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Deploy a Location Tracking Solution
with ArcGIS QuickCapture

Essential tasks and best practices for deploying a location tracking solution with ArcGIS QuickCapture.

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1. Introduction

Location tracking is a capability offered with ArcGIS QuickCapture that allows you to monitor where mobile workers are and understand where they've been. Here are some examples of why you might implement location tracking into your workflows:

- **Monitor special events**—Know where your personnel are during large scale events to ensure safety and provide quick response times.
- **Provide proof of work**—Verify on-site inspections completed by your team.
- **Determine area coverage**—Determine area coverage during events such as invasive species removal or search and rescue missions.

Location tracking is supported on ArcGIS Online and ArcGIS Enterprise. Follow along with this guide to successfully deploy location tracking with QuickCapture.

Note: For more detailed information about the location tracking capability, see Enable location tracking in ArcGIS Online or Configure location tracking in ArcGIS Enterprise.

Key components

There are three necessary components for deploying the location tracking capability with ArcGIS QuickCapture:

- **Location tracking feature layer**—Tracks and last known locations are uploaded from QuickCapture to the location tracking feature layer. Location tracking is available across your organization and can be enabled by any administrator. Once location tracking has been enabled, licensed users in your organization can use the QuickCapture mobile app to upload their historical and current locations to the location tracking layer. Users only see their own tracks, and additional permissions are required to view the tracks of others.

  The location tracking feature layer consists of three layers:
  - **Last known locations**—A point layer that contains a single record for each user representing their most recently reported location.
  - **Tracks**—A point layer that contains a record for each location where a mobile worker was tracked (a breadcrumb trail).
  - **Track lines**—A polyline layer that contains lines showing where the mobile worker has been (ArcGIS Online only).

- **Track views**—Tracks and last known locations can be shared with other users in the organization via track views. A track view is a special type of feature layer that requires an additional privilege to use. A track view contains a list of mobile users whose tracks are displayed as well as a separate list of track viewer users who are allowed to view the tracks. Like any other feature layer, track view layers can be used in maps, dashboards, and apps.

- **QuickCapture mobile app**—Tracks and last known locations are uploaded from the QuickCapture mobile app to the location tracking layers. QuickCapture records tracks whether or not there is a data connection and can provide mobile workers with control of when they are and are not tracked.

2. Account requirements

Before you can deploy a location tracking solution, your organization must meet the following requirements:

- Location tracking licenses must be included in your subscription.
- Location tracking must be enabled for your organization.

License location tracking

Location tracking is an organization extension that requires a license for each mobile worker. There are two ways that a user can be licensed:

- **Assign a Field Worker user type**—The location tracking license is included in the Field Worker user type.
- **Assign an add-on location tracking (ArcGIS Tracker) license**—The ArcGIS Tracker license can be added to any user type, including Viewer.

For more information, see How do I setup location tracking and authorize QuickCapture.

Enable location tracking

For mobile workers to upload tracks, the location tracking capability must be enabled for your organization. This must be done by an administrator. Tracks stored in ArcGIS Online are retained using a 30-day rolling window and there is no additional storage cost. In ArcGIS Enterprise, additional configuration options are available.

- See Enable location tracking in ArcGIS Online
- See Configure location tracking in ArcGIS Enterprise
- See ArcGIS Tracker Deployment Guide for ArcGIS Enterprise

3. Considerations

It's important to understand how location tracking data will be used by stakeholders. Consider the following questions before you begin configuring user types and creating location tracking content:

- Do mobile workers need to see each other's locations in near real-time?
- Do the locations of mobile workers need to be displayed in a dashboard?
- How should the locations of mobile workers be visualized?

Do mobile workers need to see each other's locations?

For many tracking deployments, it's critical that mobile workers can see where other workers are at any time. This is supported in QuickCapture, but requires additional steps to configure. Create a .csv file or a list of all the users who need to view other users' tracks.

Do the locations of mobile workers need to be displayed in a dashboard?

