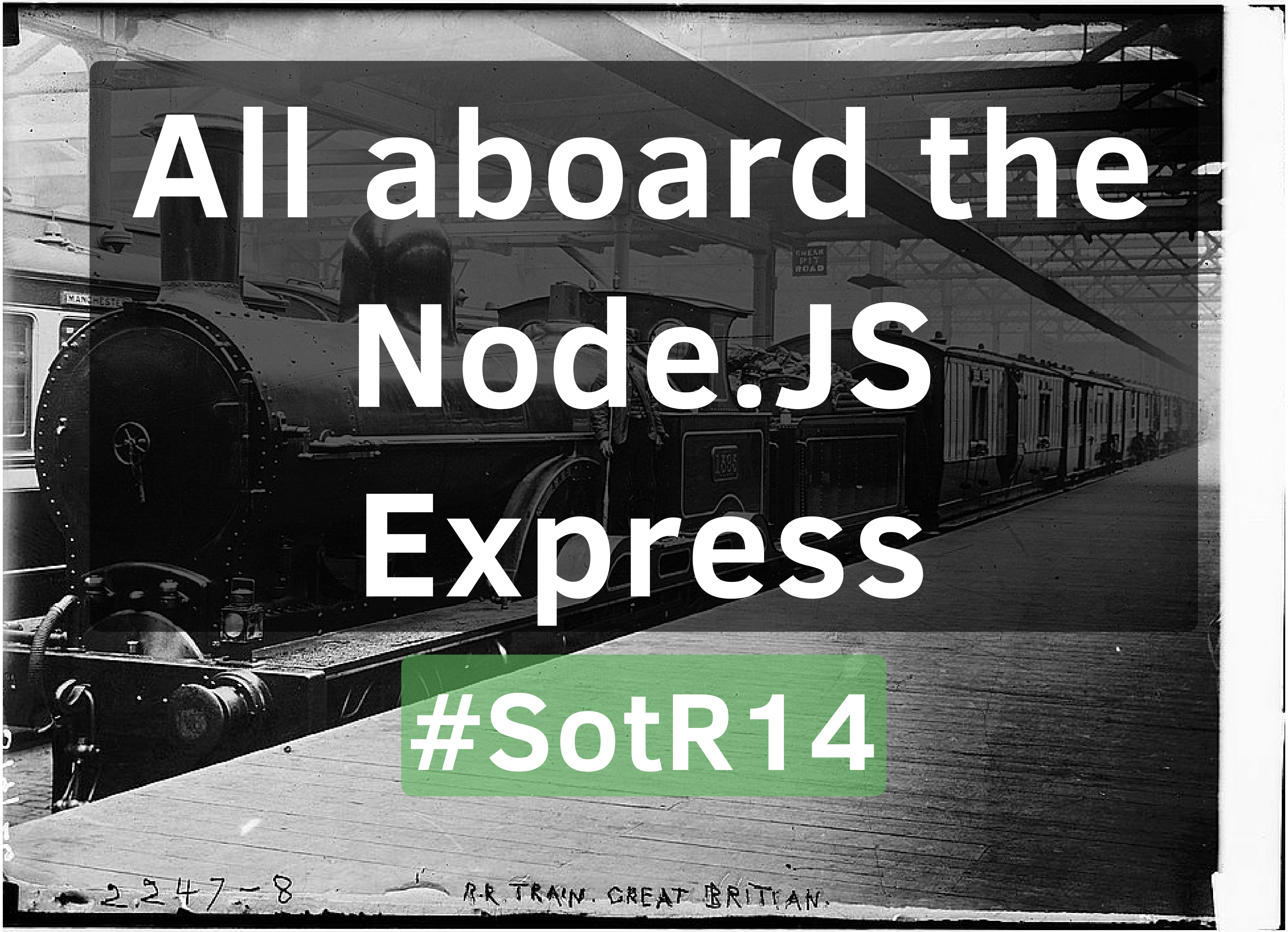
All aboard the Node.JS Express

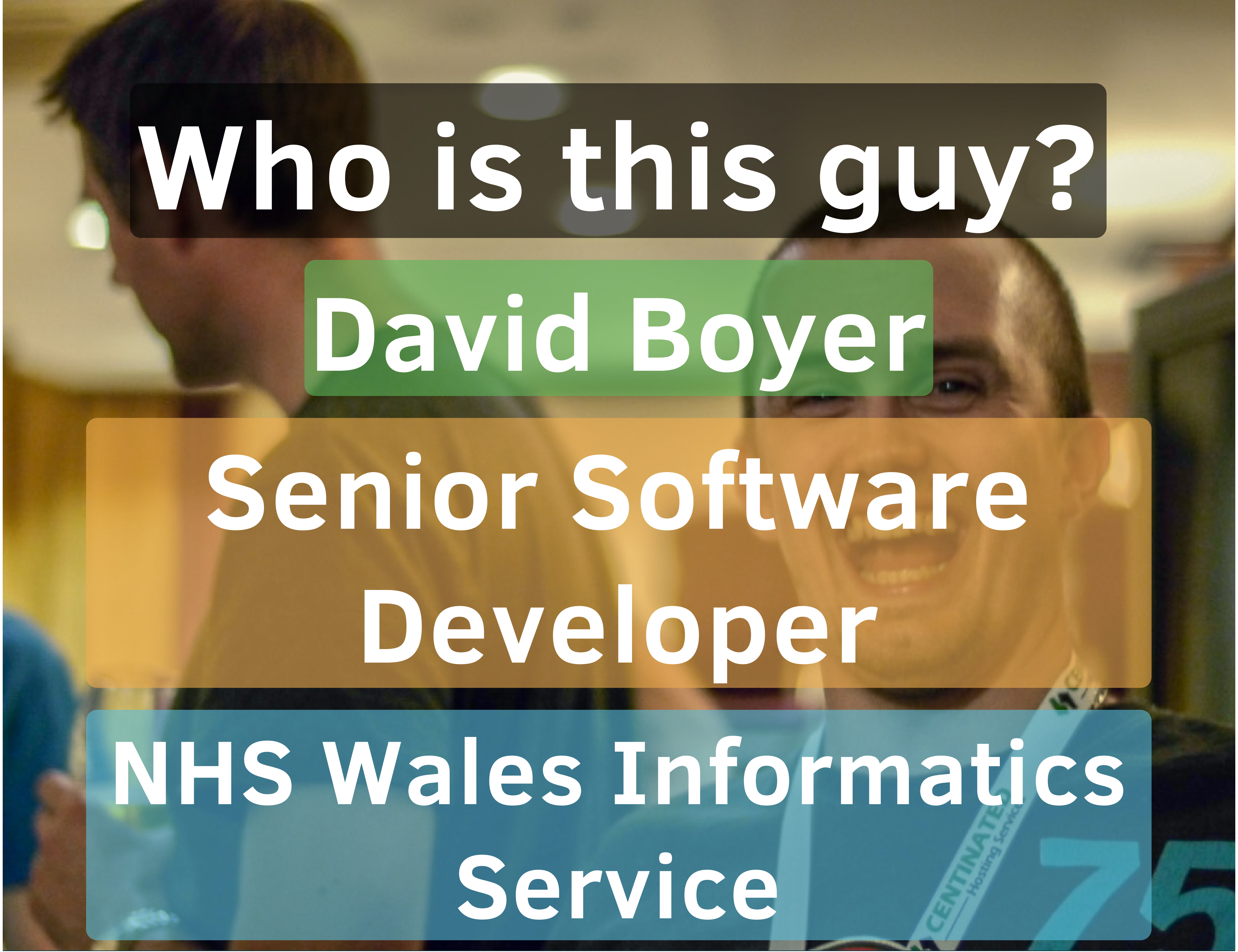
#SotR14



You know Node?

Kev McCabe is covering TDD

SotR14 - Mura Room



Who is this guy?

David Boyer

Senior Software Developer

NHS Wales Informatics Service

...and yes... that's me in the mask @ SotR13

Node.js

A JavaScript runtime

http://nodejs.org

The Details

- JavaScript
- Google's V8 engine
- Open Source - MIT License
- Cross platform
- Single threaded code
- Multi threaded IO

What can it do?

- Build web applications
- Creating command line tools
- Create desktop applications (node-webkit)

Who is using it?

PayPal, LinkedIn, Yahoo, Microsoft, eBay, 37signals, LearnBoost, Yammer, Walmart

Node in detail

In the beginning…

Install

Command line

Action!*

```
node
console.log('Hello Scotch');
```

Using the API

```
var fs = require('fs'); // Filesystem API
var http = require('http'); // http API
var crypto = require('crypto'); // Crypto AP
```

One thread to rule them all!

