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Filling The Gap: Going Mobile With JBoss Technologies Today

Jay Balunas
Principal Software
Engineer
JBoss, by Red Hat Inc.

Wesley Hales
Senior Software
Engineer
JBoss, by Red Hat Inc.

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Jay Balunas

RichFaces Project Lead

JBoss Core Developer

JSF 2.2 Expert Group

Red Hat W3C Member

<http://in.relation.to/Bloggers/Jay>

<http://twitter.com/tech4j>

jbalunas@jboss.org



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Wesley Hales

JBoss Portlet Bridge Lead

Core GateIn Developer

JSR-301/329 Red Hat Rep.

Committer on Mozilla, Apache, Richfaces....

Multiple series on InfoQ, Dzone, Refcards,
personal blog, etc...

www.wesleyhales.com

@wesleyhales

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Check It Out For Yourself

Wireless

SSID:

tweetstream

Local URL:

<http://bit.ly/tweetstream1>

Matching Tweets

Tags

#jboss #JBW #JUDCon

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TweetStream

- Built to support mobile webkit devices
- No 3rd party front end frameworks
- Completely driven by JBoss tech (from front to back)



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TweetStream Breakdown

Filling The Gap...



Infinispan



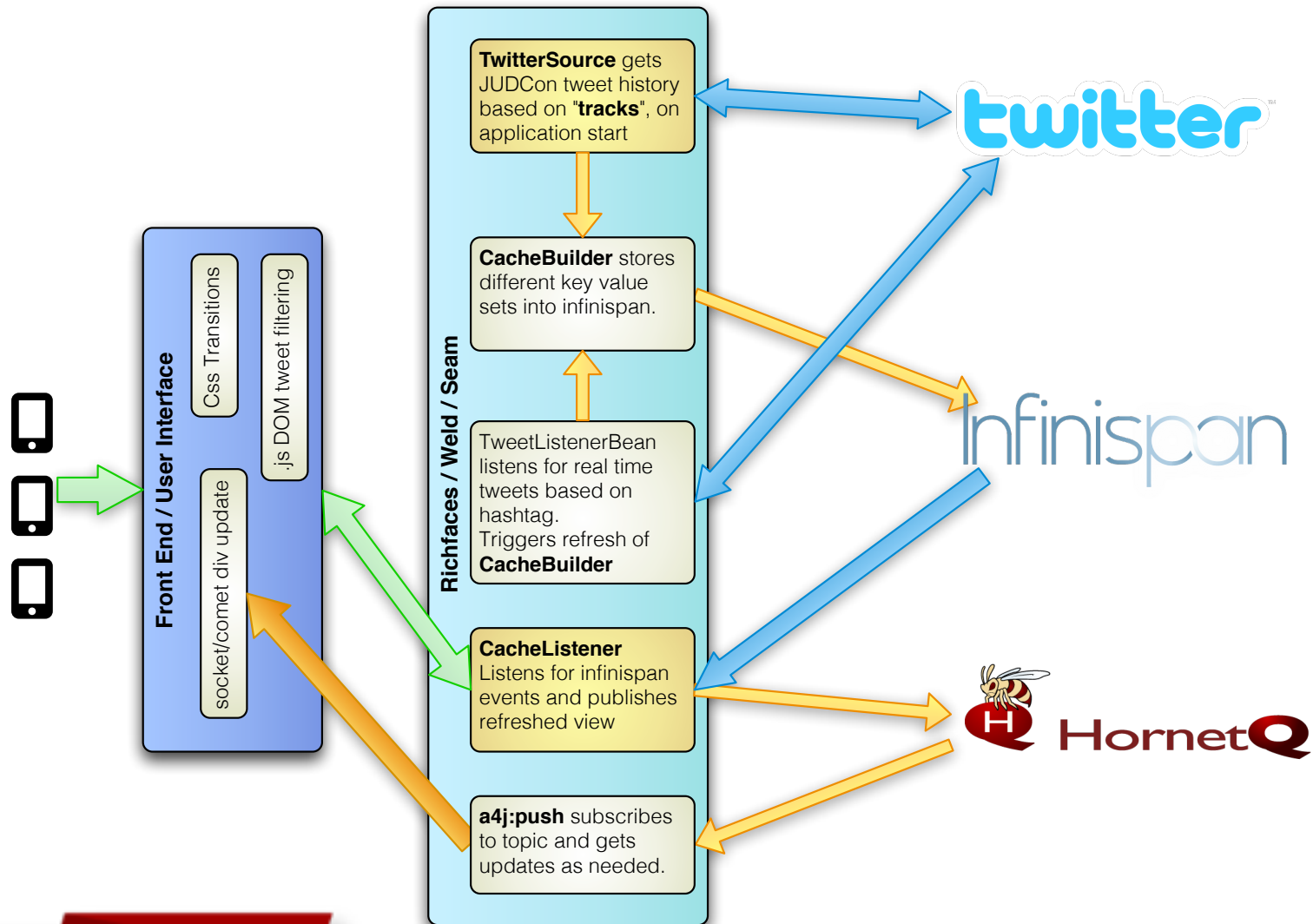
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TweetStream Architectural



