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I/O

Architecting GWT applications for production at Google

Ray Ryan
19 May 2010

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http://bit.ly/io2010-gwt8

Answering two questions

- How does Google architect its web apps?
- How are GWT 2.1 and Spring Roo going to help me do the same?
  - com.google.gwt.app
  - com.google.gwt.requestfactory

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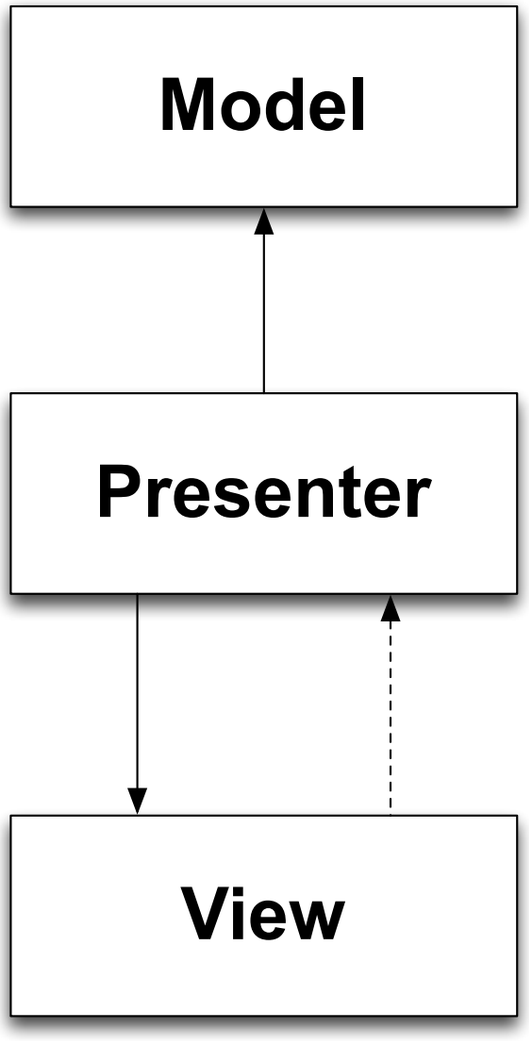
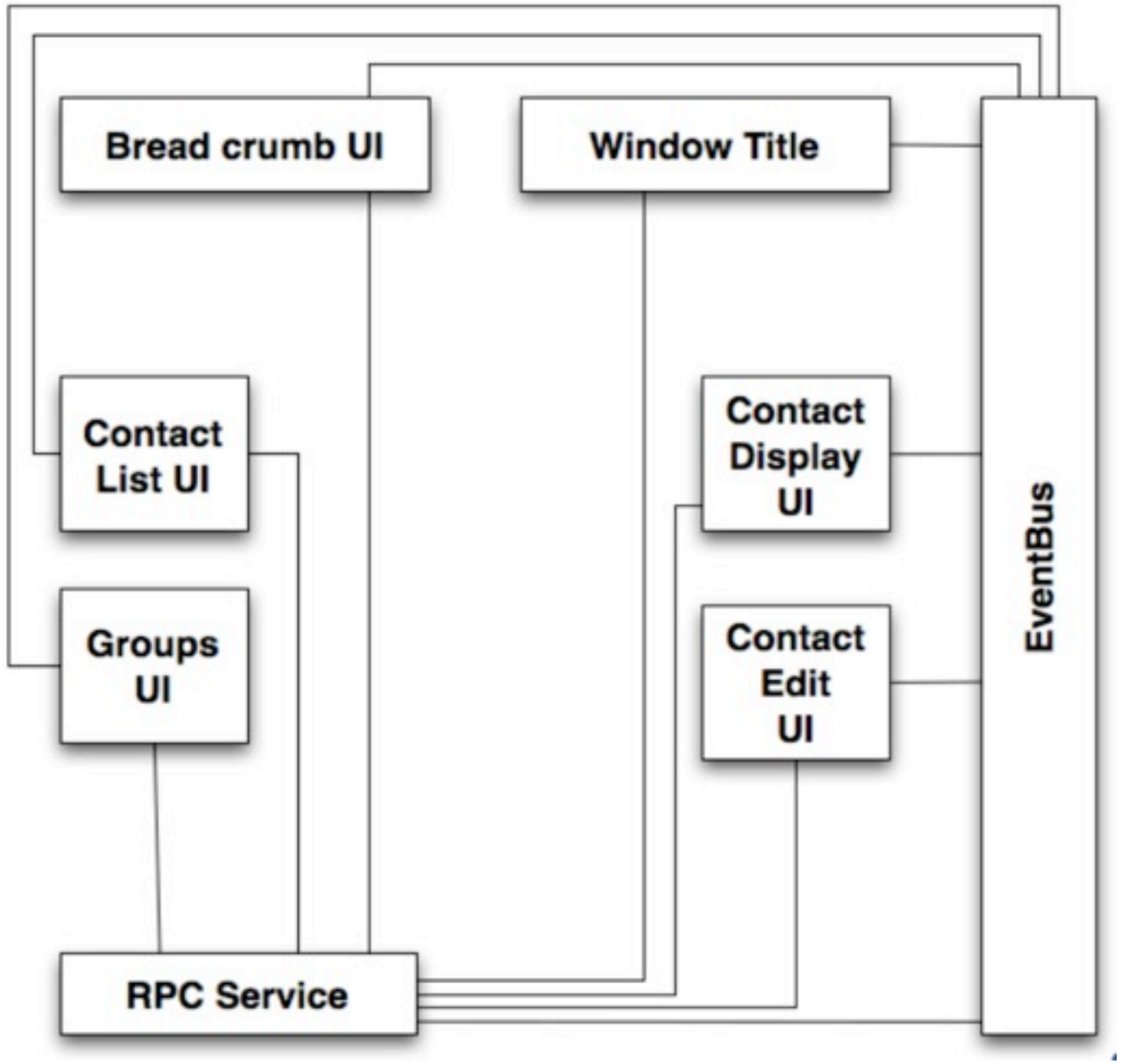
If you like this talk, you'll love…

Building on last year's *Best Practices for Architecting*

http://code.google.com/events/io/2009/sessions/GoogleWebToolkitBestPractices.html





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Production Ready

“Production ready” means…

- Well tested
- Secure
- Monitored
  - What’s broke
  - What’s slow
- Scalable
  - Lots of users
  - Lots of developers
- Bookmark friendly
- Crawlable
- Localized

Isolation

- Well tested ✔
- Secure
- Monitored
  - What's broke
  - What's slow
- Scalable ✔
  - Lots of users ✔
  - Lots of developers ✔
- Bookmark friendly ✔
- Crawlable ✔
- Localized

Instrumentation

- Well tested ✔
- Secure
- Monitored ✔
  - What's broke ✔
  - What's slow ✔
- Scalable ✔
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Suspicion

- Well tested ✔
- Secure ✔
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  - What's broke ✔
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Discussed yesterday

