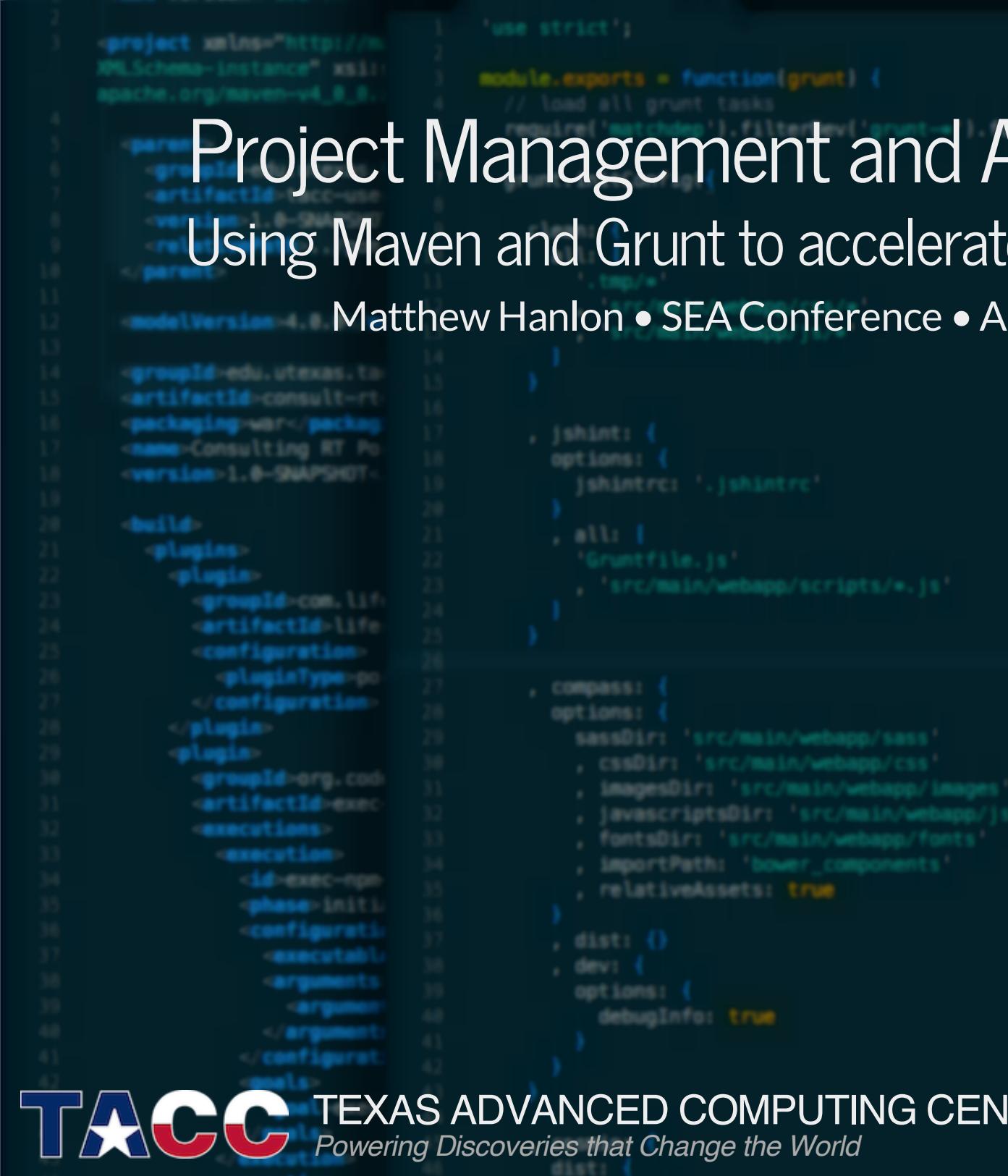


Project Management and Automation

Using Maven and Grunt to accelerate development

Matthew Hanlon • SEA Conference • April 7, 2014



Introduction

Web and Mobile Applications

Building tools and applications to make
scientists more productive.

7 Developers (and hiring!)

10+ projects

A word cloud visualization on a dark blue background, showing various web technologies and frameworks. The size of each word indicates its frequency or importance. The words are colored in shades of red, orange, yellow, green, and blue.

The visible words include:

- Python
- Web services
- Drupal
- Restlets
- CouchDB
- SOAP
- MySQL
- JSON
- Nodejs
- CakePHP
- Java
- Spring
- REST
- JSR
- XML
- NoSQL
- PHP
- jQuery
- Django
- Portlets
- liferay
- MongoDB
- SQL
- PostgreSQL
- JavaScript
- CodeIgniter

[made with: <https://www.jasondavies.com/wordcloud/>]

Without process



Boring

What's the big deal?

Too many results in published scientific papers are not reproducible

- The data is unavailable
- The environment no longer exists
- The code is broken!

Reproducibility in Computer Science

That's only a 20% success rate!

```
graph LR; A[Theoretical  
74] --> B[Hardware  
24]; B --> C[Builds  
123]; C --> D[Builds  
123]; A --> E[Email  
81]; E --> F[Build  
108]; E --> G[Email  
Not Sent  
105]; E --> H[No email  
reply  
30]; E --> I[Email  
reply-no  
140];
```

Why doesn't the code build?