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The Front End

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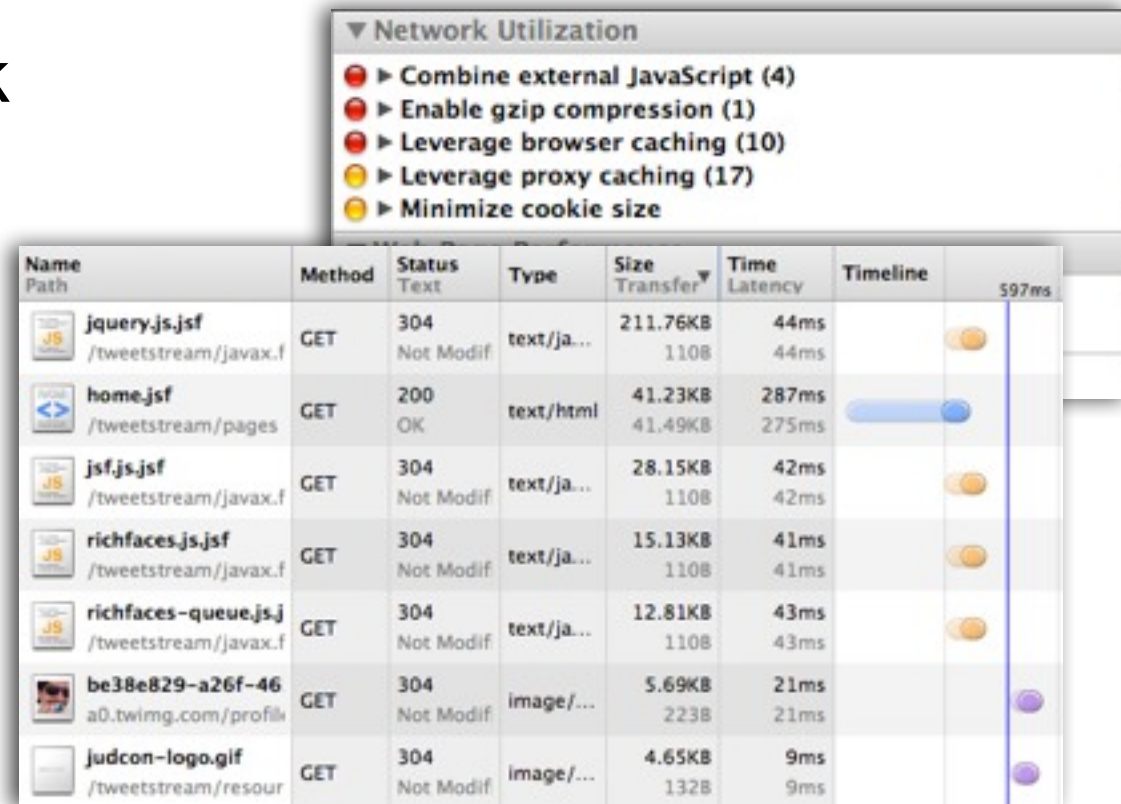


Using JSF for Mobile Dev

Sacrifices, sacrifices...

Mobile HTML5 apps live or die by the UI

Making components work with touch events



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Understanding The Problems

We know today's components are built for desktop

What exists for mobile JSF today?

