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# Moodle 2.9+ JavaScript with AMD

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# What is AMD?

- Nothing to do with the CPU/GPU company...
- Module framework for including JavaScript
  - All new JS code (2.9+) should use this framework
    - Not available in Moodle 2.8 or below
  - Other methods still work for now (YUI, Shifter)
    - No need to port existing code yet

# AMD modules

- Plugin can have one or more AMD modules
- Module is a .js file
- Can call functions in one module from another module
- Using multiple modules can improve readability

# Creating an AMD module

1. Create JS file in correct location
2. Call it from PHP code
3. Build release version

# 1 *<plugin>/amd/src/<module>.js*

```
/**
 * @module format_oustudyplan/sections
 */
define(['jquery'], function($) {
    /**
     * @alias module:format_oustudyplan/sections
     */
    var t = {
        init : function() {
            // Your code here.
        }
        // Other functions and variables here, comma-separated.
    };
    return t;
});
```

# Code structure

- You can actually organise code in a zillion ways
- Example with `t` variable is my favourite structure
  - I use `t` as short for `this` (but without special behaviour)
- Official documentation uses multiple structures
  - Hard to understand

# Actual code

- Use **jQuery** (not YUI)
  - Principles are similar to YUI
  - Many jQuery tutorials and references on the web
    - Use own judgement to select a non-sucky one
  - Moodle currently has jQuery 1.11.2
- Function names and variables should now be camelCase (different to PHP `under_lines` style)

# Calling other modules

- Example code only required jQuery.

- Add modules at start if desired

```
define(['jquery', 'local_thing/module'], function($, localThing) {
```

- Variable will be set to 't' from module

- Or require dynamically anywhere in code

```
require(['local_thing/module'], function(localThing) {  
    localThing.someFunction();  
});
```



## 2 Calling from PHP

- If no parameters to function:  
`$PAGE->requires->js_call_amd('local_thing', 'init');`
- If parameters:  
`$PAGE->requires->js_call_amd('local_thing', 'init', array('frog', 42));`
- Can call any function this way
  - `init` is not a special name

## 3 Build release version

- The previous steps work already for a developer system
  - Assuming you have `cachejs` setting off
- Need to use **grunt** to minify for release version

# Install grunt

- From Moodle root, 2 commands:

```
npm install
```

```
npm install -g grunt-cli
```

- If it doesn't work, similar troubleshooting as for phpunit
- It worked for me!

# Run grunt

- Run **grunt** after changing AMD JS files
- In command prompt (git bash), change to plugin directory then run it:  
`cd local/thing`  
`grunt jshint uglify`
- **jshint** checks your JS code for possible errors
  - If there are errors, it will stop after that
- **uglify** does the actual minification

```
sm449@PCD243687 /c/users/sm449/workspace/ou-moodle2/course/format/oustudyplan (osep)
$ grunt jshint uglify
Running "jshint:files" (jshint) task

course/format/oustudyplan/amd/src/areas.js
 36 |         initEditingToggles : function(data) {
                                ^ 'data' is defined but never used.
course/format/oustudyplan/amd/src/multiselect.js
135 |         var pos = current.offset();
                                ^ 'pos' is already defined.
137 |         var inner = $('<div class="oustudyplan-inner"></div>');
                                ^ 'inner' is already defined.
152 |         var name = content.find('span.instancename').clone(false);
                                ^ 'name' is already defined.
279 |         console.log(cmids);
                                ^ 'console' is not defined.
course/format/oustudyplan/amd/src/owned.js
 36 |         initEditingToggles : function(data) {
                                ^ 'data' is defined but never used.
course/format/oustudyplan/amd/src/sections.js
183 |         for (var i = 0; i < data.newsections.length; i++) {
                                ^ 'i' is already defined.
188 |         for (var i = 0; i < data.alsochanged.length; i++) {
                                ^ 'i' is already defined.
145 |         $('li').each(function(index) {
                                ^ 'index' is defined but never used.
388 |         ajaxError : function(jqXHR, textStatus, errorThrown) {
                                ^ 'errorThrown' is defined but never used.

>> 10 errors in 21 files
Warning: Task "jshint:files" failed. Use --force to continue.

Aborted due to warnings.
```

# Successful run

```
sm449@PCD243687 /c/users/sm449/workspace/ou-moodle2/course/format/oustudyplan (osep)
$ grunt jshint uglify
Running "jshint:files" (jshint) task
>> 21 files lint free.

Running "uglify:dynamic_mappings" (uglify) task
>> 6 files created.

Done, without errors.
```

- The **6 files created** are in **amd/build**
- Always says **created** even if they already exist

# Run before commit

- Run **grunt** to update minified files before each commit
  - If a commit affects **amd/src** then it should also update **amd/build**
- No need to run it while developing
  - Changes to **amd/src** take effect on reload when **cachejs** setting is turned off
- When **cachejs** is on, **amd/build** is used
  - Need to purge caches/update JS revision to update

# Summary

- AMD modules are .js files in `amd/src` within plugin
- Include from PHP with `$PAGE->js_call_amd`
- Run **grunt** to update `amd/build` minified versions
- Examples in `format/oustudyplan`, but currently only using AMD properly in `osep` branch
- [https://docs.moodle.org/dev/Javascript\\_Modules](https://docs.moodle.org/dev/Javascript_Modules)





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