

# Mobile development with Apache OFBiz

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# Mobile development

- For the purposes of this talk “mobile development” means “mobile web development”
- The languages and APIs for native iOS, Android and Windows phones are different but the concepts translate directly
- This talk will cover deployment as an app using PhoneGap (Apache Cordova)

# Mobile web development

- Pages are largely static assets
- Adaptive HTML/CSS with flexible screen sizes
- Templating and client logic are implemented on the client using Javascript instead of on the server
- User data is provided via AJAX calls that return JSON, XML or some other common format
- May utilize a web app framework like PhoneGap to access additional hardware features

# Benefits

- User interaction is more sophisticated and can provide functionality that would be impossible using server side template rendering (ie. Google Maps, etc)
- Multi-platform mobile app and mobile web from one source base
- Application can be more responsive and handle errors more naturally
- Better separation of business logic and presentation layer
- Improved server scalability and caching options
- Improved XSS security

# Technologies

- There are many application frameworks with similar capabilities. Dojo, jQuery/jQueryUI, Stapes, Emberjs, BackboneJS, Angular, Rivets and so on
- There are also many HTML/CSS frameworks with two dominant examples being Bootstrap and Zurb Foundation
- How do you choose?

# Todo MVC



Implementations of the same simple to-do list application using many different frameworks

Full source is provided for each implementation for comparison



Helping you **select** an MV\* framework

# This talk

- For this talk we will focus on one common stack:  
RequireJS + BackboneJS + RivetsJS
- We will also discuss the common build automation tools Bower and Grunt
- PhoneGap to package as an app for app stores
- Integrate with OFBiz using a simple servlet for REST calls
- Demonstrate execution of shared Javascript code for client and server model validation

# Benefits: Interface flexibility

Example: D3 Javascript library for graphing provides dynamic, interactive data modeling that could not be achieved using page fetches.  
(Show examples)