The future

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User Interface/Experience

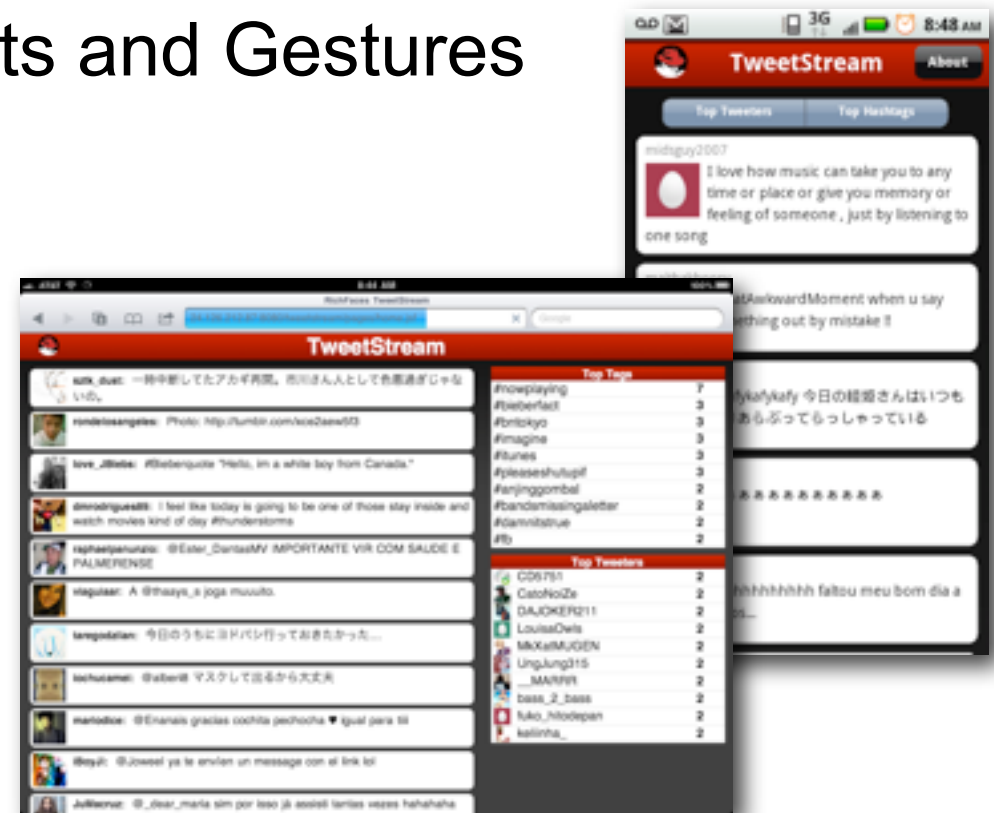
CSS3 transitions

Orientation Detection / Media Queries

Page layout approach

Understanding Touch Events and Gestures

Performance and Tweaks



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User Interaction

```
@media screen and (max-device-width: 320px) and  
(orientation:portrait) {
```

```
  .stage-left {  
    opacity: 0;  
    left: -320px;
```

```
}
```

```
  .stage-right {  
    opacity: 0;  
    left: 320px;
```

```
}
```



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User Interaction

```
<div id="page-container">  
  <div class="iphone-page" id="home-page" ...>  
  <div class="iphone-page stage-right hide" id="tweet-detail-page" ...>  
  <div class="iphone-page stage-right hide" id="top-tweeters-page" ...>  
  <div class="iphone-page stage-right hide" id="top-hashtags-page" ...>  
  <div class="iphone-page hide" id="about-page" ...>  
</div>
```

```
function swap(id, classString) {  
  document.getElementById(id).className = classString;  
}
```



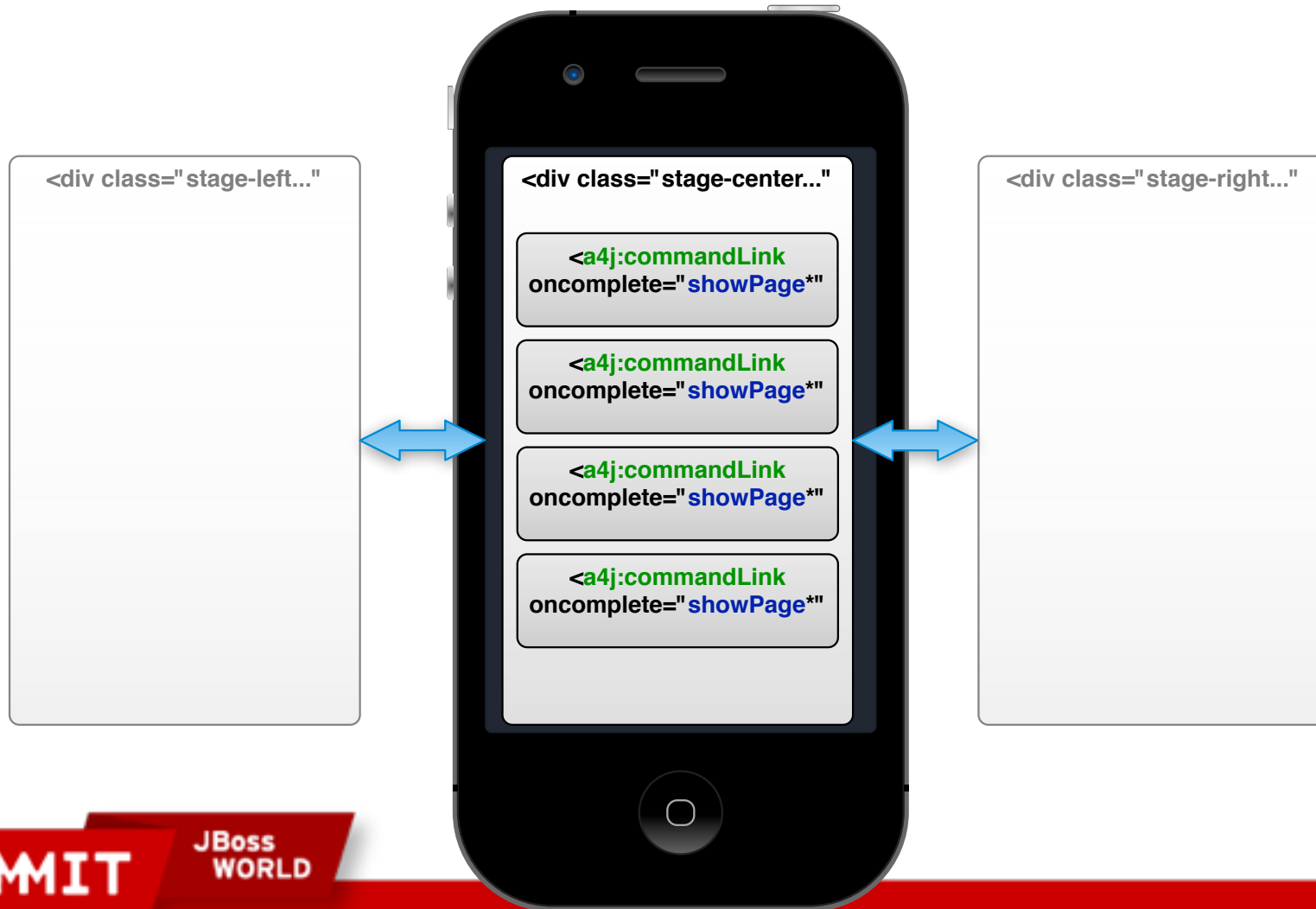
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User Interaction



