THE ERA OF MODULE BUNDLERS

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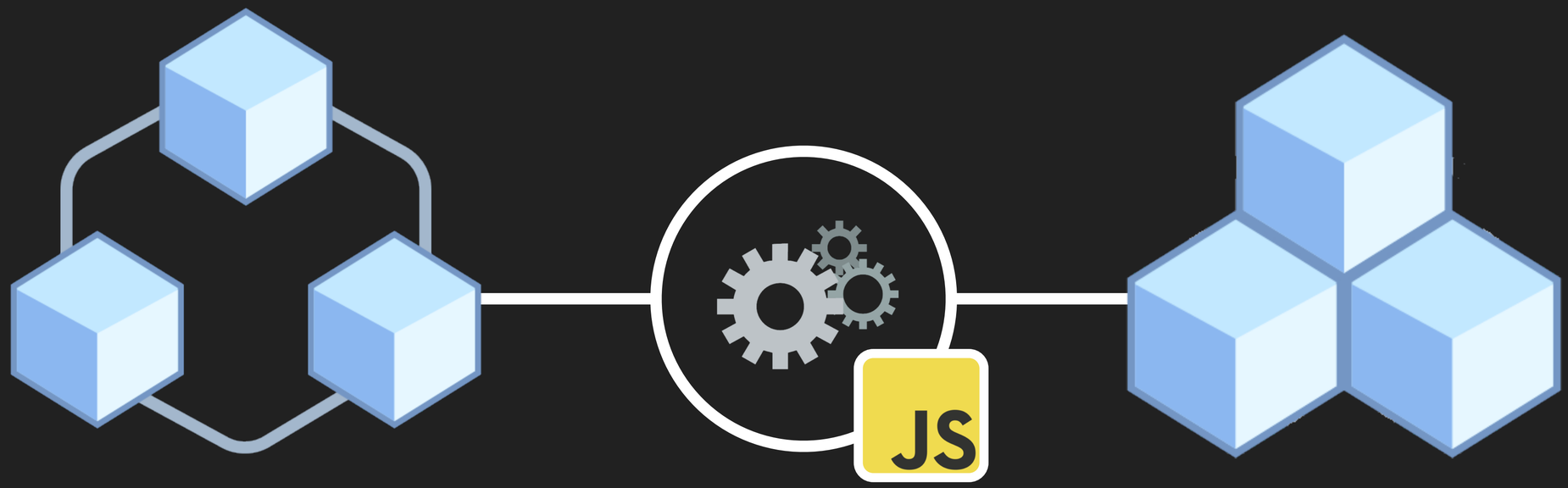
Ad Revenue Optimisation Platform

adpushup.com

Adblock Monetisation Platform

adrecover.com

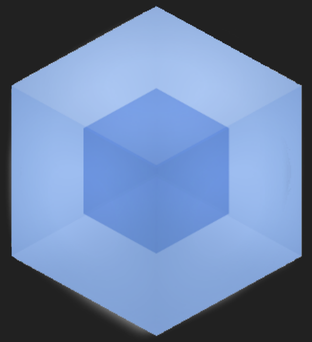
THE ERA OF MODULE BUNDLERS



http://bit.ly/Era-of-module-bundlers-demos

Task Runners

Module Bundlers



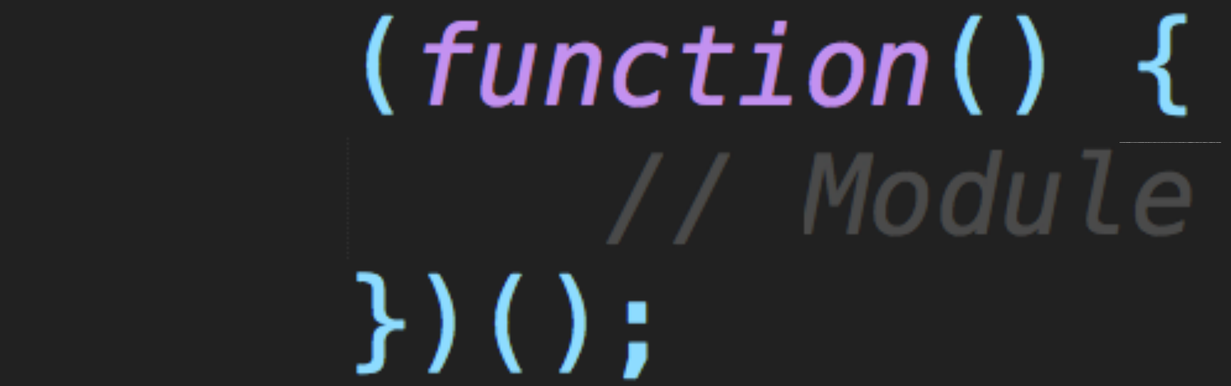
JAVASCRIPT MODULES

MAINTAINABILITY

REUSABILITY

EASE OF TESTING

MODULE SYSTEMS IN JAVASCRIPT



Immediately Invoked Function Expression

```
(function() {
    // Module code
})();
```

```
{
    // Module code
}
```

http://bit.ly/block-scoping-es6

```
var math = (function() {
    return {
        sum: function() {
            // Method code
        },
        product: function() {
            // Method code
        }
    };
})();
```