One thread for JavaScript

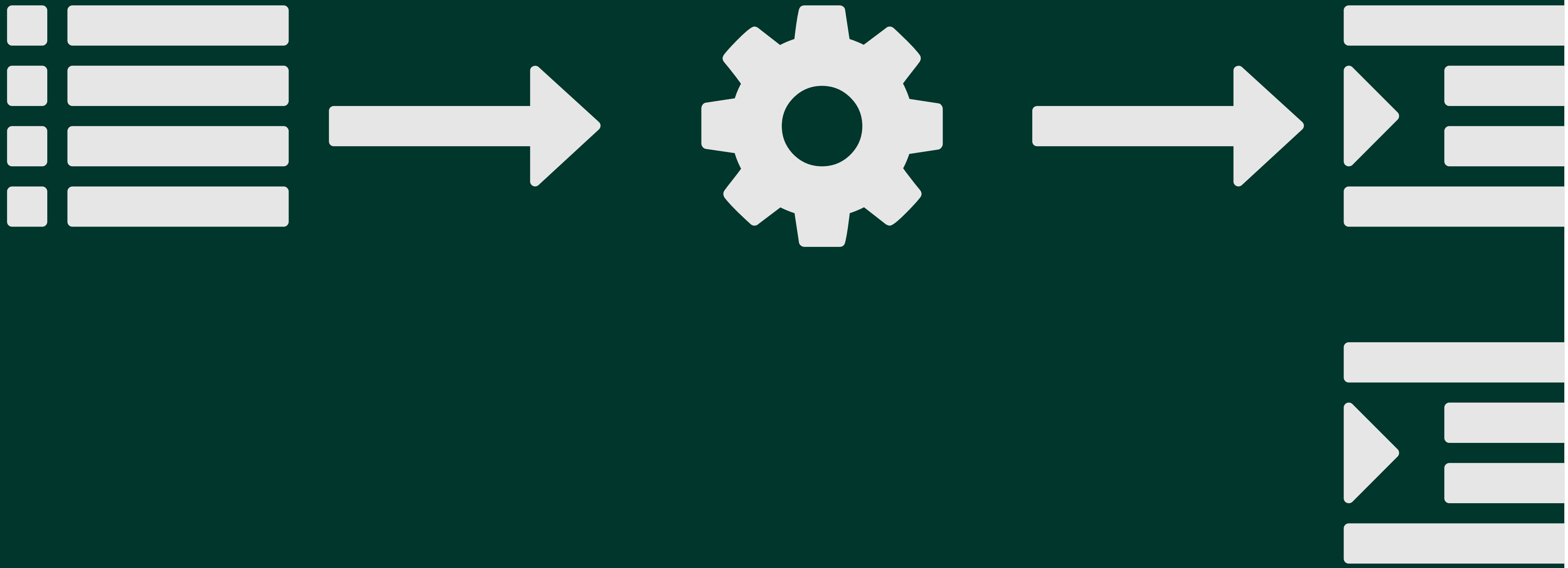
Multiple threads for I/O

The Event Loop

Event Queue

Single js thread

Multip
I/O
Threa



What does the code look like?

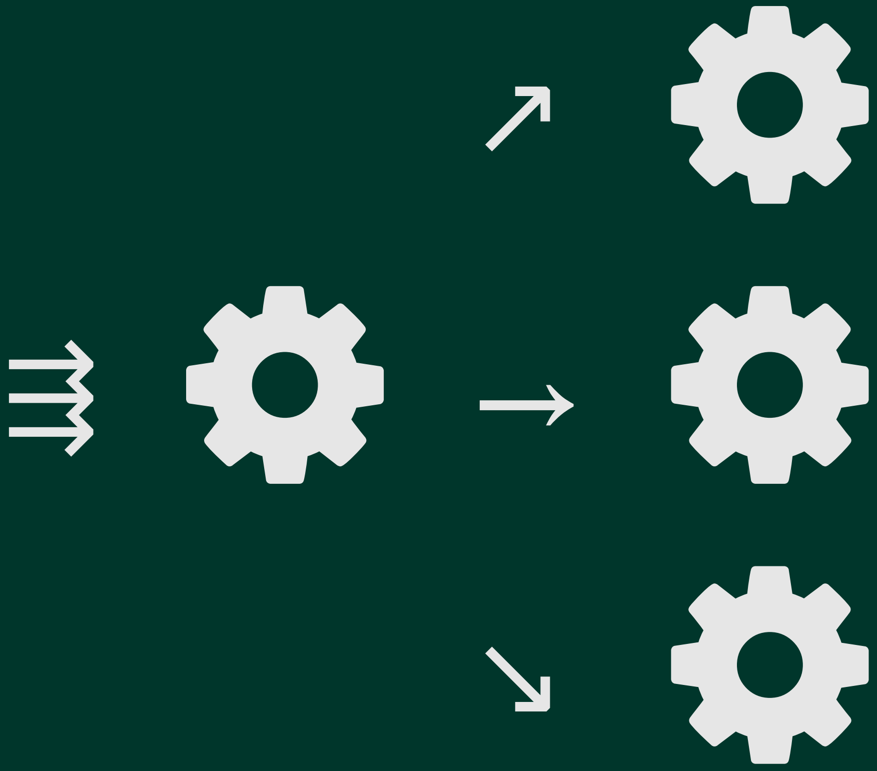
```
var fs = require('fs');
var rawData = fs.readFileSync('sotr.json');
var data = JSON.parse(rawData);
console.log(new Date());
console.log(data.message);
```

