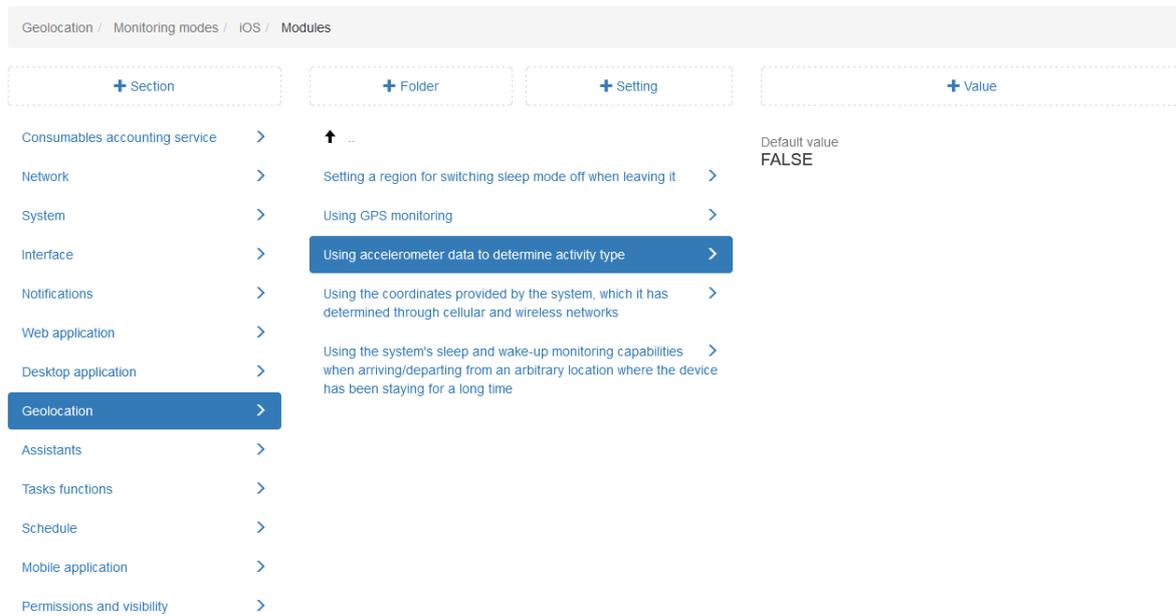
Fig. 2.280: Using accelerometer data

### Use the coordinates provided by the system, which it has determined through cellular and wireless networks

By default, iOS devices use cellular and wireless networks to determine the location. You cannot select only one of these options. This setting is enabled by default (Fig. 2.281).
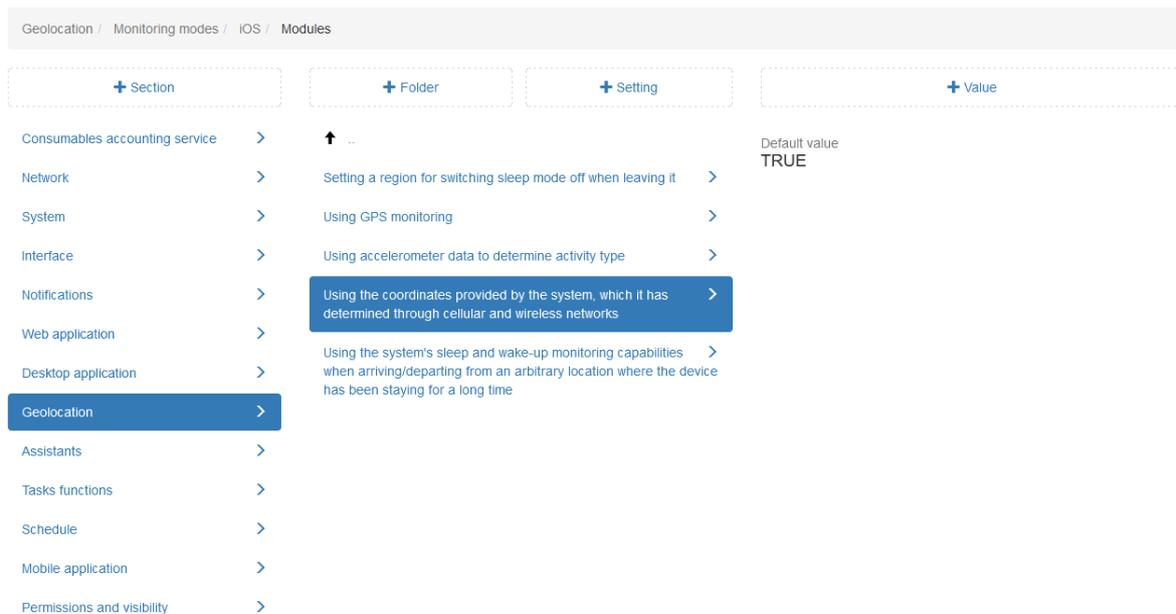


Fig. 2.281: Determining coordinates using cell and wireless networks

### Use the system's sleep and wake up monitoring capabilities when

**arriving/departing from an arbitrary location where the device has been staying for a long time** and **Setting a region for switching sleep mode off when leaving it**

Applying these settings allows users to stop sending data to the system if the user stays in one place for a long time (home, office). The setting puts the application into sleep mode after the time specified in the **Sleep Delay** setting (Fig. 2.282).
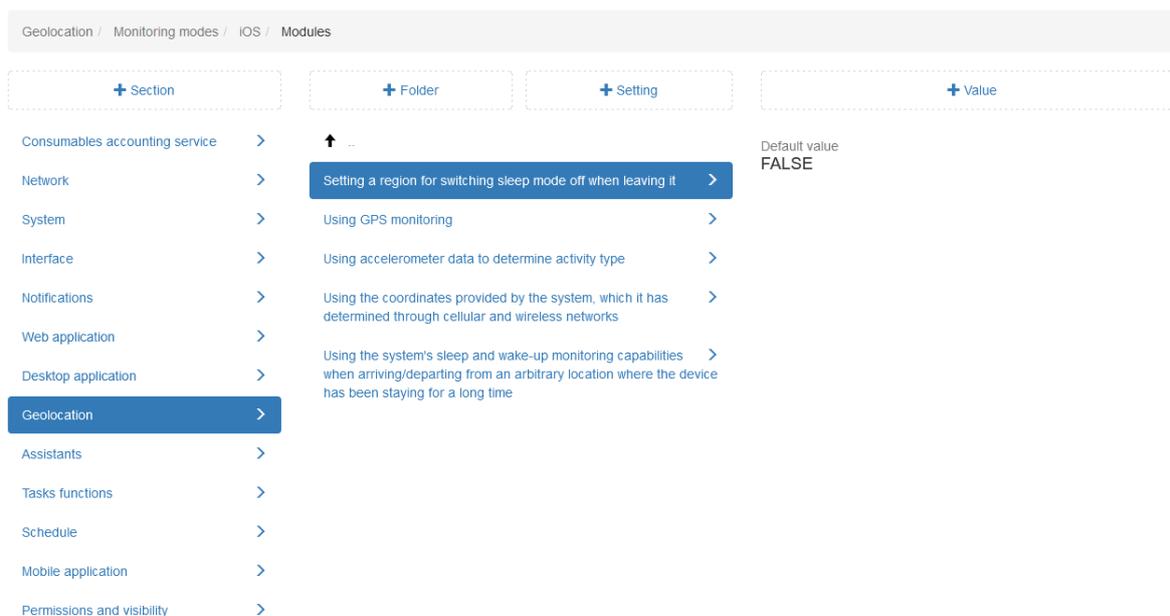


Fig. 2.282: Setting the region to wake up when coming out of it

### Fast motion monitoring settings

**Desired accuracy**

The setting is used to filter location points during fast motion, such as in a car. If the point radius is greater than the set value, these points are not used (Fig. 2.283).

Fig. 2.283: Desired accuracy during fast motion

**Minimal change of movement angle to get location update**

The setting is used to filter points. You can set the minimum angle of movement in degrees. If the angle matches the minimum value, the change is considered insignificant and the motion angle is not changed (Fig. 2.284).



Fig. 2.284: Minimal change of movement angle

**Minimum distance between points when receiving a location update**

This setting is used to filter points. You can specify how many meters should pass before a new point is recorded (Fig. 2.285). Frequent location updates can lead to increased battery consumption of the device.
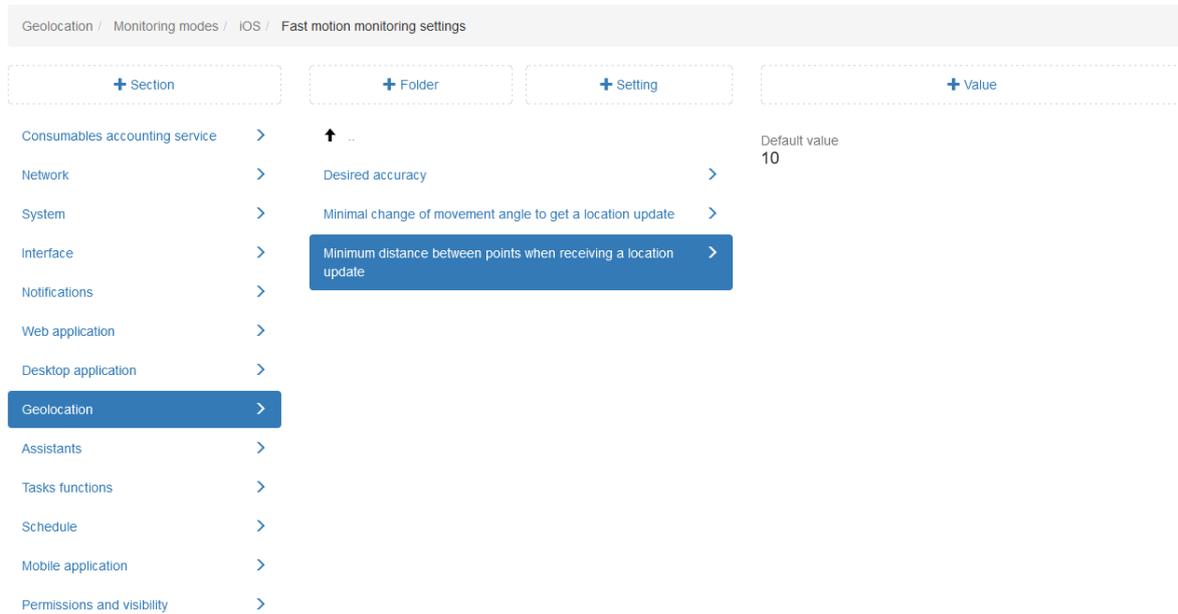


Fig. 2.285: Minimum distance between points when receiving a location update

## Slow motion monitoring settings

### Desired accuracy

The setting is used to filter location points when moving slowly, such as when walking. If the point radius is larger than the set value, these points are not used (Fig. 2.286).
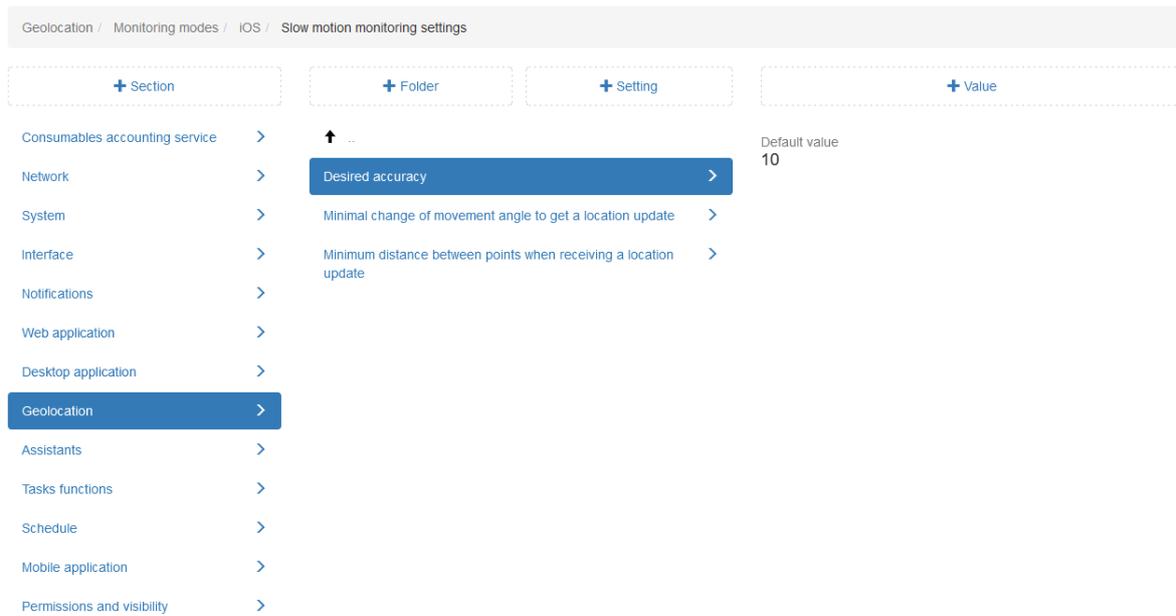
Fig. 2.286: Desired accuracy during slow movement

**Minimal change of movement angle to get a location update**

The setting is used to filter points. You can set the minimum movement angle in degrees. If the angle matches the minimum value, the change is considered insignificant and the motion angle does not change (Fig. 2.287).
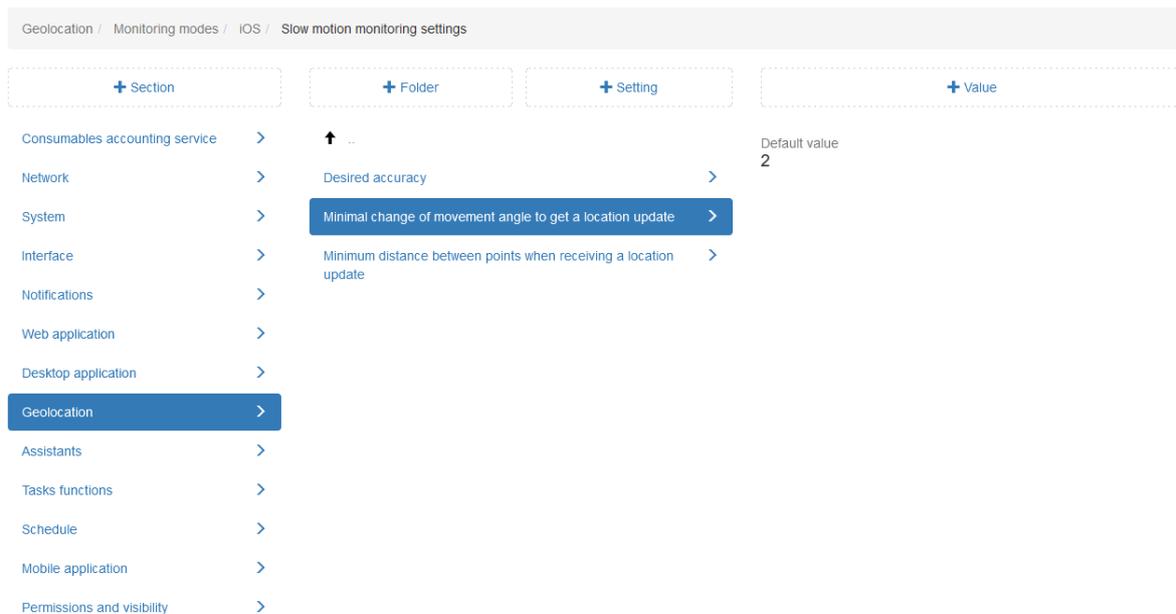


Fig. 2.287: Minimal change of movement angle

**Minimum distance between points when receiving a location update**

The setting is used to filter points. You can specify how many meters should pass before a new point is recorded (Fig. 2.288). However, frequent location updates can lead to increased battery consumption of the device.
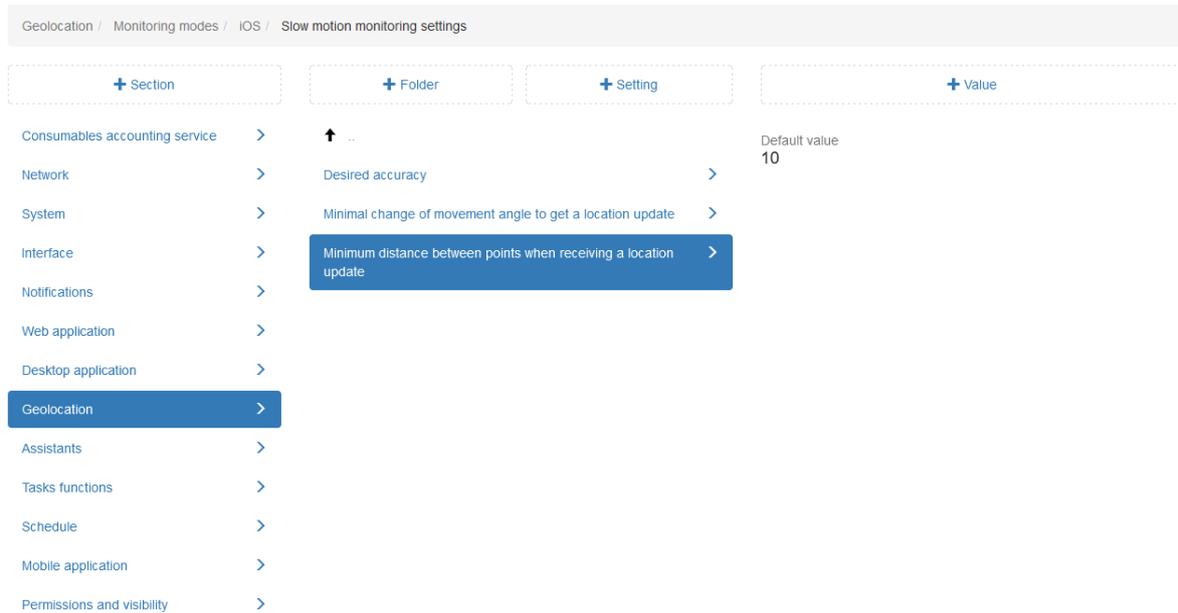


Fig. 2.288: Minimum distance between points when receiving a location update

**Default configuration**

The setting displays the geomonitoring mode activated on the server (Fig. 2.289).

Fig. 2.289: Default configuration

### Delayed switching to sleep mode

The setting specifies how many seconds to wait before switching the location monitoring to sleep mode if there is no user movement (Fig. 2.290).



Fig. 2.290: Sleep delay

**Description**

The setting contains a brief description of the selected monitoring mode
([Fig. 2.291](#)).



Fig. 2.291: Description of geolocation monitoring mode

**Identifier**

This setting specifies the ID of the selected location monitoring mode
([Fig. 2.292](#)).

Fig. 2.292: Identifier of the monitoring mode

**Maximum location error**

The setting specifies the allowable coordinate error. If a coordinate exceeds this error, it is not taken into account (Fig. 2.293).



Fig. 2.293: Maximum location error

The **Port AutoMap Daemon** and **Host AutoMap Daemon** settings

specify the address and port to connect to the server ([Fig. 2.294](#)).



Fig. 2.294: AutoMap daemon host

**Sending interval of recorded points**

This setting determines the frequency (in seconds) of sending location points to the server ([Fig. 2.295](#)).

Fig. 2.295: Recorded points sending interval

### Sort index in the list by record quality

The setting is used for the geolocation tracking service. There are 5 modes of geolocation monitoring. They are sorted in the interface of the mobile application based on this index (Fig. 2.296).



Fig. 2.296: Sort index in the list by record quality

**Title**

This setting displays the name of the selected user location monitoring mode (Fig. 2.297).
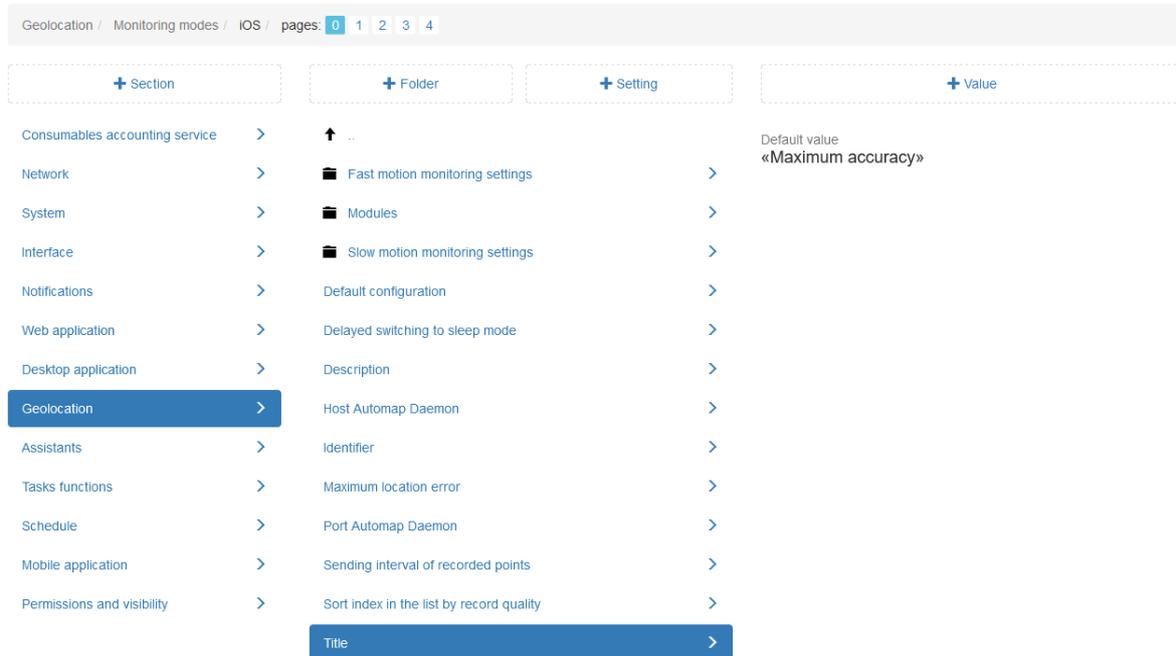


Fig. 2.297: Name of geolocation monitoring mode

## Server

In this folder, you can configure server settings for monitoring user geolocation (Fig. 2.298).
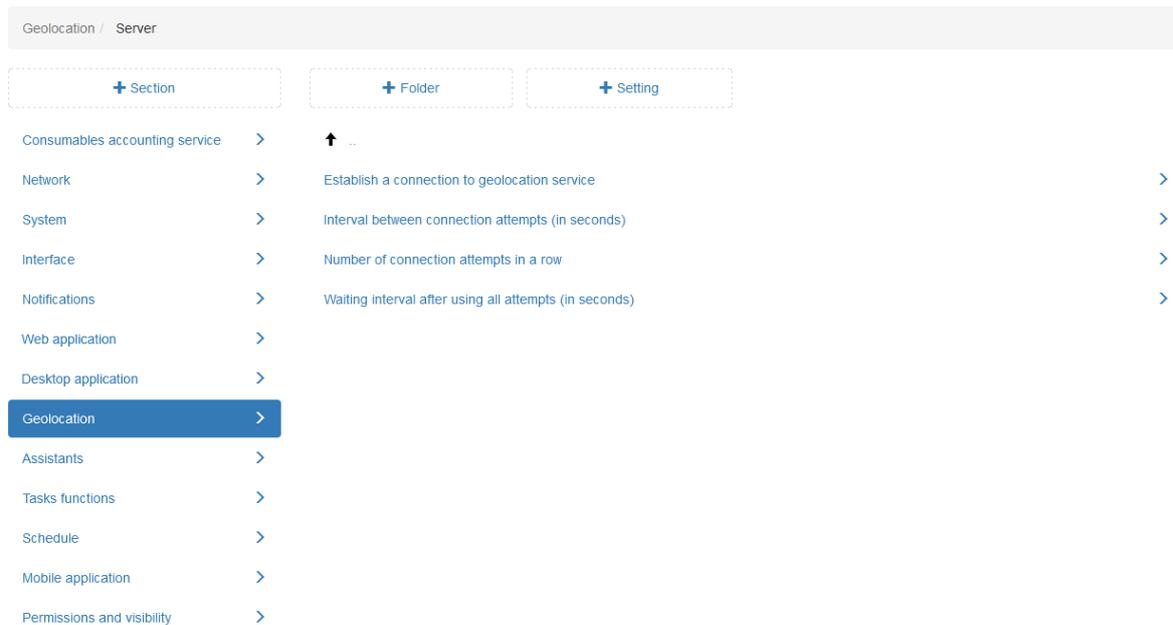
Fig. 2.298: Server settings for monitoring geolocation

**Establish a connection to geolocation service**

When the setting is enabled, Cerebellum gets the location of users by establishing a connection with the location tracking service. If this setting is disabled during operation, Cerebellum resets the connection. The response to the setting change is immediate, but the connection itself may take some time to establish. This setting is enabled by default (Fig. 2.299)
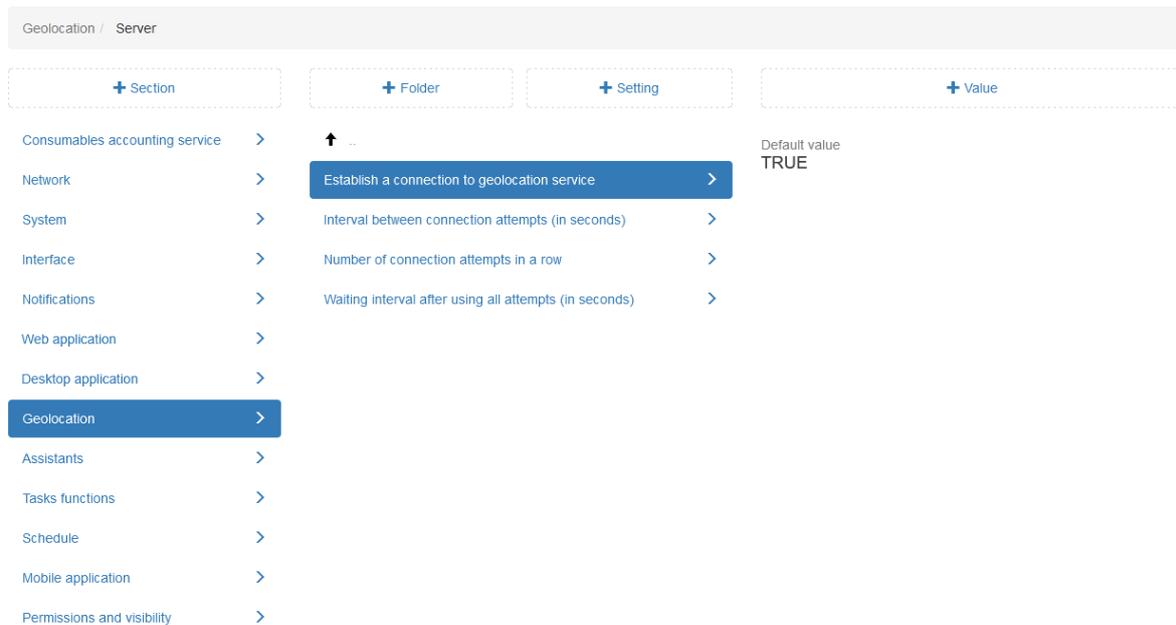
Fig. 2.299: Establishing a connection to geolocation service

