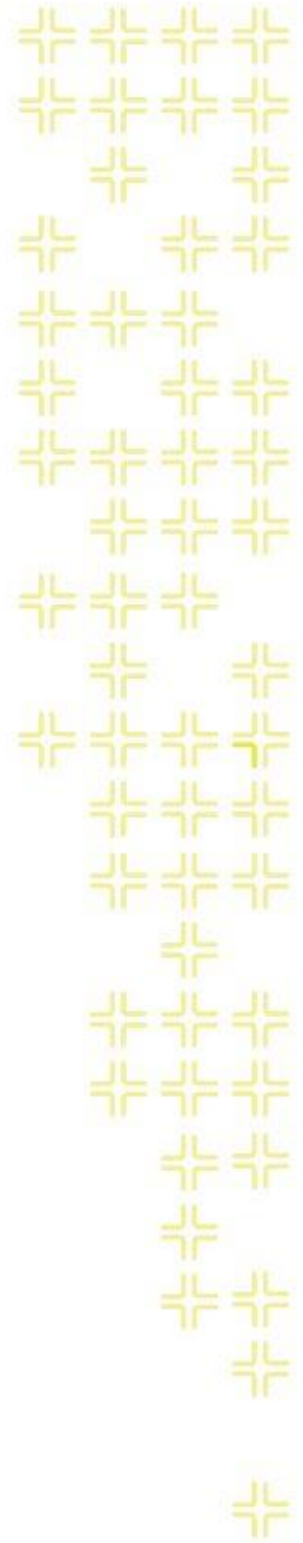




TRAINING GUIDE

Mobile for Administrators

Part 4 - Offline

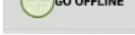



Mobile for Administrators - Offline

Contents

Going Offline	2
Android	3
iOS.....	4
GIS Offline	5
Android	5
iOS.....	6
Both Android and iOS	8
Working Offline	8
Android	9
Adding new work orders and requests	9
Editing Data Offline	11
Parts Inventory Prompting	12
Error handling and resolution	12
Conflict Resolution	13
Inventory and Inspections Offline	14
Troubleshooting or inspecting offline data status	14
iOS.....	15
Adding and editing data	15
Synchronizing data back to the server	15
Parts Inventory Prompting	15
Error handling and resolution	16
Troubleshooting or inspecting offline data status	17
Documents while offline	17
Offline Workflows	18
Example 1	18
Example 2	19
Inventory Data Cache	20
Views/Data	20
Configuring what data is potentially available to offline users.....	20
Enabling the Android or Apple (iOS) cache	21
Configuring how often your users get updates	22
Performance Considerations.....	23
GIS.....	24
Configuring Feature Services	24
Tile Caches.....	26

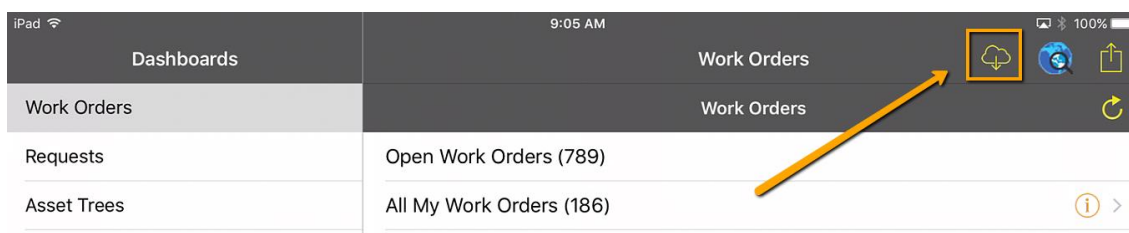
Going Offline

When an end user needs to go offline, they will click the “Go Offline” button (Android)  or the Offline  button on the iPad. This button is available on the dashboard.

Android:



iOS:

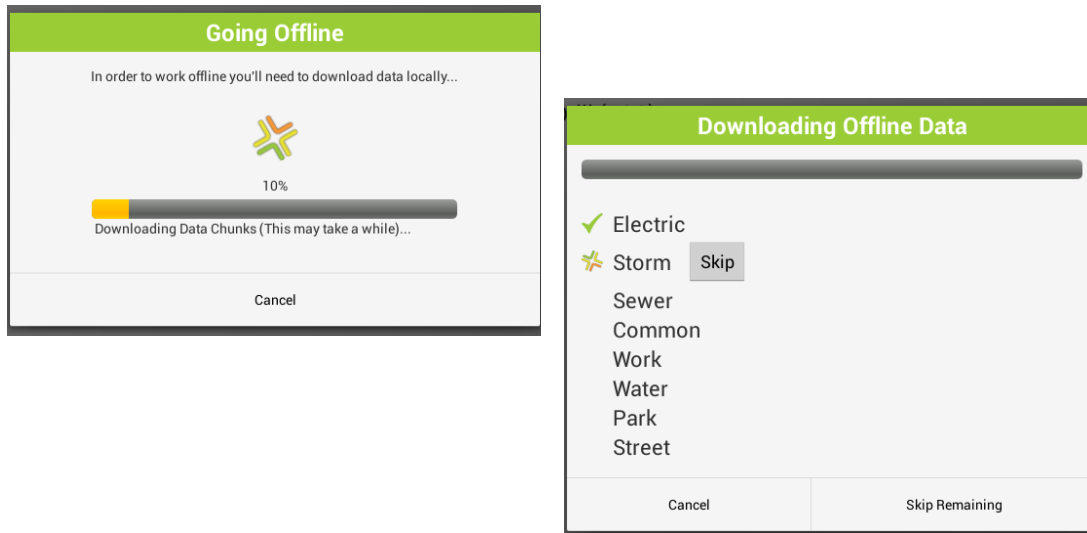


Tapping this will take their inventory, work order, and request data offline. It does not take map data offline. That must be done from the map they want offline.

Notes: _____

Android

This is what the progress looks like on Android

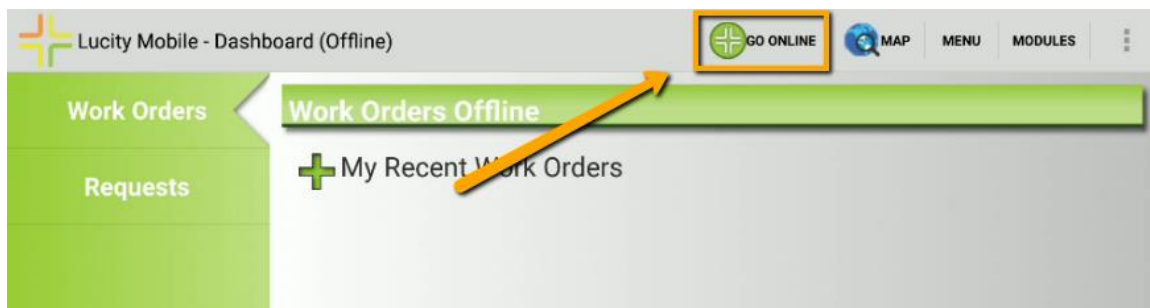


- There are several stages of download
- First it downloads the Work Order and Request data live from the server
- It persists this to local disk
- It downloads some setup data like the relationships between categories and work flow setup codes
- It downloads cached inventory datasets (these are not live; they are cached at 2:00 a.m. by default). It only downloads these if the setup indicates that they are needed (or that an update is needed) for the current user. This is not based on whether the underlying data is changed, this is based on a timed interval you specify for your agency or that user (quarterly, monthly, yearly)
- It clears existing data that should either no longer be accessible or that is being updated.
- It writes the cached inventory datasets locally to disk

The data that is downloaded includes views, forms, picklists, work orders, requests, and inventory data. No inspections are downloaded.

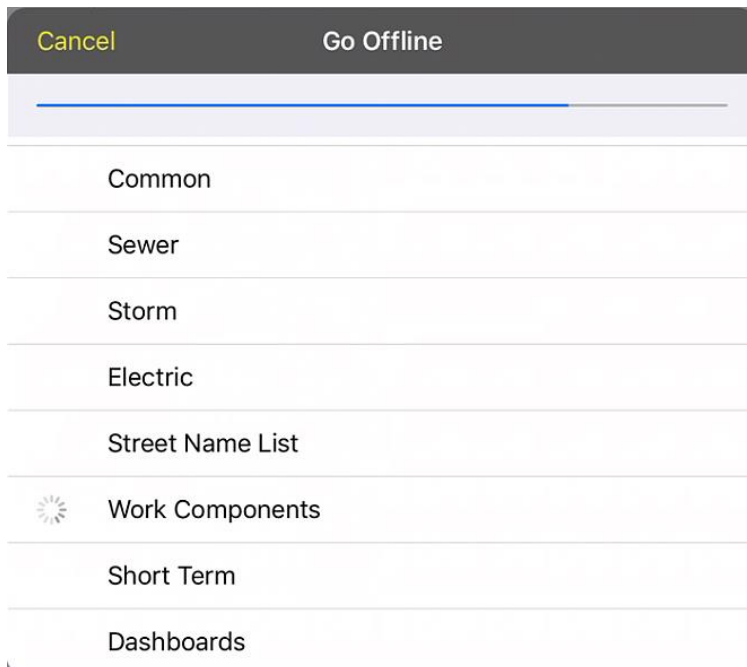
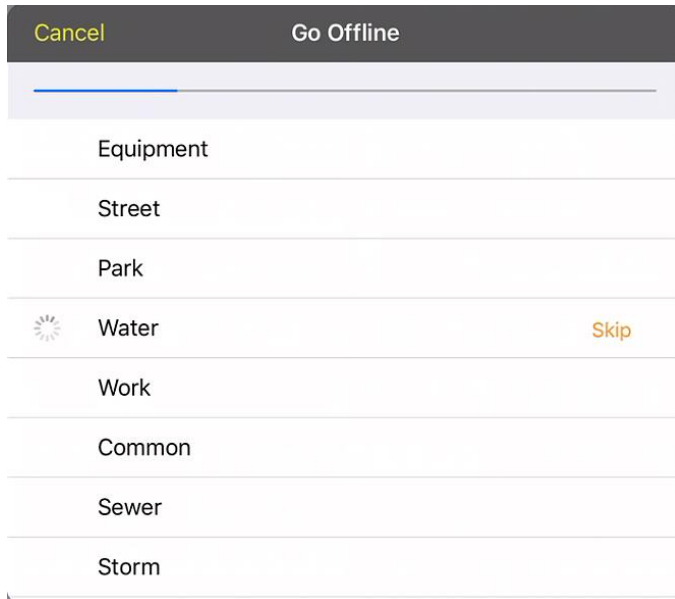
It is possible to skip downloads to save time. If the Work item is not allowed to download, it will not update the work views. If there is not an existing set of work view data already downloaded to the device, work orders and requests will be un-useable in the field.

