ETAworkforce2

Configuration

for

TOA Technologies, 2014
Part Number E62380-01

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1 Introduction

1.1 Document Purpose

This document is intended as a tool to ensure successful interaction between TOA's ETAdirect and Customer's Application at Salesoforce.com via a the Salesforce-based Package ETAworkforce2.

1.2 Scope of the Document

The document includes the overview of both systems, the description of actions with objects in ETAdirect mapped to objects in the Customer's Application and details of their relation implemented in ETAworkforce2.

While the document provides the overview of the most necessary terms and functions, it may be necessary to consult ETAdirect and/or Salesforce support and documentation for more details.

1.3 Target Audience

The document is intended for developers and administrators working on integration of Salesforce applications with ETAdirect via ETAworkforce2.

1.4 Glossary

Term	Description
Activity	Entity of the ETAdirect system that represents any time consuming work of the resource
Apex	A proprietary Java-like programming language for the Force.com platform
API	Application Programming Interface – a particular set of rules and specifications that software programs follow to communicate and interact with each other
Bucket	A resource type feature, which defines that resources of the type can contain child resources, can be assigned activities but cannot process them
Client	The company using ETAworkforce
Customer	The person on whose order and for whose benefit a resource performs an activity
CSR	Customer Service Representative (CSR) – a person responsible for communications with customers and creation/update of activities in the system
Dispatcher	A person responsible for monitoring of a resource's work and management of the corresponding routes
ETAdirect	Predictive cloud-based enterprise-level on-demand mobile workforce management solution provided by TOA Technologies
ETAworkforce	Salesforce.com application that provides integration solution between Salesforce platform and ETAdirect
ETAworkforce custom object	The Salesforce.com custom object that is created during ETAworkforce configuration process. ETAworkforce custom object includes the fields that are copied from the Salesforce.com objects used by the Client
GUI	Graphical User Interface, allowing people to use software by manipulating images rather than by issuing text commands
Inventory	Equipment that can be installed or deinstalled during an activity
Resource	Element in the resource tree representing a defined company asset
Resource Tree	Hierarchical parent-child structure of resources defined for the company
Route	List of activities assigned to a resource for a specific date, or a list of non-scheduled activities assigned to a resource
Salesforce platform	Salesforce.com's CRM solution that is broken down into several broad categories:

	Sales Cloud, Service Cloud, Data Cloud, Collaboration Cloud (including Chatter) and Custom Cloud (including Force.com)
Trigger	Apex code that executes before or after specific data manipulation
Visualforce	A component-based user interface framework for the Force.com platform. The framework includes a tag-based markup language, similar to HTML
Work Order	The Salesforce.com entity that represents the information about the order received by the Client from the Customer

2 ETAworkforce Overview

ETAworkforce is a Force.com-based Apex package in the Salesforce platform that enables integration between the Salesforce Organization and ETAdirect company for the Client.

ETAworkforce seamlessly connects Salesforce users to a full suite of field workforce and customer appointment management tools, from appointment booking to post job customer surveys and everything in between. And it does it in one cloud-based solution.

- Schedule: Booking a service request, whether at someone's home or place of business, is now easier than booking a flight online.
- Track: Service representatives, retail floor staff, and even customers can track the progress of their appointments in real time, monitoring the status of mobile workers as if they were a dispatcher, answering questions and solving problem calls.
- Connect: Seamlessly integrate ETAworkforce with Salesforce.com creating an end-to-end service solution.

The solution even delivers dynamic, up-to-date information about appointment status to customers by their choice of text, phone, email and Web.

But it does more than update delivery status. It also allows customers to proactively confirm, cancel and reschedule their appointments.

And thanks to a patented, predictive statistical engine that's continuously compiling data on individual workers and tasks, organizations have the information to identify training opportunities and optimize their field workforces.

ETAworkforce also provides additional tools for capacity management, routing and scheduling, reporting and customer experience management.

2.1 Salesforce Overview

The Salesforce platform is a Salesforce.com's CRM solution. For each Salesforce Client one or several Salesforce instances (Organizations) are created. For each Organization a set of rules can be defined including the list of persons and software that can access the Organization and process its data (addressed in Salesforce as Users) and their details including the allowed access levels, different objects and their details.

The Salesforce platform includes Sales Cloud that provides sales representatives with a complete customer profile and account history, allows the user to manage marketing campaign spending and performance and tracks all opportunity-related data including milestones, decision makers, customer communications, and any other information unique to the company's sales process; a real-time sales collaborative tool called Chatter; Service Cloud – a call center-like view that enables companies to create and track cases coming in from every channel, and automatically route and escalate what's important, Force.com platform that allows external developers to create add-on applications using Apex (a proprietary Java-like programming language for the Force.com platform) and Visualforce (an XML-like syntax for building user interfaces in HTML, Ajax or Flex) integrable into the main salesforce.com application and hosted on salesforce.com's infrastructure and AppExchange – a marketplace for cloud computing application built for the salesforce.com community and delivered by partners or by third-party developers, which users can

purchase and add to their salesforce.com environment.

2.1.1 Salesforce Objects and Fields

Salesforce has a number of standard objects, such as Account – an individual account, which is an organization involved with the business (for example, customers, competitors, or partners), Asset – an asset (for example, a product previously sold and installed) owned by an Account or a Contact, Case – a customer issue such as a customer's feedback, problem, or question, etc. It is possible to configure the system with customer objects.

Subject to the User permissions, for each such object values of various fields can be defined, retrieved and updated. For example, for each case the account ID, case number, contact ID, etc. can be defined. Each object can be individually configured by adding user-defined custom fields, e.g. the account's satisfaction level.

2.2 ETAdirect Overview

ETAdirect is a predictive cloud-based enterprise-level on-demand mobile workforce management solution provided by TOA Technologies. For each of TOA Technologies' Clients one or several ETAdirect instances (Companies) are created. For each Company there is a tailored set of rules that comply with the Company's business needs and policies, including the geographical and administrative settings, the list of people and software that can access the Company and process its data (addressed in ETAdirect as Users) and their details including the permitted access levels, available mobile employees and groups of mobile employees (addressed in ETAdirect as Resources) and their details, possible tasks (addressed in ETAdirect as Activities) and their details, sets of restrictions and constrains to be applied to Activities distribution between Resources.

To ensure successful mobile workforce distribution and performance and high customer satisfaction TOA Technologies provides the Clients with a number of dedicated functionalities, such as resource and activity location-based units, automatic task distribution optimization, capacity management, context-aware communications unit for mobile workflow participants, tailored comprehensive reports, messaging capabilities and many other features that complement the activity processing functionality – a set of purposeful tools that enable ETAdirect users to create activities in the system, define and update their details including the resources to perform them, place and time of performance, etc., process their lifecycle (define whether an activity has been started, successfully completed, if it requires some additional work, etc.).

Each registered User of the Company can access and process its data (in accordance with the permissions granted to such User) via ETAdirect's native Mobility and Manage Applications and a set of Application Interfaces. ETAdirect APIs support integration of ETAdirect with the corporate systems of a client company, enabling a wide variety of actions from getting data into ETAdirect to integration into a client's existing mobile application.

2.2.1 ETAdirect Entities and Fields

ETAdirect has a number of standard entities, such as user, resource, activity, inventory, required inventory.

Subject to the User permissions, for each such entity values of various fields can be defined, retrieved and updated. For example, for each activity the address, duration, the customer's name, phone and address, etc. can be defined. Each entity can be individually configured by adding user-defined custom fields, e.g. customer's age and discount details.

2.2.1.1 ETAdirect Users

In the course of ETAdirect implementation for a company, ETAdirect is populated with a set of users. For each user a set of fields is assigned, including: User details (name, login, language etc.) and User status in ETAdirect (active or inactive); Resources (the set of resources the user can manage) and Security Profiles (a set of predefined company-specific security profiles assigned to the user which defines whether access to a certain part of the system, interface or function is permitted for such user).

2.2.1.2 ETAdirect Activity

Activity is an entity of ETAdirect that represents any time-consuming task of the resource. The way activity is processed depends on its type and status. The Activity type defines a set of features – yes/no flags setting the specific characteristics of the particular type processing, e.g. whether activities of the type can be moved to another resource, created in buckets, rescheduled etc. Activity status defines the current state of the activity in the system, e.g. if it has been started, completed, etc.

2.2.1.3 ETAdirect Inventory

Inventory is an entity of ETAdirect representing equipment which can be installed or deinstalled in the course of the activity. The way inventory is processed depends on its type. Inventory type define inventory as serialized or non-serialized, therefore, supporting quantity or not.

2.2.1.4 ETAdirect Required Inventory

Required Inventory is an entity of ETAdirect representing the inventory necessary for an activity to be completed. Required Inventory is defined by its type, model and quantity. Unlike Inventory, Required Inventory has quantity both for serialized and non-serialized inventory.

Required Inventory is always associated with an activity, therefore, its property structure always includes the activity ID.

2.2.2 ETAdirect Activity/Inventory History

As data is processed in ETAdirect, different Events (e.g. Activity status has been set to 'Started') occur in the system. All such changes are sent to the History interface (API). The ETAworkforce service agent reads all changes for a particular activity and all fields required for the transaction and forms data to be sent.

2.3 ETAworkforce

Basically, ETAworkforce is a Force.com-based Apex package in the Salesforce platform that enables integration between Salesforce and ETAdirect for the Client.

ETAworkforce Package contains Salesforce custom objects: Activity Messages, Activity Link Messages, Inventory Messages, Required Inventory Messages, Service Run History. When the Package has been installed, these objects are added to the Client's Salesforce Organization.

Messages can be used to process the related entities in ETAdirect from Salesforce:

Fields of ETAdirect entities are mapped to the fields of the related Message. Each instance of the Message in Salesforce is related to an entity in ETAdirect. For example, when an Activity Message instance is created, deleted or updated in the Salesforce Organization, the details of the transaction are sent to ETAdirect and the Activity is created/deleted/updated in ETAdirect (for the update, values of the mapped fields are updated).

Entities in ETAdirect can be processed directly by the corresponding Messages or by defining the mapping rules between Messages and other custom or standard objects in the Organization.

The same mechanism is used for Inventory and Required inventory ETAdirect entities.

Message fields can be processed from ETAdirect:

When an ETAworkforce service runs, it reads ETAdirect Activity or Inventory History. Afterwards, ETAworkforce service forms a transaction with all required information to be updated on the Salesforce side. The transaction provides the ability to update the fields of the corresponding Message. It is possible to define mapping rules between the Message and other custom or standard object in the Organization, the fields of which will be updated with the message.

2.3.1 ETAworkforce Workflow

1. ETAworkforce is installed and deployed. As soon as deployment is completed, Activity Message, Activity Link Message, Inventory Message, Required Inventory Message and Service Run History custom objects are deployed in the Client's organization.

2. Fields of the Activity Messages, Inventory Messages and Required Inventory Messages are mapped to the fields of Activity, Inventory and Required Inventory in ETAdirect or used to define the settings of commands available in ETAdirect to process an activity.

3. ETAworkforce is configured, along with the general company settings, and update mode field mapping is defined binding the fields of Activity Messages, Inventory Messages and Required Inventory Messages to the fields of other standard or custom Object of the Client's Organization (e.g. Case).

4. When an instance of the Object is created/deleted/updated, the instance of Activity Message, Activity Link Message, Inventory Message or Required Inventory Message is created/deleted/updated in accordance with the mapping rules (if any), when an instance of an Activity Message, Activity Link Message, Inventory Message or Required Inventory Message is processed, the instance of the corresponding Activity, Activity Link, Inventory or Required Inventory is created/deleted/updated in ETAdirect accordingly.

The Activity Message, Activity Link Message, Inventory Message or Required Inventory Message success status is defined subject to success of the entity processing in ETAdirect.

5. When a certain event or condition occurs in ETAdirect, it is logged in the Activity or Inventory History, and ETAworkforce service sends all updates to the Salesforce Organization. The message pattern updates the fields of Activity Message, Activity Link Message, Inventory Message or Required Inventory Message instance, and the fields of the Object of the Client's Organization (e.g. Case) are updated in accordance with the mapping rules (if any).

6. Activity Messages, Activity Link Messages, Inventory Messages and Required Inventory Messages created/updated from Salesforce and Activity Messages, Inventory Messages and Required Inventory Messages received from ETAdirect appear on the Workforce Messages page in ETAworkforce.

Upon each agent run completion, a record is created in the Service Run History containing the data of the agent run progress and result to be used for troubleshooting and further analysis.

3 ETAworkforce Installation, Deployment and Access

3.1 Preconditions

The following conditions are to be provided before ETAworkforce can be installed.

The following has to be coordinated by the Client and TOA support team and defined in the System Requirements documentation:

- The list of ETAdirect activity fields to be managed via ETAworkforce
- The Salesforce Organization objects in addition to Activity Messages, Inventory Messages and Required Inventory Messages that can be managed from ETAdirect (if any)
- The conditions for update of Salesforce fields from ETAdirect
- SSL Encryption possibility between the Salesforce application and ETAdirect server
- Chatter should be enabled at the destination Organization.

The following settings must be performed in ETAdirect:

- Company created in ETAdirect for the Client
- All necessary fields created for the entities in the ETAdirect Company
- The ETAdirect User to process ETAworkforce-related data created in ETAdirect and relevant permissions granted to the User

The following information must be provided to the Client:

- ETAdirect frontend URL
- Company name to be used in ETAdirect
- URL to the ETAworkforce application
- Login and password for the User created in ETAdirect to interact with ETAworkforce

The following has to be provided in the Client's Organization:

- The Client's Organization in the Salesforce platform has to be created
- If the fields of Activity Message, Inventory Message or Required Inventory Message object are to be mapped to some other object of the Salesforce Organization, all necessary fields must be added to the object on the Client's side

3.2 Connectivity Settings

For the successful connection between Salesforce and ETAdirect the following connection settings must be configured:

Name	Flags	Description	Example
Salesforce login URL	mandatory, static	may be the same for all companies, used to retrieve SessionId, operation URL and sandbox flag **Note**: for UAT the following URL can be used: https://test.salesforce.com	https://login.salesforce.com
Salesforce user name	mandatory, rarely changed	Salesforce user authorized to perform connectivity settings (should be unique for all companies)	admin.user@mycompany.com.rd
Salesforce user plain text password	mandatory, rarely changed	used for retrieving Session ID	password
Salesforce user token	mandatory, rarely changed	used for retrieving Session ID	SscBvy12sjd9hVfx0dmxdRDG
ETAdirect instance URL	mandatory, static	ETAdirect frontend URL (can be the same for all companies)	https://etaworkforce.etadirect.com
ETAdirect login name	mandatory, rarely changed	Company name serving as the login for ETAdirect interfaces: Inbound, Capacity, Mobile	LoginName
ETAdirect plain text password	mandatory, rarely changed	password for ETAdirect interfaces: Inbound, Capacity, Mobile	ETAdirectPassword

3.3 ETAworkforce2 Package Installation Instructions

3.3.1 ETAworkforce Package Installation

In order to start ETAworkforce2 installation, log in to Salesforce.com using the login URL provided by TOA Technologies. After the successful login, the package URL is to be used to install ETAworkforce2. The package URL leads to the 'Package Installation Details' page.

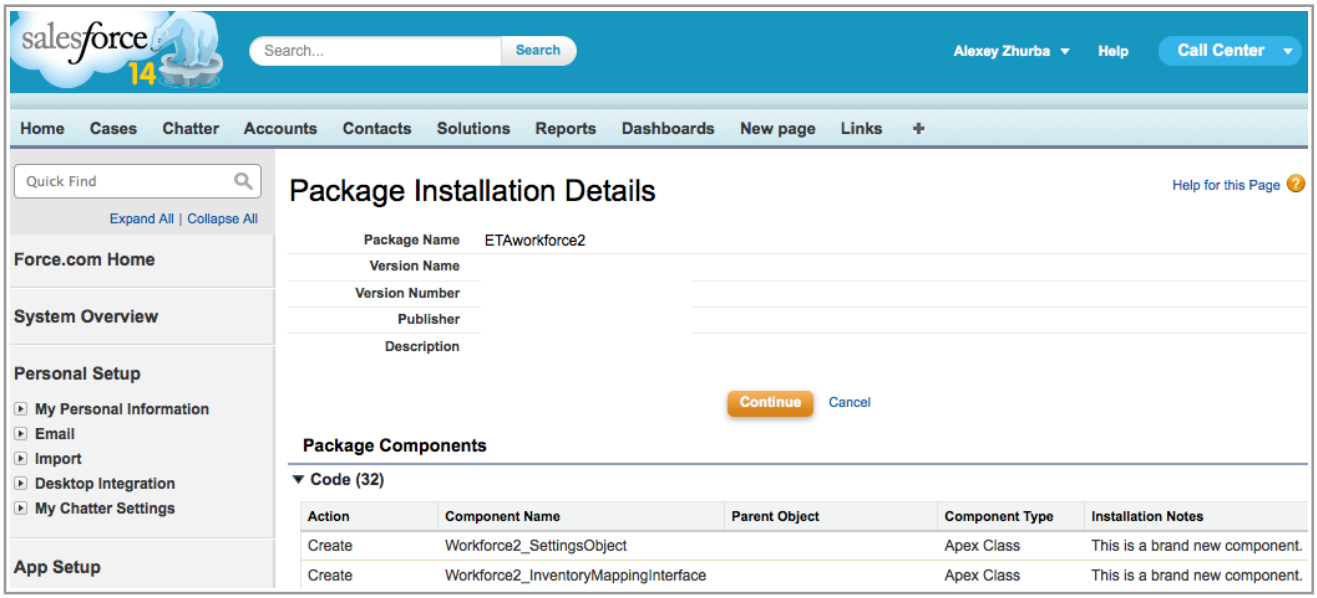


Figure 1: 'Package Installation Details' page

The screen contains the basic information of the package to be installed and the list of its components.

To start the installation click 'Continue'.

The installation of ETAworkforce2 package consists of 3 steps. The 'Continue' button in the 'Package Installation Details' page leads to 'Step 1. Approve Package API Access'.

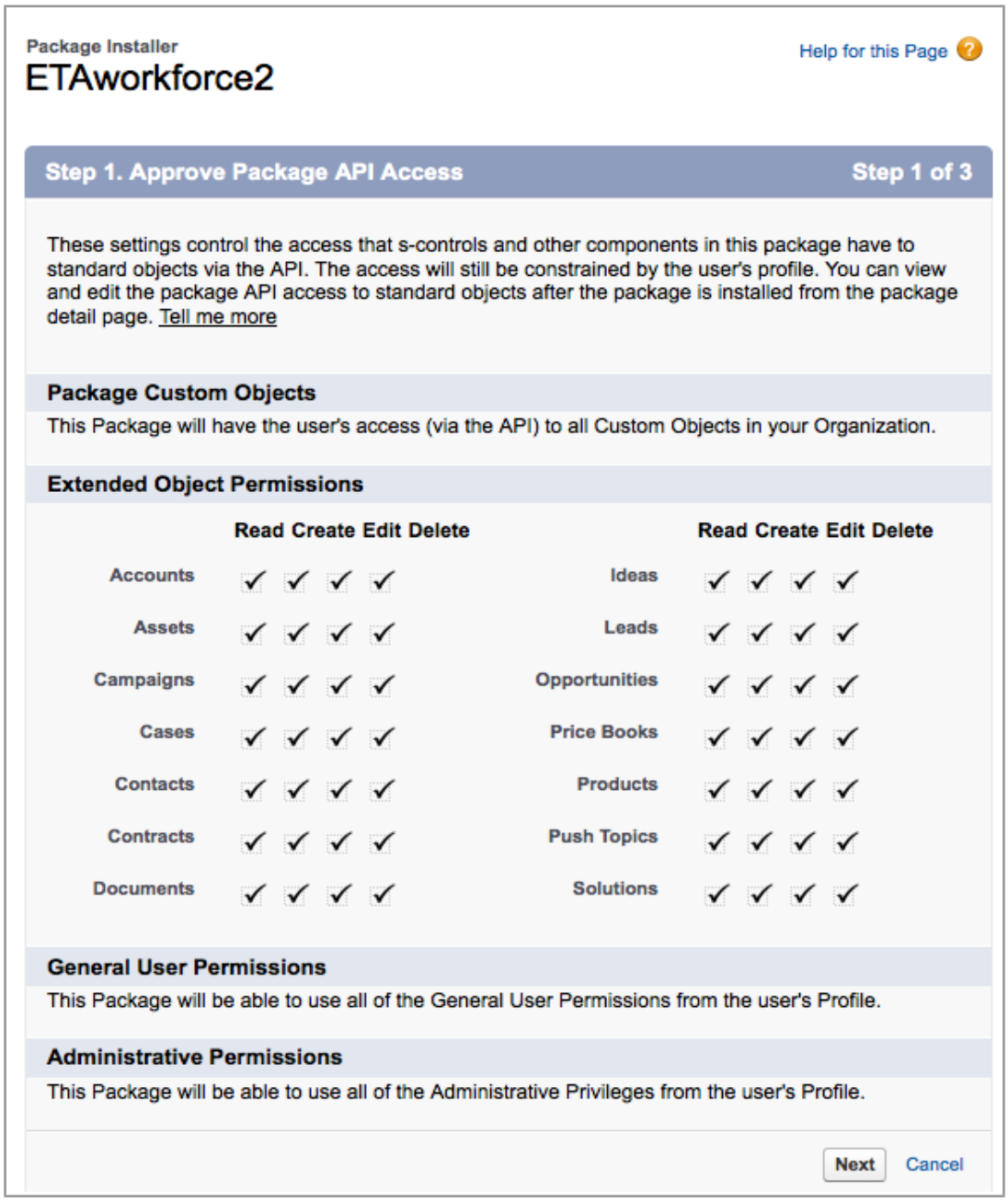


Figure 2: 'Step 1. Approve Package API Access'

This page allows setting the level of access that the package will have to the standard objects via the API. By default, the access is granted to all objects at all levels, that is ETAworkforce is able to read, create, edit and delete data on all objects. The access levels can be modified after the package installation.

Click 'Next' to proceed to 'Step 2. Choose security level'.

Here access to the custom objects can be granted or denied in accordance with the customs user profiles existing in the company.

Note: Standard profiles in the Salesforce cannot receive access to any installed custom objects, and as permissions are not editable for standard profiles, the profile must be cloned to grant access.

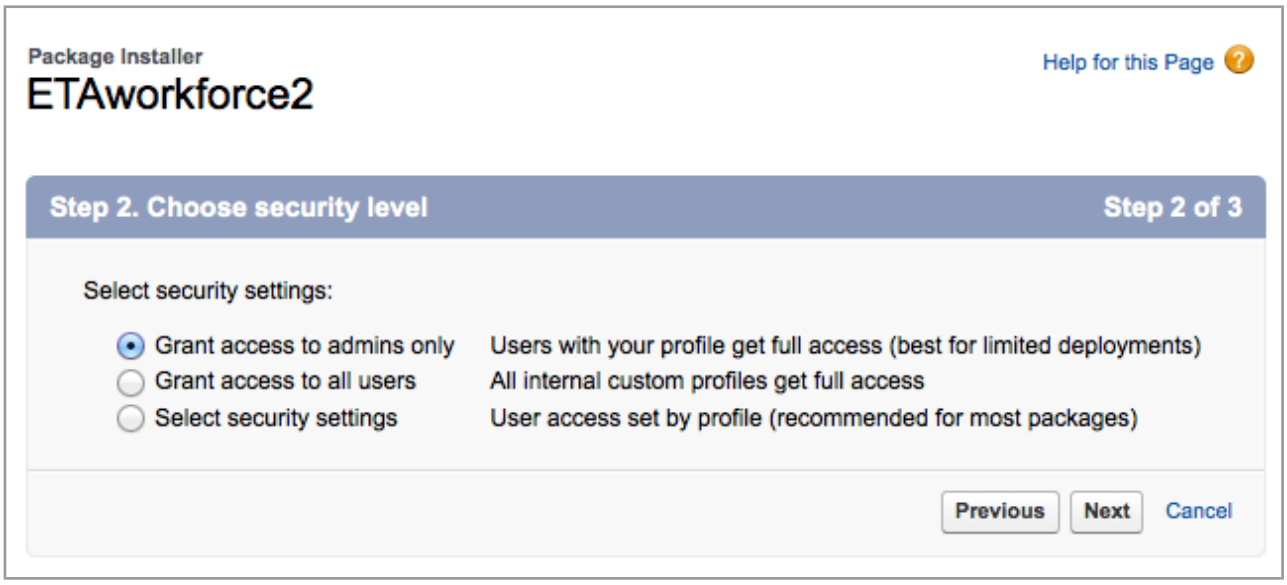


Figure 3: Security options§

There are two possible access levels – 'Full Access' (the user will be able to use ETAworkforce) and 'No Access' (the user will not be able to use ETAworkforce). The security options are as follows:

- Grant access to admins only – all users with the Administrator profile will have full access to the application. All other users will be assigned the 'No Access' level.
- Grant access to all users – all users with all profiles in the system will have full access
- Select security settings – access can be granted or denied to each individual profile. This option provides the most flexible and targeted approach to the security settings.

If the 'Select security settings' option is selected, the 'Customize security' section appears.

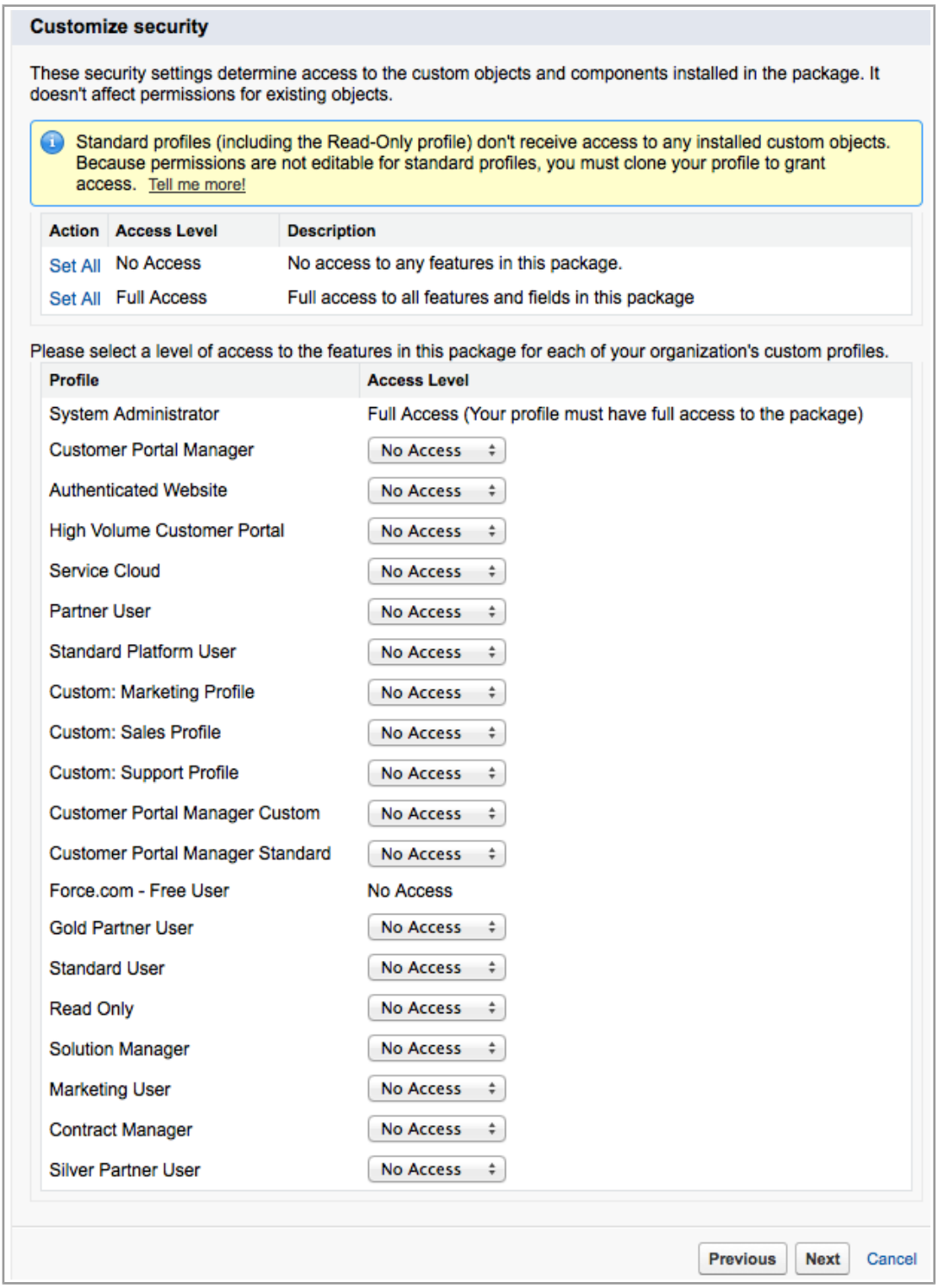


Figure 4: Customized security settings

The 'Customize security' section contains the list of all profiles existing in the company. Full access can be granted to all profiles or access can be denied to all profiles at the same time by using the 'Set All' links. Otherwise, the access level can be selected for each individual profile from the list.

