

Rich HTML5 Web Apps: Typesafe Edition 2



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JBoss
Community

Another Java Web Framework?



Web Design vs. Web Development



InDesign
HTML
CSS
PhotoShop

IDE
Compiler
Text editor
Build tools

PROBLEM

```
<html>
<head>
  <title>First JSP
  <link rel="stylesheet" href="number-styles.css">
</head>
<body>
  <%
    double num = Math.random();
    if (num > 0.95)
  %>
  <h2 class="response">You have a lucky day!</h2>
  <p class="number lucky">(num %>)</p>
  <%
  %>
  } else {
  %>
  <h2 class="response">Well, life is not...</h2>
  <p class="number lucky">(<%= num %>)</p>
  <%
  %>
  }
  %>
  <a href="request.html" >Try Again</h3></a>
</body>
</html>
```


Errai UI - HTML5

```
<!DOCTYPE html>
<link href="css/bootstrap.css" rel="stylesheet">

<form id="login">
  <legend>Log in to your account</legend>

  <label for="username">Username</label>
  <input id="username" type="text" placeholder="Username">

  <label for="pass">Password</label>
  <input id="pass" type="password" placeholder="Password">

  <button id="submit">Log in</button>
  <button>Cancel</button>
</form>
```

Errai UI - HTML5

```
@Templated @Page
public class LoginForm extends Composite {

    @Inject @DataField
    private TextBox username;

    @Inject @DataField("pass")
    private PasswordTextBox password;

    @DataField
    private Button submit = new Button();

    @EventHandler("submit")
    private void onLogin(ClickEvent e) {
        // send login request
    }
}
```

```
public class Main {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

.java



javac



.class

Java-to-JavaScript Compiler

Cross-browser support

Heavy up-front optimizations



Development Mode

Code and Refresh development

Debug client and server as Java code in your IDE

Example project layout

src/main/java

HelloWorld.gwt.xml

client

HelloWorldClient.java

shared

HelloWorldEntity.java

server

HelloWorldService.java

} Compiled to JavaScript

src/main/webapp

HelloWorld.html

WEB-INF

web.xml

src/main/resources

ErraiApp.properties

Java EE 6 APIs

Bean Validation

JAX-RS

JPA

Security Integration

CDI



HTML5 templating

Mobile support

Two-way data binding

Page navigation

Collaboration Within Large Teams



PROBLEM

Shared Data Model

```
@Bindable
@Entity
@NamedQuery(
    name = "allComplaints",
    query = "SELECT c FROM UserComplaint c ORDER BY c.id")
public class UserComplaint {
    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private Long id;

    @Version
    private Long version;

    private String name;
    private String email;
    private String text;

    private boolean done;

    @Lob
    private String image;
}
```

Errai UI - Data Binding

```
@Templated @Page
public class ComplaintForm extends Composite {

    @Inject @Bound @DataField
    private TextBox email;

    @Inject @Bound @DataField("name")
    private TextBox username;

    @Inject @Bound @DataField
    private TextArea text;

    @Inject @Model
    private UserComplaint complaint;

    @EventHandler("submit")
    private void onSubmit(ClickEvent e) {
        sendToServer(complaint);
    }
}
```

Vertical Repetition: Code duplication between the client and the server

PROBLEM

Shared Data Model with Validation

```
@Bindable
@Entity
@NamedQuery(
    name = "allComplaints",
    query = "SELECT c FROM UserComplaint c ORDER BY c.id")
public class UserComplaint {
    @Id
    @NotNull
    @GeneratedValue(strategy = GenerationType.AUTO)
    private Long id;

    @Size(min=3, max=20)
    private String name;

    @Email
    private String email;

    private String text;
    private boolean done;
    ...
}
```


CDI in the browser

Injecting and firing events

```
@Inject @Updated  
private Event<Document> updatedDocEvent;
```

```
...  
button.addClickListener(new ClickHandler() {  
    public void onClick(ClickEvent event) {  
        updatedDocEvent.fire(document);  
    }  
});
```

CDI in the browser

Observing events