When everything successfully downloads, the dashboard changes to show a “Go Online” button:



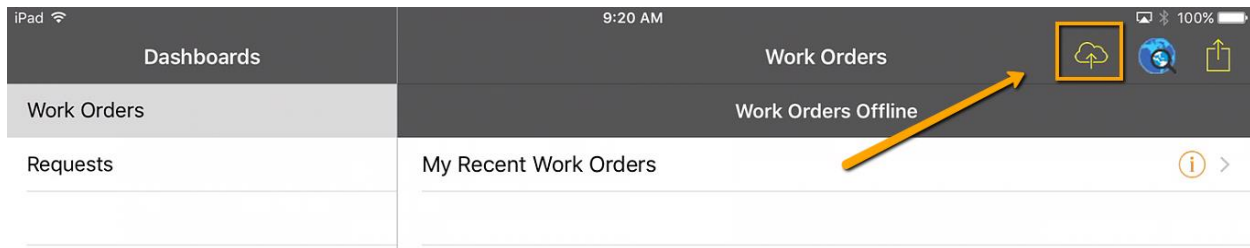
iOS

On an iPad there is only one progress dialog:



It downloads inventory data (which can be skipped), work component information (relationships between employees, problems, actions, etc and Categories), dashboards, and the Short Term cache (work orders and requests). The Dashboards, Short Term, and Work Components cannot be skipped. If you skip the Work cache and have never done a download before, you will not have any views or forms accessible for viewing or editing work order or request data.

When the offline process is completed, the button changes to a cloud with the arrow pointing up. Users will click on this when they are ready to go back online.



GIS Offline

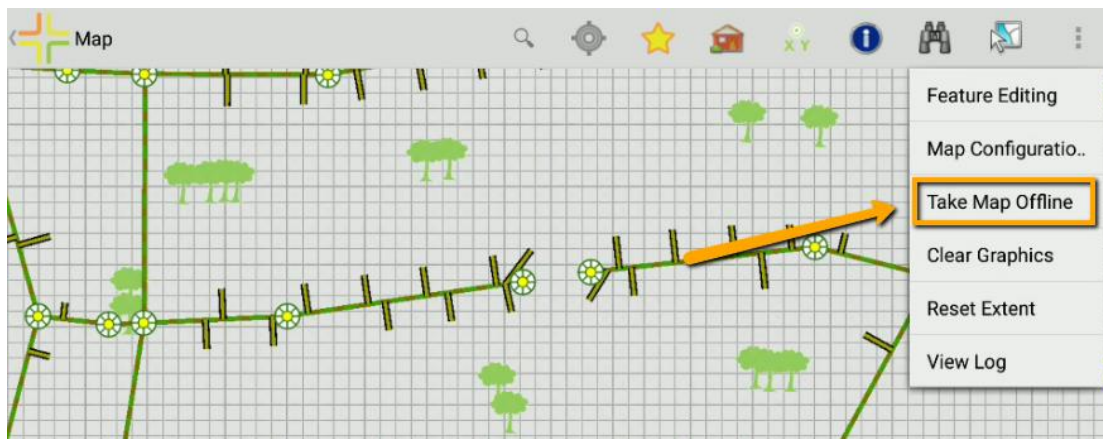
GIS data is not taken offline during the “Go Offline” process. GIS offline data is managed separately from the Lucy data. When launching the map from an offline dashboard, the system will check to see if there is an available offline map. If there is not one, the user must take a map offline to continue. A network connection is required to take a map offline.

Before taking a map offline, the current map should have a bookmark created for the map. The user will select this bookmark when taking the map offline. Currently bookmarks must be created on the tablet using the map that needs to go offline by the user that wants to take the map offline. In a future release, we will support a more robust bookmark management which supports sharing across applications and users.

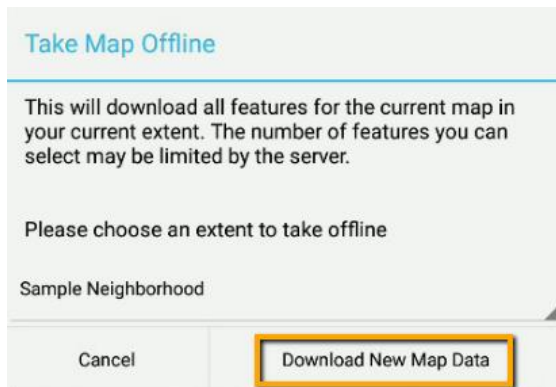
After creating the necessary bookmark(s), follow these steps to go offline:

Android

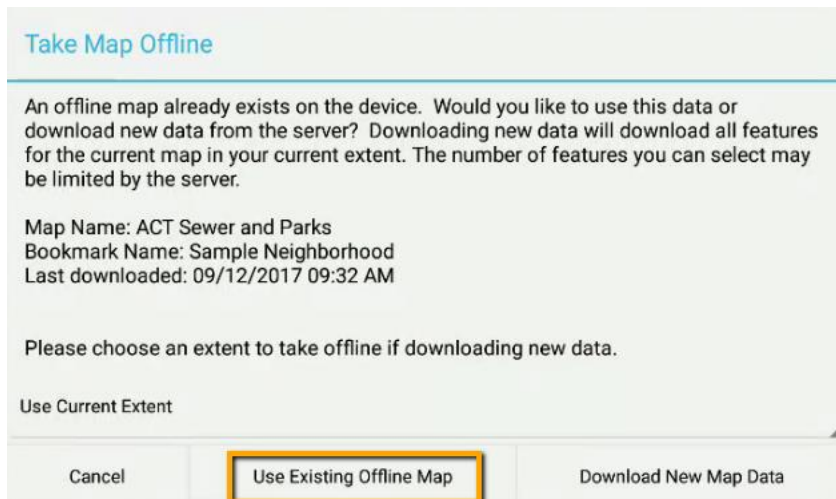
To take a map offline in Android, select “Take Map Offline” from the menu.




Select the bookmark and tap “Download New Map Data”

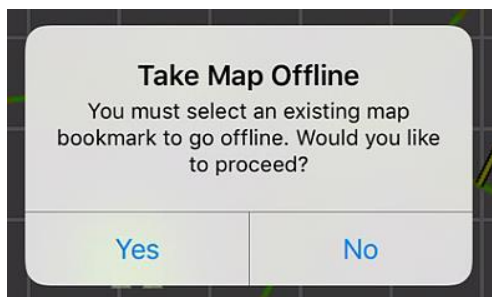


If a map was previously downloaded to the device, the prompt will include information about what map is currently offline and you will get an option to use the existing map in lieu of downloading a new one.

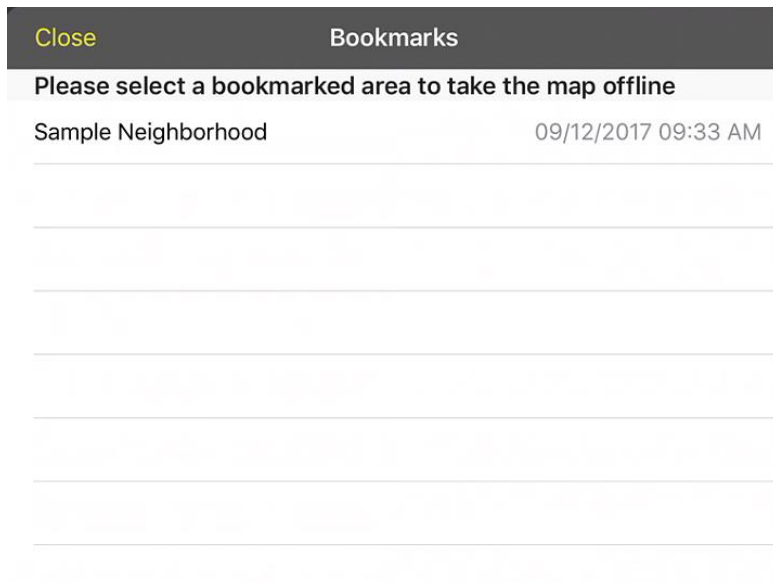


iOS

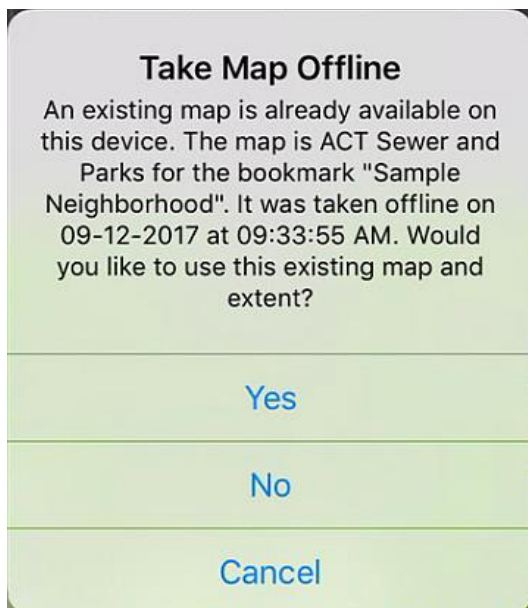
To take a map offline on an iPad, go to the map you want offline and click the  button. Select the bookmark to be taken offline when prompted. You will receive a prompt to confirm you want to take a map offline:



By tapping “Yes”, it will then prompt you for which bookmark you wish to take offline:



If a map was previously downloaded to the device, you will get an option to use the existing map in lieu of downloading a new one.