This completes the pre-installation settings of ETAworkforce. Click 'Next' to proceed to 'Step 3. Install package'.

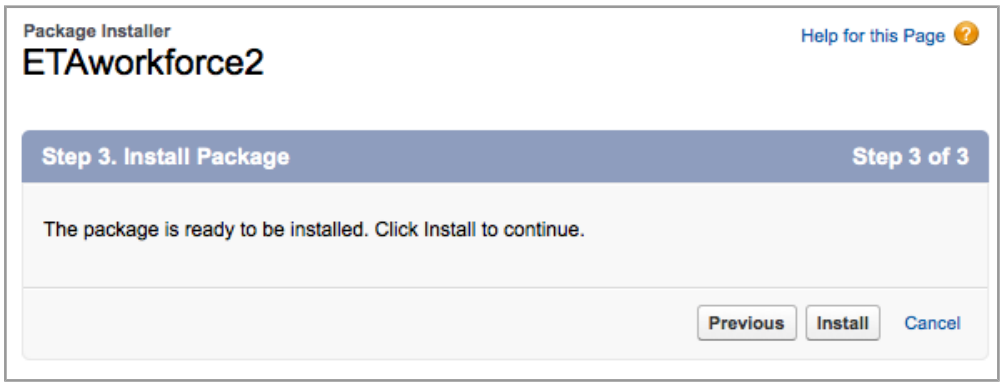


Figure 5: Installation screen of ETAworkforce

Click 'Install' to start the installation. As soon as the installation is finished, 'Install Complete' will be shown on the screen.

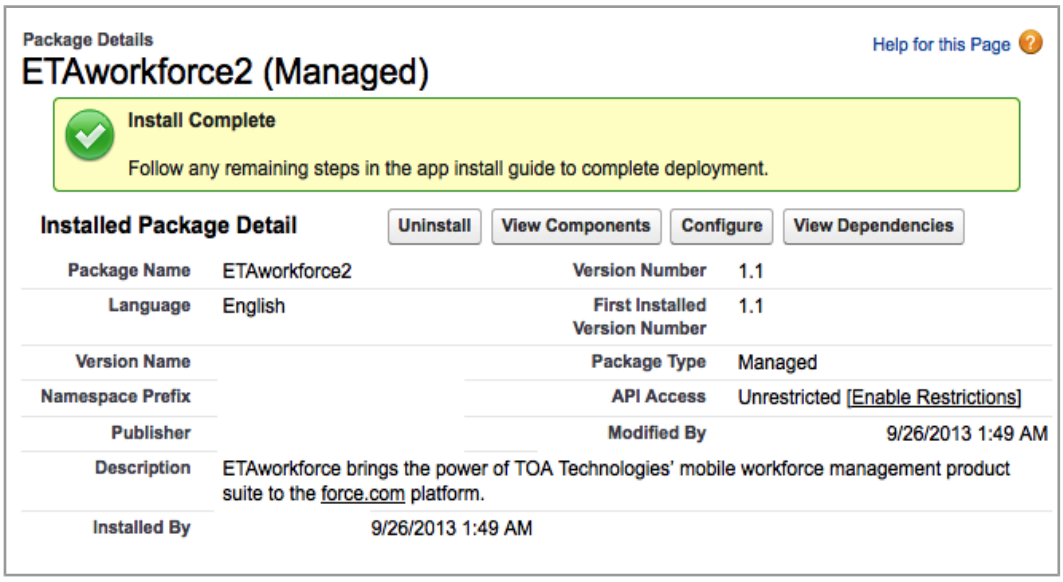


Figure 6: 'Install Complete' screen

In addition, the current user receives an email with the confirmation message.

Figure 7: ETAworkforce installation confirmation

Also, the user receives a chatter message. Both the email and the chatter message contain the link to the Setup Wizard page.

In some cases the installation process takes somewhat longer and instead of the 'Install Complete' screen the user sees a 'Processing your request' message. In this case the application window can be closed and reopened after the email and chatter message on the installation completion are received. After that the user can proceed with preparing the application for use by the Organization.

3.3.2 Classes Compilation

In order to finally adapt the ETAworkforce package to a particular application, its Apex Classes have to be compiled. For that purpose, click the 'Develop' link in the 'App Setup' section and select 'Apex Classes' in the drop-down list.

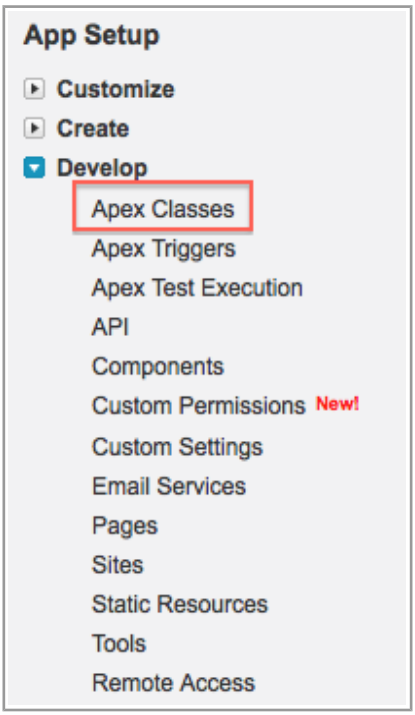


Figure 8: 'Apex Classes' link

The list of all existing Apex Classes will be displayed. To compile the classes, click 'Compile all classes'.

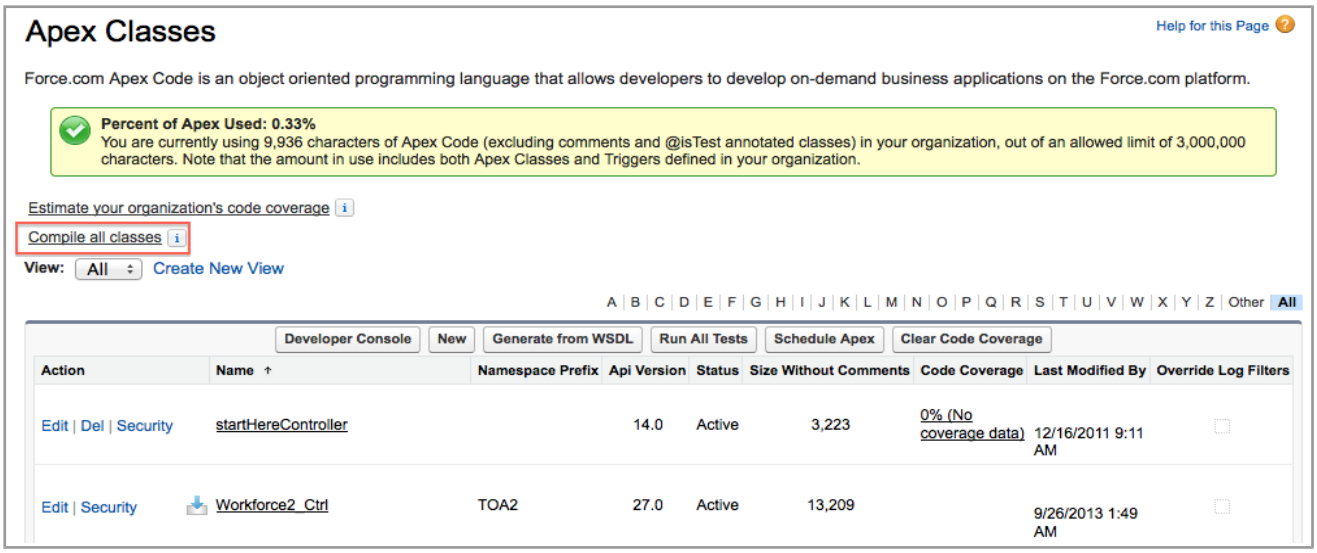


Figure 9: 'Apex Classes' list

3.3.3 Home Page Layout

The 'Home Page Layout' section allows customizing the set of components available on the Home Page and assigning such layouts to certain profiles.

On the Home Page click 'Customize' → 'Home' → 'Home Page Layouts' in the 'App Setup' section.

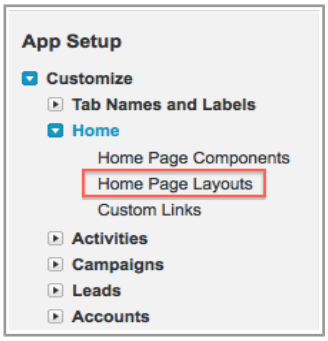


Figure 10: 'Home Page Layouts' link

In the 'Home Layouts Page' click 'Page Layout Assignment'.

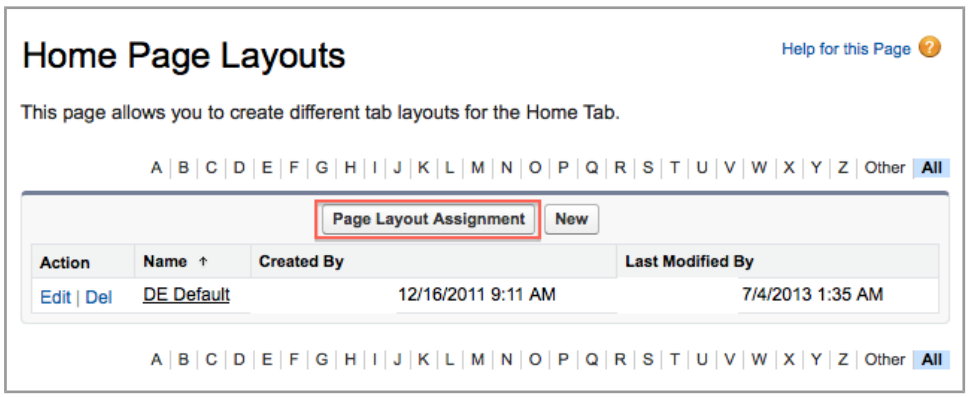


Figure 11: 'Page Layout Assignment' button

You will see the list of all profiles existing in ETAworkforce and the Home Page layouts assigned to them.

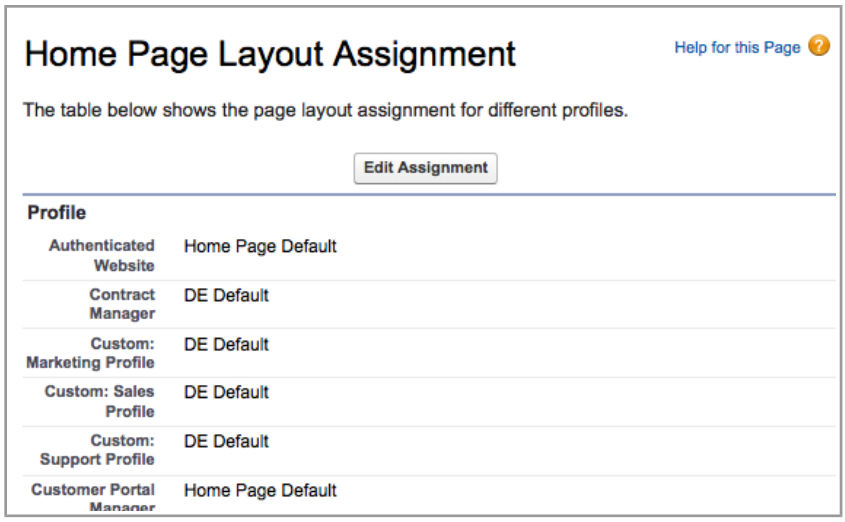


Figure 12: List of profiles and corresponding Home Page layouts

In the list, find the layout name(s) for the user group(s) which will use ETAworkforce2. Return to the previous page, 'Home Page Layouts', and click the 'Edit' links next to the name of the selected Home Page layout.

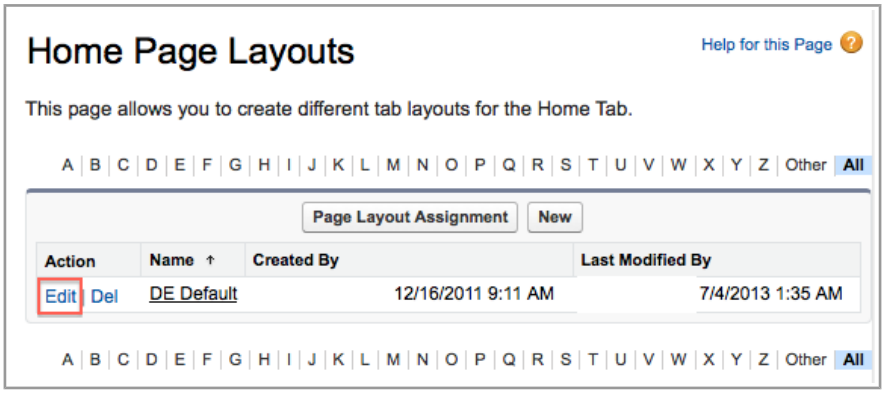


Figure 13: Home Page layout editing

The 'Edit' link leads to the 'Edit Home Layout' page where the components to be included in the home page layout can be selected. Select the 'Workforce2' option and click 'Next'.

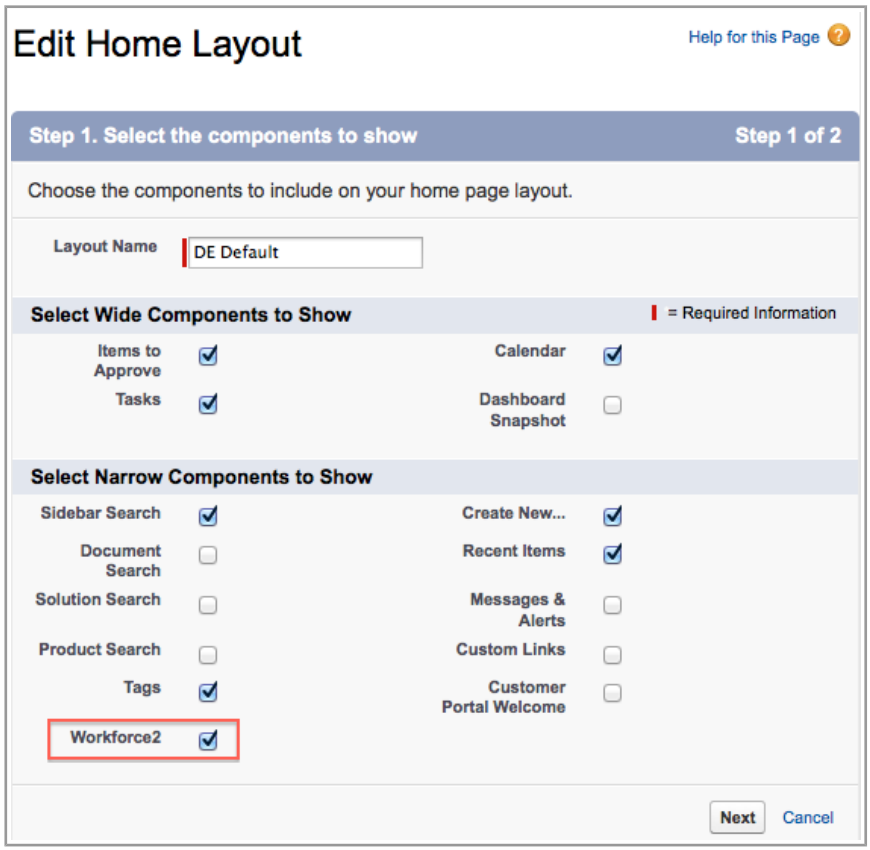


Figure 14: 'Workforce2' option selected as component of Home Page layout

On the next page the components on the home page can be arranged by moving them up or down in the respective columns by the arrow buttons. After the components are arranged to your satisfactions, click 'Save' to finish the setup.

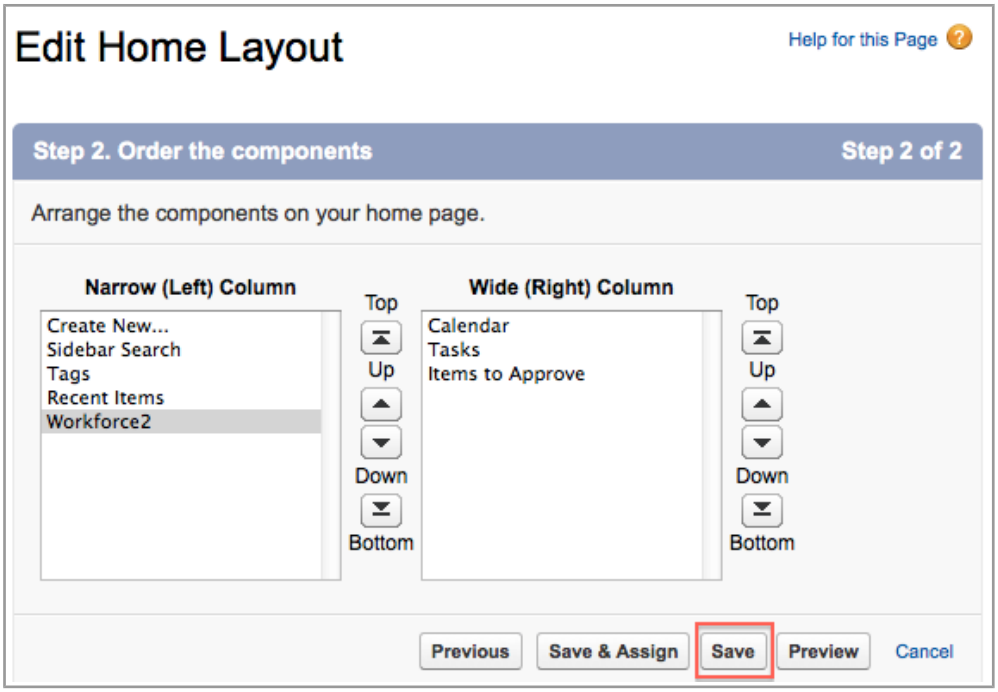


Figure 15: Settings saving

When 'Workforce2' is added to the Narrow (Left) Column, the 'Workforce2' tab appears in the left column of the Salesforce screen.

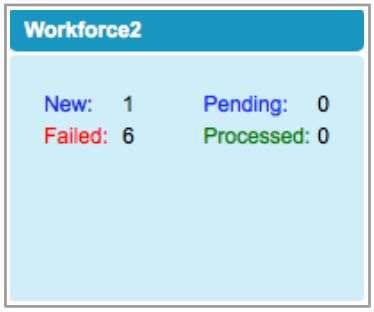


Figure 16: 'Workforce2' tab

This tab shows the number and status of all messages in Workforce2. Clicking any of the statuses opens the 'Messages' screen filtered to display the messages of the selected status.

4 General ETAworkforce Details and Settings

4.1 Activity Message Object Overview

As soon as ETAworkforce has been deployed, the Activity Message custom object is created in the Client's Salesforce Organization. Select 'Organization' → {Salesforce User Name} → 'Setup' → 'Create' → 'Objects' and click the 'Activity Message' link to see and/or modify the object details.

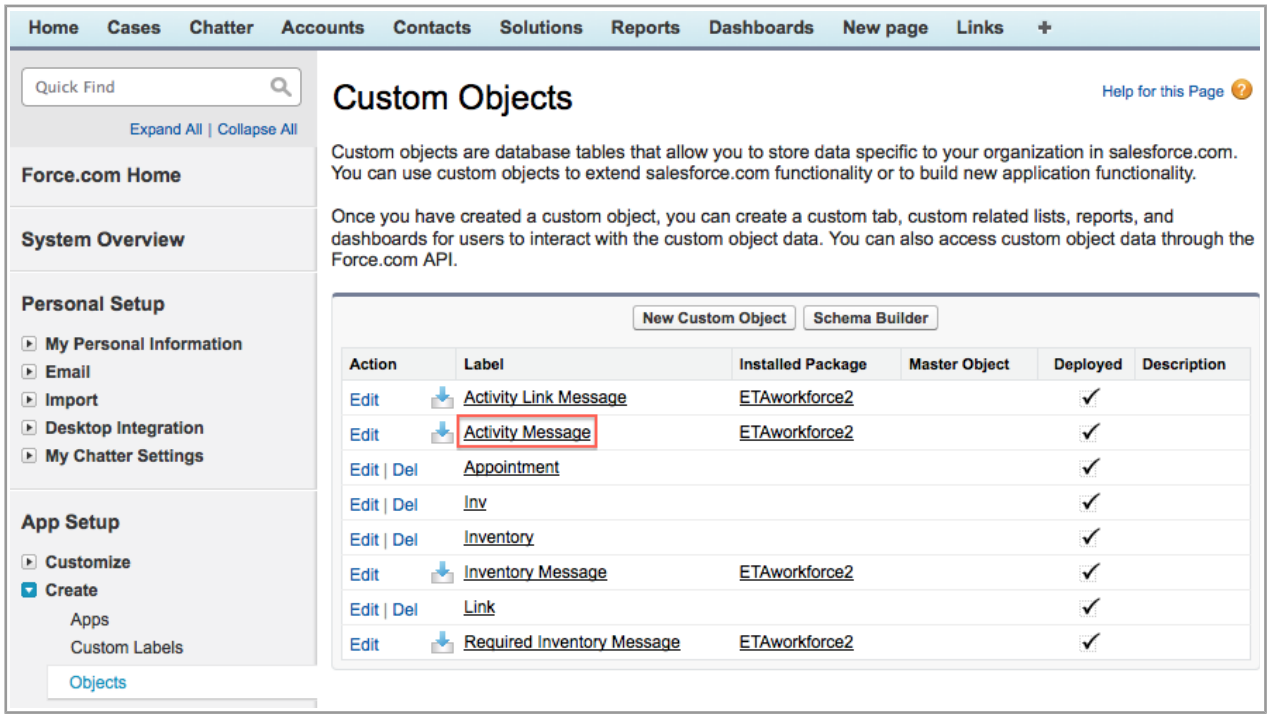


Figure 17: 'Activity Message' custom object

Initially the Object fields define the default flow of the related activity and operation and contain a set of fields mapped to the fields of Activity in ETAdirect in such a manner that when an instance of an Activity Message is processed in Salesforce, the instance of Activity is created/deleted/updated in ETAdirect, respectively, and when a certain event or condition takes place in ETAdirect, the specified fields of the Activity Message are updated.

Clicking the custom object label opens its details screen where certain attributes of the selected custom object can be edited. For ETAworkforce purposes, the relevant settings are contained in the 'Page Layouts' and 'Field Sets' sections allowing to define the message layout and the message fields, respectively.

Page Layouts define the fields displayed in the layout of the Activity Message, Inventory Message or Required Inventory Message. Field Sets contain the fields used in the message list component placed on a linked object page layout.

4.2 Page Layouts

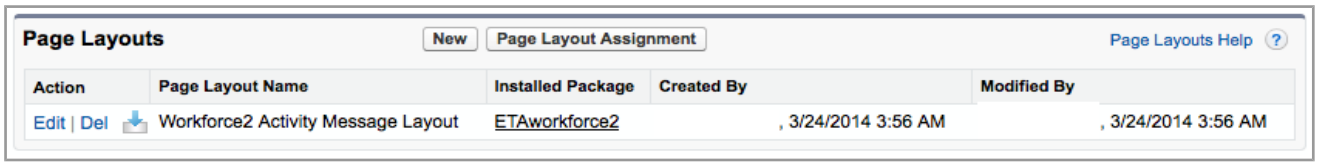


Figure 18: 'Page Layouts' section

Message Page Layout defines the fields available for message editing in the 'Activity (Inventory, Required Inventory) Messages' screen. The 'Page Layouts' section lists all available message page layouts which can be modified or deleted by clicking 'Edit' or 'Del', respectively.

To create a new Page Layout click 'New'. This button opens the 'Create New Page Layout' screen where a new message page layout can be created from scratch or cloned from another layout and modified to the user's preference.

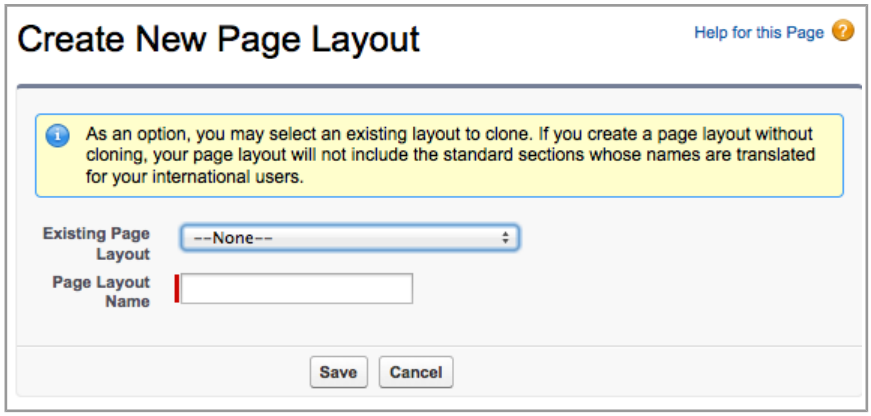


Figure 19: 'Create New Page Layout' screen

To save the Page Layout click 'Save'. This leads to the 'Message Layout' screen where the fields to be used in the current message layout can be selected. The same screen is used to modify the existing message page layouts and is accessible by the 'Edit' link of the page layout.