- Well tested ✔
- Secure ✔
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- Localized ✔

GWT's UI overhaul

http://bit.ly/io2010-gwt5

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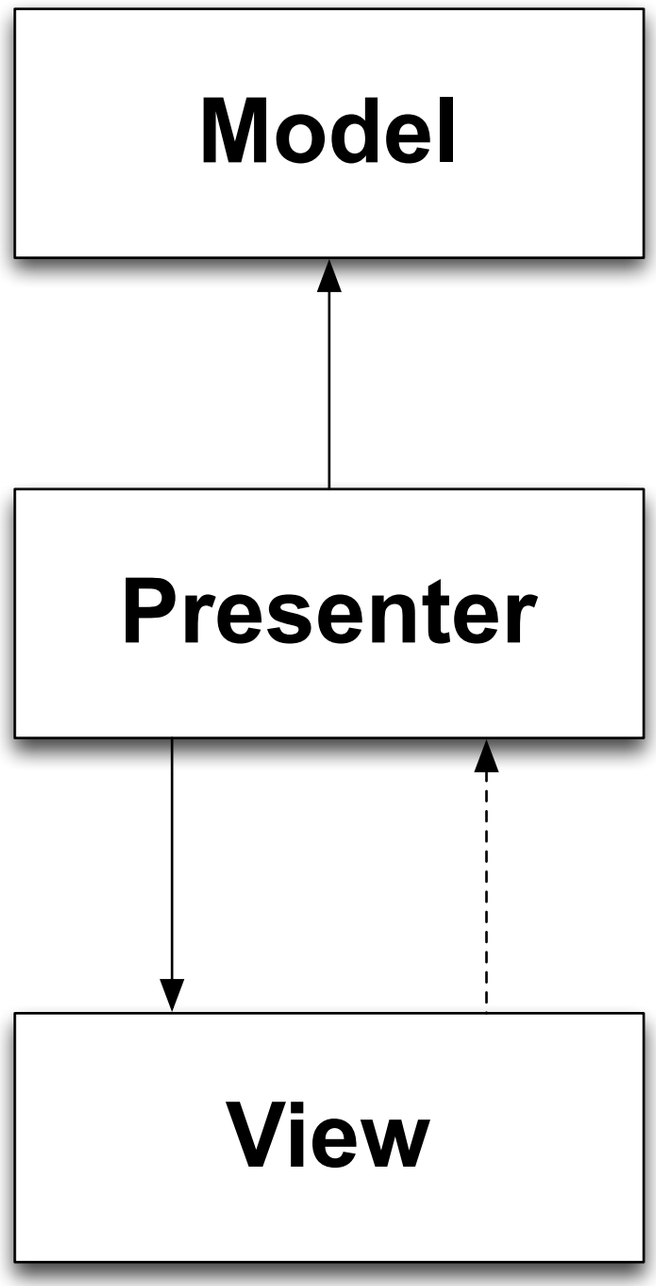
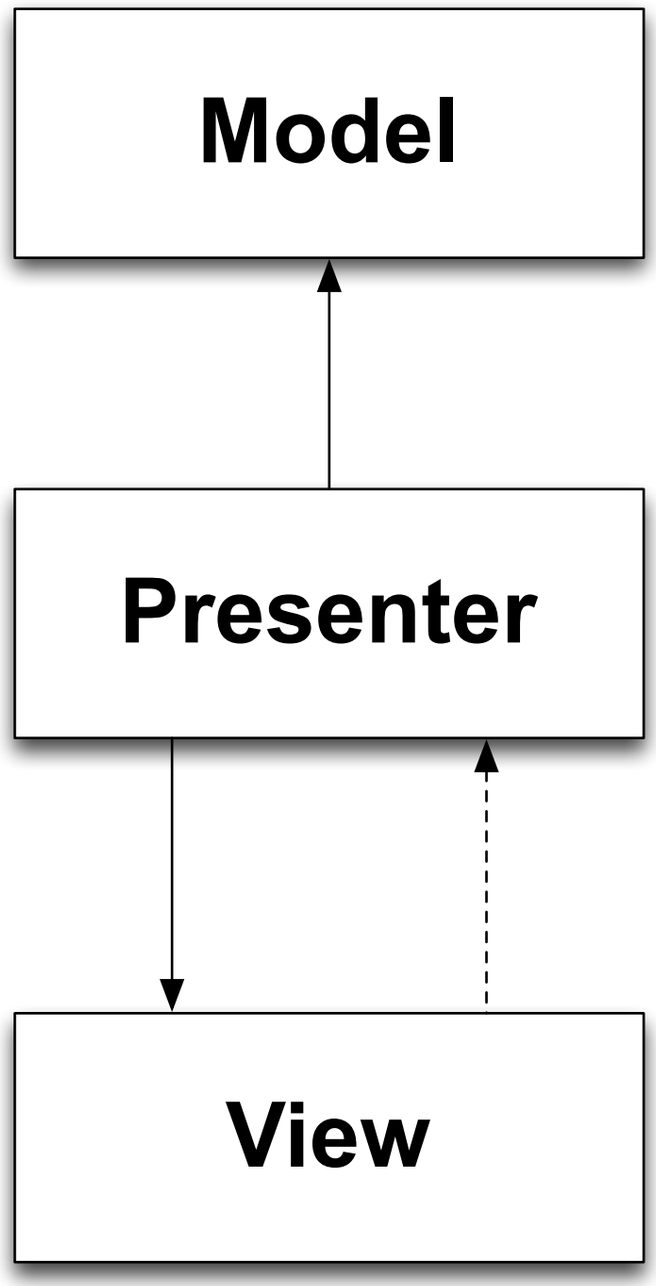
Isolation

