NODE, NPM & GULP

INTRODUCTION TO FRONT-END BUILD SYSTEMS

WHO AM I

FRONT-END DEVELOPER

SASS, ES6, EMBER.JS

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WHAT IS A BUILD SYSTEM?

- A build system **automatizes a series of small and tedious repetitive tasks.**
- They otherwise will be easily forgotten, especially when our small projects start to grow into much larger applications, heavy and bloated.

WHY USE A BUILD SYSTEM?

- A build system carries on some tasks that are meant to
- **keep our code tidy while we are developing it and efficient when we execute it**
- preprocess our code somehow so it will **be able to run wherever we need**

BUILD SYSTEMS THEN AND NOW

- **Make** was one of the first build systems. In the early days they were used to **compile code into executable formats** for an operating system.
- However, in web development, we have a completely different set of practices and operations.
- Over the past few years, there has been an interest in using build systems to more capably handle the growing complexities of our applications.

WHAT IS NODE?

- A **JavaScript platform** built on top of Google Chrome's JavaScript runtime engine, V8.
- This gives us the ability to **execute JavaScript code outside the browser**.
- Using Node, we can actually write both the **backend** and **frontend** of a web application entirely in **JavaScript**.
- Node ships with **npm, a package manager** that facilitates the installation, storage, and creation of modular components that can be used to create applications.

WHAT IS GULP?

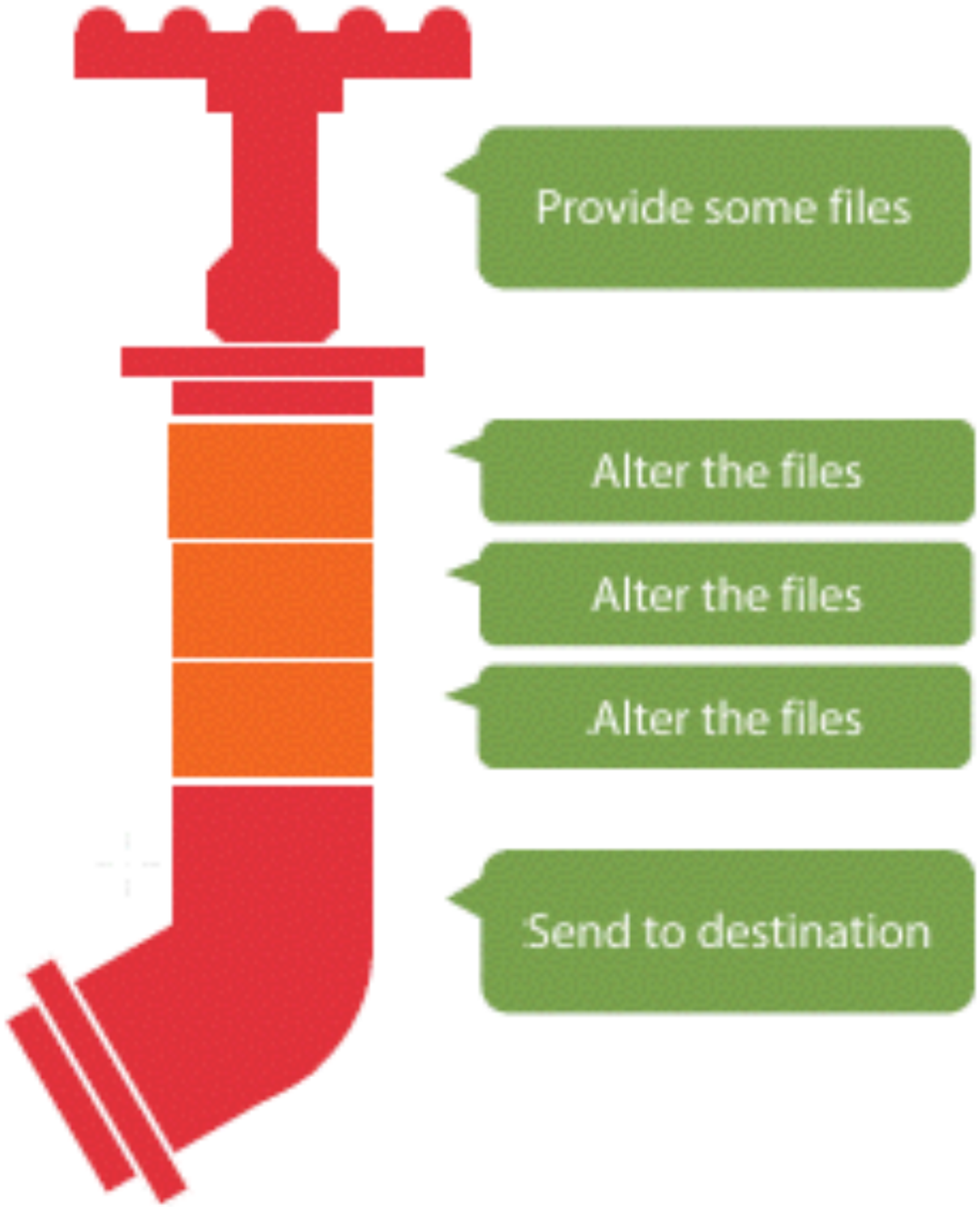
- Gulp is a **streaming JavaScript build system**.
- It leverages the power of **streams** to automate, organize, and run development tasks very quickly and efficiently.
- By simply creating a **small file of instructions**, gulp can perform just about any development task.
- Gulp uses **small, single-purpose plugins** to modify and process our project files. Additionally, we can chain, or **pipe**, these plugins together into more complex actions.
- Gulp is built upon **Node** and **npm**.

