

Writing reactive applications for fun

@matthiasnehlse



Potluck



Non-vegetarian









**Oh no, is he going
philosophical
on us?**





**HERE LIES
ART**

The Streaming APIs | Twitt x

https://dev.twitter.com/docs/api/streaming

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The Streaming APIs

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Updated on Mon, 2012-09-24 14:47

API version 1

API version 1.1

Overview

The set of streaming APIs offered by Twitter give developers low latency access to Twitter's global stream of Tweet data. A proper implementation of a streaming client will be pushed messages indicating Tweets and other events have occurred, without any of the overhead associated with polling a REST endpoint.

Twitter offers several streaming endpoints, each customized to certain use cases.

Public streams

Streams of the public data flowing through Twitter. Suitable for following specific users or topics, and data mining.

User streams

Single-user streams, containing roughly all of the data corresponding with a single user's view of Twitter.

Site streams

The multi-user version of user streams. Site streams are intended for servers which must connect to Twitter on behalf of many users.

Differences between Streaming and REST

Connecting to the streaming API requires keeping a persistent HTTP connection open. In many cases this involves thinking about your application differently than if you were interacting with the REST API. For an example, consider a web application which accepts user requests, makes one or more requests to Twitter's API, then formats and prints the result to the user, as a response to the user's initial request:

User

HTTP server

Twitter

Related Questions

- How are rate limits determined on the Streaming API?
- What's the difference between User Streams and Site Streams?

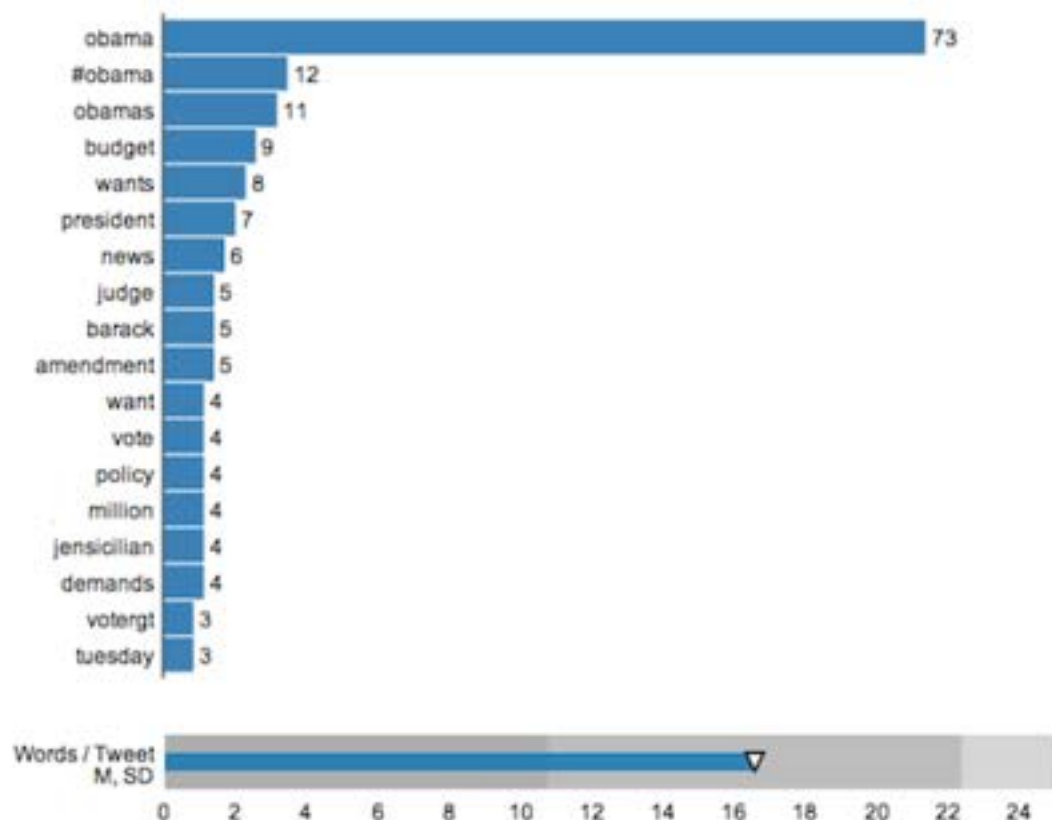
Related Case Studies

- Zappos uses Twitter to generate over 1,200 conversations per month with its customers
- Esri enriches maps with Tweets and the Streaming API