Please note: The user must have a side-loaded base map in order to see operational data in the offline map (for iOS only).

Both Android and iOS

The system will download any necessary data (and load any side-loaded tiled maps as needed) and display the offline map to the user. The ArcGIS Server instance will limit how many features are downloaded. This is configured in ArcGIS Server and is limited to 1000 features for the service. There is no control over which 1000 features are returned and if an extent has more than 1000 features there is no notification that not all features were downloaded.

Depending on how the maps and map services are designed in Lucity Administration tools it is theoretically possible for the maps to look different offline than online. Offline maps do not support advanced symbology, data joins, plus other features that online maps can use. You also may make the decision not to include all map services in the offline map.

Maps are stored on a user by user basis on the device.

Most features from the online map work the same offline. There are a few functionalities not supported offline. Some of these limitations are:

- Offline maps do not support searching for addresses
- Show in map will not show addresses. It will only show XY points and assets.
- Offline maps do not support redlining
- Offline maps do not support the relationships tool (viewing related inspections, viewing related work orders)

Working Offline

Only dashboard items that are marked for mobile offline use will appear in the dashboard. Only data drills, asset trees, and quick lookups show up on an offline dashboard.

	2014r2-2015r2	2016	2016r2	2017	2017r2
Android Offline	X	X	X	X	X
iOS Offline		X	X	X	X
Asset Trees Offline		X	X	X	X
Expanding Asset Trees Offline			X	X	X
Expanding Data Drills Offline		X	X	X	X
Quick Lookup Android		X	X	X	X
Quick Lookup iOS			X	X	X

Once offline, it is not possible to log out or to change clients. Users can exit the app. Re-opening the app opens it in offline mode and does not require a password. It is recommended that tablets be configured with lock screen passcodes to protect data.

The data that is downloaded as a part of the offline cache can range from 500MB to several GB depending on the size of the data on the server and what programs are configured to download to the device. We recommend allotting at least 1 GB for each primary Lucity system that will be on the device (Sewer, Work, Water, Parks, Streets, Storm, Facilities/Fleet/Equip, Electric, GIS). These data caches are shared across users on a device. (Note: GIS offline maps are not shared; however GIS Tiled caches can be shared if they are side-loaded).

Android

Existing work orders and requests are only accessible from the dashboard for Android. Work Orders and requests can be added through a view launched from a data drill, or from a view launched from the modules menu, or from GIS.

Toolkits and the Create Request view buttons are not supported offline. Picklists for work order assets in the work order and request and PM forms are also not currently available offline (although the asset data can be manually entered if the user knows the asset id).

The Create Work Order is available from Inventory modules but not from Requests or Inspections.

Adding new work orders and requests

Adding Work Orders and requests offline is very similar to online. Most of the custom business logic and defaulting does not occur until the data has been saved to the server, however. For example, if a user selects a problem with a default task, that default task will not be automatically populated while offline. The user can either manually select the task or leave it blank and it will populate when the work order is synced online.

This work order was added offline from the My Recent Work Orders data drill:

Work Order #:	Status Date:	Status Text:
Category Text: Courts	Problem Text: Normal Wear	Main Task Text: Resurface
Cause Text:	System ID 1:	Lead Worker Text:
Work Order #: 17-478365	Status Date: 09/12/2017	Status Text: New Work Order
Category Text: Ballfields	Problem Text: General Maintenance	Main Task Text: Drag and Level
Cause Text:	System ID 1:	Lead Worker Text:

Once added, the work order is automatically added to the My Recent Work Orders data drill (even if it does not meet the criteria for that drill, the offline app does not have enough info to know this). However, the count on the data drill is not updated. The count will continue to show the original server side accurate count at the time of download. The work order is also added to the work orders collection accessed from the Modules menu. The new work order will continue to be displayed in the data drill and in the modules menu until the user goes online, then goes offline again. At that point, the work order will no longer appear in the modules menu and will only appear in the data drill if it meets the criteria defined on the server for the data drill.

Notice that the text for records added offline is green.

Notes: _____

Continuing on creating this work order, one task and one equipment were added. The task start and end dates were populated; the resources start and end dates were left blank.

Tasks

[My Recent Work Orders](#) > [17-478366](#) > Tasks

Seq No:	Task Text: Resurface	Task Start Date: 09/12/2017
Task End Date: 09/12/2017	Status Text:	Unit of Measure Text:
Calc'd Unit Cost:	# of Units:	Lock Units: false
Total Cost:	Unit Cost:	Task Crew Text: Parks Maintenance 2
Task Supervisor Text: Newton Clute	Hours:	

Equipment

[My Recent Work Orders](#) > [17-478366](#) > [Tasks](#) > [New](#) > Equipment

Equipment: 0045	Equipment Text: Dump Truck 1-1/2 ton, 3 yd, GMC Sierra	Alt Description:
Start Date:	End Date:	UOM:
Override Unit Cost:	Units:	Unit Cost:
Total Cost:	Group Number:	

Going back to the dashboard, the dashboard will show how many items are offline and need to be saved to the server due to changes made. In this case, there are 3 (the work order, the task, and the material resource).

Lucity Mobile - Dashboard (Offline)

GO ONLINE
MAP
MENU
MODULES

Work Orders
Requests

Work Orders Offline

+ My Recent Work Orders (2)

Clicking the “3 Items Ready to Save” button will push these changes to the server (but will not download any new data from the server).

Once the data is pushed to the server, the dates on the material are populated on the server based on the task dates (along with unit of measure and other defaulted values based on the data entered on the forms).

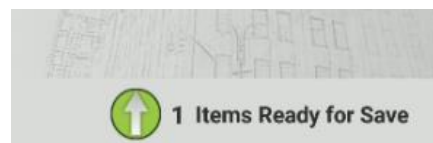
Even if the work order or request does not meet the user's dashboard criteria, the offline work order will remain available to the user since the user has not gone back online.

Editing Data Offline

Editing data offline is very similar. The following work order was edited while offline. The text for work orders with offline edits is blue:

My Recent Work Orders		
Work Order #: 17-478367	Status Date: 09/12/2017	Status Text: New Work Order
Category Text: Bridge Maintenance	Problem Text:	Main Task Text:
Cause Text:	System ID 1:	Lead Worker Text:
Work Order #: 17-478366	Status Date: 09/12/2017	Status Text: New Work Order
Category Text: Courts	Problem Text: Normal Wear	Main Task Text: Resurface
Cause Text:	System ID 1:	Lead Worker Text:
Work Order #: 17-478365	Status Date: 09/12/2017	Status Text: New Work Order
Category Text: Ballfields	Problem Text: General Maintenance	Main Task Text: Drag and Level
Cause Text:	System ID 1:	Lead Worker Text:

Notice that the text for records that have been edited is blue. After editing a work order, the dashboard shows 1 item ready to save:



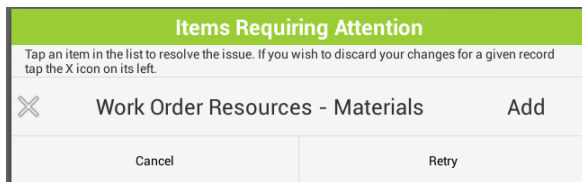
This offline edit can be pushed to the server by clicking this button, or the data will be pushed to the server when the user goes online by clicking the "Go Online" button on the dashboard. Since going back offline again can take a few minutes, the user is warned before going online:

You are about to go back online. Are you sure you want to continue?	
No	Yes

In this case, the user's work orders (and requests) will be pushed online and when the user later goes offline, the requests and work orders will only be available if they meet the criteria in one of the user's data drills.

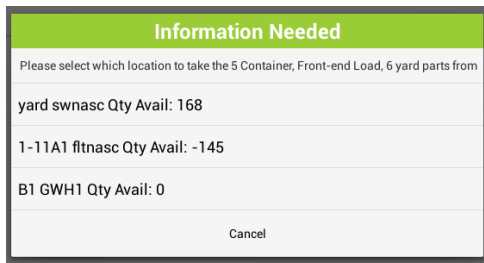
Parts Inventory Prompting

If adds or edits in materials and fluids require information about where parts should be taken, users will be prompted to select a warehouse when taking records online.



The dialog box has a green header with the title "Items Requiring Attention". Below the header is a light gray instruction bar: "Tap an item in the list to resolve the issue. If you wish to discard your changes for a given record tap the X icon on its left." The main content area has a white background and contains a list item: "Work Order Resources - Materials" with an "Add" button to its right. At the bottom, there is a white bar with two buttons: "Cancel" on the left and "Retry" on the right.