```
public void onUpdatedDocument(@Observes @Updated Document doc) {  
    // received updated document  
}
```

On the client

On the server

Or both (events are sent across the wire)

Uniform programming model on the client and server

Horizontal Repetition: Code duplication on the client



Remote Calls

Errai JAX-RS

```
@Path("customers")
public interface CustomerService {
    @POST
    @Consumes("application/json")
    @Produces("text/plain")
    public long createCustomer(Customer customer);
}
```

shared

```
@Inject
private Caller<CustomerService> customerService;
...
customerService.call(
    resp -> Window.alert(resp)
).createCustomer(customer);
```

client






Maintaining Large Projects or, “When This Codebase is Fully Operational...”

PROBLEM








IDEs Are Useful!

```
@Templated("#main")
@Page(path="share")
public class SharePage extends Composite {
    @Inject private @DataField Label overallErrorMessage;
    @Inject private @DataField TextBox email;
    @Inject private @DataField Button shareButton;
    @Inject private Caller<ShareService> shareService;
    @Inject private TransitionTo<ToDoListPage> todoListPageLink;

    @PostConstruct
    private void init() {
        overallErrorMessage.setVisible(false);
    }
}
```

 overallErrorMessage cannot be resolved

7 quick fixes available:

-  [Create local variable 'overallErrorMessage'](#)
-  [Create field 'overallErrorMessage'](#)
-  [Create parameter 'overallErrorMessage'](#)
-  [Create class 'overallErrorMessage'](#)
-  [Create constant 'overallErrorMessage'](#)
-  [Change to 'overallErrorMessage'](#)
-  [Fix project setup...](#)



Don't Reinvent the Wheel

PROBLEM

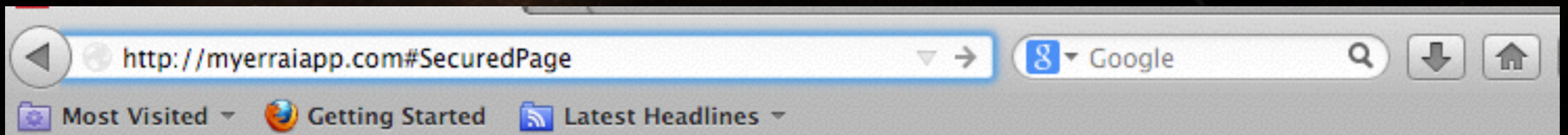


Errai Security - UI

```
@Templated
@Page
@RestrictedAccess
public class SecuredPage extends Composite {

    @Inject @DataField
    @RestrictedAccess(roles="Admin")
    private Anchor adminLink;

}
```



Errai Security - RPC

```
@Remote
@RestrictedAccess
public interface SecuredService {
    public void securedMethod();

    @RestrictedAccess(roles="Admin")
    public void adminMethod();
}
```

```
@Path("/securedService")
@RestrictedAccess
public interface SecuredService {
    @GET
    public void securedMethod();

    @GET
    @Path("/admin")
    @RestrictedAccess(roles="Admin")
    public void adminMethod();
}
```

Errai Security - Login

```
@Templated @Page
public class LoginForm extends AbstractForm {

    @Inject
    private Caller<AuthenticationService> authService;

    @Inject @Bound @DataField
    private TextBox name;

    @Inject @Bound @DataField
    private PasswordTextBox pass;

    @Inject @Model
    private User user;

    @EventHandler("login")
    private void onLogin() {
        authService.call(new RemoteCallback<User>() {
            public void callback(User authenticatedUser) {
                // process successful login
            }
        }).login(user.getName(), user.getPass());
    }
}
```



Future Work

Incremental data synchronization (JPA and OT)

Web Components

Web Workers

JavaScript APIs / Dynamic Plugins

Get in touch!

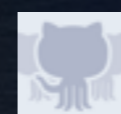
Website: <http://erraiframework.org>

IRC: #errai on freenode

Twitter: @jbosserrai



Photo by: CHIN.DENG
From: Flickr



<http://github.com/errai>