Object Interface

http://bit.ly/design-patterns-javascript

AMD

COMMON JS

AMD

```
define([], function() {
    return {
        sum: function() {
            // Method code
        },
        product: function() {
            // Method code
        }
    };
});
```

math.js

AMD

```
define([
      'math',
      'data'
], function(math, data) {
      return math.sum(2, 3);
});
```

app.js

COMMON JS

```
var math = {
    sum: function() {
        // Method code
    },
    product: function() {
        // Method code
    }
};

module.exports = math;
```

math.js

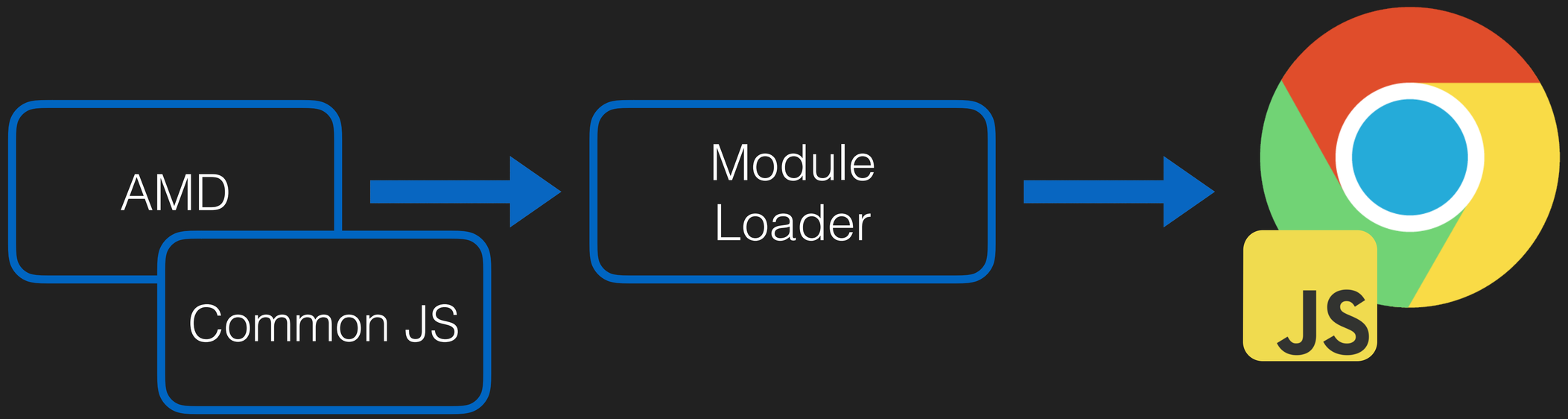
COMMON JS

```
var math = require('./math');

var value = math.sum(2, 3);
```