Tags

- Streaming API (140)

BirdWatch



topv1994

5 sept. 7:04 ma ago

B. Obama: "Se trata de hacer lo correcto".



amckrieth

5 weeks 652 ms ago

RT @TheWhiteBookpg: Congratulations President Barack Obama.
44th President of the United States. #2pac4POTUS2016 Lets
Go>>>



ArgoJournal

5 años 524 ms ago

RT @ezraklein: Exclusive: Obama budget includes \$235 million in new mental health spending <http://t.co/TuKoO4wPIJ>



Amimadrevas

5 weeks 562 ms ago

Dice obama que no puede controlar lo que se hace con las armas...
PUES NO LAS VENDAS HIJO DE PUTA



Boazziz

5 weeks 164 ms ago

Who lied 2 US #Obama? #WeThePpl haven't 4gotten #Benghazi.
Add the #twibbon ➡ <http://t.co/WtfaseCpyG>



LuanaMacLac

5 weeks 27 ms ago

RT @slone: PHYSICIAN HEAL THYSELF Obama declares Tuesday 'National Equal Pay Day,' despite paying female staffers LESS than male counte ...



yikesnarry

6 weeks 637 ms ago

RT @CorgiParty7: *obama kickflips over the white house* *more like the united SKATES ! yeah! owned!* *a crowd goes wild*



pulpark

5 weeks 838 ms ago

Obama Says He's "Determined As Ever" To Take Away Second Amendment Rights... <http://t.co/j4QgQaNrWk> #Wease!Wonk #muslim #tcot #sioa



Morlen4Distrct1

5 more 823 ms ago

Obama Budget to increase charges for Federal Employees for their a retirement benefits employees will go from 0.8 contribution to 3.1



fpatterson1050

Il socio 141 me pido

RT @ILamy7: CNN Calls Out Obama and Bloomberg for Not Understanding the Weapons They Are Trying to Ban (VIDEO)



Rotterdam



Rotterdam, Netherlands

Founded Nov 8, 2012

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Upcoming
Meetups 1

Past Meetups 9

Our calendar



Organizers:

Anna Gos,
Nicolas Leroux,
Peter Hilton



Contact

We're about:

Software Developers ·
Programming ·
Programming Languages ·
Software Engineering ·
Agile Software
Development · Web
Design · Web Technology ·
Web Development ·
Social Networking for

Social-Tech Event: Typesafe Night @ 010DEV

April 2, 2013 · 6:30 PM
[Locus Publicus](#)



Get exposed to the cutting edge technology related to Scala, Akka and Play framework! On the 2nd April 010DEV will have the great honor to welcome [James Ward](#), [Roland Kuhn](#) and [Nicolas Leroux](#) as speakers. James and Nicolas will give a presentation about mobile development using Play and Roland will introduce us to Actors implementation in Akka. Don't miss this unique opportunity to catch up with the innovation curve and mingle with the 010DEV crowd.

Details

- 18:30-21:30, Tuesday, 2 April 2013
- Venue - Locus Publicus, Oostzeedijk 364, Rotterdam ([map](#))
- Free beer

Programme

- 18:30 - Arrival and drinks
- 19:00 - "Mobile Apps with HTML5 & Play Framework" - [James Ward](#) & [Nicolas Leroux](#)
- 19:50 - Break
- 20:10 - "Akka: Actors and More" - [Roland Kuhn](#)
- 21:00 - Drinks & networking

Abstracts

- **Mobile Apps with HTML5 & Play Framework**

In this session you will learn how to build mobile apps using HTML5 and Play Framework. We will start by building the RESTful JSON back-end APIs for the application with Play Framework 2. Then using PhoneGap and HTML5 we will create the client-side of the mobile app.

- **Akka: Actors and More**

Akka is a toolkit aimed at making it easier and simpler to correctly implement fault-tolerant distributed concurrent systems. At its core lies the actor model, inspired by Erlang OTP but implemented on the

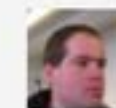
45 went



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ORGANIZER
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[Igor](#)



[Erik Bakker](#)



[Sietse de Kaper](#)



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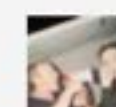
[Roel Bakker](#)



[Marga Landini](#)



[Adolfo Benedetti](#)



[Peter Dijkshoorn](#)

The *geeky* part

Application 1:

BirdWatch

Live First Previous 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Next Last