- Missing dependencies
- Mysterious configuration parameters
- Compile errors
- And of course, there is no documentation

How can we fix that?

Automate the boring stuff
Make the rest worth it

Tools for automation and process

- Apache Maven
- Grunt.js
- Bower
- Sass/Compass
- Doxygen

Maven

Managing project build, reporting, and documentation.

POM.xml

The *Project Object Model*

<i>Project information</i>	Name, version, URL, developers, contributors, licensing, organization
<i>Build settings</i>	Build process, dependencies, non-code resource handling, reporting
<i>Environment settings</i>	Source control, repositories, distribution, issue management

Plugins

- Basics: Compiler, Resources, JavaDocs, Eclipse, IntelliJ IDEA
- Advanced: Exec, Site
- Community: Doxygen, Liferay, Jetty

```
<?xml version="1.0" encoding="UTF-8"?>
<project>
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.github.mrhanlon</groupId>
    <artifactId>sea2014-demo</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>
    <dependencies>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-orm</artifactId>
            <version>${spring.version}</version>
        </dependency>
    </dependencies>

```

```
$ mvn install
[INFO] Scanning for projects...
[INFO]
[INFO] Using the builder org.apache.maven.lifecycle.internal.builder.singlethreaded.SingleThreadedBuilder@55e0...
[INFO]
[INFO] -----
[INFO] Building module1 1.0-SNAPSHOT
[INFO] -----
[INFO]
[INFO] --- maven-clean-plugin:2.5:clean (default-clean) @ module1 ---
[INFO] Deleting /Users/mrhanlon/workspace/github/mrhanlon/sea2014-demo/module1/target
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ module1 ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /Users/mrhanlon/workspace/github/mrhanlon/sea2014-demo/module1/resource
[INFO]

[INFO] --- maven-compiler-plugin:2.0.2:compile (default-compile) @ module1 ---
[INFO] Compiling 1 source file to /Users/mrhanlon/workspace/github/mrhanlon/sea2014-demo/module1/target/classes
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ module1 ---
```

Grunt

The JavaScript Task Runner

(It's not just for JavaScript!)

Gruntfile.js

Declarative JSON/JavaScript configuration file

Executes tasks in Node.js runtime

Loads of community plugins:

- jslint/jshint
- file tasks
- watch
- compass
- library/framework support

```
'use strict';

module.exports = function(grunt) {

  // Project configuration.
  grunt.initConfig({
    // Metadata.
    pkg: grunt.file.readJSON('tiny-pubsub.jquery.json'),
    banner: '/!*! <%= pkg.title || pkg.name %> - v<%= pkg.version %> - ' +
      '<%= grunt.template.today("yyyy-mm-dd") %>\n' +
      '<%= pkg.homepage ? "* " + pkg.homepage + "\n" : "" %>' +
      '* Copyright (c) <%= grunt.template.today("yyyy") %> <%= pkg.author.name %>;' +
      ' Licensed <%= _.pluck(pkg.licenses, "type").join(", ") %> */\n',
    // Task configuration.
    clean: {
      src: ['dist']
    },
    concat: {
      options: {
        banner: '<%= banner %>',
        stripBanners: true
      }
    }
  });
}
```

```
$ grunt
Running "jshint:gruntfile" (jshint) task
>> 1 file lint free.

Running "jshint:src" (jshint) task
>> 1 file lint free.

Running "jshint:test" (jshint) task
>> 1 file lint free.

Running "qunit:files" (qunit) task
Testing test/tiny-pubsub.html....OK
>> 4 assertions passed (23ms)

Running "clean:files" (clean) task
Cleaning "dist"...OK

Running "concat:dist" (concat) task
File "dist/ba-tiny-pubsub.js" created.

Running "uglify:dist" (uglify) task
```

Bower

Front-end package management
package agnostic
runs over git

Declarative JSON configuration

```
{  
  "name": "vislab-reservation-portlet",  
  "version": "1.0.0",  
  "dependencies": {  
    "modernizr": "~2.6.2",  
    "jqueryui-timepicker-addon": "1.4.3",  
    "mustache": "~0.8.1",  
    "datejs": "*",  
    "fullcalendar": "~1.6.4"  
  }  
}
```

Sass/Compass

"Expressive" CSS

```
@mixin box-sizing($bs) {
  $bs: unquote($bs);
  @include experimental(box-sizing, $bs,
    -moz, -webkit, not -o, not -ms, not -khtml, official
  );
}

* {
  @include box-sizing(border-box);
}

.alert {
  border: 1px solid black;
}

.alert-error {
  @extend .alert;
  color: red;
  border-color: red;
}
```

Doxygen

Generating documentation for annotated sources

Tons of language support

Extensions for other languages

(like JavaScript!)

Demo

So what's next?

Get up and running in minutes

```
$> git clone <repo url> my-dev-env  
$> cd my-dev-env  
$> git submodule init  
$> git submodule update  
$> mvn install  
$> mvn liferay:deploy
```

YOU MUST CHOOSE



BUT CHOOSE WISELY

The Second Law of Thermodynamics

The entropy of an isolated system never decreases, because isolated systems always evolve toward thermodynamic equilibrium a state with maximum entropy.



Peep behind the scenes of Chaos Software Ltd.
to discover how it keeps their software services under control

Fin.

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