app.js

MODULE LOADERS



REQUIRE JS

AMD Module Loader

http://bit.ly/require-js

SYSTEM JS

Common JS / AMD Module Loader

http://bit.ly/system-js

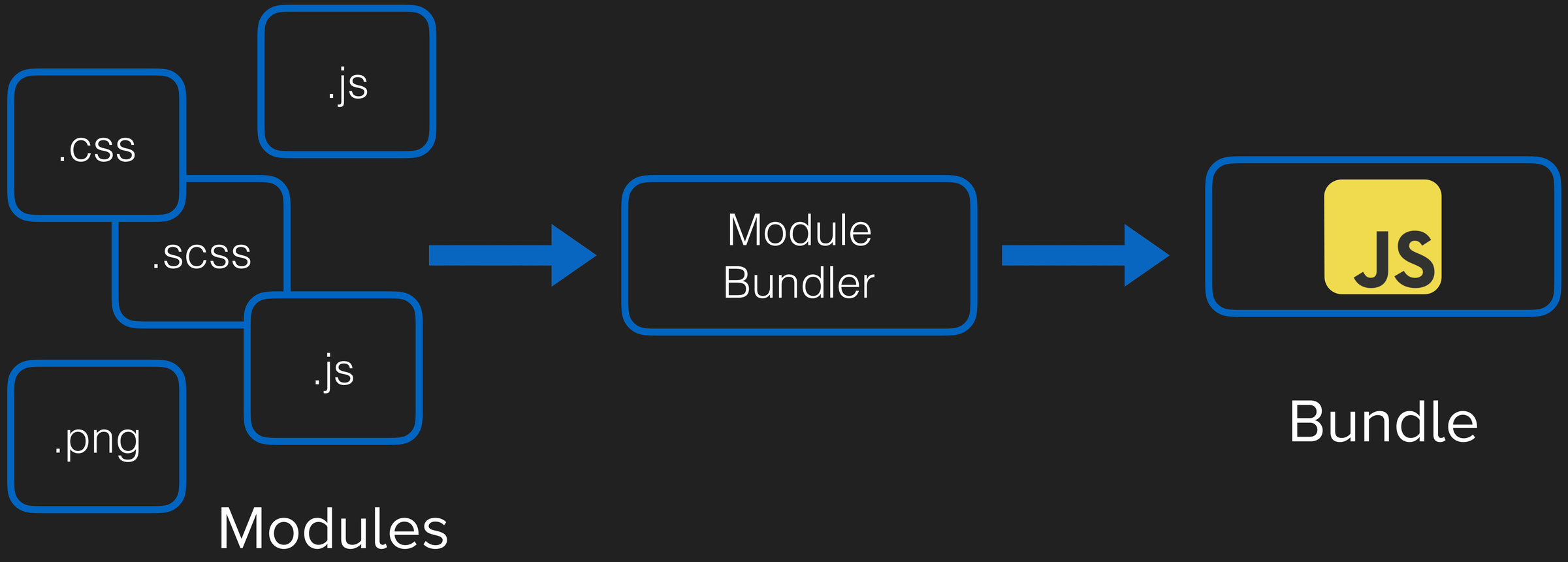
*demo

```
<html>
<head>
    <title>Page 1</title>
    <script data-main="js/page1" src="require.js">
    </script>
</head>
<body>

</body>
</html>
```

