

Developing plugin support for the mobile app

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1 Developer system







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Developer system

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How to set up your PC so that you can make changes to mobile app plugins.

Basic development environment

- Moodle development environment
 - If you've made a plugin, you probably have this already!
- Configure dev server to enable mobile app
- Test with real devices...
- ...and (I recommend) use a debug build of the desktop app

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Desktop app (debug mode)





Build this app yourself

You need a working app development setup to build the app in debug mode. More instructions here:

https://docs.moodle.org/ dev/Moodle_Mobile_ debugging_WS_requests



Or get one I made earlier (Windows, 3.6.1)

Device simulation Occasionally useful* but slower and can break.

* Touch emulation, iOS styles (but not in Safari!)

How the app works

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A summary of how the app is constructed, and how it works with the Moodle server.

Frameworks

- Cordova: runs a single-page HTML/JavaScript app on Android and iOS
- Ionic 3: HTML/JS-based interface that looks like Android or iOS components
- Angular 5: Hideous framework for writing JavaScript in a confusing manner
 - Uses not-quite-JavaScript source code (TypeScript, .ts) that is compiled to .js





Single-page app





- Entire app is one web page
- 'Pages' added and removed
- Higher-level 'pages' remain in the DOM behind current page
 - When you go 'back' it just reveals what's underneath

Login process





* When using SSO rather than manual login, this can be set to use an in-app browser and your normal login form

Everything after login





...and many more

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How plugins work

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How to implement an activity module within the app.

Mobile plugin support

- Official documentation
 - <u>https://docs.moodle.org/dev/Mobile_support_for_plugins</u>
- Plugin support works with a web service
 - tool_mobile_get_content
- Automatically calls functions in your code
 - Includes arguments, like cmid
- Your code returns data to display in app
 - HTML template
 - JavaScript code and data



db/mobile.php (for activity module)



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Handler functions

- Called by the app via web service
- Defined in classes/output/mobile.php



Template templates



- Use Mustache template to write output
- Output can be plain HTML...
 - Include Ionic component tags where appropriate
- ... but is actually an Angular template
 - You can use Angular constructs like *ngIf to include something or not based on data
 - Angular template parts are evaluated immediately if they change in JS, Mustache template only on the server
 - Up to you how much to use Angular templating

JavaScript vs Angular



- With Angular you usually code a 'component'
 - By writing a TypeScript (.ts) file which gets compiled
- Our JS is just a chunk of inline code
 - this (from the point where your code runs) is a component owned by the app
 - You can add functions to it: this.funcName = function() {}
 - And then refer to them from the Angular template:
 <button (click)="funcName()">...</button>
- Lots of useful stuff available from this
 - Use debugger to see

Reusing JavaScript?



- What if your module already has JavaScript?
 - E.g. drag and drop question...
- Cannot be reused as-is
 - No jQuery
 - No AMD module support
 - DOM structure different
- Re-implement by hand
 - Modern JavaScript available
 - Can use original code as a basis
 - Avoid repeating the same bugs





- You can restart the debug desktop app easily
 - Click into the right-hand (dev tools) area
 - Press F5
- Insert debugger; keyword into JS to cause a breakpoint
- Try out CSS changes in dev tools first
- App caches web service calls
 - See console to find out if this is happening to you
 - Cache lasts 5 minutes



Change Mustache file

Refresh page (pull down from top)

Change init JS

- Restart app (F5)
- Navigate back where you were

Change page JS

Refresh page (pull down from top)

Change CSS file

- Update version in db/mobile.php
- Purge caches on server
- Restart app (F5)
- Navigate back where you were



Behat testing

How Behat testing works with the mobile app (from Moodle 3.7).



Behat: what and why



- In case you aren't familiar with Behat testing...
 - Automated functional testing
 - The test run uses a browser and simulates a person clicking on buttons, typing text, etc.
 - Used in Moodle development for some years
- Particularly important with mobile app plugins
 - Updates to the mobile app might break your plugin
 - Can't control the timing of updates
 - Test against every version of the app before release
 - Doing this manually would be super tedious

Behat for mobile app plugins

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- Documentation on wiki:
 - <u>https://docs.moodle.org/dev/Acceptance_testing_for_the_mobile_app</u>
- Requires running Moodle app installation on your PC
 - Automatic using Docker (in instructions above)
 - If Docker doesn't work for you...
 - Install app development environment
 - <u>https://docs.moodle.org/dev/Setting_up_your_</u> development_environment_for_Moodle_Mobile_2

How it works



- App appears in Chrome
- Some aspects not testable
 - Device features
 - iOS/Android differences

Writing a test: overview

- 1: Set up Moodle as usual
 - Create and configure courses and users
- 2: Go into the app and do some testing
 - Press buttons, check things appear



Writing a test: special steps

- I enter the app Starts the app
- Many standard steps ('click on') not reliable
 - Confused by presence of other pages in DOM
- I press "X" in the app Presses a button/text/image
- I press "X" near "Y" in the app Distinguishes between different instances
- A few others

Example



1 These tags are required; include others too, as appropriate

3 Normal login step works for the app login page too

5 App step to check it's on the correct page

@app @javascript

Feature: Test app (demo) In order to test something in the app As a developer I need for this test script to work

Background:

Given the following "courses" exist: fullname | shortname Course 1 | C1 And the following "users" exist: username student1 And the following "course enrolments" exist: user | course | role student1 | C1 student Scenario: Try going into the course When I enter the app And I log in as "student1" And I press "Course 1" near "Course overview" in the app Then the header should be "Course 1" in the app

2 The app will start and connect to your Behat test Moodle server at this point

4 The 'Course 1' text appears in the app several times so you need 'near' to specify which one to press



The normal Moodle web site appears first while it runs the background steps, and anything else prior to entering the app.



You are not logged in. (<u>Log in</u>) **Data** retention summary





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- You can make custom modules (and some other plugins) work in the Moodle Mobile app
- To make it easier to test your plugin against future app versions, create automated Behat tests