**Interval between connection attempts (in seconds)**

If the connection to the location tracking service fails, the next attempt
is made after the time specified in this setting (Fig. 2.300).
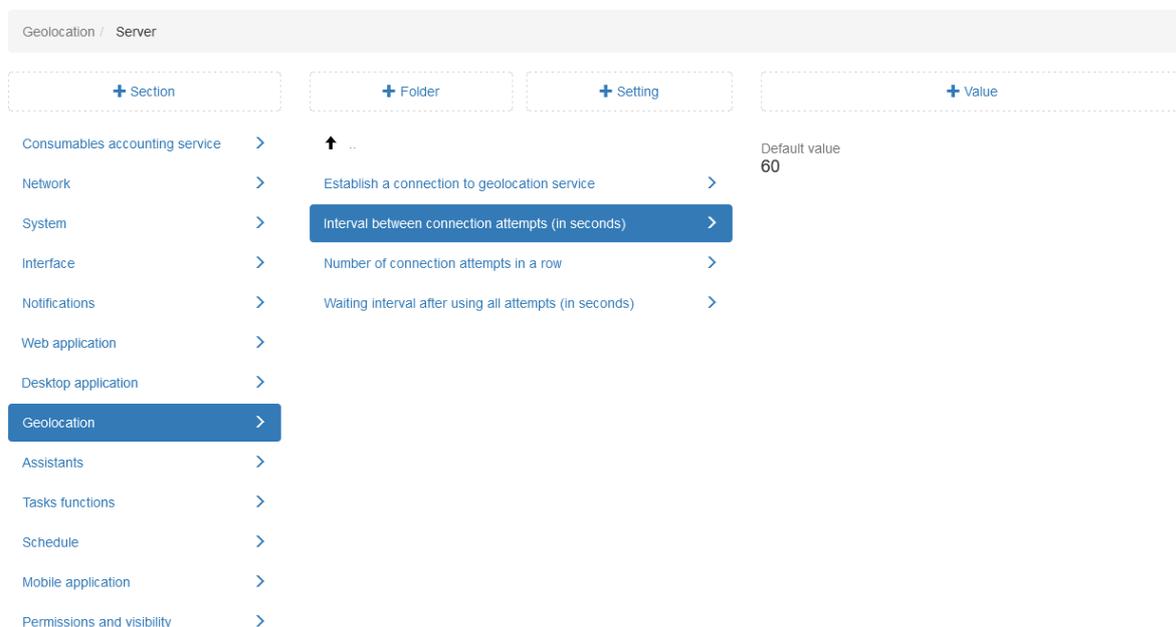


Fig. 2.300: Interval between connection attempts

**Number of connection attempts in a row**

Unsuccessful connection attempts are combined into groups. The maximum number of attempts in a group is specified in this setting (Fig. 2.301).
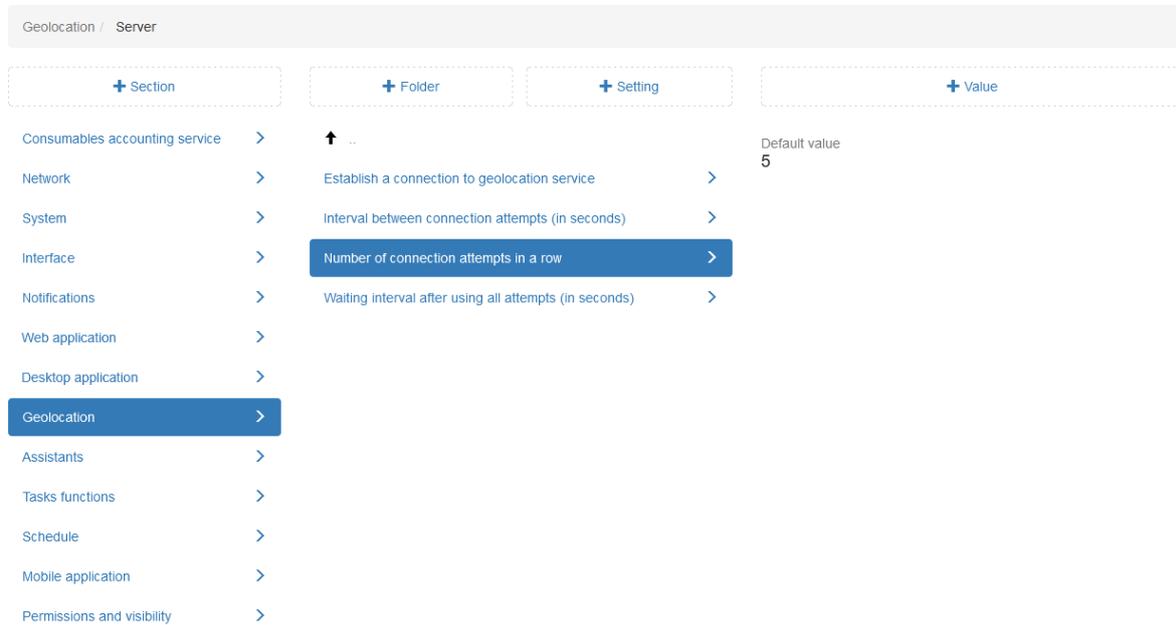


Fig. 2.301: Number of connection attempts

**Waiting interval after using all attempts**

After using all the attempts in a group, the next group of attempts is made after the time specified in this setting (Fig. 2.302).
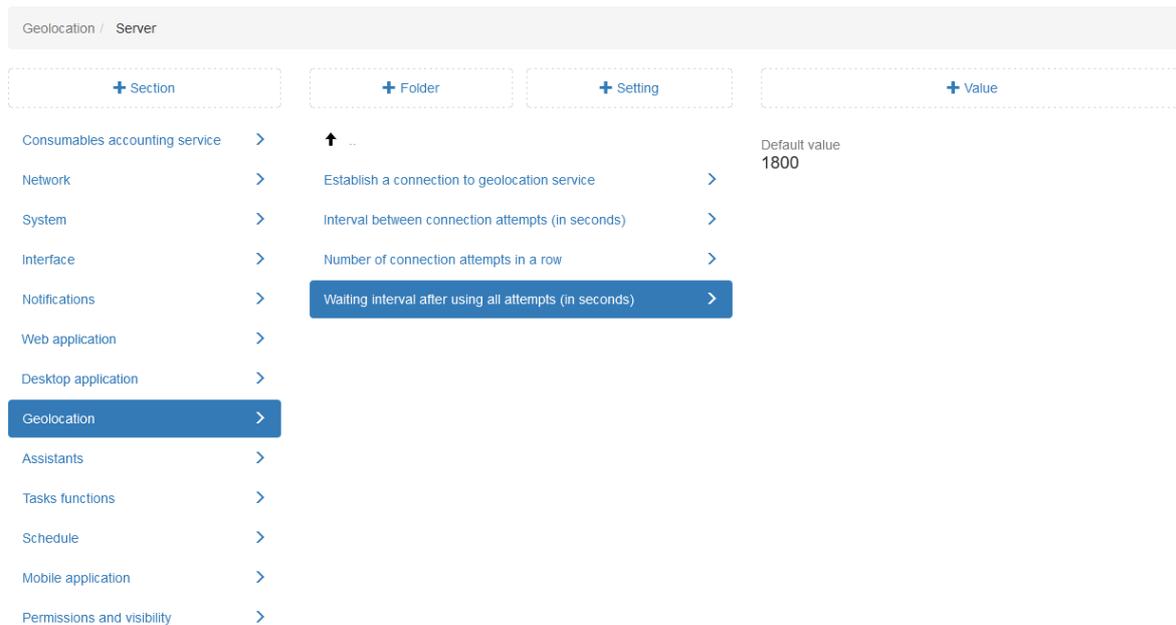
Fig. 2.302: Waiting interval after using all attempts

### 2.3.3.7.9 "Assistants" section

The section allows users to customize existing algorithms that perform certain actions (Fig. 2.303). You can set a new value by selecting the setting, then clicking "+ Value". In the window that opens, enable/disable the toggle switch or enter the required name, and then fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
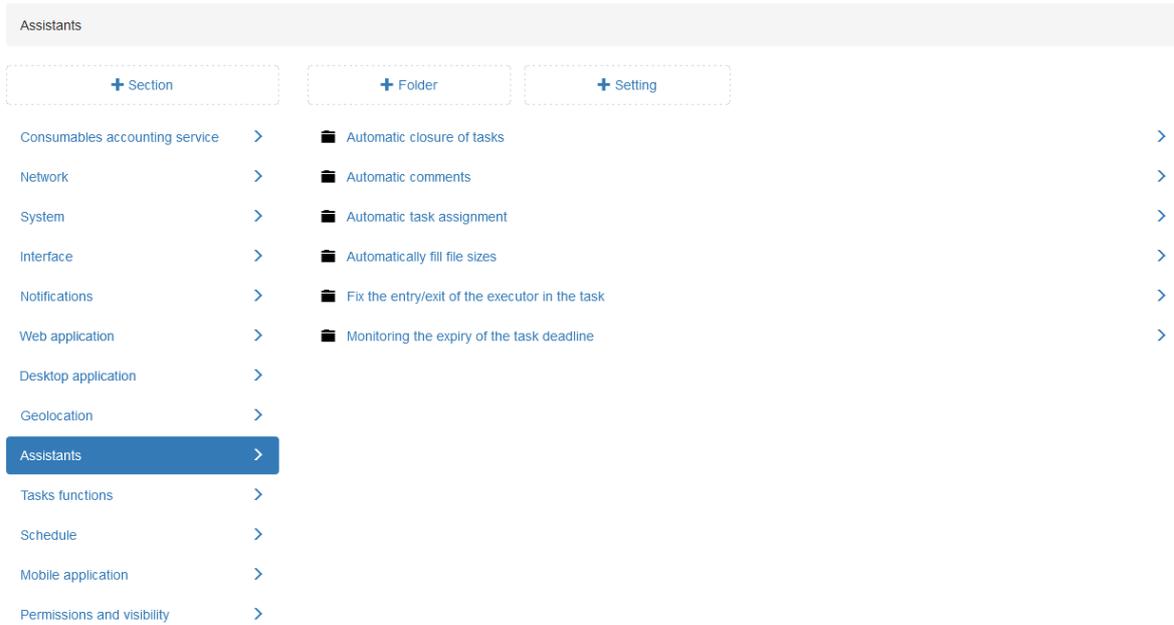
Fig. 2.303: "Assistants" section

## Automatic closure of tasks

A setting that allows users to transfer the task automatically at the closing step to the "Completed" stage. This setting is disabled by default (Fig. 2.304).
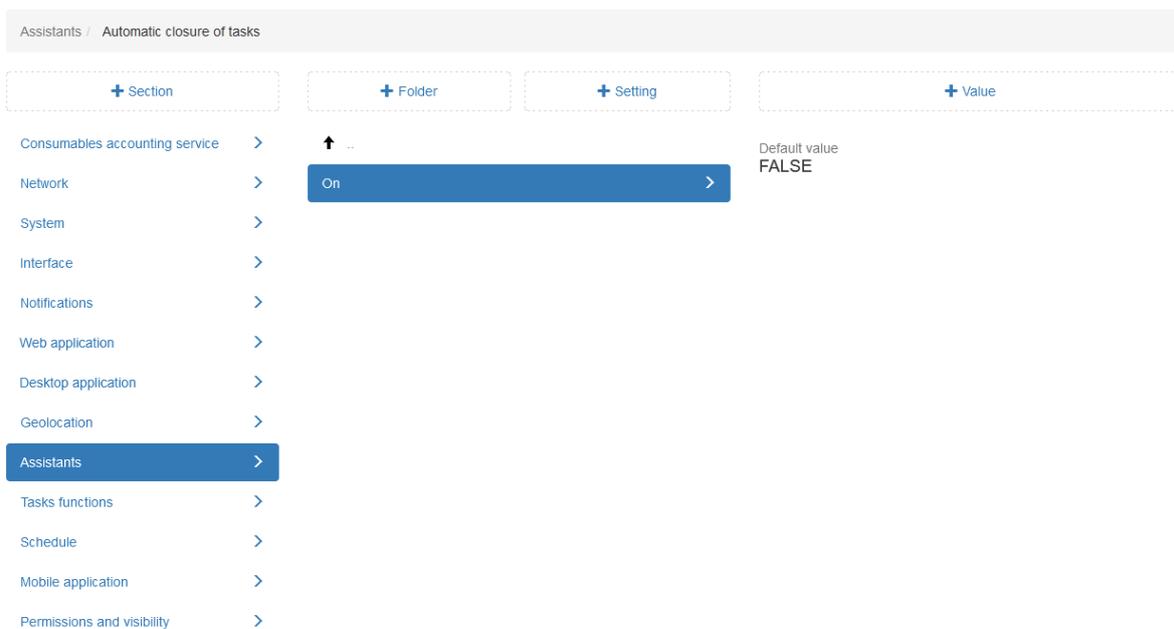


Fig. 2.304: Automatic task closing

## Automatic comments

This setting allows adding comments about attaching a file to the history at the time of task creation. The setting is enabled by default (Fig. 2.305).
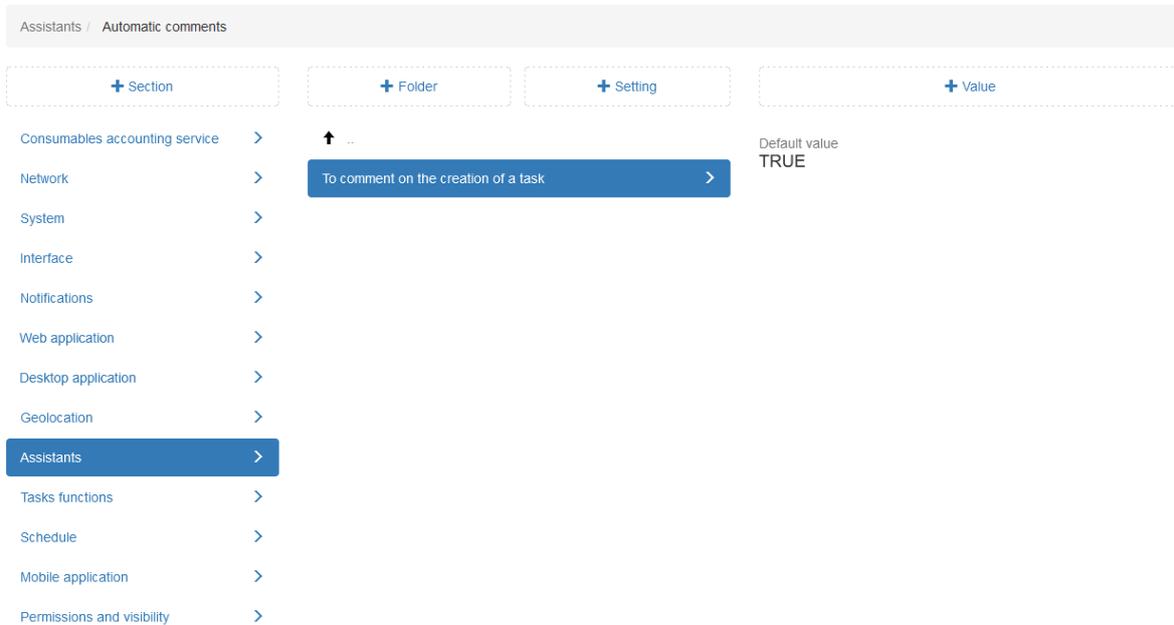


Fig. 2.305: Automatic comments

## Automatic task assignment

This setting is responsible for the automatic assignment of tasks by the system to the user (Fig. 2.306).
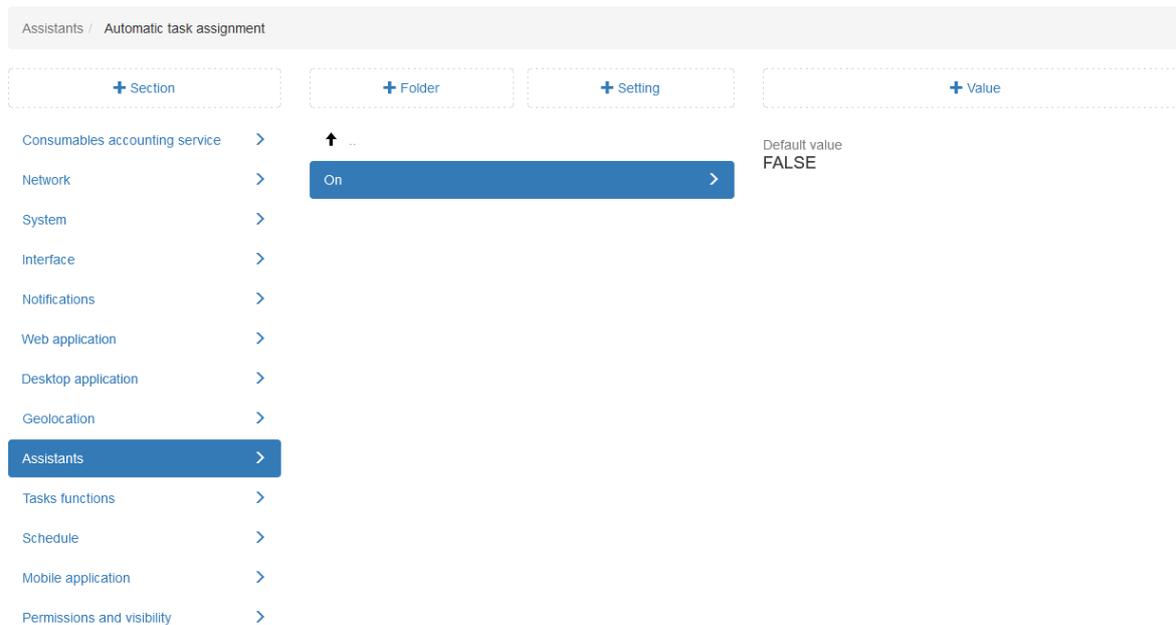
Fig. 2.306: Automatic task assignment

## Automatically fill file sizes

This setting allows filling in the "File size" column in the database for old files. To start the process of gradual filling with data, enable this setting. It loads the specified number of files from the database in the **Number of files to process at a time** setting with the frequency specified in the **Startup period** setting. It searches for them on the disk and collects information by the size. This setting is disabled by default (Fig. 2.307).
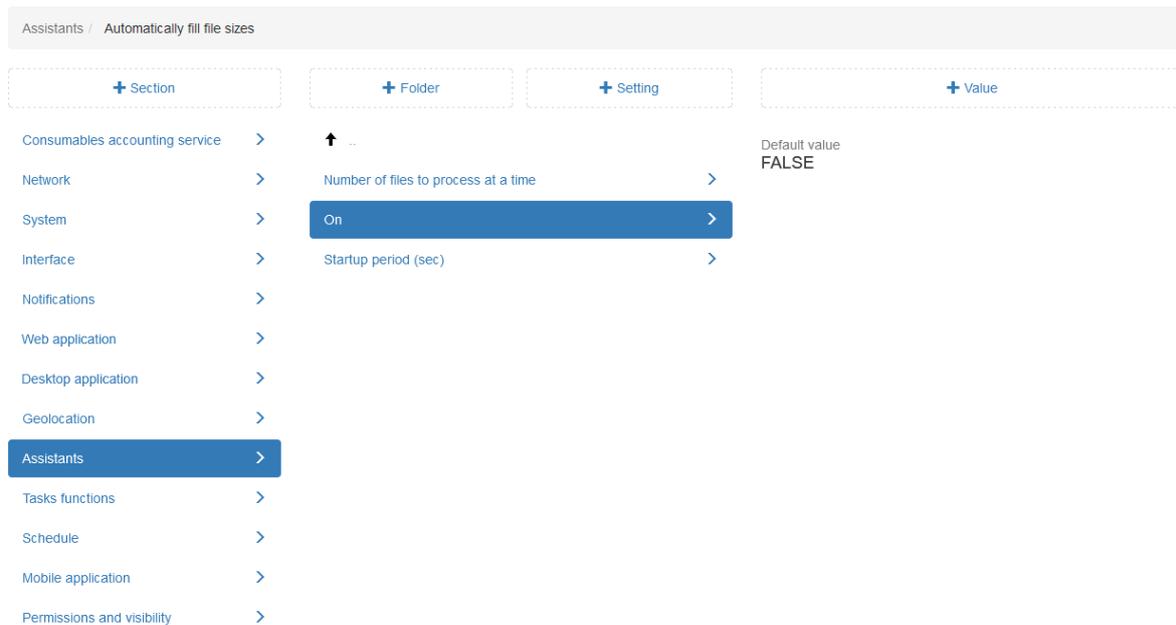
Fig. 2.307: Automatic filling of file sizes

### Fix the entry/exit of the executor in the task

Cerebellum has a mechanism for controlling the entry/exit of executors into/from the task zones. Zones are defined as circles around the task points. To ensure the correct work of the mechanism, enable the connection with the location determination service.

The zone entry control works when the following conditions are met:

- The zone entry control mechanism is enabled;

- The executor's location tracking is enabled;

- The task has a point;

- The task is not a template;

- The task is in the "In progress" or in the "Completed" step, but the executor is in the task zone.

> **Attention:** If the task is completed, but the executor is in the zone, the control mechanism waits for the executor to leave the zone and then stops monitoring the task. However, this does not refer to the tasks that are in the "Completed" step at the time of launching Cerebellum. For such tasks, it is impossible to determine correctly whether the executors are in the zone or not, so their entry/exit is not tracked.

If the conditions described above are met for the task and the executor enters/exits the task zone, the following happens:

- a record is added to the corresponding table with a fixation of:
    - The user;
    - The task point;
    - Date and time;
    - Entry/exit sign;
    - Indication of the event occurrence directly at the moment of assigning to executor;
- one of the following comments is created on behalf of the executor in the task:
    - "The executor has left the task area";
    - "The executor has entered the task area";
    - "The executor is out of range of the task" if the event occurred at the moment of assignment to the executor or at the moment of changing the zone radius setting;
    - "The executor is inside the zone of the task" if the event occurred at the moment of assignment to the executor or at the moment of changing the zone radius setting.

This setting is enabled by default (Fig. 2.308).
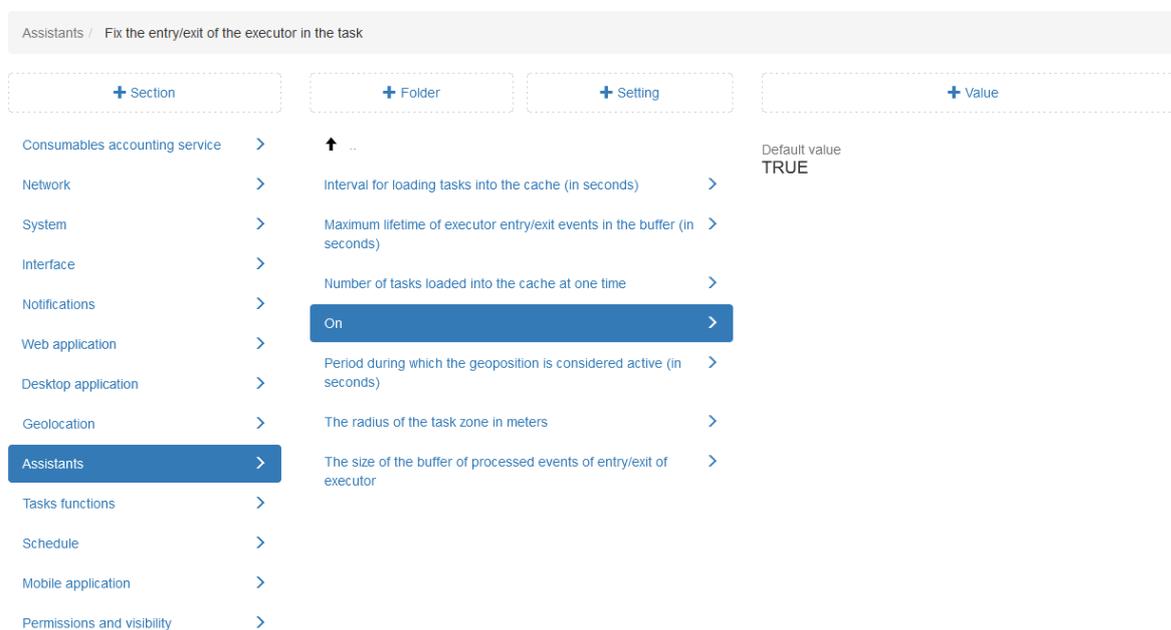


Fig. 2.308: Fixing the entry/exit of the executor in the task

**Interval for loading tasks into the cache (in seconds)**

The setting controls the process of filling the internal cache with tasks in the mechanism of tracking the user entry/exit from the task zone.

Namely, it specifies how often the next set of tasks should be loaded from the database into the cache (Fig. 2.309).



Fig. 2.309: Interval for loading tasks into the cache

### Maximum lifetime of executor entry/exit events in the buffer (in seconds)

The engineering setting. This value is for developer use only during debugging. It specifies the frequency of sending events from the buffer for processing regardless of buffer fullness. The timeout is set for the timely processing of events in case the entry/exit event from the task zone occurs very rarely (Fig. 2.310). The default is 1 second.

Fig. 2.310: Maximum lifetime of executor entry/exit events in the buffer (in seconds)

**Number of tasks loaded into the cache at one time**

To track the entry/exit of executors from the task zone, Cerebellum uses a task cache. It stores the part of the information necessary to calculate the entry and exit events. When Cerebellum is started, the cache is filled with information. However, this happens gradually to avoid excessive load on the server. With a certain periodicity, Cerebellum saves the next tasks in the cache, in descending order of their IDs. This setting specifies how many tasks are loaded from the database into the cache at once (Fig. 2.311).

Fig. 2.311: Number of tasks loaded into the cache at once

**Period during which the geoposition is considered active**

The setting sets the duration for which the user's geoposition is considered active. The default is 3 hours (Fig. 2.312).



Fig. 2.312: Period during which the geoposition is considered active

**The radius of the task zone in meters**

You can set the distance from the task point at which the executor is considered to have entered or left the task zone. The default is 75 meters (Fig. 2.313).
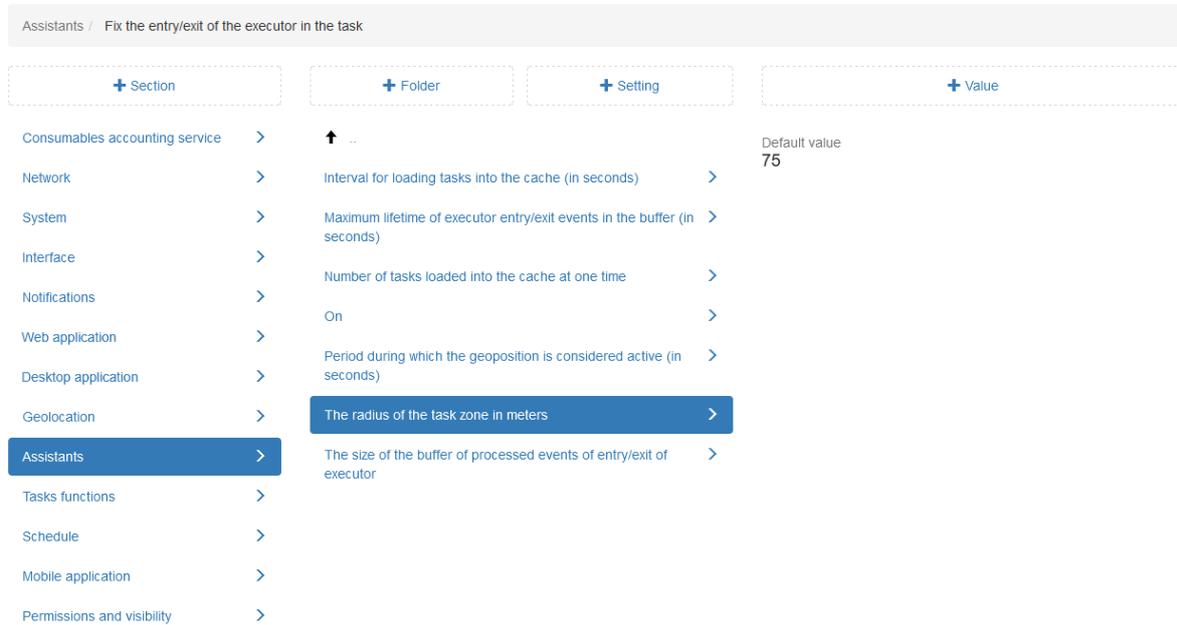


Fig. 2.313: Task zone radius

> **Attention:** If you change this setting while Cerebellum is running, a large number of executors may get in/out of the task radius. This can severely overload the system by causing a mass addition of comments.

### The size of the buffer of processed events of entry/exit of the executor

Engineering setting. This value is for developer use only during debugging. There can be a large number of tasks in the system, where the event of entering/leaving the zone of the task occurs. For all these tasks, the system has to add the appropriate comment. First of all, the system takes the task from the database, since only its id is stored in the cache. Performing this operation one by one for all tasks can cause a large load on the database. Therefore, the buffer of processed events is used. This setting specifies the size of the buffer (Fig. 2.314). The default is 20 events.