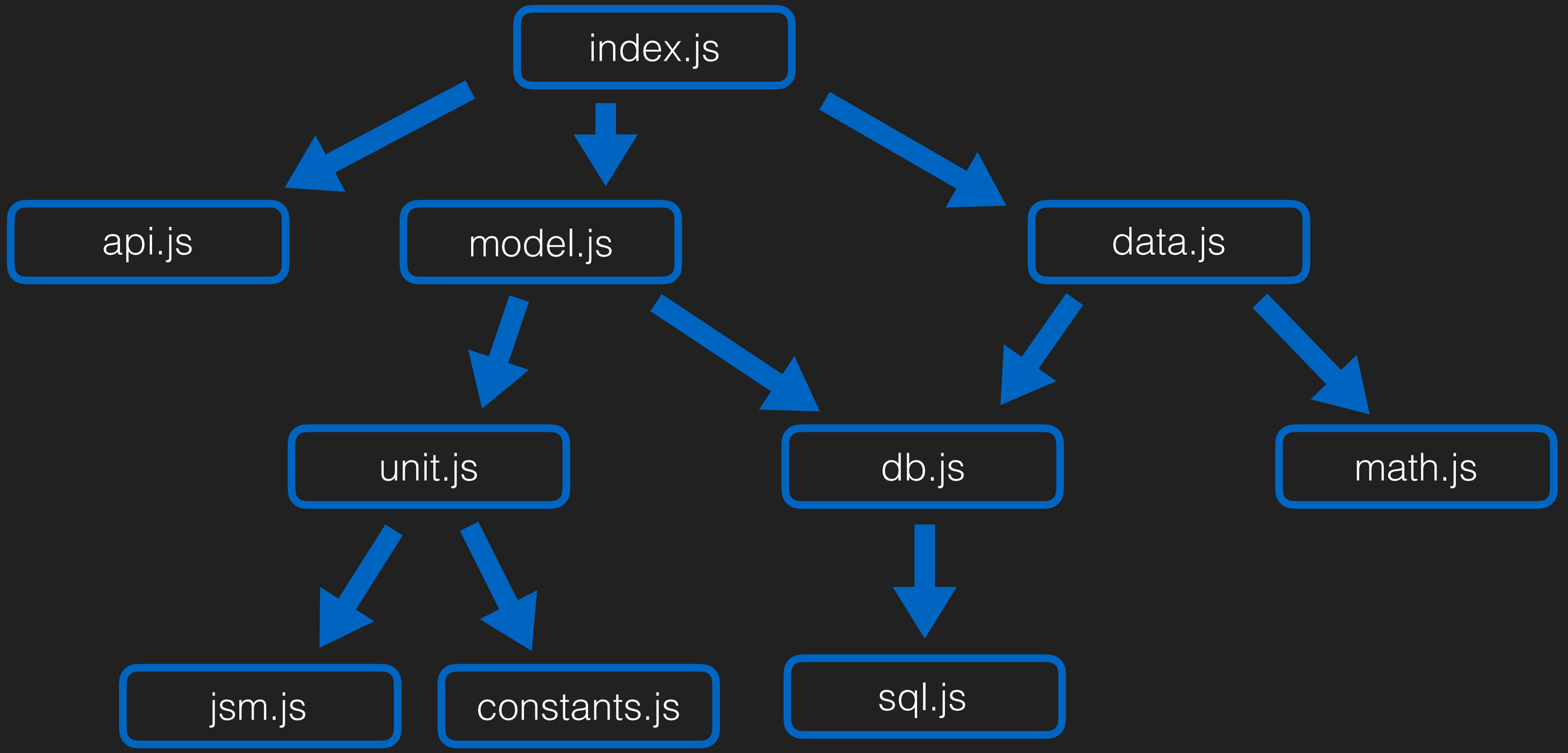
http://bit.ly/require-js-examples

MODULE BUNDLING



```
<html>
    <head>My Webpage</head>
    <body>
        <script src="script1.js"></script>
        <script src="script2.js"></script>
        <script src="script3.js"></script>
        <script src="script4.js"></script>
    </body>
</html>
```

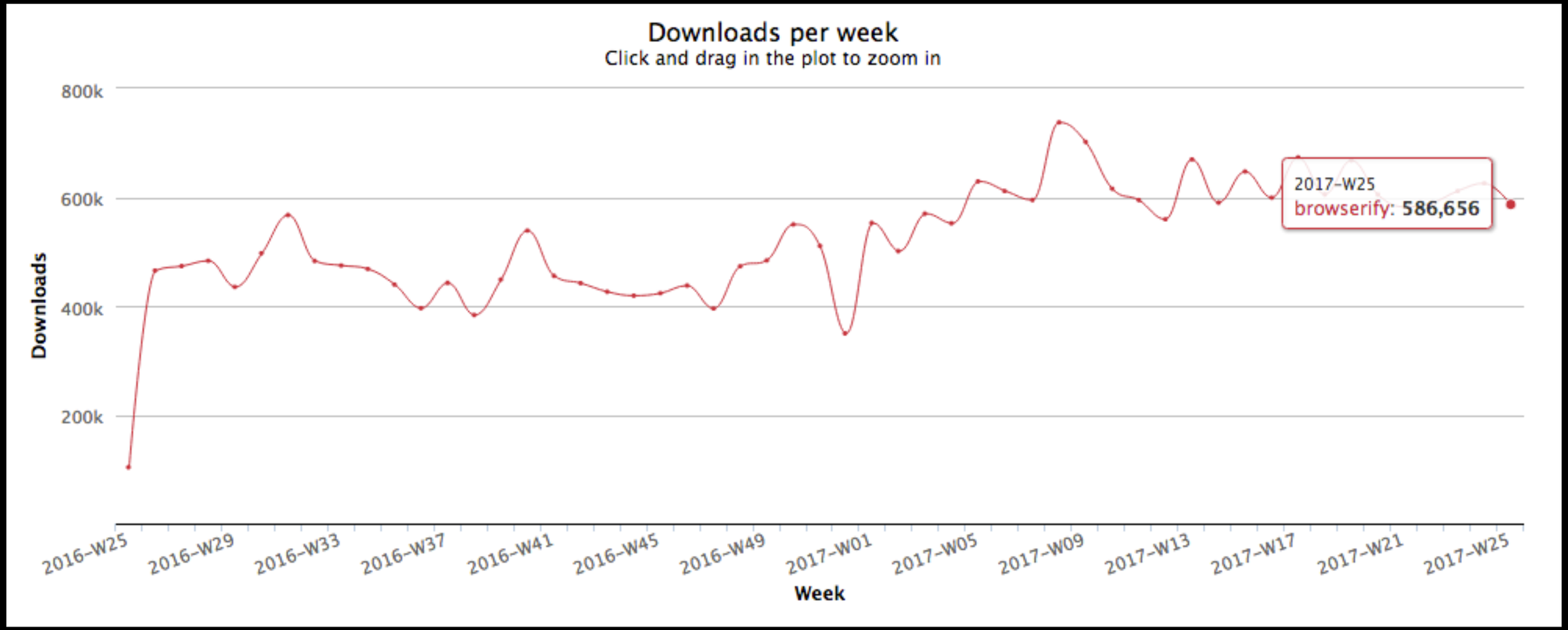
HOW DO MODULE BUNDLERS WORK ?



Dependency Graph

BROWSERIFY

NPM modules on the browser side! Yay!


