

Overview

Short Description

The application is a Web application making use of cloud services to track the whereabouts of almost any type of physical asset (unit).

Potential users are fleet managers who would subscribe to the service for keeping track of their assets.

Features

- Enables users to track business assets containing GPS devices showing current and historical asset locations in tables and Google Maps.
- Enables users to define landmarks that can be used for issuing notifications upon asset arrival and departure.
- Implemented to use JSON Web Token security.
- Implemented as a single application to manage many accounts, where user management is separately controlled by the account managers.
- Developed to work with both small and large screen sizes.
- Lightweight serverless implementation taking advantage of Google cloud services.
- Allows application administrators to limit individual account utilizations by parameters such as time, transaction load, etc.

Devices

An android application, LayTrax, has been developed to work with this application, no OBD GPS devices, are currently available.

Supported Browsers

Google Chrome

Operational Costs

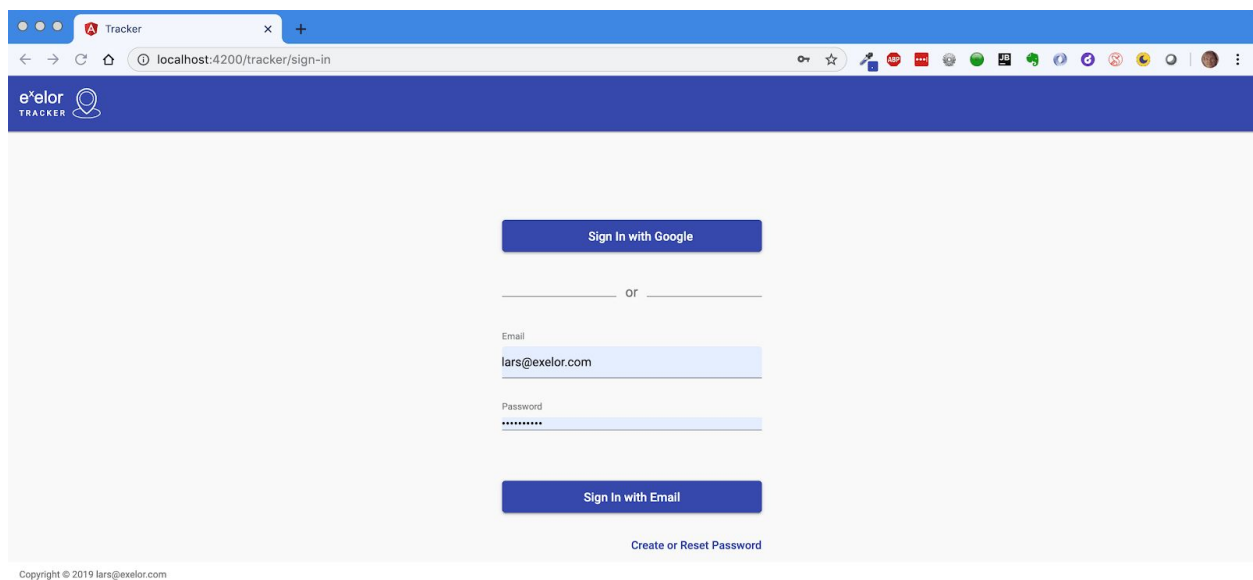
Google's Firestore charging algorithms take database writes, reads, storage, and network egress into account.

Income Potential

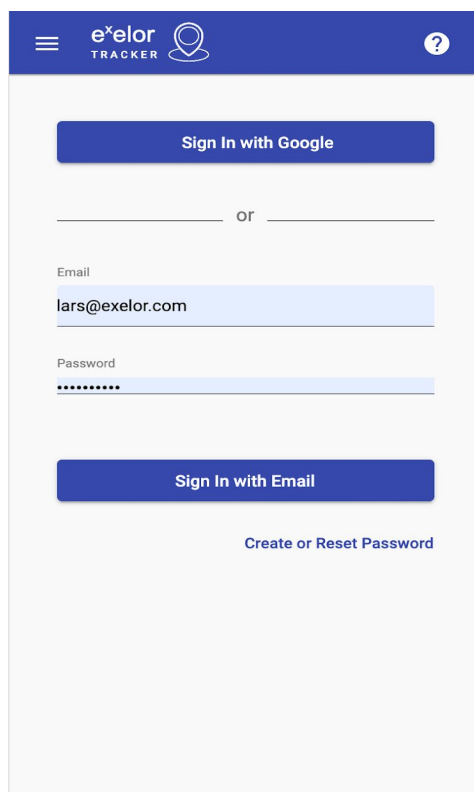
Customers pay for time-limited account service subscriptions. Customers may also be given free trial periods with strict resource limitations.

User Access

Sign In



The screenshot shows a web browser window with the address bar displaying "localhost:4200/tracker/sign-in". The page features a blue header with the "e*elor TRACKER" logo. The main content area is white and contains a sign-in form. At the top of the form is a blue button labeled "Sign In with Google". Below it is a horizontal line with the word "or" in the center. Underneath the line are two input fields: "Email" with the value "lars@exelor.com" and "Password" with masked characters "*****". Below these fields is another blue button labeled "Sign In with Email". At the bottom of the form is a link that says "Create or Reset Password". The footer of the page contains the text "Copyright © 2019 lars@exelor.com".



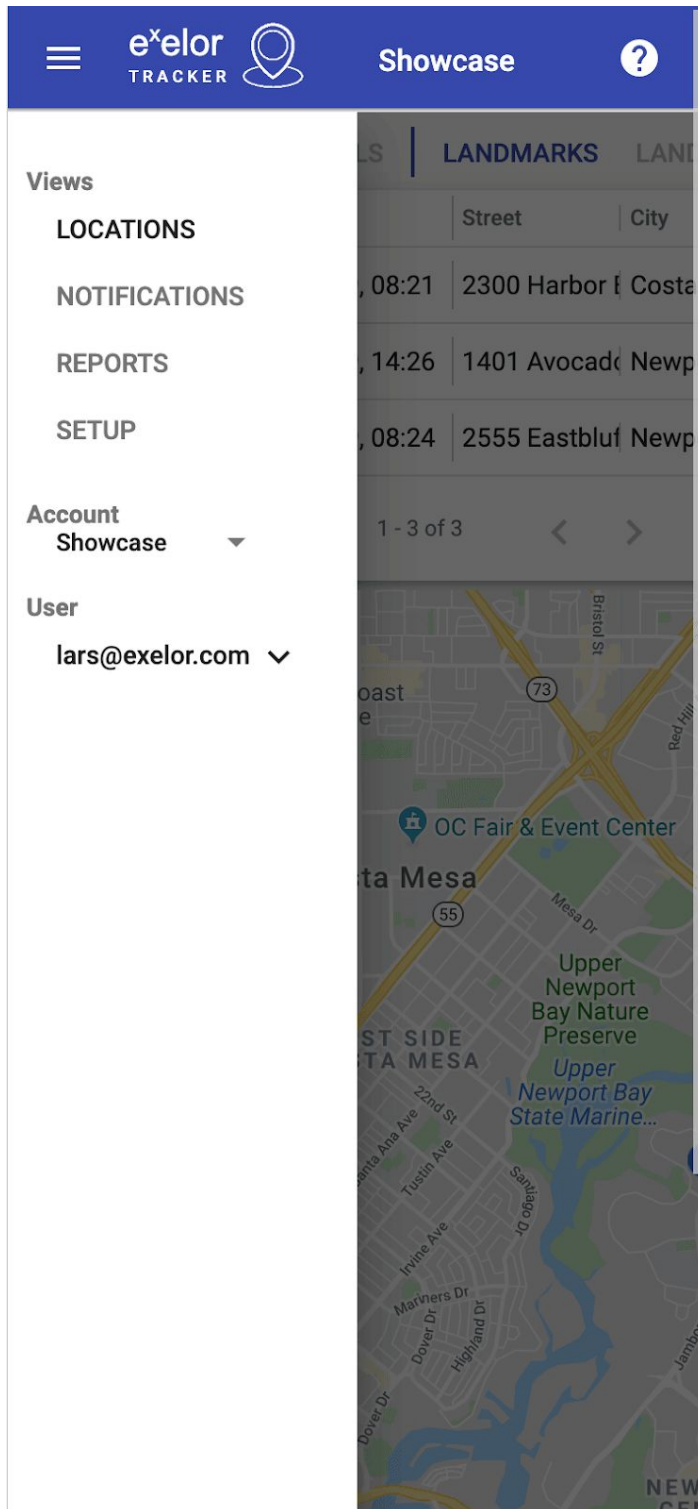
This screenshot shows the same sign-in page as the previous one, but with a dark blue sidebar on the left. The sidebar contains a hamburger menu icon, the "e*elor TRACKER" logo, and a question mark icon. The sign-in form is now positioned to the right of the sidebar. The form elements are identical to the previous screenshot: a "Sign In with Google" button, an "or" separator, email and password input fields (with "lars@exelor.com" and "*****" respectively), a "Sign In with Email" button, and a "Create or Reset Password" link.