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UX / Orientation Detection

CSS3 Media Queries

@media screen and (max-device-width: 320px)

and (orientation:portrait) {

Viewport Settings

```
<meta name="viewport" content="width=device-width,  
minimum-scale=1.0, maximum-scale=1.0"/>
```



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Using Touch Events and Gestures

Duck Punch approach
<http://bit.ly/k8b2aB>

onmousedown /
onmouseup
measurements for swipe



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Network Detection (WiFi, 3G, etc..)

`navigator.connection` (Android 2.2+)

```
// contents of navigator.connection object
{
  "type": "3",
  "UNKNOWN": "0",
  "ETHERNET": "1",
  "WIFI": "2",
  "CELL_2G": "3",
  "CELL_3G": "4"
}
```

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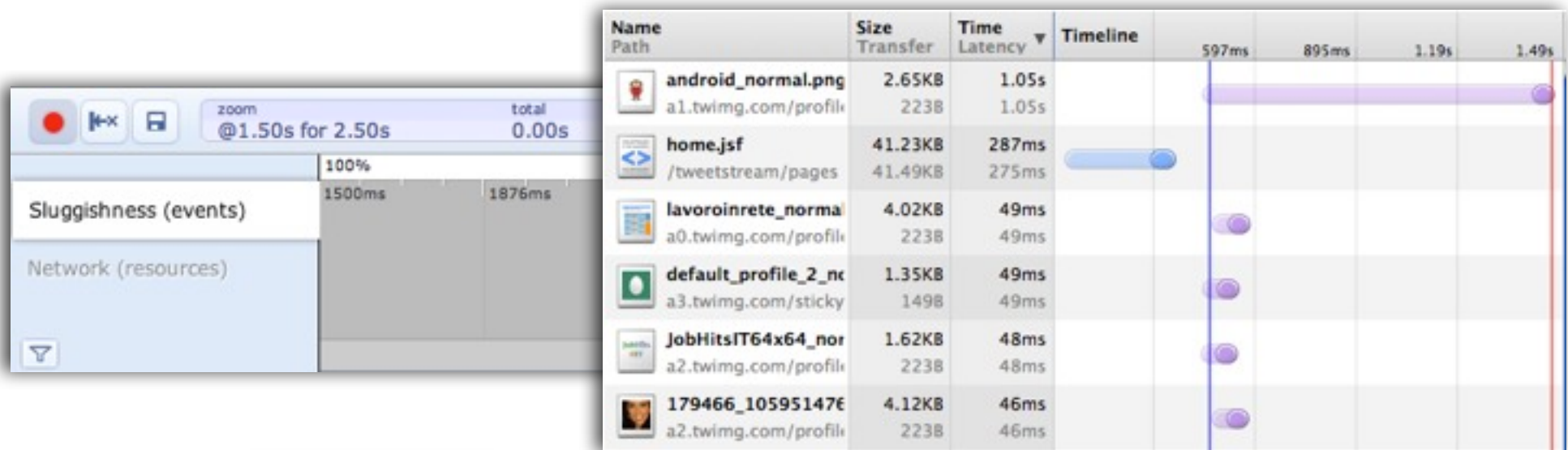
Tweaks and Optimization

Getting close to a native feel...