Downloads per week
Click and drag in the plot to zoom in
800k
600k
400k
200k
Downloads
2017-W25
browserify: 586,656
2016-W25
2016-W29
2016-W33
2016-W37
2016-W41
2016-W45
2016-W49
2017-W01
2017-W05
2017-W09
2017-W13
2017-W17
2017-W21
2017-W25
Week

INSTALLATION

```
> npm install -g browserify
```

USAGE

```
> browserify app.js -o bundle.js
```

*demo

TRANSFORMS

http://bit.ly/browserify-transforms

USING TRANSFORMS

```
> browserify app.js -o bundle.js -t [ babelify --presets
[ es2015 ] ]
```

TASK RUNNERS

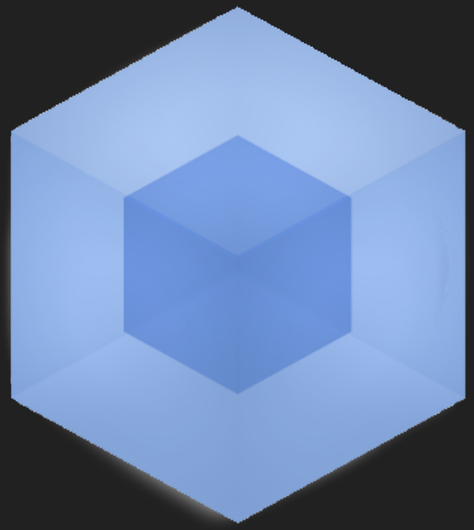
```
grunt.initConfig({
    watchFiles: {
        // Watcher task
    },
    browserify: {
        // Module bundling task
    },
    minifyCss: {
        // CSS optimisation task
    },
    optimiseImages: {
        // Image optimisation task
    },
    uploadOnCDN: {
        // Deployment task
    }
});
```

BABELIFY TRANSFORM

> npm install grunt grunt-browserify babelify babel-preset-es2015 —save-dev

*demo

WEBPACK



INSTALLATION

> npm install -g webpack

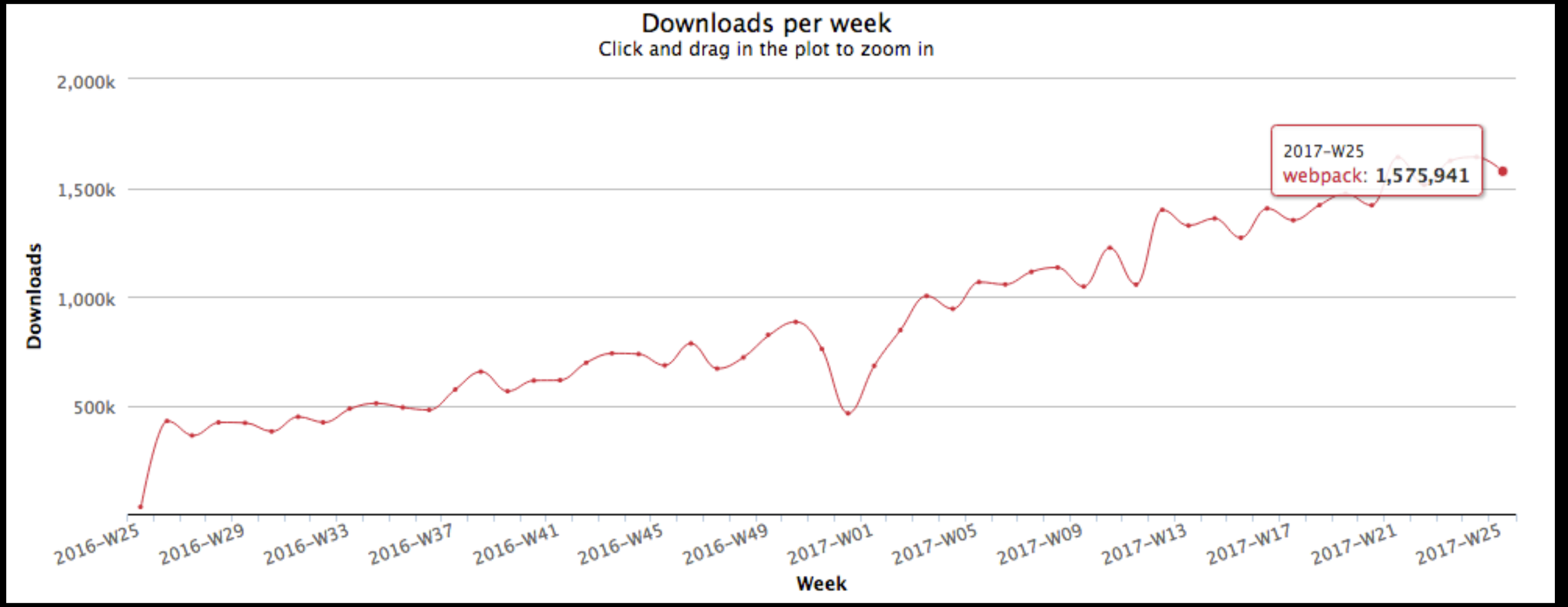
USAGE

> webpack app.js bundle.js

WEBPACK CONFIG FILE

```
module.exports = {
  entry: './app.js',
  output: {
    filename: './bundle.js'
  }
};
```

