MAKE YOUR GWT APPLICATION READY FOR GWT 3.0

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About Me

Senior Software Engineer at Red Hat

Component Lead of the WildFly Management Console

Working with GWT since 2008

http://hpehl.info

https://github.com/hpehl

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HAL - WildFly Management Console

HAL.next

Reuse Business Logic

Rewrite most of the UI Code

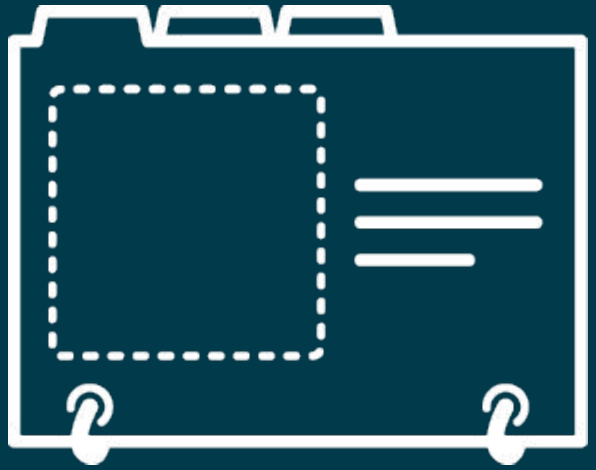
Demo

http://localhost:9990/

Get ready  for 3.0

GWT

DONT PANIC



User Interface

User Interface

Lightweight

No GWT Widgets

Builder & Templates

```
Elements.Builder builder = new Elements.Builder()
    .p()
        .a().css(clickable, pullRight).on(click, event -> update())
            .span().css(fontAwesome("refresh"), marginRight5).end()
            .span().textContent(resources.constants().refresh()).end()
        .end()
    .end()
    .section().css(centerBlock).rememberAs(LOADING_SECTION)
        .p().textContent(resources.constants().loading()).end()
        .div().css(spinner, spinnerLg).end()
    .end()
    .section().rememberAs(TOPOLOGY_SECTION).end();
```

```
<div data-element="root" class="row">
   <div class="col-lg-12 col-md-12 col-sm-12">
       <h1 data-element="header">server.log</h1>
       <div data-element="logFileControls" class="editor-controls">
           <div data-element="search"></div>
           <div data-element="status" class="editor-status"></div>
           <div class="log-file-follow">
               <label for="log-file-follow">{{resources().constants().tailMode()}}</label>
               <input data-element="tailMode" class="bootstrap-switch" type="checkbox"/>
           </div>
           <div class="editor-buttons btn-group">
               <a data-element="refresh" class="btn btn-default clickable">
                 <i class="fa fa-refresh"></i>
             </a>
               <a data-element="copyToClipboard" class="btn btn-default clickable">
                 <i class="fa fa-clipboard"></i>
             </a>
           </div>
       </div>
       <div data-element="editorContainer" class="margin-bottom-large log-file-editor-container">
           <div data-element="loading" class="spinner spinner-lg"></div>
       </div>
   </div>
</div>
```

```java
@Templated("LogFileView.html#root")
public abstract class LogFileView {

    public static LogFileView create() {
        return new Templated_LogFileView();
    }

    private Search search;

    @DataElement Element header;
    @DataElement Element tailMode;

    @DataElement("search")
    Search setupSearch() {
        ...
    }

    @EventHandler(element = "refresh", on = click)
    void onRefresh() {
        presenter.refresh();
    }
}
```