You can use ArcGIS Dashboards to display the last known locations of mobile workers. A dashboard can be displayed in an emergency operating center (EOC) during an event where situational awareness is critical. Dashboards can also be shared with additional stakeholders as necessary. See Add the map to a dashboard.

How should the locations of mobile workers be visualized?

It's important to understand if locations need to be visualized based on the mobile worker's role (for example, a paramedic), their last update time, or any other attribute. If symbolizing by roles, make sure you know how and when roles may change. It's also important to know if the historical tracks and lines need to be displayed in the map, app, or dashboard you're using.

4. Configure user types and roles

There are two personas in a location tracking solution: mobile workers and track viewers. Each persona requires specific privileges and licenses. A mobile worker can also be a track viewer if they need to view the tracks of other mobile workers. Configure user types and roles for a location tracking solution by completing the following steps:

- Add users to your organizations
- Configure mobile user licenses
- Configure track viewer roles

Add users to your organization

If you are deploying a tracking solution for the first time, you may need to add new users to your organization. This can be done quickly by importing users from a .csv file.

- See Invite or add members in ArcGIS Online
- See Add members to your portal in ArcGIS Enterprise

Configure mobile user licenses

Each mobile worker who needs to be tracked must have a location tracking license. This can be done by setting their **User Type** to **Field Worker** or by assigning an add-on **ArcGIS Tracker** license.

- See User types, roles, and privileges in ArcGIS Online
- See User types, roles, and privileges in ArcGIS Enterprise
- See Manage licenses in ArcGIS Online
- See Manage licenses in ArcGIS Enterprise

Configure track viewer roles

To view the tracks of mobile workers, a user must have the **View location tracks** privilege assigned to their role. The easiest way to do this is by creating a new custom role that includes this privilege. Assign this role to each user who needs to view the tracks of other mobile workers.

Note: Depending on the current roles assigned to your users, you may need to change existing roles or create additional roles with more privileges.

- See User types, roles, and privileges in ArcGIS Online
- See User types, roles, and privileges in ArcGIS Enterprise
- See View tracks in Track Viewer

5. Create tracking content

Once location tracking has been enabled for your organization and users are configured, build the maps and apps that mobile workers use to track location and monitor activity. Complete the following steps:

- Create a track view.
- Add a track view to a map.
- Add a map to a dashboard.
- Configure a map for mobile users.

Create a track view

Track views are created in the Track Viewer web app. Select the mobile users who should appear in the track view and which users can view those tracks. Once completed, a hosted feature layer view and a group in ArcGIS Online or ArcGIS Enterprise that controls access to the track view are also created. The layer is available to use in maps and apps, including Track Viewer.

*Note: You can share the track view with users outside your organization by inviting them to the group created with the feature layer view. For users to access the track view, the administrator for their organization must assign the **View location tracks** privilege to their role.*

- See Create tracks in track viewer
- See Overview of the location tracking schema

Add a track view to a map

Use Map Viewer to create a new map or open an existing one and add the track view feature layer to the map. Each layer should be configured to suit your specific requirements, but here are some general recommendations.

Layer visibility

The last known locations layer should be the first layer listed in the map so it draws on top of every layer listed below it. To improve overall performance when panning and zooming the map, set the **Visible range** of the tracks layer from **Street** to **Room**. Similarly, for the track lines layer, set the **Visible range** from **World** to **Street**.

- See Set transparency and visible range (Map Viewer)

Layer filters

Apply a temporal filter to all three location tracking layers to avoid showing unnecessary or stale data (for example, showing outdated location timestamps).

- See Apply filters (Map Viewer)

Layer refresh intervals

Refresh intervals determine how frequently layers are updated in the map. The last known locations layer should have a relatively short interval (30 seconds to a minute). This ensures the map accurately reflects where someone is as they move. The track points and track lines layers should use a longer interval (5 to 10 minutes) since those are uploaded less frequently.

- See Set refresh interval (Map Viewer)

Layer symbology

The three most common ways to symbolize track data are by location, name, or category or role.

Symbolize by location

The default drawing style for each location tracking layer is **Location (single symbol)**. Each user and their tracks are symbolized using the same colors and symbols.