Having been given account access by an account administrator users can sign in with Google or by using their email addresses. First-time users signing in with email must use the Create or Reset Password link to create their initial passwords. When creating or resetting the passwords, it is necessary that the users have access to the email account for the email address.

In addition to providing a user with access to the account, the administrator also specifies the user's role permissions, such as read, create, and update.

A given user may be given access to multiple accounts and with different role permissions on the different accounts.

Mobile Device Interface



To accommodate smaller devices the user interface is made to respond to the screen width. In such cases, the items on the top navigation bar may appear inside a collapsible side drawer and tables and maps may be stacked vertically as opposed to be positioned side by side.

Locations Module

Unit Locations View

UNITS	UNIT	DETAILS	LANDMARKS	LANDMARK
Name	Time	Street	City	Lat
Pixel 3	11-02-2019, 08:21	2300 Harbor Bou	Costa Mesa	
Pixel 3a XL	11-08-2019, 20:01	300 Avenida Carl	Newport Beach	Bl
Galaxy Note 4	11-07-2019, 14:26	1401 Avocado A	Newport Beach	
Simulator One	11-05-2019, 08:24	2555 Eastbluff D	Newport Beach	

Items per page: 20 1 - 4 of 4

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UNITS	UNIT	DETAILS	LANDMARKS	LAND
Name	Time	Street		
Pixel 3	11-02-2019, 08:21	2300 Harbor Bou		
Galaxy Note 4	11-05-2019, 13:19	1981 Vista Cauda		
Simulator One	11-05-2019, 08:24	2555 Eastbluff Dr		

Items per page: 20 1 - 3 of 3

Showing the current location of all units for account Showcase.

The selected unit has the red marker on the map.

[Work is needed to, instead of PNGs, create an SVG marker, which can be pointed correctly with respect to the bearing from one map point to the next (some issues with SVGs and the map library). Also, the selected marker should have the color of the selected row.]

A double-click on the table row for a given unit brings up the Unit History View for that unit.

Users with access to multiple accounts can switch between their accounts using a drop-down menu on the top navigation bar.

Unit History View

Tracker

localhost:4200/tracker/locations/lg/unit-history/e986aaf40fb5ce52

e*elox TRACKER

LOCATIONS NOTIFICATIONS REPORTS SETUP SIMULATOR Showcase

lars@exelox.com

UNITS UNIT DETAILS LANDMARKS LANDMARK

Galaxy Note 4 History

11/7/2019 to 11/7/2019

Time	Street	City	Landmarks
11-07-2019, 14:26	1401 Avocado Av	Newport Beach	
11-07-2019, 14:25	567 San Nicolas C	Newport Beach	
11-07-2019, 14:25	550 Newport Cent	Newport Beach	
11-07-2019, 14:22	906 Spring Tide D	Newport Beach	
11-07-2019, 14:20	2022 Barranca	Newport Beach	Bluffs 1000

Items per page: 20 1 - 5 of 5

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e*elox TRACKER Showcase

UNITS UNIT DETAILS LANDMARKS LAND

Galaxy Note 4 History

11/5/2019 to 11/5/2019

Time	Street	City
11-05-2019, 13:19	1981 Vista Caudal	Newport Beach
11-05-2019, 13:18	1419 Sea Ridge Dr	Newport Beach
11-05-2019, 13:01	1419 Sea Ridge Dr	Newport Beach
11-05-2019, 12:44	302 Avenida Carlo	Newport Beach
11-05-2019, 12:34	1419 Sea Ridge Dr	Newport Beach
11-05-2019, 12:04	302 Avenida Carlo	Newport Beach
11-05-2019, 12:01	1419 Sea Ridge Dr	Newport Beach
11-05-2019, 11:37	302 Avenida Carlo	Newport Beach
11-05-2019, 11:31	1121 Back Bay Dri	Newport Beach
11-05-2019, 11:21	302 Avenida Carlo	Newport Beach
11-05-2019, 11:19	1121 Back Bay Dri	Newport Beach

Items per page: 20 1 - 11 of 11

Costa Mesa Newport Beach

Showing a particular unit's whereabouts over time.

The table content is filtered by date range, is paginated, and, in addition to time and location, shows any landmarks visited.

A double-click on the table row for a given history point in time brings up the Unit Details View for that unit.

Unit Details View

Galaxy Note 4	
Account	Showcase
Accuracy	58.01300048828125
Address	
Street	1401
Locality	Avocado Avenue
Postal Code	92660
County	Orange County
Country	United States
Altitude	38.29999923706055
Altitude Given	true
Bearing	0
Bearing Given	false
Bearing Forward	

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Galaxy Note 4	
Account	Showcase
Accuracy	23.02899932861328
Address	
Street	1981
Locality	Vista Caudal
Postal Code	92660
County	Orange County
Country	United States
Altitude	-13.199999809265137
Altitude Given	true
Bearing	0
Bearing Given	false
Bearing Forward	
Device ID	e986aaf40fb5ce52
Device Time	2019-11-05, 13:19:27
Document ID	E8SIYad7m0DgFRxa97yH
Email	lars@exelorr.com
Landmarks	Bluffs
	Bluffs 1000
Latitude	33.6345154
Longitude	-117.8848439
Previous Location Bearing	-0.408827006816864

The table shows all data received from the device transmitting from the unit at a particular time of the monitored history.

Landmarks View

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Items per page: 10 0 of 0

Showing all landmarks defined for the account. Selecting a landmark row in the table makes the map flag bounce a few times and assume the color of the selected row.

All landmarks are circular with colors and radius lengths controlled by the users.

The number of units present, if any, at the landmarks are shown in the table.

For further details on a selected landmark, click the **LANDMARK** link.

Landmark View

Tracker

localhost:4200/tracker/locations/lg/(place//map:place-map)

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LOCATIONS NOTIFICATIONS REPORTS SETUP SIMULATOR Showcase

lars@exelorr.com

UNITS UNIT DETAILS LANDMARKS LANDMARK

Gardena

Landmark ID	Gardena
Units Present	
Fence Radius (meters)	100
Latitude	33.8929929
Longitude	-118.29500489999998
Last Modified	2019-10-30, 15:06:41
comment	

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e*elorr TRACKER

Showcase

UNITS UNIT DETAILS LANDMARKS LANDMARK

Gardena

Landmark ID	Gardena
Units Present	
Fence Radius (meters)	100
Latitude	33.8929929
Longitude	-118.29500489999998
Last Modified	2019-10-30, 15:06:41
comment	

Showing the details for the selected landmark.