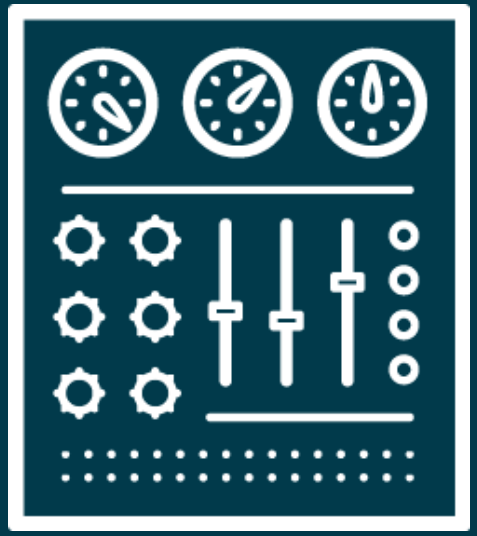
Generate UI

Reduce Boilerplate

Annotation Processor

Pragmatic

```
<view>
    <metadata address="/{selected.profile}/subsystem=ejb3/thread-pool=*">
        <h1>Thread Pool</h1>
        <p>{{metadata.getDescription().getDescription()}}</p>
        <table id="thread-pool-table" title="Thread Pool" form-ref="thread-pool-form">
            <actions>
                <action handler-ref="add-resource"/>
                <action handler-ref="remove-resource" scope="selected"
                    name-resolver="{{api.selectedRow().getName()}}"/>
            </actions>
            <columns>
                <column name="name" value="{{row.getName()}}"/>
            </columns>
        </table>
        <form id="thread-pool-form" title="Thread Pool" auto-save="true"
            name-resolver="{{form.getModel().getName()}}"/>
     </metadata>
</view>
```



Widgets

Widgets

KISS

DOM Elements

Web Components

Custom Elements

JsInterop

PatternFly

Bootstrap

Datatables

jsTree

AceEditor

```java
public class Breadcrumb implements IsElement {

    private final Element root;

    public Breadcrumb() {
        root = Browser.getDocument().createElement("ol");
        root.getClassList().add(breadcrumb);
    }

    public Breadcrumb append(final String segment) {
        Element li = new Elements.Builder()
            .li().css(active).textContent(segment).end()
            .build();
        root.appendChild(li);
        return this;
    }

    @Override
    public Element asElement() {
        return root;
    }
}
```

```java
@JsType(isNative = true)
public abstract class Modal {

   @JsFunction @FunctionalInterface
   public interface ModalHandler {
       void handle();
   }

   @JsType(isNative = true, namespace = GLOBAL, name = OBJECT)
   public static class ModalOptions {

       public boolean keyboard;

       @JsOverlay
       public static ModalOptions create(final boolean closeOnEsc) {
           ModalOptions options = new ModalOptions();
           options.keyboard = closeOnEsc;
           return options;
       }
   }

   @JsMethod(namespace = GLOBAL)
   public native static Modal $(@NonNls String selector);

   public native void modal(ModalOptions modalOptions);

   public native void on(@NonNls String event, ModalHandler handler);
}
```

CSS / Styling

CSS / Styling

Less / Sass

Follow best practices

- http://getbem.com/
- http://cssguidelin.es/

Interface with class constants

```
public interface CSS {

    String address = "address";
    String active = "active";
    String alert = "alert";
    String alertDanger = "alert-danger";
    String alertInfo = "alert-info";
    String alertSuccess = "alert-success";

    ...

    String warning = "warning";
    String warningTriangleO = "warning-triangle-o";
    String withProgress = "with-progress";

    static String fontAwesome(@NonNls String name, FontAwesomeSize size) {
        @NonNls String css = "fa fa-" + name;
        if (size != null) {
            css += " fa-" + size.size();
        }
        return css;
    }
}
```

```
Elements.Builder builder = new Elements.Builder()
    .form().attr("novalidate", "true").css(upload)
        .add(alert)
        .div().rememberAs(ICON_ELEMENT).css(uploadIcon, fontAwesome("upload", x4)).end()
        .input(file)
            .rememberAs(FILE_INPUT_ELEMENT)
            .id(Ids.UPLOAD_FILE_INPUT)
            .css(uploadFile)
            .on(change, event -> showFiles(fileInput.getFiles()))
        .label().attr("for", Ids.UPLOAD_FILE_INPUT).rememberAs(LABEL_ELEMENT)
            .a().css(clickable)
                .textContent(CONSTANTS.chooseFile())
            .end()
            .span().rememberAs(DRAG_ELEMENT)
                .textContent(CONSTANTS.orDragItHere())
            .end()
        .end()
    .end();
```