Assistants / Fix the entry/exit of the executor in the task

| **+ Section** | **+ Folder** | **+ Setting** | **+ Value** |
|---|---|---|---|

| Consumables accounting service | > |
| Network | > |
| System | > |
| Interface | > |
| Notifications | > |
| Web application | > |
| Desktop application | > |
| Geolocation | > |
| **Assistants** | **>** |
| Tasks functions | > |
| Schedule | > |
| Mobile application | > |
| Permissions and visibility | > |

↑ ..

Interval for loading tasks into the cache (in seconds) >

Maximum lifetime of executor entry/exit events in the buffer (in seconds) >

Number of tasks loaded into the cache at one time >

On >

Period during which the geoposition is considered active (in seconds) >

The radius of the task zone in meters >

The size of the buffer of processed events of entry/exit of executor >

Default value
20

Fig. 2.314: The size of the buffer of processed events of entry/exit of the executor

### Monitoring the expiry of the task deadline

These settings allow recording the expiration of the task in the task history. This setting is enabled by default (Fig. 2.315).

Expiration control functions under the following conditions:

- The "Control of the expiration of tasks" setting is enabled.
- The task is not a template.
- The task execution deadline is in the future.
- The task is at the "In progress" step.
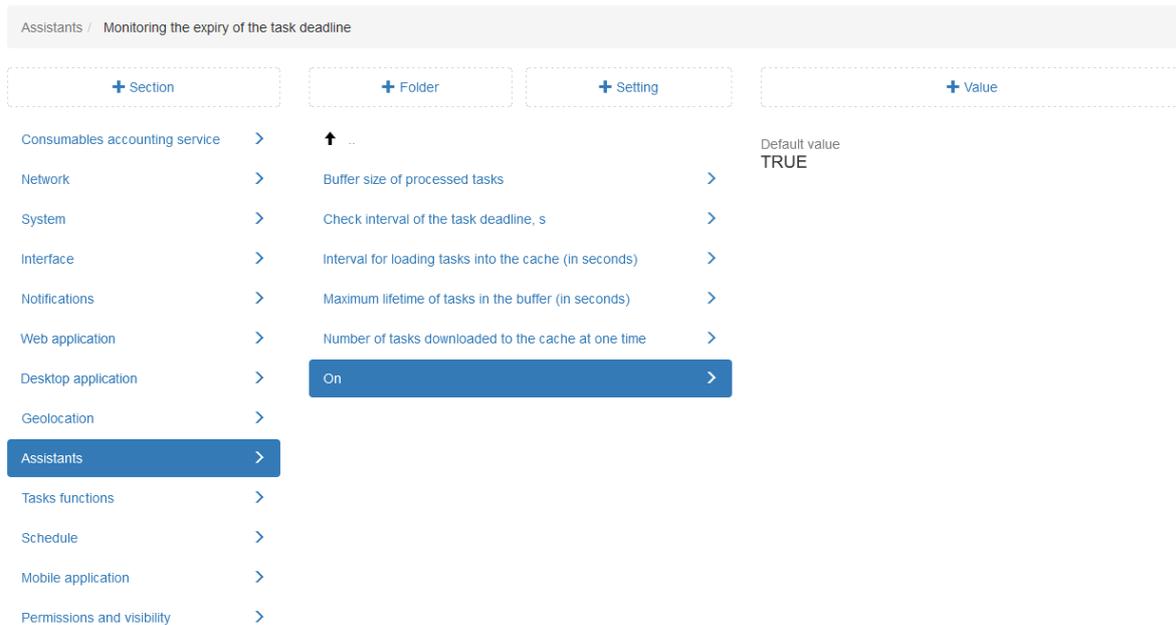
Fig. 2.315: Deadline control for tasks

> **Attention:** The deadline is monitored regardless of the value of the setting. The value only affects whether events of deadlines expiration are recorded in the database or in comments in the task.

**Buffer size of processed tasks**

Engineering setting. This value is for developer use only during debugging. There may be a large number of tasks in the system with the same execution deadline, such as scheduled tasks. Upon expiration, the system has to change the corresponding column and add a comment in each of these tasks. First of all, the system takes the task from the database, since only its ID is stored in the cache. Performing this operation one by one for all expired tasks can cause a large load on the database. Therefore, there is a buffer of expired tasks that fills up as the due date arrives. Expired tasks from the buffer are sent for processing only after the buffer is fully filled, as well as on timeout. This setting specifies the size of the buffer (Fig. 2.316). The default is 50 tasks.

Fig. 2.316: Buffer size of processed tasks

### Check interval of the task deadline

This setting specifies how often Cerebellum checks for expired tasks (Fig. 2.317). The default is 30 seconds.



Fig. 2.317: Expiration check interval

### Interval for loading tasks into the cache (in seconds)

This setting controls the process of filling the internal cache of the deadline control mechanism with tasks. It specifies how often the next sets of tasks should be loaded from the database into the cache (Fig. 2.318).



Fig. 2.318: Interval for loading tasks into the cache

**Maximum lifetime of tasks in the buffer (in seconds)**

Engineering setting. This value is for developer use only during debugging. It specifies the frequency of sending expired tasks for processing from the buffer regardless of the buffer size. The timeout is used for timely processing of expired tasks if the expiration event occurs very rarely (Fig. 2.319). The default is 1 second.
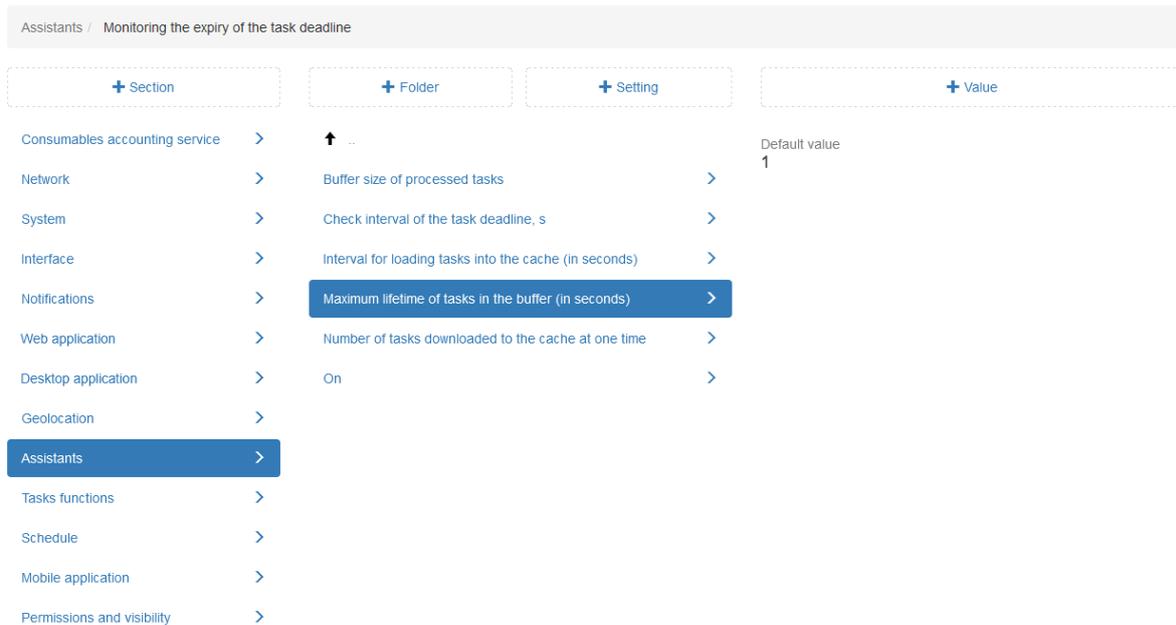
Fig. 2.319: Maximum lifetime of tasks in the buffer

**Number of tasks downloaded to the cache at one time**

To track the deadline for execution, Cerebellum uses a cache that stores the mapping between tasks and their execution deadlines in ascending order. The cache is populated and updated when tasks are created, modified, and deleted, as well as when Cerebellum starts to load information about existing tasks. Such a load happens gradually to avoid excessive server load. With a certain periodicity, Cerebellum saves the next set of tasks in the cache in ascending order of their execution deadlines. This setting specifies how many tasks are loaded from the database into the cache at once (Fig. 2.320).

Fig. 2.320: Number of tasks downloaded to the cache at once

### 2.3.3.7.10 "Task functions" section

This section contains settings for server operation with tasks and beacons (Fig. 2.321). You can set a new value for the setting by selecting it, then clicking "+ Value". Turn on/off the toggle switch or enter a new value in the opened window and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
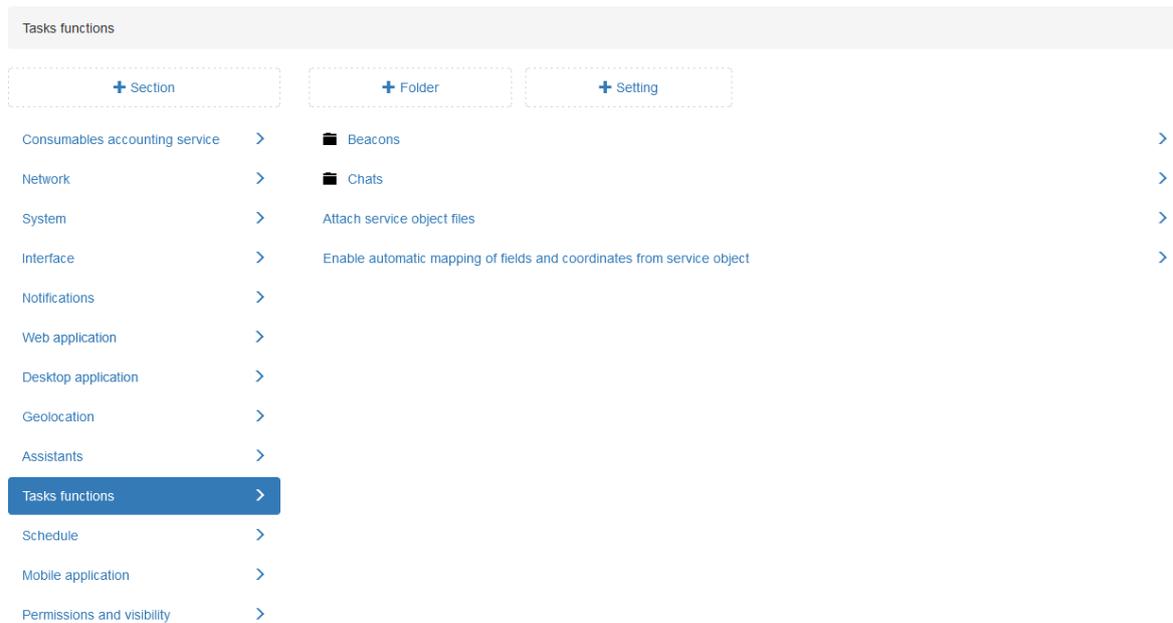
Fig. 2.321: "Task functions" section

### Beacons

The folder contains settings for working with BLE tags (beacons).

**Bluetooth Low Energy (BLE) tags**, also known as beacons, is a class of Bluetooth Low Energy (LE) devices that broadcast their identifiers to nearby portable electronic devices. The identifier and several bytes sent with it can be used to determine the device's physical location, track customers, or trigger a location-based action on the device.

**Beacons collecting enabled**

The setting allows you to activate the collection of BLE tags (beacons) in the system. The setting is enabled by default (Fig. 2.322).
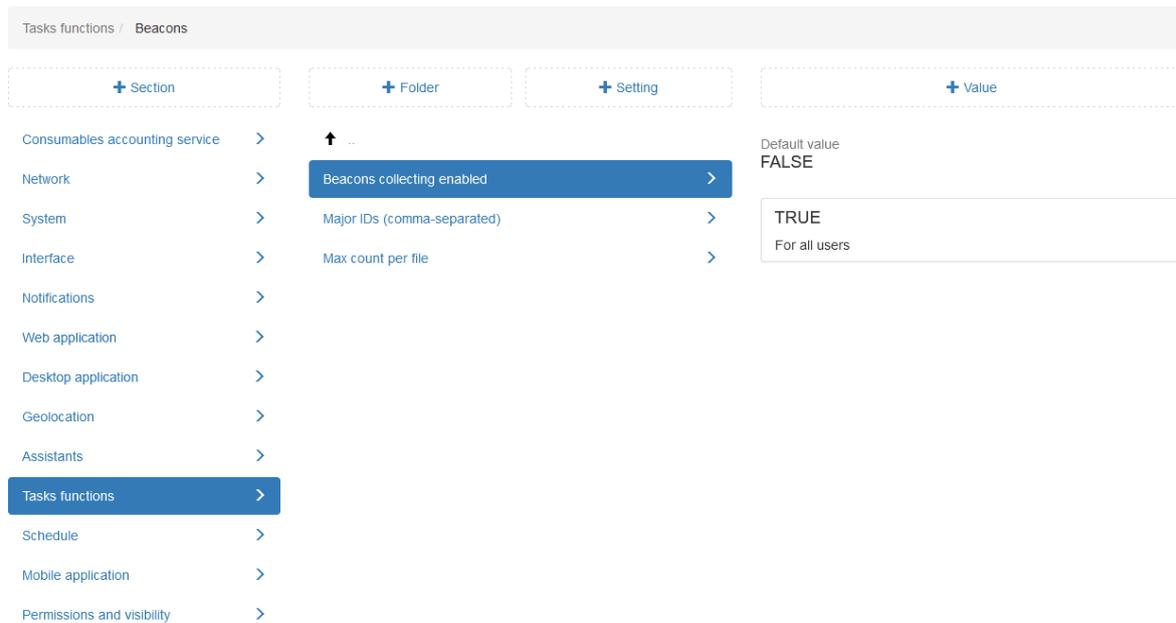
Fig. 2.322: Beacons collecting

### Major IDs (comma-separated)

The setting specifies identifiers for filtering BLE tags (beacons). If no values are set, then all BLE tags will be detected (Fig. 2.323). After specifying new identifiers, you have to update the data in the ActiveMap Mobile application.
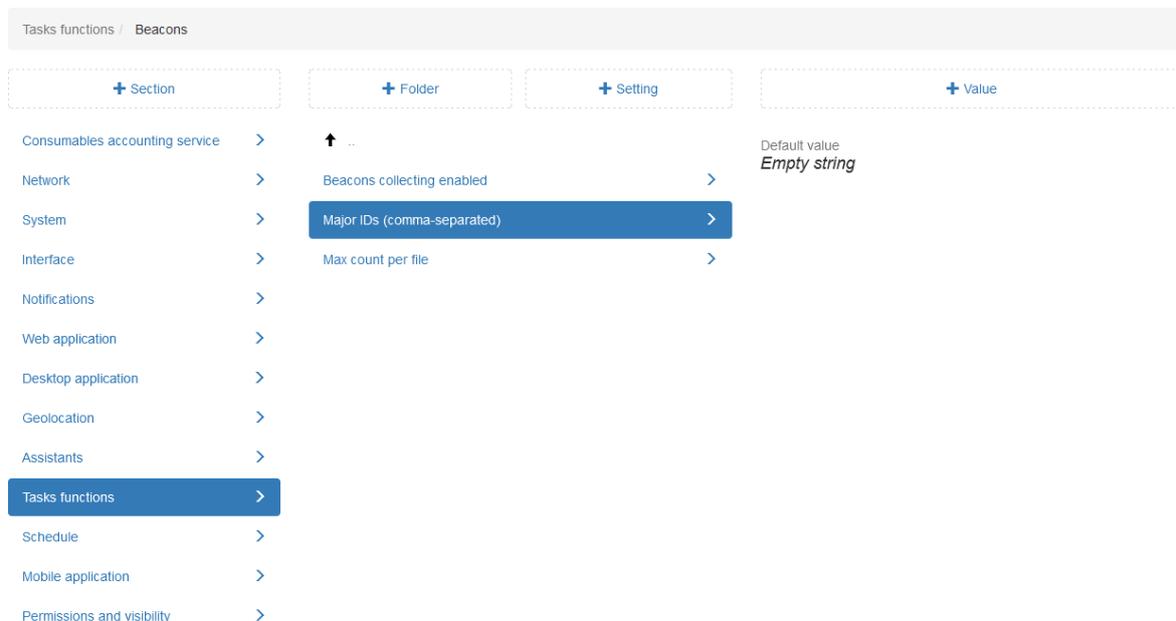


Fig. 2.323: Major beacon IDs

### Max count per file

---

There can be a large number of active BLE tags (beacons) inside a building. The setting allows you to set the maximum number of beacons which information will be stored in the photo. The default setting is 5 beacons (Fig. 2.324).
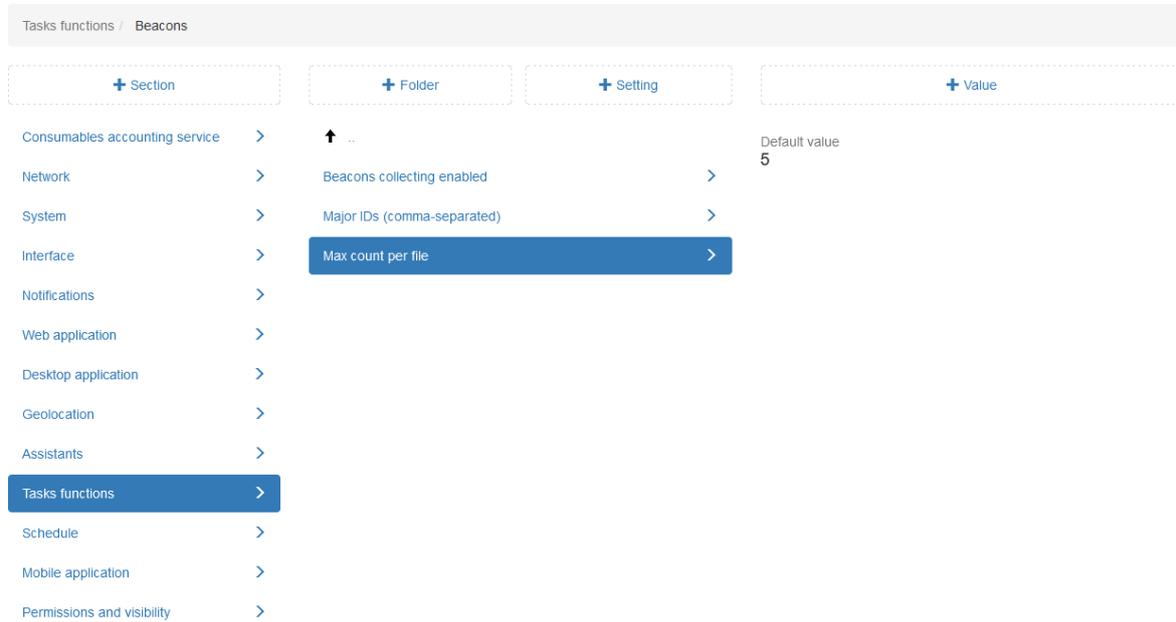


Fig. 2.324: Maximum number of tags per file

## Chats

### Number of chats loaded at a time when the application starts

Engineering setting. Only developers change it during debugging. It specifies how many comments are loaded at once when starting (Fig. 2.325).

Fig. 2.325: Number of chats loaded at a time when the application starts

### Attach service object files when creating a task

Setting that allows users to copy files of the related service object when creating a task. By default, this setting is disabled (Fig. 2.326).



Fig. 2.326: Attachment of service object files

### Enable automatic mapping of fields and coordinates from the service object

Server setting that allows users to enable copying of fields and coordinates from the service object to custom fields when creating a task. By default, the setting is enabled (Fig. 2.327).
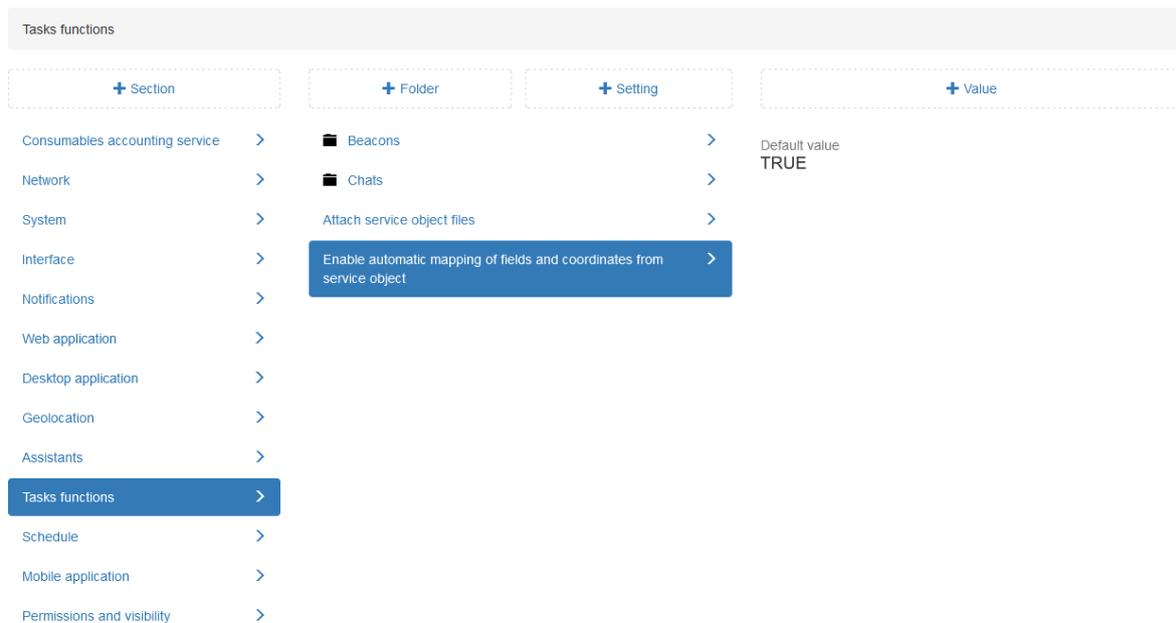


Fig. 2.327: Automatic mapping of fields and coordinates from the service object

### 2.3.3.7.11 "Schedule" section

This section contains settings that allow you to optimize system performance when creating schedules (Fig. 2.328). You can set a new value for the setting by selecting it, then clicking "+ Value". Turn on/off the toggle switch or enter a new value in the opened window and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
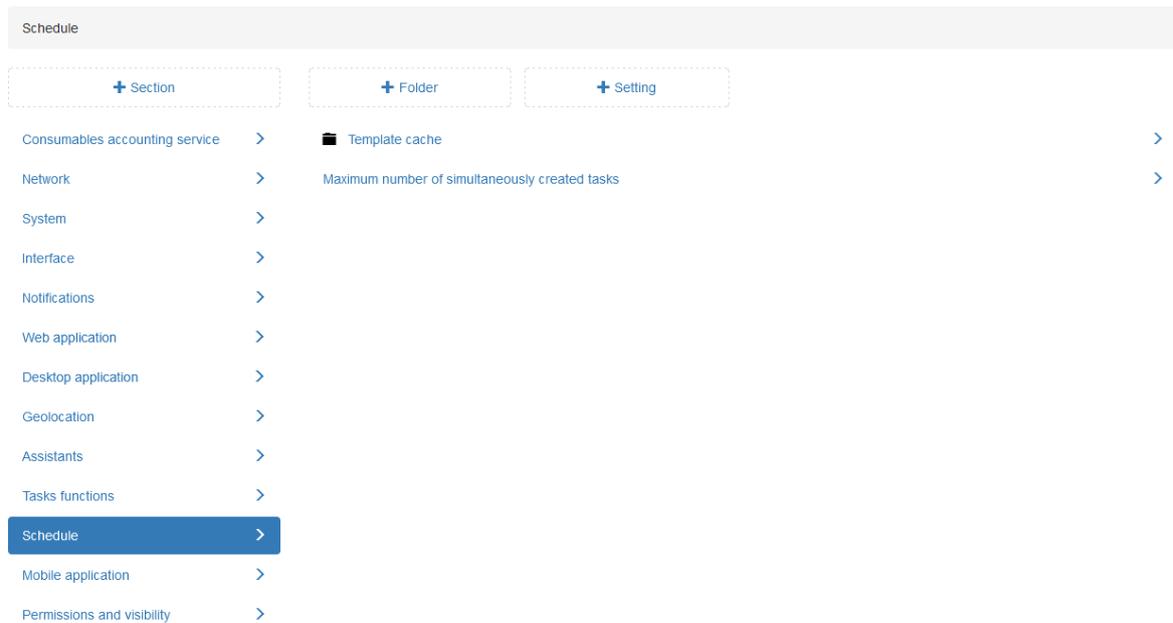
Fig. 2.328: "Schedule" section

## Template cache

The folder contains settings for the cache of task templates created by schedule.