Notifications Module

Notifications

Subscription	Time	Type	Landmark	Device Name
<input checked="" type="checkbox"/> Bluffs 1000 Arrival	11/8/19, 8:01 PM	Arrival	Bluffs 1000	Pixel 3a XL
<input checked="" type="checkbox"/> Gardena Arrival	11/8/19, 8:30 AM	Arrival	Gardena	Pixel 3a XL
<input checked="" type="checkbox"/> Bluffs 1000 Arrival	11/7/19, 6:10 PM	Arrival	Bluffs 1000	Pixel 3a XL
<input checked="" type="checkbox"/> Bluffs Departure	11/7/19, 2:20 PM	Departure	Bluffs	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs Arrival	11/5/19, 1:19 PM	Arrival	Bluffs	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 1:19 PM	Arrival	Bluffs 1000	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs Departure	11/5/19, 1:01 PM	Departure	Bluffs	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 12:44 PM	Arrival	Bluffs 1000	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs Arrival	11/5/19, 12:44 PM	Arrival	Bluffs	Galaxy Note 4
<input checked="" type="checkbox"/> Bluffs Departure	11/5/19, 12:34 PM	Departure	Bluffs	Galaxy Note 4

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Subscription	Time	Type	Landmark
<input type="checkbox"/> Bluffs Departure	11/7/19, 2:20 PM	Departure	Bluffs
<input type="checkbox"/> Bluffs Arrival	11/5/19, 1:19 PM	Arrival	Bluffs
<input type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 1:19 PM	Arrival	Bluffs 1000
<input type="checkbox"/> Bluffs Departure	11/5/19, 1:01 PM	Departure	Bluffs
<input type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 12:44 PM	Arrival	Bluffs 1000
<input type="checkbox"/> Bluffs Arrival	11/5/19, 12:44 PM	Arrival	Bluffs
<input type="checkbox"/> Bluffs Departure	11/5/19, 12:34 PM	Departure	Bluffs
<input type="checkbox"/> Bluffs Arrival	11/5/19, 12:04 PM	Arrival	Bluffs
<input type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 12:04 PM	Arrival	Bluffs 1000
<input type="checkbox"/> Bluffs Departure	11/5/19, 12:01 PM	Departure	Bluffs
<input type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 11:37 AM	Arrival	Bluffs 1000
<input type="checkbox"/> Bluffs Arrival	11/5/19, 11:37 AM	Arrival	Bluffs
<input type="checkbox"/> Bluffs Departure	11/5/19, 11:31 AM	Departure	Bluffs
<input type="checkbox"/> Bluffs 1000 Arrival	11/5/19, 11:21 AM	Arrival	Bluffs 1000
<input type="checkbox"/> Bluffs Arrival	11/5/19, 11:21 AM	Arrival	Bluffs

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Showing notifications issued based upon conditions specified by users.

Currently, only landmark arrival and departure notifications are supported.

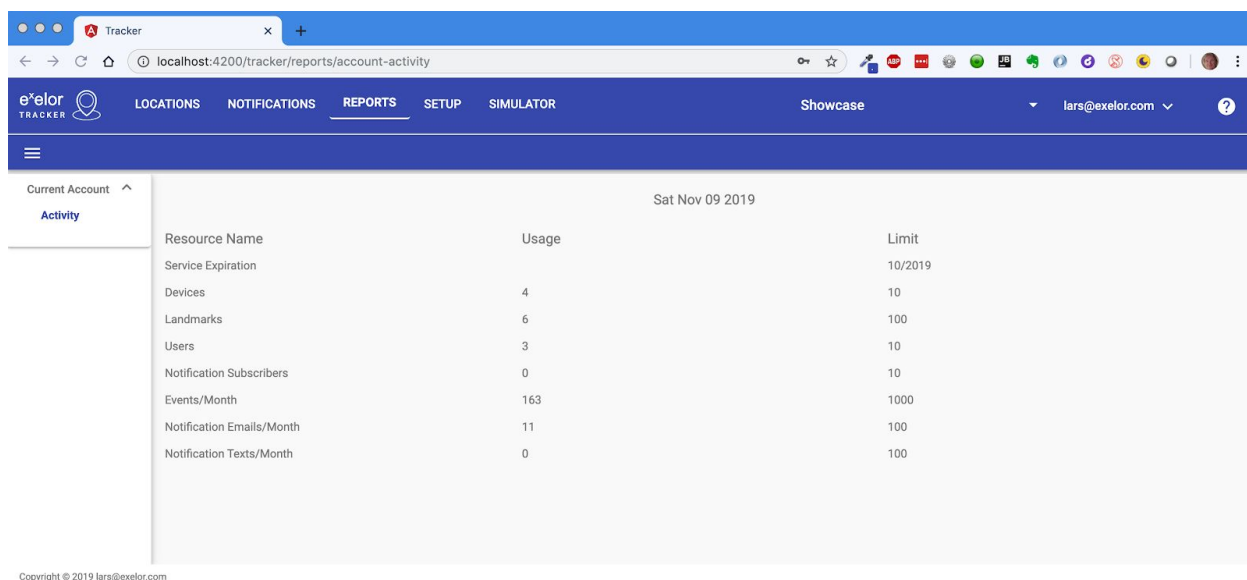
Notifications may also be issued in the form of email and text messages.

Reports Module

This module is intended to support various reporting functions. Report may be displayed on the screen and/or exported as CSV files.

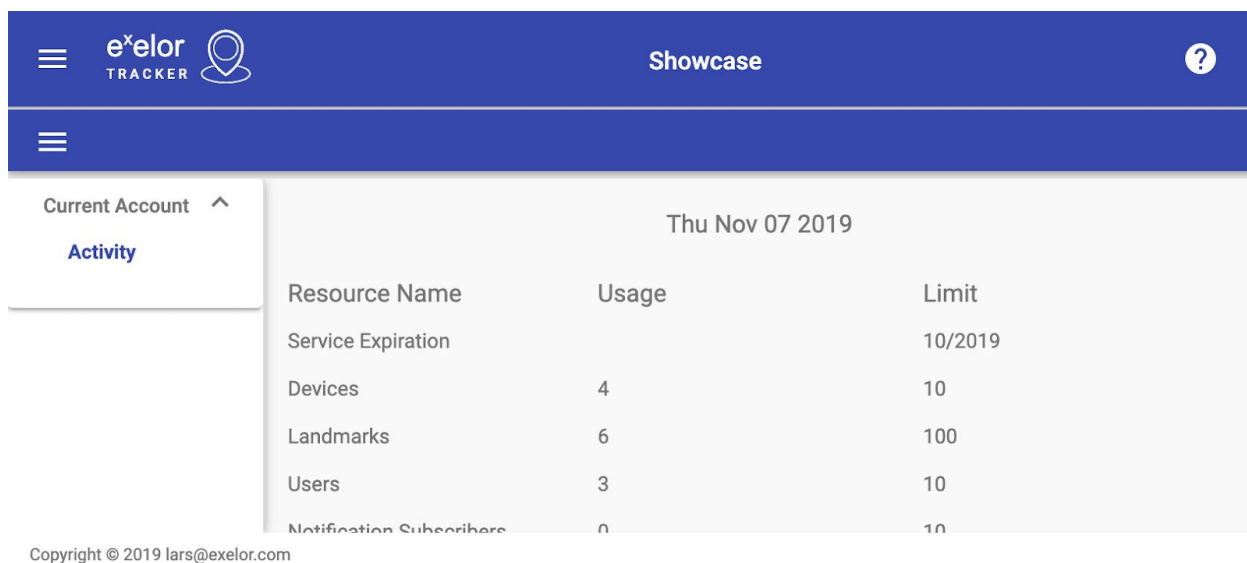
Report implementations may be restricted on mobile devices.