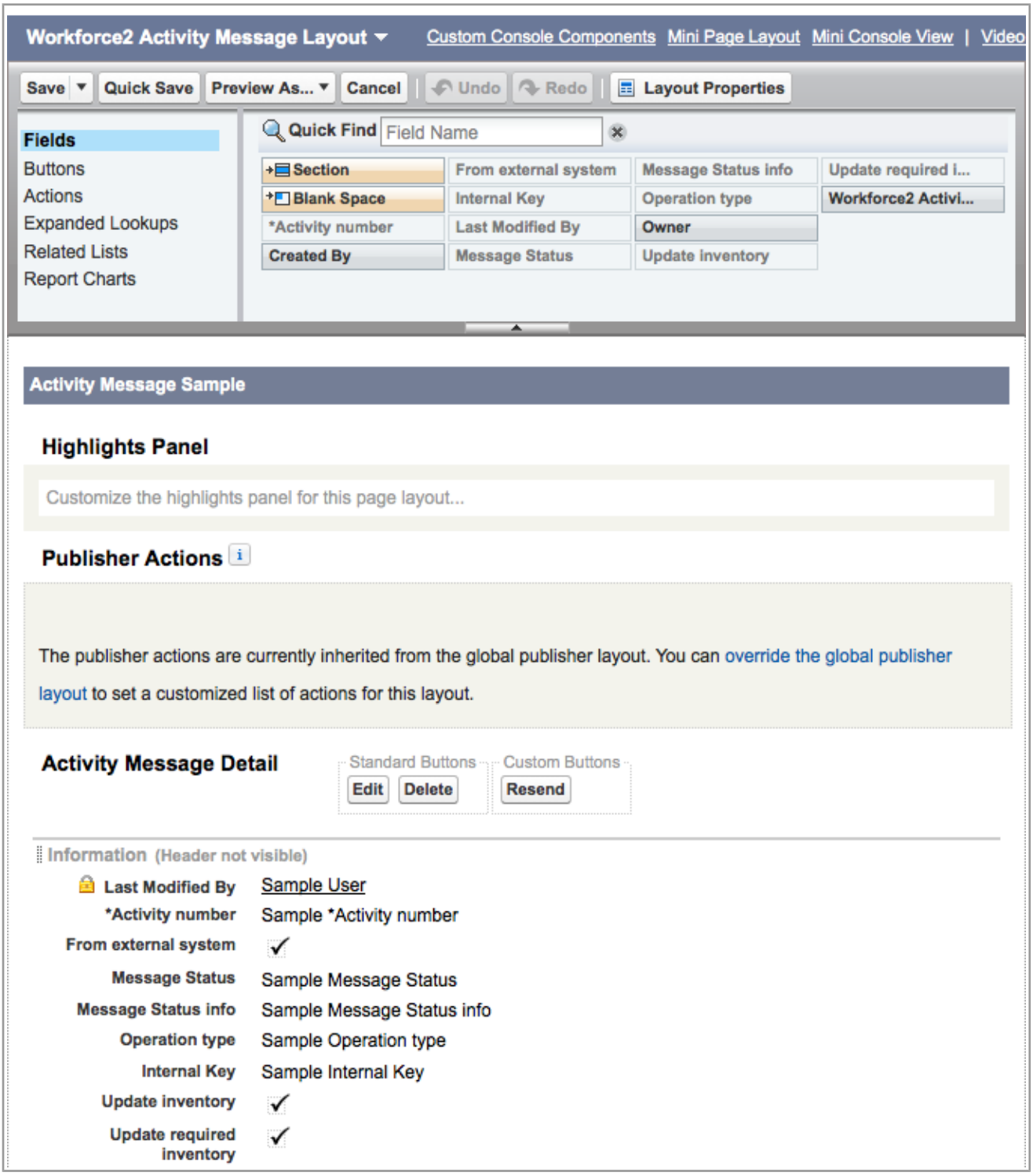


Figure 20: 'Message layout' screen

The 'Message Sample' section contains the current layout of the selected message. The layout can be changed by dragging additional items from the list of available items at the top of the screen into the message sample or by dragging items from the message sample back to the list of available items. The green line defines the position of the newly-added item in the layout.

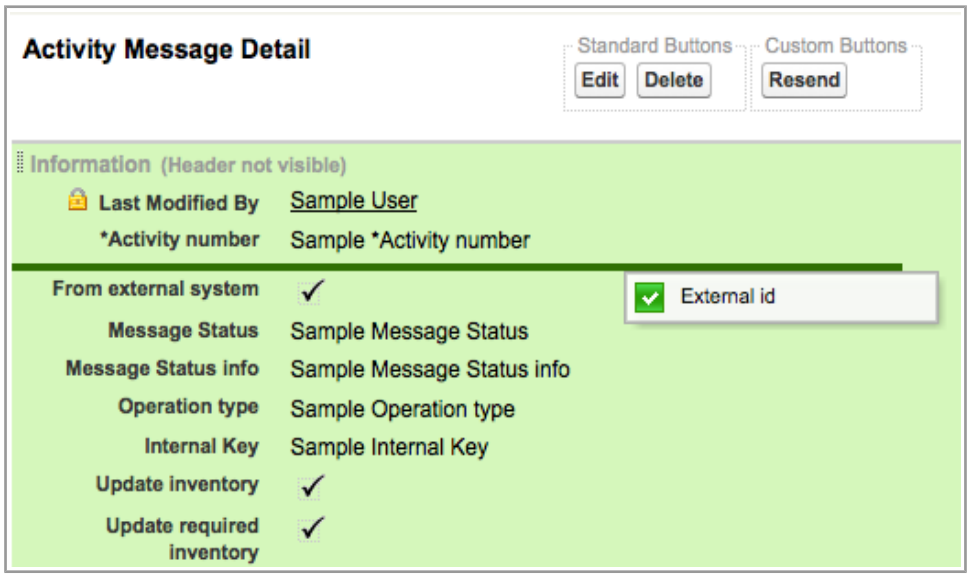


Figure 21: Adding a new item to layout

When the mouse hovers over the sample message fields, they are highlighted with two icons appearing in the field line – 'Remove' ( ) and 'Properties' ( ).

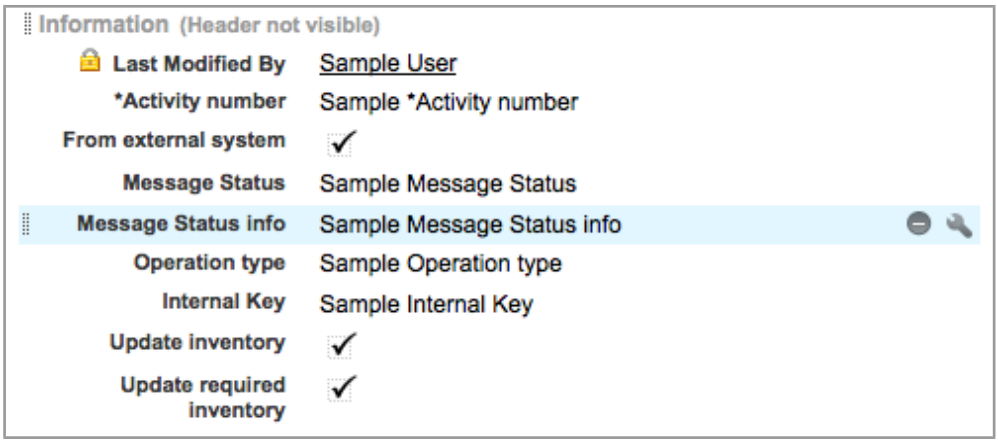


Figure 22: Highlighted field

Clicking the 'Remove' icon removes the field. Clicking the 'Properties' icon opens the 'Field Properties' window where the field can be defined as 'Read-Only' or 'Required'. Double-clicking a field in the list opens the same window.

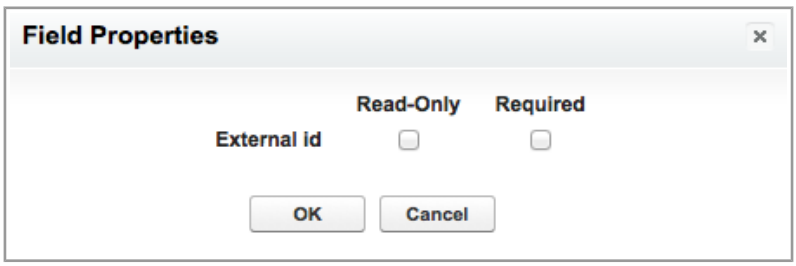


Figure 23: 'Field Properties' window

Read-Only fields are marked with a 'lock' icon.

To save the Message Layout, click 'Save'.

Different Page Layouts can be assigned to different Profiles. To assign page layouts or change the existing assignments click 'Page Layout Assignment' in the 'Page Layout' section. This leads to the screen showing the current page layout assignments.

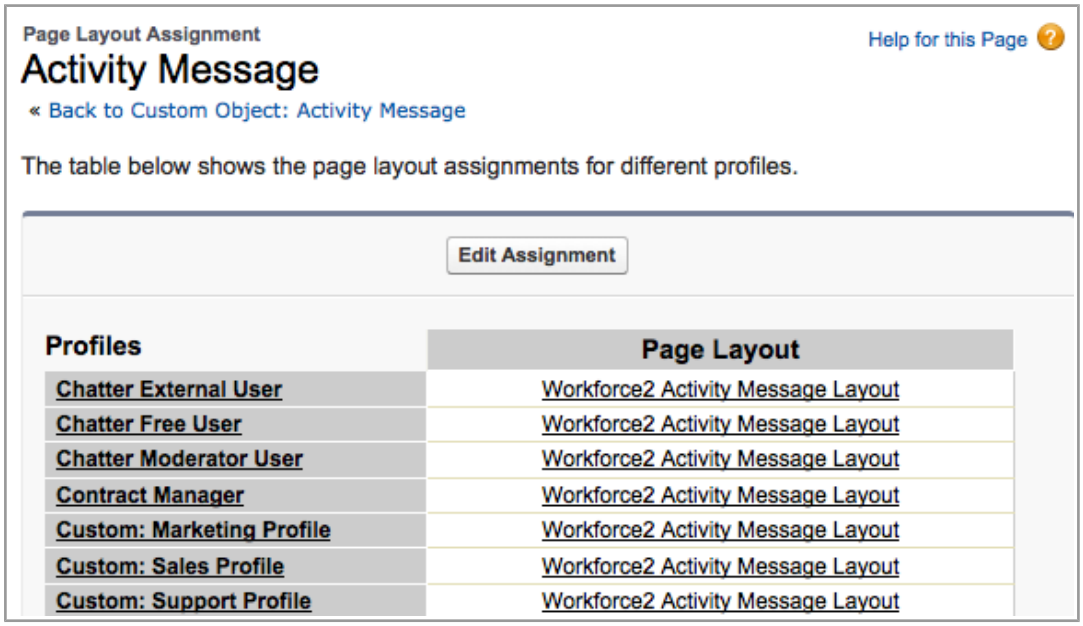


Figure 24: Page layout assignments

To modify page layout assignments click 'Edit assignment' which opens the screen where new page layouts can be selected for the profiles.

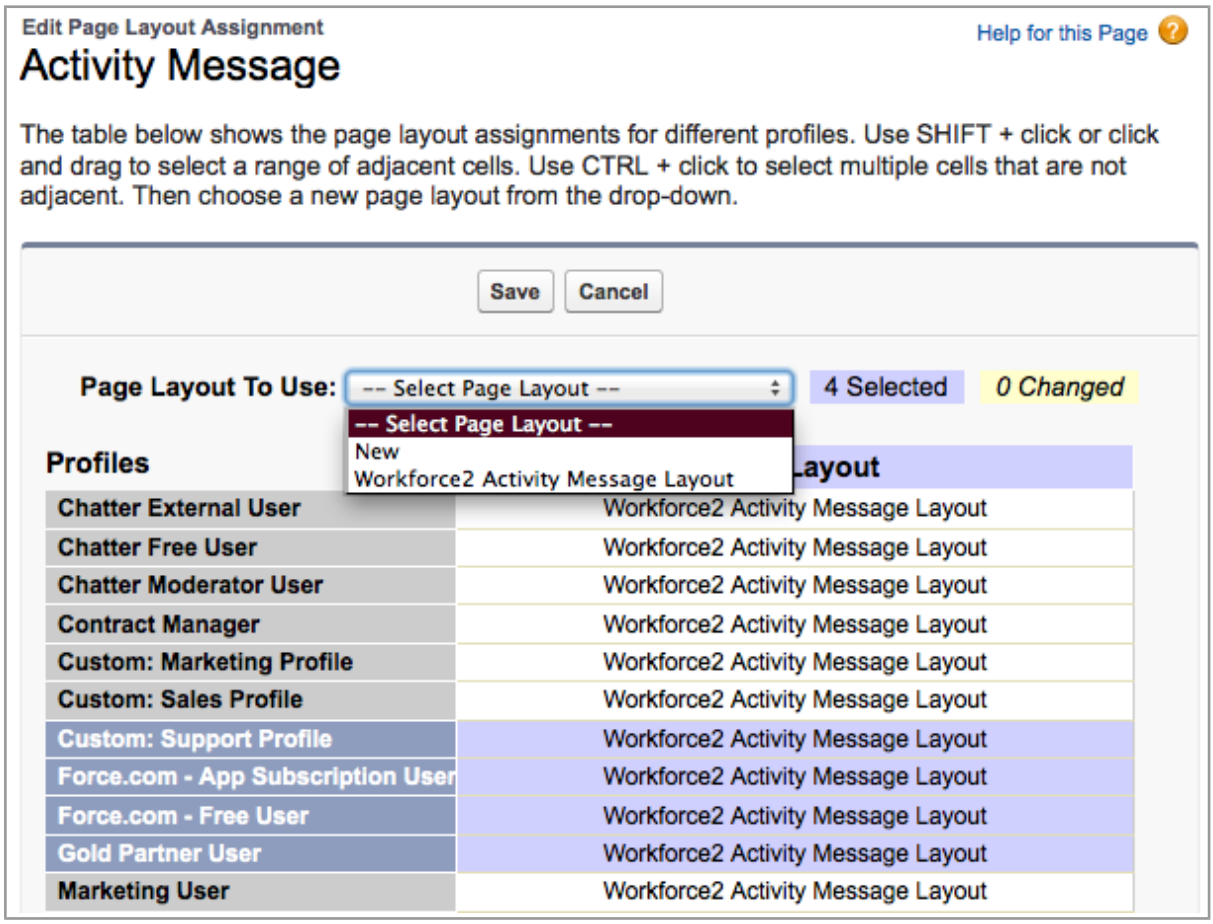


Figure 25: Page layout assignments

One or more profiles can be selected from the list by clicking the profile name. The counter shows the number of selected profiles. Afterwards the same page layout can be assigned to the selected profiles by choosing the page layout from the 'Page Layout To Use' drop-down list. The 'Changed' counter shows the number of profiles for which the page layout has been changed. To save the changes click 'Save'.

4.3 Field Sets

The message component fields are defined in the 'Field Sets' section.

Figure 26: 'Field Sets' section

The Field Set defines the message component fields for the corresponding object. The 'Field Sets' section lists all available field sets which can be modified by clicking 'Edit'.

To create a new Field Set click 'New'. This button opens the 'New Field Set' screen where a new field set can be created.

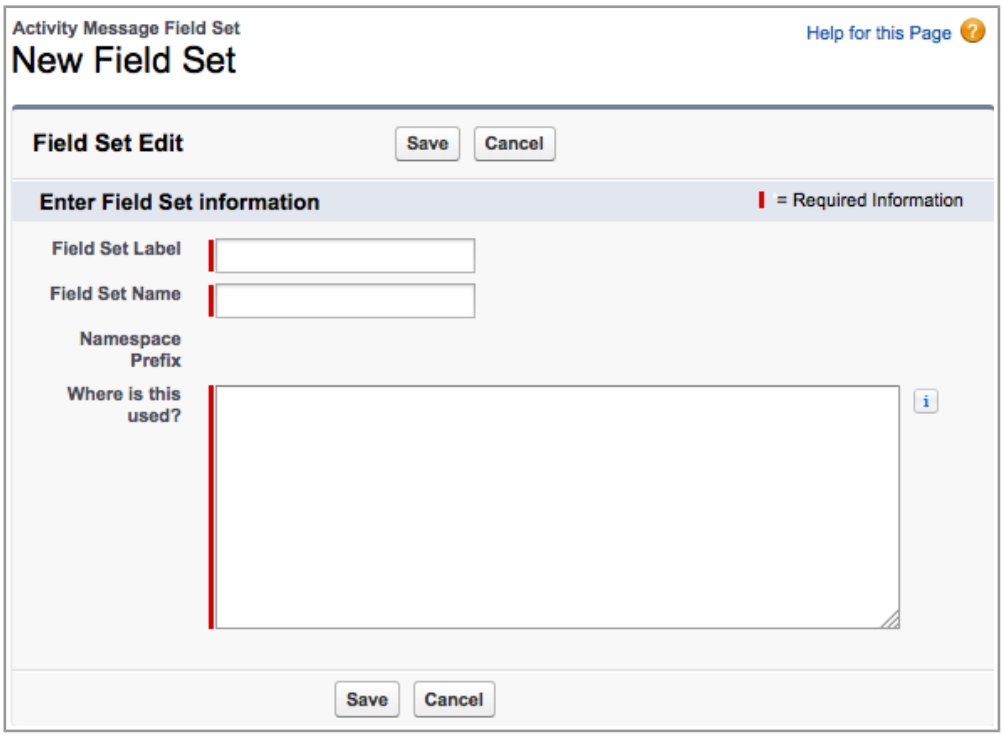


Figure 27: 'New Field Set' screen

To save the Field Set click 'Save'. This leads to the 'Message component fields' screen where the fields to be used in the current field set an be selected. The same screen is used to modify the existing field set and is accessible by the 'Edit' link of the field set.

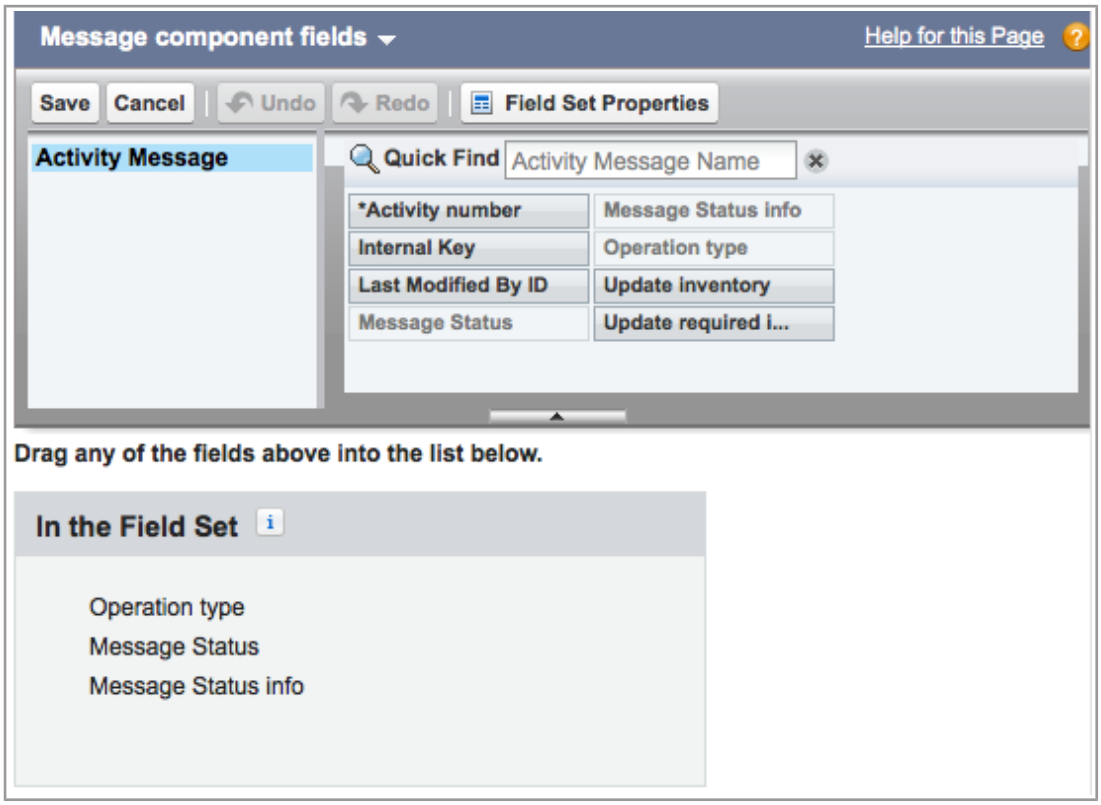


Figure 28: 'Message component fields' screen

The 'In the Field Set' section contains the current set of the message component fields. The set can be changed by dragging additional items from the list of available items at the top of the screen into the 'In the Field Set' section or by dragging items from the field set back to the list of available items. The green line defines the position of the newly-added item in the layout.

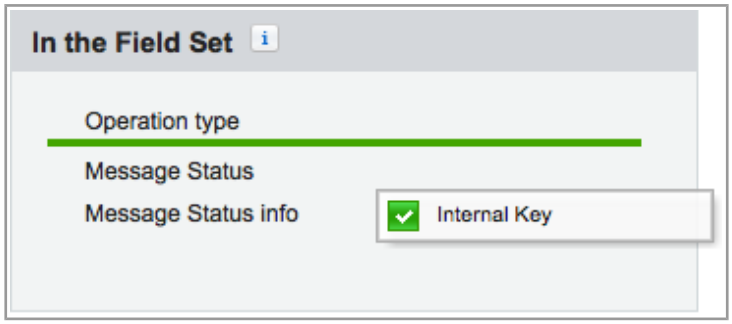


Figure 29: Adding new item to field set

When the mouse hovers over the fields, they are highlighted with two icons appearing in the field line – 'Remove' ( ) and 'Properties' ( ).

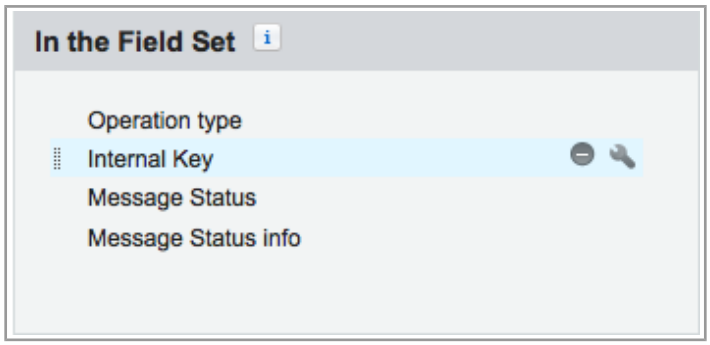


Figure 30: Highlighted field

Clicking the 'Remove' icon removes the field. Clicking the 'Properties' icon opens the 'Field Set Item Properties' window where the field can be defined as 'Required'. Double-clicking a field of the 'In the Field Set' list opens the same window.

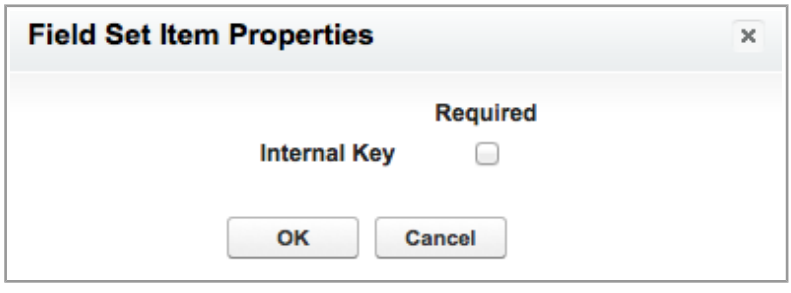


Figure 31: 'Field Set Item Properties' window

Required fields are marked with red asterisks.

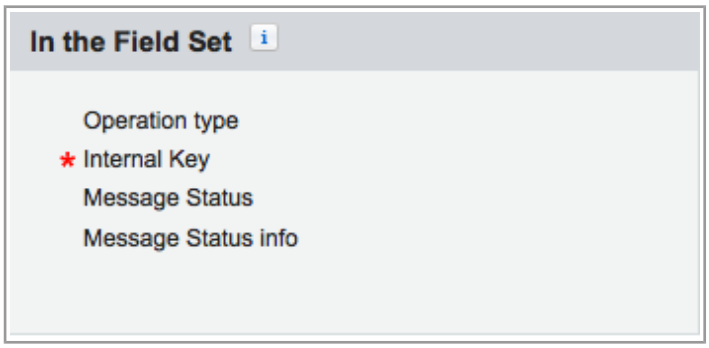


Figure 32: Required field

To save the Field Set, click 'Save'.

The 'Inventory Message' and 'Required Inventory Message' custom objects are created and managed in a similar manner.

5 ETAworkforce Settings

5.1 Fields Mapping

The fields of ETAworkforce objects need to be mapped to fields of ETAdirect entities. The basic mandatory fields of Activity and Inventory can be mapped to fields of ETAworkforce object with the help of the Workforce2 Wizard.

5.2 Fields Mapping Wizard

In order to simplify ETAworkforce object fields mapping, the application offers a wizard leading the user through the mapping process step by step. The Wizard can be found on the 'All Tabs' screen.

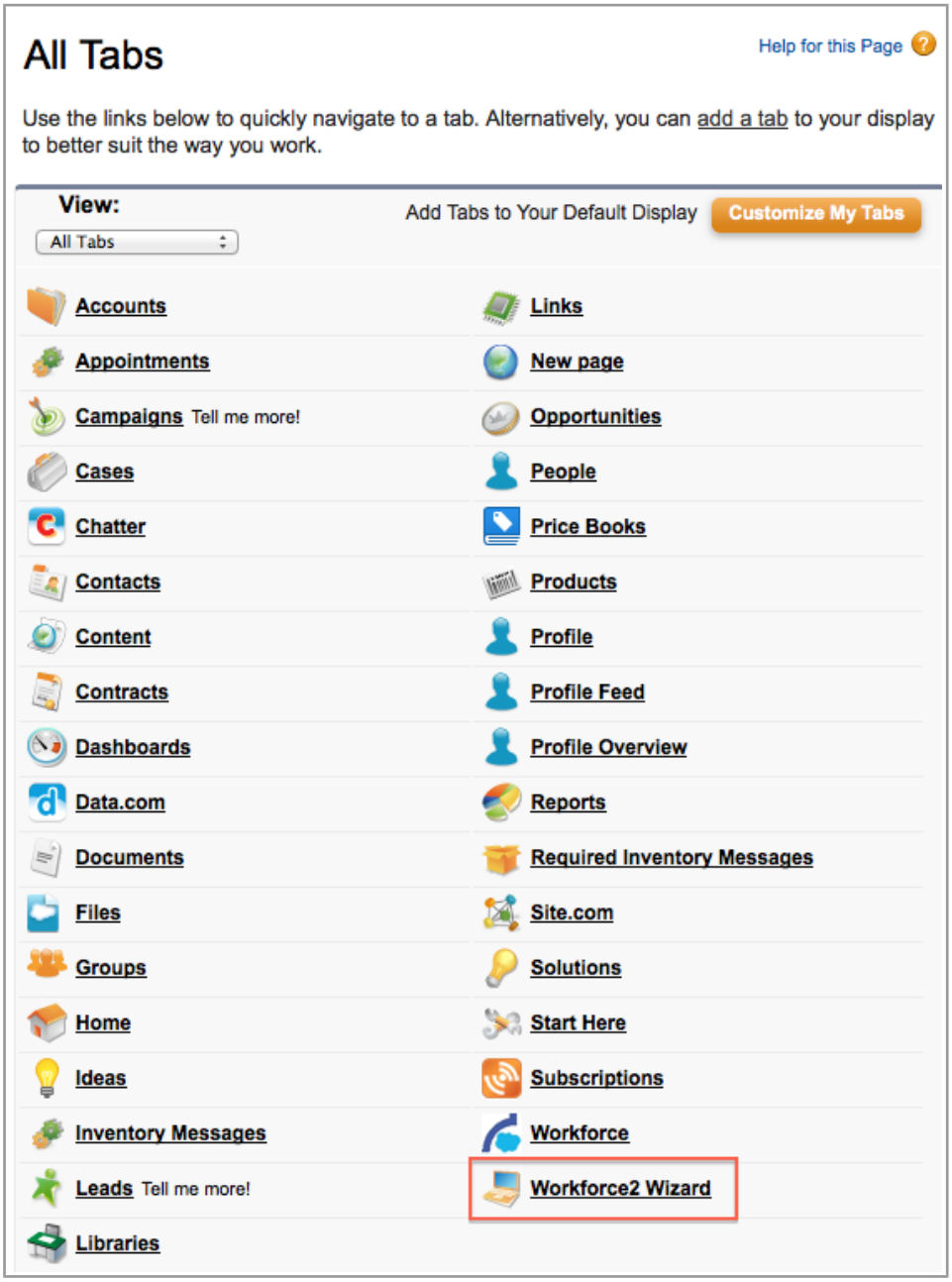


Figure 33: 'Workforce2 Wizard' link

The Wizard guides the user through three steps of fields mapping. Otherwise, the Wizard can be skipped to proceed to the 'Settings' page immediately. To do so, click 'Skip' in the Wizard window.

