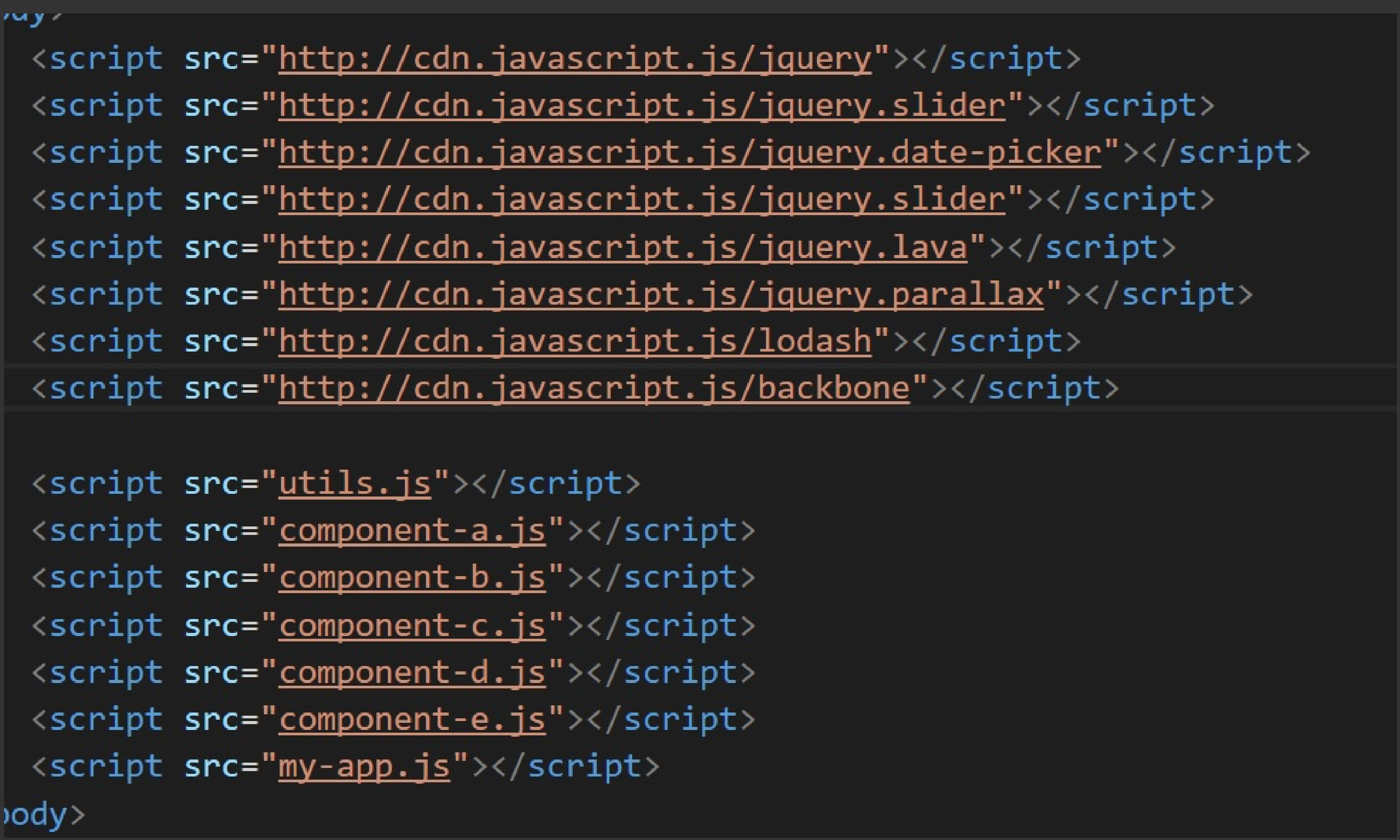
Webpack
Learn and lunch

November 2017

Back in the day in the front-end environment

“Script tag stack” era



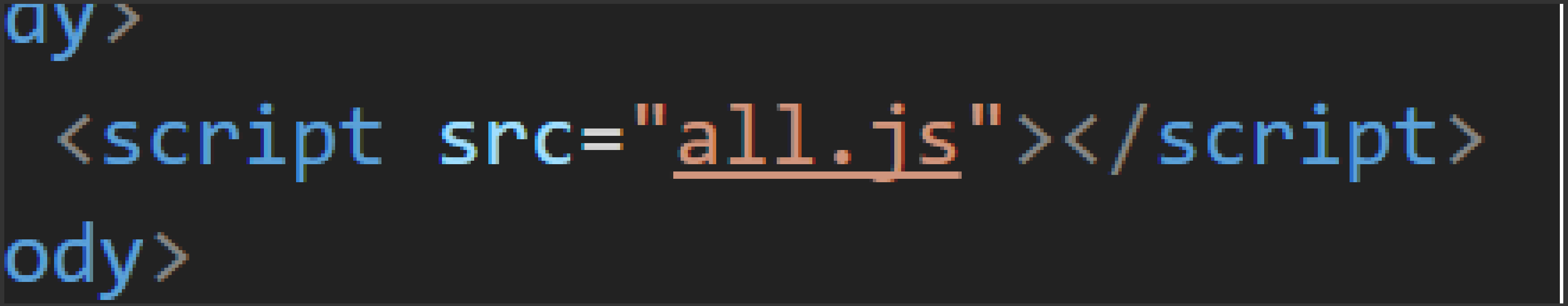
```
  <script src="http://cdn.javascript.js/jquery"></script>
  <script src="http://cdn.javascript.js/jquery.slider"></script>
  <script src="http://cdn.javascript.js/jquery.date-picker"></script>
  <script src="http://cdn.javascript.js/jquery.slider"></script>
  <script src="http://cdn.javascript.js/jquery.lava"></script>
  <script src="http://cdn.javascript.js/jquery.parallax"></script>
  <script src="http://cdn.javascript.js/lodash"></script>
  <script src="http://cdn.javascript.js/backbone"></script>

  <script src="utils.js"></script>
  <script src="component-a.js"></script>
  <script src="component-b.js"></script>
  <script src="component-c.js"></script>
  <script src="component-d.js"></script>
  <script src="component-e.js"></script>
  <script src="my-app.js"></script>
ody>
```

“Script tag stack” problems

Multiple HTTP requests
Order is important
Scripts can have interdependencies

all.js/script concatenation era



```
ay>
  <script src="all.js"></script>
ody>
```

all.js/script concatenation problems

~~Multiple HTTP requests~~

Order is **still** important

Scripts can **still** have interdependencies

Unnecessary chunks of scripts are loaded

Node.js

2009

Based on Google’s Chrome’s JS V8

Event loop

Javascript on server side

Modules

Node.js - module

- Function/variable/class reusable easily
- Maintability
- Imported with keyword “require”
- Exported with keyword modules.exports
- scoped => no mainspace pollution

Node.js - npm

Node package manager

Has a ton of packages for almost everything

Twitter’s Bower 2012

Pkg manager for front-end (img, js...)

“Deprecated”

Browserify 2011

Allows “require” **in the browser**