MVP



MVP



Effective Testing…

http://bit.ly/io2010-gwt7

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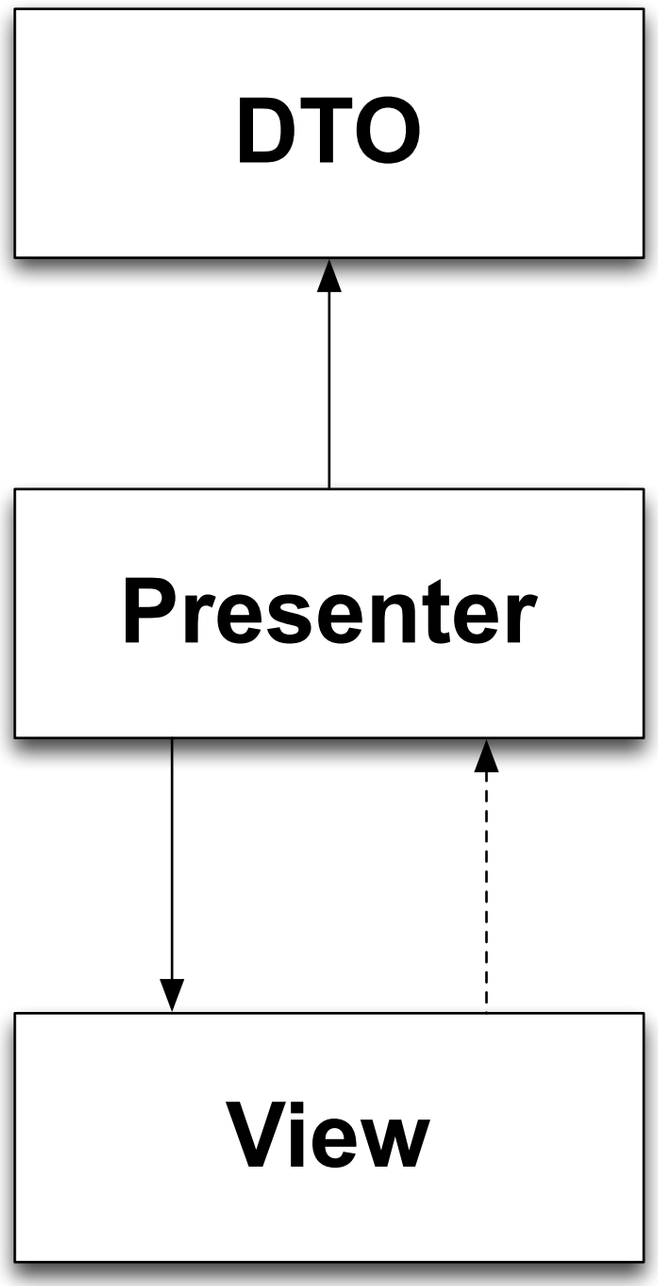
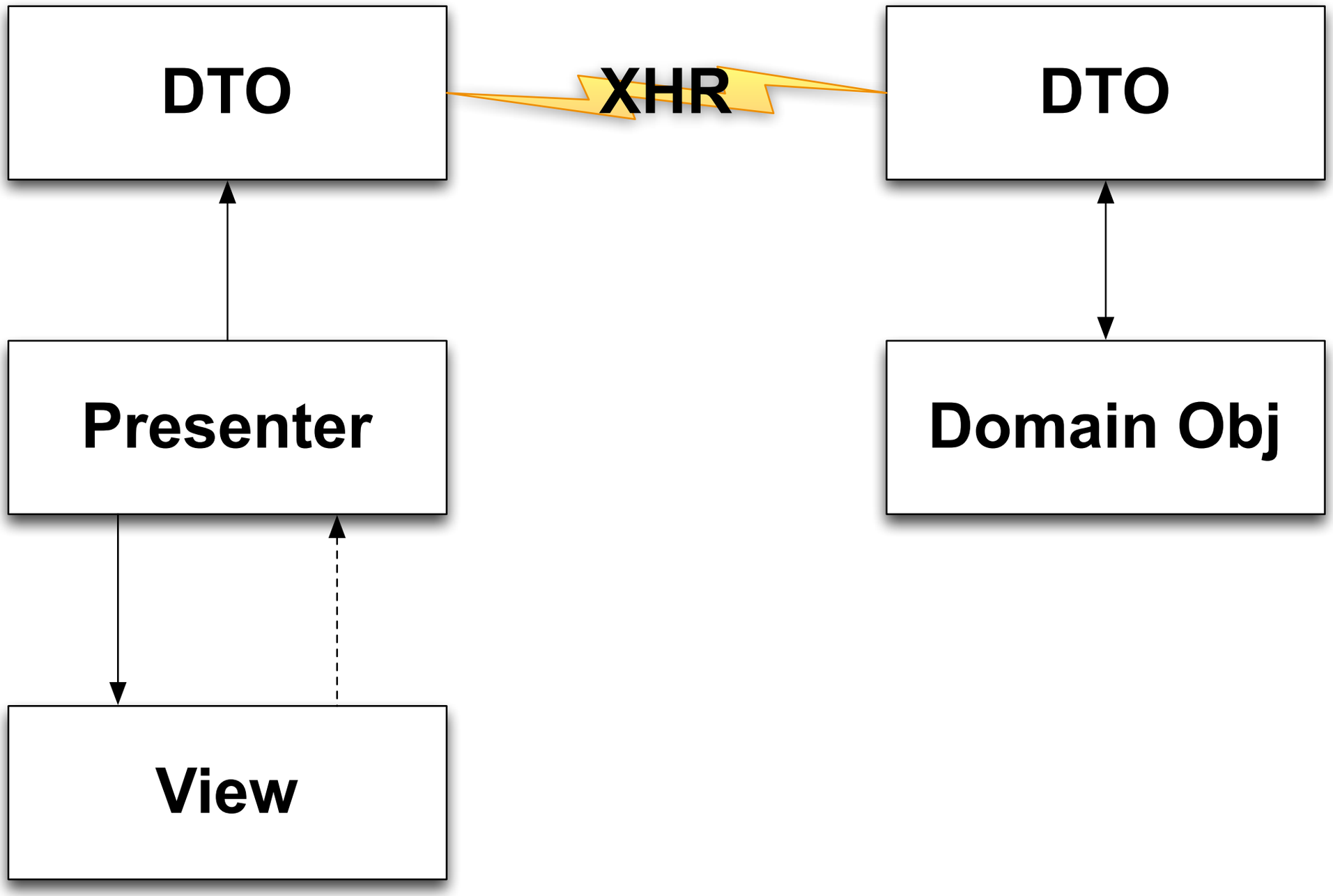
MVP