Sort by

latest

followers

retweets



Łukasz Sowa @lukaow

4 minutes

It was great to hang out with #ScalaDays attendees yesterday night. Can't wait for main event to start :) #Berlin
<http://t.co/6CpBo4yQnp>

72 followers



Alexis Agahi @aagahi

2 minutes

RT @jeanhelou: Recon complete, primary target *
 #ScalaDays venue *found. Secondary target : a nice kaffee close by to standby :) <http://t.co/6CpBo4yQnp>

442 followers



Stephan Schmidt @oodemonkeyiam

2 minutes

RT @pascalado: Just in time for #ScalaDays, the third part of our series on Microservices, Scala and Finagle @ SoundCloud <http://t.co/TL5MDY...>

3.6K followers



Phil Calgado @pascalado

3 minutes

Just in time for #ScalaDays, the third part of our series on Microservices, Scala and Finagle @ SoundCloud <http://t.co/TL5MDY...> #fb #in

4K followers



Michał Kiedys @mkiedys

12 minutes

Enjoying #Berlin while waiting for @ScalaDays #Scala
<http://t.co/1dFSTRNZID>

38 followers



Workday @Workday

14 minutes

Heading to #ScalaDays Berlin? Be sure to say hello to the #WDAY team! scaladays.org #scala #wdayEMEA

15.4K followers



Melisa Bok @melisabok

27 minutes

RT @huntsch: Add people - awesome #ScalaDays
<http://t.co/34g28rhJkN>

173 followers



Jean Helou @jeanhelou

31 minutes

Recon complete, primary target * #ScalaDays venue *found. Secondary target : a nice kaffee close by to standby :) <http://t.co/n2t7FEvoYH>

443 followers



Michael Pisula @MichaelPisula

37 minutes

RT @scaladays: Kicking off #ScalaDays Berlin today! Keynote by @odersky, BBQ & #WorldCup games all wrapped into one awesome evening <http://t.co/6CpBo4yQnp>

26 followers



Eventifier @TryEventifier

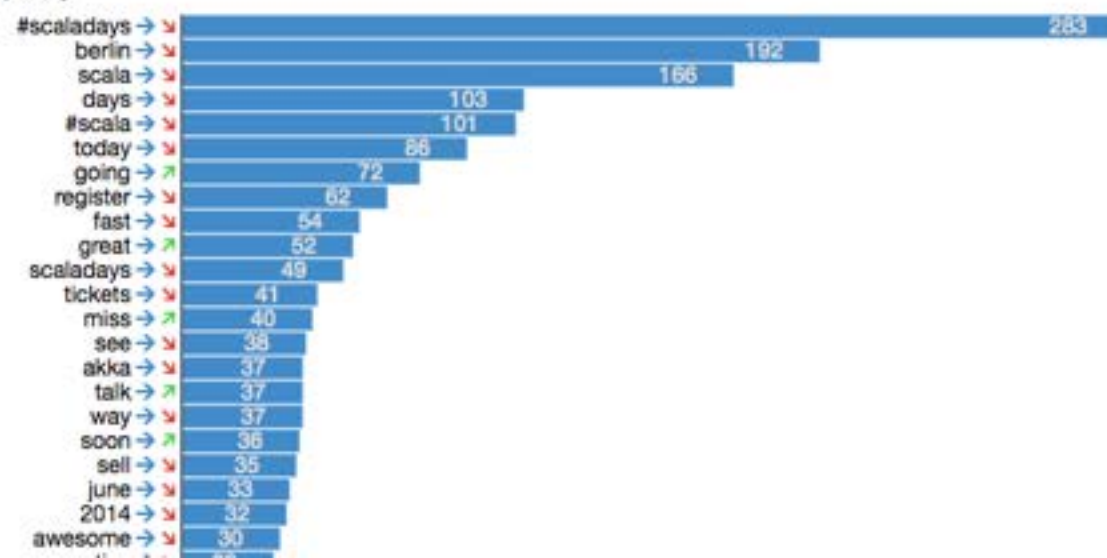
42 minutes

@scaladays Catch all the social media feeds of #ScalaDays here: eventifier.com/event/scaladay... CC @huntsch @Mikelland Ty.