Why not just be multi-threaded?

- Each thread needs more memory
- Switching between threads costs CPU
- Avoids thread safety issues

Scaling single threads

The Cluster API



```
var cluster = require('cluster');
var http = require('http');
var cpus = require('os').cpus().length;

if (cluster.isMaster) {
  for (var i = 0; i < cpus; i++) {
    cluster.fork();
  }
  cluster.on('exit', function(worker, code,
    console.log('Process ID ' + worker.proce
  });
} else {
  http.createServer(function(req, res) {...}
}
```

Switching mindset

From sync to async

Lots of callbacks

Callback Hell!

Highway to Hell

```
fs.readFile('sotr.json', function(err, data)
  var info = JSON.parse(data);
  db.findOne({id: info.id}, function(err, re
    fs.writeFile('sotr.dat', record.title, f
      console.log('Finish job');
    })
  })
})
```

Escape from Nested Callbacks

- Break it apart
- Use a async module like "async"
- Promises
- Generators (ES6)

Node as a web application

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

var server = http.createServer(function(req,
  res.end('Hello Scotch!');
});

server.listen(80);
```

Modules

```
// conf.js
function Conference(name, year) {
  this.name = name; this.year = year;
};
Conference.prototype.getTitle = function() {
  return this.name + ' ' + this.year;
};
module.exports = Conference

// index.js
var Conf = require(__dirname + '/conf.js');
var sotr = new Conf('Scotch on the Rocks', 2
console.log(sotr.getTitle());
```

npm

The Node.js Package Manager

Initialise your project

```
npm init

name: (conference) sotr-example
version: (0.0.0) 0.1.2
description: An example project
entry point: (index.js) index.js
test command: grunt nodeunit
git repository: git://github.com/misterdai/i
keywords: example, app
author: David Boyer
license: (BSD-2-Clause) MIT
```

Finding modules

https://npmjs.org

https://nodejsmodules.org/

http://eirikb.github.io/nipster/

Common modules

Databases: mysql, mongodb, sqlite

Callbacks: async, q, when, co

Testing: Mocha, nodeunit, should

Templating: Jade, handlebars, ejs

Web frameworks: express, geddy, sails

Installing modules

```
npm install async
npm install --save coffee-script
npm install --save-dev grunt-imagemin

npm install

npm uninstall --save coffee-script
```

Installing commands

```
npm install -g coffee-script
npm uninstall -g grunt-cli
npm install -g gulp
```

Other npm super powers

Publish modules

Execute scripts (e.g. npm build, npm run)

Bump your version number (semver)

Summary

Let npm manage your modules

Use it to install useful tools such as grunt

Don't have to keep node_modules in source control

Store project related commands in package.json

Express yourself

Express, a web framework for Node.js

Very flexible

Minimal

Version 4

- Bundled middleware are now their own modules*.

  * Except "static".
- More robust routing. `app.router()` is gone and more flexible methods are now available.

Installing

```
mkdir website
cd website
npm init
npm install --save express
touch index.js
```

A static site

Serving static files from a directory

A dynamic site

JavaScript providing the content

A template engine

https://github.com/visionmedia/cons

Jade, EJS (Embedded JavaScript), Handlebars...

Try being MEAN! 😐

Popular stack for building Node.js based web apps.

- MongoDB
- Express
- AngularJS
- Node.js

Thanks for listening to my first ever conference talk

Questions

?

If we have time...

...or catch me at the bar 🍺.

GAME 🎮 OVER

All aboard the NodeJS Express

David "Mister Dai" Boyer

🐦 @misterdai