### Cache cleanup interval (seconds)

The setting allows you to specify how often the template cache will be cleared (Fig. 2.329). The default is 3600 seconds (1 hour).
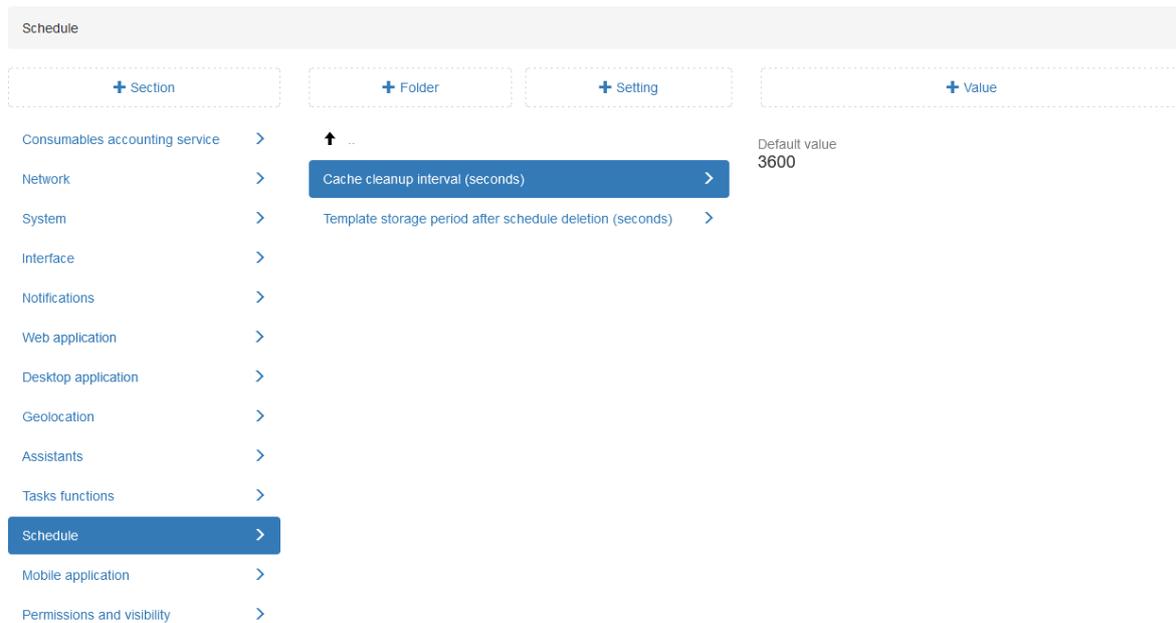
Fig. 2.329: Cache cleanup interval (in seconds)

**Template storage period after schedule deletion (seconds)**

The setting allows you to specify the template storage period in the cache after deleting or changing the schedule (Fig. 2.330). The default is 3600 seconds (1 hour).
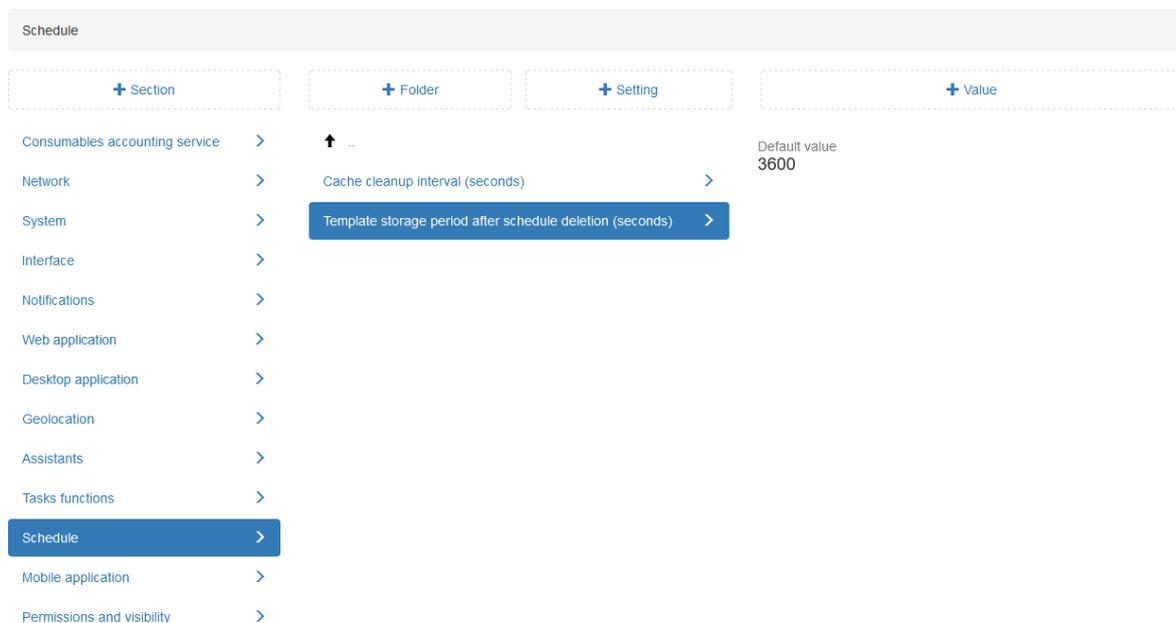


Fig. 2.330: Template storage period after schedule deletion (in seconds)

**Maximum number of simultaneously created tasks**

This section specifies the maximum number of simultaneously created scheduled tasks. The default setting is 2 tasks. This means that no more than 2 schedule tasks are created at once (Fig. 2.331).
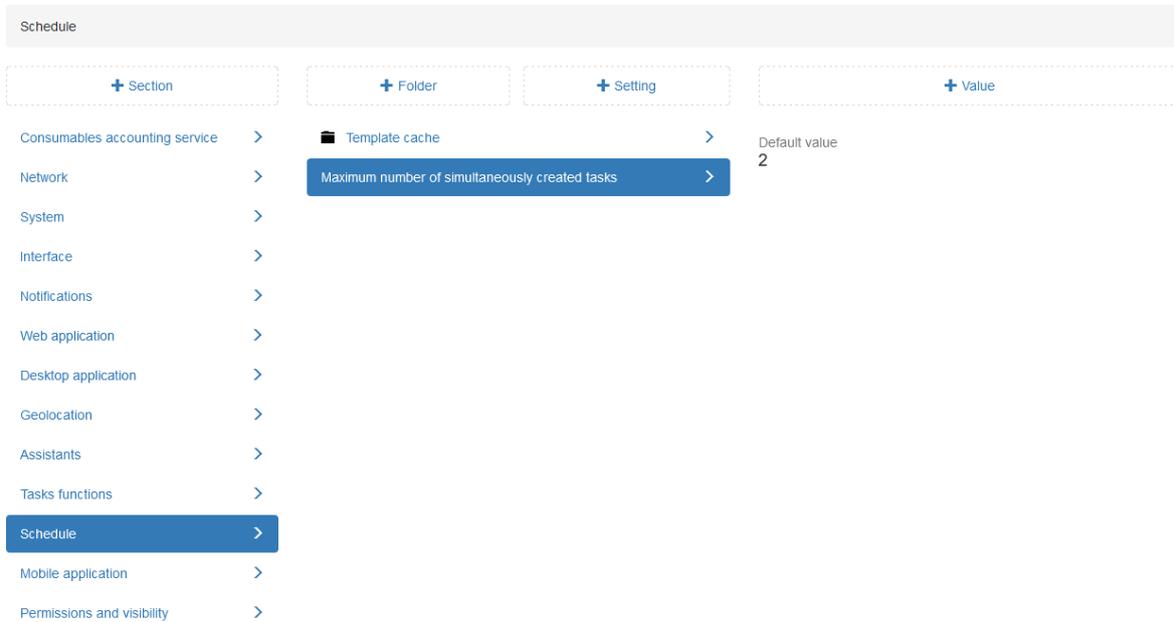


Fig. 2.331: Maximum number of simultaneously created tasks

### 2.3.3.7.12 "Mobile application" section

The "Mobile application" section allows configuring additional options for working in the ActiveMap Mobile application as well as in the simplified version of the mobile app (Fig. 2.332). You can set a new value by selecting the setting, then clicking "+Value". Enable/disable the toggle switch or enter the required name in the opened window and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
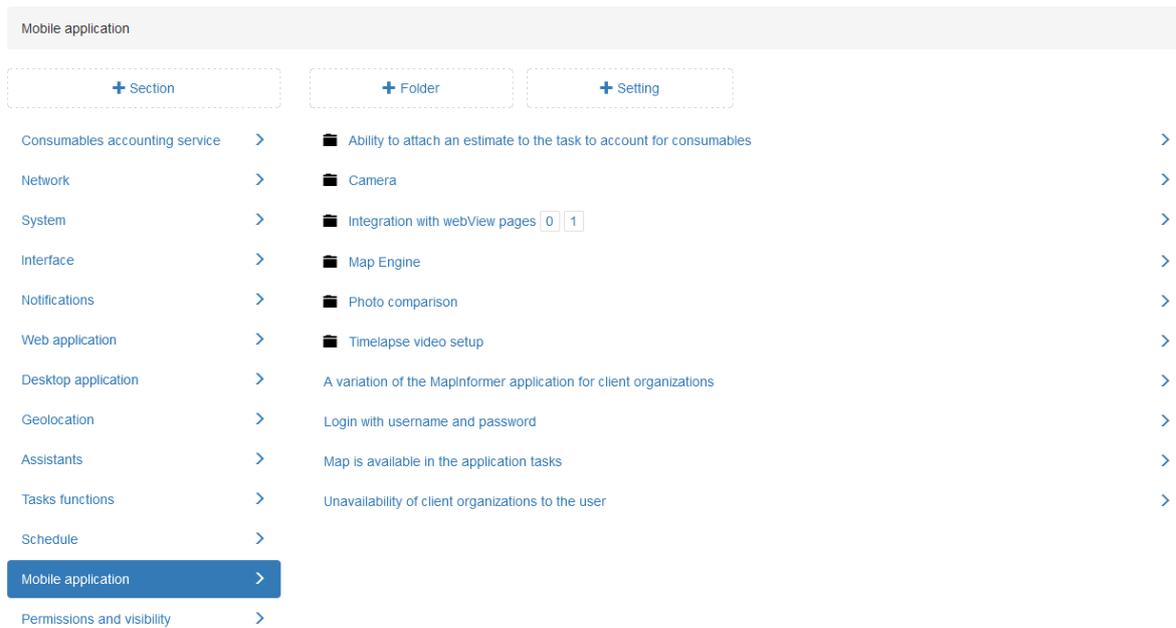
Fig. 2.332: "Mobile application" section

## Ability to attach an estimate to the task to account for consumables

In this folder, you can add the invoice module (the "Invoice" button in the task card).

**Paragraph text**

This setting allows you to set the name of the module in the application (Fig. 2.333).
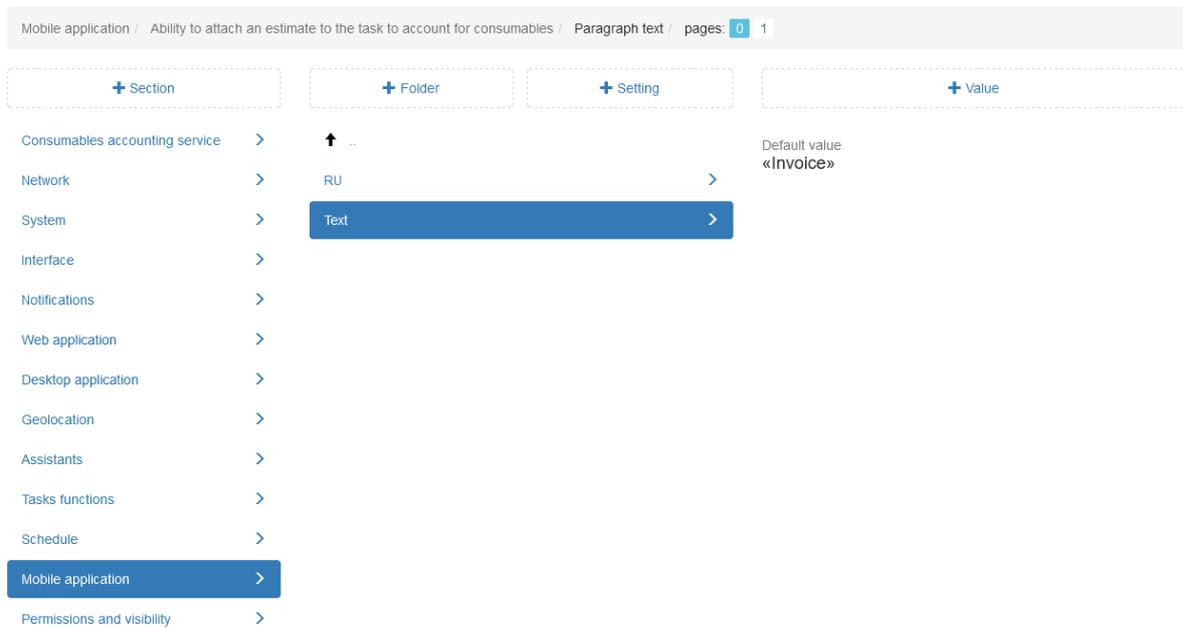
Fig. 2.333: Specifying the name of the module

### Activate

This setting allows you to activate the invoice module. By default, this setting is disabled (Fig. 2.334).
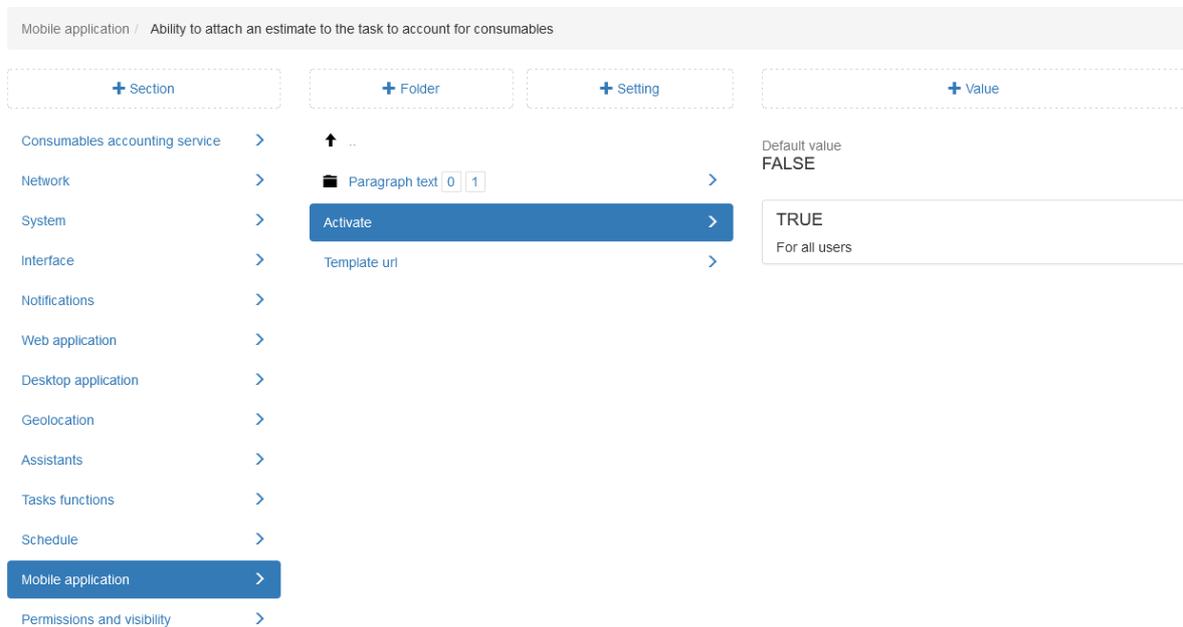


Fig. 2.334: Activating the invoice module

### URL template

This setting shows the web address of the page that opens when you

click the "Invoice" button.

## Camera

In this folder, you can add settings for the custom camera in the mobile application.

**Consider the distance from the task point**

If both this setting and **"Prohibit photographing"** are enabled and the user is far from the task point, a message appears when trying to add a photo. It indicates that a photo cannot be taken due to a large location error. If **"Prohibit photographing"** is disabled and this setting is active, you still can take a photo, but the geolocation icon turns red. By default, this setting is disabled (Fig. 2.335).

Fig. 2.335: Distance from the task point

**GPS Only**

The setting allows users to set the location source. If the setting is enabled, only information from the GPS source is used to determine the location. When the setting is off, coordinates can also be determined by cellular networks. By default, this setting is disabled (Fig. 2.336).

Fig. 2.336: Coordinate source

**Geolocation control when using a camera**

When the camera is launched, the application begins to search for the user's current location. If the location cannot be found, the photo has no coordinates. This setting prevents taking photos until the user's location is determined. This setting is enabled by default. If a value is added that prohibits controlling the location when using the camera, the application does not prevent taking photos, even if the coordinates have not yet been determined (Fig. 2.337).

Fig. 2.337: Geolocation control when using a camera

### Is caption to the photo obligatory?

This setting makes it mandatory to add a caption to the attached photo. Thus, the user cannot attach a photo to a task without adding a caption first. By default, this setting is disabled (Fig. 2.338).

Fig. 2.338: Add a caption to the photo

**Maximum distance from the task point**

This setting sets the maximum distance (in meters) from the task point at which a photo can be taken (Fig. 2.339).

Fig. 2.339: Maximum distance from the task point

**Maximum location delay**

This setting specifies the time (in milliseconds) of the relevance of the device's geolocation after losing the GPS signal when using the built-in camera. If the location was obtained more than the specified value of milliseconds ago and the "Prohibit photographing" setting is enabled, the application does not allow taking a photo until it receives a point that meets the requirements (Fig. 2.340).

Fig. 2.340: Maximum location delay

### Maximum location error

The setting allows specifying the permissible error (in meters) of determining the device's geolocation when using the built-in camera. If the received location has a larger error than the set value and the "Prohibit photographing" setting is enabled, then the application does not allow taking a photo until it receives a point that meets the requirements (Fig. 2.341).
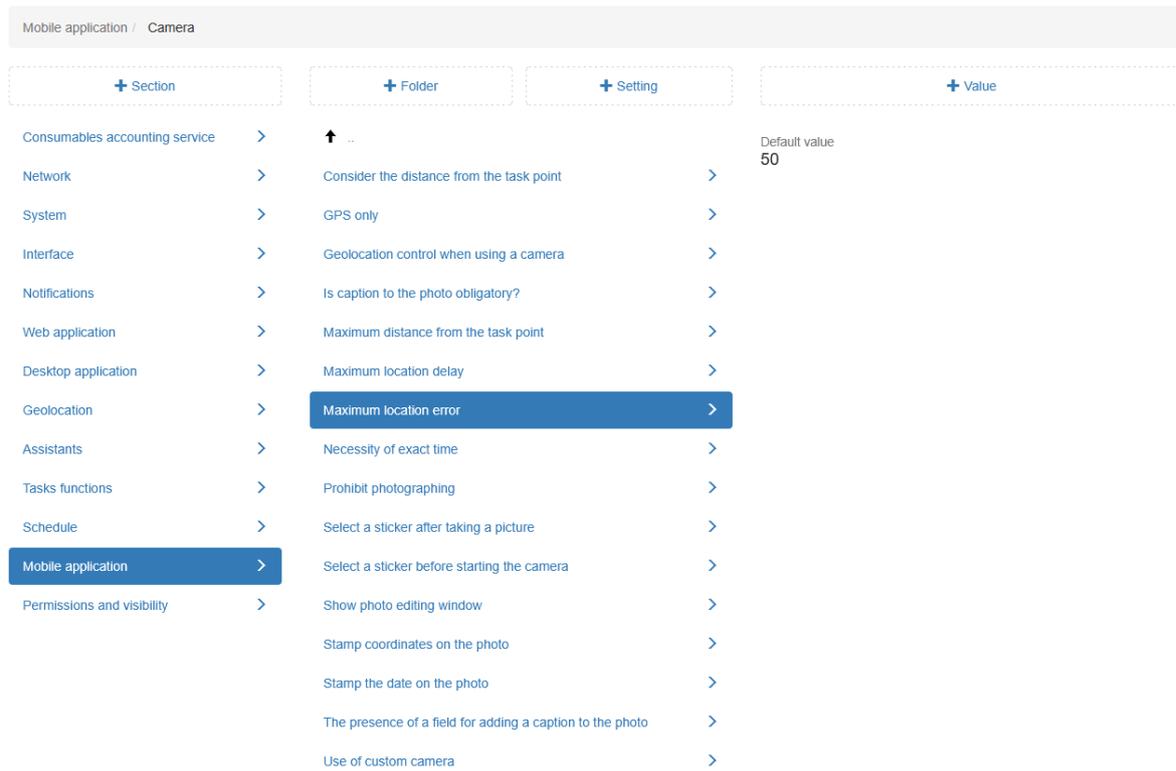
Fig. 2.341: Maximum location error

**Necessity of exact time**

When this setting is enabled, the application does not allow taking a photo until the time is synchronized with accurate time (from the Internet or GPS). Synchronization is required once and is saved until the device is turned off. If this setting is disabled, synchronization is still performed, but it does not prevent taking photos, creating a situation where the device time is attached to the photo. By default, this setting is disabled (Fig. 2.342).

Fig. 2.342: Necessity of exact time

**Prohibit photographing**

The setting prohibits taking a photo if the user is outside the task zone geolocation, or if the geolocation function on the device is turned off, or if the geolocation services cannot determine (with a given accuracy) the location of the device. By default, this setting is disabled (Fig. 2.343).

Fig. 2.343: Prohibition of photography

**Select a sticker after taking a picture**

The setting makes it mandatory to select a sticker after taking a photo. The application does not allow attaching a photo to the task without specifying a sticker first. The sticker selected from the list is added to the taken photo. This setting is disabled by default (Fig. 2.344).

Fig. 2.344: Selecting a sticker after taking a picture

### Select a sticker before starting the camera

This setting activates the window for selecting a sticker when clicking the "Add photo" button on the task card. You should specify the sticker first and then take the photo. Otherwise, you cannot add the photo. The sticker selected from the list is added to the photo taken. By default, this setting is disabled (Fig. 2.345).

Fig. 2.345: Selecting a sticker before starting the camera

**Show photo editing window**

A setting that controls whether the photo preview and editing window appears when you use the camera. This setting is enabled by default (Fig. 2.346).

Fig. 2.346: Show photo editing window

### Stamp coordinates on the photo

The setting allows adding a location stamp (longitude and latitude coordinates) to photos taken via a custom camera in the ActiveMap Mobile Android (Fig. 2.347).

Fig. 2.347: Stamp coordinates on the photo

### Stamp the date on the photo

This setting allows adding a date and time stamp to photos taken via a custom camera in the ActiveMap Mobile Android. This setting is enabled by default (Fig. 2.348).

Fig. 2.348: Stamp the date on the photo

**The presence of a field for adding a caption to the photo**

The setting allows adding photo descriptions in the photo editor in the mobile application. This setting is enabled by default (Fig. 2.349).
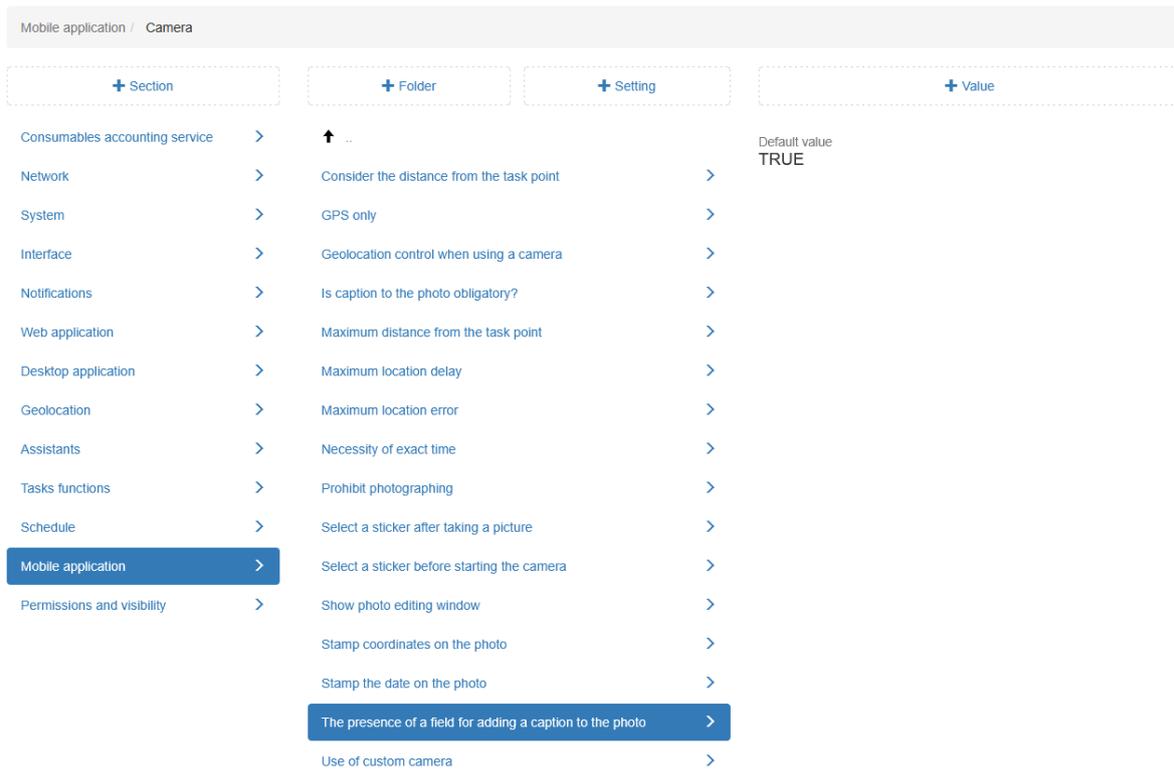
Fig. 2.349: Adding a caption to a photo

**Use of custom camera**

This setting allows you to prohibit using the standard device camera when working in a mobile application. This setting is enabled by default. If a value has been added that prohibits the use of a custom camera on the device, then the settings in this folder are ignored (Fig. 2.350).
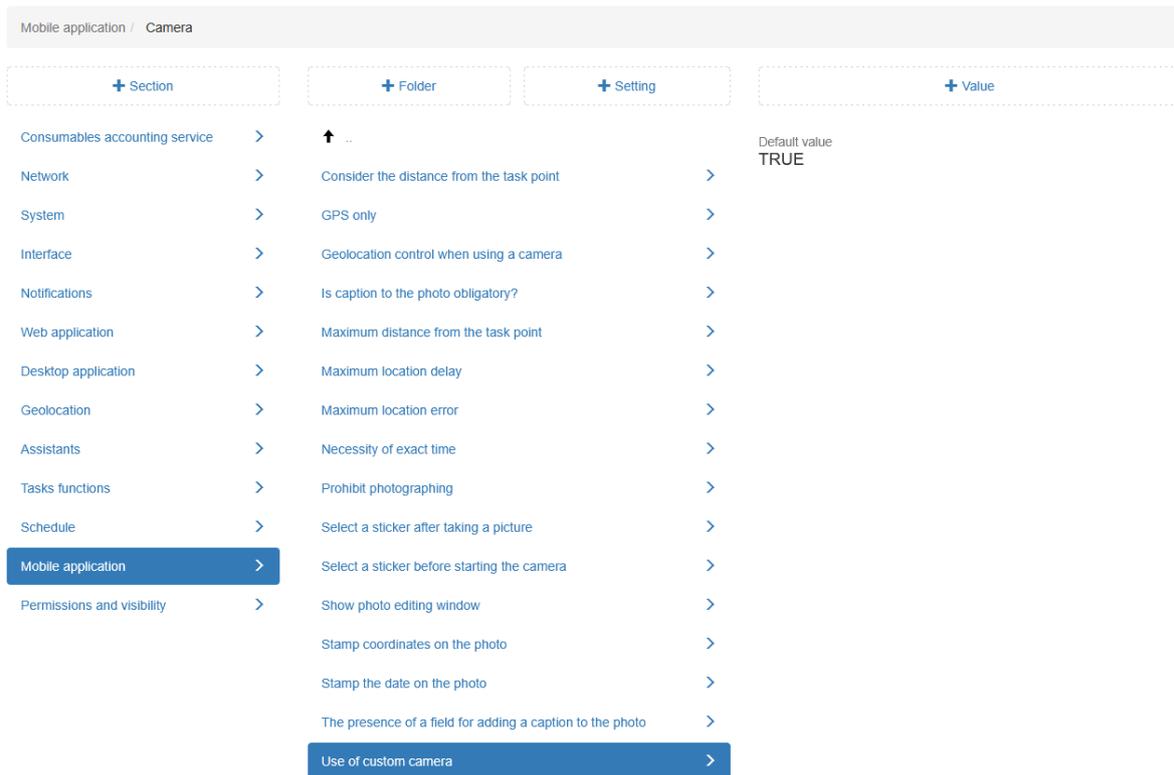
Fig. 2.350: Use of custom camera

### Integration with webView pages

In this folder, you can add sections of third-party web applications and services to the navigation menu of the mobile application.