Account Activity



Resource Name	Usage	Limit
Service Expiration		10/2019
Devices	4	10
Landmarks	6	100
Users	3	10
Notification Subscribers	0	10
Events/Month	163	1000
Notification Emails/Month	11	100
Notification Texts/Month	0	100

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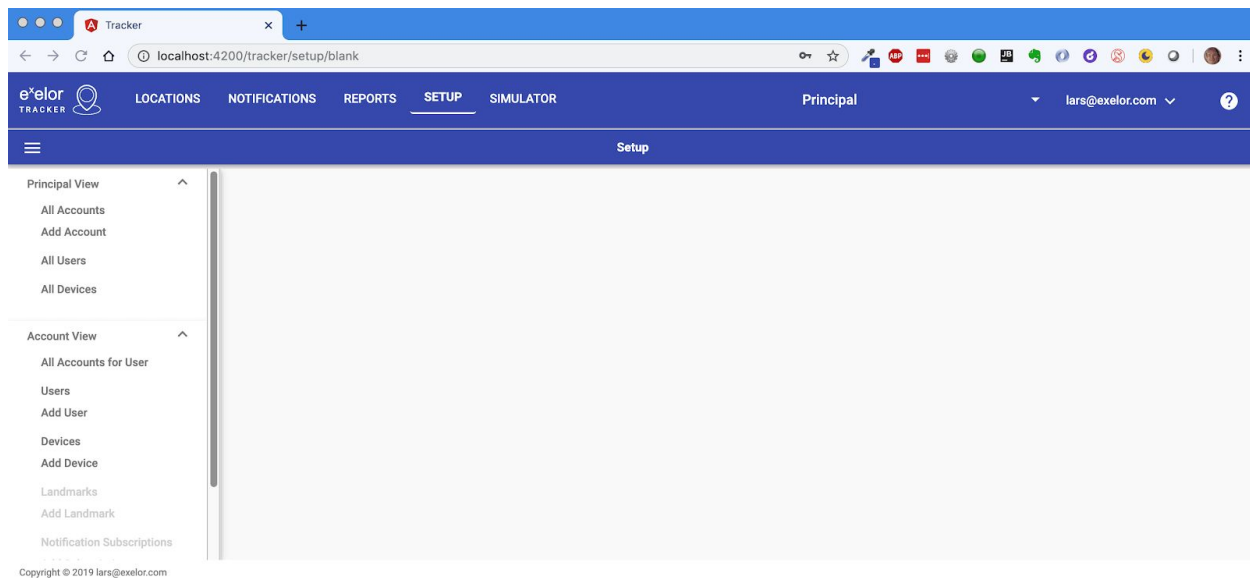
Resource Name	Usage	Limit
Service Expiration		10/2019
Devices	4	10
Landmarks	6	100
Users	3	10
Notification Subscribers	0	10

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Setup Module

The Setup Module is used for creating and setting up user accounts. The user interface supports both desktop and mobile size screens, but we will show only the desktop screenshots in the following.

Principal Account



The two views, Principal and Account, separates system users from account users. Only Principal account users with special user roles can create new accounts and deactivate existing accounts. A Principal user must also create the initial account administrator for a new account.

Other than that, Principal users can view all accounts as well as all users and devices regardless of their user account assignments.

Add Account

The following steps are needed to create a new account.

Tracker

localhost:4200/tracker/setup/create-principal-account

e*elOR TRACKER

LOCATIONS NOTIFICATIONS REPORTS **SETUP** SIMULATOR

Principal lars@exelor.com

Add Account

Principal View

- All Accounts
- Add Account**
- All Users
- All Devices

Account View

- All Accounts for User
- Users
- Add User
- Devices
- Add Device
- Landmarks
- Add Landmark
- Notification Subscriptions
- Add Subscription
- Notification Subscribers
- Add Subscriber

☐ Active

Name *

Sample

Address 1

Address 2

City

State

Postal Code

Modified

Created

Description

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After Save the new account appears in the account list:

Tracker

localhost:4200/tracker/setup/principal-accounts-list

e*elOR TRACKER

LOCATIONS NOTIFICATIONS REPORTS **SETUP** SIMULATOR

Principal lars@exelor.com

All Accounts

Name	Active	Service Constraints
BMW	false	...
Principal	true	...
Sample	true	...
Shakedown	false	...
Showcase	true	...
Tracking Demo	true	...

Items per page: 10 0 of 0 < >

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Click the “more” button in the Service Constraints column to view and edit the service constraints for the account. The application will refuse requests that exceed the set resource limits.

The screenshot shows the 'eXelOR TRACKER' web application interface. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP', and 'SIMULATOR'. The 'SETUP' tab is active, and the 'Principal' account is selected. The left sidebar shows a tree view with 'Principal View' (All Accounts, Add Account, All Users, All Devices) and 'Account View' (All Accounts for User, Users, Add User, Devices, Add Device, Landmarks, Add Landmark, Notification Subscriptions, Add Subscription, Notification Subscribers, Add Subscriber). The main content area is titled 'Account Constraints' and displays the 'Sample Account' configuration. The form includes the following fields:

- Max Devices *: 10
- Max Users *: 10
- Max Landmarks *: 100
- Max Notification Subscriptions *: 100
- Max Notification Subscribers *: 10
- Max Monthly Events *: 1500
- Max Monthly Notification Emails *: 100
- Max Monthly Notification Texts *: 100
- Service Expiration (MM/YYYY) *: 2019/11
- Time Last Modified: November 7, 2019 at 5:48:41 PM GMT-8
- Comment: (empty text area)

At the bottom of the form are 'Cancel' and 'Save' buttons. The footer text reads 'Copyright © 2019 lars@exelOR.com'.

Finally, switch to the new account and create a user that can act as an administrator for the account:

The screenshot shows the 'eXelOR TRACKER' web application interface. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP', and 'SIMULATOR'. The 'SETUP' tab is active, and the 'Sample' account is selected. The left sidebar shows a tree view with 'Principal View' (All Accounts, Add Account, All Users, All Devices) and 'Account View' (All Accounts for User, Users, Add User, Devices, Add Device, Landmarks, Add Landmark, Notification Subscriptions, Add Subscription, Notification Subscribers, Add Subscriber). The main content area is titled 'Add User' and displays the 'Sample' account configuration. The form includes the following fields:

- Email (User ID) *: jdoe@exelOR.com
- Account Roles *: Creator
- Name *: John Doe
- Phone: (empty text area)
- Comment: (empty text area)
- ☒ User can log in
- ☒ User can access current account

At the bottom of the form are 'Cancel', 'Clear', and 'Save' buttons. The footer text reads 'Copyright © 2019 lars@exelOR.com'.

Clicking Save creates the new user and, if the user is not already a member of another account, switches the login to this user. The user is now able to manage the account.

Note that, since the Principal account is no longer selected, the sidebar selections for Principal are no longer enabled. They could alternatively be hidden altogether.

User Accounts

Each user account has its own set of users for monitoring units and landmarks and administrators for managing the accounts.