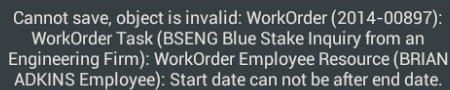
Selecting the material will open the materials form and will display a prompt so the user can select a location:



The dialog box has a green header with the title "Information Needed". Below the header is a light gray instruction bar: "Please select which location to take the 5 Container, Front-end Load, 6 yard parts from". The main content area has a white background and contains three lines of text: "yard swncsc Qty Avail: 168", "1-11A1 ftncsc Qty Avail: -145", and "B1 GWH1 Qty Avail: 0". At the bottom, there is a white bar with a single button: "Cancel".

Error handling and resolution

Errors are handled in a similar manner. When a user error is encountered that cannot be caught offline (like breaking a rule with end date and start date), the Requires Attention dialog will include the relevant record. When the user taps on the item it will open the form for the user and show the error:




The error message is displayed in a dark gray box with white text. The text reads: "Cannot save, object is invalid: WorkOrder (2014-00897): WorkOrder Task (BSENG Blue Stake Inquiry from an Engineering Firm): WorkOrder Employee Resource (BRIAN ADKINS Employee): Start date can not be after end date."

The user can fix the error and click save. To continue reviewing any remaining conflicts, navigate back to the dashboard.



Notes: _____

Conflict Resolution

If two users edit the same data on the same record, a conflict can occur. These also appear as items requiring attention during the online push.

Items Requiring Attention	
Tap an item in the list to resolve the issue. If you wish to discard your changes for a given record tap the X icon on its left.	
 Work Orders	17-478365
Cancel	Retry

By tapping on the record showing the conflict, a dialog is displayed allowing the user to choose how to handle the conflict:

 Conflict Resolution 

The record you changed was also changed by someone else. We attempted to merge your changes but the red fields were in conflict. Please select which values you'd like to use, then press save.

mattw	MattW
Work Order #: 17-478365	17-478365
Status: (2) New Work Order	(2) New Work Order
Status Date: 09/12/2017	09/12/2017
Status Time: 10:20 AM	10:20 AM
Category: (PPP06) Ballfields	(PPP06) Ballfields
Problem: (PRKP02) General Maintenance	(PRKP02) General Maintenance
Main Task: (PRKT26) Drag and Level	(PRKT26) Drag and Level
Cause:	
Assigned Crew: <input type="checkbox"/> (PPP2) Parks Maintenance 2	<input type="checkbox"/> (BMNT) BUILDING MAINTENANCE
Supervisor: (0208) Newton Clute	(0208) Newton Clute
Lead Worker: <input type="checkbox"/>	<input checked="" type="checkbox"/> (0227) Marcela Jang
Priority:	
Account #:	
Proj No - Acct:	
Project Text:	
Reason:	
Assigned By:	
Assigned Date:	
Assigned Time:	
Start Date:	
Start Time:	
End Date:	
End Time:	
Problem: false	false
Overdue: false	false
Leadworker: false	false
Task: false	false
Supervisor: false	false
Hard Lock WO: false	false
Comment From Request:	
Address:	

Place a check next to the value you want to keep and click Save.

Note: The advanced conflict resolution available in Android mentioned here is not offered in iOS.

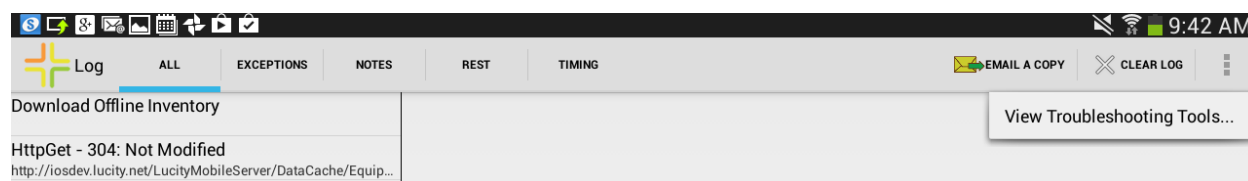
Inventory and Inspections Offline

Inventory data can be accessed from the modules menu, asset trees, or data drills offline. No inspection data is sent to the field, but inspection data can be collected while out in the field (as can inventory data, if desired, but GIS editing is not available).

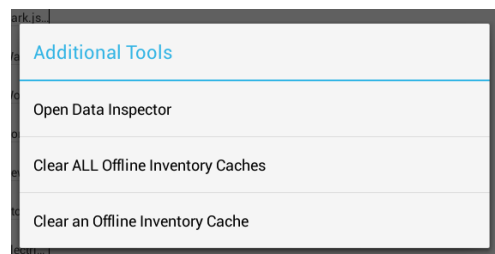
Inspections and inventory are pushed to the server and saved just like requests and work orders. However, inspections and inventory will stay cached offline on the device even after synched to the server until the relevant dataset is scheduled to be updated. For example, a user who is collecting Sign Inspections and has the Street dataset scheduled to update on the tablet monthly will accumulate up to 30 days of offline Sign Inspection data on the tablet. Documents are not kept locally on the device for inspections and inventory once the user goes online, however.

Troubleshooting or inspecting offline data status

To get information about the status of offline data (non-GIS) on a tablet, an interface for inspecting the offline metadata is available. To get to this, go to the View Logs on the menu. Once in the Logs view, click the View Troubleshooting Tools Menu

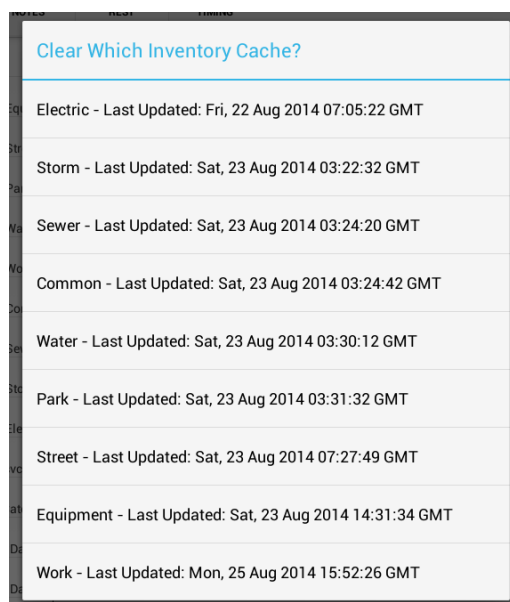


This is available online or offline. It provides 3 options:



The Data Inspector is for Lucy support and development purposes and is not documented for use by end users.

The Clear Offline Inventory Cache options provide metadata about the caches currently stored locally and allows one cache to be forcibly refreshed on the next go offline process.





Existing work orders and requests are accessible from the dashboard or from the Modules menu. They are also accessible as children of inventory items that are offline. Work Orders and requests can be added through a view launched from a data drill, or from a view launched from the modules menu, or from GIS.

Toolkits and the Create Request view buttons are not supported offline. Picklists for work order assets in the work order and request and PM forms are also not available offline (although the asset data can be manually entered if the user knows the asset id).


The Create Work Order is available from Inventory modules but not from Requests or Inspections.

Adding and editing data

Adding and editing data offline is very similar to online. Most of the custom business logic and defaulting does not occur until the data has been saved to the server, however. For example, if a user selects a problem with a default task, that default task will not be automatically populated while offline. The user can either manually select the task or leave it blank and it will populate when the work order is pushed online.

Synchronizing data back to the server

When you are ready to be online again, you need to synchronize your changes back to the server. You cannot go online until all changes have been synchronized to the server or abandoned.

Go back online by tapping the Go Online  button.

Parts Inventory Prompting

If adds or edits in materials and fluids require information about where parts should be taken, users will be prompted to select a warehouse when taking records online.

Cancel
Please select which location to take the 2 Test Part parts from
1989-1.2 1989-1 Qty Avail: 1
1989-1.1 1989-1 Qty Avail: 2
UTWD-2 UTWD Qty Avail: 28
UTWD-1 UTWD Qty Avail: 47

Error handling and resolution

If errors are encountered (errors that cannot be caught by simple required, min/max, valid value error checking), users will be prompted with the error message. For example, if the user enters an end date that is prior to a start date on a work order.

The screenshot shows a mobile application interface for managing work orders. A modal dialog box titled "Conflict Encountered" is displayed in the center. The dialog contains the following text: "Cannot save, object is invalid:", "WorkOrder (17-478365): Start date can not be after end date., WorkOrder (17-478365):", "WorkOrderDurationActual value of -8 is below the minimum allowed value of 0", and "Would you like to abandon all changes to this record?". At the bottom of the dialog are two buttons: "Yes" and "No". The background shows a "Work Orders" form with various fields such as "Work Order #", "Status", "Category", "Problem", "Main Task", "Asset", "Location", "Cause", "Assigned Crew", "Supervisor", "Lead Worker", "Priority", "Account #", "Proj No", "Project Text", "Reason", "Start Date", "Start Time", "End Date", "End Time", and "Overrides".

If you click Yes on this prompt, the record will be abandoned and the sync will continue. If you click No, you will be able to edit the record and hit Save and the sync will continue. A prompt will ask if you want to continue the go online process.

The screenshot shows a mobile application interface with a modal dialog box titled "Online". The dialog contains the text "Would you like to continue the go online process?" and two buttons at the bottom: "Yes" and "No".