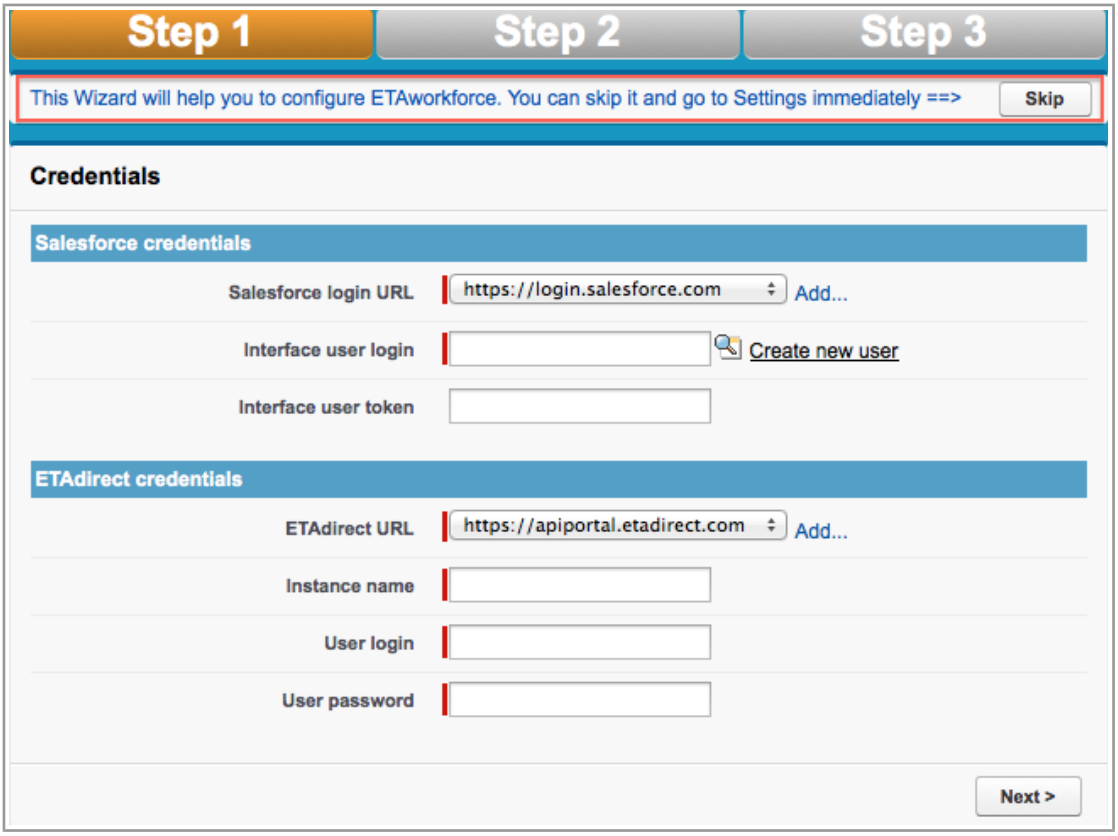


Figure 34: Wizard window with 'Skip' button

To configure ETAworkforce with the help of the Wizard, enter your credentials in Step 1 to verify your authorization to use Salesforce and ETAdirect. The mandatory fields are marked with red lines. Please refer to Connectivity Settings section for the description of the user's credentials.

Note: Step 1 of the Wizard uses the credentials of the Interface User, i.e. the user handling the objects during interaction between Salesforce and ETAdirect. When no such user exists, click 'Create new user' and use the credentials received in the e-mail.

Note: when creating the Interface User, make sure that the Interface User has English (United States) locale and that their 'API Enabled' profile permission is turned on.

After entering the credentials click 'Next' and enter the Salesforce user's password in the new popup window. This must be the password of the Interface User entered in the 'Interface user login' field.

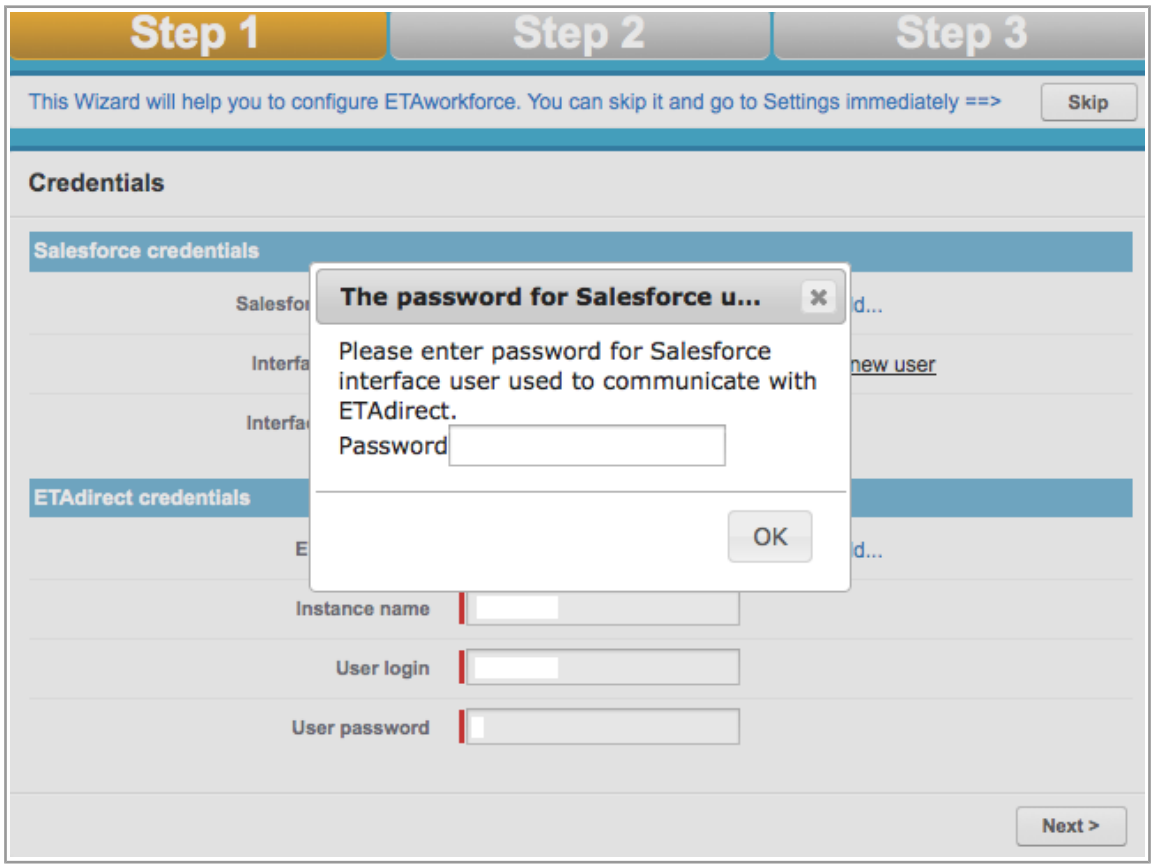


Figure 35: Password window

If the authentication is successful, the Wizard proceeds to Step 2 where Activity fields can be mapped to the fields of the selected ETAworkforce object.

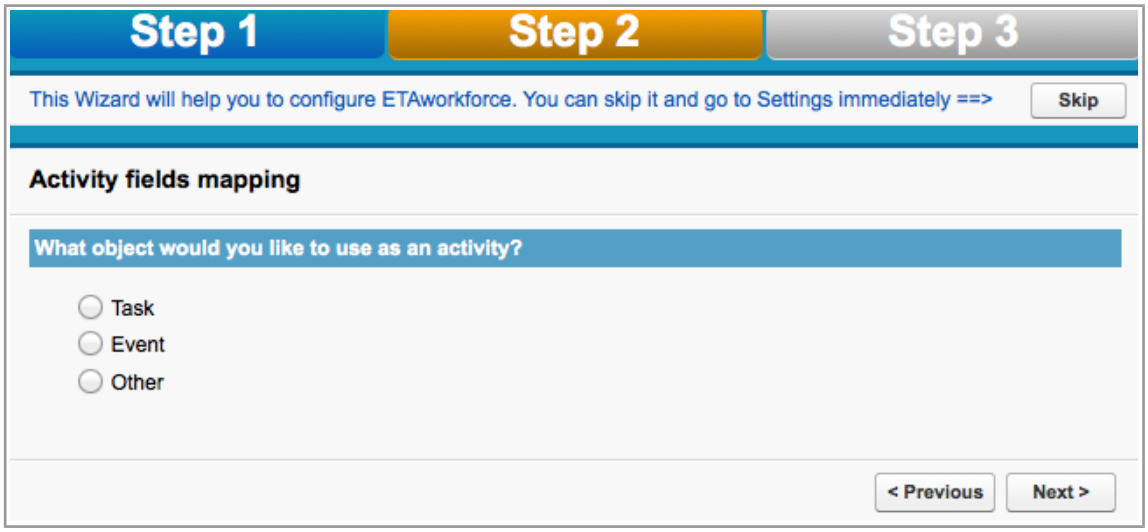


Figure 36: 'Activity fields mapping' screen

Select the object to be used as the activity in ETAworkforce. Activity fields in ETAdirect will be filled with values of the fields of the selected ETAworkforce object, and vice versa.

Three options are available: Task, Event and Other.

If Task is selected, activity fields of ETAdirect will be mapped to the fields of Task object in ETAworkforce.

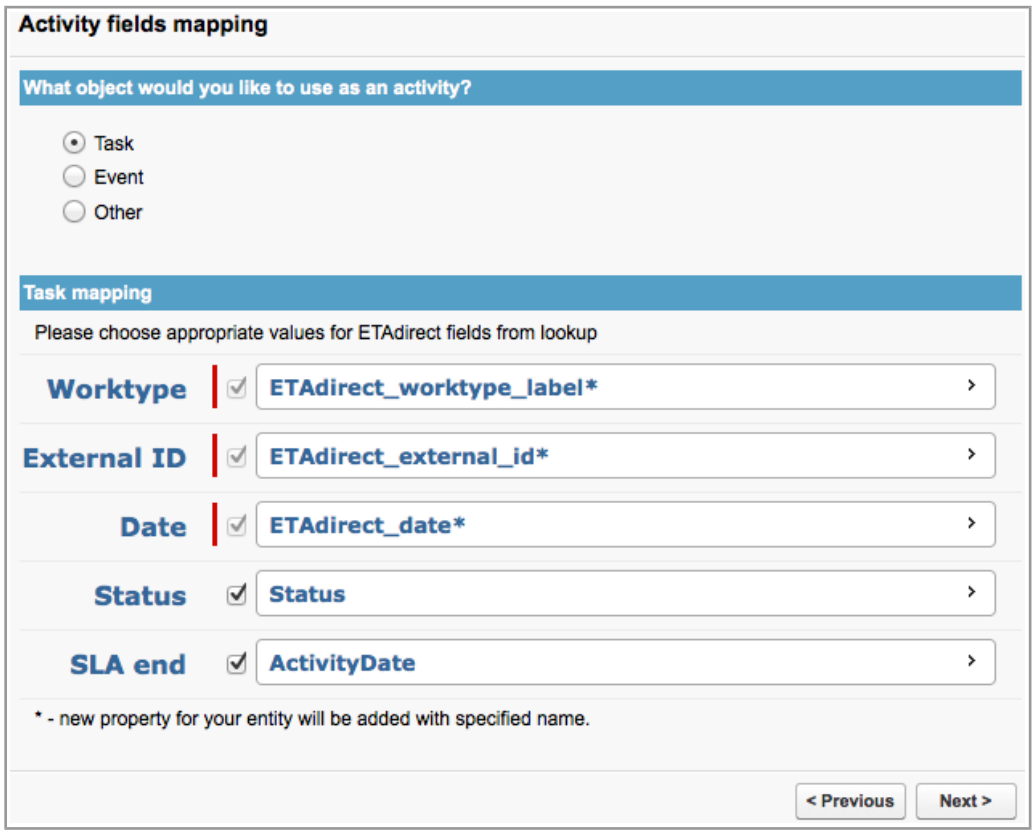


Figure 37: Activity fields mapping to Task fields

The Wizard allows mapping the mandatory Activity fields required for Activity creation in ETAdirect ('Worktype', 'External ID' and 'Date'). Mandatory fields are marked with red lines. In addition, the 'Status' and 'SLA end' fields can be mapped from Task fields. The Wizard suggests the Task fields which correspond to the Activity fields and the form is immediately filled-in. If you accept the mapping suggested by the Wizard, click 'Next' to proceed to the next screen.

However, you can make a different choice of fields to be mapped to the Activity fields. Hover the mouse over an ETAworkforce field, to see the list of all Task fields where other fields can be selected.

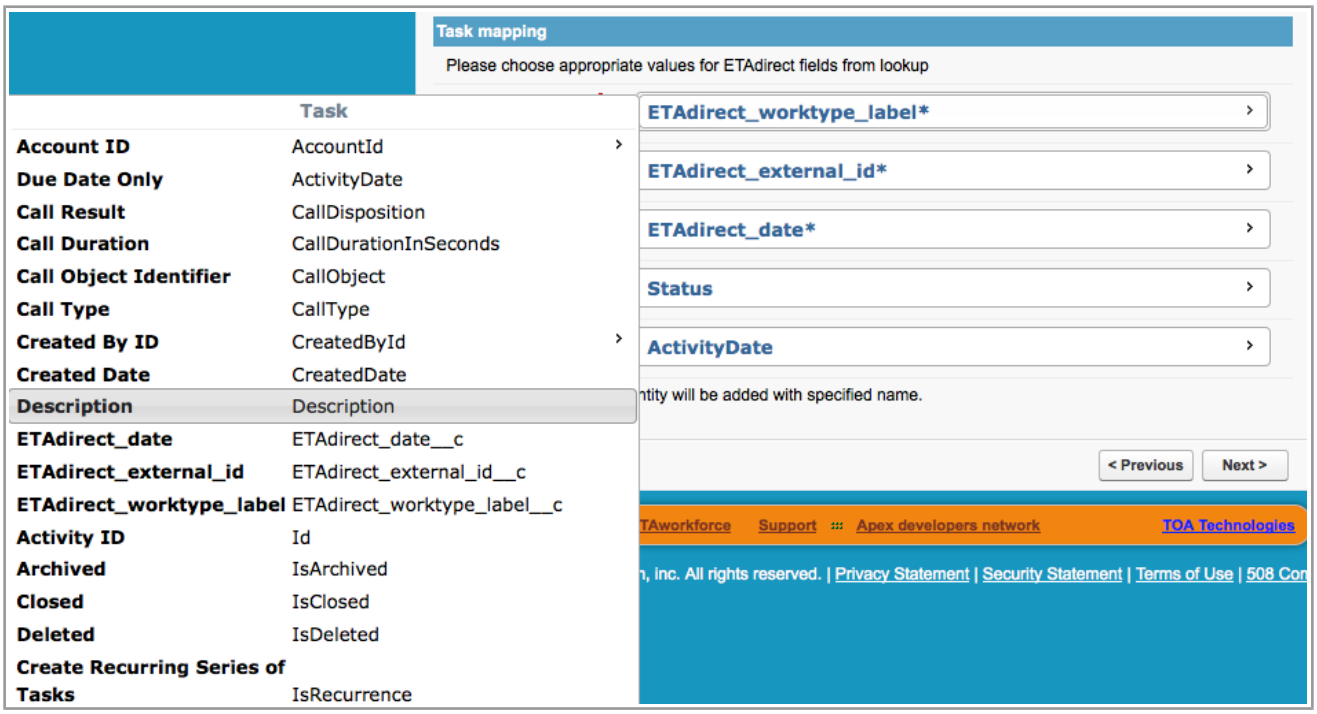


Figure 38: Task fields list

If Event is selected as the object for mapping, the mandatory Activity fields remain the same, but, additionally, the 'Duration', 'SLA Start' and 'SLA End' fields will be mapped as well.

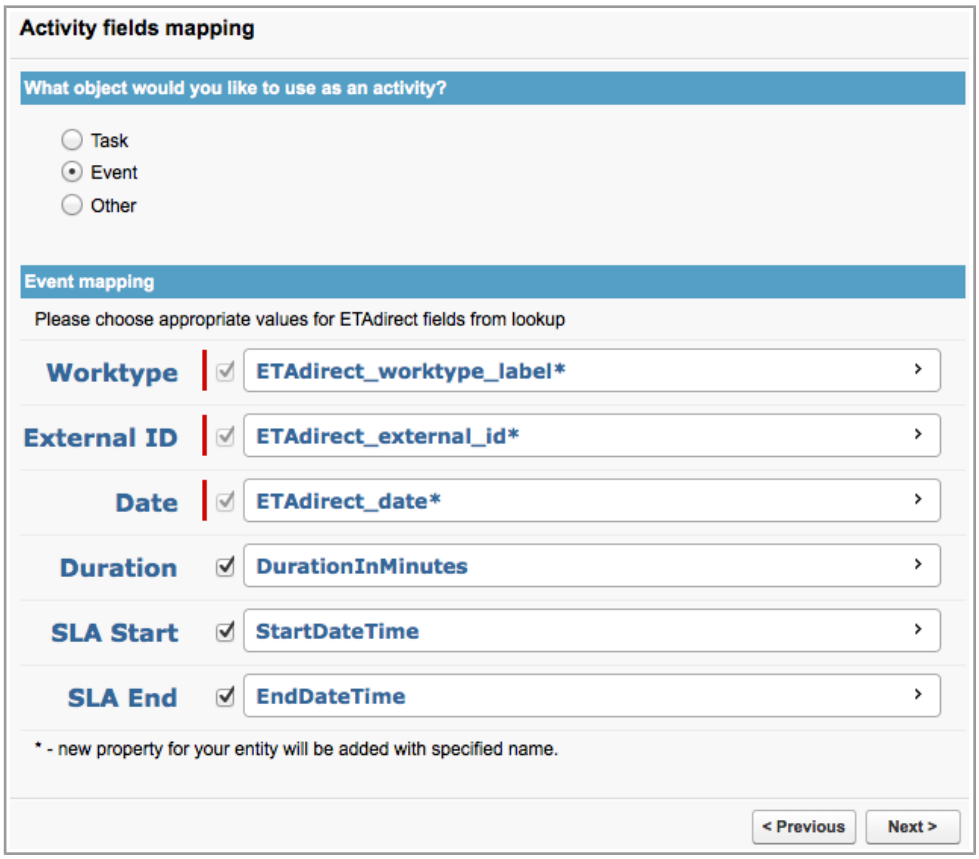


Figure 39: Activity fields mapping to Event fields

You may select a different Salesforce object for Activity fields mapping. When the Other option is selected, you will be prompted to choose the Salesforce object from the drop-down list.

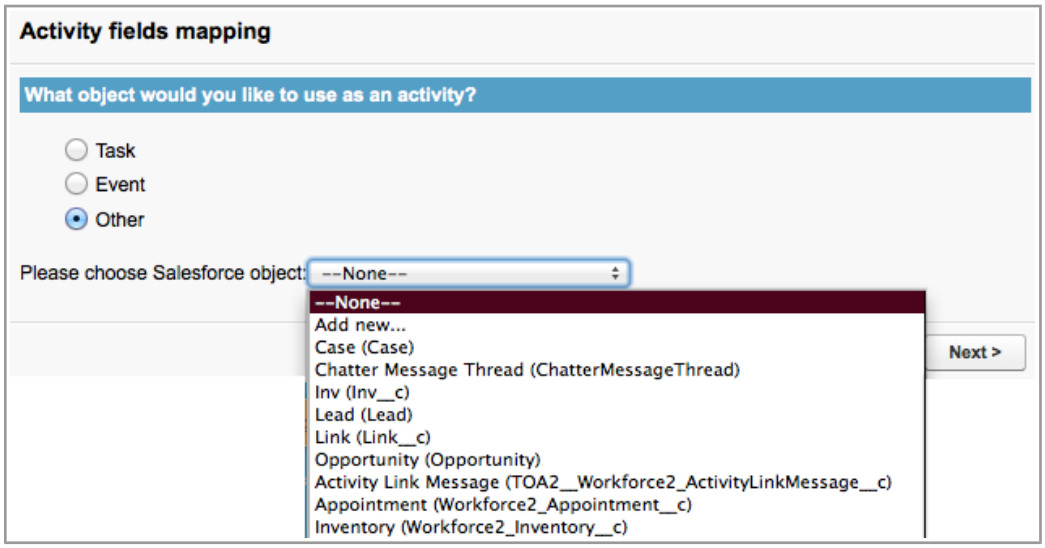


Figure 40: Other objects to be selected for mapping

As soon as the object is selected, the 'Custom mapping' section containing mandatory Activity fields is shown. The list also contains the 'Add new' option allowing to create a new Salesforce object the fields of which will be mapped to Activity fields. Enter the name of the object to be created.

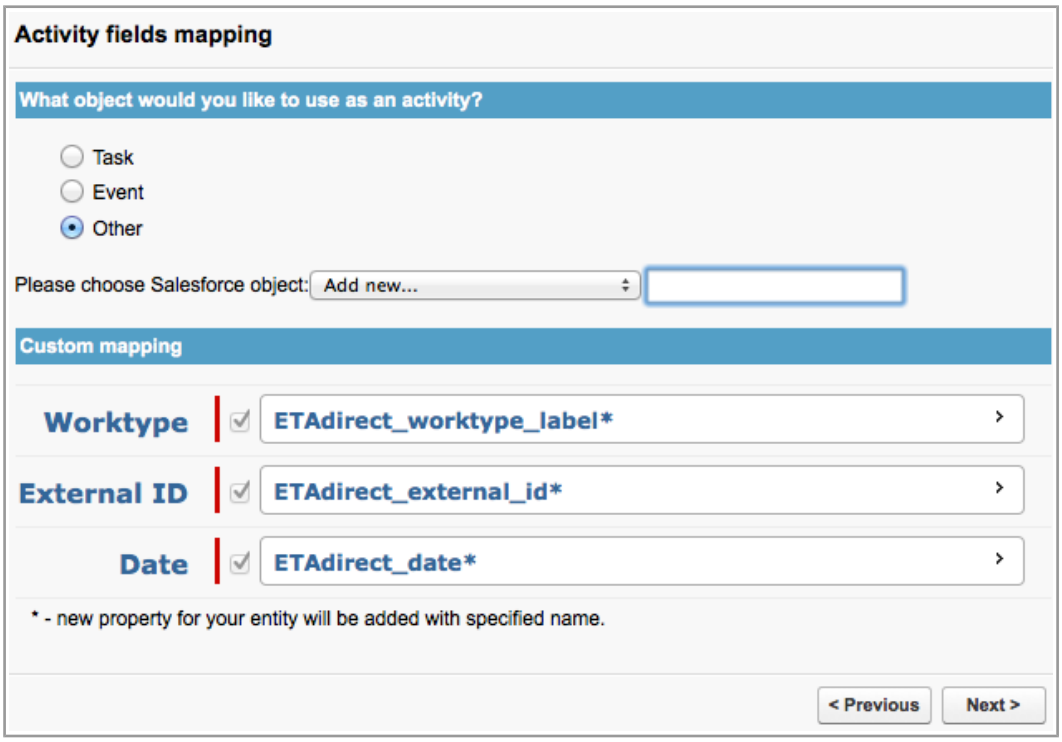


Figure 41: Custom mapping

When Activity fields mapping is completed, click 'Next' to proceed to Step 3, 'Inventory fields mapping'. Also, you can move to a different Wizard step by clicking the Step tab.

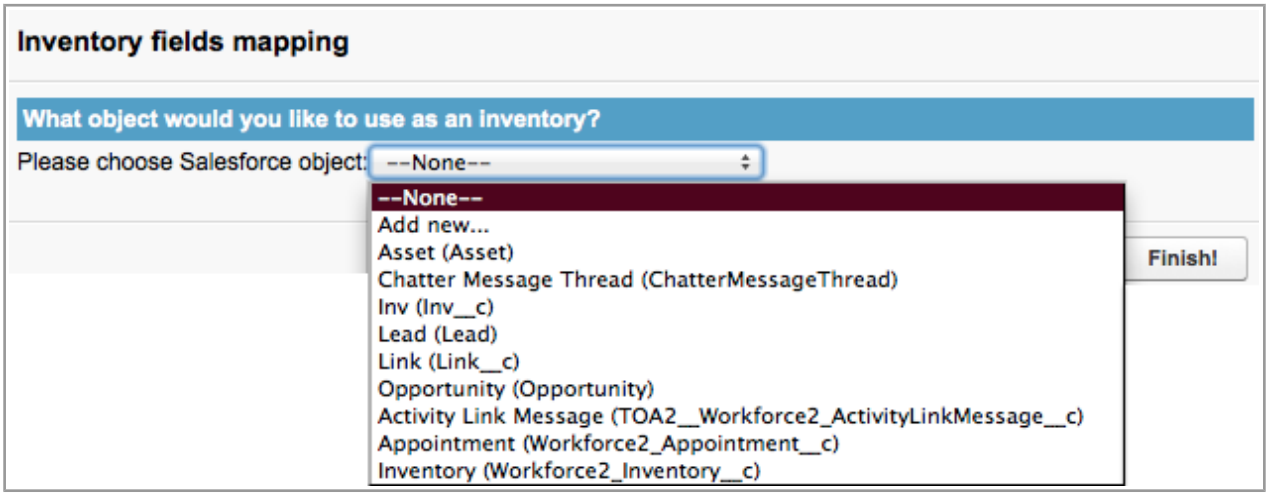


Figure 42: 'Inventory fields mapping' screen

Select the object for mapping to Inventory in ETAdirect from a drop-down list of Salesforce objects. As soon as the object is selected, the 'Custom mapping' section containing mandatory Inventory fields ('Type' and 'Quantity') is shown. The corresponding fields of the selected Salesforce objects are already filled-in, but you can make a different selection from the list appearing when the mouse is hovered over the object field name.