All Accounts for User

The screenshot shows a web browser window displaying the eXelOR Tracker application. The URL in the address bar is `localhost:4200/tracker/setup/user-accounts-list`. The application has a dark blue header with the eXelOR logo and navigation tabs: LOCATIONS, NOTIFICATIONS, REPORTS, SETUP (active), and SIMULATOR. The user is logged in as 'jdoe@exelOR.com' with the role 'Sample'. The main content area is titled 'All Accounts for User' and contains a table with the following data:

Name	Active
Sample	true

The left sidebar shows a 'Principal View' with links for 'All Accounts', 'Add Account', 'All Users', and 'All Devices'. Below this is an 'Account View' section with a dropdown arrow, containing links for 'All Accounts for User' (selected), 'Users', 'Add User', 'Devices', 'Add Device', 'Landmarks', 'Add Landmark', 'Notification Subscriptions', 'Add Subscription', 'Notification Subscribers', and 'Add Subscriber'. The footer of the application states 'Copyright © 2019 lars@exelOR.com'.

Showing all accounts for the currently signed in user. A double-click on a table row will bring up the previously shown details form for that account.

Users

The screenshot shows the 'e*elOR TRACKER' web application. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP' (selected), and 'SIMULATOR'. The user 'jdoe@exelor.com' is logged in. The 'Users' section is active, displaying a table of users:

Email	Name	Phone	Roles	Active	Signed In
jdoe@exelor.com	John Doe		Creator	true	2019-11-09
lars@exelor.com	Lars H		Creator	true	2019-11-09

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Showing all users having access to the current account. Double-clicking on a table row brings up the user details form, which is also used for adding new users.

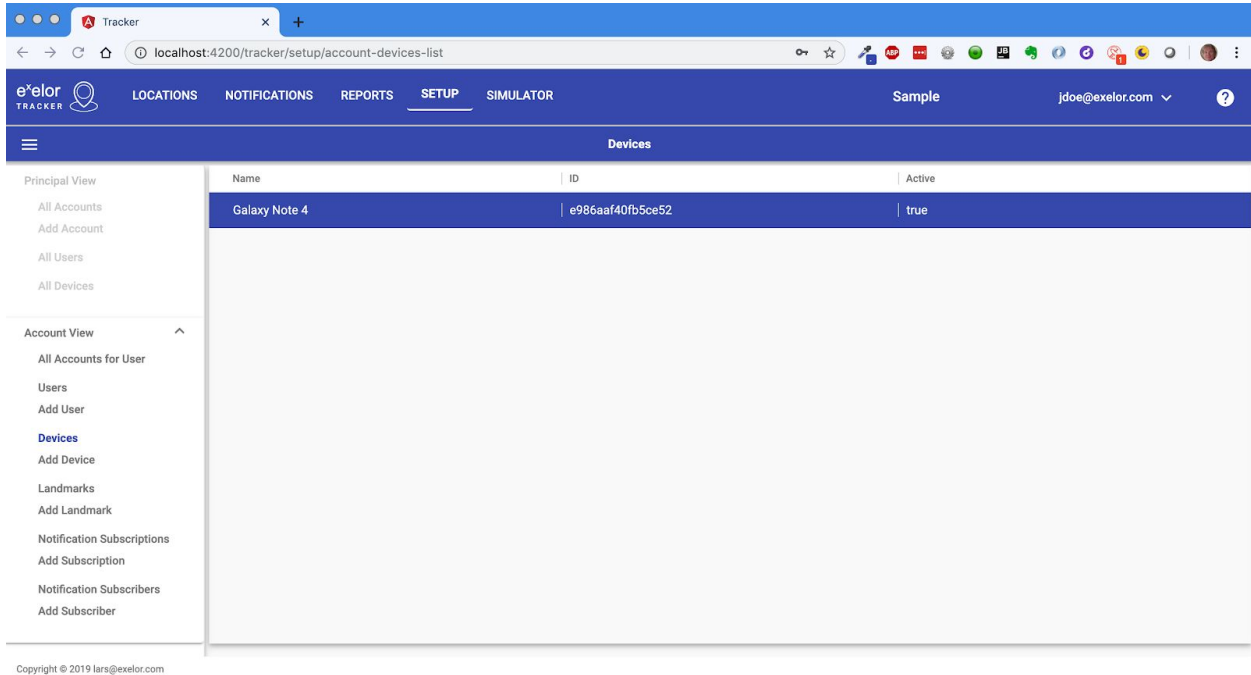
The screenshot shows the 'User Details' form for the user 'jdoe@exelor.com'. The form includes the following fields and options:

- Email (User ID) *: jdoe@exelor.com
- Account Roles *: Creator
- Name *: John Doe
- Phone:
- Last Signin: November 7, 2019 at 8:57:40 PM GMT-8
- Modified: November 7, 2019 at 8:57:40 PM GMT-8
- Created: November 7, 2019 at 8:57:40 PM GMT-8
- Comment:
- ☒ User can log in
- ☒ User can access current account
- Buttons: Cancel, Clear, Save

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Users have no access rights outside of the account of which they are created, but a given user may be added as user inside any number of accounts.

Devices

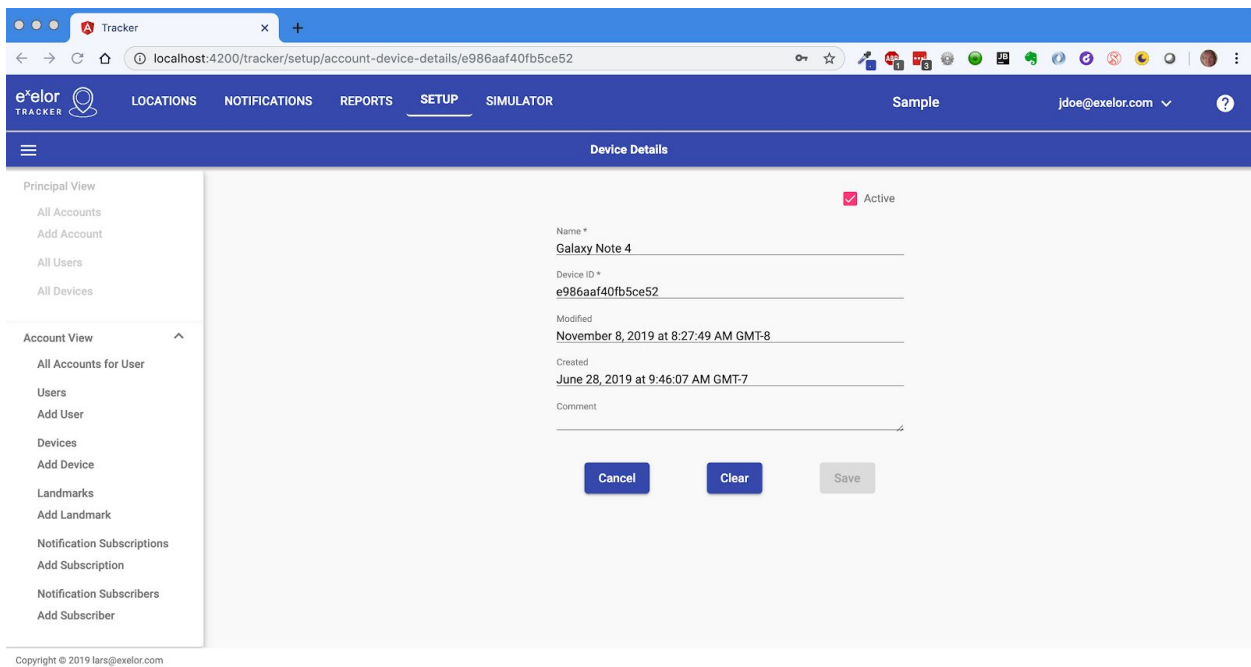


The screenshot shows the Tracker application interface. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP' (selected), and 'SIMULATOR'. The user is logged in as 'jdoe@exelor.com'. The left sidebar shows the 'Principal View' with options like 'All Accounts', 'Add Account', 'All Users', and 'All Devices'. The 'Account View' section is expanded, showing 'All Accounts for User', 'Users', 'Add User', 'Devices' (selected), 'Add Device', 'Landmarks', 'Add Landmark', 'Notification Subscriptions', 'Add Subscription', 'Notification Subscribers', and 'Add Subscriber'. The main content area displays a table of devices:

Name	ID	Active
Galaxy Note 4	e986aaf40fb5ce52	true

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Showing all devices registered with the account. The application will accept input only from registered devices. Double-clicking a device row brings up the details form for that device.