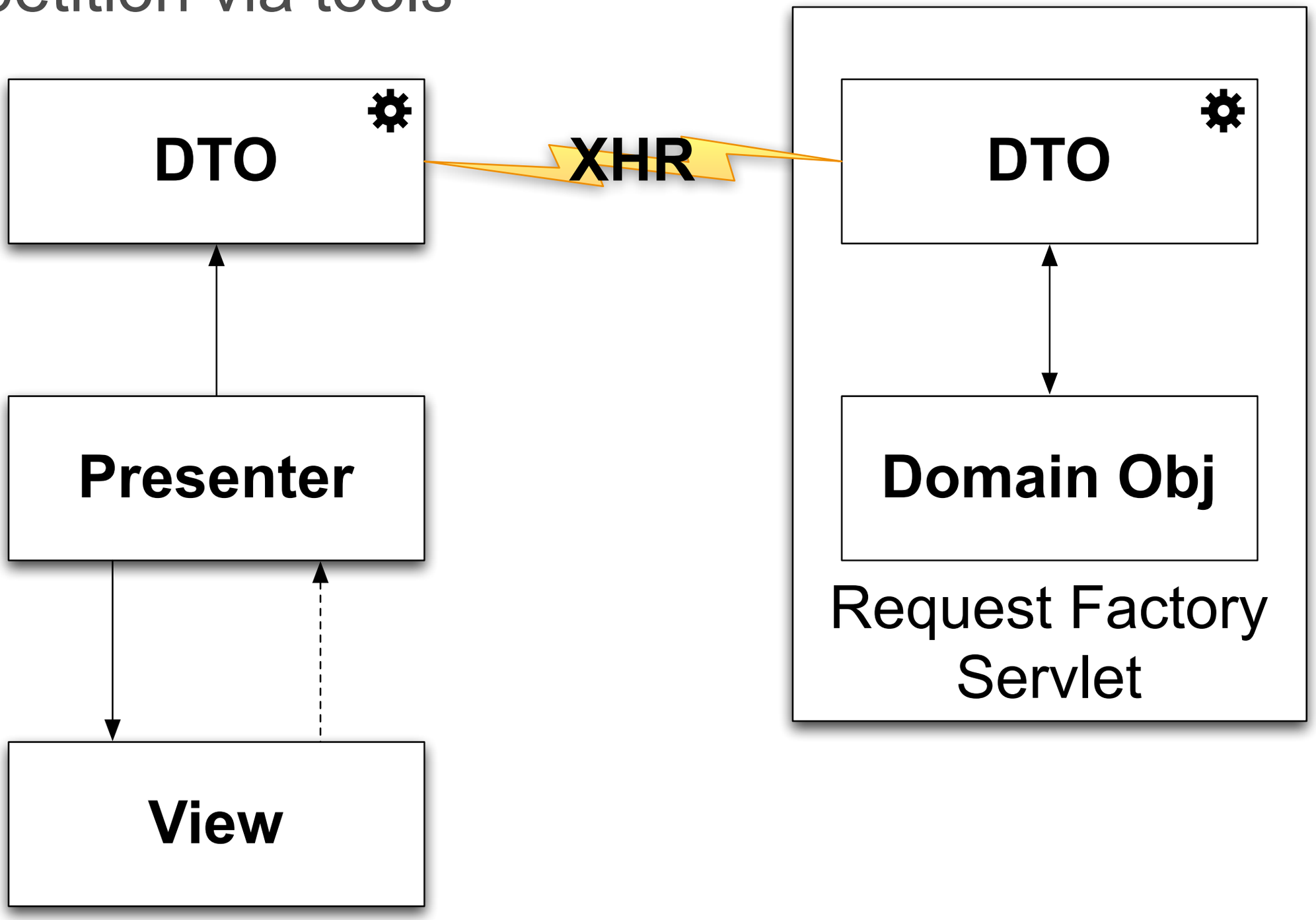
Effective Testing…

http://bit.ly/io2010-gwt7

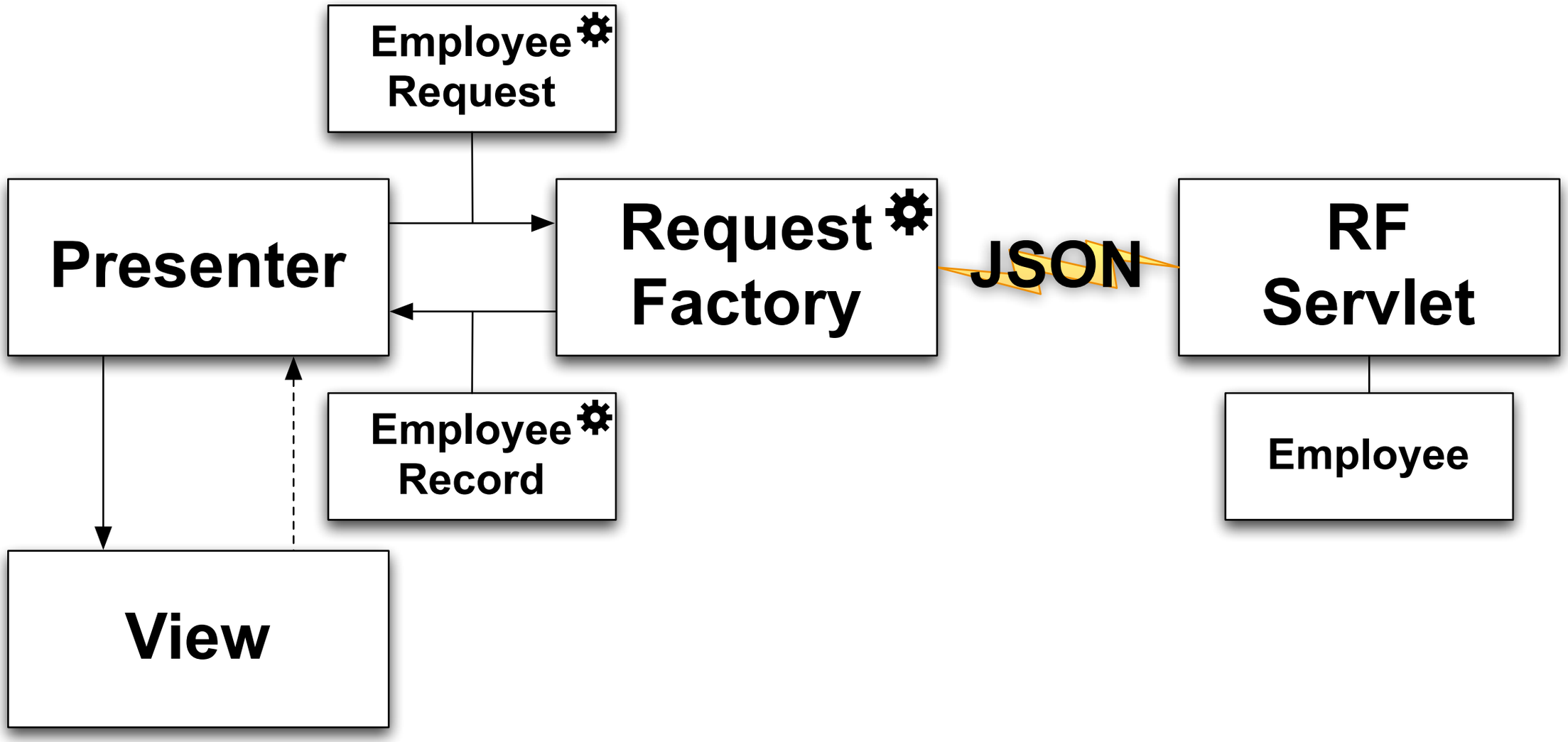
Waaah, DTOs violate DRY



Repetition via tools



cRud


Employee Request
Presenter
Request Factory
JSON
RF Servlet
Employee Record
Employee
View