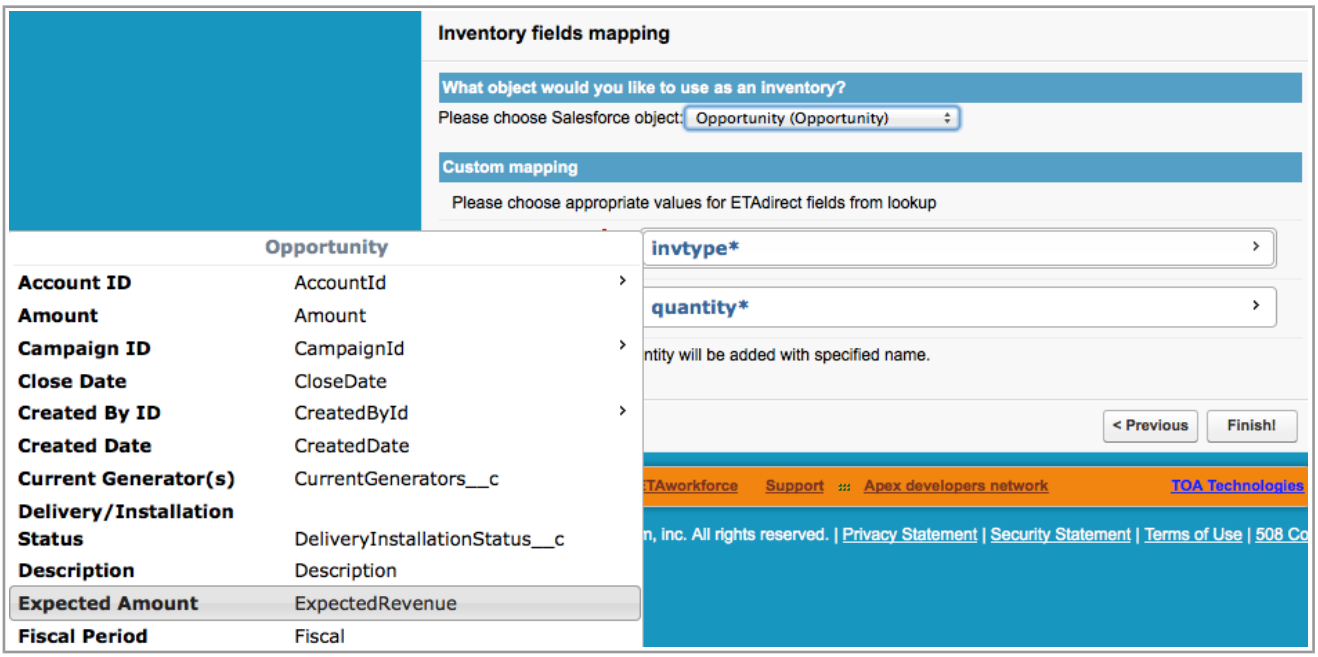


Figure 43: Object fields list

Similarly to the 'Activity mapping fields' screen, the list also contains the 'Add new' option allowing to create a new Salesforce object the fields of which will be mapped to Inventory fields. Enter the name of the object to be created.

Note: The same Salesforce object cannot be selected both for Activity and Inventory mapping in the Wizard. As soon as an object is selected for Activity mapping at Step 2, this object is no longer available in the list of Salesforce objects for Inventory mapping.

When the Inventory fields mapping is completed, click 'Finish!' to complete fields mapping.

The Wizard completes the process with the 'Installation info' screen listing the configuration steps performed.

Figure 44: Wizard completion screen

The 'Show settings' link leads to the 'Settings View' screen summarizing the installed package details and the mapping settings made with the help of the Wizard.

If any stage fails, it is not marked as completed, the installation process stops, the screen displays an error message describing the problem and the user may return to the previous screens to make corrections. To return to the previous stage the user has to click the 'Back' button.

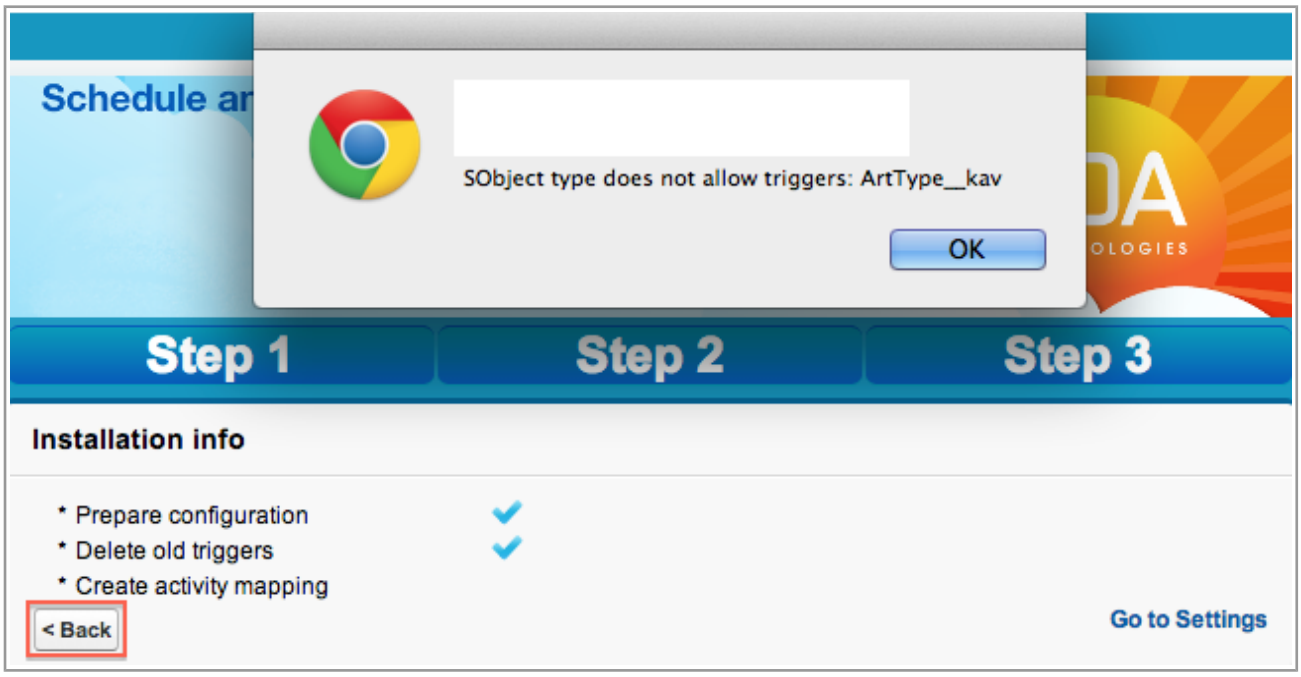


Figure 45: 'Back' button

The Wizard creates the basic object mapping between Salesforce and ETAdirect. All mapping rules created through the Wizard work in both directions – when a Salesforce object fields is updated, the related ETAdirect entity field is updated as well. And vice versa, any update of an ETAdirect entity field causes update of the corresponding fields of the related Salesforce object.

The user may return to the previous screen and make changes to the configuration settings. The system will repeat the checklist and complete the configuration, if no other errors are found. The user may, however, proceed with the configuration without returning to the previous screens by clicking 'Go to Settings'. In this case only the successfully completed settings will be saved.

5.3 Settings

As soon as ETAworkforce installation has been completed, the installed ETAworkforce package can be accessed from the User profile in Salesforce ('Organization' → {Salesforce User Name} → 'Setup' → 'App Setup' → 'Installed Packages' → 'ETAworkforce' → 'Configure'). The 'Settings View' page will appear (as the page is rather big, it is separated into several screen shots with their descriptions).

5.3.1 ETAworkforce Details

The 'Settings View' contains the 'ETAworkforce details' section displaying the basic user and package details. If ETAworkforce was configured using the Wizard, the 'ETAworkforce details' section is filled-in with the user's credentials entered in the Wizard. Otherwise, the section is empty and needs to be filled-in by the user.

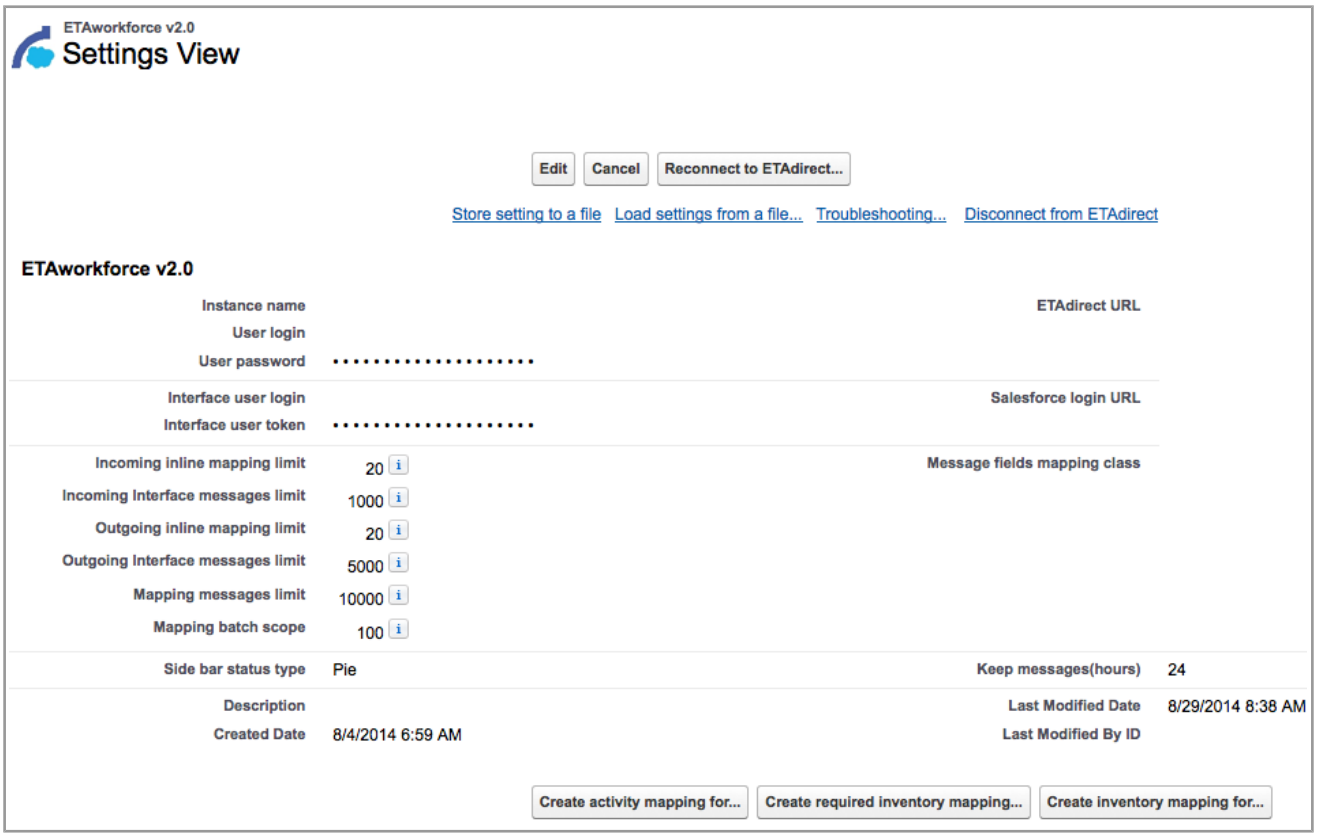


Figure 46: 'ETAworkforce details' section

The 'ETAworkforce' details section contains the credentials data applied by the current user, the data on the settings creation and last modification and the following mapping limit settings:

Incoming inline mapping limit	If the number of incoming messages is more than this value, mapping Apex Job will be created for them
Incoming Interface messages limit	How many status updates or messages will be sent to Salesforce during 1 agent run. Values range 1-9999.
Outgoing inline mapping limit	If the number of outgoing messages is more than this value, mapping Apex Job will be created for them
Outgoing Interface messages limit	How many Activity messages will be processed and then sent to ETAdirect during 1 agent run. Values range 1-9999.
Mapping messages limit	How many Activity messages in new status will be processed during 1 Apex job run.
Mapping batch scope	Number of messages in new status processed in 1 batch of Apex job. Note that # of batches should not exceed 200, so 'Mapping messages limit' divided by 'Mapping batch scope' should be < 200.

The 'ETAworkforce details' section can be edited by clicking 'Edit'. This opens the 'Settings Edit' screen where settings can be entered or modified.

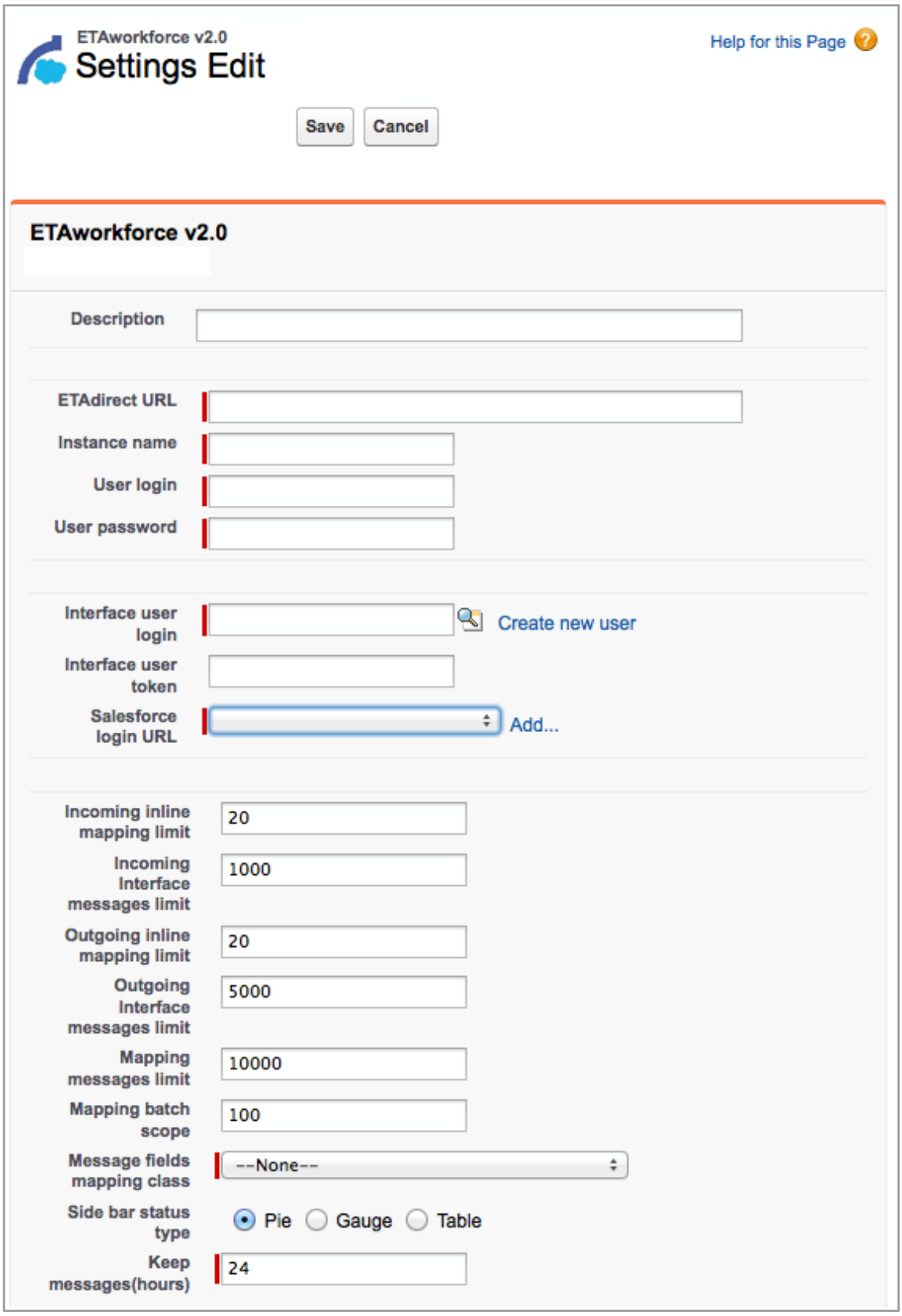


Figure 47: 'Settings Edit' screen

The mandatory fields are marked with red lines. Please refer to Connectivity Settings section for the

description of the user's credentials. When the form is completed, store the data by clicking the 'Save' button. Otherwise, the form can be discarded by clicking the 'Cancel' button.

The existing settings can be saved to a file in the user's documents in Salesforce by clicking the 'Store settings to a file' link. Saved settings can be loaded by clicking the 'Load settings from a file...' link offering to select the previously stored file from which settings are to be loaded. In this case previous settings are overwritten.

5.3.2 Fields Mapping

5.3.2.1 Mapping Creation

Fields mapping is the process of 'linking' the Salesforce fields sent in a message to the corresponding fields in ETAdirect. Correct mapping ensures proper update of Salesforce fields with the update of the corresponding fields in ETAdirect, and vice versa.

If no Wizard was used to configure ETAworkforce, the 'Settings View' screen contains no mapping sections. In this case they must be created by the user. Activity Fields mapping rules are set by clicking 'Create activity mapping for...', Inventory Fields mapping rules – by clicking 'Create inventory mapping for...' and Required Inventory Fields mapping rules – by clicking 'Create required inventory mapping...'.

Figure 48: 'Create mapping...' buttons

Clicking any of these buttons opens the 'Map to Object' popup window containing the list of Salesforce objects to which the selected ETAdirect entity can be mapped.

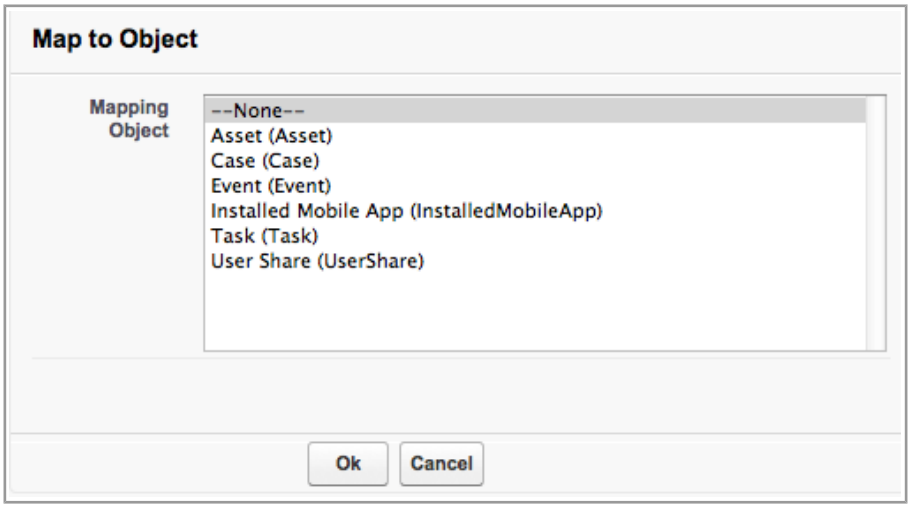


Figure 49: 'Map to Object' window

When a Salesforce object is selected, the corresponding mapping section is created with the 'Triggers' and 'Fields mapping' subsections. Each section has a header of the following structure: '[ETAdirect field name] mapping for [Salesforce object name] object'.

Note: each Salesforce object can be selected only once for an ETAdirect entity. As soon as an object is selected for mapping, its name is no longer available in the 'Map to Object' list.

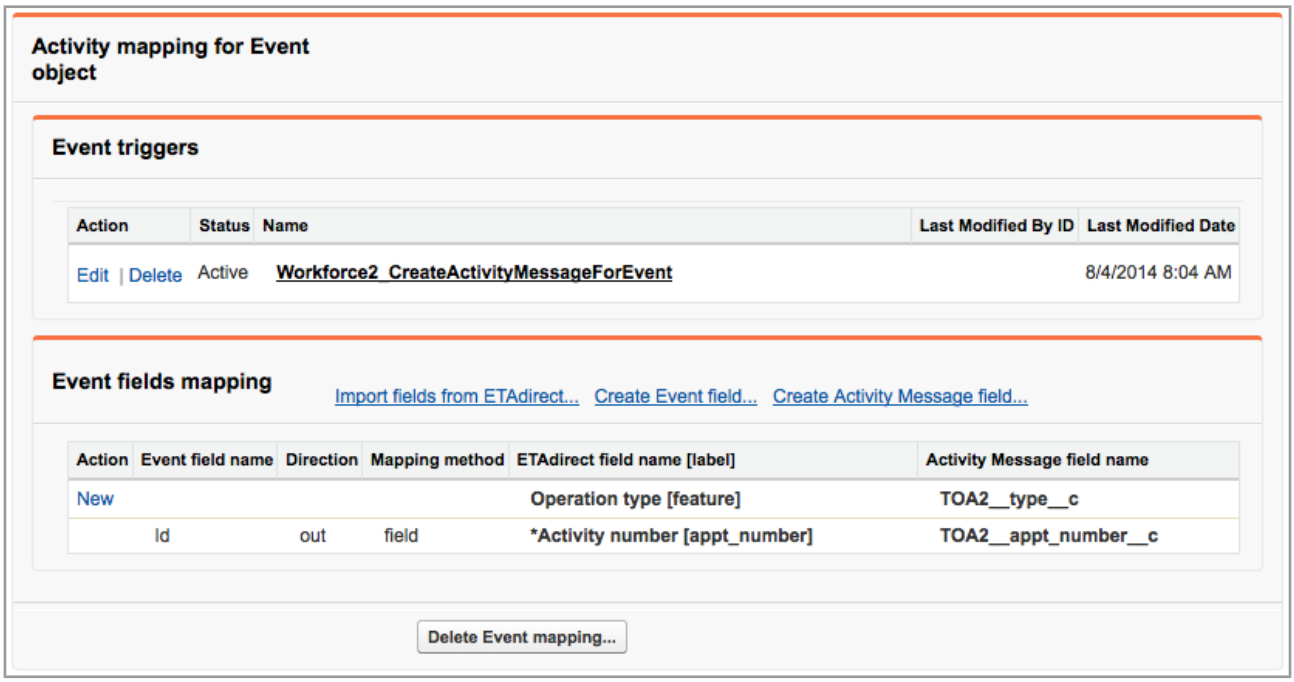


Figure 50: Newly created mapping section

Note: if ETAworkforce was configured using the Wizard, the 'Settings View' screen will contain the mapping sections corresponding to the Activity and Inventory mapping rules set in the Wizard. The Salesforce objects selected for mapping in the Wizard can no longer be selected for the same ETAdirect entity.

The 'Fields mapping' subsection lists the Salesforce object fields which can be sent in the Activity Message, Inventory Message or Required Inventory Message (the '[Mapping Object] field name' column) corresponding to the imported ETAdirect fields, if any (the 'ETAdirect field name [label]' column).

Note: whenever a new object for mapping is added, one field is always already configured. This field serves as the 'key' field for the entity in ETAdirect. Such fields are as follows:

- Activity – Activity number
- Inventory – Serial number
- Required Inventory – Required Inventory ID

These fields cannot be modified or deleted. They are marked with asterisks in the list.

Other ETAdirect fields can be imported, if needed, by clicking 'Import fields from ETAdirect...'. This link leads to the 'Import mapping fields' screen where ETAdirect fields related to the selected entity can be imported to Salesforce.

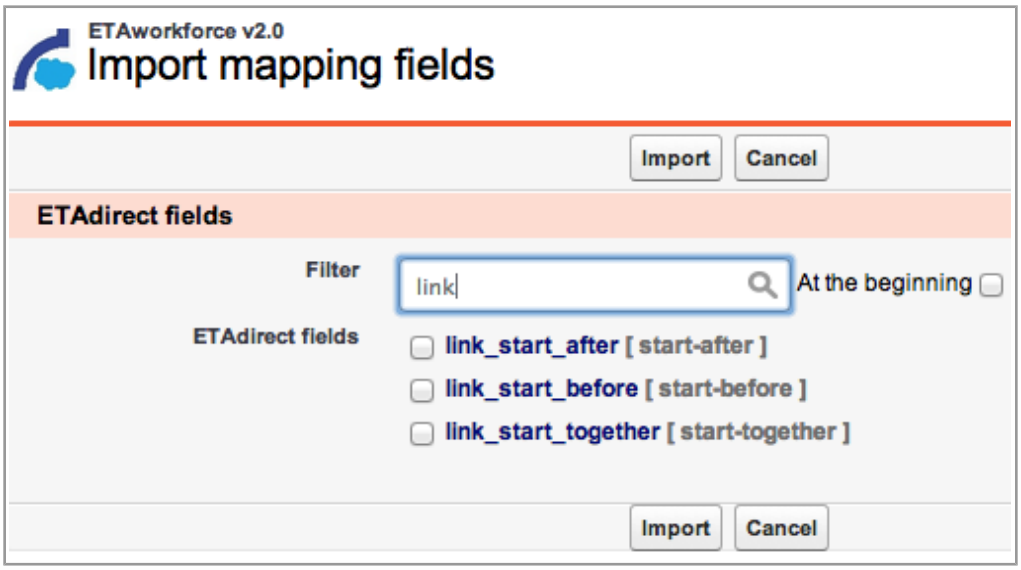


Figure 51: 'Import mapping fields' screen

The screen contains the list of ETAdirect fields available for import with their labels and names. The list can be filtered by typing a key in the 'Filter' field. The list is filtered as you type. The 'At the beginning' checkbox filters the list even further, returning only the fields having the search key at the beginning of their description.

Note: ETAdirect properties with spaces in their labels cannot be imported, as Salesforce does not support properties with spaces in their names.

When the field(s) are selected, click 'Import'. The selected fields will be added to the 'Fields mapping' list with their corresponding Salesforce fields. At the same time, the corresponding Message fields are added as well (the '[Object] Message field name' column).

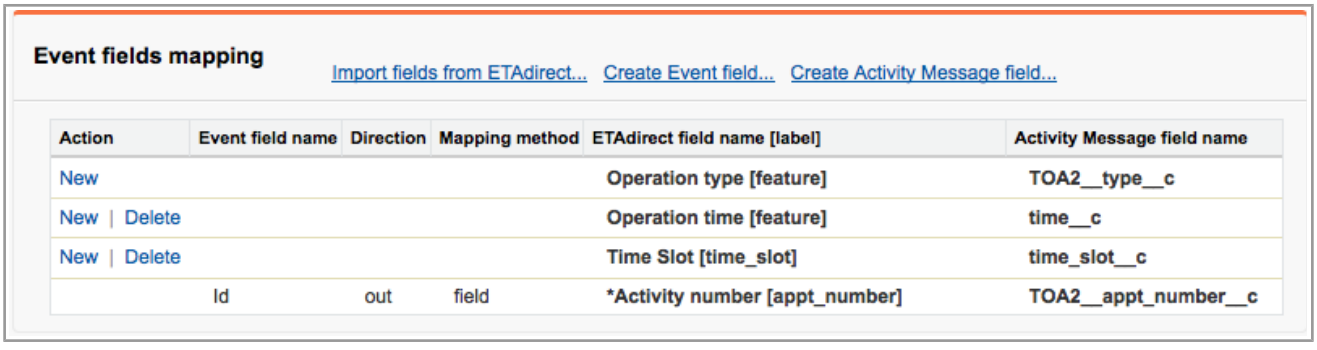


Figure 52: ETAdirect fields added to mapping table

Note: ETAdirect fields are listed under their names as existing in ETAdirect with their corresponding labels in brackets. However, some fields can only be used by the Inbound API and cannot be found in the ETAdirect fields list. Such fields have [feature] as their labels.

5.3.2.2 Mapping Rules Creation

When the list of ETAdirect fields and corresponding Message fields has been completed, the mapping rules, that is, the principles of field updates transfer between Salesforce and ETAdirect, must be defined.

To define the mapping rules for a Salesforce fields and the corresponding ETAdirect field, click 'New' in the 'Action' column. This link leads to the 'New message mapping field' screen where the mapping rules are actually defined.