Start with chrome or firebug profiling (SpeedTracer, yslow, etc...)

Access the GPU for smooth transitions:

`-webkit-transform: translateZ(0);`



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Other Helper Frameworks

SenchaTouch

jQuery*

Phone Gap

...

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Questions?

The Source:

<https://github.com/richfaces/tweetstream>

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Page Layout / Optimization

Reducing Latency over cell networks:

One huge page o' markup = less file requests

Dealing with external file requests

What about client side caching?

Paving the way for future components...

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Reducing Latency

🟡 ▼ Remove unused CSS rules (22)

27.07KB (37%) of CSS is not used by the current page.

- ▶ [skinning.ecss.jsf](#): 1.58KB (71%) is not used by the current page.
- ▶ Inline block #1: 25.49KB (36%) is not used by the current page.

Name Path	Size Transfer	Time Latency ▼	Timeline	597ms	895ms	1.19s	1.49s
 android_normal.png a1.twimg.com/profil	2.65KB 223B	1.05s 1.05s					
 home.jsf /tweetstream/pages	41.23KB 41.49KB	287ms 275ms					
 lavoroinrete_normal a0.twimg.com/profil	4.02KB 223B	49ms 49ms					
 default_profile_2_nc a3.twimg.com/sticky	1.35KB 149B	49ms 49ms					
 JobHitsIT64x64_nor a2.twimg.com/profil	1.62KB 223B	48ms 48ms					
 179466_105951476	4.12KB	46ms					



Caching External Resources

One possible solution would be:

Infinispan

Base64 images to javascript using canvas
Infinispan Storage

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Tweetstream Architecture Details

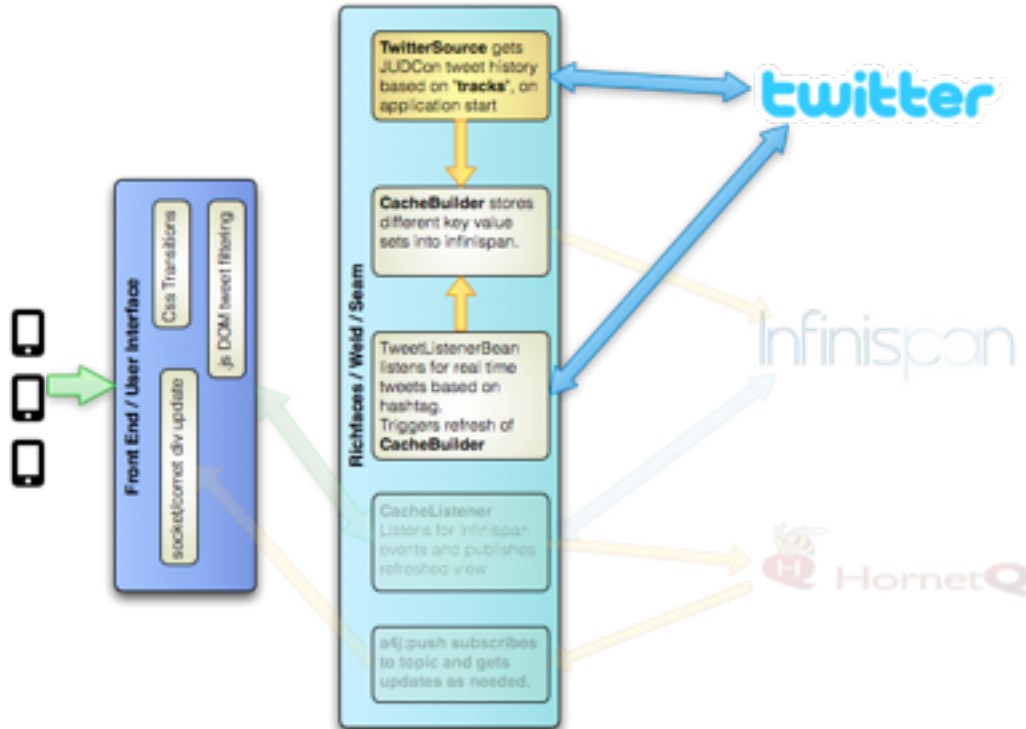
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TweetStream Twitter4j