**Text**

To specify the name of a new section, go to the **"Menu name"** folder, select the **"Text"** setting, and enter the necessary value (Fig. 2.351).
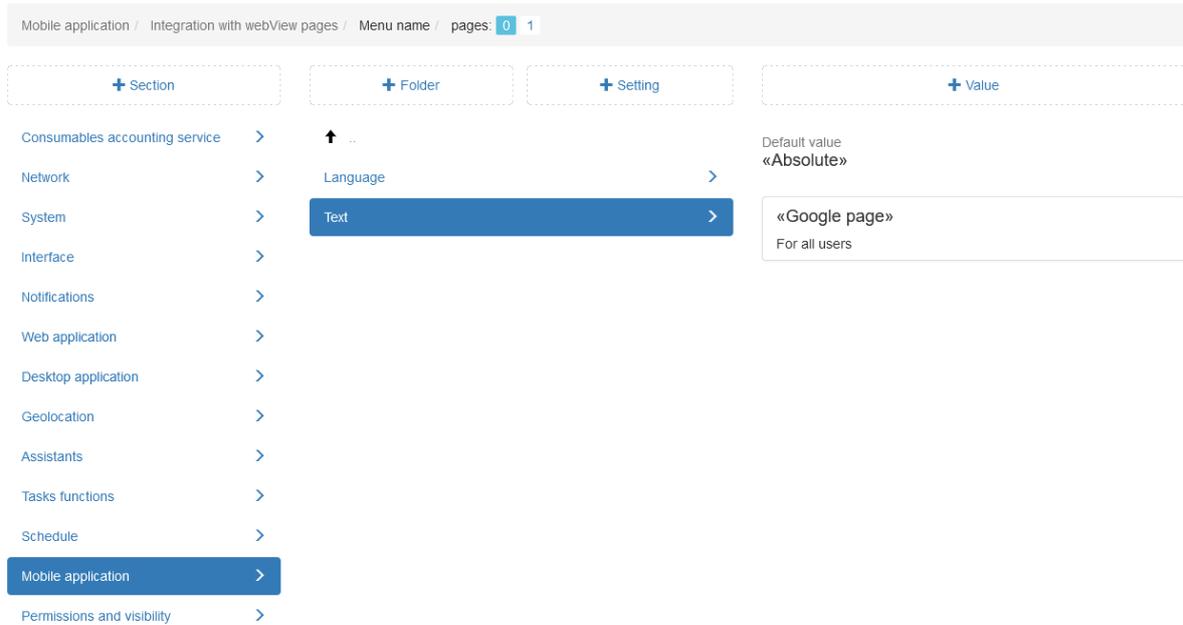
Fig. 2.351: Name of the connected web service

### On

The setting allows enabling the connection of a third-party service. By default, this setting is disabled (Fig. 2.352).
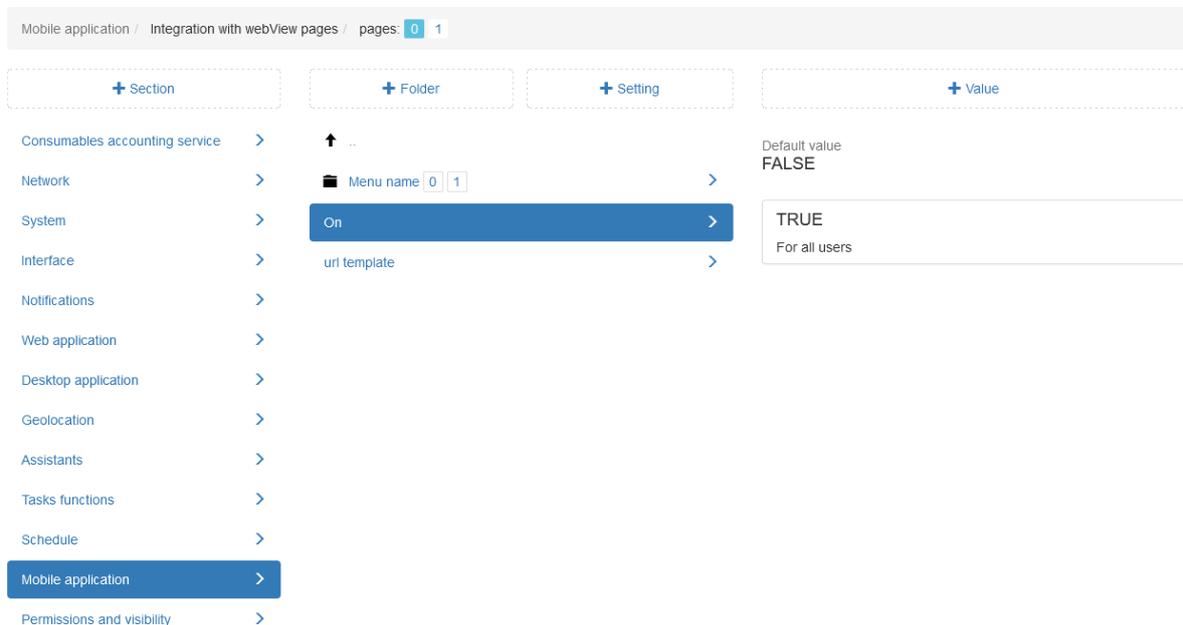


Fig. 2.352: Connecting web applications

### URL template

In this setting you can specify the address of a third-party web applica-

tion or service (Fig. 2.353).
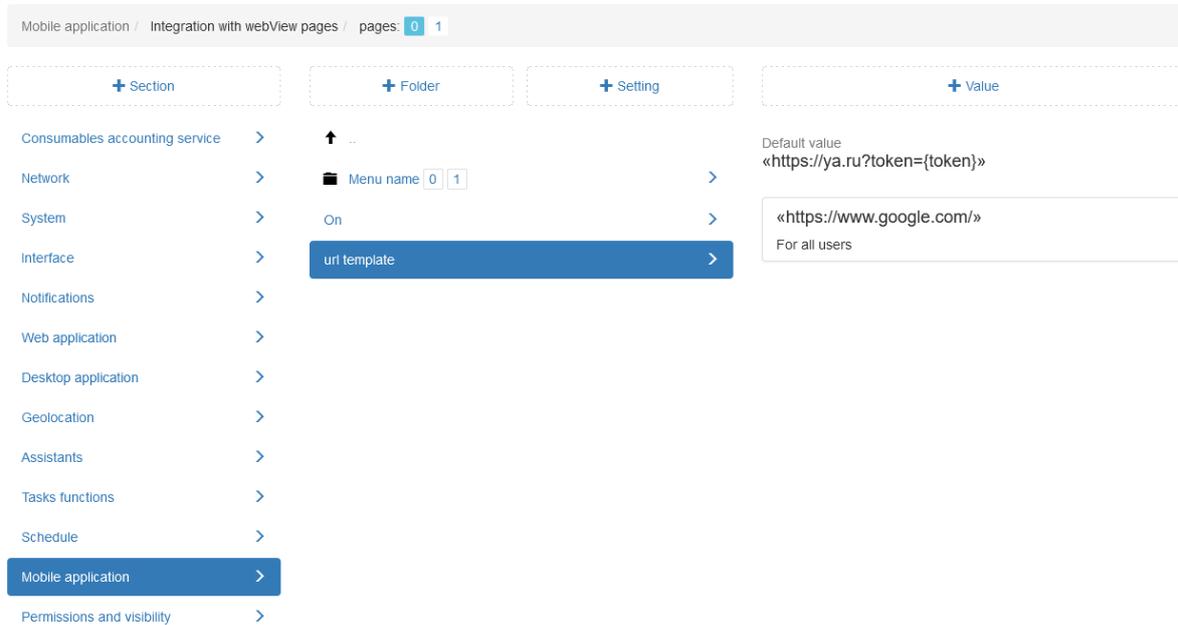


Fig. 2.353: Name of the connected web application

## Map Engine

### Do not use Google Maps Engine

This setting allows you to exclude the use of Google Maps in ActiveMap Mobile Android. By default, the setting is disabled (Fig. 2.354). After activation, Google Maps becomes unavailable in the mobile application. At the same time, user management in the "Map" section is also disabled.
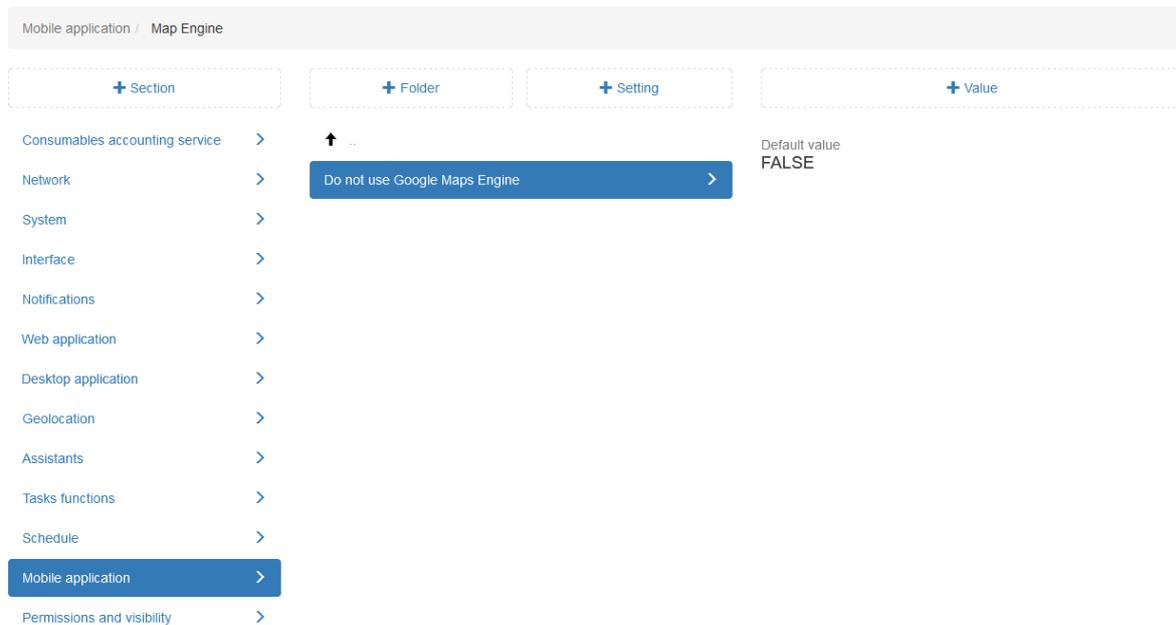
Fig. 2.354: Disabling Google Maps in the mobile application

### Photo comparison

In this folder, you can add URLs for online and offline neural network models. The selected model compares the sample photo and the result, then displays the percentage of matching in the photo editing window of the mobile application.

**Allowable percentage comparison of two photos**

In this setting, you can specify a number that determines the percentage threshold after which the photo can be considered similar to the sample. If the percentage is higher than the specified value, then the background with the percentage information is colored in green, if lower – in red. If this setting is not filled, the background is not colored (Fig. 2.355).

Fig. 2.355: Positive comparison percentage of two photos

**Offline (URL to file)**

The setting allows specifying the URL to the file that is loaded with the reference tables (dictionaries). Once the file is successfully uploaded, the photo editing window displays the percentage of similarity with the sample (Fig. 2.356).



Fig. 2.356: Offline (URL to file)

**Online (URL to service)**

The setting allows specifying the URL of the service that compares the sample photo and the result. If no value is added, then the comparison button is not available in the result photo editing window (Fig. 2.357).
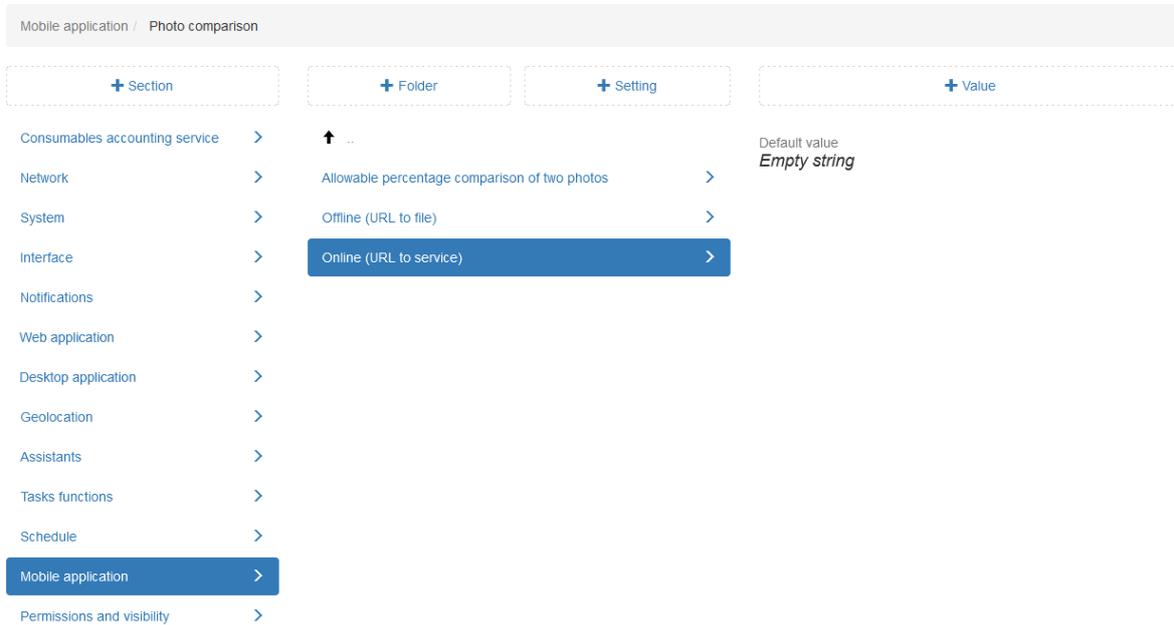


Fig. 2.357: Online (URL to service)

### Timelapse video setup

There is an option to record timelapse videos in the ActiveMap Mobile application for Android. In this mode, the geographic coordinates of the camera are recorded along with the video itself. This allows creating tasks from frames of this video with the attachment of the current frame (as a task photo) and geoposition in ActiveMap Desktop. In this section, you can add settings for recording timelapse videos in the mobile application.

**Allow location recording**

This setting enables the recording of the device's movement and location while recording the current frame. You can play the recording in the ActiveMap Desktop. By default, this setting is disabled (Fig. 2.358).

Fig. 2.358: Allow location recording

### FPS (View)

This setting defines the number of frames played back per second. The default is 5 frames per second (Fig. 2.359).



Fig. 2.359: FPS (View)

### Maximum error in meters

This setting specifies the acceptable coordinate error when recording timelapse videos. If the coordinate exceeds this error, it is not taken

into account when recording. By default, the permissible error is 100 meters (Fig. 2.360).



Fig. 2.360: Maximum error in meters

### Minimum change in distance in meters

This setting specifies the minimum distance between location updates when recording a video. The default setting is 5 meters (Fig. 2.361).



Fig. 2.361: Minimum change in distance in meters

### Quality

This setting allows you to select the quality of recorded video files. The default is 480 pixels (Fig. 2.362).



Fig. 2.362: Video quality

### Record FPS

This setting defines the number of frames recorded per second. The default is 2 frames per second (Fig. 2.363).



Fig. 2.363: FPS (Record)

### Login with username and password

The setting activates user authorization in a simplified version of the mobile application using a login and password instead of a phone number. This setting is disabled by default (Fig. 2.364).



Fig. 2.364: Login with username and password

### Map is available in the application tasks

This setting allows you to enable or hide the map window in tasks in mobile applications. This setting is enabled by default (Fig. 2.365).

Fig. 2.365: Map availability in the application

## Unavailability of client organizations to the user

The setting is intended for selecting an organization when registering a user in a simplified version of the mobile application. If this setting is enabled, the user cannot select an organization. This setting is disabled by default (Fig. 2.366).



Fig. 2.366: Unavailability of client organizations to the user

### 2.3.3.7.13 "Permissions and visibility" section

The section allows you to add settings to block user actions that can lead to incorrect operation of the system (Fig. 2.367). You can set a new value for each setting in this folder by selecting it, then clicking "+ Value". Enable/disable the toggle switch or enter a new value in the opened window and fill in the remaining fields. For more information about the process of adding a new value, see *"Settings" block* (page 164).
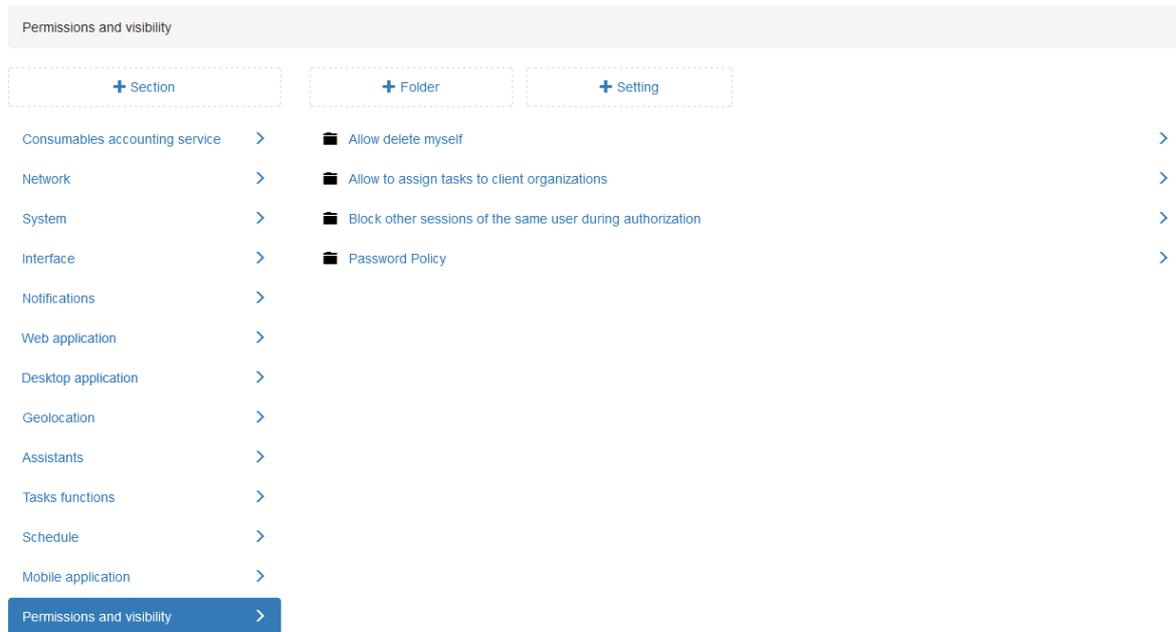


Fig. 2.367: "Permissions and visibility" section

### Allow delete myself

In this setting, you can specify the role, organization, or users who can delete their user accounts in the ActiveMap Mobile iOS application (Fig. 2.368).
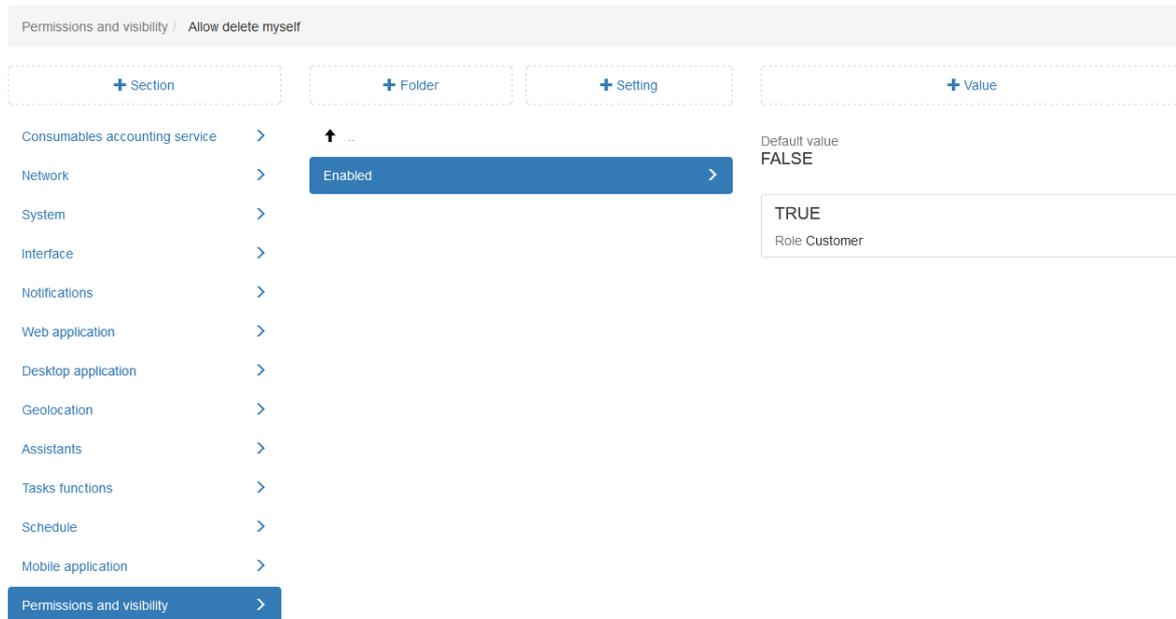
Fig. 2.368: Deleting your account

### Allow to assign tasks to client organizations

In this setting, you can prohibit assigning tasks to a client organization. If you try to assign a task, you see the blocked action information, but the task is created and the "Performing Organization" field remains blank. This setting is disabled by default (Fig. 2.369).
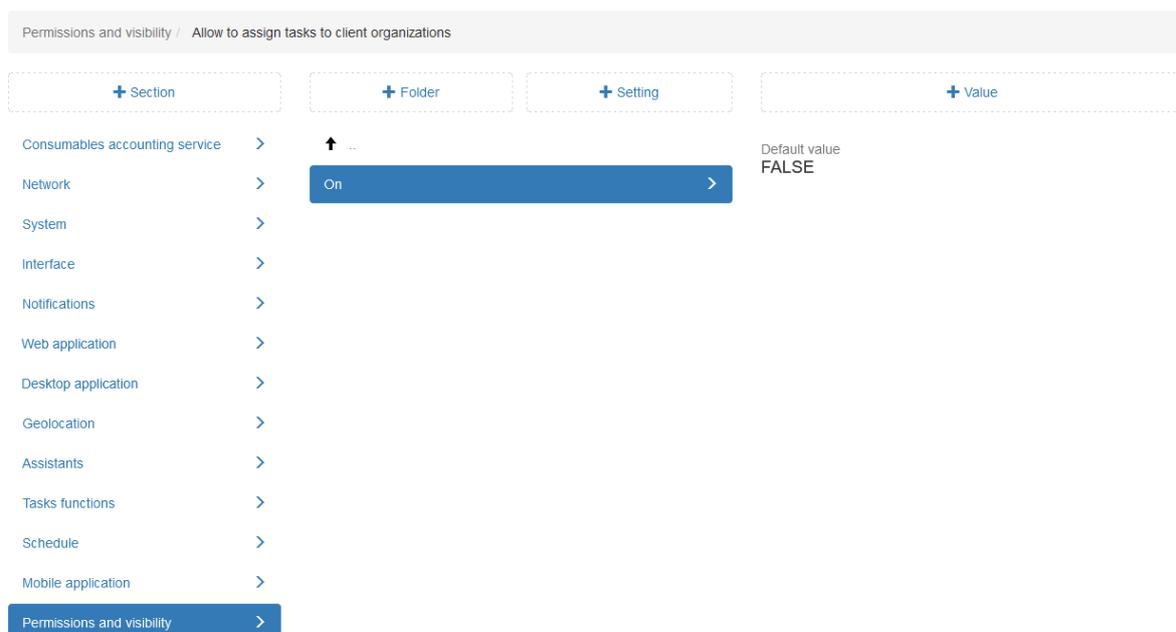


Fig. 2.369: Prohibit assigning tasks to client organizations

### Block other sessions of the same user during authorization

This setting allows you to block a user's session in the application when re-authorizing with the same account in the same application on another device. For example, if a user was authorized in the ActiveMap Desktop, access to another user under this account in the desktop application is blocked. By default, this setting is disabled (Fig. 2.370).
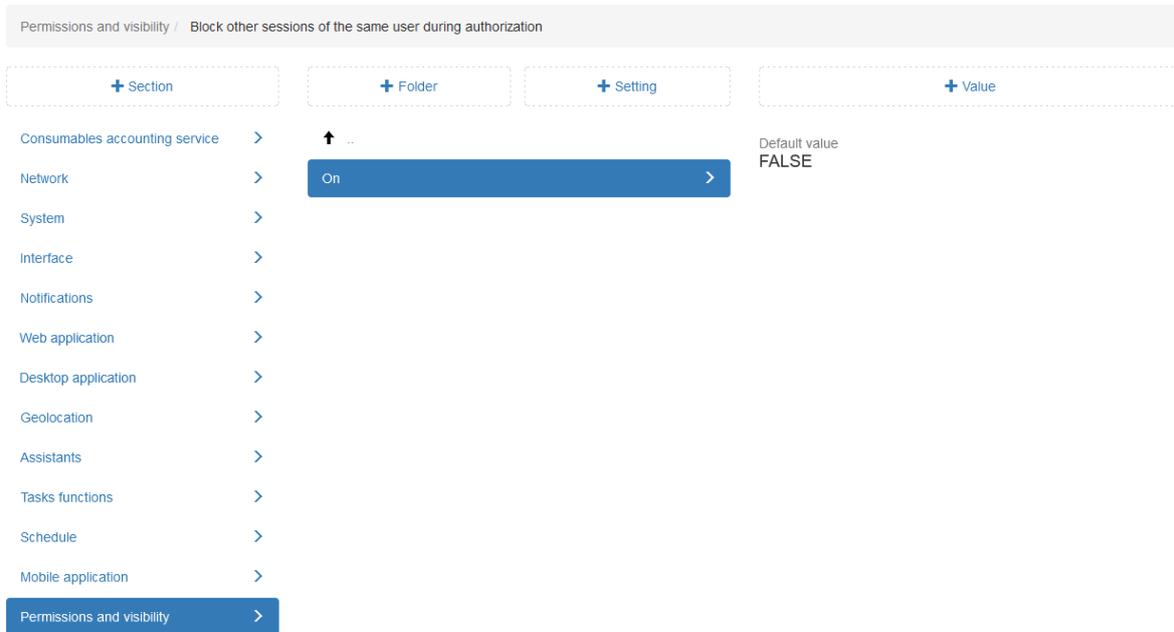


Fig. 2.370: Blocking other sessions of the same user during authorization

### Password Policy

The folder contains settings for creating user passwords.

**Allowed characters**

The default setting lists the allowed characters for forming a password. You can also add your own values (Fig. 2.371).
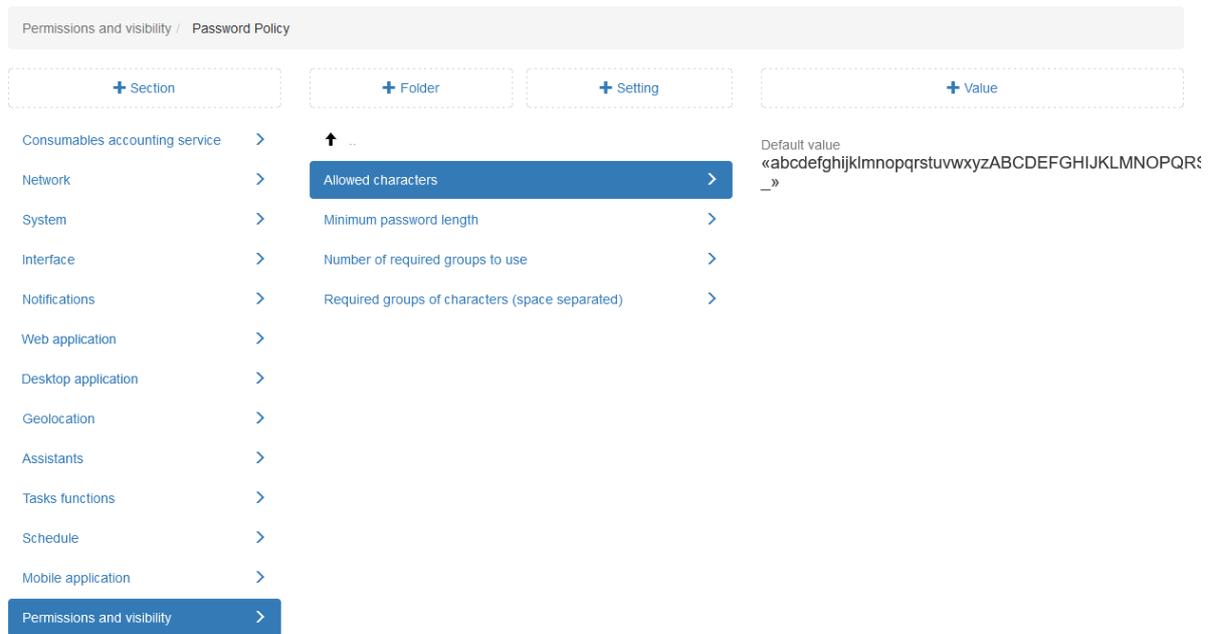
Fig. 2.371: Allowed characters for the password

If other characters not specified in this setting are used in the password, a corresponding message appears when saving (Fig. 2.372).
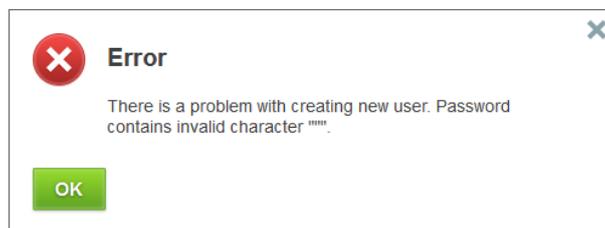


Fig. 2.372: Error message when creating a user (using unallowed characters in the password)

**Minimum password length**

You can specify the minimum number of characters required to create a user password. The default is 8 characters. For each role, you can set its own value (Fig. 2.373).
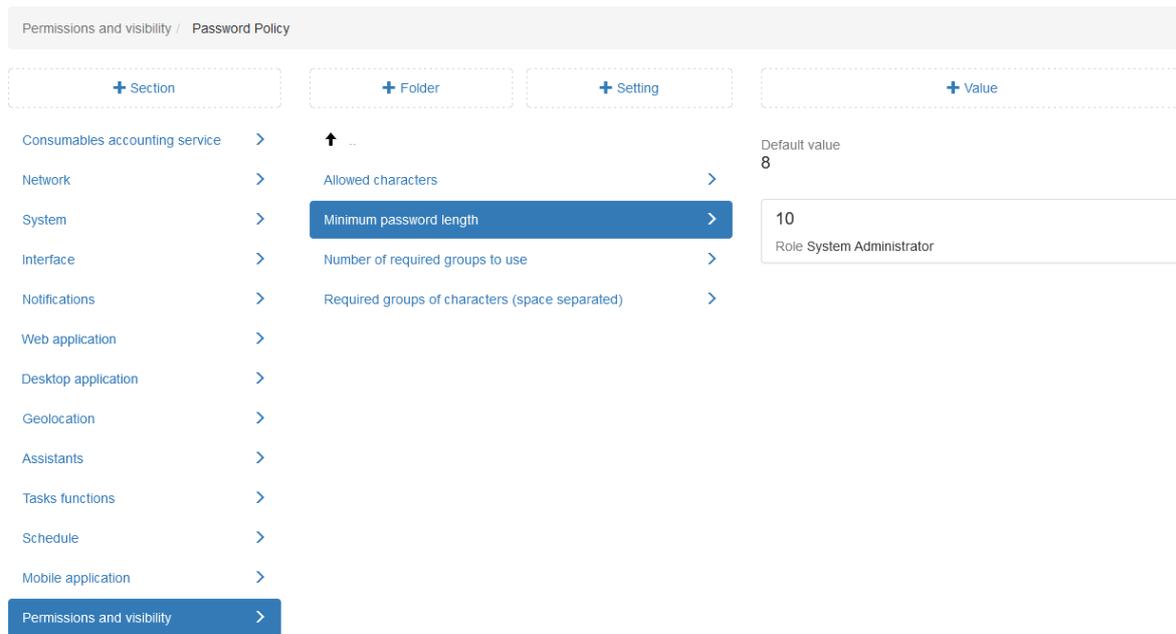
Fig. 2.373: Setting the minimum password length for different roles

If a password is created with fewer characters than set in this setting, a corresponding message appears (Fig. 2.374).
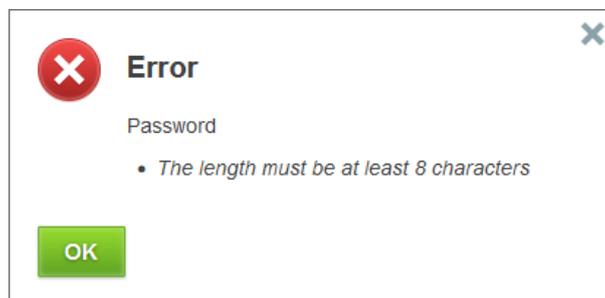


Fig. 2.374: Error message when creating a user (minimum password length not met)

### Required groups of characters (space separated)

In this settings, you can specify groups of characters that should be used when creating a password (Fig. 2.375). A group of characters must be separated by a space. If no values are specified, the previous password policy is used.