The screenshot shows the Tracker application interface with the 'Device Details' form open. The top navigation bar and user information are the same. The left sidebar shows the 'Principal View' and 'Account View' sections. The main content area displays the 'Device Details' form for the device 'Galaxy Note 4' (ID: e986aaf40fb5ce52). The form includes fields for Name, Device ID, Modified, Created, and Comment. The 'Active' checkbox is checked. The form has 'Cancel', 'Clear', and 'Save' buttons.

Device Details

☒ Active

Name *
Galaxy Note 4

Device ID *
e986aaf40fb5ce52

Modified
November 8, 2019 at 8:27:49 AM GMT-8

Created
June 28, 2019 at 9:46:07 AM GMT-7

Comment

Cancel Clear Save

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This form is also used for adding new devices to the account.

Landmarks

The screenshot shows the Exelior Tracker web application interface. The top navigation bar includes links for LOCATIONS, NOTIFICATIONS, REPORTS, SETUP (active), and SIMULATOR. The user is logged in as 'jdoe@exelior.com'. The main content area is titled 'Landmarks' and features a sidebar on the left with a menu for 'Principal View' (All Accounts, Add Account, All Users, All Devices) and 'Account View' (All Accounts for User, Users, Add User, Devices, Add Device, Landmarks, Add Landmark, Notification Subscriptions, Add Subscription, Notification Subscribers, Add Subscriber). The main table lists landmarks with columns for Name (ID) and Active status. The first entry is 'Wedge 300' with an Active status of 'true'. To the right of the table is a map of Corona Del Mar, California, showing various landmarks like Balboa Pavilion, Balboa Peninsula, Corona Del Mar Bend, and Lookout Point. A red circle highlights the 'Wedge 300' landmark on the map.

Name (ID)	Active
Wedge 300	true

Showing all landmarks defined for the account. Double-clicking a landmark row brings up the details form for that landmark.

Tracker

localhost:4200/tracker/setup/account-landmark/Sample:Wedge%20300

eXelOR TRACKER

LOCATIONS NOTIFICATIONS REPORTS **SETUP** SIMULATOR

Sample jdoe@exel.or.com

Landmark

Principal View

- All Accounts
- Add Account
- All Users
- All Devices

Account View

- All Accounts for User
- Users
- Add User
- Devices
- Add Device
- Landmarks
- Add Landmark
- Notification Subscriptions
- Add Subscription
- Notification Subscribers
- Add Subscriber

☒ Active

Name (ID) *

Wedge 300

Latitude *

33.59477354271358

Longitude *

-117.88311416842276

Fence Radius (meters) *

300

Color *

red

- Address (Use with Preview to obtain coordinates)

Street Number

Street

City

State

Postal Code

Country

Modified

11/8/19, 8:47 AM

Created

11/8/19, 8:47 AM

Comment

Cancel Delete Preview Save

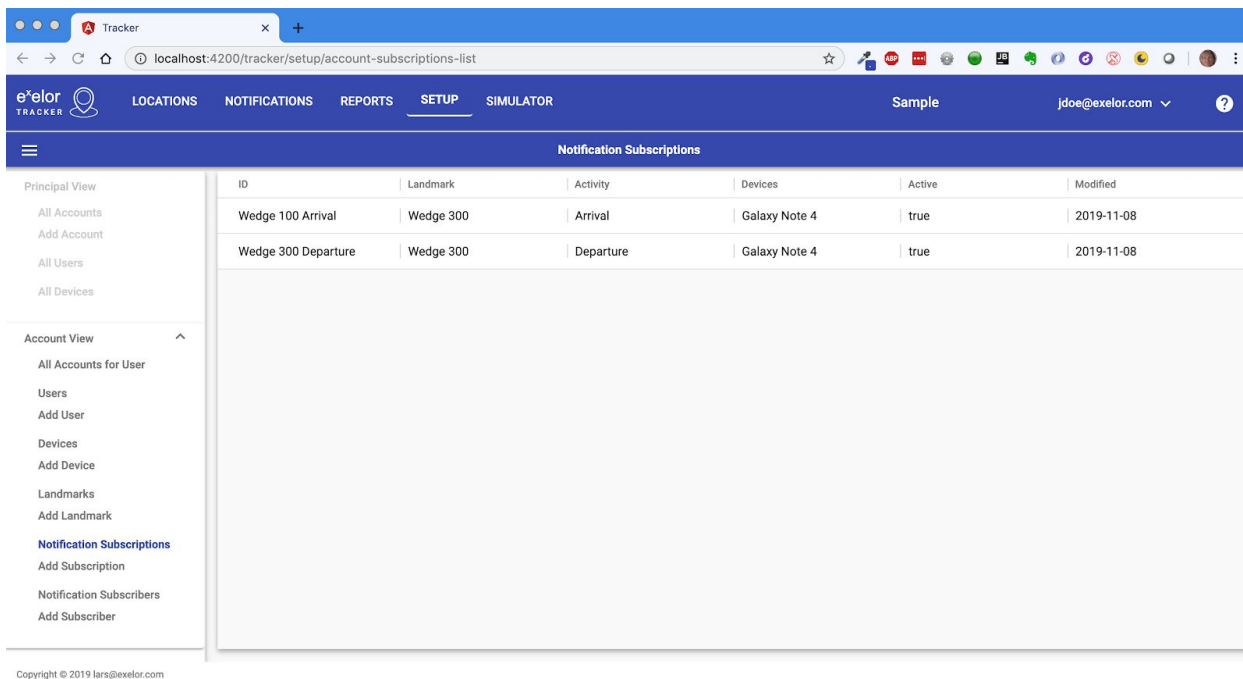
Map data ©2019 Google Terms of Use Report a map error

Copyright © 2019 lars@exel.or.com

This form is also used for setting up new landmarks. Users can position landmarks either by clicking on a map location or by filling in the address box. Clicking the Preview button will render the landmark on the map.

Any number of landmarks can be overlapping.