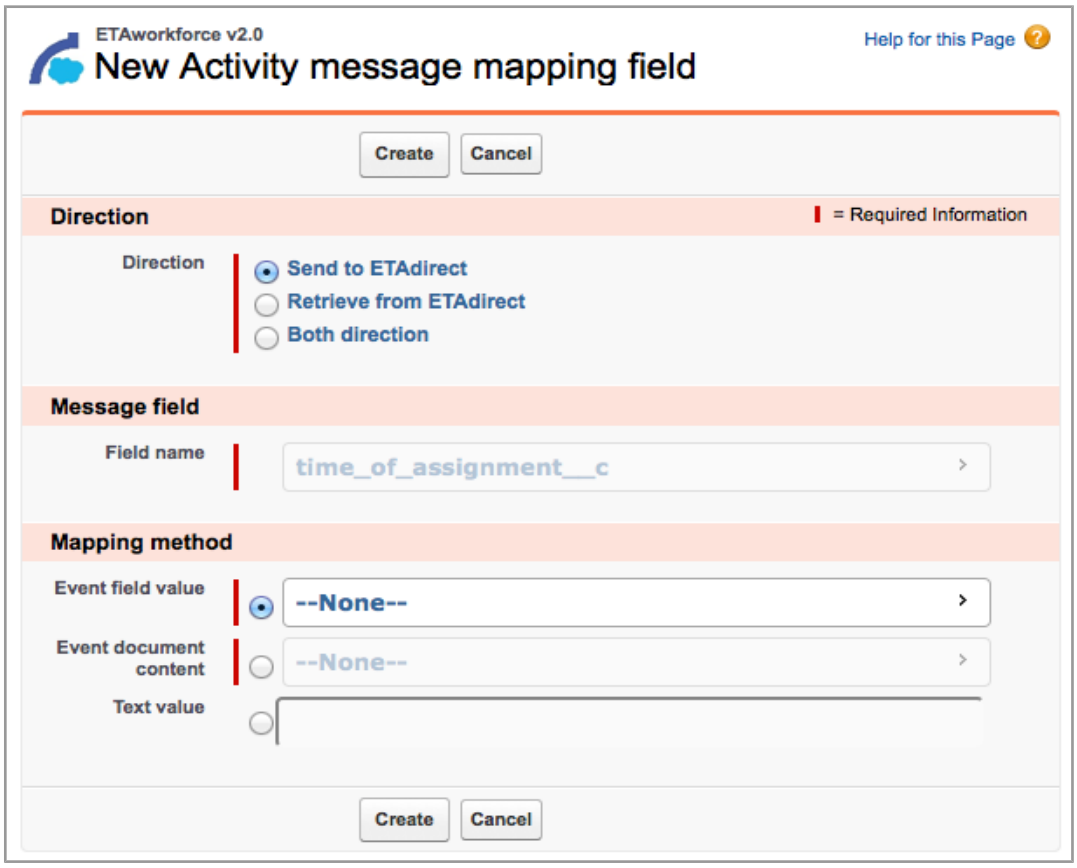


Figure 53: 'New message mapping field' screen

The 'Direction' radio-group defines the direction of field update by the message:

- Send to ETAdirect – any update to a Salesforce object field is sent to ETAdirect and the corresponding entity field is updated accordingly. No updates of ETAdirect entity fields are sent to Salesforce.
- Retrieve from ETAdirect – any update to a ETAdirect entity fields is retrieved by Salesforce and the corresponding object field is updated accordingly. No updates of Salesforce object fields are sent to ETAdirect.
- Both directions – updates of ETAdirect entity fields and Salesforce object fields are sent in both directions and cause updates of the corresponding fields in both applications.

The 'Message Field' contains the ReadOnly name of the message field for which the mapping rule is created.

The 'Mapping method' section allows selecting the method of field update:

- Field value – the field is updated with the value of the corresponding field in the other application. When this option is selected, the user should choose the object field for mapping. When the mouse hovers over the field, the list of all fields is shown where the desired field can be selected.

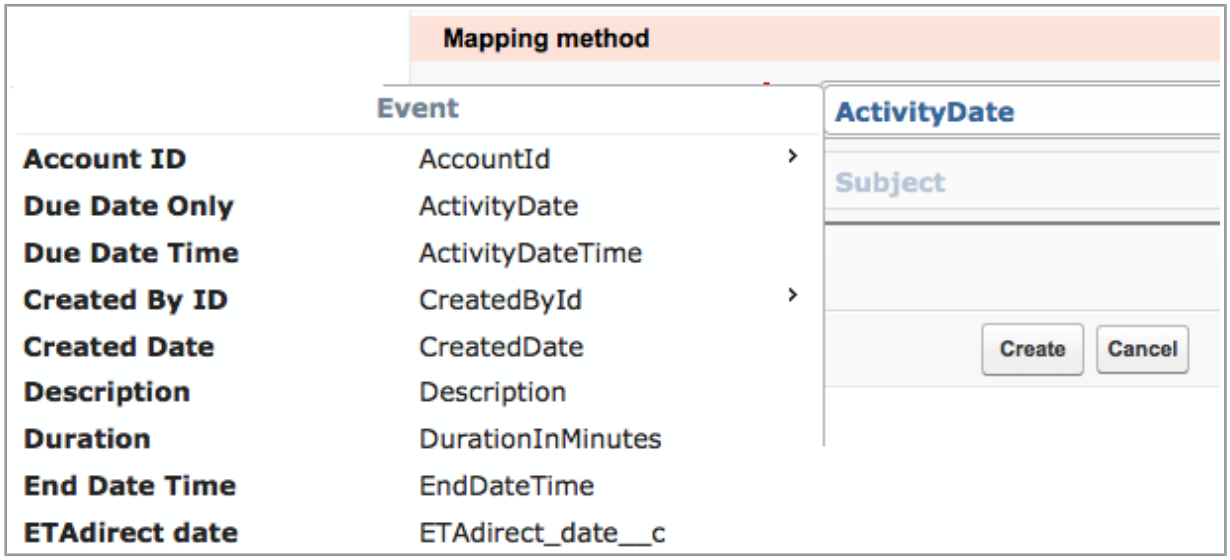


Figure 54: Fields list

- Document content – when the mapped field is a file property, the corresponding field is updated with the content of such file property.
- Text value – when this option is selected, enter the text value in the field. The mapped field(s) will always be updated with such value.

When the mapping rule is defined, click 'Create' to save the changes and add the new rule to the 'Fields mapping' list.

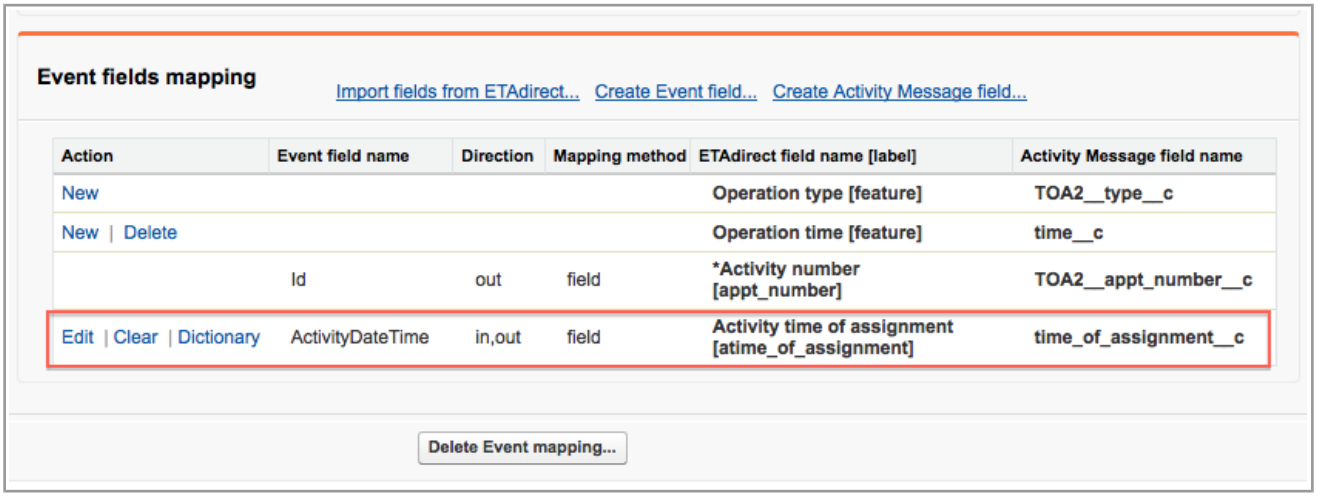


Figure 55: Mapping rule

The settings defined for the new rule are shown in the 'Direction', 'Mapping method' and '[Object] field name' columns. The rule defined in the example above means that the 'Activity type of assignment' field in ETAdirect is mapped to the 'ActivityDateTime' field in Salesforce. These fields can be updated in both directions with their corresponding values which are sent in the 'time_of_assignment_c' field of the Activity Message.

To change mapping rules click 'Edit' in the action column. This link leads to the 'Edit message mapping field'

screen similar to the 'New message mapping field' screen. All settings made during the mapping rule creation can be modified. To save the changes, click 'Save'.

To clear a mapping rule click the 'Clear' link. The 'Clear' action removes the mapping rules defined for the selected ETAdirect field, while leaving the field in the mapping list. After the 'Clear' action a new mapping rule can be defined for the field.

After the 'Clear' action this link is replaced with 'Delete' which removes the ETAdirect field from the mapping list. The same link also exists for newly imported ETAdirect fields and has the same effect.

In some situations it is important to ensure that certain field values cause the mapped fields to be updated with other specified values. This can be achieved by creating the 'Dictionary' of values between the pair of Salesforce and ETAdirect fields. Click the 'Dictionary' link to open the 'Mapping dictionary' screen.

Figure 56: 'Mapping dictionary' screen

The 'Mapping dictionary' screen consists of two subsections, 'To message' and 'From message' defining the correlation between the linked type field value and the message field value in both directions. Click 'New' to define the field values.

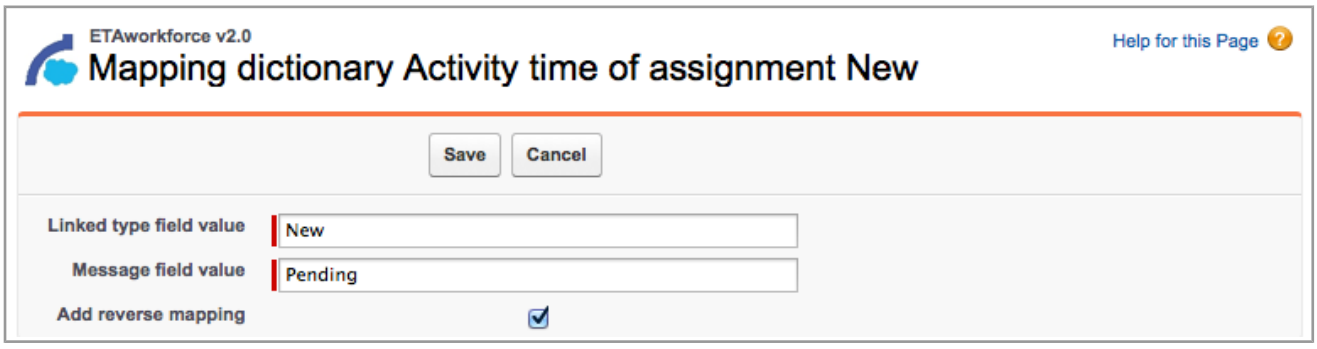


Figure 57: Mapping dictionary values definition

In this screen enter the 'Linked type field value' and the corresponding 'Message field value'. The 'Add reverse mapping' option, when enabled, causes the defined dictionary rules to be applied in the reverse direction, too. In this case the other dictionary subsection ('To message' or 'From message') is filled in automatically with the reverse values. Click 'Save' to store the dictionary values.

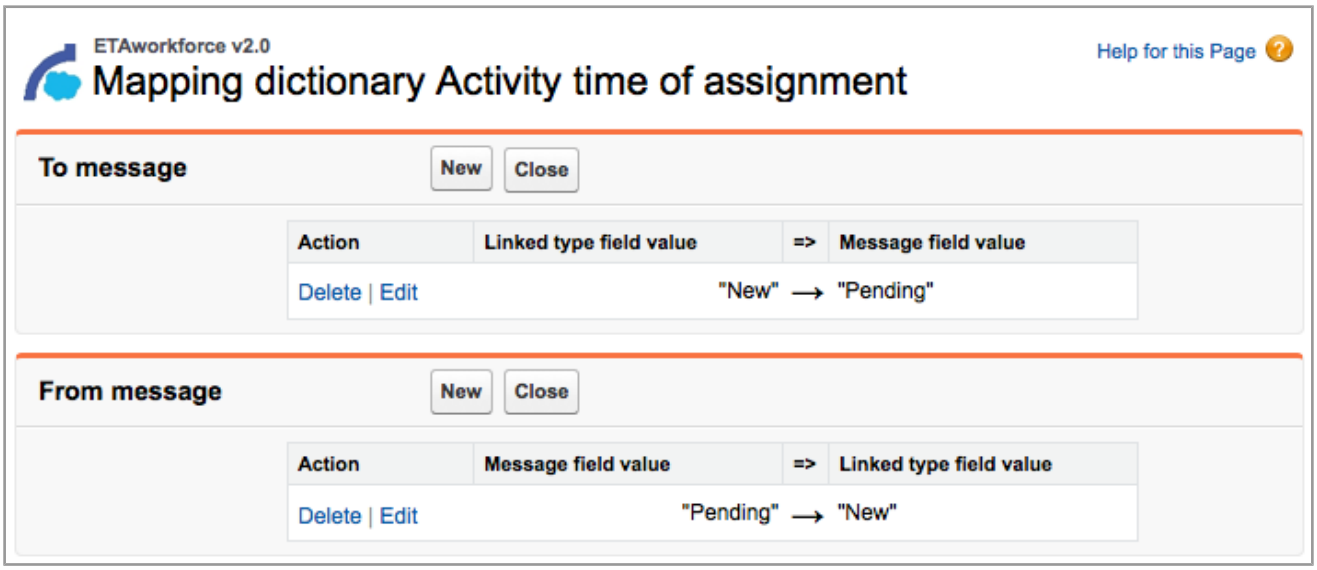


Figure 58: Mapping dictionary rule

The rule defined in the example above means that whenever the field value is 'New' in Salesforce, the corresponding message field will send the value 'Pending' to ETAdirect. The rule works in both directions, i.e. whenever the message field value is 'Pending' in ETAdirect, the corresponding field in Salesforce is set to 'New'.

Mapping dictionary rules can be edited or deleted by clicking 'Edit' or 'Delete', respectively.

Note: whenever a mapping rule is removed by the 'Clear' link, the related dictionary is also removed. Therefore, when a new mapping rule is created for the same ETAdirect field, the dictionary is to be created again, if needed.

Each mapping subsection has the 'Delete mapping...' button which deletes the entire subsection.

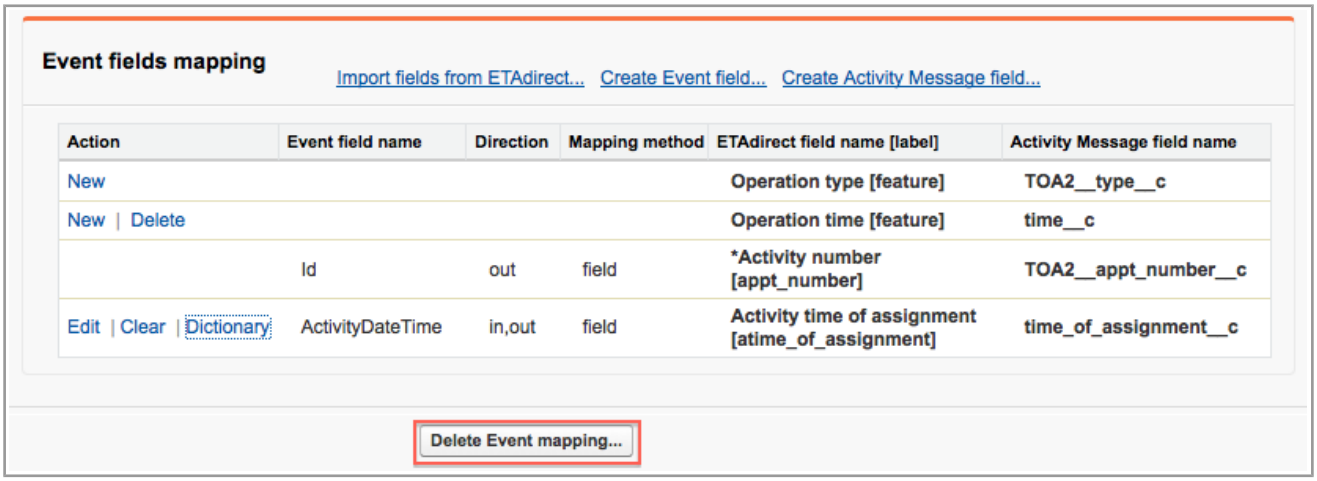


Figure 59: 'Delete mapping...' button

5.3.2.3 Links Mapping

Links mapping is defined as part of Activity mapping and included in the Activity mapping table. To create Links mapping the corresponding fields must be imported from ETAdirect. When the list of ETAdirect fields

is filtered to show links, it shows the list of link templates configured in ETAdirect.

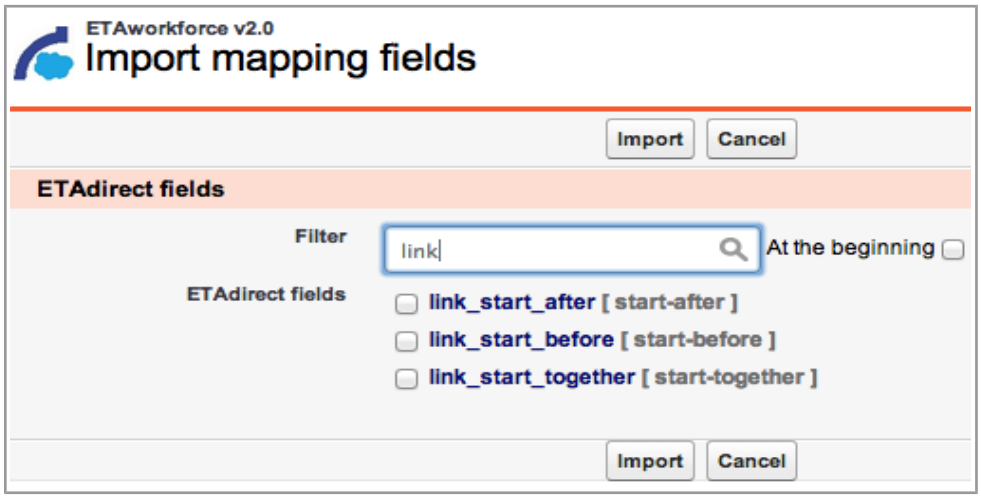


Figure 60: Link templates

Note: one link template can have two link directions (for example, start-before and start-after). Therefore, two items can be imported for the same link template.

Link fields are not actually the activity fields in ETAdirect, so, when imported, they have [feature] instead of a label.

New | Delete	ZIP [czip]	TOADEMO__zip__c
New | Delete	Date [date]	date__c
New | Delete	Resource ID [pid]	external_id__c
New | Delete	Start-after [feature]	link_start_after__c
New | Delete	Start-before [feature]	link_start_before__c
New | Delete	Start-together [feature]	link_start_together__c
New | Delete	Operation time [feature]	time__c
New | Delete	Activity time of assignment [atime_of_assignment]	time_of_assignment__c

Figure 61: Imported link templates

When link templates have been imported, mapping rules must be defined for them for correct updates between ETAdirect and Salesforce. It is recommended to choose the Lookup relation field to the same object, so that the Activity object has only one link per direction.

When Links are properly imported and mapped, they work as follows:

- when a Link field is changed, a new Activity Link Message is created sending a request to ETAdirect Activity Management API to link 2 activities
- when the Link is changed in ETAdirect, an Activity Link Message with the 'External System' flag is created in Salesforce updating the Link field
- if there are several activities with the same Activity ID (this can happen when an activity was, for example, suspended, cancelled and then reopened), the activity to be linked will be a scheduled activity not in a final status which is the most distant in the future. For example, if the following activities had the same ID:

3000-01-01 Pending
2020-01-01 Canceled
2019-01-01 Pending
2018-01-01 Pending
2000-01-01 Pending,

the pending activity scheduled for 2019-01-01 will be selected for linking. The '3000-01-01 Pending' activity is non-scheduled, the '2020-01-01 Canceled' activity is in a final status, and of the remaining three the '2019-01-01 Pending' activity is the most distant in the future.

5.3.2.4 Triggers

Each object mapping section contains the 'Triggers' subsection allowing to manage the triggers causing the corresponding Message to be sent.

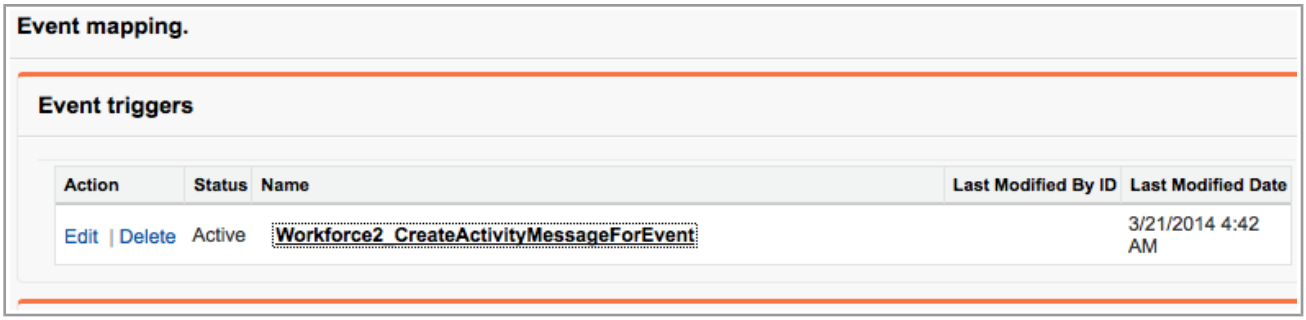


Figure 62: 'Triggers' subsection

The triggers can be edited or deleted by means of the 'Edit' and 'Delete' action links, respectively.

5.3.3 Advanced Mapping Rules

In some cases, simple GUI-supported mapping rules are not enough (e.g. it is necessary to create a complex rule, where the mapping is to be performed if a certain condition is true but not otherwise). The rules can use the Apex-trigger supported logics of any complexity.

To create an advanced mapping rule Apex trigger is used – Apex code that executes before or after specific data manipulation.

The goal of this trigger is to provide a possibility for Client to manage object messages, e.g. customize conditions of creating messages, messages behavior, perform fields mapping and handle message statuses.

To view and edit the trigger select 'Organization' → {Salesforce user name} → 'Setup' → 'App Setup' → 'Develop' → 'Apex Triggers'.

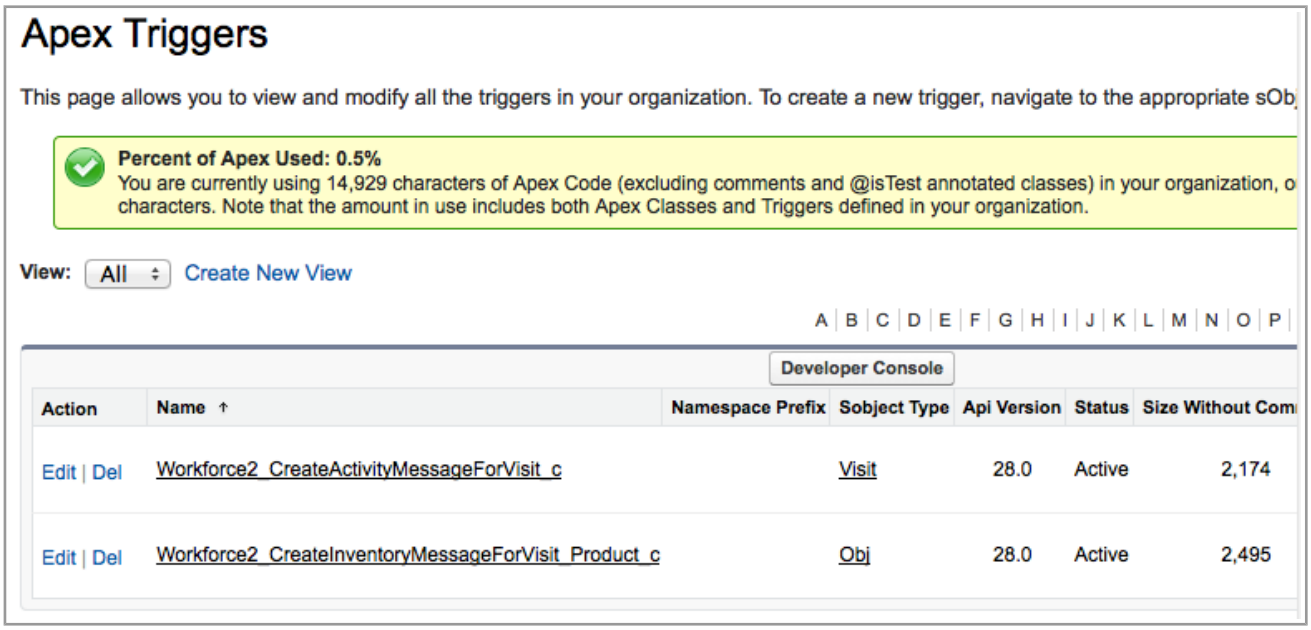


Figure 63: 'Apex Triggers' screen

Click the trigger name and the corresponding page will appear. To edit the trigger click 'Edit'.

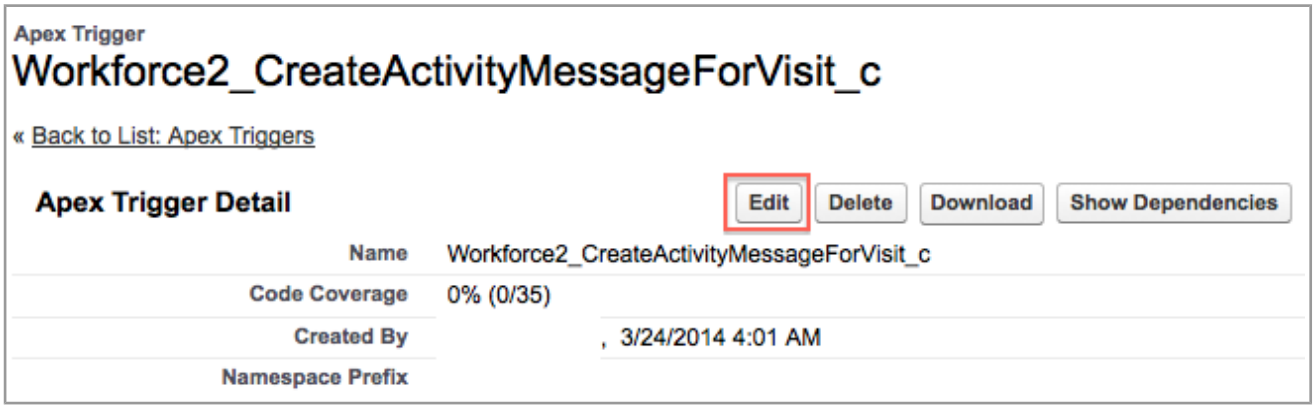


Figure 64: Apex trigger screen with 'Edit' button

The 'Edit' button leads to the 'Apex Trigger Edit' screen.