Fig. 2.375: Required character groups for a password

**Number of required groups to use**

In the setting, you can specify how many groups of required characters should be used when creating a password (Fig. 2.376).



Fig. 2.376: Number of required password groups

If the value is set, but not all groups are used when creating the password, a corresponding message appears when saving (Fig. 2.377).

Fig. 2.377: Error message when creating a user (not all required character groups are used in the password)

#### 2.3.3.8 "System" block

This block contains custom settings that you can apply to the system.

#### 2.3.3.8.1 "Global" tab

In this tab you can change the title of the system, add your logo and website icon, enable automatic assignment of an organization upon creation and save a password when logging into the system.

When you activate the "Assign an organization to yourself when creating" setting, the "Assigned organization" field is automatically filled with the name of the created organization after saving new organizations. In the organization card, you can specify another assigned organization by selecting it from the drop-down list and then save the changes.

---

**Important:** The assigned organization should belong to the creator's organization cluster.

---

"Show the "Save password" checkbox" setting allows you to show/hide the "Save password" checkbox when logging in ActiveMap Web and ActiveMap Desktop.

In this tab you can also change the visible area (the part of the map that is loaded when the web application is launched) by selecting the desired boundaries and clicking "Apply" (Fig. 2.378).
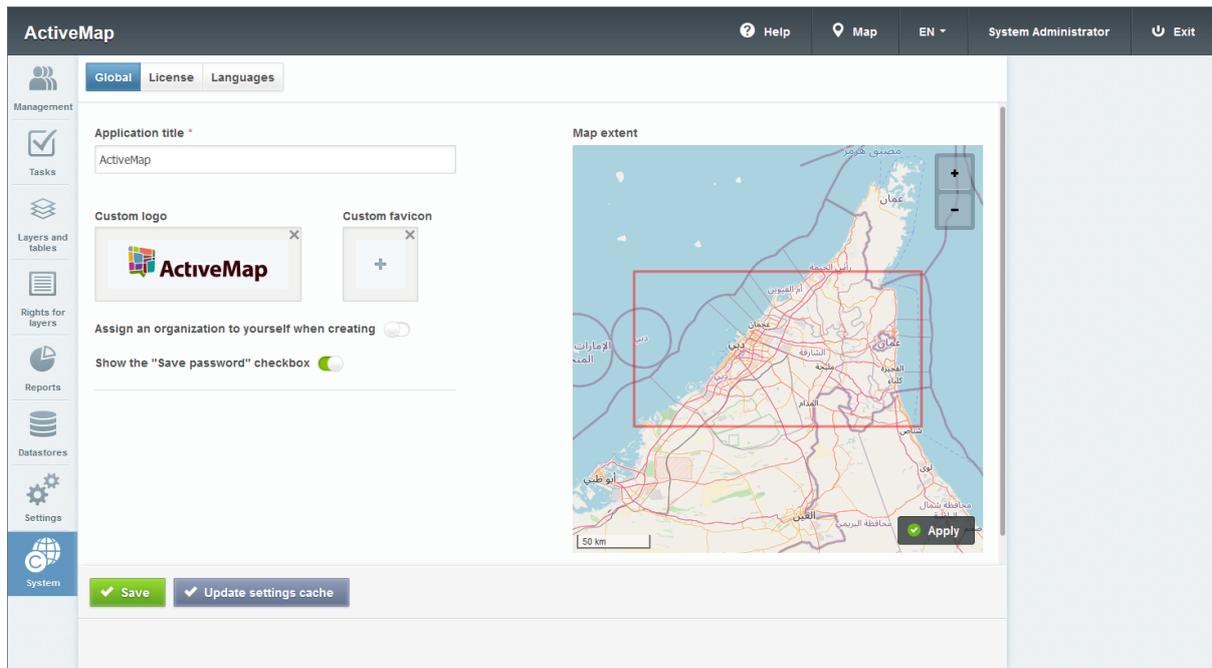
Fig. 2.378: Global system settings

Click **✔ Save** to save your changes. Clicking **✔ Update settings cache** starts the process of updating the internal cache of the web application to download the settings from Cerebellum.

### 2.3.3.8.2 "License" tab

Once the first user with the "System Administrator" role gains access to the system, he/she should perform the license activation procedure. Information about the license activation requirement is displayed in a pop-up window on the administration panel (Fig. 2.379).



Fig. 2.379: "License is not active" pop-up window

If the license is not activated, you cannot create users, and an appropriate message is displayed if you try to save data.

To activate the license, go to the "System" block and select the "License" tab or follow the link in the "License is not active" pop-up window. Enter the license key you received from your service provider and click **✔ Send** (Fig. 2.380).
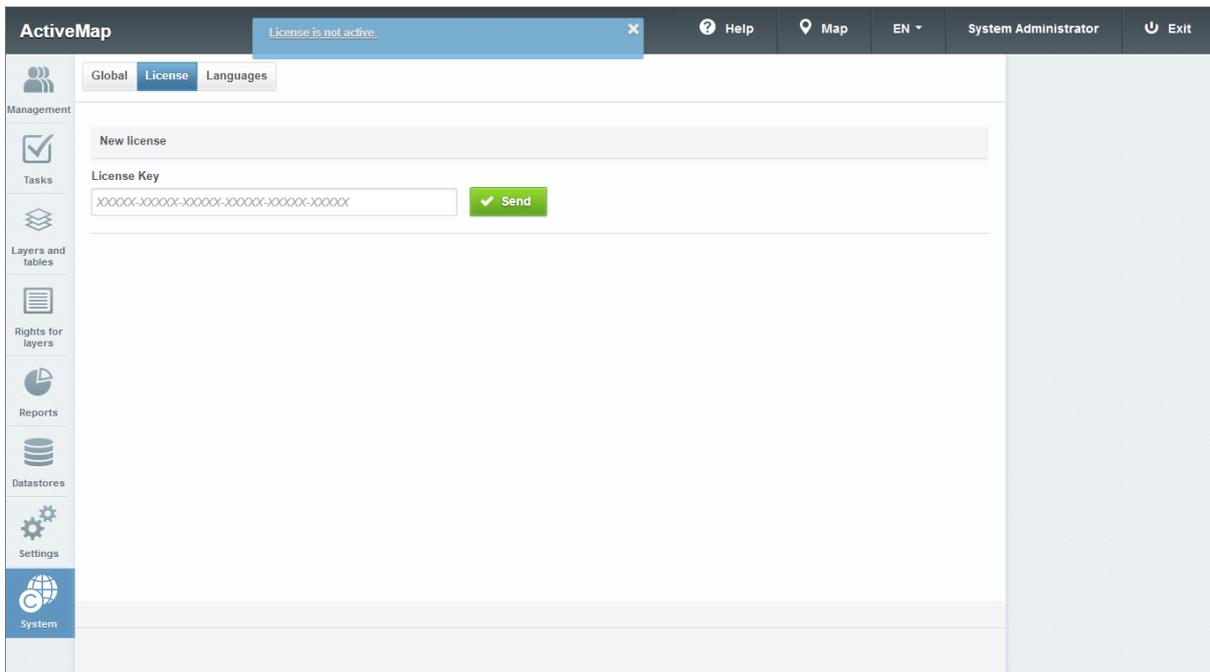
Fig. 2.380: License key entry field

The window displays information about the current license. If the license key is correct, when you click ![Activate Users], the system asks you to enter the number of users required for activation (Fig. 2.381).
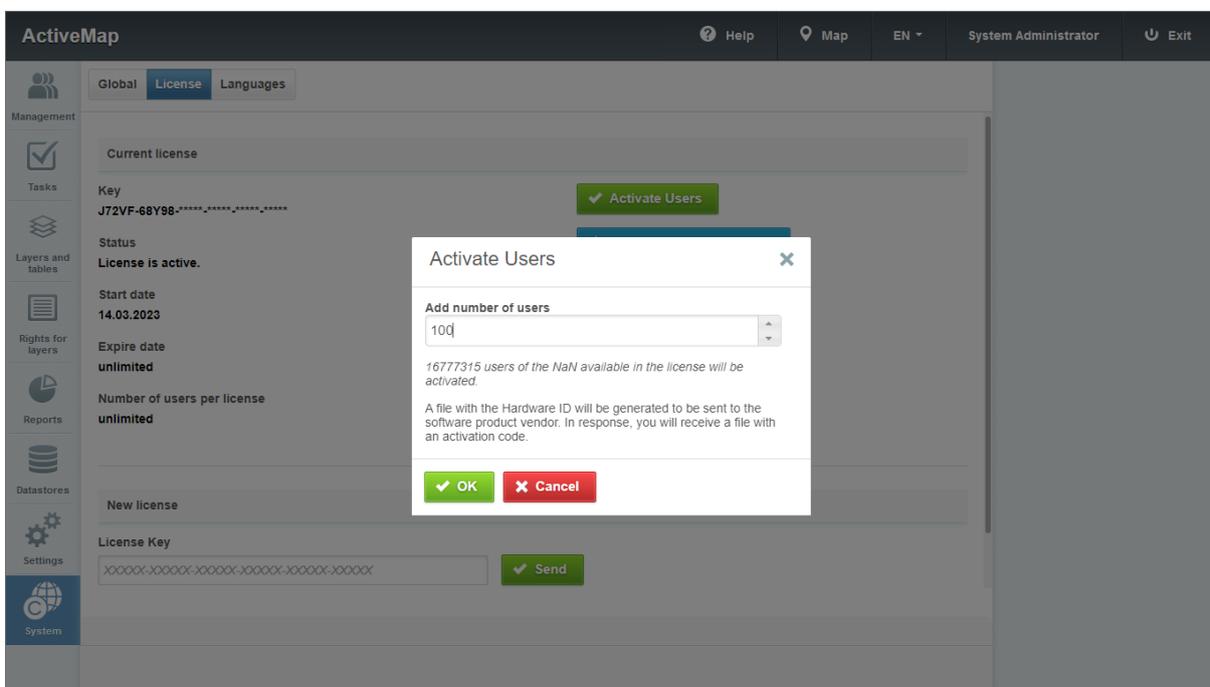


Fig. 2.381: "Activate users" window

Save the "Hardware Code" file, which contains encrypted information

about the server characteristics and the license key (Fig. 2.382).
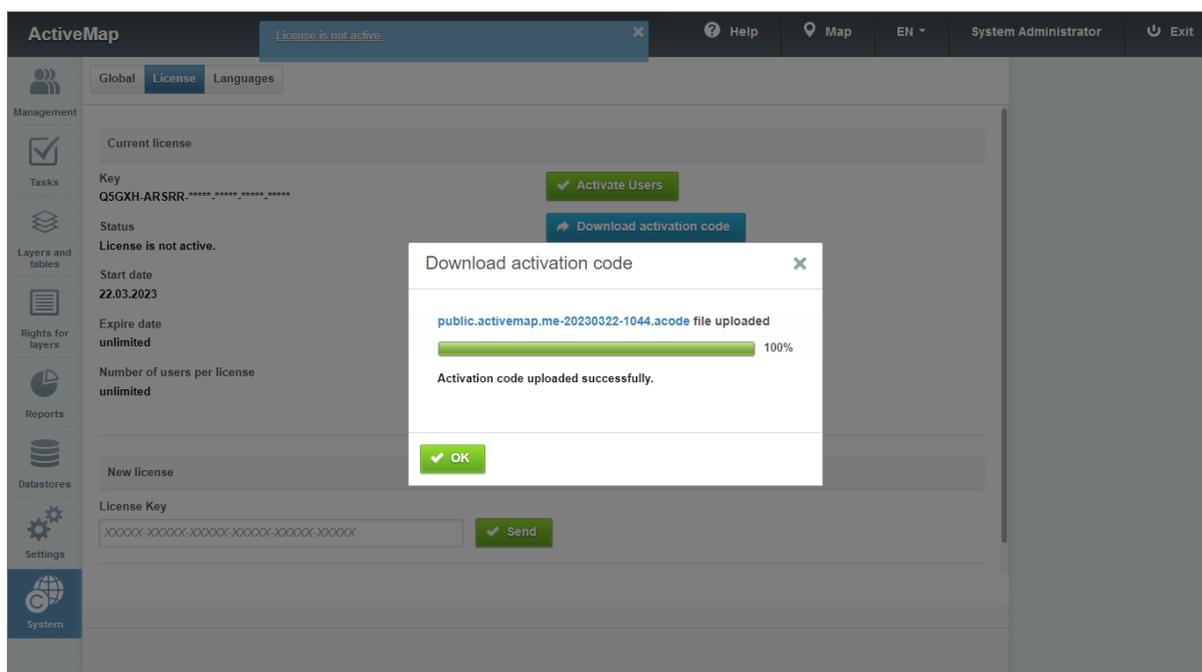


Fig. 2.382: Saving the hardware code

Transfer this file to the service provider for activation by sending a corresponding request to the e-mail. The email should include organization name, number of user licenses required, server domain name where the license key is activated. Service provider verifies the received information and checks that the requested number of users does not exceed the value specified in the license. If the data is correct, the service provider sends a file with an activation code, valid for the server specified in the email. Upload the received file to the "License" tab by clicking

. After successful license activation the system displays the following data: status, validity period, maximum allowed number of users, and number of activated users in the system (Fig. 2.383).
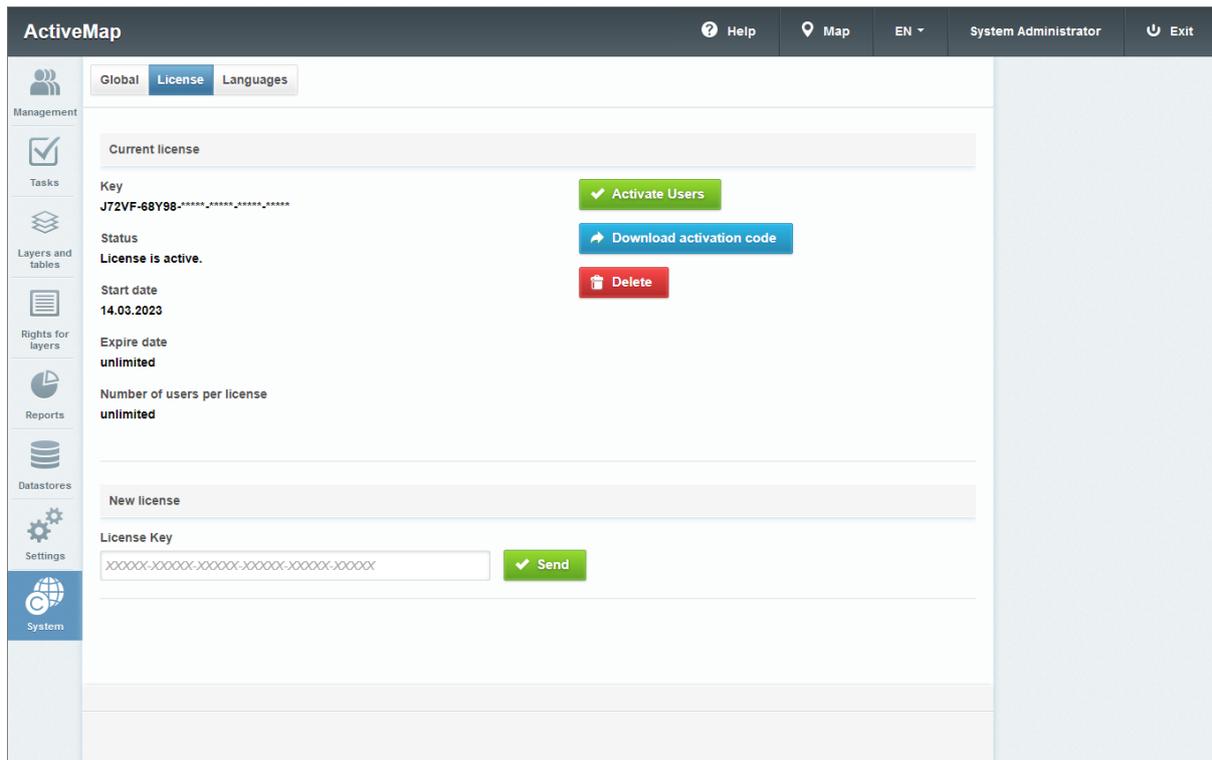
Fig. 2.383: Information about the current license

If necessary, you can request additional licenses for users by following the same steps. You can repeat this process until the total number of users exceeds the allowed number of licenses for this server. Activating this license on another server is not possible, since the activation server stores information that this license key has already been used.

To switch to another license (perpetual or unlimited in number of users), purchase a new license key and enter it into the system. Then load the activation code using both the old and the new hardware code. The system checks the activation code against both hardware codes. If the activation code matches the new hardware code, the old files are deleted and the new activation code is applied.

To terminate the license on a given server, click . A deletion confirmation message appears (Fig. 2.384).
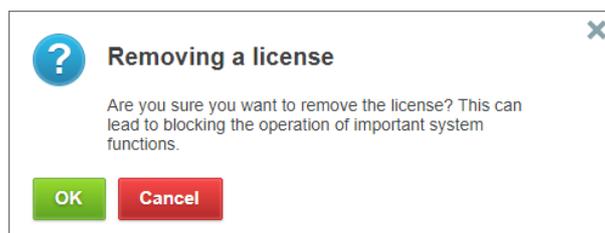


Fig. 2.384: Deletion confirmation message

### 2.3.3.8.3 "Languages" tab

This tab contains a list of available interface languages (Fig. 2.385). You can activate the language by turning on the toggle switch in the line. The activated language is displayed in the drop-down list on the user panel. You can also change the order in which languages appear in the list. To do this, drag the line above or below and click ✔ **Save order**.



Fig. 2.385: List of available interface languages

## 2.4 Exit the program

To exit the program, click "Exit" in the upper right corner of the window and close the browser tab.

# FREQUENTLY ASKED QUESTIONS

## 3.1 Starting the Program

If you have problems with starting the Program, try to open the program page in another browser or contact technical support via the hotline phone number indicated on the https://activemap.me/ website, or write an email to support@activemap.me.

## 3.2 Log in to the Program

If you are experiencing authorization problems, please contact technical support by calling the hotline number listed on the https://activemap.me/ website or by sending an email to support@activemap.me.

# GLOSSARY

**Account** is a set of data about a user stored in the system, necessary for the authentication and providing access to personal data and settings.

**Activation code** is a file containing an encrypted hardware code, information about the number of users, and the license period.

**Applied software suite** is a set of interconnected programs designed to solve problems of a certain class of a particular subject area and interact with the user.

**Attribute data** are values describing features of the objects. Attribute data types are: integer, real, text, date, date and time, geometry.

**Band** is an object that is placed directly on the report page. It is a container for the other objects, such as "Text", "Picture", etc.

**Basemap** is the dominant or underlying layer in a given map that provides geographical context to the map and other dataset layers above it. Users visualize tasks, objects, and thematic layers above the basemap. They use it for navigation through a map and for getting general information about the area of interest.

**Bluetooth Low Energy (BLE) tags**, also known as beacons, is a class of Bluetooth Low Energy (LE) devices that broadcast their identifier to nearby portable electronic devices. The identifier and several bytes sent with it can be used to determine the device's physical location, track customers, or trigger a location-based action on the device.

**Centroid** is the center of a geographical object on a map. For most objects, the centroid coincides with the center of the rectangle described around the object.

**Client organization** is an association of users who make their requests via the mobile application, monitor their status, who are capable of evaluating the work performed. User rights for operating the System are restricted.

**Cluster** is an association of several organizations for the purpose of enabling the in-process control of the performance of departments.

**Cluster Administrator** is a user role in the System responsible for administering one or more specified clusters, namely: managing organizations and users, layers and tables; granting access rights to layers and reports; managing tasks within the specified clusters. Managing includes creating, editing and deleting.

**Cluster Inspector** is a user role in the System responsible for managing tasks within one or more specified clusters and having rights to create new layers and tables, as well as edit or delete available ones. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.

**Clusterization** is the representation of raster layer objects located nearby by a single label on a map.

**Composite field** is a custom field format that contains one or more nested fields and supports the creation of multiple field instances in a task card. It is used to add several similar field sets to the task, with the number of sets being unknown in advance.

**Contract** is an entity for accounting and planning the task to be performed by organizations under contractual obligations.

**Custom fields** are attribute fields, which can be customized in the system versus features of a project underway, and be referenced to the certain work items.

**Data export** is a data loading from the Program database to an external file.

**Data table** is a set of the related data stored in a structured format in a database.

**DBF data format** is a data storage format used as one of the standard ways of storing and transmitting information by database management systems, spreadsheets, etc.

**Drag and Drop** is a way to manipulate interface elements using a mouse or a touch screen. The method is implemented by "grabbing" (pressing and holding the left mouse button) the object displayed on the screen, which is available for such operation, and then moving it to another place (to change its location) or "dropping" it to another element (to call the corresponding action in the program).

**Executor** is a user role in the System responsible for executing assigned tasks and having the rights to create new tasks, layers, and tables, as well as edit or delete available layers and tables.

**GDAL** (Geospatial Data Abstraction Library) is a translator library for raster and vector geospatial data formats. As a library, it presents a single raster abstract data model and a single vector abstract data model to the calling application for all supported formats.

**Geographic coordinates** are the mathematical values that designate a position on the earth relative to a given reference system.

**GeoJSON data format** (Geographic JavaScript Object Notation) is a format for representing various geographic data structures. A GeoJSON object can be represented by a geometry, a feature, or a feature collection. GeoJSON supports the following geometry types: Point, LineString, Polygon, MultiPoint, MultiLineString, MultiPolygon and GeometryCollection. A feature in GeoJSON consists of geometry and additional properties. Feature collection consists of a set of features.

**Geographic Information System (GIS)** is an information system designed to collect, store, analyze, and display spatial data and related information about presented GIS objects.

**GPS** is a satellite navigation system that measures distance, time and determines the location in the WGS 84 world coordinate system. It can accurately determine the three-dimensional coordinates of an object equipped with a GPS receiver: latitude, longitude, height above sea level, as well as its speed, direction of movement, and current time.

**File label (sticker)** is a textual mark in a picture.

**Hardware code** is a file that contains encrypted information about the server characteristics and the license key.

**Hatching** is a set of drawings and colors used to fill polygonal objects.

**Image sticker (file label)** is a text mark on the photo.

**Information display panel** is a panel designed to display specific information related to user actions, as well as messages that correct user actions (warning messages, tips).

**Installer** is a program that installs files on the end user's computer.

**Interval** is a data table that is used to configure the display styles of layer objects on the map depending on their specific numerical characteristics. The Program uses intervals of (a, b) type.

**Invitation (an invite link)** is a link containing information on the server address, login, and password of a user to simplify the process of authorization in the mobile application.

**Layer** is a visual representation of geographical data in the environment of any digital map.

**Layer group** is a set of layers grouped according to thematic or other specified criteria.

**Layer object visibility on the map** is a displaying the layer object on the map as a certain symbol, line, or polygon.

**Layer visibility on the map** is a displaying of all layer objects on the map as a group of symbols, lines, or polygons.

**LDAP (Lightweight Directory Access Protocol)** is an open, vendor-neutral, industry standard application protocol for accessing and maintaining distributed directory information services over an Internet Protocol (IP) network.

**Legend** is a set of symbols and explanations on a map.

**License** is a file containing information on the acceptable quantity of users and validity period, allowing to link the server software of the System to the equipment.

**License key** is a character string provided to the customer by the software vendor after purchasing the license, used to activate the product and obtain a digital license for a fixed server. Contains the maximum number of users and the license period in an encrypted form.

**Linear object** is an object on a digital map that represents a place or item that has length but no area at a given scale.

**Managing map layers** is the set of actions for managing layer visibility, creating and editing the geometry of layer objects on the map.

**Map scale** is the ratio of a distance on a map to the corresponding distance on the ground. A scale of 1:100,000 means that one unit on the map corresponds to 100,000 of the same units of measurement on the ground.

**Mapping** is a correspondence between a layer attribute and a task field.

**MapInfo Interchange Format (MIF)** is a MapInfo text data format that includes geographic data (objects) and a description of the data table containing attribute information related to objects.

**Metadata** is the information that describes the characteristics and properties of a particular layer.

**Multi-object** is a combination of several objects. Multi-objects can be of point, line, and polygon geometric types.

**Node** is the point representing the beginning or ending of an edge of a linear or polygonal object, topologically linked to all the edges that meet there.

**Object attributes (attribute data)** are values describing the object properties. Attribute data types are: integer, real, text, date and time, geometry.

**Object geometry** is the measurements and properties of points, lines and surfaces. In GIS, geometry represents spatial components of geographic objects.

**Object import** is a data loading from external files into the Program database.

**One-to-many relationship** is a relation between two sets of data where one record in a parent table can be associated with one or more records in another table (child data table).

**Operational tasks** are the tasks created to solve current issues.

**Organization Administrator** is a user role in the System responsible for administering the organization, namely: managing users, layers and tables; granting access rights to layers and reports; managing tasks within the organization. Managing includes creating, editing and deleting.

**Organization Inspector** is a user role in the System responsible for managing tasks within the organization and having rights to create new layers and tables, as well as edit or delete available ones. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.

**Parent tasks** are first-level tasks. They can be linked to child tasks (second-level tasks) or have no child tasks.

**Photo sample** is a reference photo used as the basis for assessing similarity with a photo uploaded by the user to confirm the completion of work on the service object.

**Photo response** is a photo uploaded by the executor to the task as a response to the attached photo sample to confirm the completed work on the service object.

**Point object** is a cartographic object that does not have length or area in the accepted scale.

**Polygonal (area) object** is a cartographic object that bounds the area at a given scale.

**Program user (User)** is a person (employee) or organization that uses the current Program to perform a specific function.

**Raster layer** represents data in the form of geographically-referenced images as well as fragments of raster images displayed in the same projection and prepared for each level of map detail.

**Reference table (dictionary)** is a table with systematically organized data intended to help users to handle attribute information on objects.

**Schedule** is a tool that allow users to automatically create and assign template tasks at a certain time with a specified periodicity.

**SHP data format** is a vector format of geographic files. It allows users to store the following types of geometric objects: points (polypoints), lines (polylines), polygons, and other objects. A file can contain only one object type. Each entry in the SHP file can have multiple attributes to describe its geometry.