Notification Subscriptions

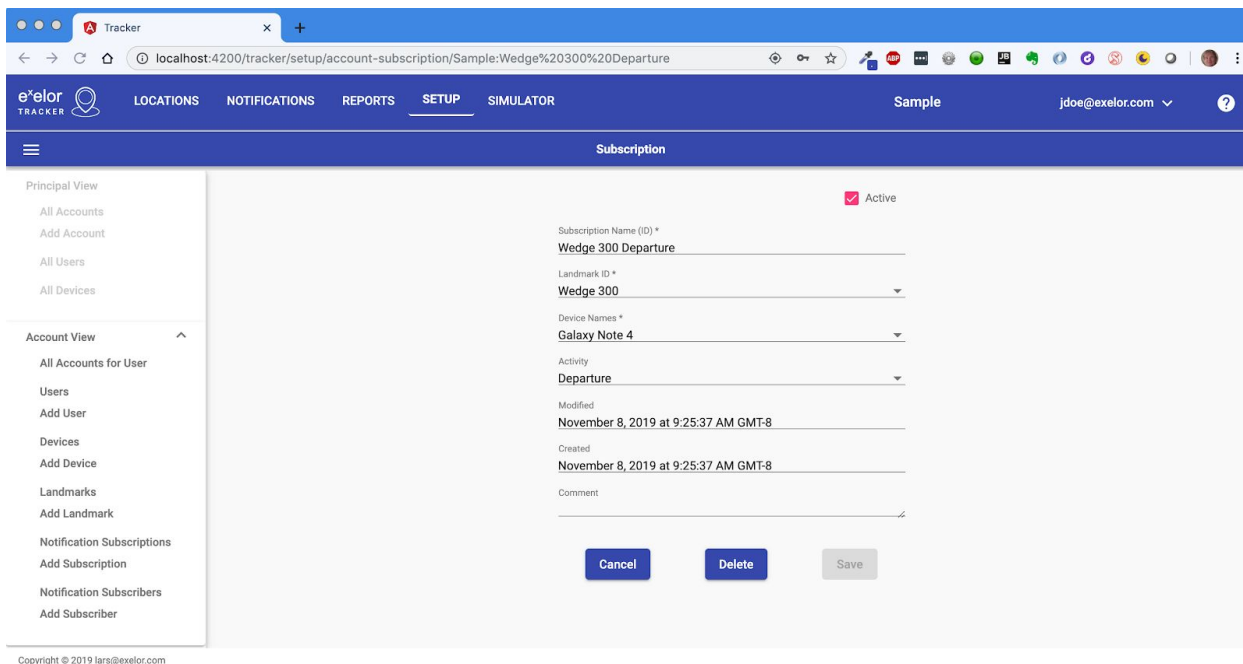


The screenshot shows the 'e*elox TRACKER' web application interface. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP', and 'SIMULATOR'. The 'SETUP' tab is active, and the 'Notification Subscriptions' page is displayed. The left sidebar shows a menu with 'Principal View' and 'Account View' sections. The main content area shows a table with the following data:

ID	Landmark	Activity	Devices	Active	Modified
Wedge 100 Arrival	Wedge 300	Arrival	Galaxy Note 4	true	2019-11-08
Wedge 300 Departure	Wedge 300	Departure	Galaxy Note 4	true	2019-11-08

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Showing the conditions to be met for the NOTIFICATIONS page to display notifications as the conditions are met. Currently, notifications can be generated only for landmark arrivals and departures. Double-clicking a notification subscription row brings up the details for that subscription.



The screenshot shows the 'e*elox TRACKER' web application interface. The top navigation bar includes 'LOCATIONS', 'NOTIFICATIONS', 'REPORTS', 'SETUP', and 'SIMULATOR'. The 'SETUP' tab is active, and the 'Subscription' page is displayed. The left sidebar shows a menu with 'Principal View' and 'Account View' sections. The main content area shows the details for a subscription:

☒ Active

Subscription Name (ID) *
Wedge 300 Departure

Landmark ID *
Wedge 300

Device Names *
Galaxy Note 4

Activity
Departure

Modified
November 8, 2019 at 9:25:37 AM GMT-8

Created
November 8, 2019 at 9:25:37 AM GMT-8

Comment

Buttons: Cancel, Delete, Save

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This form is also used for creating new subscriptions.

Notification Subscribers

Subscriber	Subscription	Email Msg	Text Msg	Active	Modified
jdoe@exelor.com	Wedge 100 Arrival	true	false	true	2019-11-08

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Showing the notification subscribers list. A notification subscriber is notified personally if a particular condition as defined in Notification Subscriptions has been met. Personal notifications can be sent as email and text messages. Double-clicking a subscriber brings up the details form for that subscription.

Subscriber *
jdoe@exelor.com

Subscription *
Wedge 100 Arrival

☒ Email Notification
☐ Text Message Notification

Modified
November 8, 2019 at 5:39:01 PM GMT-8

Created
November 8, 2019 at 5:39:01 PM GMT-8

Comment

Cancel Delete Save

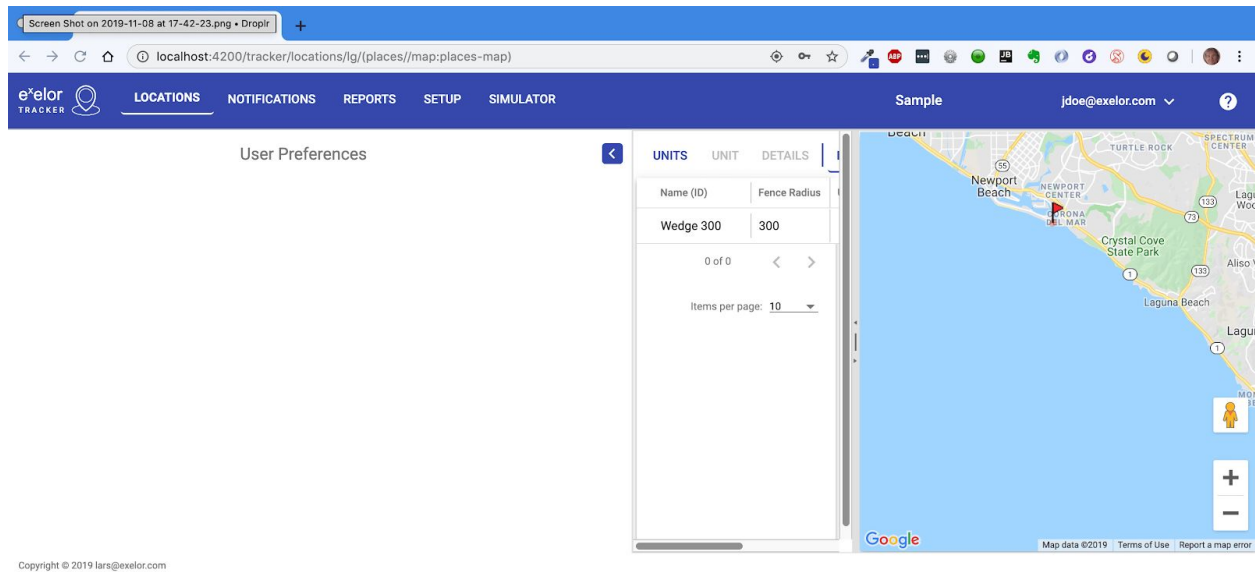
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This form is also used for creating new subscribers.

User Preferences

Preferences Drawer

User preferences, such as localization settings are yet to be implemented. However, a currently empty side drawer has been implemented for this purpose. It is reachable from the user drop-down menu on the top navigation bar.