WHY USE GULP? – STREAMS (I)

- Streams were originally introduced in Unix as a way **to "pipe" together small, single-purpose applications** to perform complex, flexible operations.
- Additionally, streams were created to operate on data **without the need to buffer the entire file**, leading to quicker processing.
- Like Unix, Node has its own built-in stream module. This is what gulp uses to operate on our data and perform tasks.

WHY USE GULP? – STREAMS (II)

- This allows developers to create small **gulp plugins or node modules** that perform **single operations** and then **pipe them together with others** to perform an entire chain of actions.



WHY USE GULP? – DEPENDENCIES

- We need to **keep track of all the dependencies** that we use in our projects.
- A dependency is a software package that **contains one or several modules or plugins**.
- Node uses a file named **`package.json`** to store information about our project.
- npm uses this same file to **manage all of the dependencies** our project requires to run properly.

MAIN METHODS USED IN A GULP FILE

- Apart from the `package.json`, we need a **`gulpfile.js`** which gulp will execute each time we want to carry on a task.

- It will contain **all the tasks that we'll be able to perform**. Each of them will be build using some methods that operate on the modules or plugins provided by the dependencies.

- Each method represent a **specific purpose** and will act as the building blocks of our gulp file.

WRITING A TASK

```
gulp.task(taskName, () =>
  gulp.src(srcPath)
    .pipe(plugin1)
    .pipe(plugin2)
    .pipe(gulp.dest(destPath));
);
```

THE .SRC() METHOD

```
.src(string || array)
```

- The **source files** that we plan on modifying. It accepts either a single string or an array of strings as an argument.
- Normally we store these files in a **`src`** directory that will contain all our codebase. This is what we **store in our repository when we want to distribute our source code** so others can collaborate on it.

THE .TASK() METHOD

```
.task(string, function)
```

- The **basic wrapper for which we create our tasks**. It takes two arguments:
  - a string value representing the name of the task.
  - a function that will contain the code to execute upon running that task.

THE .WATCH() METHOD

```
.watch(string, array)
```

- **Looks for changes in the files**.
- This will **keep gulp running again right after any changes are made** so that we don't need to rerun gulp manually any time we need to process our tasks.

THE .PIPE() METHOD

```
.pipe(function)
```

- Will allow us to **pipe together smaller single-purpose plugins or applications** into a pipechain.
- This is what gives us full control of the order in which we would need to process our files.

THE .DEST() METHOD

```
.dest(string)
```

- Sets the **output destination of our processed file**. Most often, this will be used to output our data into a distribution directory.
- This distribution directory will be usually called **`dist`** and it will contain **all the production code**, ready to be deployed to a web server so it can be **executed** in a browser. It could also be **distributed** as a library or a plugin to use within another project.
- Note that **this code should not be uploaded to any repository**, since it will be generated automatically from **`src`** using gulp.

```
const sass        = require('gulp-sass');
const uglify      = require('gulp-uglify');
const cleanCss    = require('gulp-clean-css');
const htmlReplace = require('gulp-html-replace');
const babel       = require('gulp-babel');
const tar         = require('gulp-tar');        // https://www.npmjs.com/package/gulp-tar
const gzip        = require('gulp-gzip');       // https://www.npmjs.com/package/gulp-gzip

gulp.task('scss', () =>
  gulp.src('src/scss/styles.scss')
    .pipe(sass().on('error', sass.logError))
    .pipe(cleanCss())
    .pipe(gulp.dest('dist/css'))
);

gulp.task('es6', () =>
  gulp.src('src/js/*.js')
    .pipe(concat('scripts.js'))
    .pipe(babel({ presets: ['es2015'] }))
    .pipe(uglify())
    .pipe(gulp.dest('dist/js'))
);

gulp.task('html', () =>
  gulp.src('src/index.html')
    .pipe(htmlReplace({
      css: 'css/styles.css',
      js: 'js/scripts.js',
    }))
    .pipe(gulp.dest('dist'))
);

gulp.task('compress', () =>
  gulp.src('dist/*')
    .pipe(tar('code.tar'))   // Pack all the files together
    .pipe(gzip())            // Compress the package using gzip
    .pipe(gulp.dest('.'))
);
```

SHOW ME THE CODE!