*demo


Downloads per week
Click and drag in the plot to zoom in
2,000k
1,500k
1,000k
500k
Downloads
2017-W25
webpack: 1,575,941
2016-W25
2016-W29
2016-W33
2016-W37
2016-W41
2016-W45
2016-W49
2017-W01
2017-W05
2017-W09
2017-W13
2017-W17
2017-W21
2017-W25
Week

LOADERS

Transform code from one form to another that is part of the bundle

PLUGINS

Act on the bundle or bundle chunks for customisation and optimisation

*demo

BUNDLE OPTIMISATION WITH WEBPACK

BUNDLE ANALYSIS

WEBPACK BUNDLE ANALYZERS

NPM Module

http://bit.ly/webpack-bundle-analyzer

Web-based Analysers

http://bit.ly/webpack-visualizer

http://bit.ly/webpack-chart

WEBPACK BUNDLE ANALYZER

```
plugins: [
    new BundleAnalyzerPlugin()
]
```

*demo

WEB-BASED BUNDLE ANALYZERS

```
> webpack --profile --json > stats.json
```

PRODUCTION READY BUNDLE

UGLIFICATION

```
plugins: [
    new webpack.optimize.UglifyJsPlugin()
]
```

*demo

NODE ENVIRONMENT VARIABLE

```
plugins: [
    new webpack.DefinePlugin({
        'process.env.NODE_ENV': JSON.stringify('production')
    })
]
```

*demo

WEBPACK PRODUCTION FLAG

> webpack -p

BUILD-TIME GZIPPING

DYNAMIC GZIPPING

```
var compression = require('compression');

app.use(compression());
```

BUILD-TIME GZIPPING

> npm install compression-webpack-plugin --save-dev

http://bit.ly/webpack-compression-plugin

*demo

```
app.get('*.js', function (req, res, next) {
  req.url = req.url + '.gz';
  res.set('Content-Encoding', 'gzip');
  next();
});
```

TREE SHAKING

Dead Code Elimination

Works with ES2015 Modules

babel-plugin-transform-es2015-modules-commonjs

ES2015 MODULES (STATIC STRUCTURE)