Allows node_modules in the browser*
Transforms your **javascript files**
Loads **synchronously** modules
Bundles your js file

* Not all pkg are usable in the browser

Bundle ?

Bundling

Create a file containing every modules of an app

Process non-javascript code/assets :

- Optimize image
- Transpile templates into js / non-js to js

Single Page Application (SPA) era (20XX)

BackboneJS
Angular / AngularJS
Aurelia
Ember.js
VueJS
React
...

Single Page Application (SPA) era

- Websites are dead, long life to applications
- Everything in the javascript
- Images/css/templates are loaded in the js

Browserify

don’t handle natively all front-end assets...

...but you can use transforms

Browserify - transforms

Applied during compilation

“Transforms your non-js” code to js :

- es6 : babelify (formerly 6to5ify)
- bower : debowerify
- node env vars : envify
- coffeescript : coffeeify
- and more*

* https://github.com/browserify/browserify/wiki/list-of-transforms

Browserify - transforms

A lot are third parties

Browserify - transforms

A lot are third parties

Can have compatibility issues between them
Can be abandoned

So Webpack came

https://webpack.js.org

Bundle manager for front-end

Webpack

- Created in 2012
- Two major versions this year : 2 and 3

Webpack

- Bundles javascript

Webpack

- Bundles javascript
- Bundles html, images, css and more natively*
- Philosophy : Convention over configuration**
- (Can) Loads modules **asynchronously** natively
- Allows ES6 modules before native browser support

https://webpack.github.io/docs/motivation.html

* Requires specific loaders

** https://en.wikipedia.org/wiki/Convention_over_configuration

Let’s use it

- npm install -D webpack / yarn install -D webpack
- webpack <entry> <output>

That’s it

Webpack - cli

Has a lot of options* for compilation :