**Scheduled tasks** are the tasks created at a specified date and time according to a template.

**Spatial database** is a database optimized to store and access spatial data or data that defines a geometric space.

**SQLite** is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine.

**SQLite Data Format** is the SQLite relational database file format.

**Sub-object** is an object included in the multi-object.

**Symbol** is a graphical representation of a geographic object or a class of spatial objects, which helps to identify and distinguish them from other spatial objects on the map.

**System Administrator** is a user role in the System with the maximum rights responsible for its configuration and administration, including managing clusters, organizations, users of all roles, contracts, layers and tables; granting access rights to layers and reports; managing tasks. Managing includes creating, editing and deleting.

**System Inspector** is a user role in the System responsible for managing tasks across all clusters. Managing includes creating and editing tasks, except for changing the title, organization, type of work, priority, description, deadline, and location.

**System reference table** is a reference table generated automatically based on data entered into the system. System reference tables include tables of system users, priorities and types of work.

**TAB data format** is the format of MapInfo vector spatial data files (MapInfo files).

**Task** is a system entity containing information about the type of work, creation date, deadline, priority, execution step, contract, object, as well as instructions for execution. It is possible to attach photo samples, photo responses, and other auxiliary files (documents, photos, and videos) to the task.

**Task priority** is a characteristic of the urgency of the task.

**Task status** is a characteristic of the completion degree of work on the task, determined by the dispatcher or administrator when accepting the task.

**Task step** is a stage in the sequence of actions for completing a task changed by the task executor, dispatcher, or automatically by the system according to the set algorithm.

**Task objects (service objects)** are the layer and table objects associated with tasks and containing information useful for their execution. They can be used to automatically fill in task fields according to the configured mapping (correspondence between a layer or table attribute and a task field).

**Thematic layer** is a spatial data bank layer which objects are interrelated by the same topic.

**Tile (map tile)** is one of many images that a map is divided into. Most map services use square tiles of 256x256 pixels.

**Timelapse-video** is a video file comprising a series of pictures taken via a video camera during a long time period.

**Tile Map Service (TMS)** is a specification for storing and retrieving cartographic data that provides access to the map tiles rendered at a specific scale level. These resources are accessed via the "REST" interface.

**Toolbar** is a graphical user interface with buttons for performing Program commands.

**Tiled Web Map Service (TWMS)** is a specification for storing and retrieving map data that provides pre-built georeferenced map images. TWMS relies on technologies for building and transmitting large images to the Internet using tiles – small, standard-sized image fragments. A TWMS service may also include one or more styles, dimensions, or tiling schemes to define how the TWMS layer is displayed. Accessing data via the TWMS protocol requires preprocessing of the source cartographic data by creating tiles for the full range of scales, over the entire area. This technology allows locally caching an image by building a tile grid.

**User profile** is a characteristic of an individual system user, represented by a set of attributes, such as full name, email, phone number, etc.

**User rights management** is a set of actions for registering and managing user rights in the Program.

**User tag** is an entity allowing to group users against a specified attribute (e.g., the phone model).

**User type** is a user characteristic (a human being or a vehicle) to determine the user mapping settings versus the type selected.

**Vector image** is a representation of graphical objects and images based on the use of geometric primitives such as points, lines, and polygons.

**Webhook** is an automated launching of http requests in response to operations on entities (comments and tasks).

**Web Feature Service (WFS)** is a web service for querying spatial data that includes a standardized API. Unlike the Web Map Service (WMS), which returns a map image (rendered data), the WFS service returns actual objects with geometry and attributes that can be used in any type of geospatial analysis. WFS services also support filters that allow users to perform spatial and attribute queries on the data.

**Web Map Service (WMS)** is a standard protocol for serving geographically referenced images over the Internet, generated by a cartographic server based on data from the GIS database. The WMS service may also include a Styled Layer Descriptor (SLD) to define how the WMS layer should be displayed. The WMS service layer consists of three elements arranged hierarchically in the table of contents. At the top is the name of the WMS service, which contains all the layers of the WMS map. The next level down contains the WMS composite layers whose only function is to organize the WMS sublayers into appropriate groups. There is at least one WMS composite layer, but there can be any number of composite WMS layers (and even nested groups within groups). WMS composite layers do not contain map layers. This is the third group, WMS sublayers that actually contain map layers.

# ATTACHMENTS

## 5.1 Attachment 1. Python plugins

### 5.1.1 General information

Plugins are Python scripts that run before and after changing (creating, editing, or deleting) of system server core entities.

The system supports the following types:

**Validation** is a plugin that runs before modifying a system server core entity, which allows you to check the correctness of the entered data.

**Reaction** is a plugin that runs after modifying a system server core entity, which allows you to trigger another action in response to data changes.

Version 0.38 of the system's server core supports plugins invoked in response to actions with tasks and comments (creating, editing, or deleting). However, in this version, it is not possible to edit or delete comments from plugins.

Version 0.41 of the system's server core adds support for plugins invoked in response to user actions (creating, editing, or deleting).

The plugin receives entity states before and after changes, as well as system utilities. Plugin execution can trigger a response action in the server core of the system. To do this, the plug-in code must return the result of its execution to the system's server core.

All plugins are executed on behalf of the "Plugin system" system user with the System Administrator role.

When creating and deleting tasks, users, or task comments, the following variables are available in Python code:

- model (also known as after) – the task, user, or comment being created;

- subject – the creator of the task, user, or comment.

When editing tasks and users the following are available:

- model (also known as after) – the task or user after modification;

- before – the task or user before modification;

- subject – the user making the request.

For security reasons, the variables store wrappers over the models (Java objects) which are read-only.

## 5.1.2 Wrapper methods

All wrappers, except those explicitly listed below, have only one method, `getId()`.

    **model/before/Mockups.Task**

| Return type | Method name (parameter list) | Description |
|---|---|---|
| | getId() | task id |
| Mockups.User | getUser() | task creator |
| | getDate() | task date |
| | getOrganization() | creator organization |
| | getWorkgroup() | task project |
| | getType() | type of work |
| | getPriority() | priority |
| | getStage() | task step |
| | getStatus() | task status |
| | getText() | description |
| | getTitle() | title |
| | getAs signedOrganization() | assigned organization |
| Mockups.User | getAssignedUser() | assigned user |
| Mockups.Contract | getContract() | contract |
| | getServiceObjectId() | object id |
| | getSe rviceObjectLayerId() | object layer id |
| | get ServiceObjectTitle() | object title |
| | getScheduleId() | shedule id |
| | getTemplateId() | template id |
| | getParentId() | parent task id |
| | getLocation() | point coordinates [lon, lat] |
| Attachment | getMainPhoto() | main photo |
| [ Mockups.Attachment ] | getFiles() | files |
| [ Mockups.Attachment ] | getPhotos() | photos |
| [ Mockups.Attachment ] | getVideos() | video files |
| [ Mockups.Attachment ] | getSounds() | audio files |
| | get(String translit) | value of a custom field whose 'translit' is requested |
| | getDeadline() | deadline |
| | getExpiredDate() | expire date |
| | getSampleMatching() | minimum photo matching percentage with the sample |
| | getAddedPhotoCount() | number of added photos |

    **subject/Mockups.User**

| Return type | Method name (parameter list) | Description |
|---|---|---|
| | getId() | user id |
| Mockups.Role | getRole() | user role |
| Mockups.Cluster | getCluster() | user cluster |
| Mockups.Organization | getOrganization() | main organization |
| Mockups.Organization | getOrganizations() | list of available organizations |
| | getFio() | full name |
| | getLogin() | user login |
| | getPassword() | user password |
| Mockups.UserInfo | getInfo() | detailed user information |
| | getEmail() | user email |
| | getAddress() | user address |
| | getPhone() | user phone |
| | getPassport() | user passport |
| | getSystem() | system user or not |
| Mockups.UserType | getType() | user type |
| Mockups.Tag | getTags() | user tags |
| | getBlocked() | user blocked or not |
| | getTracking() | tracking enabled or not |
| | getGlonassId() | GLONASS-id for tracking |
| | getAvatarFileName() | avatar file name after upload to the server |
| | g etAvatarUpdateDate() | avatar update date |
| | get LdapAuthentication() | user authentication through LDAP |
| | get LastAuthentication() | user's last authorization date |
| | getGisEditorAccess() | user integration with GIS-editor |

**model/Mockups.Comment**

| Return type | Method name (parameter list) | Description |
|---|---|---|
|  | getId() | comment id |
|  | getUuid() | comment UUID4 |
|  | getReferenceId() | id of the comment to which this comment is a reply |
|  | getLevel() | comment level |
| Mockups.User | getUser() | comment creator |
|  | getUpdateText() | update text (for task update comments) |
|  | getComment() | comment text |
|  | getType() | comment type (regular or system) |
| Mockups.Diff | getDiff() | information about the changes made to the task (for system comments) |
| Mockups.Chat | getChat() | channel information |
|  | getChatMessageNumber() | message number in the chat channel |
|  | getSystemMessageCode() | system message code |
| Mockups.Task | getTask() | information about the task to which the comment relates |

**Mockups.Attachment**

| Method name (parameter list) | Description |
|---|---|
| getId() | id |
| getSticker() | sticker |
| getAttachmentLocation() | attachment file location coordinates in [lon, lat] format |
| getOriginLocation() | coordinates of the file creation location in [lon, lat] format |
| getName() | filename on the server |
| getType() | file type; possible values: photos, sounds, video, dif_files |
| getDescription() | file description |
| getNum() | file serial number |
| getIsRemote() | remote file or not |
| getFile() | physical file |
| getParentPhotoId() | parent photo id (available only for photos) |
| getSampleMatching() | photo match percentage with the sample |

**Mockups.File**

| Method name (parameter list) | Description |
|---|---|
| getId() | id |
| getAuthor() | author |
| getDate() | creation date |

**Mockups.Sticker**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | id |
| getName() | name |

**Mockups.Type**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | id |
| getName() | name |

**Mockups.Organization**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | id |
| getName() | name |

**Mockups.UserInfo**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | id |
| getEmail() | email |
| getAddress() | address |
| getPhone() | phone |
| getPassport() | passport |

**Mockups.UserType**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | user type id |
| getTitle() | user type name |
| getIconFileName() | icon file name after uploading to the server |
| getIconUpdateDate() | date of the last icon change |
| getIsDefault() | is this user type the default |
| getUseInitials() | whether to use user's initials in the marker on the map (instead of an icon) |
| getUseAvatar() | whether to use user's avatar in the marker on the map (instead of icons and initials) |

**Mockups.Tag**

| *Method name (parameter list)* | *Description* |
|---|---|
| getId() | id |
| getTitle() | name |

**Mockups.Contract**

---

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| Method name (parameter list) | Description |
|---|---|
| getId() | id |
| getTitle() | title |
| getStartDate() | contract start date |
| getFinishDate() | contract end date |
| getGrantTaskCreation() | contractor's rights to create contract tasks |
| getCluster() | cluster |
| getCustomer() | customer organization |
| getAssignedOrganization() | executing organization |

**Mockups.Diff**

| Method name (parameter list) | Description |
|---|---|
| getId() | id of the entry with information on changes made to the task (for system comments) |

**Mockups.Chat**

| Method name (parameter list) | Description |
|---|---|
| getId() | id of the entry with information on the message channel |

### 5.1.3 Validations

Validator plugins allow you to check the correctness of an entity when performing actions on it. Validators are executed before the entity is saved in the database.

The plugin should return one of three possible values:

- valid() – everything is correct, the entity can be saved.

- invalid() – error, the entity cannot be saved.

- invalid(String error) – error, the entity cannot be saved, show error message.

```python
if(len(model.getPhotos()) == 0):
    return invalid()

for photo in model.getPhotos():
    if(photo.getAttachmentLocation() is None or photo.getOriginLocation() is
→None):
        return invalid()

    dist = utils.dist(photo.getAttachmentLocation(), photo.
→getOriginLocation())

    if(dist > 1000):
        return invalid('too much distance between points')

return valid()
```

## 5.1.4 Reactions

A reaction is the ability to launch a request for one or more operations on the same task or user in response to a successful operation on a task or user. For example, in response to attaching new files to a task, run a request to change a custom field storing the number of files. The server core of the system processes requests asynchronously, therefore, although the reaction launches the request, it is processed in a thread separate from the reaction and almost certainly ends after its execution.

A reaction can launch a single response request:

```
return upd().setTitle(after.getTitle() + '!')
```

Or launch several response requests:

```
return [
    upd().setText('JEP-modified'),
    upd().setTitle('Modified by JEP')
]
```

Also, the reaction may return a message to the system's server core that no action is required:

```
return noop()
```

In reactions, you can specify the user on whose behalf the request to create or modify a task is made.

```
return ins().by(101).set...
return fullclone().by(101).set...
return briefcopy().by(101).set...
return upd().by(101).set...
```

In version 0.38 of the system's server core, the `ins()`, `upd()`, `briefcopy()`, `fullclone()` methods are available only when writing a reaction to a task operation. Starting with version 0.41 of the system's server core, the `ins()` and `upd()` methods become available when writing a reaction to a user operation.

## 5.1.5 Creating new tasks and users

```
# create a new task/user
return ins()

# create a full copy of the current task (including files)
return fullclone()

# create a partial copy of the current task (excluding files):
return briefcopy()
```

Calls to the `ins()`, `briefcopy()`, `fullclone()` methods for a task create a ready-made request, which you can modify. For example, change the fields for the created task: title, text, date, add files, etc. For the `ins()` method, these modifications are mandatory, because `ins()` for a task creates an empty task without the following mandatory fields: type of work, priority, and organization.

Calling the `ins()` method for a user creates an empty user without login, password, full name, and organization (these are mandatory fields that must be filled in).

```python
# fill in the mandatory fields when creating a task
return ins().setTitle('Hello').setType(1).setPriority(1).setOrganization(4)

# create a full copy of the current task and change the title at the same time
 return fullclone().setTitle(after.getTitle() + ' - Modified')

# create a new user
return ins().setLogin('test_123').setPassword('123').setFio('test_123').
↪setOrganization(3).setRole(7).setAddress('Moscow').setEmail('test@ya.ru')
```

By default, the `briefcopy()` and `fullclone()` methods use `after` as the data source for copying
(`before` in the case of reaction to task deletion). However, you can explicitly specify which of the two
task states to use:

```python
# If this is a reaction to a change:
# Create a copy of the task state BEFORE the change
# for each transaction
return fullclone(before)
```

## 5.1.6 Methods for setting task fields

| Method name (parameter list) | Description |
| --- | --- |
| set(String translit, Object value) | value of a custom field by transliteration |
| add(List<Attachment> attachments) | add a list of files |
| add(Attachment attachment) | add a file |
| setMainPhoto(Attachment photo) | set new main task photo |
| setLocation(Double lon, Double lat) | set coordinates |
| setLocation(List<Double> coordinates) | set coordinates |
| setTitle(String title) | set title |
| setText(String text) | set description |
| setOrganization(Long id) | set creator's organization id (only when creating a task) |
| setWorkgroup(Long id) | set project id (only when creating a task) |
| setDate(Date date) | set task date in java.util.Date format (only when creating a task) |
| setDate(Double date) | set task date in python timestamp format (only when creating a task) |
| setType(Long id) | set work id |
| setContract(Long id) | set contract id |
| setPriority(Long id) | set priority id |
| setAssignedOrganization(Long id) | set assigned organization id |
| setAssignedUser(Long id) | set assigned user id |
| setStage(Long stage) | set task step |
| setStatus(Long id) | set status id |
| setParent(Long id) | set parent task id |
| setServiceObject(Long id) | set object id |
| setServiceObjectLayer(Long id) | set object layer id |
| setArchive(Boolean archive) | set task as archived |
| setDeadline(Date date) | set deadline in java.util.Date format |
| setDeadline(Double date) | set deadline in python timestamp format |
| setExpiredDate(Date date) | moment when the task was overdue in the java.util.Date format |
| setExpiredDate(Double date) | moment when the task was overdue in the java.util.Date format |

### 5.1.7 Methods for setting user fields

| Method name (parameter list) | Description |
|---|---|
| setFio(String text) | set user name |
| setLogin(String login) | set user login |
| setPassword(String password) | set user password |
| setEmail(String email) | set user email |
| setAddress(String address) | set user address |
| setPhone(String phone) | set user phone |
| setPassport(String passport) | set user passport |
| setRole(Long id) | set user role id |
| setOrganization(Long id) | set id of the main organization |
| addOrganizations(List<Long> ids) | add user access to organizations, list of organization ids |
| removeOrganizations(List<Long> ids) | remove user access to organizations, list of organization ids |
| setType(Long id) | user type id |
| addTags(List<Long> ids) | add tags to the user, list of id tags |
| removeTags(List<Long> ids) | remove user tags, list of id tags |
| setBlocked(Boolean blocked) | enable or disable blocking of user |
| setTracking(Boolean tracking) | enable or disable tracking of user |
| setAvatarFileName(String avatarFileName) | add user's avatar (avatar file name after uploading to server) |
| setLdapAuthentication(Boolean ldapAuthentication) | enable or disable user authentication via LDAP |
| setGisEditorAccess(Boolean gisEditorAccess) | enable or disable integration with GIS editor (available only to the System Administrator) |

### 5.1.8 Working with dates

The `setDate()`, `setDeadline()`, and `setExpiredDate()` methods have two versions that accept `Date` and `Double` respectively. You can call the version with `Date` using special utilities for generating `Date` objects:

```python
if model.getDeadline() is not None:
    return noop();


return upd().setDeadline(dates.get(2021, 12, 31, 12, 30, 0))
# or
return upd().setDeadline(dates.get("2022-02-12 13:05:30"))
# or
return upd().setDeadline(dates.get(1637668042))
# or
return upd().setDeadline(dates.now())
```

The version with `Double` is intended for working with the `datetime` package:

```python
import datetime


if model.getDeadline() is not None:
```

```
    return noop();

tomorrow = datetime.datetime.now() + datetime.timedelta(days=1)

return upd().setDeadline(tomorrow.timestamp())
```

### 5.1.9 Adding files to a task

In reactions, you can initiate the attachment of files to a task.

To do this, you need to:

1. Pass the name of the file on the disk relative to the server core's file directory to one of the functions:
   photo, sound, video, or anyfile. The file should already be in this directory.

2. Call (if necessary) methods to specify additional file fields (setSticker, setDescription).

3. Add the result of the function call to the task using the add methods (you can transfer either a
   single file or several ones).

```
file1 = photo('photo-2/2021/06/22/16-06/d392a0c4-eb12-1004-8555-4a467d53f32e.
→jpg')
file2 = photo('nas-2/2021/06/22/16-06/d3bf55b0-eb12-1004-8555-4a467d53f32e.jpg
→').setSticker(1163)
file3 = photo('photo-2/2021/06/22/16-06/d392a0c4-eb12-1004-8555-4a467d53f32e.
→jpg').setDescription('test')
file4 = photo('photo-2/2021/06/22/16-07/d3d27ba4-eb12-1004-8555-4a467d53f32e.
→jpg').setDescription('test').setSticker(1163)
return upd().add([file1, file2]).add(file3).add(file4)
```

You can attach an existing photo from after or before:

```
return [
    # "short" copy with additional
    # attachment of the first photo from the original task
    briefcopy().add(before.getPhotos()[0]),
    # similar to to fullclone()
    briefcopy().add(after.getPhotos())
]
```

You can also attach an existing photo, but at the same time set a new (different) sticker or description for
it:

```
return ins().add(photo(after.getPhotos[0]).setSticker(4))
```

In reactions, you can attach stickers to existing files:

```
u = upd()
u.getPhoto(0).setSticker(3)
return u
```

## 5.1.10 Editing tasks and users

Returning the result of the upd() function from reaction initiates a modification of the current task or user. Just like with ins(), you can call methods that set the required fields of the task or user:

```
# modifying task
u = upd().setTitle(after.getTitle() + ' - Modified')
u.add(photo('photos/somfilehere.jpg))
return u
```

```
# modifying user
u = upd().setFio(after.getFio() + ' - Modified')
u.setOrganization(11).addOrganizations([4,5]).removeOrganizations([1,3])
return u
```

## 5.1.11 Modifying task files

You can use the ins() and upd() functions to call methods that add files to a task:

```
u = upd().add(photo('photos/somfilehere.jpg))
return u
```

You can also modify existing task files. To do this, you need to:

1. Get a link to a file by calling one of the methods: getPhoto(), getFile(), getSound(), getVideo().

2. Call one of the required methods: setSticker() or setDescription().

```
u = upd()
# The getPhoto(int) method fetches the file link
# by the sequential method in the getPhotos() array.
# Numeration starts from 0.
# The serial number is not num! (not a file number)
u.getPhoto(0).setDescription('The first photo')
u.getFile(0).setSticker(3)
return u
```

The result of the getPhoto(i) method call differs from the result of the getPhotos()[i] call. The first call returns a link to a file to which you can make changes. The second returns a wrapper object that only allows you to read some file properties:

```
u = upd()
# this does not work! you need to use getPhoto(i)
u.getPhotos()[0].setSticker(3)
return u
```

Also in version 0.38 of the system's server core, writing the entire action into one line without an intermediate variable does not work. Reactions expect that the response returns the result of the upd() call, not getPhoto():

```
# this does not work!
return upd().getPhoto(0).setSticker(3)
```

### 5.1.12 Setting the main photo of the task

You can set the main photo both when creating a task and when changing it. The installed main photo can be from the "old" files and from the "new" ones.

```
# making a copy of the task, setting the first photo as main
return fullclone().setMainPhoto(after.getPhotos()[0])
```

```
# making a copy of the task, adding a new photo,
# making it the main one
f = fullclone()
p = photo('photos/somephoto.jpg')
return f.add(p).setMainPhoto(p)
```

```
# making the first photo the main one
return upd().setMainPhoto(after.getPhotos()[0])
```

```
# adding a copy of the first photo,
# making the copy of the main one
u = upd()
p = photo(after.getPhotos()[0])
return u.add(p).setMainPhoto(p)
```

And an example of incorrect use:

```
# photo(...) creates an auxiliary photo object,
# which is used when adding;
# but in this case the photo is not added,
# so it's useless to try to make it the main one
return upd().setMainPhoto(photo(after.getPhotos()[0]))
```

### 5.1.13 Webhooks

Among the reactions, **webhooks** is particularly noteworthy. This is an automated launch of http requests in response to operations on entities. Unlike regular reactions, webhooks can be written **for tasks or users, as well as for comments**. Python code can construct the url and body of the request, or specify that no request needs to be made. To run a query, the reaction must return the result of one of the special functions:

```
return post(url)
return patch(url)   # or
return put(url)     # or
return delete(url)  # or
return get(url)     # or
```

The passed URL can be either absolute or relative. A relative URL is completed to the address of the system's local server core (usually http://localhost:9099). The URL may contain a placeholder/:id, which is replaced with the ID of the current entity. If the request is sent to http://localhost / http://127.0.0.1, then the "Plugin System" system user token with the "System Administrator" role is automatically added to it.

For example, you can write a reaction that adds a comment to any task change:

```
# Sends { "comment": "Hello" } to http://localhost:9099/rest/tasks/:id/
↪comment?token=...
# The initial / can be omitted.
# The prop() method allows you to add properties to the JSON request body;
# more on it below.
return post('/rest/tasks/:id/comment').prop('comment', 'Hello')
```

The reaction can trigger any number of webhooks:

```
return [
    post('/rest/tasks/:id/comment').prop('comment', '#1'),
    post('/rest/tasks/:id/comment').prop('comment', '#2'),
    post('/rest/tasks/:id/comment').prop('comment', '#3')
]
```

Finally, in the reaction, you can freely mix requests to create or change the task and webhooks:

```
return [
    post('/rest/tasks/:id/comment').prop('comment', 'Comment'),
    upd().setTitle(after.getTitle() + '!')
]
```

Webhooks solve the same tasks that can be solved by the `requests` module.

The first difference from the `requests` is the automatic completion of the URL and the addition of a token.

But the second difference is much more important. Requests made via `requests` are executed immediately. They are blocking, i.e. the plugin is stopped until a response to the request (successful or unsuccessful) is received. If a request is executed for a long time (for example, a minute), and there are several such requests, then they can block the entire work of the server core. In contrast, the `return post()` call does not start the request. It only builds and schedules it for sending. After the request is formed, the work of plugins continues as usual. Incoming requests are processed in a separate thread. The server for sending the request is determined for each of them. For all such servers, the server core keeps a record of the number of sent requests for which a response has not been received yet. If this value is less than the threshold value N (controlled by the *Webhooks* (page 204) setting), then the request is sent immediately. Otherwise, the request is sent after receiving a response to any of the requests in processing. For example, if N = 10, then the first 10 requests to the https://your.server server are sent immediately, and the 11th is sent only after at least one of the first 10 has completed.

Finally, the third difference from the `requests` module is that you can create and attach destination servers for webhooks in the system (actually, an http address that that you can name, enable/disable, and delete) (Fig. 5.1).

Fig. 5.1: Webhook destination servers

If a reaction has an attached server and generates a *relative* request (tasks/:id/comment instead of https://your.server/tasks/:id/comment), the request is sent exactly to the attached server.

For example:

```
# Assuming the https://your.server server is attached to the reaction script
# Then the script below tries to send { "comment": "Hello" }
# to https://your.server/rest/tasks/:id/comment
# (unsuccessfully, because at least a token is not added).
return post('/rest/tasks/:id/comment').prop('comment', 'Hello')
```

The request is ignored if the server is turned off or deleted.

Destination servers are required to group webhooks and quickly change the destination server. If there are 5-10 webhooks and their API entry point has changed, it is enough to change only the address of the destination server.

Finally, special methods have been added to build requests that allow you to specify the request body in JSON format.

```
req = post('/herewego')
# props sets several properties in the body
req.props({
    'x': 2,
    'y': 3
})
# prop adds one property to the body
req.prop('op', '+')
# props adds properties rather than replacing them
req.props({
    'ans': 5
```

---

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```
})

return req
```

Each `prop` argument can be a string, number, boolean type, date, list of values, or dictionary of values. In addition, you can pass `after`/`before` (for tasks and comments) to `prop`. The data about them is automatically converted to JSON when you submit a request (see its format in `/ rest/docs`):

```
return post('/someurl')
    .prop('before', before)
    .prop('after', after)
```

Finally, there are methods that allow you to set the entire body as a `map`. The difference from `props` is that `props` does not clear the previously passed body:

```
body = {
    'before': before,
    'after': after
}
```

In `body` you can pass not only `map`, but also `before`/`after`:

```
# subsequent calls to prop/props
# add new properties to the body
return post('/someurl').body(after).prop('operation': 'update')
```

In conclusion, one more example:

```
return post("/users")
    .prop("login", "user")
    .prop("paswd", "password")
    .prop("fio", "Test user")
    .prop("organization_id", 3)
    .prop("workgroup_ids", [1, 3, 4])
    .prop("role_id", 7)
    .prop("type", {"id": 2})
    .prop("tracking", False)
```

### 5.1.14 Utilities

Reference tables are available in the plugin code:

```
refbooks().types().byName(...)
refbooks().stickers().byName(...)
refbooks().users().byName(...)
refbooks().statuses().byName(...)
refbooks().fields().byName(...)
```

The `byName()` method for each reference table searches for a model with the required "name/title/fio". This depends on which field of this model is more suitable in meaning to `byName()`. Returns the desired

---

`Mockups.*` model.

Utility functions are also available:

```
// Returns the approximate distance
// between two points on the surface of the Earth (in kilometers).
// It is assumed that the Earth is a perfect sphere.
dist(List<Double> point1, List<Double> point2)


// The function gets two collections of photos, and returns those,
// which are in "after", but which are not in "before".
diffPhotos(List<Attachment> before, List<Attachment> after)
```

### 5.1.15 Imports in Python

You can install additional packages if needed. One of the easiest ways to install a package is to use the `pip` utility: `pip install <packagename>`. In the script, the package is connected using the `import` operator.