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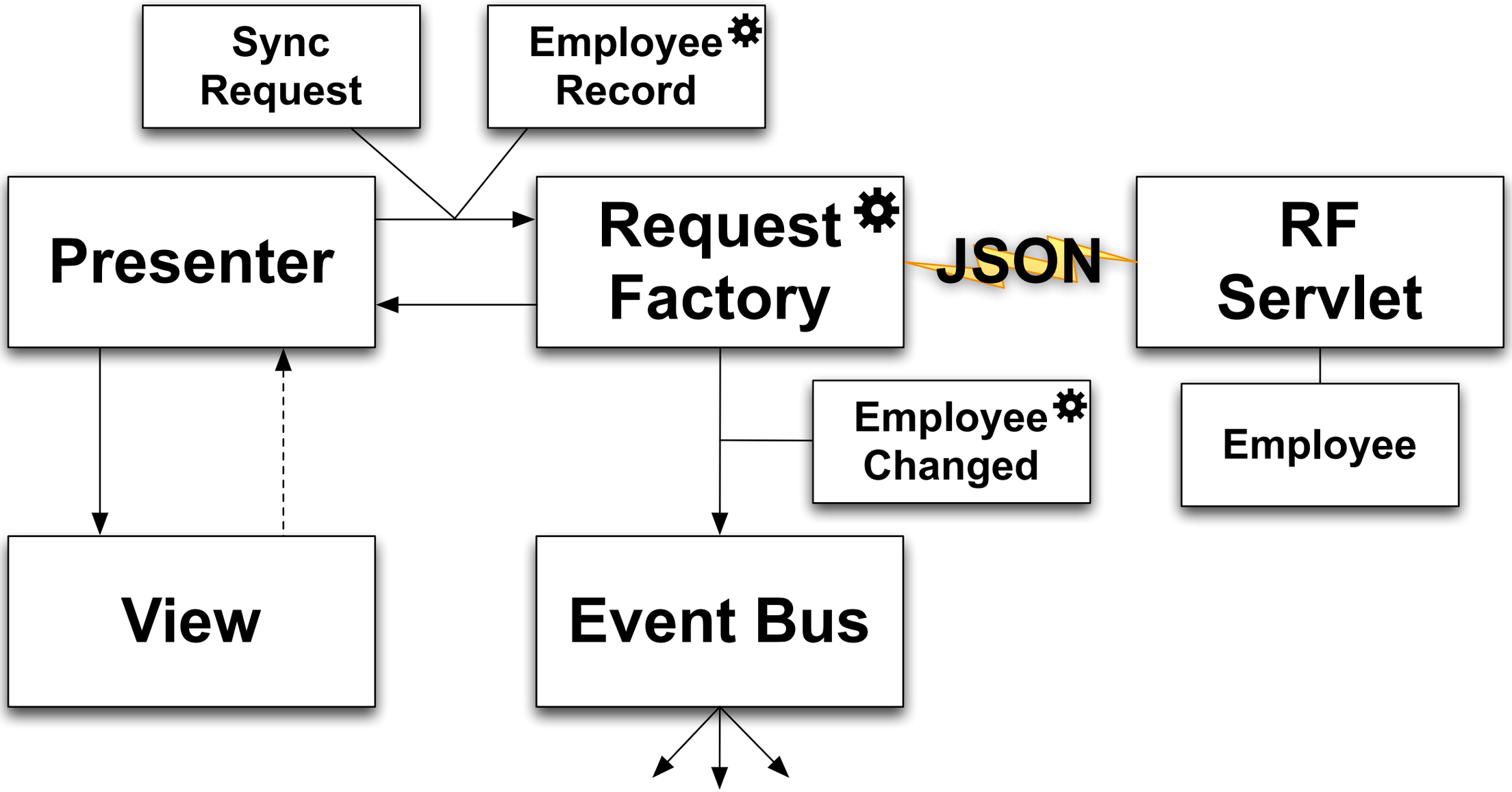
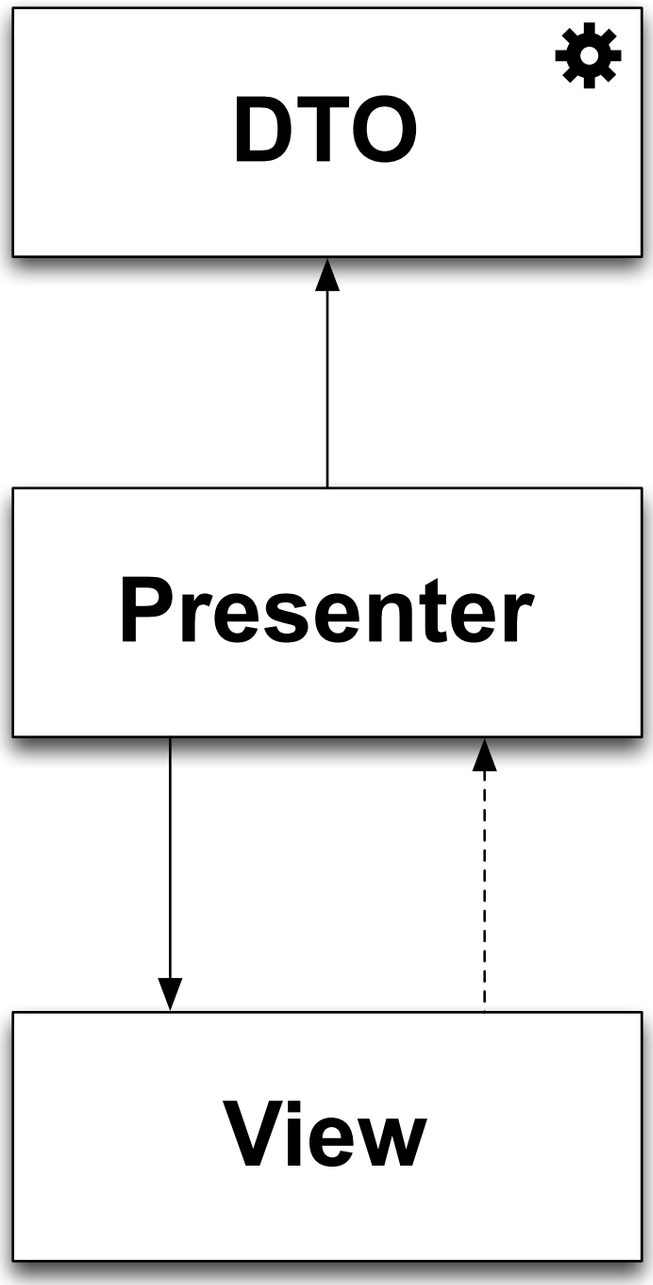
CrUD


Sync Request
Employee Record
Presenter
Request Factory
JSON
RF Servlet
Employee Changed
Employee
View
Event Bus