 Data-Driven Documents

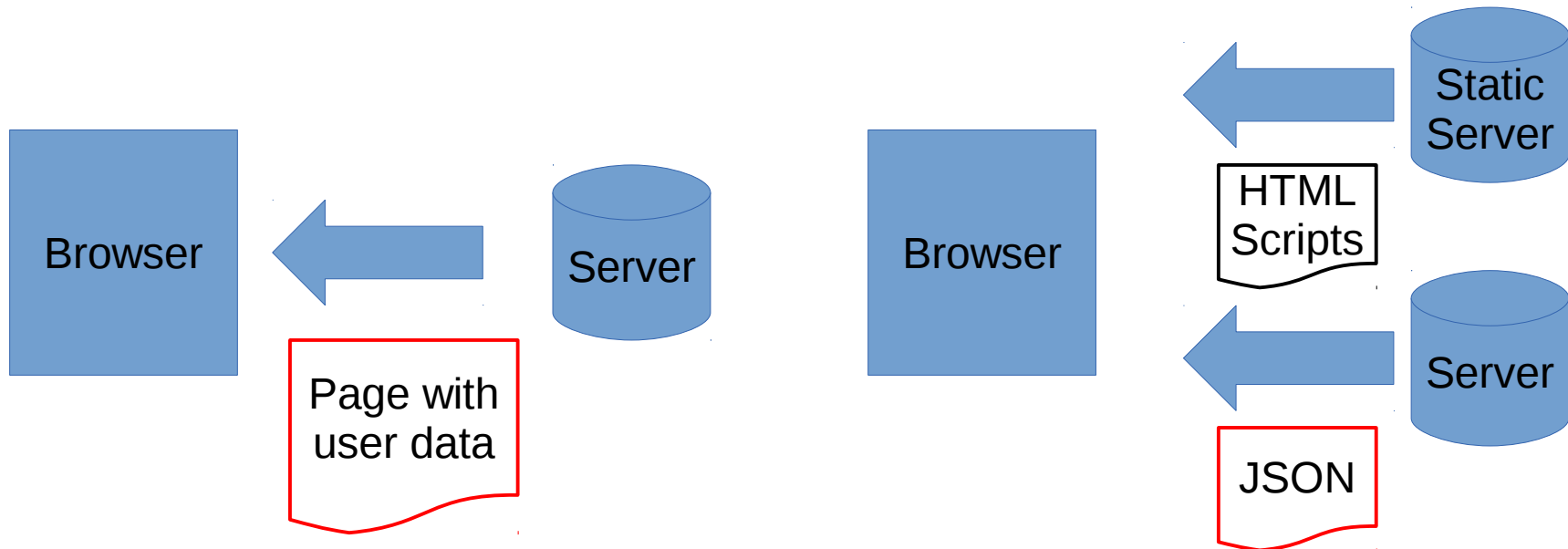




# Benefits: Single source base

- If an application is designed carefully then the same HTML, CSS and Javascript that is served to browsers can be packaged as a mobile app and distributed through the mobile app stores
- Static assets load from the phone locally instead of from the server and only AJAX calls are fetched remotely
- Fast start up, good performance even with poor signal quality

# Benefits: Error handling



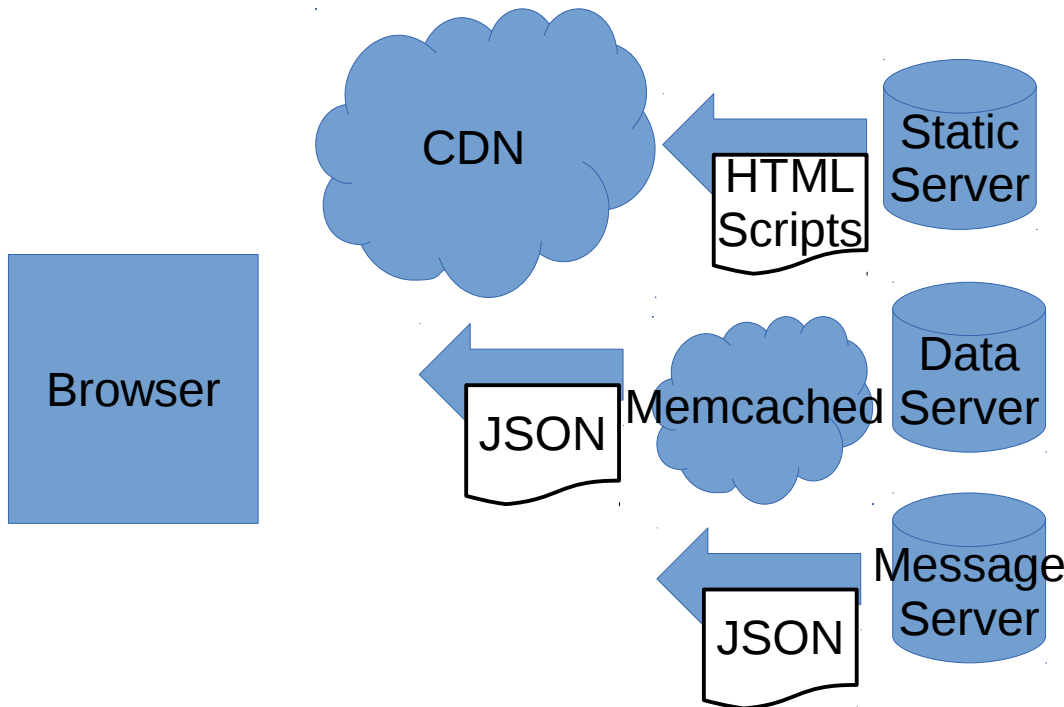
```
HTTP Status 500 -  
type Exception report  
message  
description The server encountered an internal error () that prevented it from fulfilling this request.  
exception  
java.lang.IllegalStateException: No WebApplicationContext found: no ContextLoaderListener registered?  
org.springframework.web.filter.DelegatingFilterProxy.doFilter(DelegatingFilterProxy.java:251)  
com.atlassian.plugin.servlet.filter.ServletFilterModuleContainerFilter.doFilter(ServletFilterModuleContainerFilter.java:71)  
com.atlassian.plugin.servlet.filter.ServletFilterModuleContainerFilter.doFilter(ServletFilterModuleContainerFilter.java:63)  
com.atlassian.plugin.servlet.filter.ServletFilterModuleContainerFilter.doFilter(ServletFilterModuleContainerFilter.java:71)  
com.atlassian.plugin.servlet.filter.ServletFilterModuleContainerFilter.doFilter(ServletFilterModuleContainerFilter.java:63)  
com.atlassian.johnson.spring.web.filter.BypassableDelegatingFilterProxy.doFilter(BypassableDelegatingFilterProxy.java:49)  
com.atlassian.johnson.filters.AbstractJohnsonFilter.doFilter(AbstractJohnsonFilter.java:67)  
com.atlassian.johnson.spring.web.filter.BypassableDelegatingFilterProxy.doFilter(BypassableDelegatingFilterProxy.java:49)  
org.springframework.web.filter.CharacterEncodingFilter.doFilterInternal(CharacterEncodingFilter.java:88)  
org.springframework.web.filter.OncePerRequestFilter.doFilter(OncePerRequestFilter.java:76)  
note The full stack trace of the root cause is available in the Apache Tomcat/6.0.32 logs.  
Apache Tomcat/6.0.32
```