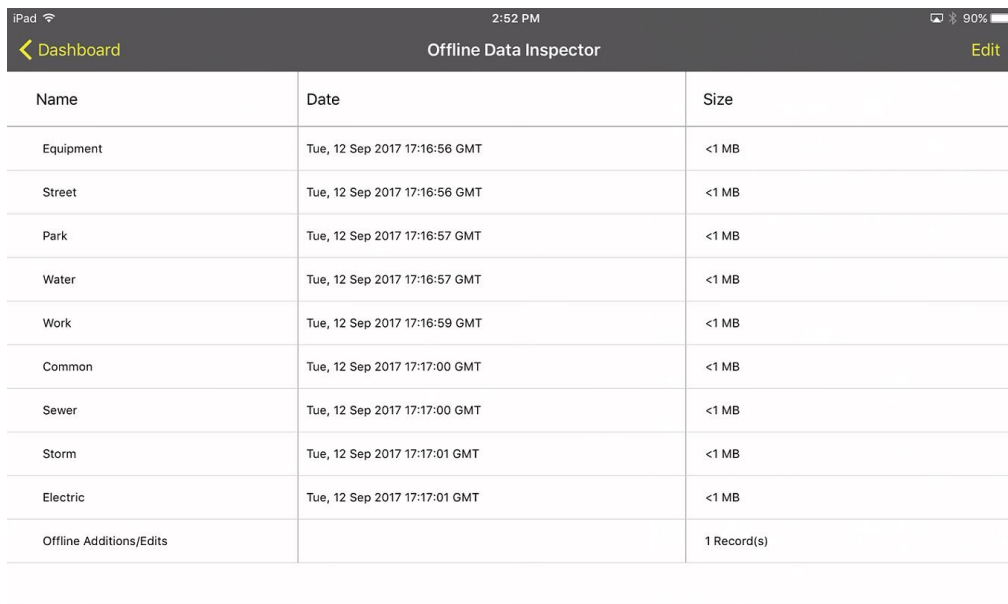
Warnings will be handled with a message dialog with a "Next" button to page through all of the warnings.

The screenshot shows a mobile application interface with a warning dialog box. The dialog has a "Cancel" button at the top left and an "Ok" button at the top right. The main text of the dialog reads: "1001 is already attached to the following open Work Orders:" followed by "Work Order ID: 17-478368".

Troubleshooting or inspecting offline data status

To get information about the status of offline data (non-GIS) on a tablet, an interface for inspecting the offline metadata is available. To get to this, select Offline Data Inspector from the menu on the dashboard.

This screen provides information about what caches are downloaded to the device, when they were downloaded, what size they are, and how many local edits are currently on the device. You can clear a specific cache (which will force it to try and download on the next Go Offline) by clicking edit. You can also discard all of your local offline changes through this Edit menu.



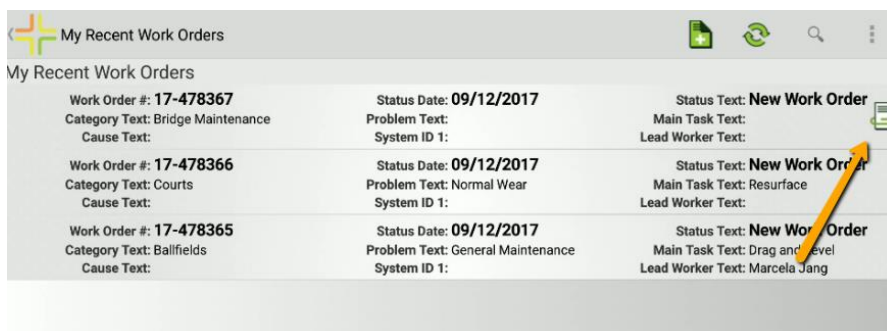
Name	Date	Size
Equipment	Tue, 12 Sep 2017 17:16:56 GMT	<1 MB
Street	Tue, 12 Sep 2017 17:16:56 GMT	<1 MB
Park	Tue, 12 Sep 2017 17:16:57 GMT	<1 MB
Water	Tue, 12 Sep 2017 17:16:57 GMT	<1 MB
Work	Tue, 12 Sep 2017 17:16:59 GMT	<1 MB
Common	Tue, 12 Sep 2017 17:17:00 GMT	<1 MB
Sewer	Tue, 12 Sep 2017 17:17:00 GMT	<1 MB
Storm	Tue, 12 Sep 2017 17:17:01 GMT	<1 MB
Electric	Tue, 12 Sep 2017 17:17:01 GMT	<1 MB
Offline Additions/Edits		1 Record(s)

Documents while offline

Documents can be attached to new or existing records while offline. Existing documents are not available while offline.

Attaching documents works the same offline as online. Unlike the online version however, documents added offline require a description entered by the user.

Documents added offline are available during the current offline session for all modules.



Work Order #	Category Text	Cause Text	Status Date	Problem Text	System ID 1	Status Text	Main Task Text	Lead Worker Text
17-478367	Bridge Maintenance		09/12/2017			New Work Order		
17-478366	Courts		09/12/2017	Normal Wear		New Work Order	Resurface	
17-478365	Ballfields		09/12/2017	General Maintenance		New Work Order	Drag and Level	Marcela Jang

Pushing the edits to the server will save the documents to the server and will leave the documents on the tablet for use locally while offline. Going online will also save the documents to the server, but when the user goes offline again, the documents will no longer be available. This is true of all modules (including inventory and inspections).

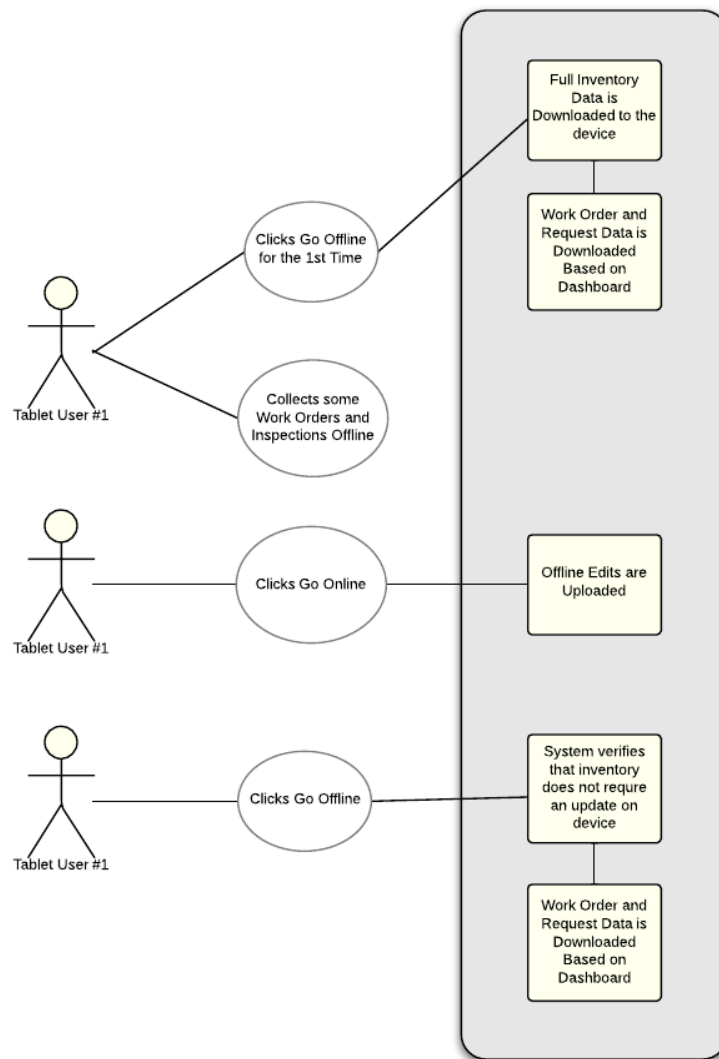
Offline Workflows

When a user goes offline, the tablet application downloads a cache of all of the inventory data so that it is available while the user is offline. The tablet application also reviews the user's dashboard for any Work Order or Request data that is marked for offline use and downloads that as well.

Downloading and processing the inventory datasets for offline use can be time consuming depending on the processor on the tablet and therefore is optimized to only download updates when needed. The following diagrams show some example workflows:

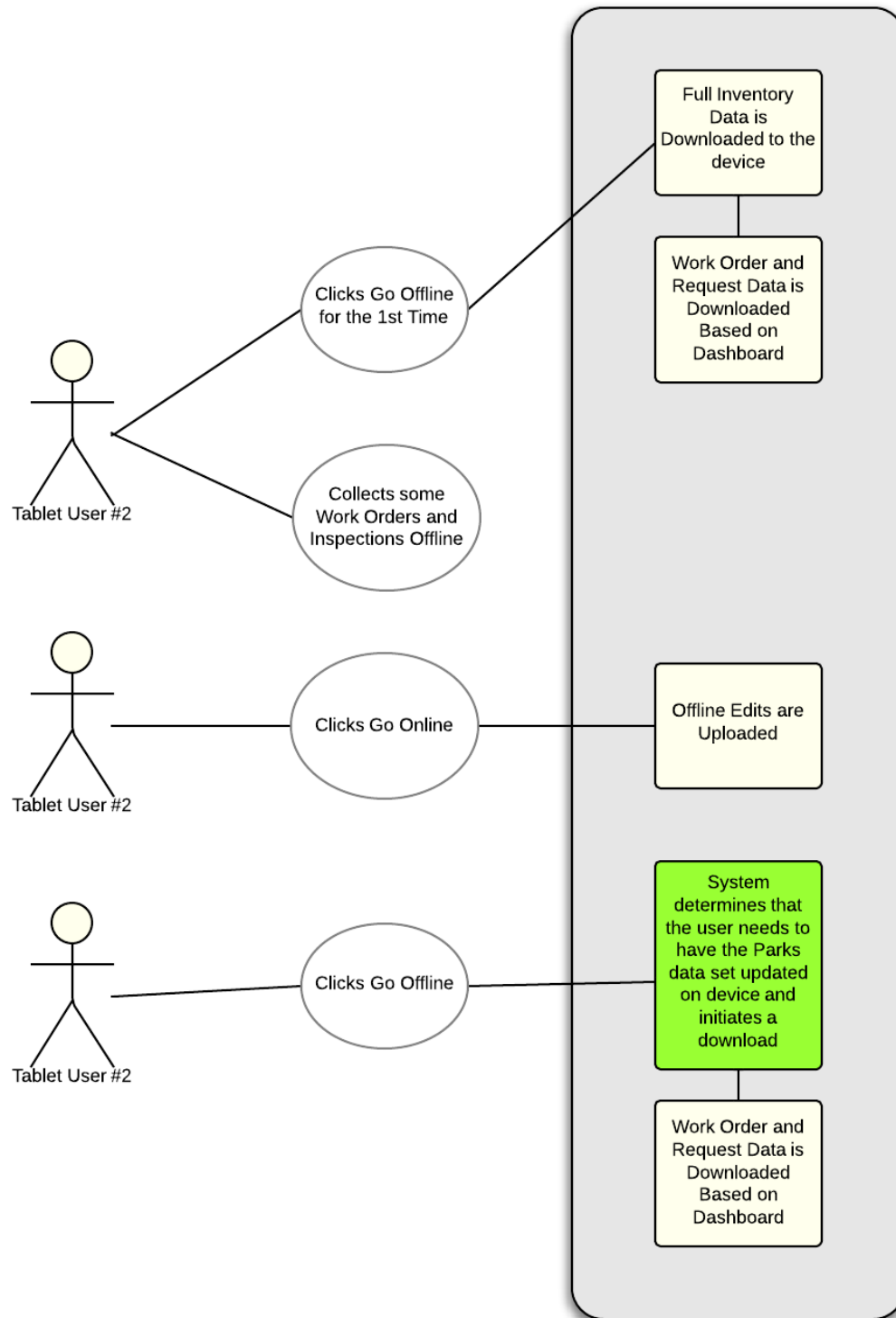
Example 1

Tablet User #1 does not need current inventory data. The data will download the first time and may not download again for a month or 3 months or even a year. The system knows this based on his login. It will check each time he goes offline but if he does not need an update, it will not download an update to the inventory data.



Example 2

Tablet User #2 is working on a project where he needs weekly updates to the Parks dataset on his tablet. All data will download the first time. The system will check each time he goes offline to see if the Parks dataset is older than 1 week. If it is, it will download it when he goes offline.



Inventory Data Cache

Inventory data and the direct children of inventory records (such as comment grids, status grids, field ties) are cached nightly. Inspections and tests, construction records, work projects, and other non-inventory modules are not cached nightly.

By default this cache happens at 2:00 am directly after the 1:45 app recycle.

The time to complete a cache will vary based on how much data you are caching, your database server, and your web server where mobile server is installed. It can range from 20 minutes to 4 hours (or more in some cases although this is cause for review).

In addition to inventory data and the direct children of inventory records, views/forms/grids are also cached into the nightly static cache. This also will include picklists for fields on forms (including relationship style picklists which can be very large).

Views/Data

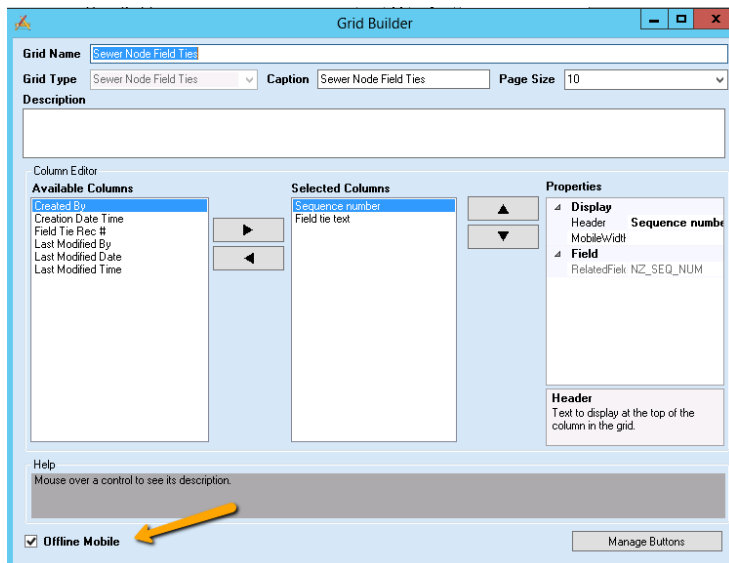
You can control what data goes out to the field so that you can streamline the experience and minimize the load on the server and the bandwidth required to go offline.

Configuring what data is potentially available to offline users

Configure which views are available offline using the Offline Mobile flag in the view builder. And in the grid builder (for children).

The screenshot shows the 'View Builder' window for a view named 'Sewer Node'. The interface is divided into several sections:

- View Name:** A text field containing 'Sewer Node'.
- Alternate View Name:** An empty text field.
- Step 1: Select a Grid Type:** A tree view showing a hierarchy of options. 'Sewer Nodes' is selected, and under it, 'Sewer Node Field Ties' is also selected. Other options include 'Work Orders', 'Work Requests', 'PM/Work Templates', 'Sewer Comment Grid', and 'Sewer Construction Assets'.
- Step 2: Select a Grid:** A dropdown menu showing 'Sewer Node'. Below it are 'New Grid' and 'Edit Grid' buttons.
- Step 3: Select a Form for Grid (optional):** A dropdown menu showing 'Sewer Node Form'. Below it are 'New Form', 'Edit Form', and 'Preview' buttons.
- Help:** A section with the text 'Mouse over a control to see its description.' and a large grey area for a tooltip.
- Offline Mobile:** A checkbox that is checked. An orange arrow points to this checkbox from the left.
- This is the default view for the Sewer Nodes:** A checkbox that is checked.
- Buttons:** 'Save' and 'Cancel' buttons are at the bottom right.



In addition to these settings, starting with Lucy 2016r2, we also automatically cache views and forms of any module which is flagged for offline in a data drill on an offline dashboard frame for any users in your system.

Enabling the Android or Apple (iOS) cache

Android and Apple caches are separate caches.

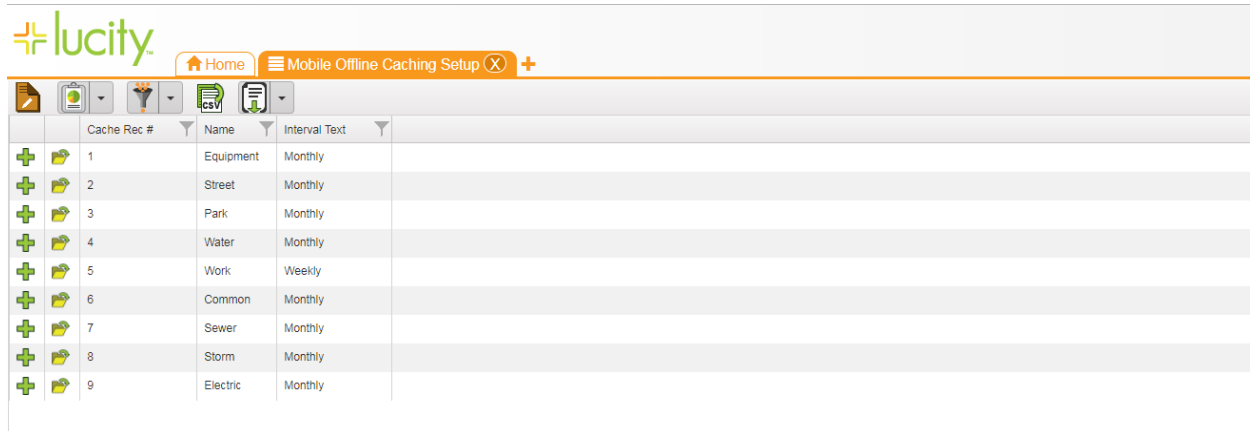
- We produce cache files with a file extension .json for Android
 - These are json formatted text files
 - Pre gzipped to json.gz file
 - The json.gz file is streamed to the client
 - Android post processes the data into a local SQLite database
- We produce cache files with a file extension .db for Apple devices
 - These are SQLite database files
 - Pre gzipped to a db.gz file
 - The db.gz file is streamed to the client

By default, only the Android cache is refreshed nightly. If you want to use Lucy offline on an Apple device, you must enable nightly caching for iOS.

Mobile			
Setting Description	Setting Value	Setting Category	
Log device latitude and longitude	TRUE	Mobile	
Max Columns Returned	20	Mobile	
Maximum number of days to store device location history	30	Mobile	
Maximum records to return per request for mobile	100	Mobile	
Update the offline Android cache nightly	TRUE	Mobile	
Update the offline iOS cache nightly	TRUE	Mobile	
Url for the Lucy Mobile Server Virtual Directory	https://demo.lucity.net/LucityMobileDev	Mobile	

Configuring how often your users get updates

The frequency of tablet downloads is controlled by the Mobile Offline Cache Setup module (under the General menu). This is accessible in Lucity Web, Lucity Mobile, and Lucity Desktop. In order to use this module in Lucity Web and Lucity Mobile a view must be imported or created for the module.