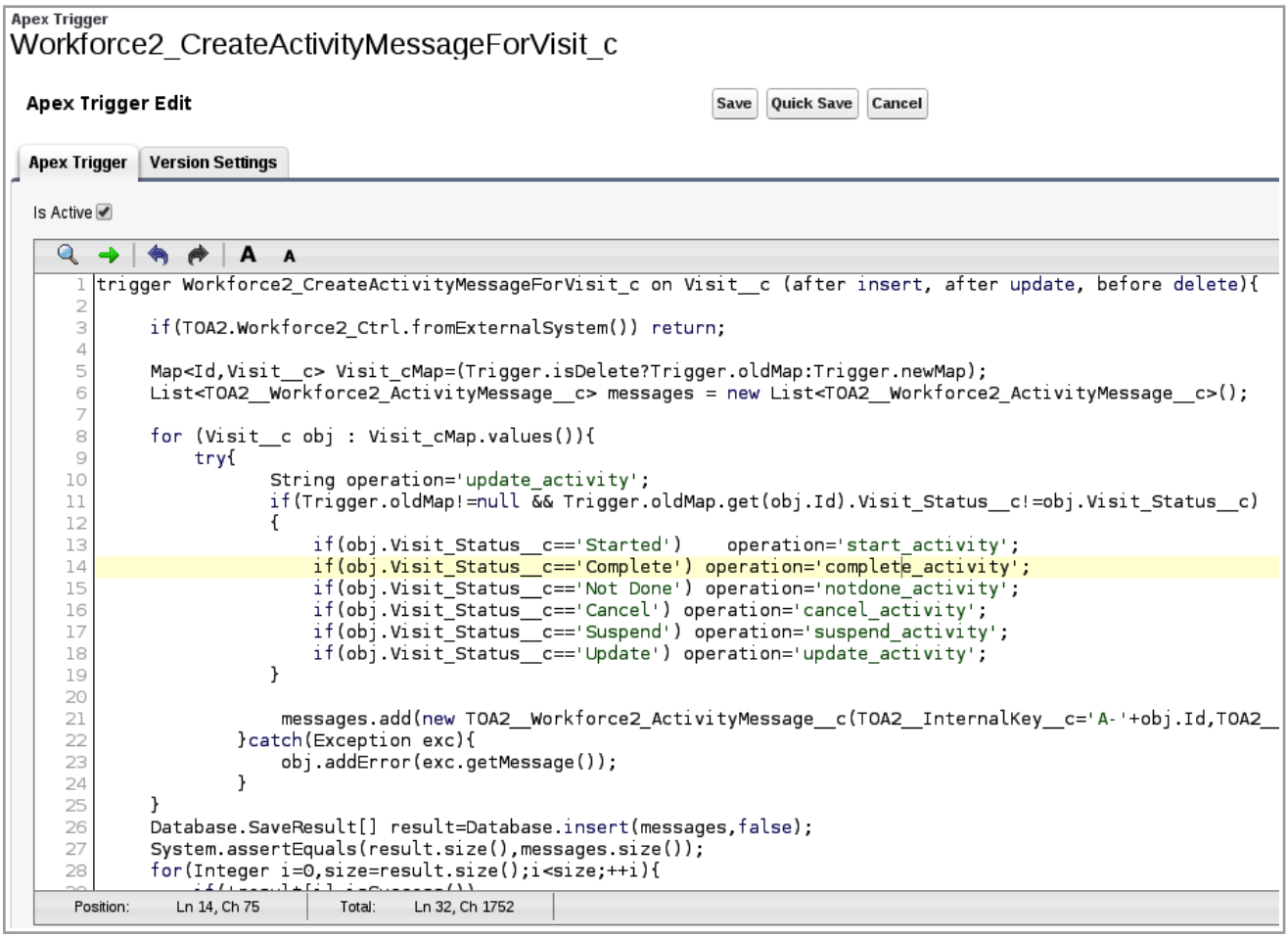


Figure 65: 'Apex Trigger Edit' screen

Here the custom logic of creating the Message object is implemented. The example above shows that depending on the 'Visit_Status' field the operation type for the Inbound transaction can be changed to start, cancel, suspend, etc. the activity.

5.3.3.1 Activity Operations in Salesforce

Advanced mapping involving Apex triggers is used to perform activity operations (start, cancel, suspend, etc. activity) in ETAdirect. To initiate an activity operation, find the '[Linked Object] triggers' section on the ETAworkforce 'Settings View' screen and click 'Edit' for the 'Workforce2_CreateActivityMessageFor[Linked object name]' trigger. The 'Apex Trigger Edit' page will appear, where

```
messages.add(new
TOA2__Workforce2_ActivityMessage__c(TOA2__InternalKey__c='A-'+obj.Id,TOA2__appt_n
umber__c=obj.Id));
```

is to be replaced with

```
String operation='update_activity';
                if(Trigger.oldMap!=null && Trigger.oldMap.get(obj.Id).<Your
field>!=obj.<Your field>)
                {
                    if(obj.<Your field>=='<Your start status>')
operation='start_activity';
```

```
                    if(obj.<Your field>=='<Your complete status>')
operation='complete_activity';
                }

                messages.add(new
TOA2__Workforce2_ActivityMessage__c(TOA2__InternalKey__c='A-'+obj.Id,TOA2__appt_n
umber__c=obj.Id,TOA2__type__c=operation));
```

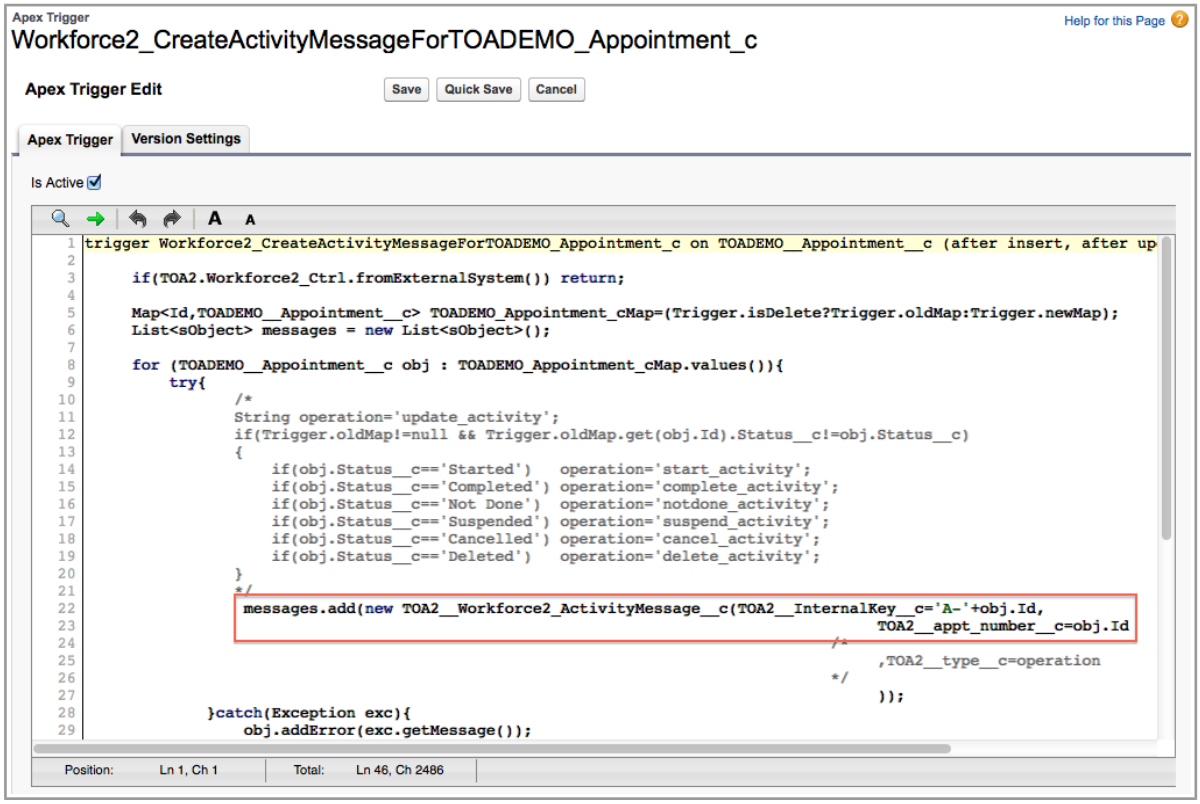


Figure 66: Apex Trigger line to be replaced

The following operations are available:

- start_activity
- complete_activity
- notdone_activity
- suspend_activity
- update_activity
- cancel_activity
- delete_activity

5.4 Mapping Update in ETAdirect

When the mapping is complete, the new mapping settings must be communicated to ETAdirect for the fields mapping to work. For this purpose the communication between ETAdirect and Salesforce needs to be

established or reestablished. This is done by clicking the 'Connect to ETAdirect...' at the top of the 'Settings View' screen and entering the password. When the mapping settings are sent to ETAdirect, they are applied when the mapped fields are updated in either application.

All changes to the ETAworkforce Settings except the URLs and user credentials are updated and applied automatically after the next agent run. However, changes to the URLs and user credentials (Instance name, User login, User password, ETAdirect URL, Interface user login, Interface user token, Salesforce user login) require reconnection to ETAdirect. Also, link mapping settings are not applied automatically and require reconnection. This is done by clicking the 'Reconnect to ETAdirect...' button. In this case the current connection is interrupted and a new connection is established using the new credentials.

Also, changes to link templates, resource list and/or time zones in ETAdirect require reconnection to be updated in Salesforce. Otherwise, ETAworkforce continues using old values for 15 minutes

If a different organization needs to use the same instance to connect to ETAdirect, the existing connection has to be interrupted. For this purpose the 'Settings View' screen has the 'Disconnect from ETAdirect' action link.

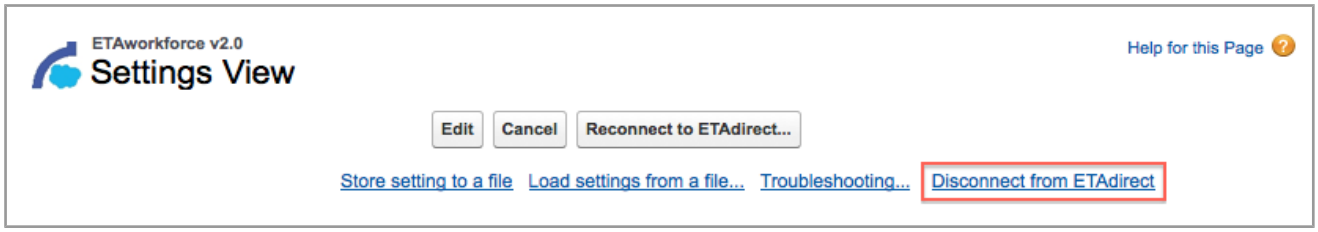


Figure 67: 'Disconnect from ETAdirect' link

6 Messages Page

The messages page can be used to view the list of messages and their status. It is accessible from the 'All Tabs' page. Select 'Workforce2 Messages' to open the Messages page.

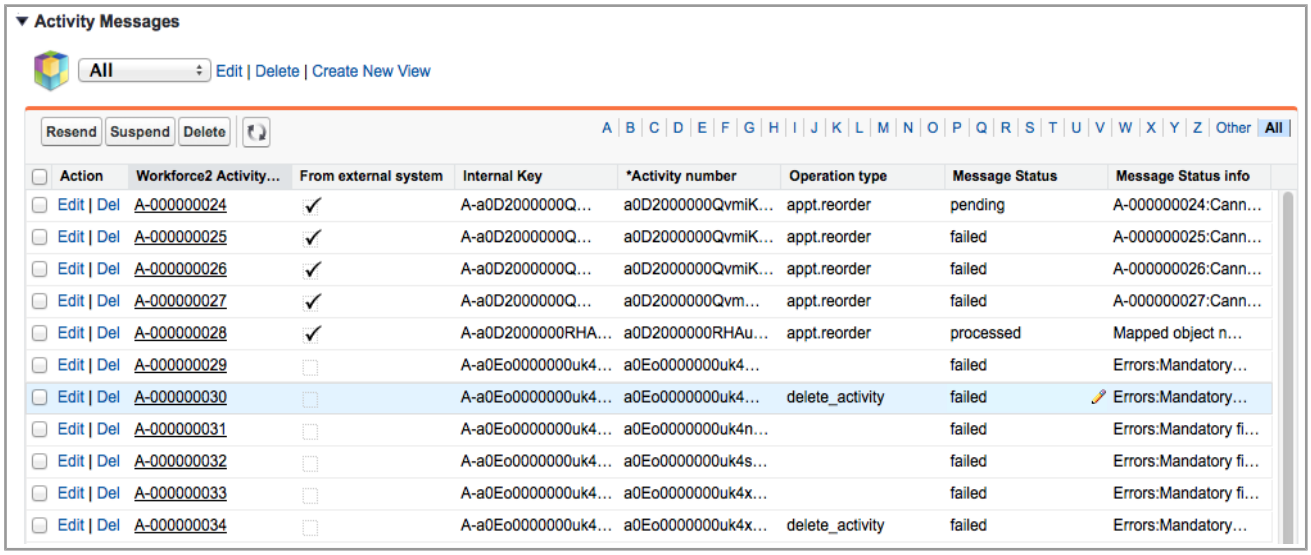


Figure 68: Messages page

The columns to be displayed and their order in the 'Messages' table can be configured by pressing the 'Edit' button. To create a brand new view, press 'Create New View' on the 'Messages' screen.

The 'Messages' table contains the following columns:

- Action – links to the actions which can be performed to the message. The 'Edit' link allows editing the selected message, and the 'Del' link deletes the selected message.
- Workforce2 Message Name – automatically generated Workforce2 message name. Click the name link to see the message details, including its basic details and values of the message fields.
- From external system – the checkbox showing whether the message was received from the external system.
- Internal Key – automatically generated message internal key.
- Fields defining the entity for which messages are processed. For example, for Activity Messages the table contains the 'Activity number' column showing the IDs of activities related to the message. For Inventory Messages the table contains the 'Activity ID' and 'Serial Number' columns, and for Required Inventory Messages – 'Activity ID' and 'Required Inventory ID'.
- Operation type – the type of operation performed as the result of the message.
- Message Status – the status of the selected message. The following message statuses are possible:

  New – newly-created message which has not yet been processed

  Failed – unsuccessful message

  Pending – message waiting for sending by the agent

Processed – successfully processed message

Suspended – message to be ignored by the agent until its status is changed

– Message Status Info – error messages received in case of 'Failed' message status (error messages used in the Inbound API) or warning messages received for 'Processed' messages

The messages list can be filtered by their statuses. To filter the list select the message status from the drop-down list above the table.

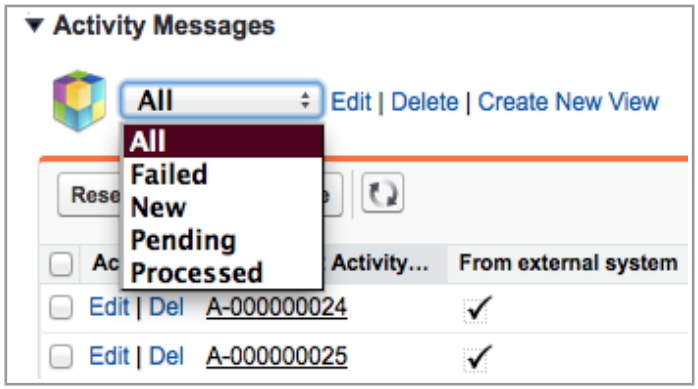


Figure 69: Message status filter

One or more messages can be selected from the list by checking the checkboxes in the leftmost column of the table. The selected message(s) can be resent by clicking the 'Resend' button which performs a group 'resend' action.

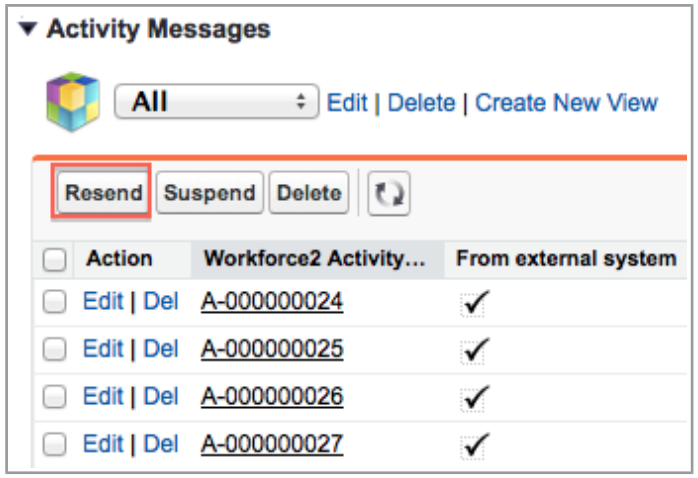


Figure 70: 'Resend' button

Clicking 'Resend' returns the selected messages to the 'Pending' status and the next agent run will send them again with all data currently contained in the message.

Note: resending a message will reset all changes performed to the object after the initial message was sent. For example, if a failed message is followed by a successful message on the same object, resending of the failed message will override the successful message. Therefore, this action should be used with caution.

The selected pending message(s) can be suspended, if necessary. The message status is changed to 'Suspended' and the message is ignored by the agent until its status is changed again (for example, by the

'Resend' button). If an outgoing Activity Message is suspended, no data (Activity, Inventory, Required Inventory or Links) will be transferred. If an incoming Activity Message is suspended, only the Activity data is not transferred. Messages can be suspended by selecting them from the list and clicking 'Suspend'.

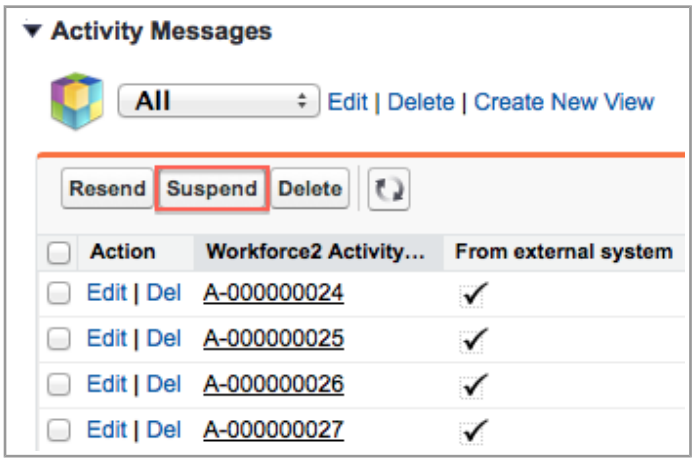


Figure 71: 'Delay' button

One or more messages can be deleted by selecting them in the list and clicking 'Delete'.

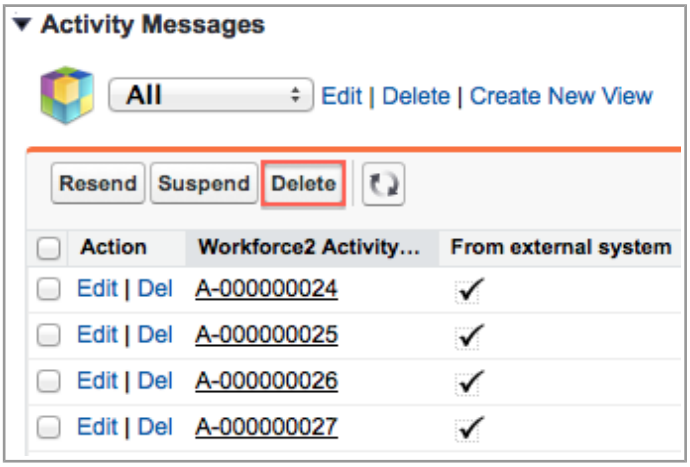


Figure 72: 'Delete' button

7 Advanced Message Creation. Processing ETAdirect Activities from Salesforce

As soon as ETAworkforce has been deployed, the Activity Message custom object is created in the Client's Salesforce Organization. To view and edit the Activity Message object, select 'Organization' → {Salesforce User Name} → 'Setup' → 'Create' → 'Objects' → 'Activity Message'. In some cases the complexity of the Client's Salesforce-based application requires ability to create Activity Message instances and send them to ETAdirect via ETAworkforce to process the Activities from the Application Code. For that purpose, the code needs to be implemented that creates Activity Message object instance with all necessary fields that define the way Activity instance in ETAdirect is to be processed. To ensure successful Activity processing from ETAworkforce it is necessary to explain the logics of possible actions and operations.

Note: For more details on Activity Processing please refer to 'Inbound SDK' document.

7.1 Activity Processing Details

The way activity is processed depends on its type and status.

7.1.1 Activity Types

ETAdirect 'Activity' corresponds to all time-consuming things done by technicians. Each Activity Type includes a set of features which are yes/no flags defining the peculiarities of the Activity Type processing, e.g. whether activities of the type can be moved, created in bucket, rescheduled etc.
The table below provides detailed description of the features that may influence Activity processing from Salesforce via ETAworkforce:

Feature	If enabled, the activities of the type...
Allow to create from Incoming Interface	… can be created from external systems, including ETAworkforce
Allow move between resources	… can be moved between resources
Allow creation in buckets	... can be created in buckets
Allow reschedule	… can be moved to another day
Support of not-ordered activities	… can be not-ordered – such that can be started by the resource before/after any other activity within the route
Allow non-scheduled	... can be activities without a date
Support of time slots	… can use time slots (time-period within which they are to be started can be defined)
Define duration manually	must have 'duration' field defined manually

7.1.2 Activity Statuses

Activity in ETAdirect can have following statuses:

Pending: when activity is created in the resource's route it gets 'pending' status

Started: activity that has been started and is being processed

only one activity can be 'started' within one route at the same time

Completed: activity that has been successfully completed

Cancelled: activity that has not been started and will not be performed

Not done: activity that has been started but has not been completed

Suspended: activity that was postponed for some reason

when activity is postponed in ETAdirect, its 'end_time' is set as the time of suspension, and it gets a 'suspended' status

along with activity suspension, a new activity of 'pending' status copying the suspended one is created

the 'suspended' activity is ignored by ETAworkforce, and the 'pending' one is processed

Deleted: activity that has been deleted from the system

deleted activities do no appear anywhere in the system and cannot be viewed

7.1.2.1 Activity Statuses and Activity Processing Logics

All activity commands ignore any prework, activities with status set to 'cancelled' from Salesforce, activities with status set to 'deleted' or 'suspended' (regardless of how the status was set), activities scheduled for the past date.

Thus even if any of the above-mentioned activities have the key fields, they are not considered among existing activities and treated by the Inbound API as if they do not exist (e.g. if a command is set, and the key fields are present only in the activity cancelled via the Inbound API and/or in deleted activity, they will not be considered and new activity will be inserted).

If there is more than one activity with the same key fields, activity with the maximum ID is processed and the rest are treated as 'duplicating' (and cancelled/deleted in the end of the transaction).

'Pending' activities are processed in accordance with the command flow, all of its fields, including date, resource and other fields can be processed if the command request sets so.

Activities with 'started', 'completed', 'cancelled' (from ETAdirect) or 'not done' status, are processed in accordance with 'action_if_completed' value specified.

'action_if_completed' Meanings

The 'action_if_completed' parameter can have any of the following values:

'ignore': not to update the activity and neither to insert a new activity:

- new activity is never created and 'appointment status is not pending' error is generated

'update': update existing activity:

- new activity is never created and existing activity is updated

Note: only custom properties can be updated. Date, resource and standard ETAdirect fields cannot be updated.

'create': always create a new activity, unless an existing activity is 'started'

- 'cancelled' by user, 'completed' and 'not done' activities are ignored – new activity is created
- 'started' activity properties are updated

'create_if_reassign_or_reschedule': create activity with new date or 'provider/provider_group' (= 'create_as_new' and default)

- if date specified for the transaction is different from the one specified for the started activity, a new 'pending' activity is created
- if date OR provider/provider group specified for the transaction is different from the one specified for 'cancelled' by user, 'completed' or 'not done', a new 'pending' activity is created
- otherwise, the existing activity is updated

7.2 Activity Fields Processing Details

The way specific activity fields are processed depends on their visibility and type.

7.2.1 Activity Fields Visibility

Visibility of the most fields is defined for a specific User (subject to the Display profile) and may be one of the following:

Not Visible: the field cannot be accessed (customer-specific).
if the Activity Message contains a 'not visible' field, the field is ignored and a corresponding warning is sent.

ReadOnly: the field value can be retrieved but cannot be edited.
If the Activity Message contains a 'ReadOnly' field, the field is ignored and a corresponding warning is sent to ETAworkforce from ETAdirect.

Optional: the field value can be retrieved and, optionally, edited.
If the Activity Message contains an optional field, the field is processed.
If the Activity Message contains an invalid optional field, the field is ignored and a corresponding warning is sent.

Mandatory: the field must be defined.
If the Activity Message contains a 'mandatory' field, the field is processed.
If the Activity Message contains an invalid or no mandatory field, the activity is not processed and error message is sent to Salesforce.

7.2.2 Activity Fields Type

Every field has fixed type which can be one of the following:

Text: any string can be assigned to a field.

Number: any integer numbers can be assigned to a field.
If the Activity Message has a field of 'number' type but with non-numeric value and the field visibility is not 'mandatory', the field is ignored and a warning is sent to Salesforce.
If the Activity Message contains a field of 'number' type but with non-numeric value and the field visibility is 'mandatory', activity is not processed and error message is sent.

Email: email address in the established format (the '@' symbol must always be used)
If the Activity Message contains 'Email' field with an invalid value, such field is not updated and the 'Invalid Email' error message is sent.

Picklist: only values of a fixed subset of integers can be assigned to a field.
The subset is defined for the field and cannot be configured.

Date: date in the MM/DD/YYYY format.
If the Activity Message contains 'Date' field in an invalid format, such field is not updated, and the 'Invalid Date' error message is sent.

DateTime: date and time in the MM/DD/YYYY HH:MM[AM/PM] format.

If the Activity Message contains 'DateTime' field in an invalid format, such field is not updated, and the 'Invalid Date and Time' error message is sent.

7.2.3 Duplicating fields

Two fields with the same name are called duplicating. They can have different values but in the course of update all will have the value that belongs to ETAdirect activity with the highest ID. As sometimes duplicating fields are necessary to implement specific logics but meanwhile can cause some confusion, a corresponding warning is issued when trying to add duplicating fields.

7.2.4 Ordering Activities in the Route

Activities in ETAdirect can be ordered and not ordered.

Not-ordered Activities can be completed at any time of the day and appear at the top of the list in the GUIs, and can be started at any time. Relative order of not-ordered activities is not significant.

(If an activity is created from ETAworkforce and its service window time is not specified, it becomes not-ordered).

Ordered Activities should be started within the period defined with the service window start and service window end values. In the GUIs, earlier activities are higher in the list.

Activities are ordered in the resource's route (activity ordering is not significant for buckets):

- by service window end values
- if they are the same, activities are ordered by the service window start values
- if they are the same, activities are ordered by their SLA window end values
- if they are the same, activities are ordered by their SLA window start values
- if they are the same, activities are ordered by the activity ID

When a route contains ordered finish-to-start linked activities, such links have higher priority in the activities ordering than any other criteria. The activities are ordered according to their sequence in the link and afterwards the service window, SLA and ID are checked.

Here is an example of correct ordering:

#	service window start	service window end
1	08:00	10:00
2	10:00	11:00
3	08:00	12:00
4	10:00	12:00

When activities are updated, they are again reordered by the same criteria, if necessary.

7.2.5 Updating/Replacing Properties

In the course of activity-related commands execution, activity properties can be updated or replaced, subject to 'head/properties_mode' setting of the transaction.

'replace': when activity is updated, all existing properties are erased and properties from the request are added instead

'update': when activity is updated, properties from the request are added to the existing properties, the existing properties are not deleted.

The time slot (service window) values are always updated to the values specified in the Activity Message. If the Activity Message field has an empty value, the activity is set to not-ordered. If the field is not defined for the Activity Message, it is not changed.