Model View Presenter

MVP

GWTP

- DI through GIN
- Simple and powerful history management
- Support for nested presenters
- Lifecycle events using GWT eventbus
- Lazy instantiation for presenters and views
- Effortless and efficient code splitting

Widget ↔ Element Adapter

```java
/**
 * Adapter between GWTPs views which are based on widgets and
 * HAL views which are based on elements.
 *
 * @author Harald Pehl
 */
public interface HalView extends View, IsElement, HasElements {

    /**
     * This method should be called <em>after</em> the view's elements are attached to the DOM.
     * Typically this method is called from {@link HalPresenter#onReveal()}.
     */
    void attach();

    /**
     * Counterpart to {@link #attach()}. Implement this method if you need to remove stuff
     * which was setup in {@link #attach()}. The default implementation does nothing.
     */
    default void detach() {}
}
```

GWT-RPC / RequestFactory

GWT-RPC / RequestFactory

Plain XmlHttpRequest

JSON, XML, ... as payload

Central class

- Provides high level API
- Contains low level code

```
public class Dispatcher {

   public void execute(final Composite composite, final CompositeCallback callback) {
      ...
   }

   public void execute(final Operation operation, final OperationCallback callback) {
      ...
   }

   public void upload(final File file, final Operation operation,
           final OperationCallback callback) {
      ...
   }
}
```

Deferred Binding

Deferred Binding

Replace with Annotation Processing

Use 3rd party libraries

- https://github.com/hpehl/apt-tools
- https://github.com/google/auto
- https://github.com/google/compile-testing

```
<#-- @ftlvariable name="generatedWith" type="java.lang.String" -->
<#-- @ftlvariable name="packageName" type="java.lang.String" -->
<#-- @ftlvariable name="className" type="java.lang.String" -->
<#-- @ftlvariable name="bindings" type="java.util.List<org.jboss.hal.processor.RegistryBinding>" -->
package ${packageName};

import javax.annotation.Generated;

import com.google.inject.Singleton;
import com.google.gwt.inject.client.AbstractGinModule;

import org.jboss.hal.spi.GinModule;

/*
 * WARNING! This class is generated. Do not modify.
 */
@GinModule
@Generated("${generatedWith}")
public class ${className} extends AbstractGinModule {

   @Override
   protected void configure() {
       <#list bindings as binding>
       bind(${binding.interface}.class).to(${binding.implementation}.class).in(Singleton.class);
       </#list>
   }
}
```

```java
public class FormTest {

    @Test
    public void simpleForm() {
        Compilation compilation = javac()
                .withOptions("-proc:only")
                .withProcessors(new MbuiViewProcessor())
                .compile(JavaFileObjects.forResource("SimpleForm.java"));

        assertThat(compilation)
                .generatedSourceFile("Mbui_SimpleForm")
                .hasSourceEquivalentTo(
                    JavaFileObjects.forResource("Mbui_SimpleForm.java"));
    }
}
```

Debug / Run / Build

Debug / Run / Build

Debug: Browser Dev Tools

Run & Build

- Maven Multi Module
- Maven Plugin for GWT
- Frontend Maven Plugin
    - NPM
    - Bower
    - Grunt

```
{
  "name": "org.jboss.hal.bower",
  "version": "0.4.3",
  "description": "Bower setup for HAL",
  "license": "Apache-2.0",
  "dependencies": {
    "ace-builds": "^1.2.4",
    "datatables.net": "~1.10.12",
    "datatables.net-buttons": "~1.2.2",
    "datatables.net-keytable": "^2.1.3",
    "datatables.net-select": "~1.2.0",
    "javascript-auto-complete": "1.0.4",
    "jquery": "~2.2.4",
    "jstree": "~3.3.1",
    "patternfly": "~3.14.0",
    "tagmanager": "~3.0.2",
    "zeroclipboard": "^2.2.0"
  }
}
```

What’s left?

What's Left

ClientBundle / i18n

Dependency Injection

Thanks!
Questions?