Open source project

Java API for easy
access

OAuth support

Streaming feeds

Historical feeds

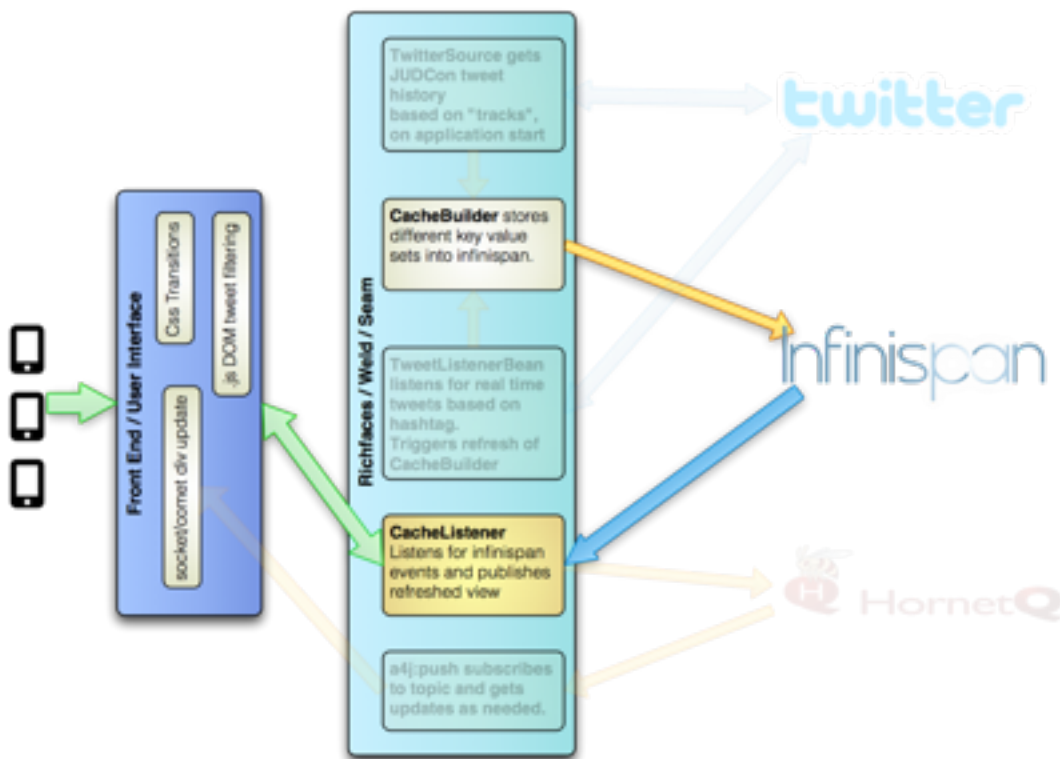
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TweetStream Infinispan



JBoss open source

Highly scalable

datagrid

In memory & disk

options

Easily clusters out

Management facilities

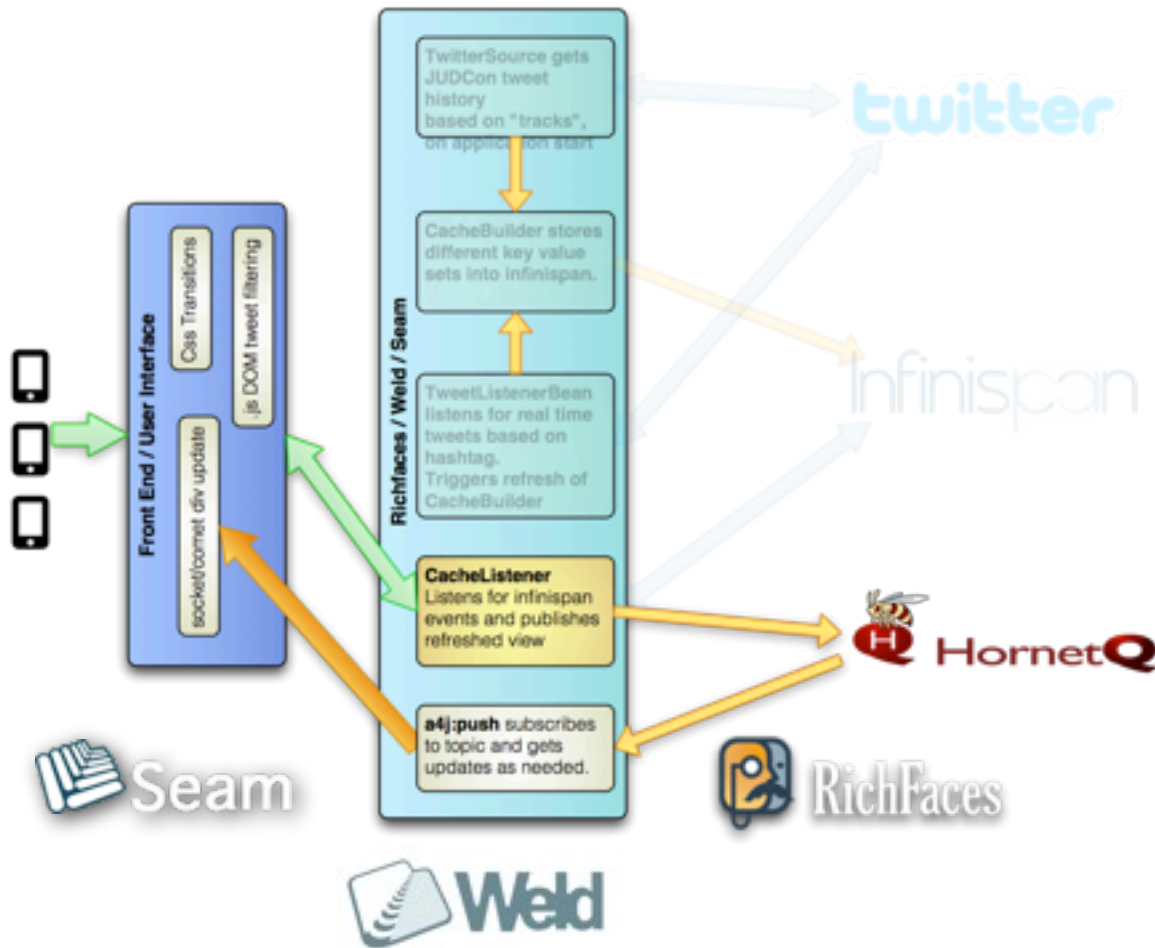
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TweetStream HornetQ &