Waaah, presenter is too much boilerplate



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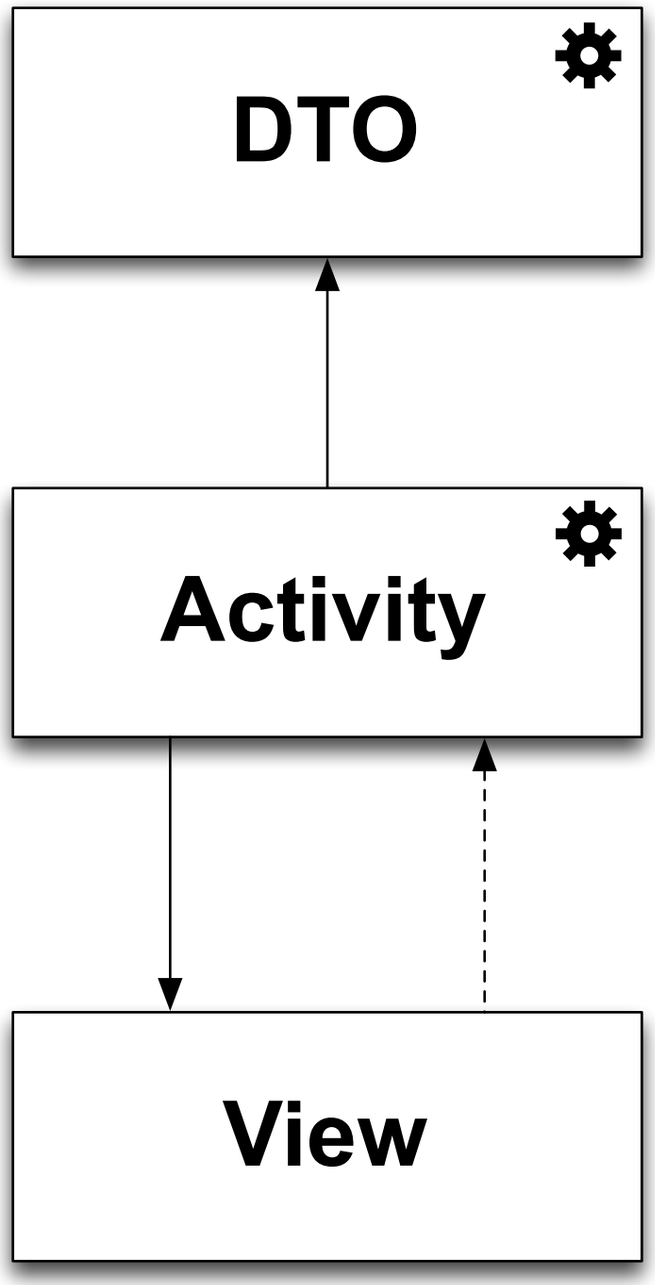
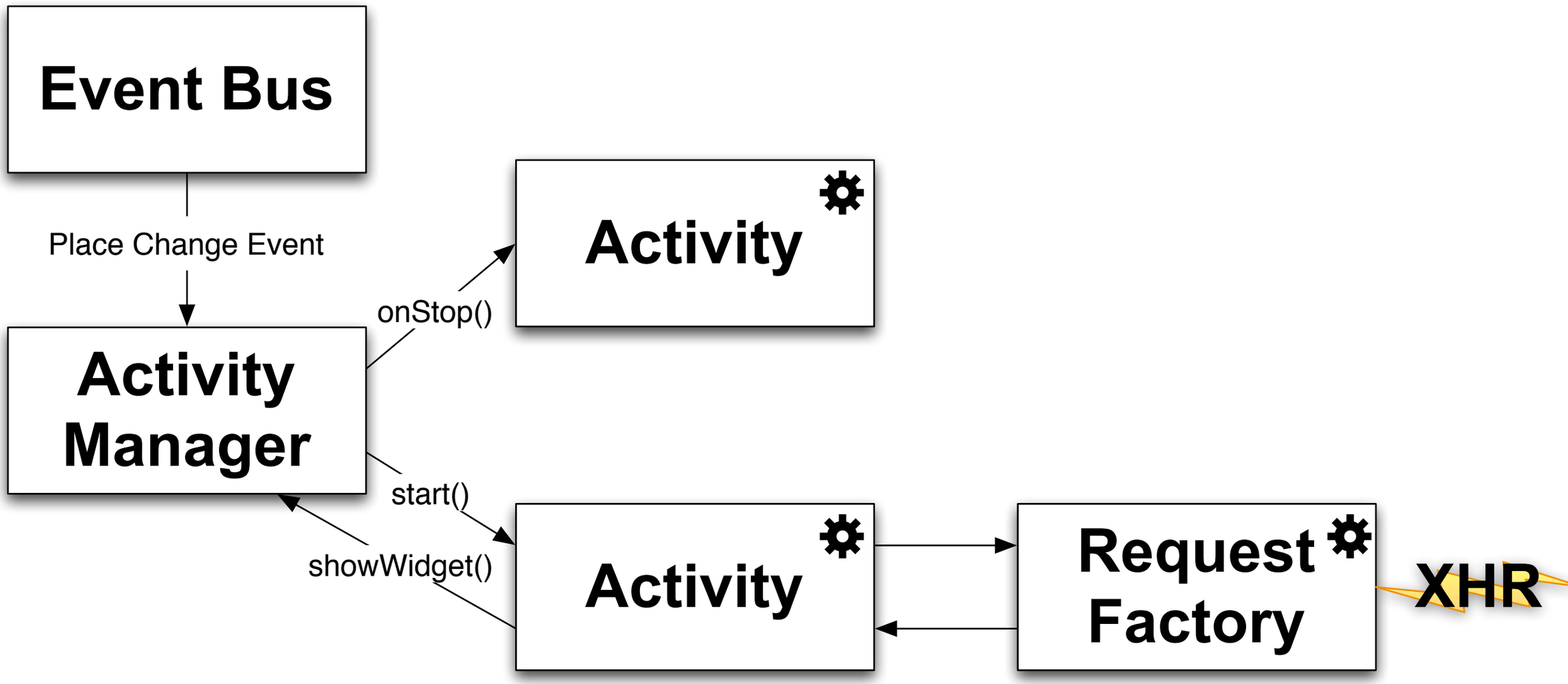