Symbolize by name

If mobile users do the same type of work, it may make sense to use a different color to more easily identify specific mobile users. In this case, a **Types (unique symbols)** drawing style should be used with the **Full Name** or **Created User** attribute.

Symbolize by category or role

When there are multiple groups of mobile users, it may make sense to symbolize each user based on their role or the type of work they do. For example, all police officers could be blue, and all firefighters could be red. In this case, a **Types (unique symbols)** drawing style should be used with an Arcade expression that returns a category for a given feature.

Here is a sample Arcade expression that determines if a feature should be categorized as Firefighter or Police Officer:

```
var fireFighters = ['username1', 'username2']
var policeOfficers = ['username3']

if (includes(fireFighters, $feature.created_user)) {
  return 'Firefighter'
}

else if (includes(policeOfficers, $feature.created_user)) {
  return Police Officer
}
```

- See Style location (Map Viewer)
- See Style categories (Map Viewer)
- See Getting Started with ArcGIS Arcade documentation
- See Generate a user-based Arcade expression

Add a map to a dashboard

Once you've configured a map for location tracking, add it to a dashboard in ArcGIS Dashboards. This dashboard can be shared with stakeholders so they can see where mobile users are in near real-time. Once the map is added to the dashboard, you can add additional dashboard elements such as indicators and lists.

Make sure you share your dashboard with the track viewers group. For security and privacy, the location tracking layers cannot be shared publicly, so your dashboard and maps should not be shared publicly.

- See Create a dashboard
- See Create a location tracking dashboard

Configure a map for mobile workers

You may want to create a separate map for mobile workers. To get started, make a copy of the map you configured for track viewers and make adjustments as needed. For example, if mobile workers do not need to see each other's locations, you can remove the track view layers from the map.

Note: It is not necessary to have a track view layer in the map to record and share tracks.

In QuickCapture designer you can change the basemap that is shown in your project. By default, the organization default basemap will be used. To change the basemap complete the following steps:

1. Click the **Configure project map** menu item
2. Uncheck the **Use organization default basemap** option
3. Click **Change**
4. Select the mobile worker basemap that you created
5. Click **Save**

6. Start tracking mobile workers

Once users and maps are configured for location tracking, mobile workers can start recording their locations. Location tracking works offline too—when a worker regains connectivity, the tracks and last known location will automatically upload to the location tracking layer.

First, account credentials should be assigned to each user so they can sign in to the mobile app. Next, instructions should be provided to mobile users about how to get started.

At a high level, the following steps should be provided to mobile users in an instruction manual:

1. Download the QuickCapture mobile app from the Apple App Store, Google Play Store, or Microsoft Store.
2. Scan the provided QR code to launch the app.
3. Sign in with credentials.
4. Accept the permission prompts for location and tracking.

Note: Mobile workers may not have to download the mobile app if a mobile device management solution (MDM) *is used.*
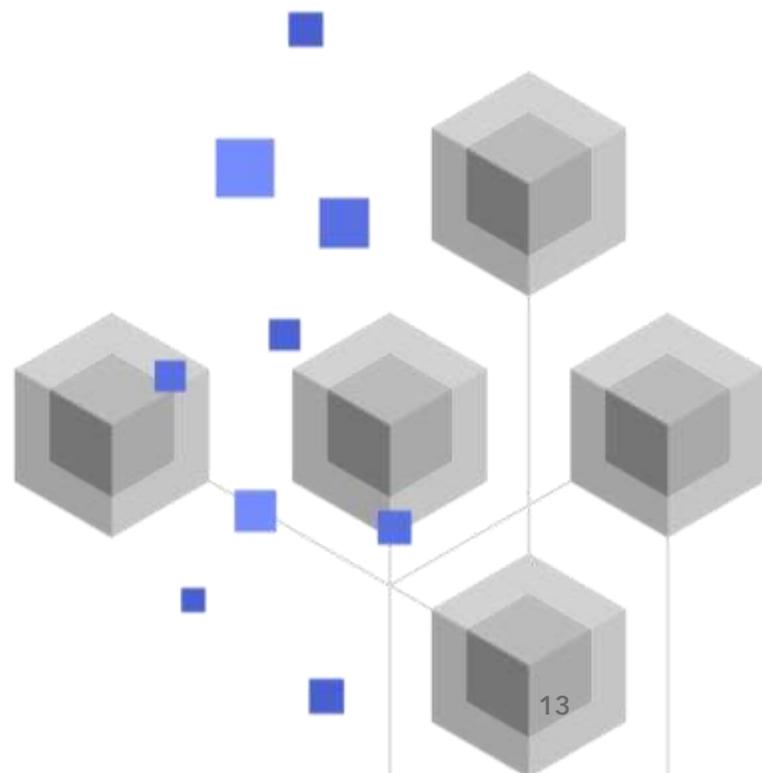
7. Learn more