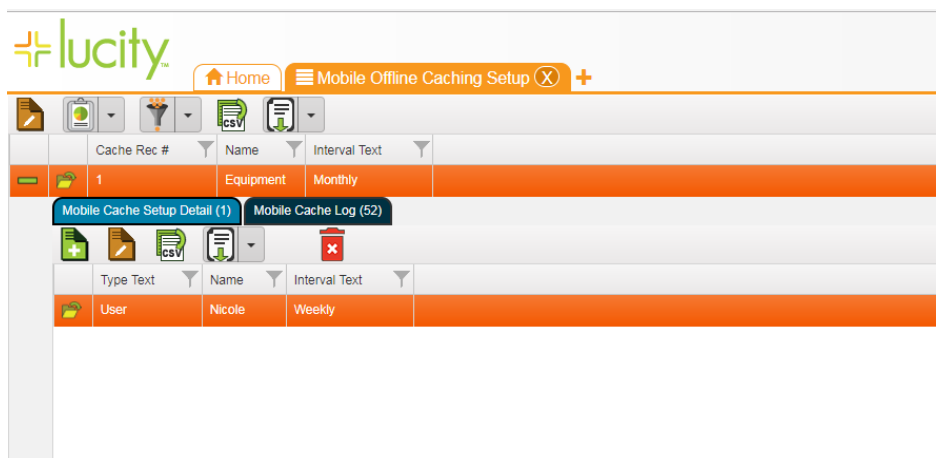


The screenshot shows the Lucity web interface with the 'Mobile Offline Caching Setup' module selected. A table lists nine cache records with columns for Cache Rec #, Name, and Interval Text.

Cache Rec #	Name	Interval Text
1	Equipment	Monthly
2	Street	Monthly
3	Park	Monthly
4	Water	Monthly
5	Work	Weekly
6	Common	Monthly
7	Sewer	Monthly
8	Storm	Monthly
9	Electric	Monthly

By default all tablets will get all databases monthly. It is important to review and change this to fit the workflows required. Monthly may be too frequent in many cases. Tablets which do not need access to datasets should be configured to not download the datasets.

To configure what is downloaded on a user or group basis, add an override record to the Mobile Cache Setup Detail child of Mobile Offline Caching Setup. These will override the global parent values. The bottom screen cap, Park is configured to download Monthly for all users except Nicole. Nicole gets the data weekly.



The screenshot shows the 'Mobile Cache Setup Detail' view for record 1 (Equipment). It displays an override record for user Nicole with a weekly interval.

Type Text	Name	Interval Text
User	Nicole	Weekly

One of the picklist options for Interval is "Never". This allows an administrator to optimize and not send down datasets that a user or group of users will not need. Downloading too many datasets will cause the tablet to take a long time to go offline and will put unnecessary load on the web server.

Performance Considerations

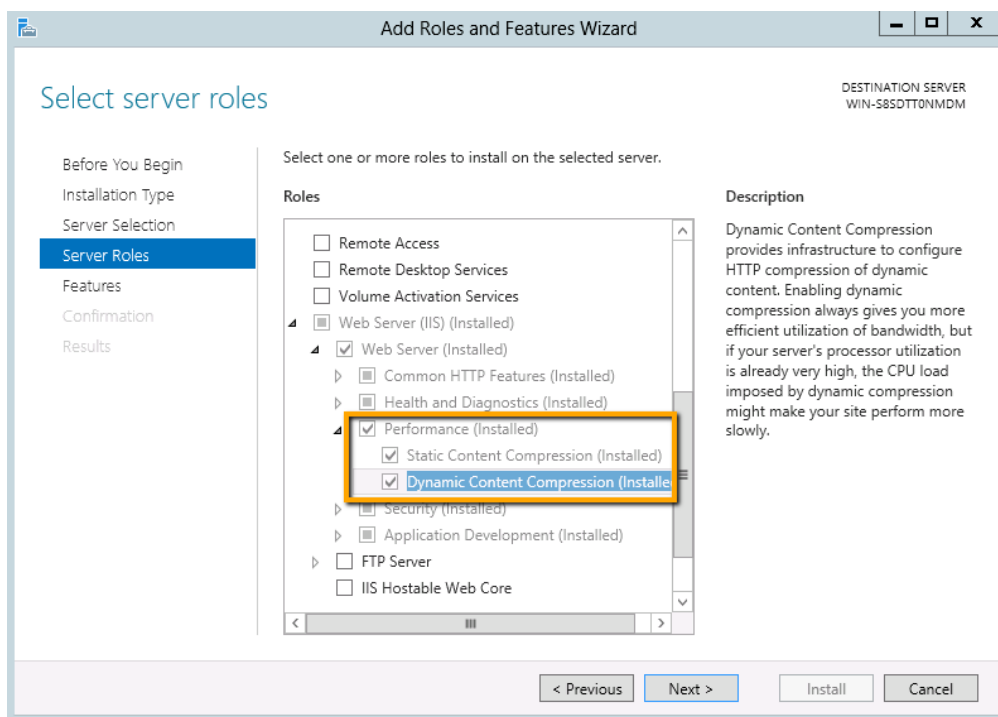
The performance of the Go Offline process is strongly correlated to the processor and memory available on the tablet for Android. Writing to disk is the most expensive activity during a Go Offline process. Slow or older tablets can take 10 to 20 times longer than newer faster tablets at writing information to disk. Keep this in mind when deciding which tablets will use offline data, how much offline data to push to the tablets, and how often the offline data is updated.

For iOS devices, the device model (how old it is) will affect download. Offline is only officially tested on iPads (not touch or iPhone) and we have good luck with most modern iOS devices. The iPad 2nd generation and Mini 1st generation will not perform well.

Additional optimizations that can be made include the following (in order of importance):

- Remove views which are not used or un-assign forms and child views from them or remove the Offline mobile flag.
- Do not add value lookups to forms unless they are needed. Remove value lookups from inventory and inspection forms that are not used or are not important. The default imported forms for Lucy have many fields which may not be necessary for your workflow.
- Remove fields from forms that are not used.

Additionally, you should enable dynamic content compression (if not already enabled) on your web server. This will allow for greater compression of data from the live/short term data cache (Work Orders and Requests).



GIS

Configuring GIS for use with offline maps requires deploying feature services and raster tile packages (if desired).

Configuring Feature Services

Feature Services have special requirements for offline usage. They must have Sync enabled.

This is an example of a feature service configured for offline use:

The screenshot shows the 'Service Editor' dialog box for a feature service named 'parks'. The 'Feature Access' tab is selected in the left-hand navigation pane. The 'Connection' is 'arcgis on localhost_6080 (admin)'. The 'REST URL' is 'http://localhost:6080/arcgis/rest/services/parks/FeatureServer' and the 'SOAP URL' is 'http://localhost:6080/arcgis/services/parks/MapServer/FeatureServer'. Under 'Operations allowed', 'Query' and 'Sync' are checked, while 'Create', 'Delete', and 'Update' are unchecked. The 'Properties' section contains three sub-sections: 'Allow geometry updates' (unchecked), 'Apply default z-value' (unchecked, with a text box set to '0'), and 'Enable ownership-based access control on features' (unchecked). The 'Advanced Options...' button is visible at the bottom right of the 'Properties' section. The 'OK' and 'Cancel' buttons are at the bottom of the dialog.

Prior to deploying this feature service:

- Global Ids were added to the datasets
- Data archiving was enabled on the datasets
- Symbology was simplified in the project
- Joins were removed
- Some changes were made to ensure that all layers in the map service were in a consistent state (either all versioned or all un-versioned; in the above example they are all versioned).
- The ArcMap project database connection was switched to a user with edit permissions to the geodatabase

- Switched operational (non-tile cache) services to use the same spatial reference for all operational services
- The analyze tool was run in ArcMap as a part of the map service creation and all issues were resolved that were critical

Another consideration is the map service is the number of features returned. This can be bumped up if desired:

Service Editor

Connection: arcgis on localhost_6080 (admin) Service Name: parks

General

Parameters

Capabilities

Mapping

Feature Access

Pooling

Processes

Caching

Item Description

Parameters

Document Location

Original Document: D:\arcgisserver\resources\parks.mxd

Anti-aliasing

Anti-aliasing: None

Text Anti-aliasing: Force

Properties

Maximum number of records returned by the server: 1000

Advanced...

Cluster

Choose the cluster hosting the service: default

Output Directory

Directory: D:\arcgisserver\directories\arcgisoutput

OK Cancel

Keep in mind that if the server is returning more features, the offline map process will be slower and will generate more load on the server.