- -p : build for production
- -d : build for development
- --watch, -w : watch file for changes
- --help, -h : list all options
- [...]
- --config : build source using a config file

* https://webpack.js.org/api/cli/

Webpack - config file

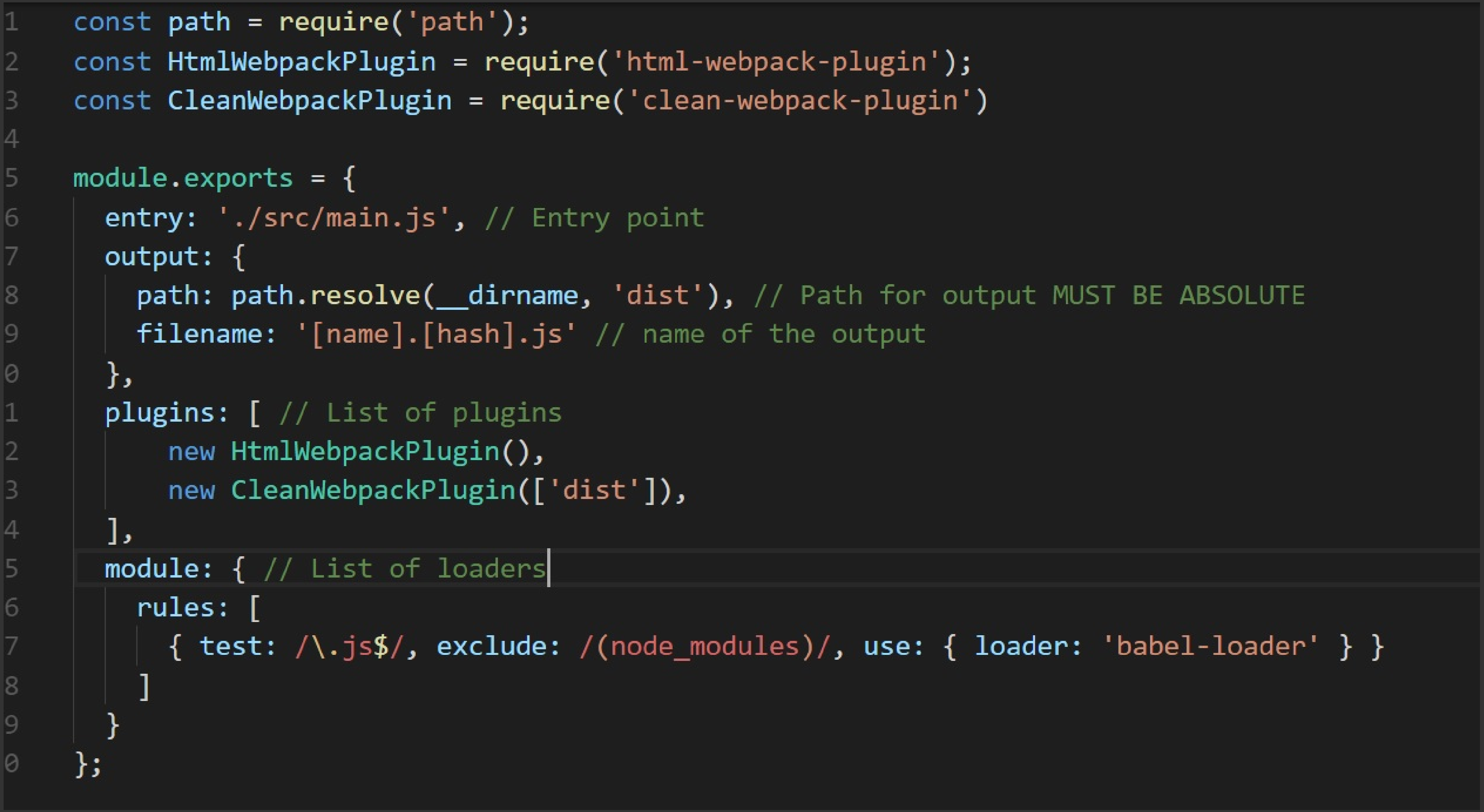
- Named webpack.config.js by default
- Can **inherit** from another file
- More user-friendly than cli
- Must return an object