JBoss open source

Reliable, high
performant

Flexible clustering

POJO based design

Perfect for RichFaces

Push!

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From Standard To Mobile Web

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From standard to mobile web



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From standard to mobile web



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From standard to mobile web



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Considerations

- Device and feature detection
- Using RichFaces push effectively
- HTML 5 & CSS3
- Touch & gesture support

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Device Detection

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Header Inspection

HTTP_HOST == myproxylists.com

HTTP_USER_AGENT == Mozilla/5.0 (iPad; U; CPU OS 4_3_2 like Mac OS X; en-us) AppleWebKit/533.17.9 (KHTML, like Gecko) Version/5.0.2 Mobile/8H7 Safari/6533.18.5

HTTP_ACCEPT == application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,image/png,*/*;q=0.5

HTTP_ACCEPT_LANGUAGE == en-us

HTTP_ACCEPT_ENCODING == gzip, deflate

HTTP_CONNECTION == keep-alive

REMOTE_ADDR == xx.xxx.x.xxx

REMOTE_PORT == 53298

REQUEST_METHOD == GET

REQUEST_URI == /my-http-headers

REQUEST_TIME == 1304015649

REMOTE_HOST == pool-xx-xxx-x-xxx.fios.verizon.net

COUNTRY == [US] UNITED STATES

Don't Parse This Yourself....

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Help Is Out There

MobileESP

WURFL APIs

Single Class
User-Agent
Processor

Wireless Universal Resource File

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For Tweetstream

MobileESP

WURFL APIs

Single Class
User-Agent
Processor

Wireless Universal Resource File

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Mobile ESP

```
@Named("userAgent")
@RequestScoped
public class UserAgentProcessor
{
    @PostConstruct
    public void init()
    {
        FacesContext context = FacesContext.getCurrentInstance();
        HttpServletRequest request = (HttpServletRequest)context.getExternalContext
().getRequest();
        userAgentStr = request.getHeader("user-agent");
        httpAccept = request.getHeader("Accept");
        uAgentTest = new UAgentInfo(userAgentStr, httpAccept);
    }

    public boolean isPhone()
    {
        //Detects a whole tier of phones that support similar functionality as the iphone
        return uAgentTest.detectTierIphone();
    }

    public boolean isTablet()
    {
        //Detect ipads, xooms, blackberry tablets, but not galaxy - they use a strange
user-agent
        return uAgentTest.detectTierTablet();
    }
}
```

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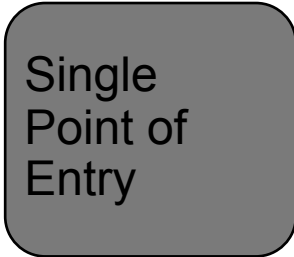
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home.xhtml