## My Site

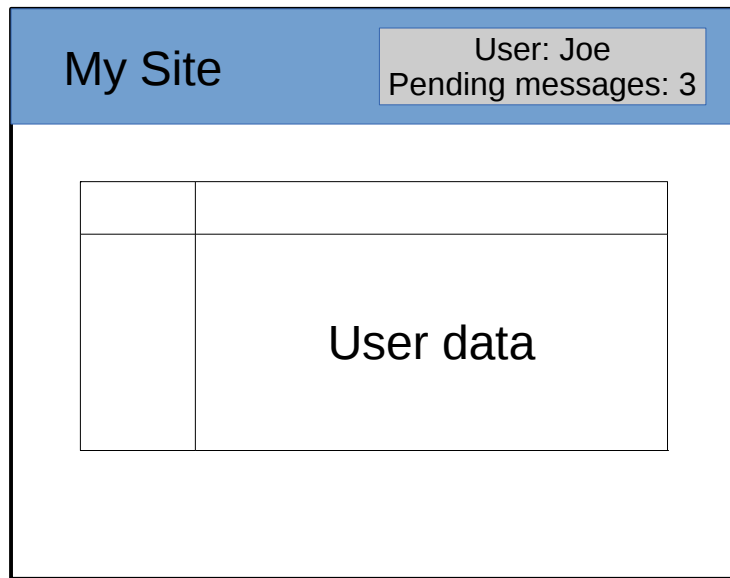
Data is not available

OK

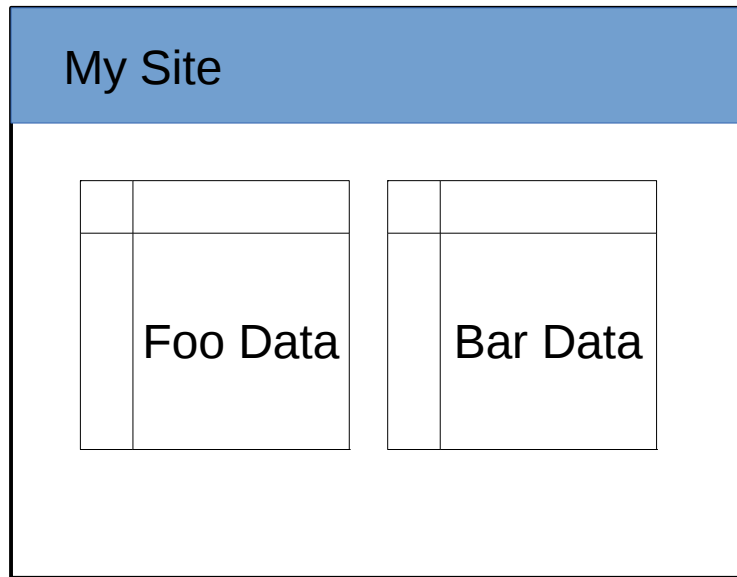
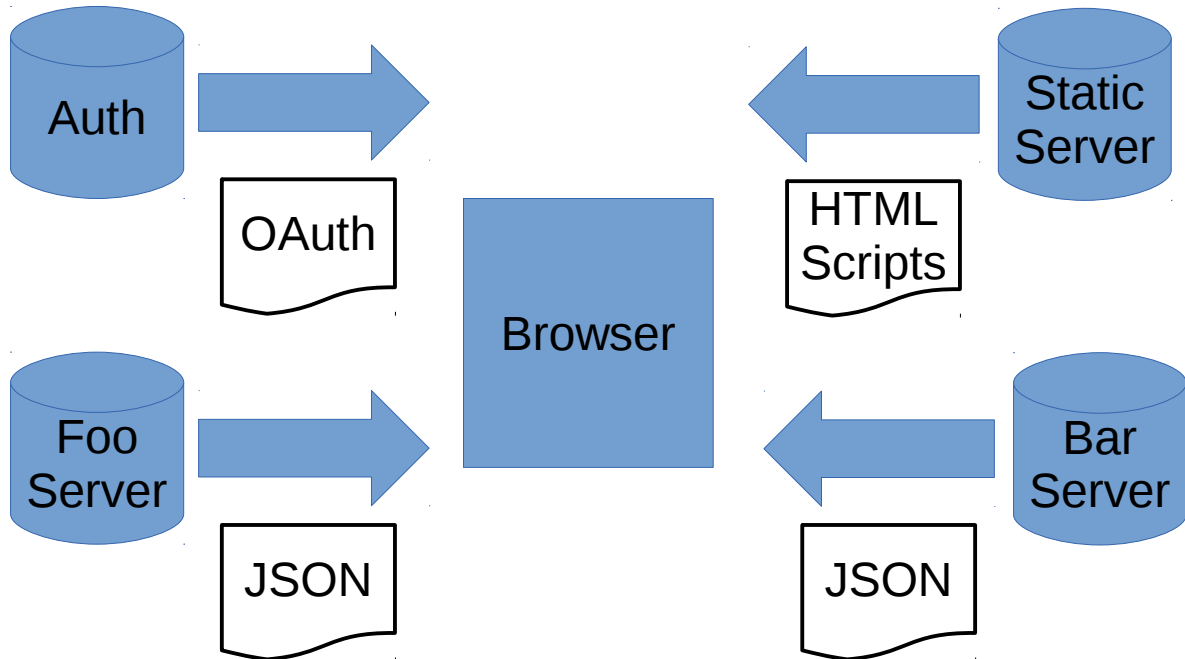
# Benefit: Scalability



Since the presentation layer is rendered on the client the UI components can be served via a content distribution network. Typically whole files can be cached and it is no longer necessary to construct fine grained caches of page fragments to gain performance.



# Benefit: Separation of concerns



User interface is largely decoupled from business logic. Application servers are no longer tied to specific HTML presentations and can be reused in multiple applications. If there is shared authentication then everything can be driven off a single user log in.

# Benefits: Security

- More resistant to XSS (cross side scripting) attacks.
  - When using Javascript to set the text content of a DOM node there is never a chance that the text will be interpreted as Javascript and executed.
  - Many frameworks (ie. Angular, RivetsJS) handle this automatically in their data binding system so inputs and divs are automatically secure against XSS.
  - If AJAX calls require authentication tokens then many XSS link phishing attacks are also blocked.

# Technology: RequireJS

Replaces carefully ordered `<script>` tags with explicit dependencies

```
<script src="js/jquery.js"></script>
<script src="js/underscore.js"></script>
<script src="js/backbone.js"></script>
<script src="js/foo.js"></script>
<script src="js/bar.js"></script>
<script src="js/cookie.js"></script>
<script src="js/calendar.js"></script>
<script src="js/beans.js"></script>
<script src="js/numeral.js"></script>
<script src="js/hammer.js"></script>
<script src="js/wire.js"></script>
<script src="js/baz.js"></script>
```

```
<script data-main="js/main.js"
src="js/require.js"></script>
```

main.js:

```
require(['foo'], function(foo) { foo(); });
```

foo.js:

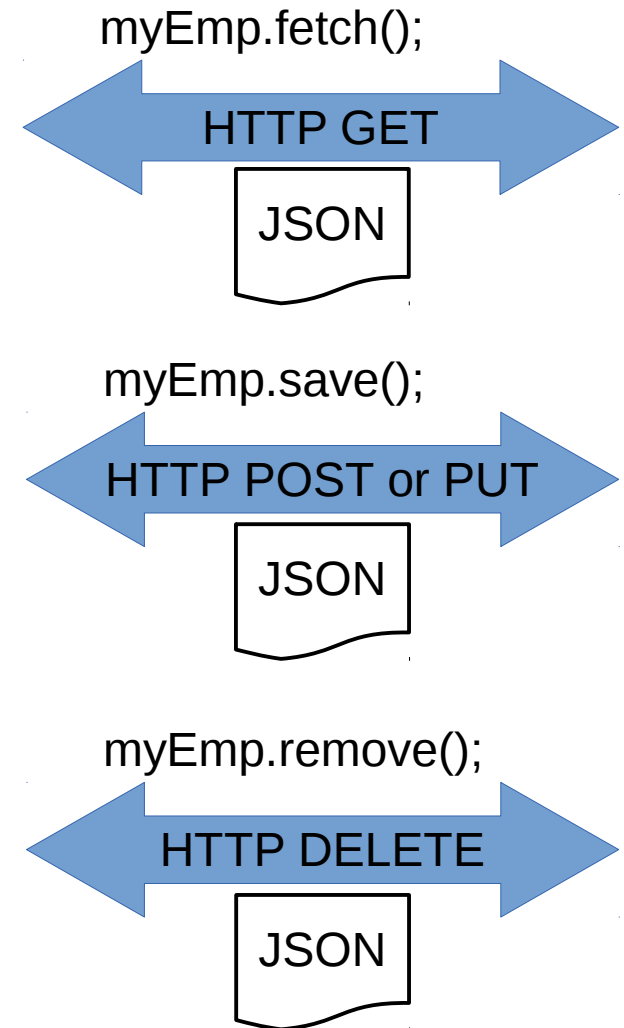
```
define('foo', [
  'underscore',
  'backbone',
  'bar'], function(foo, _, Backbone, bar) {
  ... do stuff ...
});
```

# Technology: BackboneJS

Backbone provides an abstraction layer for dealing with RESTful CRUD operations. This provides a simple API but, more importantly, decouples the web side logic from the details of how the data is delivered.

```
require(['Employee'],  
function(Employee) {  
  var myEmp =  
    new Employee();  
  ...  
})
```

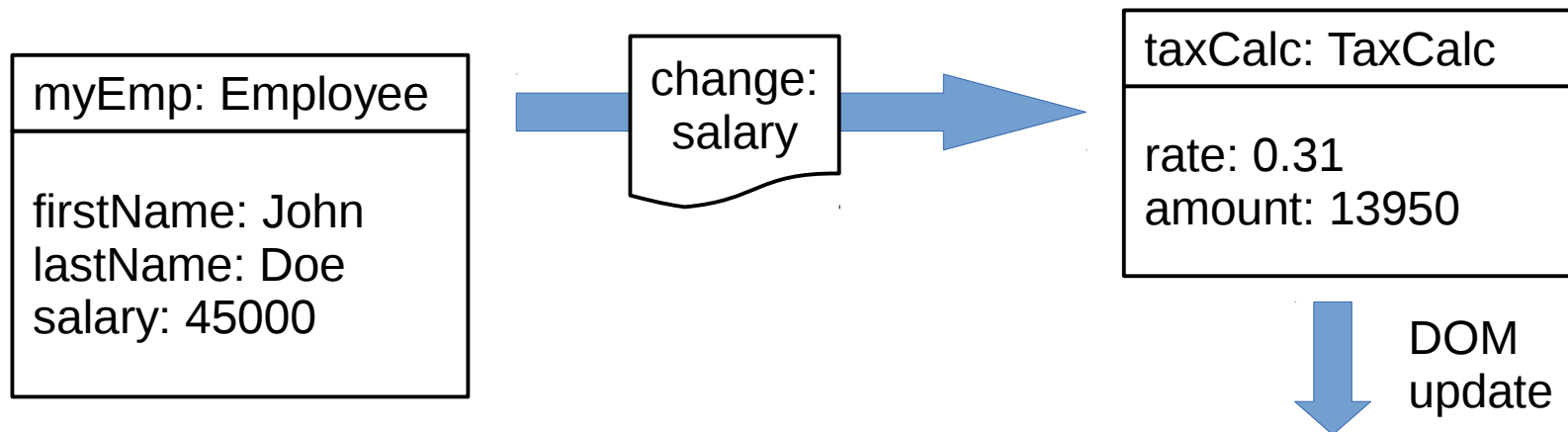
myEmp: Employee
firstName: John lastName: Doe