Once a feature service is configured, the map service in Lucy Admin should be configured for the new offline feature service:

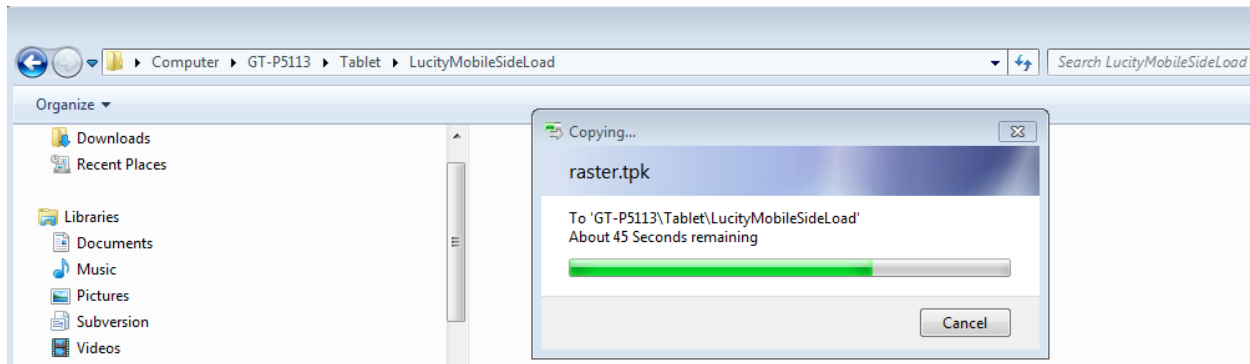
GIS Map Services													
Name		Order	Opacity	Base Map?	Tiled?	Has Feature Service?	Disable Local Caching	Require Logon?	U	Pass	M/U	Offline Mobile Feature Service Url	Pr
image	gis/rest/services/rasterimageservice/ImageServer	1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SecureInfrastructureWithCred	\\arcgis/rest/services/InfrastructureNewDemoSecure/MapS...	3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	t...	xxx			
SecureBaseMapWithCred	\\arcgis/rest/services/parcelsTiledSecure/MapServer	0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	t...	xxx			
SecureInfrastructure	\\arcgis/rest/services/InfrastructureNewDemoSecure/MapS...	3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	t...	xxx			
SecureBaseMap	\\arcgis/rest/services/parcelsTiledSecure/MapServer	0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
InfrastructureNewDemo	\\arcgis/rest/services/InfrastructureNewDemo/MapServer	5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Parks	\\arcgis/rest/services/parks/MapServer	6		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				http://demo.lucity.net:6080/arcgis/rest/services/parks/FeatureServer	
QA Tablet Parcels	\\arcgis/rest/services/parcels/MapServer	2		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
QA Tablet Demo	\\arcgis/rest/services/NewDemo/MapServer	4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
QA World	gis.com/arcgis/rest/services/World_Street_Map/MapServer/	1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

If a feature service url is provided, Lucy will assume that the map can be taken offline with the provided feature service url.

Tile Caches

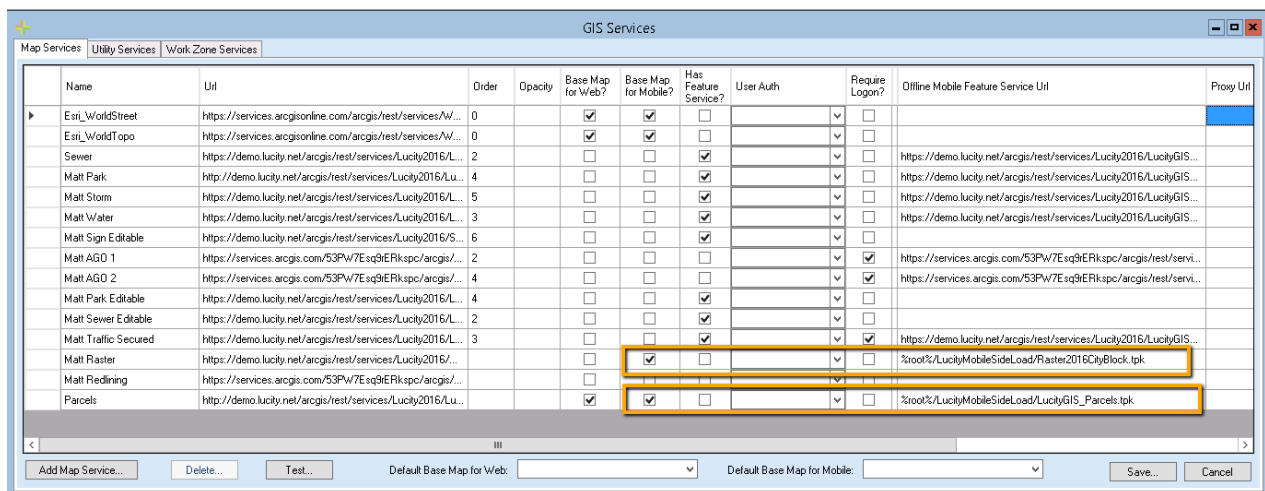
It is possible to side load tile caches on the device to provide a basemap. For details on creating tile cache tpk files, see Esri documentation. Once a tpk is created, it can be copied to the tablet. Create a folder in a consistent hive on the android file system and store the tpk in the same location on each device.

Here the tile cache is being copied to a new folder created on the root of the tablet called "LucityMobileSideLoad".



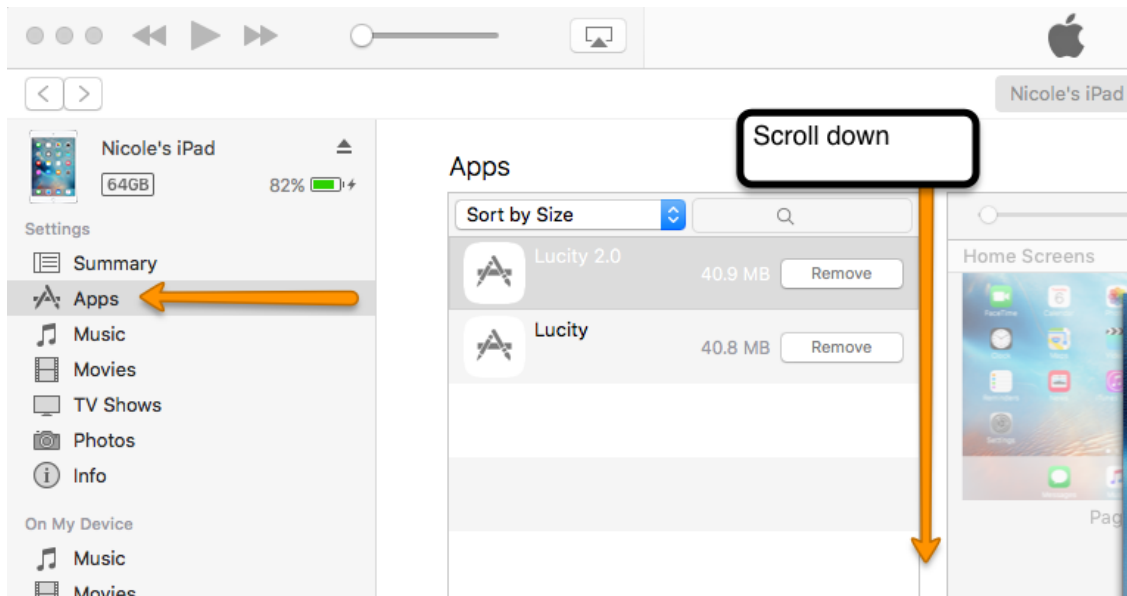
In Lucity Admin, the tiled service used in the map is updated with the location of this tiled cache stored locally: %root%/LucityMobileSideLoad/raster.tpk

The direction of the slashes in the above relative path are important.

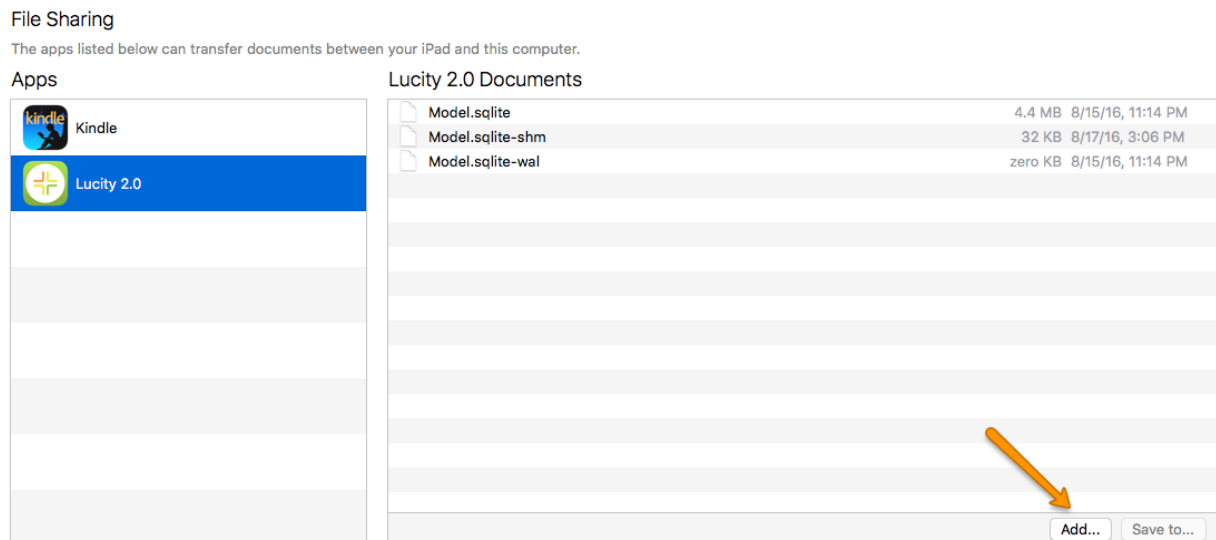


When going offline, the Lucity application will look for side loaded maps and load them for use on the device with an offline map.

For iOS devices, these should be loaded using File Sharing on iTunes. Connect the device to a PC or Mac and open iTunes. Click apps and scroll down to the bottom of the page and look for File Sharing.



Click Add and select the TPKs you want to have available. No folder can be created; it will be stored alongside the Lucity application in a dedicated folder.



You must Sync after adding the TPK.

For iOS, the system will ignore any folder names specified in the Offline Mobile path in GIS Map Services and will only do a file name match to match the TPK with the basemap.