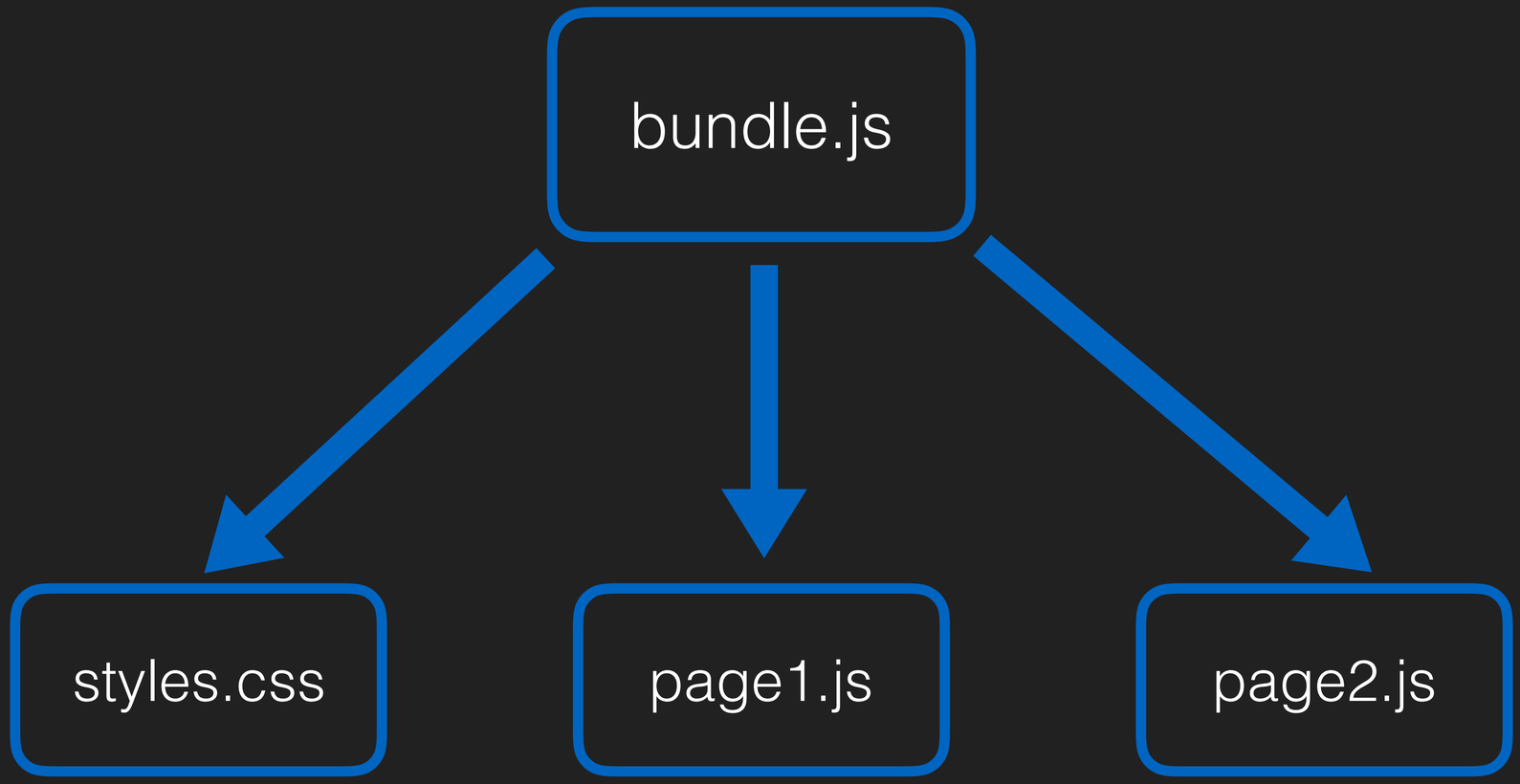
Can be tree-shaken

COMMON JS & OTHERS (DYNAMIC STRUCTURE)