Single
Point of
Entry



```
<c:choose>
  <c:when test="{userAgent.phone}">
    <ui:include src="phoneHome.xhtml" />
  </c:when>
  <c:when test="{userAgent.tablet}">
    <ui:include src="tabletHome.xhtml" />
  </c:when>
  <c:otherwise>
    <!-- <ui:include src="desktopHome.xhtml" />
    <ui:include src="tabletHome.xhtml" />
  </c:otherwise>
</c:choose>
```

Detection Made By
Form-Factor



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Feature Detection

- WURFL (server-side)
- Modernizr (client-side)
- CSS 3 & HTML 5

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For TweetStream

- WURFL (server-side)
- Modernizr (client-side)

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CSS 3

```
/* catch tablet portrait orientation */  
@media all and (orientation:portrait) {}
```

```
/* catch tablet landscape orientation */  
@media all and (orientation:landscape) {}
```

```
/*iphone landscape screen width*/  
@media screen and (max-device-width: 480px) and  
(orientation:landscape) {}
```

```
/*iphone portrait screen width*/  
@media screen and (max-device-width: 320px) and  
(orientation:portrait) {}
```

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Modernizr Example

Simple JavaScript File to load

```
.multiplebgs div p {  
    /* properties for browsers that  
       support multiple backgrounds */  
}  
  
.no-multiplebgs div p {  
    /* optional fallback properties  
       for browsers that don't */  
}
```

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RichFaces Push

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RichFaces Push

- Integrates with Atmosphere
 - Comet/WebSockets
 - Graceful degradation
- Java Messaging Service (JMS)
 - Reliability, flexibility, security

Cross Browser
Cross Device
Cross

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Getting The Message Out

- RichFaces TopicsContext
- Direct JMS

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For TweetStream

- **RichFaces TopicsContext**
- Direct JMS

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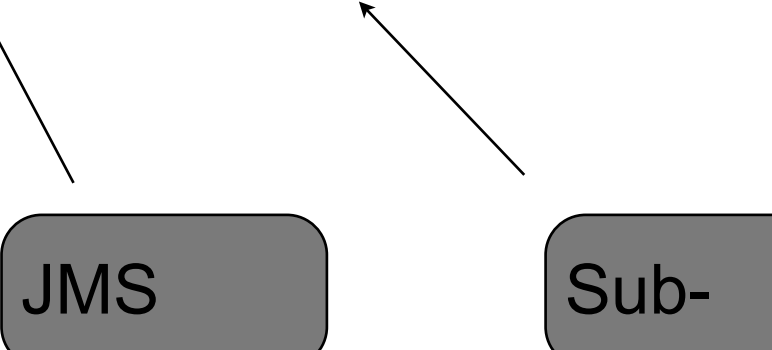
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TopicsContext

```
try
{
    log.debug("Pushing Update notification, no data
needed");
    TopicsContext.lookup().publish(
        new TopicKey("twitter", "content"),
        null);
}
catch (Exception e)
{
    log.error(e.getMessage(), e)
}
```



The diagram shows two gray rounded rectangular boxes at the bottom. The left box contains the text "JMS" and the right box contains "Sub-". Two black arrows originate from the top of these boxes. The arrow from the "JMS" box points to the word "new" in the code line "new TopicKey(...)". The arrow from the "Sub-" box points to the string "content" in the same line.

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JMS Direct

```
//Standard JMS connection setup not shown  
topicConnection = cf.createConnection("guest", "guest");  
Topic topic = (Topic) ic.lookup("/topic/twitter");
```

...

```
message = session.createTextMessage();  
//Publishing update notification, no data needed  
message.setText(null);
```

```
//Set the subtopic for the message to "content"  
message.setStringProperty("rf_push_subtopic", "content");
```

```
producer.send(message);
```

JMS

Sub-

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Client Side Push Options

- Direct DOM Updates
- Partial Page Rendering

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For TweetStream

- Direct DOM Updates
- **Partial Page Rendering**

Partial Page Rendering

Topic & Sub-Topic

```
graph TD; A[Topic & Sub-Topic] --> B[Code]; B --> C[Event Triggered]; B --> D[What to Re-];
```

```
<a4j:push address="content@twitter"
          onerror="alert('Error processing
          push')">
  <a4j:ajax event="dataavailable"
            render="tweeters tops"
            execute="@none"/>
</a4j:push>
```

Event
Triggered

What to
Re-

DOM Updates With Data Push

```
<a4j:push address="tweets@twitter"  
          onerror="alert(event.rf.data)"  
          ondataavailable="processData  
(event.rf.data)"/>
```

- JMS Message Types
 - ObjectMessage (JSON)
 - TextMessage (String)

Direct DOM
processing in

event.rf.data
on client side

Questions?

The Source:

**[https://github.com/richfaces/
tweetstream](https://github.com/richfaces/tweetstream)**

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