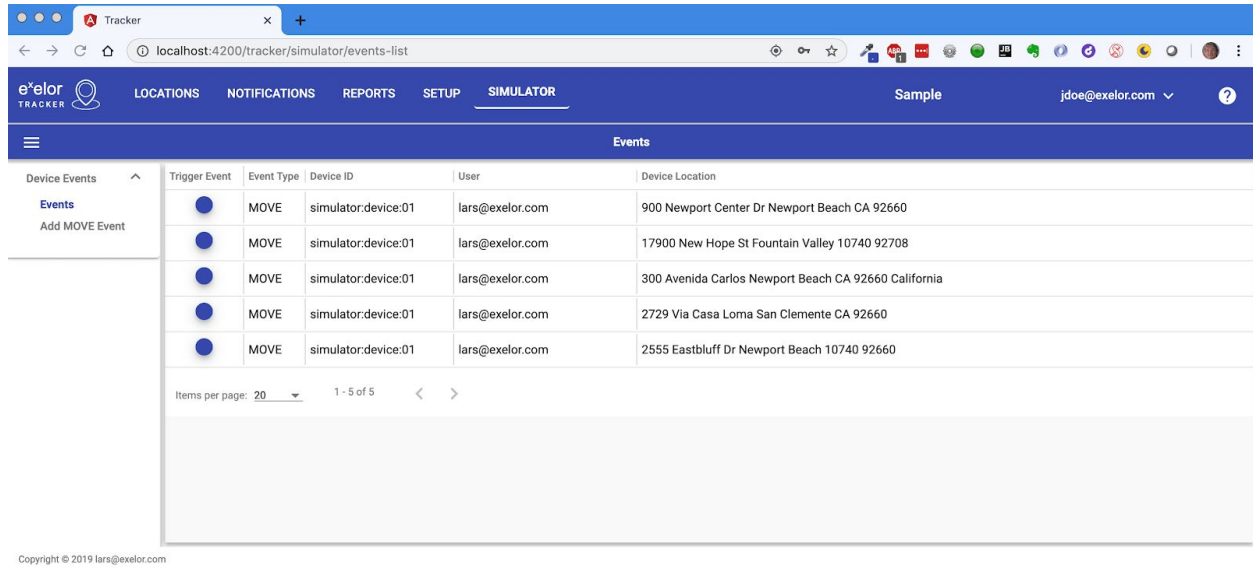


User Documentation

Context sensitive user documentation is displayed by clicking the question mark icon on the top navigation bar.

Simulator






Device Events



The screenshot shows a web browser window with the URL `localhost:4200/tracker/simulator/events-list`. The application is titled "e*elOR TRACKER" and has a navigation bar with links for LOCATIONS, NOTIFICATIONS, REPORTS, SETUP, and SIMULATOR. The SIMULATOR tab is active. On the right side of the navigation bar, there is a "Sample" button and a user profile "jdoe@exelor.com".

On the left side, there is a sidebar with "Device Events" and "Events" sections. The "Events" section is expanded, showing "Add MOVE Event".

The main content area displays a table of events:

Trigger Event	Event Type	Device ID	User	Device Location
	MOVE	simulator:device:01	lars@exelor.com	900 Newport Center Dr Newport Beach CA 92660
	MOVE	simulator:device:01	lars@exelor.com	17900 New Hope St Fountain Valley 10740 92708
	MOVE	simulator:device:01	lars@exelor.com	300 Avenida Carlos Newport Beach CA 92660 California
	MOVE	simulator:device:01	lars@exelor.com	2729 Via Casa Loma San Clemente CA 92660
	MOVE	simulator:device:01	lars@exelor.com	2555 Eastbluff Dr Newport Beach 10740 92660

Below the table, there is a pagination control showing "Items per page: 20" and "1 - 5 of 5".

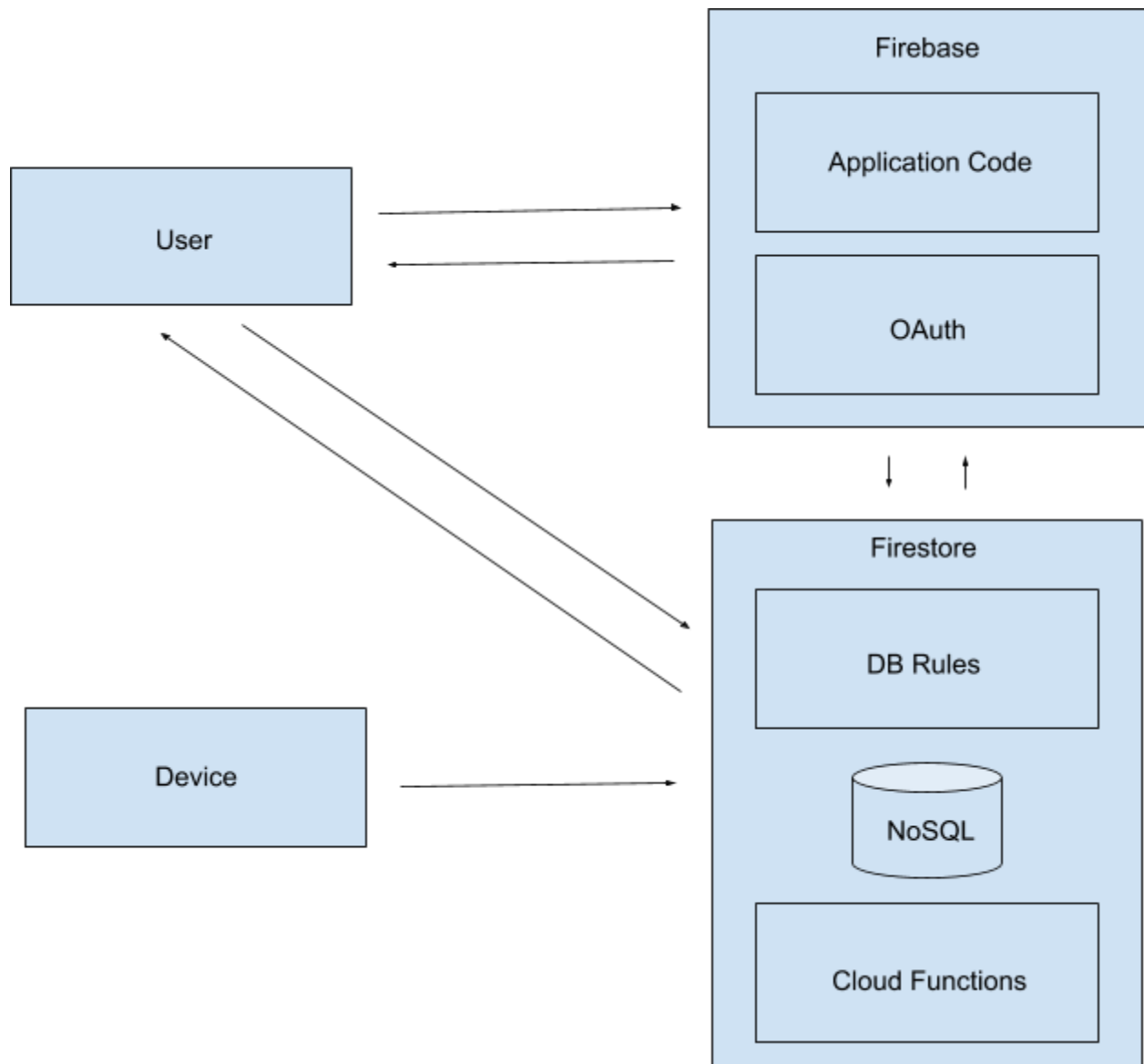
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The Simulator can be used for sending device events to the backend for testing purposes. It is available in the development build only.

Architecture

The application is designed for modular development. The Core module provides sign-in capability and basic features for use by other modules. The Setup module manages users and accounts as well as the relationships between these entities. Specific application functionality is implemented through the Units, Places, and Notifications pages.

The application is hosted on Google Firebase but aside from some database functions runs entirely in the user's Web browser. It is written in Angular and makes use of several public libraries developed for Angular. Use of the Firebase OAuth implementation provides both authentication and authorization security.



Registered devices send their events directly into the Firestore NoSQL database, which also holds all configurational data. Database storage requirements are automatically scaled by Google.

The Firestore DB rules handles all device event and user access control as well as the enforcement of all user account service constraints.

The Firestore cloud functions are invoked by Node.js servers to handle individual database requests and are used to augment and measure the requests. Functions of this type can also be defined for regular database management activities.

The application currently makes use of one proprietary user interface control from Kendo UI Core.