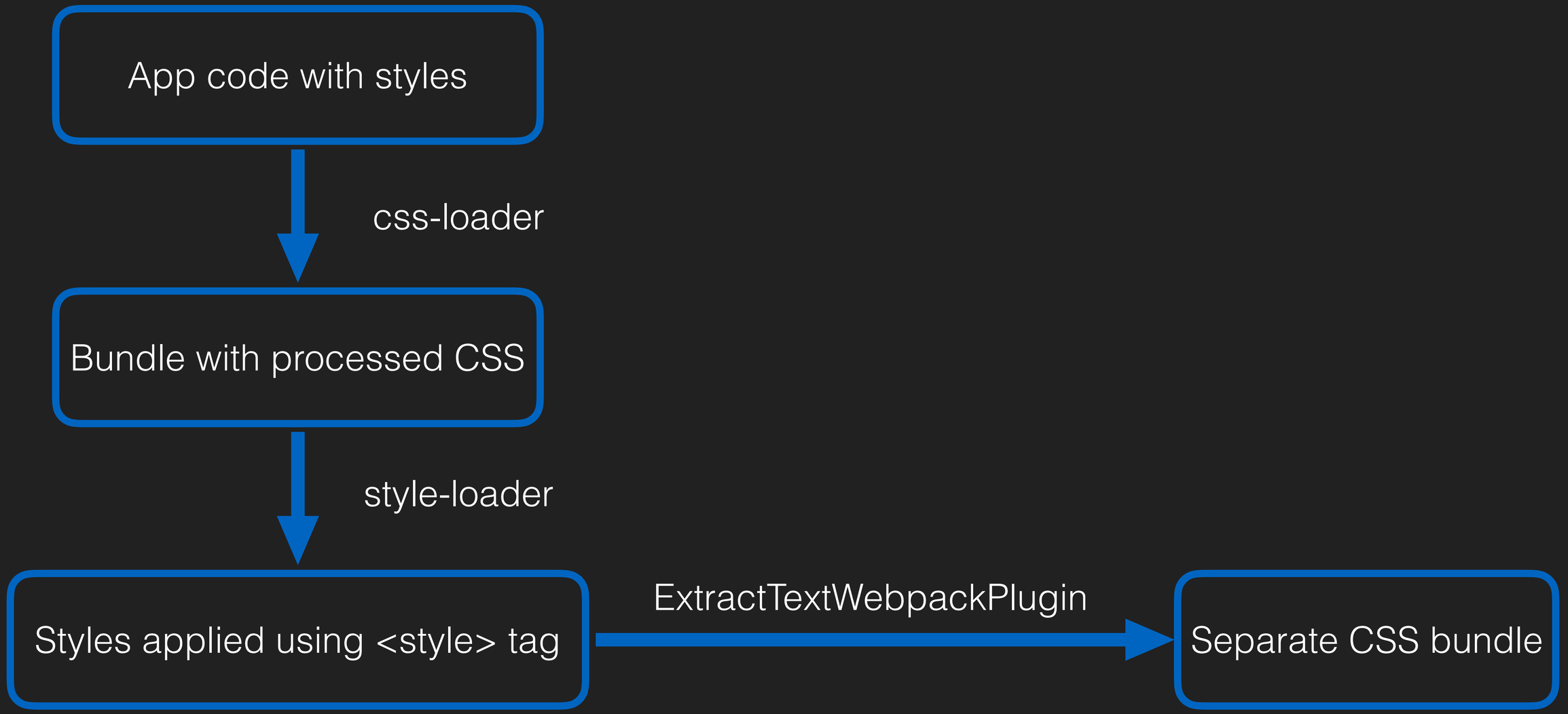
Cannot be tree-shaken

*demo

CODE SPLITTING



CSS CODE SPLITTING



INSTALLATION

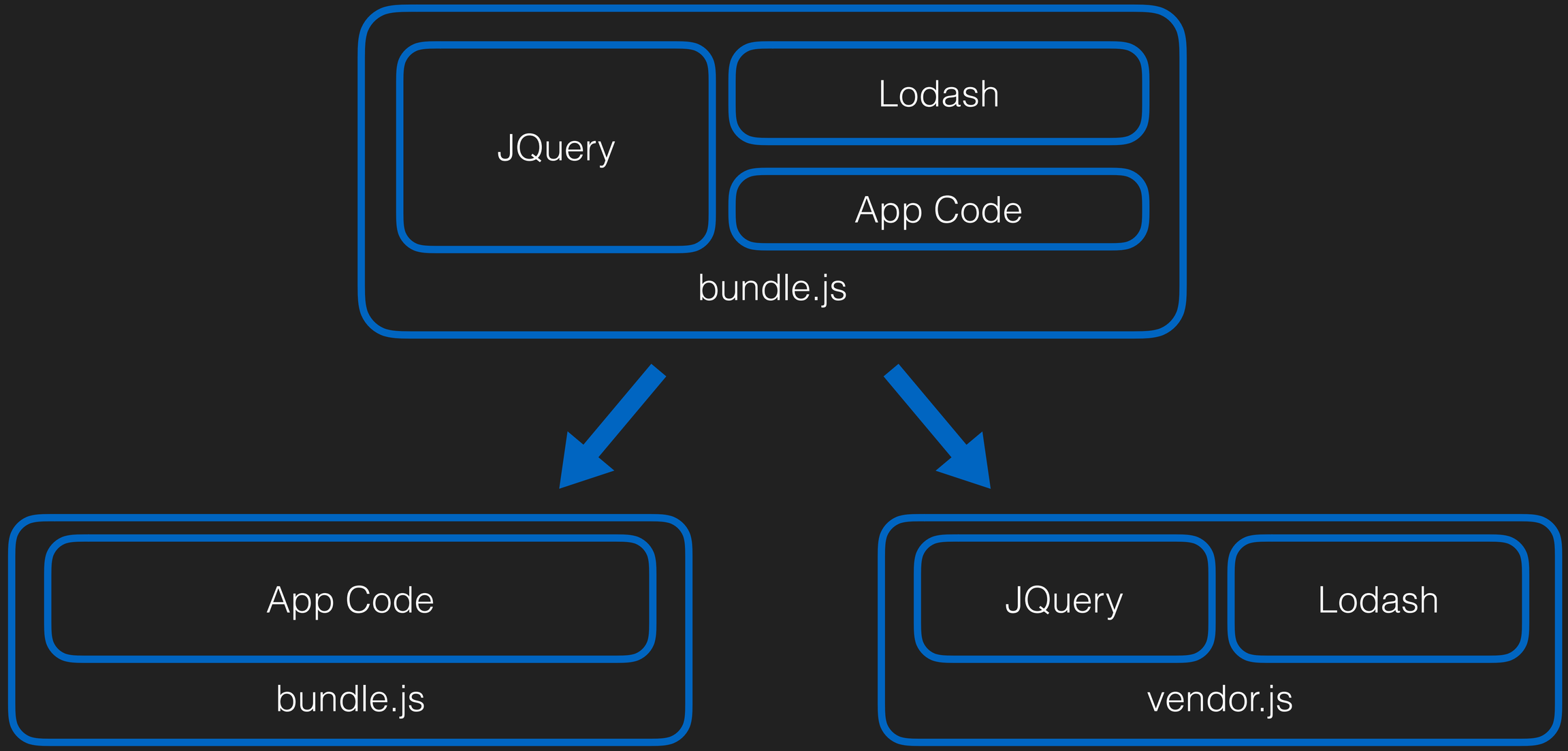
> npm install —save-dev extract-text-webpack-plugin

USAGE

```
plugins: [
    new ExtractTextPlugin('./build/styles.css')
]
```

*demo

CODE SPLITTING LIBRARIES



COMMON CHUNKS PLUGIN

```
plugins: [
    new webpack.optimize.CommonsChunkPlugin(options)
]
```

http://bit.ly/common-chunks-plugin

*demo

IMPLICIT COMMON VENDOR CHUNK

```
plugins: [
    new webpack.optimize.CommonsChunkPlugin({
        name: 'vendor',
        minChunks: function (module) {
            return module.context && module.context.indexOf('node_modules') !== -1;
        }
    })
]
```

AUTOMATIC SPLITTING

```
import header from './header';
import slider from './slider';

require.ensure(['./productList'], function(require) {
    require('./productList');
});
```

*demo

ES2015 MODULES

import
export

```
const math = {
    sum: (a, b) => a + b,
    product: (a, b) => a * b
};

export default math;
```

```
import math from './math';

const value = math.sum(2, 3);
console.log(value);
```

THANK YOU