There is so much more you can do with location tracking in ArcGIS QuickCapture. The resources in this section will help you explore more opportunities as well as help you troubleshoot and answer questions.

- Join the ArcGIS QuickCapture Community. You can join discussions with a diverse group of ArcGIS QuickCapture users and Esri staff.
- Read articles from the ArcGIS QuickCapture team on the ArcGIS Blog.
- Browse the ArcGIS QuickCapture Resources page. This is your hub for all things ArcGIS QuickCapture—documentation, blogs, videos, learning materials, and more.

Troubleshooting and support

Looking for assistance with ArcGIS QuickCapture? Check out the following:

- The ArcGIS QuickCapture help is searchable by keyword and contains documentation for everything from designing layers and maps to configuring forms and using the app.
- Consult the ArcGIS QuickCapture Community and get specific answers from peers and members of the ArcGIS QuickCapture team.
- If you've tried the options above and still need assistance, contact Esri Technical Support for technical issues or Esri Customer Service for licensing questions.
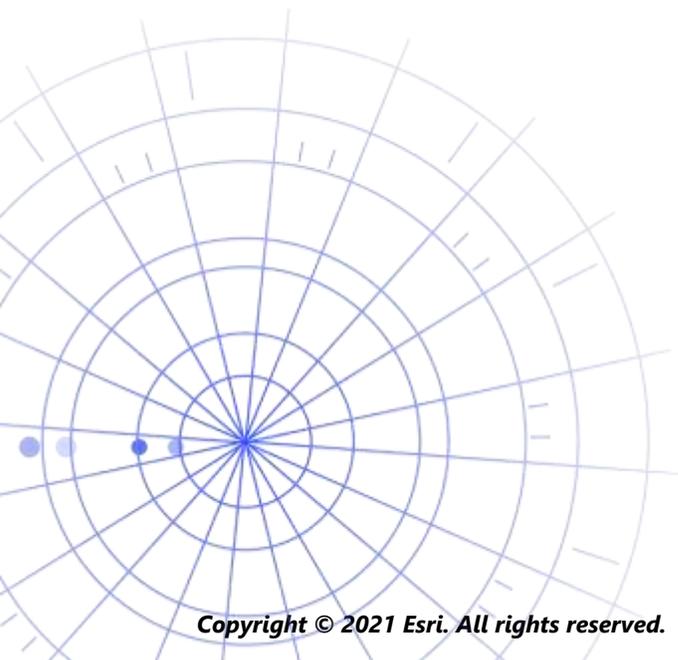
8. FAQ

How do I get the app?

The ArcGIS QuickCapture mobile app is available on Google Play for Android devices, the App Store for iPad and iPhone, and Microsoft Store for Windows devices.

Note: If you can't access Google Play or the Microsoft Store, download from the QuickCapture Resources page.

Can I change the upload frequency of tracks?

Tracks are uploaded every 10 minutes, this frequency can not be changed.

Separately, the last known location of the mobile device is updated every 60 seconds by default. This interval can be modified by the project author to be 15 or 60 minutes.

How can I analyze the track data?

Tracks can be exported from ArcGIS Online, and tools in ArcGIS Pro can be used to gain insights into the data. If using ArcGIS Enterprise, you can use ArcGIS GeoAnalytics Server to directly analyze the features stored in the location tracking layers.