```python
import requests
import warnings

warnings.filterwarnings("ignore")
url = 'https://integration.dev.geo4.pro/rest/'

def getToken():
  response = requests.post(url + 'auth/by-login?apiVersion=2.0', json = {
↪'login': 'depadmin', 'password': '123456789'}, verify = False)
  return None if response.status_code != 200 else response.json()['token']

def postComment(id):
  return requests.post(url + 'tasks/%d/comments?token=%s&apiVersion=2.0' %
↪(id, getToken()), json = {'comment': 'jep\'s comment'}, verify = False)

postComment(model.getId())
return noop()
```

### 5.1.16 Potential vulnerability: recursive triggering of the change reaction

It is important to note that the creation or modification of a task in the reaction is the same as all other requests. Validations and reactions are also launched for it. Therefore, it is easy to write a script that triggers an endless series of reactions. For example, if you need to change the deadline (set it a day ahead) with each update of the task, the following script triggers an infinite chain of reactions:

```python
import datetime

now = datetime.datetime.now()
tomorrow = now + datetime.timedelta(days=1)

return upd().setDeadline(tomorrow.timestamp())
```

### 5.1.17 Plugin script examples

**Upload files to a layer object**

```python
if after.getServiceObjectLayerId() is not None and after.getServiceObjectId()
↪is not None:
    attach_list = []
    if len(after.getPhotos()) > 0:
        body_photo = list(map(lambda attach_name: {
            'path': f"/department_files/photos/{attach_name.getName().replace(
↪'_', '/')}",
            'fileName': attach_name.getName().replace('/', '_'),
            'isUrl': True
        }
        , after.getPhotos()))
        for photo in after.getPhotos():
            photo_location = photo.getOriginLocation() if photo.
↪getOriginLocation() is not None else photo.getAttachmentLocation()
            if photo_location is not None and model.getLocation() is None:
                geom = {'coordinates': [(photo_location[0], photo_
↪location[1])], 'type': 'MultiPoint'}

        if model.getLocation() is not None:
            geom = {'coordinates': [(model.getLocation()[0], model.
↪getLocation()[1])], 'type': 'MultiPoint'}

    if len(after.getVideos()) > 0:
        for item in after.getVideos():
            attach_list.append(item.getName())
        attach_path = 'video'

    if len(after.getSounds()) > 0:
        for item in after.getSounds():
            attach_list.append(item.getName())
        attach_path = 'sounds'

    if len(after.getFiles()) > 0:
        for item in after.getFiles():
            attach_list.append(item.getName())
        attach_path = 'dif_files'

    body_files = list(map(lambda attach_name: {
        'path': f"/department_files/{attach_path}/{attach_name.replace('_', '/
↪')}",
        'fileName': attach_name,
        'isUrl': True
    }
    , attach_list))

    req = patch(f"/layers/{after.getServiceObjectLayerId()}/features/{after.
↪getServiceObjectId()}/files")
```

```
    req.props({'photos': body_photo, 'files': body_files})

    return [
        req,
        patch(f"/layers/{after.getServiceObjectLayerId()}/features/{after.
↪getServiceObjectId()}").prop('geometry', geom)
        ]
```

**Checking the number of photos**

```
if after.get('photo_count') is not None and after.get('photo_count') !=␣
↪before.get('photo_count') and subject.getId() != after.getUser().getId():
    return invalid("\nOnly the task creator can change the 'Number of Angles'␣
↪field.\n"
                   "\nPlease return the previous value.")

if len(after.getPhotos()) is not None and after.get('photo_count') is not␣
↪None and after.getStatus().getId() != before.getStatus().getId():
    if len(after.getPhotos()) < int(after.get('photo_count')) and after.
↪getStatus().getId() == 4:
        send_photo_count = int(after.get('photo_count')) - len(after.
↪getPhotos())
        return invalid(f"Not enough photos to change the step. You need to␣
↪add more {send_photo_count}")
```

## 5.2 Attachment 2. Examples of advanced layer styles

For more information about creating geocss styles, see https://docs.geoserver.org/stable/en/user/styling/workshop/css/css.html.

** Example of a point layer style using standard icons (circles) for categories**

```
/* @title Offices */
[fclass = 'bank'] {
 mark: symbol('circle');
}
[fclass = 'bank']
 :mark{
  fill:#68904D;
  stroke:black;
  stroke-width:1;
  size:18;
}


/* @title ATMs */
  [fclass = 'atm'] {
 mark: symbol('circle');
```

```
}
[fclass = 'atm']
:mark{
  fill:#EE9B01;
  stroke:#000000;
  stroke-width:1;
  size:9;
}
```

Where:

```
/* @title Offices */ - category name to be displayed in the legend.
[amenity = 'bank'] - the field to filter by and the value of the field.
mark: symbol('circle') - icon shape (circle).
fill:#68904D - icon fill color. You can use the name or the hex color code.
stroke: black/#000000 - color of the icon stroke. You can use the name or hex␣
↪color code (black = #000000).
stroke-width:1 - icon stroke width in pixels.
size:18 - icon size in pixels.
```
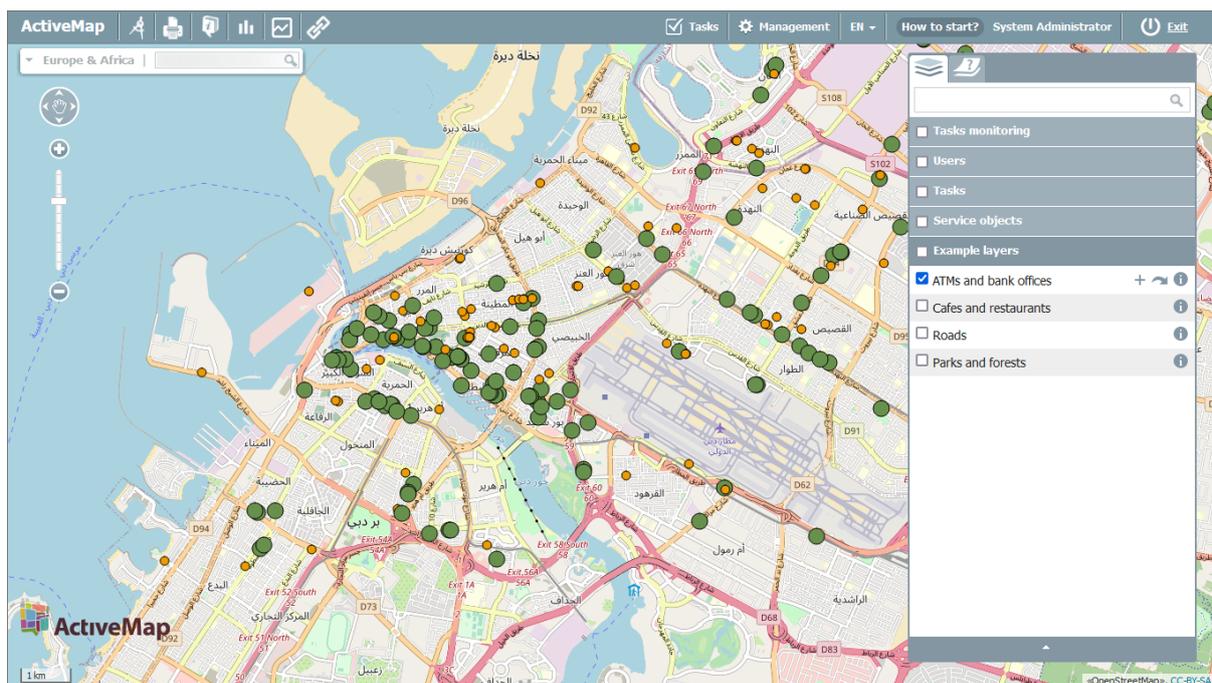


Fig. 5.2: Example of a point layer style for bank offices and ATMs using standard icons (circles) for categories

**Example of a point layer style using icons for categories**

```
 /* @title Fast food */
[ fclass = 'fast_food' ] {
  mark-opacity: 1;
  mark-rotation: 0;
```

```
    mark-size: 28;
    mark: url(https://public.activemap.me/dictionary/icons/79/view);
}
/* @title Cafes */
[ fclass = 'cafe' ] {
    mark-opacity: 1;
    mark-rotation: 0;
    mark-size: 28;
    mark: url(https://public.activemap.me/dictionary/icons/78/view);
}
/* @title Restaurants */
[ fclass = 'restaurant' ] {
    mark-opacity: 1;
    mark-rotation: 0;
    mark-size: 28;
    mark: url(https://public.activemap.me/dictionary/icons/80/view);
}
```

Where:

```
/* @title Cafes */ - category name to be displayed in the legend.
[fclass = 'cafe'] - the field to filter by and the value of the field.
mark-opacity: 1 - icon transparency (can be changed from 0 - full␣
↪transparency to 1 - full opacity).
mark-rotation: 0 - angle of icon rotation in degrees.
mark-size: 28 - icon size in pixels.
url(https://public.activemap.me/dictionary/icons/78/view) - link to the icon.␣
↪You can get it by going to the "Layers" block, the "Icons" tab, right-
↪clicking on the icon and selecting "Copy image URL" (:ref:`icon_url`).
```
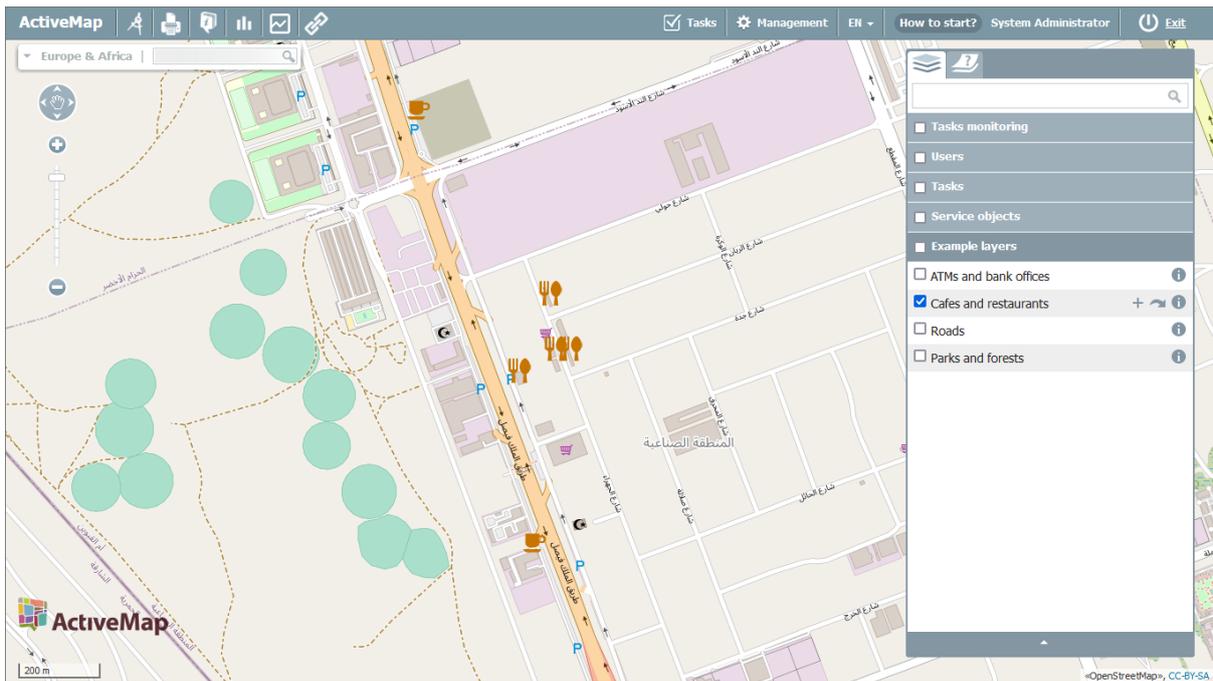
Fig. 5.3: Example of a point layer style for cafes and restaurants using icons for categories

**Example of a linear layer style with labels and line color information from the data**

```
* {
  stroke: [stroke_color];
  stroke-dashoffset: 0;
  stroke-linecap: butt;
  stroke-width: 4;
  label: [naimen];
  font-family: Arial;
  font-weight: bold;
  font-fill: black;
  font-size: 12;
  halo-color: white;
  halo-radius: 2;
  -gt-label-follow-line: true;
  -gt-label-max-angle-delta: 60;
  -gt-label-max-displacement: 400;
  -gt-label-repeat: 300;
  }
```

Where:

```
stroke: [stroke_color] - color of the line stroke. In this case it is taken␣
↪from the value of the specified field (stroke_color) and is not displayed␣
↪in the legend.
stroke-dashoffset: 0 - offset of the stroke from its initial position in␣
↪pixels.
stroke-linecap: round - parameter defining the shape of line ends (round -␣
↪rounded corners, butt - cut at a right angle immediately after the end of␣
```

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```
↪the line, square - cut at a right angle after a distance equal to half the␣
↪stroke-width).
stroke-width: 4 - line width in pixels.
label: [naimen] - name of the field which values are used to label objects.
font-family: Arial - font family for labeling objects.
font-weight: bold - font weight (thickness of label characters).
font-fill: black - font color. You can use name or hex color code (black =
↪#000000).
font-size: 10 - font size in pixels.
halo-color: white - color of the caption stroke. You can use name or hex␣
↪color code (black = #000000).
halo-radius: 1 - radius of the label stroke in pixels.
-gt-label-follow-line: - following the contours of linear object labels.
-gt-label-max-angle-delta: 90 - maximum bending angle of the caption in␣
↪degrees.
-gt-label-max-displacement: 400 - maximum displacement of the label in pixels.
-gt-label-repeat: 150 - repetition of object's caption through the specified␣
↪number of pixels.
```

**Example of a linear layer style with captions and different line types for categories**

```
 * {
 label: [name];
 font-family: Arial;
 font-weight: bold;
 font-fill: black;
 font-size: 10;
 halo-color: white;
 halo-radius: 1;
 -gt-label-follow-line: true;
 -gt-label-max-angle-delta: 90;
 -gt-label-max-displacement: 400;
 -gt-label-repeat: 150;
 }

/* @title Motorways */
[stylegroup = 'motorway'] {
stroke: #d1386f, #db798f;
stroke-width: 8px, 6px;
stroke-linecap: round;
z-index: 8, 9;
}
/* @title Main Roads */
[stylegroup = 'mainroad'] {
stroke: #be9239, #f8ce8c;
stroke-width: 6px, 4px;
stroke-linecap: round;
z-index: 6, 7;
}
```

```
/* @title Streets */
[stylegroup = 'minorroad'] {
stroke: #d9d6d0, #fefefe;
stroke-width: 4px, 3px;
stroke-linecap: round;
z-index: 4, 5;
}
/* @title Alleys */
[stylegroup = 'service'] {
stroke: #d9d6d0, #fefefe;
stroke-width: 3px, 2px;
stroke-linecap: round;
z-index: 2, 3;
}
/* @title Pedestrian zones */
[stylegroup = 'noauto'] {
stroke: #f99589;
stroke-width: 3px;
stroke-dasharray: 5 2;
z-index: 1;
}
/* @title Others */
[stylegroup = 'other'] {
stroke: #d9d6d0;
stroke-width: 2px;
z-index: 0;
}
```

Where:

```
 1. General parameters determined for the entire layer:

 label: [name] - name of the field which values are used to label objects.
 font-family: Arial - font family for labeling objects.
 font-weight: bold - weight of the font (the thickness of the caption␣
→characters).
 font-fill: black - font color. You can use name or hex color code (black =␣
→#000000).
 font-size: 10 - font size in pixels.
 halo-color: white - stroke color of the caption. You can use name or hex␣
→color code (black = #000000).
 halo-radius: 1 - radius of the signature stroke in pixels.
 -gt-label-follow-line: - follow line feature labels.
 -gt-label-max-angle-delta: 90 - maximum label bend angle in degrees.
 -gt-label-max-displacement: 400 - maximum label offset in pixels.
 -gt-label-repeat: 150 - repeats the label of the object after a given number␣
→of pixels.

2. Parameters for individual categories:
```

---

**5.2. Attachment 2. Examples of advanced layer styles**

```
Simple line:

/* @title Others */ - category name to be displayed in the legend.
[stylegroup = 'other']- field that is filtered and field value.
stroke: #d9d6d0 - color of lines. You can use name or hex color code (black =
↪#000000).
stroke-width: 2px - line width in pixels.
z-index: 0 - the order in which the category is shown relative to other layer
↪categories (starts with 0, objects with z-index: 0 is displayed below all
↪other objects with larger index values).


Dotted line:

/* @title Pedestrian zones */ - category name to be displayed in the legend.
[stylegroup = 'noauto'] - the field that is filtered and the value of the
↪field.
stroke: #f99589 - color of the lines. You can use name or hex color code
↪(black = #000000).
stroke-width: 3px - line width.
stroke-dasharray: 5 2 - length of strokes (5) and spaces (2) in pixels.
z-index: 1 - the order in which the category is shown relative to other layer
↪categories.


Stroke line:

/* @title Motorway */ - category name to be displayed in the legend.
[stylegroup = 'motorway'] - the field that is filtered and the value of the
↪field.
stroke: #d1386f, #db798f - colors of strokes for lines. You can use name or
↪hex color code (black = #000000).
stroke-width: 8px, 6px - line width in pixels.
stroke-linecap: round - parameter defining the shape of the line ends (round
↪- rounded corners, butt - right angle break right after the line ends,
↪square - right angle break after half of the stroke-width).
z-index: 8, 9 - order of category showing relative to other layer categories
↪and lines within one category when imitating style with stroke-width.
```

For lines in CSS there is no concept of "fill", only "stroke". Thus, unlike points and polygons, it is not possible to style the "edge" of a line. However, this effect can be achieved by drawing each line twice: once with a certain width and again with a slightly smaller width. This creates the illusion of fill and stroke. The style uses CSS support for "multi-valued properties" with two colors and widths. In this case, the highways are colored first with a dark red line (#d1386f) of 8 pixels wide and then a thinner pink line (#db798f) of 5 pixels wide. Since each line is drawn twice, the render order determined by the z-index parameter is important. The wider line must have a smaller index value so as not to overlap the thinner line.
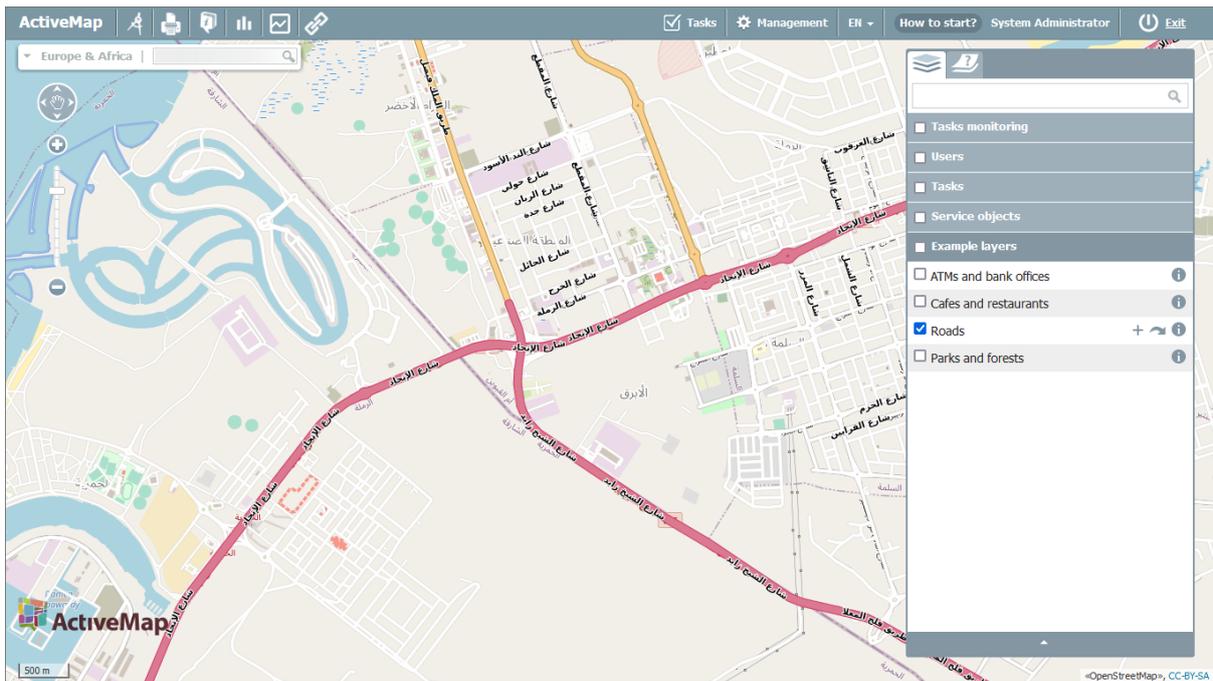
Fig. 5.4: Example of the road network linear layer style with captions and different line types for categories

**Example of a polygon layer style with fill by range**

```
*{
    fill-opacity:0.7;
    stroke:#254911;
    stroke-width:1;
  font-family: "Times New Roman";
  font-style: "normal";
  font-weight: "bold";
  font-size:10;
  font-fill:#000000;
  label-anchor: 0.5 0;
  label: [name];
  label-geometry: [centroid(the_geom)];
  -gt-label-max-displacement: 40;
  -gt-label-auto-wrap: 70;


}

/* @title Population < 20000 people */
[population_num < 20000] {
  fill:  #BDD880;}

/* @title Population between 20000 and 50000*/
 [population_num > 20000 and population_num < 50000]{
  fill:  #FFEB84;}

/* @title Population between 50000 and 100000*/
```

(continues on next page)

```
 [population_num > 50000 and population_num < 100000]{
  fill:  #FDBA7B;}


/* @title Population > 100000*/
 [population_num > 100000]{
  fill:  #F8696B;}
```

Where:

```
1. General parameters determined for the entire layer:

fill-opacity:0.7 - transparency of the polygon fill (ranges from 0 to 1).
stroke:#254911 - polygon stroke color. You can use the color name or␣
↪hexadecimal code.
stroke-width:1 - polygon stroke width in pixels.
font-family: "Times New Roman" - font family for labeling objects.
font-style: "normal" - font style (normal, italic).
font-weight: "bold" - weight of the font (weight of the caption characters).
font-size:10 - font size.
font-fill:#000000 - color of the signature symbols. You can use name or hex␣
↪color code (black = #000000).
label-anchor: 0.5 0 - anchor point that determines the placement of the label␣
↪relative to the centroid of the polygon. In this case, the label is offset␣
↪50% horizontally from the polygon's centroid and centered vertically.
label: [name] - name of the field which values are used to label objects.
label-geometry: [centroid(the_geom)] - relative location of the label␣
↪(location relative to the centroid).
-gt-label-max-displacement: 40 - maximum offset of the label in pixels␣
↪relative to the centroid of the polygon.
-gt-label-auto-wrap: 70 - breaks the label into lines if its length exceeds␣
↪the specified value in pixels.


2. Parameters for individual ranges:

/* @title Population < 20000 */*/ - range name to be displayed in the legend.
[population_num < 20000] - field to filter by and the value of the field.
fill: #BDD880 - the color of the polygon fill for the specified range. You␣
↪can use the color name or hexadecimal code.
```

**Example of a polygon layer style with hatching by category**

```
/* @title Parks */
 [fclass = 'park'] *{
 fill: symbol('shape://times');
 fill-size: 22px;
 stroke: darkgreen;
 }
 :fill {
 stroke: green;
 size: 8;
```

```
}

/* @title Forests */
[fclass = 'forest'] *{
fill: symbol('shape://plus');
fill-size: 12px;
stroke: darkbrown;
}
:fill {
stroke: brown;
size: 8;
}
```

Where:

```
/* @title Parks */*/*// - name of the category to be displayed in the legend.
[natural = 'park'] - field to filter by and the value of the field.
fill: symbol('shape://times') - fill polygon with symbols for creating a␣
↪shifting effect.
fill-size: 22px - size of symbols to fill in pixels.
stroke: darkgreen - color of polygons stroke.
:fill {
  stroke: green; - color of the characters stroke.
  size: 8; - symbols stroke thickness.
}
```
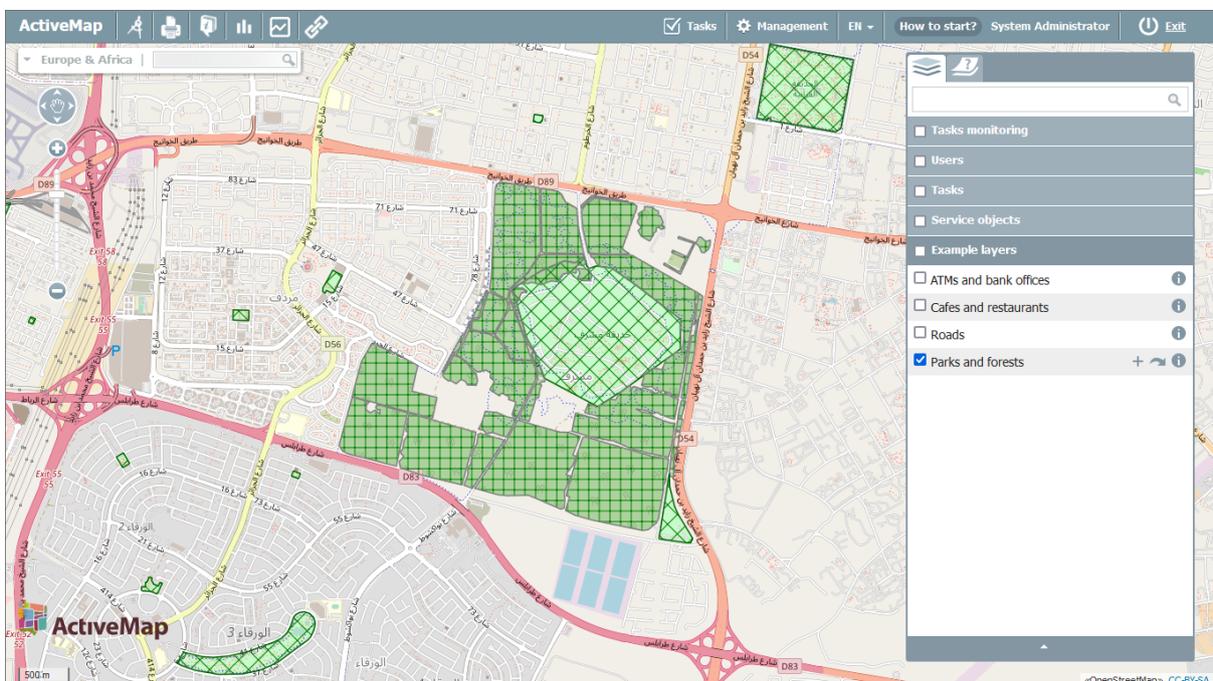


Fig. 5.5: Example of a polygon layer style for vegetation with hatching by category

## 5.3 Attachment 3. User rights grid

Table 5.2: user

| Rights/ Role | System Administrator | System Inspector | Clus |
|---|---|---|---|
| | | | |
| Change titles | + | – | + |
| Edit description | + | – | + |
| Change custom fields | + | +$^2$ | + |
| Change priority | + | – | + |
| Change step | +$^1$ | +$^1$ | +$^1$ |
| Change deadline | + | – | + |
| Change status | + | + | + |
| Change the set point | + | – | + |
| Add an object to a created task, if it has not been added before | + | + | + |
| Assign an executor | +$^2$ | +$^2$ | +$^2$ |
| Assign an organization | +$^2$ | +$^2$ | +$^2$ |
| View the creator | + | + | + |
| Attach photos/ videos (gallery) | + | +/– | +/– |
| Attach photos/ videos (camera) | + | +/– | +/– |
| Work with the invoice module | + | +/– | +/– |
| Delete | + | – | + |
| | | | |
| View | + | + | + |
| Create | + | – | + |
| Edit | + | – | + |
| | | | |
| View | + | + | + |
| Create | + | – | + |
| Edit | + | – | + |
| Delete | + | – | + |
| | | | |
| View | + | + | + |
| Create | + | – | – |
| Edit | + | – | + |
| Assign to other users | + | – | + |
| | | | |
| Edit the name | + | + | + |
| Change login | + | + | + |
| Change password | + | + | + |
| Add a tag | + | + | + |
| Edit contact information | + | + | + |
| Change role | + | – | + |
| Change user type | + | + | + |
| Change main organization | – | – | + |
| Change additional organization | – | – | + |
| Add an avatar | + | + | + |
| | | | |
| View | + | + | + |

Table 5.2 – continued f

| Rights/ Role | System Administrator | System Inspector | Clus |
|---|---|---|---|
| Create | + | – | + |
| Edit | + | – | + |

**1**

task at the "in progress" step.

**2**

task at the "in progress" step or draft.

**3**

task at the "completed" or "new" step.

**4**

task at the "in progress" step, step is not closed or draft.