Activity life cycle



Activity in test

Isolated activity is crawlable activity

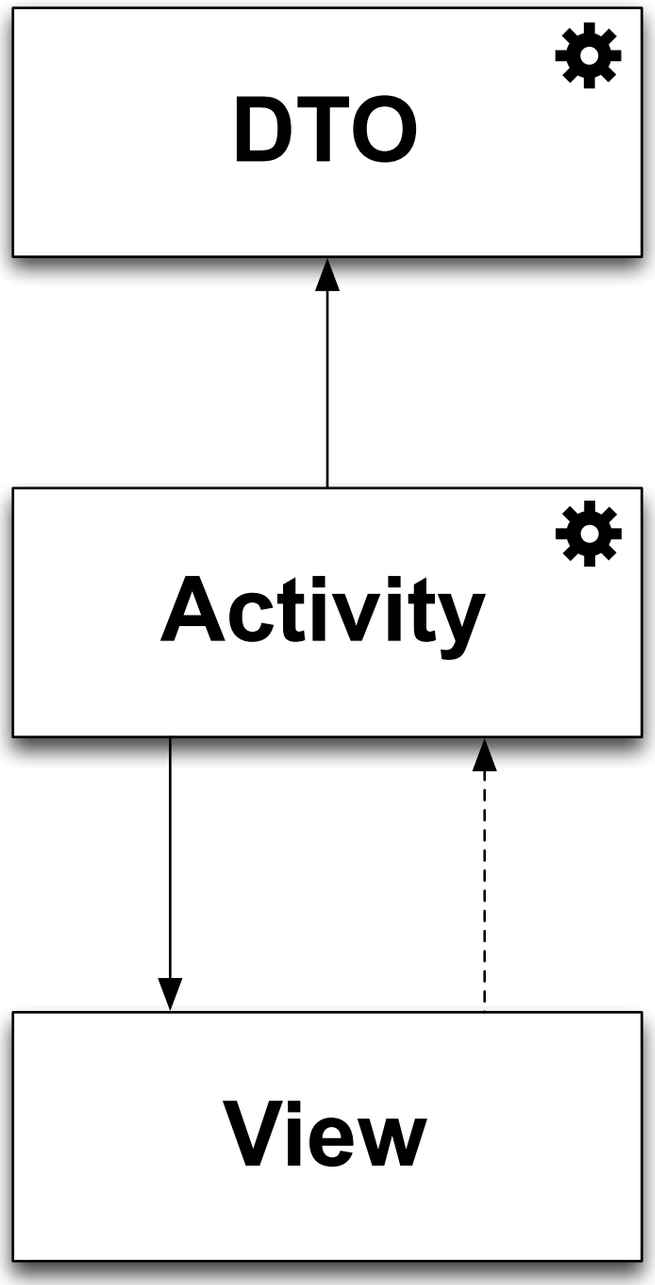
- Activity life cycle tied to history changes

- History changes tied to discrete URLs — bookmarkable
  - http://example.com/#report:123456

- Add a bang and a headless server — crawlable
  - http://example.com/#**!**report:123456

- http://code.google.com/web/ajaxcrawling/docs/getting-started.html

Waaah, too boring to test is too boring to write



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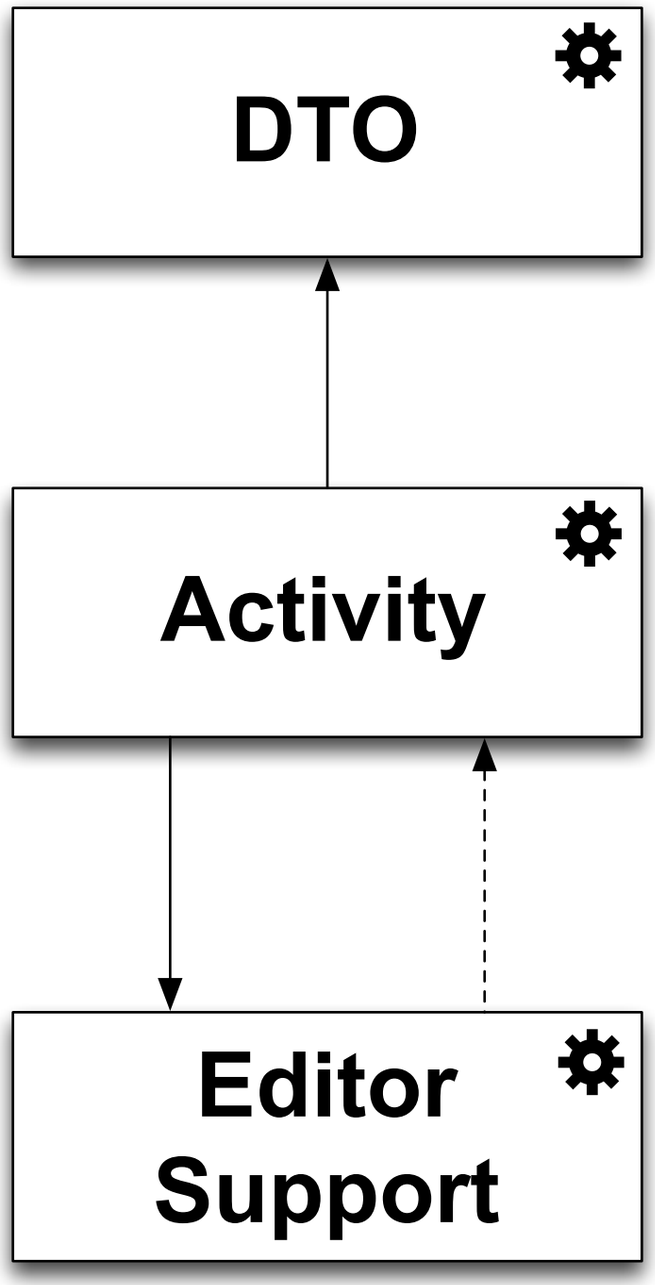

Selections of EditView<EmployeeRecord>

```
private static final EditorSupport SUPPORT =
  GWT.create(EditorSupport.class);

@UiField TextBox displayName;
@UiField TextBox userName;

public void setValue(EmployeeRecord value) {
  this.record = value;
  SUPPORT.setValue(this, value);
}

public boolean isChanged() {
  return SUPPORT.isChanged(this);
}
```

All isolation promises kept but one

- Well tested ✔
- Secure
- Monitored
  - What's broke
  - What's slow
- Scalable ✔
  - Lots of users ✔
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Give me convenience or give me scale

JPA-- No reference fields (No joins)	**Super portable** **Super scalable**
JPA for real	**Anywhere but GAE** **Scalable enough**

Instrumentation

Your eyes on the browser

- Logging
- Stack traces
- User Actions

Logging: phone home

- Client side logger with remote logging service
  - http://code.google.com/p/gwt-log/ today
  - java.util.logging in GWT 2.1 (no remote yet in 2.1 M1)

- Accumulate logs client side
- Watch for request batches and ride along, or flush on timer

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Stack Traces

- Method level for free on most modern browsers
- Get it to the server
  - HttpThrowableReporter to send JSON formatted via XHR
  - In gwt-log, use RemoteLoggerService
- Re-symbolize obfuscated traces server side
  - http://code.google.com/p/google-web-toolkit/wiki/WebModeExceptions
  - Fair warning: that page is terse to the point of encryption

Emulated Stack Traces

- For line-level traces
  - and anything at all on less modern browsers

```
<set-property name="compiler.emulatedStack" value="true" />
<set-property name="compiler.recordLineNumbers"
    value="true" />
```

- But your app is fatter and slower

Emulated stack traces in production

Let your uses opt in

http://www.example.com/?debug

```
<define-property name="traces" values="true,false"/>
<property-provider name="traces"><[CDATA[
  return $wnd.location.query.contains('debug');
]]></property-provider>
<set-property name="compiler.emulatedStack" value="true" >
  <when-property-is name="traces" value="true" />
</set-property>
<set-property name="compiler.recordLineNumbers" value="true" >
  <when-property-is name="traces" value="true" />
</set-property>
```