* https://webpack.js.org/api/cli/

Example

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/basic

Webpack - config file’s anatomy*



```
const path = require('path');
const HtmlWebpackPlugin = require('html-webpack-plugin');
const CleanWebpackPlugin = require('clean-webpack-plugin')

module.exports = {
  entry: './src/main.js', // Entry point
  output: {
    path: path.resolve(__dirname, 'dist'), // Path for output MUST BE ABSOLUTE
    filename: '[name].[hash].js' // name of the output
  },
  plugins: [ // List of plugins
      new HtmlWebpackPlugin(),
      new CleanWebpackPlugin(['dist']),
  ],
  module: { // List of loaders
    rules: [
      { test: /\.js$/, exclude: /(node_modules)/, use: { loader: 'babel-loader' } }
    ]
  }
};
```

* https://webpack.js.org/configuration/

Webpack - loaders*

- Equivalent of browserify’s transforms
- Process non-JavaScript modules as dependancies for bundles
- Loaded under “module.rules” key in a config file

* https://webpack.js.org/concepts/loaders/

Example

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/loaders

What we saw until now

- Script loading were painful until browserify
- Browserify allow developers to bundle js
- webpack’s loaders are browserify’s transforms

What we saw until now

- Script loading were painful until browserify
- Browserify allow developers to bundle js
- webpack’s loaders are browserify’s transforms

- webpack and browserify do the same thing

Plugins

https://webpack.js.org/plugins/

Webpack - plugins

- Plugin does what a loader can’t
- Most of the time they are applied **after** loaders

Webpack – plugins examples*

- Define env vars
- Copy file
- Compress files
- and more and yours

* https://webpack.js.org/plugins

Example

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/plugins

Webpack – plugins and

- Define env vars
- Copy file
- Compress files
- and more and yours

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/plugins

Advanced webpack

Environments management

Goals :

- Execute specific code into specific environment
- Use inheritance for config files

Example :

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/environments

Internationalization (i18n)

Goal :

- Create a specific bundle for each localisation

Example :

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/modules

Single Page App – CSS in JS

Goal :

- Create a ReactJS application
- Load css and images in javascript file

Example :

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/assets-in-js

Single Page App with HMR

Goals :

- Improve development production
- Reload only modules/css edited

Example :

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/hot-reload

Code Splitting

Use case :

PageA.html

lodash.js
luxon.js
pageA.js

pa.bundle.js

PageB.html

lodash.js
pageB.js

pb.bundle.js

PageC.html

lodash.js
react.js
pageC.js

pc.bundle.js

Code Splitting

Use case :

PageA.html

lodash.js
luxon.js
pageA.js

pa.bundle.js

PageB.html

lodash.js
pageB.js

pb.bundle.js

PageC.html

lodash.js
react.js
pageC.js

pc.bundle.js

Code Splitting

Lodash.js is loaded three times on three differents pages! → Two loadings are useless

Code Splitting

Four ways to split code:
- Manual code splitting
- CommonsChunkPlugin
- Dynamic code splitting
- Lazy loading code splitting

https://webpack.js.org/guides/code-splitting/
https://webpack.js.org/guides/lazy-loading/

Code Splitting

Application (CommonsChunkPlugin) :

PageA.html

lodash.js
luxon.js
pageA.js

lodash.js (1st call)
pa.bundle.js

PageB.html

lodash.js
pageB.js

lodash.js (cached)
pb.bundle.js

PageC.html

lodash.js
react.js
pageC.js

lodash.js (cached)
pc.bundle.js

Code Splitting

Benefits:
- Decrease bundle size
- Decrease datas download
- Decrease loading time

Code Splitting

Goal :

- Extract into a specific bundle every module in common

Example :

https://github.com/DanYellow/misc-tests/tree/master/webpack-presentation-examples/webpack-samples/code-splitting

Webpack

Pros

- Using asynchronous and synchronous modules
- Code splitting
- Convention philosophy
- Handles natively all front-end assets
- Hot module reloading
- Ton of natives plugins / loaders

Cons

- Hard learning curve
- Complex to setup
- Overkill for non-SPA project
- Config file can be hard to read

Summary of this presentation

Webpack is **convention**
Browserify is **configuration**
Webpack bundles all front-end assets **natively**
Webpack ~= gulp + browserify
Webpack’s plugins = browserify’s plugins
Webpack’s loaders = browserify’s transforms

Thank you
for your attention

All examples and presentation:
https://github.com/DanYellow/misc-tests/webpack-presentation-examples

Questions ?