7.2.5.1 Updating Fields Changed from ETAdirect GUI

Some fields of the existing activities cannot be updated from ETAworkforce, if they have been previously changed in ETAdirect GUI. If ETAworkforce attempts to change such field after any manual changes made from the ETAdirect GUI, such changes are rejected. These fields are:

- reminder_time
- language
- time_zone
- phone
- email
- cell
- sla_window_start
- service_window_start
- name
- address
- city
- zip
- state
- time_slot_id
- sla_window_end
- service_window_end

7.2.5.2 Fields Updated Only from ETAdirect

Some fields can only be updated in ETAdirect and sent to Salesforce. No reverse process is available due to the field values nature (for example, some fields, like 'delivery_window', are calculated in ETAdirect, therefore, cannot be updated from Salesforce). These fields can only be retrieved from ETAdirect, consequently, for such fields mapping has to be set only in the 'in' direction. Mapping in the 'out' direction will have no effect. These fields are:

- appt_number (key field which cannot be changed in Salesforce. At the same time, if 'appt_number' is changed in ETAdirect, the related object will not be updated in Salesforce)
- astatus (can only be mapped through the 'start_activity' and 'cancel_activity' operations. For more details please refer to Advanced Mapping Rules)
- aworkzone
- end_time (only used in the 'complete_activity' operation)
- eta_end_time
- acoord_status
- accord_y
- atravelarea
- ETA
- atime_of_assignment
- activity_workskills
- aid
- time_delivered
- delivery_window
- pid
- accord_x
- travel
- activity_capacity_categories
- auto_routed_to_date
- atime_of_booking
- auto_routed_to_provider_id
- first_manual_operation
- first_manual_operation_interface
- first_manual_operation_user_name
- first_manual_operation_user_id
- first_manual_operation_user_login
- auto_routed_to_provider_name

7.2.6 Canceling/Deleting Activities

If there is more than one existing activity, only the activity with the maximum ID is processed. Other such activities are:

- deleted if the resource's route has not yet been started, or
- cancelled if the route has been started.

7.2.7 Non-Scheduled Activity Processing

When canceling a non-scheduled activity, if the date is not specified, it will be rescheduled to the current day and then cancelled.

IF: the resource has a non-working day or is inactive

AND the 'fallback_external_id' is not specified or invalid,

THEN: an error will appear and the activity will not be cancelled

IF: the resource has a non-working day or is inactive

AND the 'fallback_external_id' is specified and valid,

THEN: the activity will be moved to the fallback resource's route for the current day and cancelled

The 'delete_activity' command can delete non-scheduled activities without moving them, so it will never fail.

7.2.8 Updating Activity Assigned to a Non-Working Resource

If an existing activity was assigned to a resource with non-working calendar or inactive resource or has to be moved to such a resource with the update, such an activity will be updated as requested, but it will not be moved or cancelled.

7.3 Activity Processing Commands

Activity processing command can be used to manage an activity throughout its lifecycle.

The following activity-related commands are available:

- start_activity
- complete_activity
- notdone_activity
- suspend_activity
- update_activity
- cancel_activity
- delete_activity

7.3.1 'start_activity' Command

The command affects only the activity specified by the key fields that exists in the system within an active route for the current day and sets the activity status to 'started'. The command will:

1. If the activity processed is not the first in the route:

move the activity into the first position in the queue

issue 'the appointment starting order is invalid' warning

2. If/when the activity processed is the first in the route:

start the activity specified by the key fields

update activity fields with the values from the Activity Message

record travel time (time from the end of the previous activity to the start of the processed activity) in the statistics table unless the activity was not initially the first in the route

The command will fail if:

- activity does not exist in ETAdirect
- activity is in an inactive route
- 'command/time' is not current day (except overnight work)
- another activity in the route has the 'started' status
- 'command/time' is less than the route activation time
- 'command/time' is less than the time the previous activity was finished

7.3.2 'complete_activity' Command

The command affects only the started activity specified by the key fields which exists in the system and sets the activity status to 'completed'. The command will:

- complete the existing started activity, specified by key fields
- update activity fields

The command will fail if:

- activity does not exist in ETAdirect
- activity status is other than 'started'
- 'command/time' is less than the activity start time

7.3.3 'notdone_activity' Command

The command affects only the started activity specified by the key fields that exists in the system and sets the activity status to 'not done'. The command will:

- set the existing started activity, specified by the key fields to 'not done'
- update the activity fields with the fields of the Activity Message

The command will fail if:

- activity does not exist in ETAdirect
- activity status is other than 'started'
- 'command/time' is less than the activity start time

7.3.4 'suspend_activity' Command

The command affects only the started activity specified by the key fields that exists in the system, sets the activity status to 'pending' and creates a new 'suspended' activity. The command will:

- set the existing started activity specified by the key fields to 'pending' and make it not-ordered
- create a new activity with 'suspended' status that duplicates the 'pending' activity
- set the 'end_time' of the suspended activity to 'command/time'
- update the 'pending' activity fields with the fields of the Activity Message

The command will fail if:

- activity does not exist in ETAdirect
- activity status is other than 'started'
- 'command/time' is less than the activity start time

7.3.5 'update_activity' Command

The command affects only the activity specified by the key fields:

1. If no activities with the specified key field values exist in the system:

a new activity is inserted

standard and custom fields are set for it as specified in the Activity Message

2. If a 'pending' activity with the specified key field values exists in the system:

its date, resource, fields, and custom fields are updated/replaced as specified in the Activity Message

all duplicating activities are deleted/cancelled

3. if a 'started', 'cancelled' from the ETAdirect GUI, 'completed' or 'notdone' activity with the specified key field values exists in the system, it is processed in accordance with its 'action_if_completed' meaning

7.3.6 'cancel_activity' command

1. If no activities with the specified key field values exist in the system, the command is rejected

2. If an activity with the specified key field values exists in the system:

activity standard and custom fields are updated ('update_activity' command)

activity is cancelled

all duplicating activities are deleted

3. If the existing activity is not-scheduled and the 'date' field is not defined:

if the resource for the current day is valid, the activity is rescheduled to the current date and then cancelled

if the resource is not working or not valid for the current day and the fallback resource is specified and valid, the activity is moved to the fallback resource, rescheduled to the current date and then cancelled

if the resource is not working or not valid for the current day and fallback resource is not specified or is invalid, the command is rejected and the activity is not cancelled

7.3.7 'delete_activity' Command

The command affects the pending activity specified by the key fields that exists in the system and deletes the activity from the system if the route has not been started yet or cancels activity otherwise. The command will:

1. move the activity to the specified resource, if the 'external_id' is specified in the command and is different from the existing activity 'external_id'

2. if the resource's route is active:

update the standard and custom fields ('update_activity' command)

cancel the activity

3. if the resource's route is inactive – delete activity

The command will fail if:

- the activity does not exist in ETAdirect
- activity status is other than 'pending'

8 Advanced Message Creation. Processing ETAdirect Inventory from Salesforce

As soon as ETAworkforce has been deployed, the Inventory Message custom object is created in the Client's Salesforce Organization. To view and edit the Inventory Message object, select 'Organization' → {Salesforce User Name} → 'Setup' → 'Create' → 'Objects' → 'Inventory Message'. In some cases the complexity of the Client's Salesforce-based application requires ability to create Inventory Message instances and send them to ETAdirect via ETAworkforce to process the Inventories from the Application Code. For that purpose, the code needs to be implemented that creates Inventory Message object instance with all necessary fields that define the way Inventory instance in ETAdirect is to be processed. To ensure successful Inventory processing from ETAworkforce it is necessary to explain the logics of possible actions and operations.

Note: For more details on Inventory Processing please refer to 'Inbound SDK' document.

8.1 Inventory Processing Details

In the context of Salesforce, Inventory is a piece of hardware existing at the customer's premises before the activity performance. It is referred to as 'customer inventory'. Customer inventory is actually an activity property of the activity it is assigned to.

Serialized and Non-Serialized Inventory

Serialized inventory is identified with a serial number, while non-serialized inventory has no serial number and is identified by inventory type and model. Non-serialized inventory has the 'quantity' property which defines the number of inventory units in the pool.

8.1.1 Updating Activity Inventory

In the course of activity-related commands execution, activity inventory's properties can be updated. All activity inventory specified in the request is validated and the inventory that has been validated is updated.

8.1.1.1 Activity Inventory Validation

Inventory is validated or rejected if conditions are not met, and the successfully validated activity inventory items are updated. The inventory is validated as follows:

IF: inventory keys are not set

THEN: inventory is rejected with the 'inventory key fields are not defined' message

IF: inventory has no properties at all

THEN: inventory is rejected with the 'inventory properties are absent' or 'inventory key is absent' message

IF: any of inventory key fields is not specified

THEN: inventory is rejected with the 'inventory key field <FIELD> is empty' or 'inventory key field <FIELD> is absent' message

IF: any of 'inv_pid', 'inv_aid', 'invtype', 'invid', 'inv_change_invid' values are non-numeric

THEN: inventory is rejected with the 'inventory key field <FIELD> has numeric type but non-numeric value <VALUE>' message

IF: any inventory property has no name

THEN: inventory is rejected with the 'property has no name' message

NOTE: If an inventory fails any of the following checks, then only this inventory action is not performed.

8.1.1.2 Updating Validated Inventory

No existing inventory is deleted. For each inventory piece, the following logics are realized:

IF: the existing activity has inventory with the same key values as this inventory

THEN: all non-key fields of the existing inventory are updated with the values from the Inventory Message AND the fields of the existing inventory absent in Inventory Message are deleted (if any)

IF: the existing activity does not have this inventory

THEN: new inventory is inserted

9 Advanced Message Creation. Processing ETAdirect Required Inventory from Salesforce

As soon as ETAworkforce has been deployed, the Required Inventory Message custom object is created in the Client's Salesforce Organization. To view and edit the Required Inventory Message object, select 'Organization' → {Salesforce User Name} → 'Setup' → 'Create' → 'Objects' → 'Required Inventory Message'. In some cases the complexity of the Client's Salesforce-based application requires ability to create Required Inventory Message instances and send them to ETAdirect via ETAworkforce to process the Required Inventories from the Application Code. For that purpose, the code needs to be implemented that creates Required Inventory Message object instance with all necessary fields that define the way Required Inventory instance in ETAdirect is to be processed. To ensure successful Required Inventory processing from ETAworkforce it is necessary to explain the logics of possible actions and operations.

Note: For more details on Required Inventory Processing please refer to 'Inbound SDK' document.

9.1 Required Inventory Processing Details

If an 'update_activity' command contains a 'required_inventories' element, then:

- the existing required inventories of the activity are deleted
- new required inventories are added when specified in the request
- an empty 'required_inventories' element deletes all existing required inventories of the activity

The required inventory will not be added if:

- command type is not 'update_activity'
- activity status is other than 'pending'
- activity does not have the 'required inventory support' feature enabled
- Inventory Type specified in the request is invalid
- model specified in the request does not match the model property rules
- Required Inventory with this type ID and Model already exists for this activity

In all of the above cases, a warning is returned in response and the rest of the command is executed without modifying the required inventory.

Note: each Activity Message in ETAworkforce contains the 'Update required inventory' field set to 'true' by default. Therefore, a Required Inventory Message is sent even when there is no required inventory for the activity. In this case, the following warning may be issued: 'Cannot add required inventories: 'It is not allowed to set required inventory for this type of activity. ApptID=xxxx''.

In this case, depending on the actual situation, either enable the 'Support of required inventory' feature for the Activity Type or disable the 'Update required inventory' field for the Activity Message by changing the trigger.

10 Advanced Message Processing. Updating Salesforce Objects from ETAdirect

Subject to the conditions defined in the System Requirements Specification, the list of message scenarios is created, used to deliver Messages to ETAworkforce. While some of these Messages provide ETAworkforce users with transaction success details, some Messages can be used to modify the values of the Message instances and, sequentially of another mapped Salesforce object (if any).

Basically upon certain event or condition in the system, ETAworkforce will receive the Message with a set of Message fields and values.

11 Troubleshooting

All events occurring between Salesforce and ETAdirect are recorded in the Service Run History, a special Salesforce object intended to store the operations history. The log records can be viewed on the 'Troubleshooting' screen accessible by clicking the 'Troubleshooting' link on the 'Settings View' screen.

Figure 73: 'Troubleshooting' link

This link opens the 'Troubleshooting' screen.

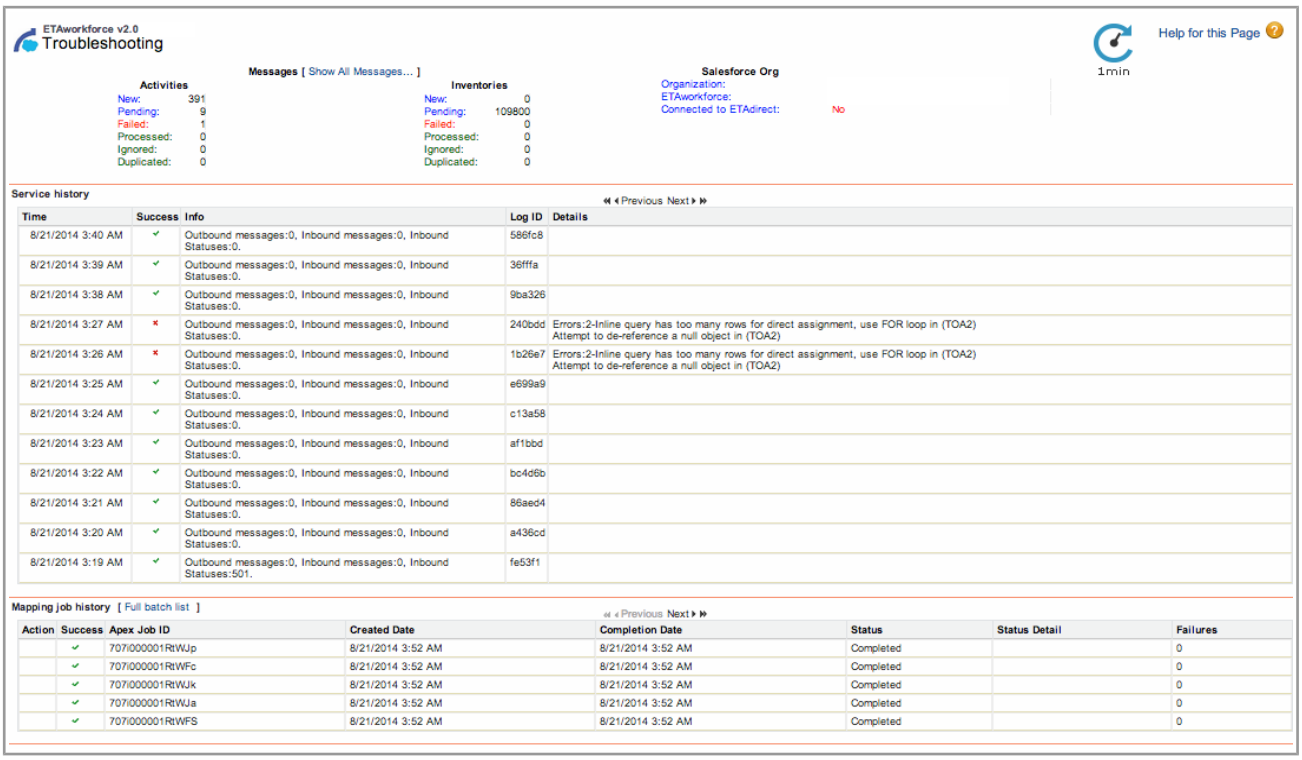


Figure 74: 'Troubleshooting' screen

The header of the 'Troubleshooting' screen contains the summary of all processed messages by statuses. The message summary is grouped by objects (Activities, Inventories, Required Inventories or Activity Links). The message summary is shown only for the objects for which mapping has been defined. When no mapping rules exist for an object, the 'Troubleshooting' screen has no message summary column for such object.

Also, the header contains the Salesforce organization info (the name and ID, the ETAworkforce version used and the ETAdirect connection status).

The control in the top right of the 'Troubleshooting' screen allows enabling or disabling the auto-update of the screen. When auto-update is enabled, the screen is refreshed automatically every minute. Otherwise,

the user has to refresh the screen manually. Click the control to switch the update mode.

Figure 75: Auto-update disabled (left) and enabled (right)

The 'Service history' section contains the details of each agent run as follows:

Time – date and time of the agent run

Success – agent run status

Info – number of all messages in the 'pending' status which were sent to ETAdirect (Outbound messages), number of all ETAdirect updates received (Inbound messages), and number of all statuses received from ETAdirect (Inbound statuses)

Log ID – identification number of the agent run recorded in the log

Details – error message sent if an error occurred.

The 'Troubleshooting' screen also has the 'Mapping job history' and 'Deleting job history' sections logging the performed mapping and deleting jobs with their details. These sections contain the summary of the detailed information which can be found under Setup → Administration Setup → Monitoring → Apex Jobs.

Note: only 5 jobs can be running at the same time.

The 'Debug Log' section contains the summary of debug operations information which can be found under Setup → Administration Setup → Monitoring → Debug Logs. Add the interface user to the 'Monitored users' list in the 'Debug Logs' screen by clicking 'New' and selecting the interface user.

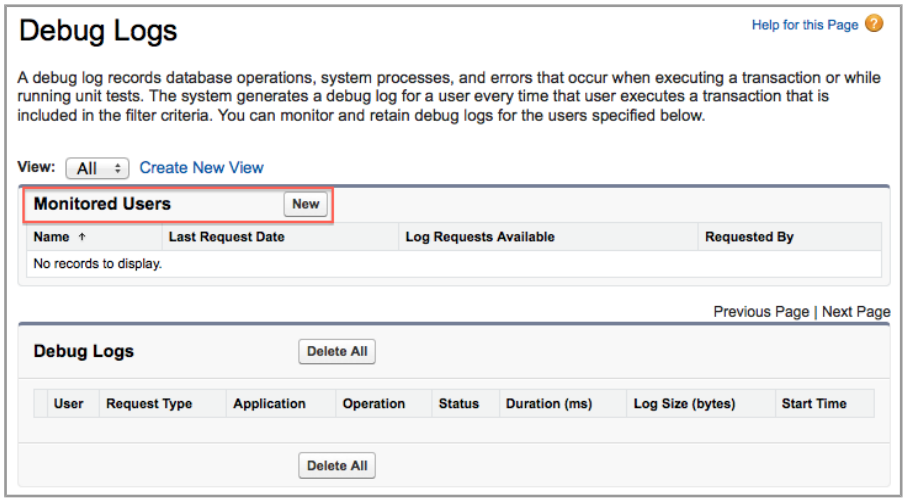


Figure 76: Adding new monitored user

The logs can be downloaded in text format.

11.1 Other Salesforce Logs

In addition to the log data displayed on the 'Troubleshooting' screen, other Salesforce logs are available. They can be found under Setup → Administration Setup → Monitoring.

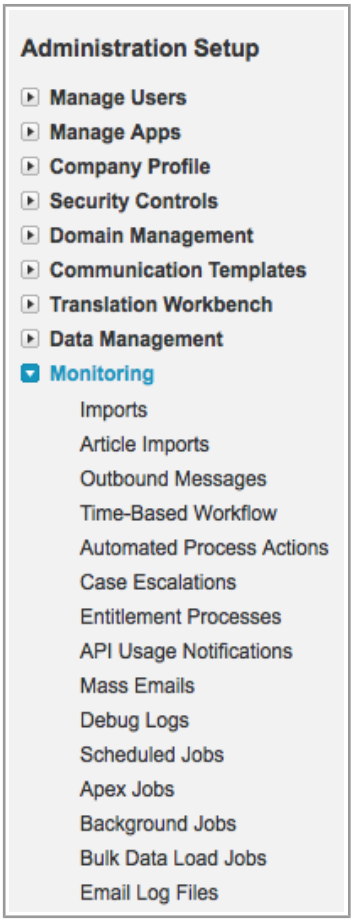


Figure 77: Salesforce logs

11.2 Potential Errors and Solutions

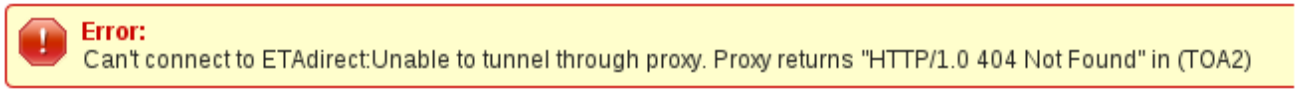
Should any issues occur in the connection between Salesforce and ETAdirect, make the following checks:

- Check 'Last connect message' in the ETAworkforce sidebar component
- Check 'Last connect message' on the ETAworkforce settings page
- Check 'Service Run History' on the 'Troubleshooting' screen to make sure that the agent connects to Salesforce and attempts to process messages
- Check the current Salesforce user e-mail
- Check the primary contact e-mail of the Salesforce Organization
- Try clicking 'Connect/Reconnect to ETAdirect...' from the ETAworkforce Settings page

If the problem persists, contact TOA support.

The following errors may occur:

Error 404:

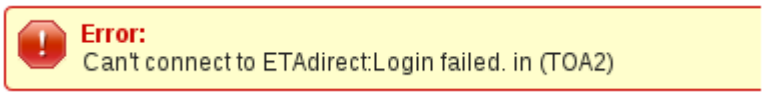


When Error 404 occurs, check ETAdirect URL on the Settings page. If the URL stated on the page is correct, contact TOA support.

API Portal error:

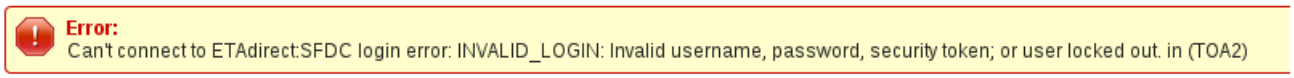
When API-Portal error occurs, check the Instance name. If the Instance name is correct, contact TOA support.

Login Failed error:



When Login Failed error occurs, check the User login and User password.

INVALID_LOGIN error (only on the Settings screen):



When INVALID_LOGIN error occurs, check the Interface user login, Interface user token, Interface user password and Salesforce login URL.

In the event of any errors related to the limits of the 'Service Run History' or 'Mapping jobs' tables, lower the current limits on the 'ETAworkforce Settings' screen.

12 ETAworkforce Package Uninstallation

To uninstall ETAworkforce2, the user should log in to Salesforce.com using the login URL provided by TOA Technologies and access the 'Installed Packages' screen ({Salesforce User Name} → Setup → App Setup → Installed Packages).

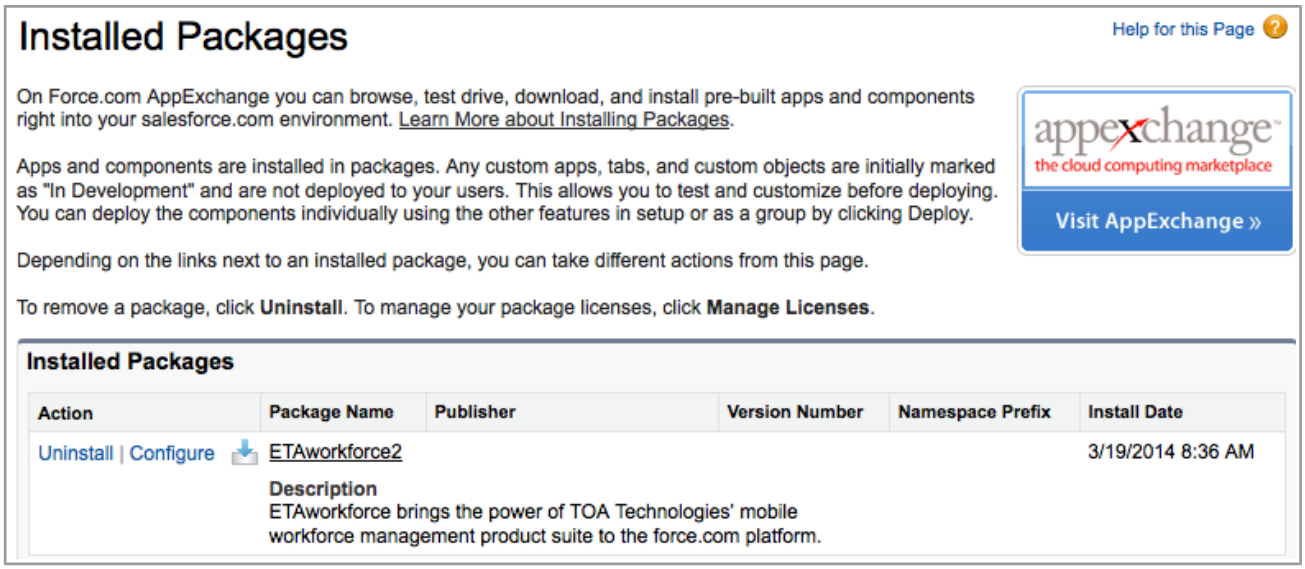


Figure 78: 'Installed packages' screen

If the installed package settings are required for further use, they can be stored by clicking 'Configure' and 'Store setting to a file...' in the next screen.

All existing triggers should be deleted in the 'Apex Triggers' screen ({Salesforce User Name} → Setup → App Setup → Develop → Apex Triggers).

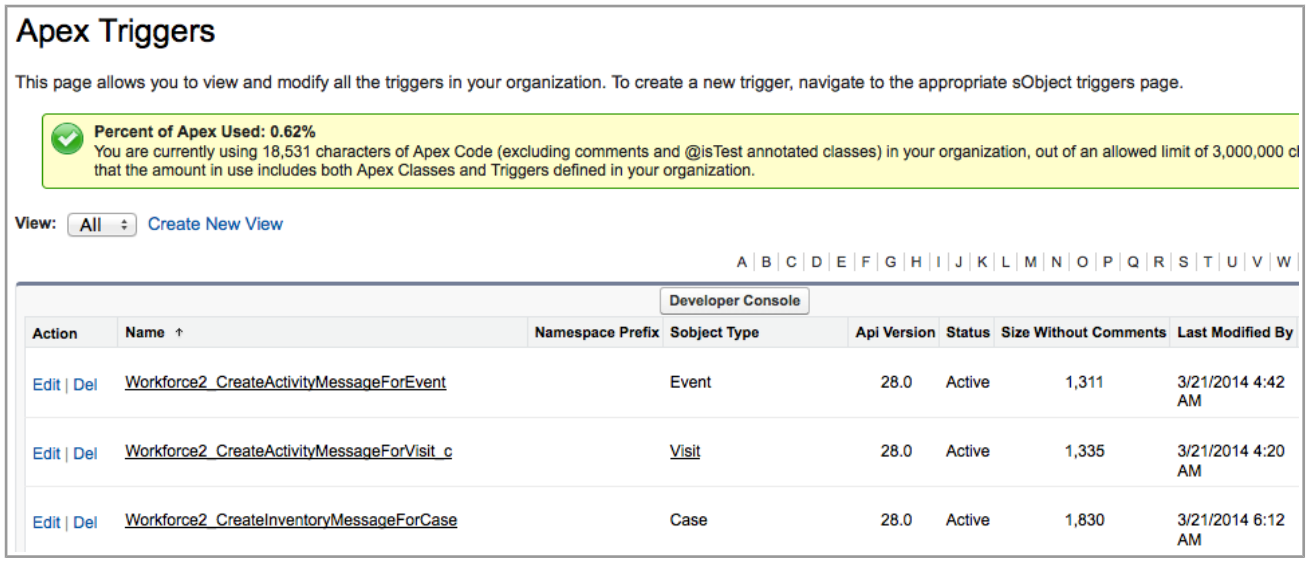


Figure 79: 'Apex Triggers' screen

Each trigger should be deleted by clicking the 'Del' link in the 'Action' column.

When all triggers are deleted, the ETAworkforce package should be uninstalled from the 'Installed packages'

screen by means of the 'Uninstall' link. The link leads to the 'Uninstalling a package' screen listing the package components and customs object data which will be deleted in the process of uninstallation. The uninstallation is to be confirmed by checking the 'Yes, I want to uninstall this package and permanently delete all associated components' and clicking the 'Uninstall' button.