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User Actions

- Unique strings associated with each interesting UI element
  - links, buttons
  - maybe in ui.xml

- User gestures (clicks a link, say), user action event posted on event bus
  - Time is noted
  - rpc queued in this event loop attributed to this action

- When all rpcs return, time is tallied, logs trickle to server

- Planned for GWT 2.1 (but not in 2.1 M1)

Suspicion

Secure: guard against cross site scripting attacks

- RemoteServiceServlet watching for X-GWT-Permutation header for XSRF paranoia
  - New in GWT 2.1
  - Only XHR can set a header, and XHR is from your domain

- SafeHTML
  - Debuts as open source in new web-based Wave FedOne client
  - http://code.google.com/p/wave-protocol/
  - Destined for GWT 2.something

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SafeHtml: because setHtml() isn't

- If the user typed it, you must not render it as HTML
  - prefer HasText#setText to HasHTML#setHTML
  - prefer Element#setInnerText to #setInnerHTML

- SafeHtml interface promises its asString() produces harmless HTML

- SafeHtmlBuilder and SimpleHtmlSanitizer
- for assembling untrusted strings into SafeHtml instances

- SafeHtml aware widgets that replace setHTML() with setSafeHtml()

Now say what you said

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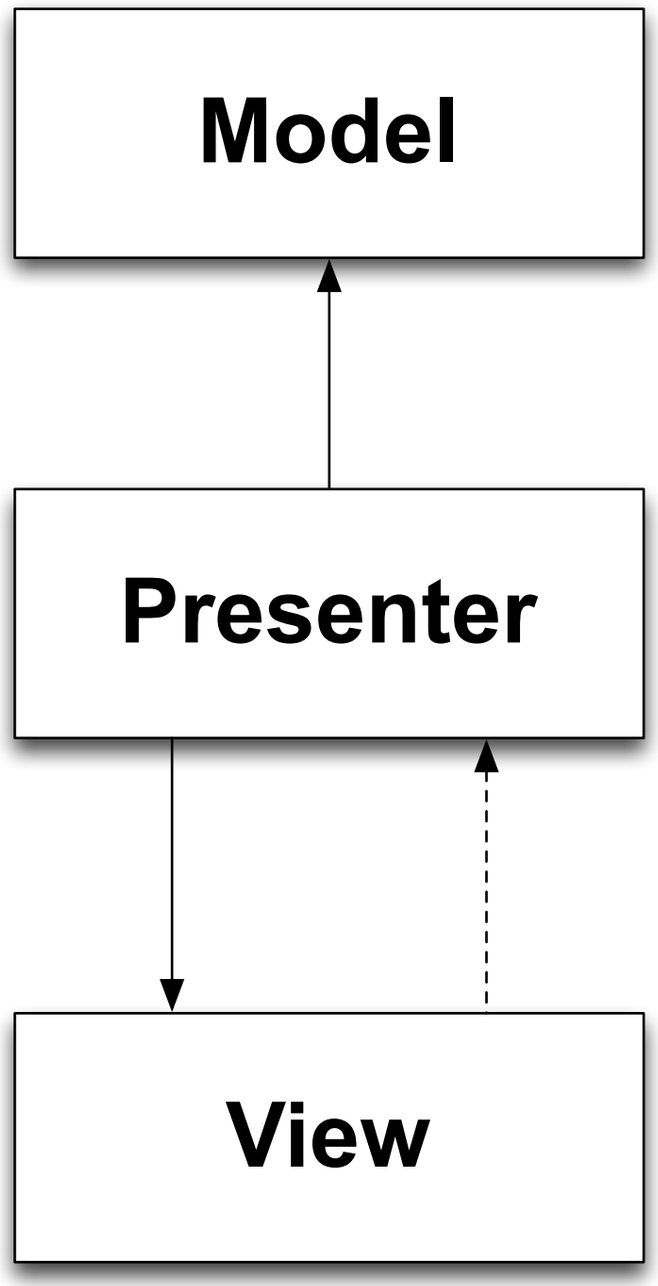
- Be isolated
- Be instrumented
- Be suspicious

Don’t work so hard



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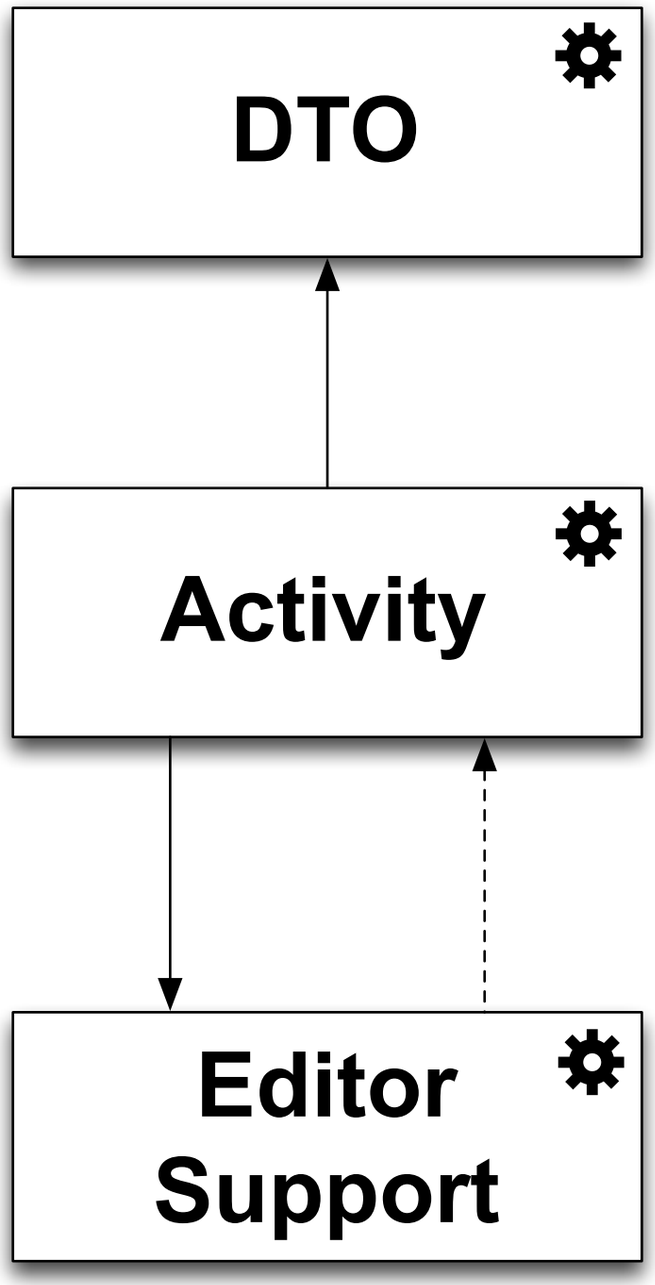

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