# Technology: BackboneJS

```
require(['Employee', 'TaxCalc'],  
function(Employee, TaxCalc) {  
  var myEmp = new Employee();  
  var taxCalc = new TaxCalc({ emp: myEmp });  
  ...  
});
```

```
... inside TaxCalc ...  
emp.onChange('salary', function() {  
  this.set('amount',  
    emp.get('salary') * rate);  
});
```



```
<div>  
  <div>Current salary: {myEmp:salary|dollars}</div>  
  <div>Current taxes: {taxCalc:amount|dollars}</div>  
</div>
```

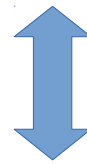
Current salary: \$45,000.00  
Current taxes: \$13,950.00



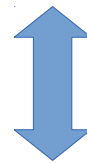
# Technology: RivetsJS

Like AngularJS, provides two-way updating between DOM and javascript objects:

```
scope.myvar = 'Hello world!';
```



```
Label: <input rv-value="myvar">  
<div rv-text="myvar"></div>
```



Label:

Hello world!

# Technology: Bootstrap

- Pre-built recipes for handling adaptive websites that work well on desktop, tablet and mobile devices.
- Huge user and developer base (79K stars, 31K forks on GitHub)
- Many third party UI component add-ons that match the basic look and feel.
- Saves weeks, maybe months of development.

# Technology: Bootstrap

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By Sabrina Rubin Drentl | November 10, 2014

# Technology: PhoneGap

- Based on Apache's Cordova project
- Wraps a HTML/Javascript based application in a binary wrapper that allows it to be uploaded to native web stores
- Allows access to phone hardware features such as GPS, accelerometer, camera and local file storage
- Near native performance of interfaces and improving all the time

# OFBiz: HTTP Integration

- OFBiz already provides basic support for delivering JSON data from web services but does not support mapping different HTTP methods to different services (ie. REST)
- For our projects we wrote a small servlet that implements RESTful method mapping and JSON input on the request body. This is what Backbone prefers.

# OFBiz: Framework challenges

- One major challenge is the OFBiz screen/form widget system's deep set dependency on access to the delegator
- Unconstrained remote access to the delegator is a security problem
- Moqui attempts to solve this problem with its authz system but still makes extensive use of server side templates
- This is a problem for any client/server technology (ie. iOS/Android native apps, Swing, etc.)

# OFBiz: Server side Javascript

- The OFBiz-Rhino integration currently allows server side scripting with Javascript within OFBiz
- This provides opportunities to share code (validation, etc.) between the client and server
- The new Nashorn infrastructure opens possibilities for much better performance and node.js compatibility on the Java VM

# OFBiz: ECAs and SECAs

- Using websockets or long-polling COMET it is possible to have ECA and SECA events propagate to the client
- We implemented this as an add-in servlet but it would be a nice addition to the core platform
- Allows “Google Docs-like” features in editing and display screens



Demo

Q&A

Thanks!

Let's keep the conversation going:

@schue

<http://schu.es>

[ean@brainfood.com](mailto:ean@brainfood.com)

<http://github.com/schue/ac15demo>