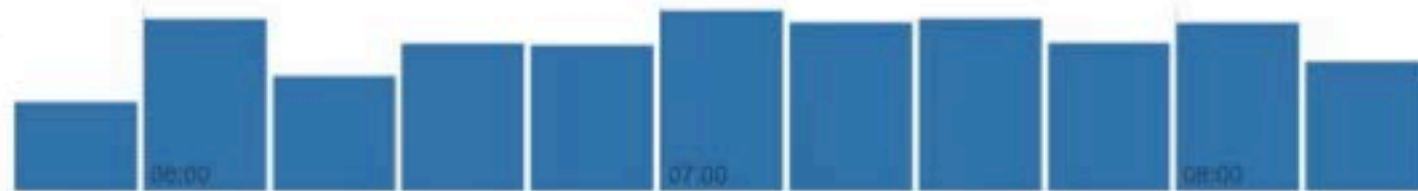
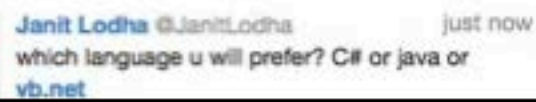
565 followers



word frequency



#ScalaDays



Technology	Jobs	Trend
java	653	Up
oracle	500	Down
python	406	Down
#bigdata	390	Up
functional	357	Up
#job	307	Up
developer	255	Down
javascript	237	Up
#jobs	233	Up
sql	210	Down
cassandra	200	Up
data	186	Down
#javascript	177	Up

Application 2:

sse-chat



Matthias Nehlsen @matthiasnehlse · 12 Jun 2013

the world clearly needed another example chat app... #ScalaDays
#Scala #playframework bit.ly/sse-chat-examp...



1



[View summary](#)

Your Name:

Jane

Room 1

a few seconds ago

Romeo says: I have night's cloak to hide me from their eyes,
And, but thou love me, let them find me here;
My life were better ended by their hate
Than death prorogued, wanting of thy love.

a few seconds ago

Jane says: yo

a few seconds ago

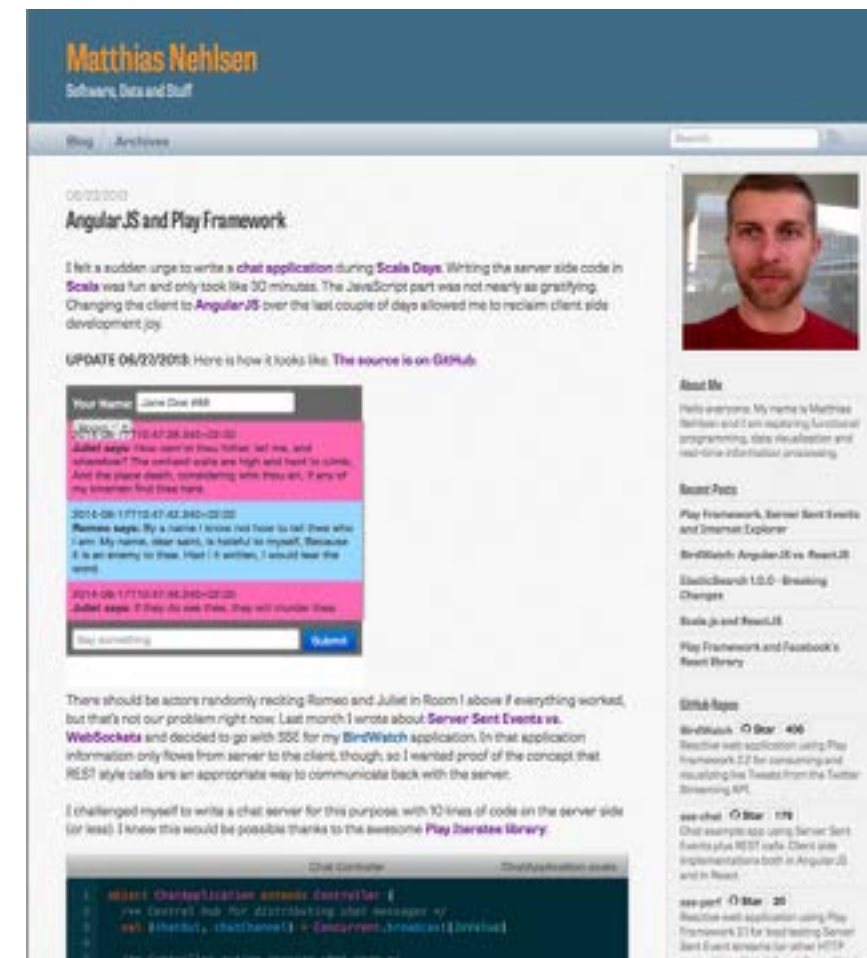
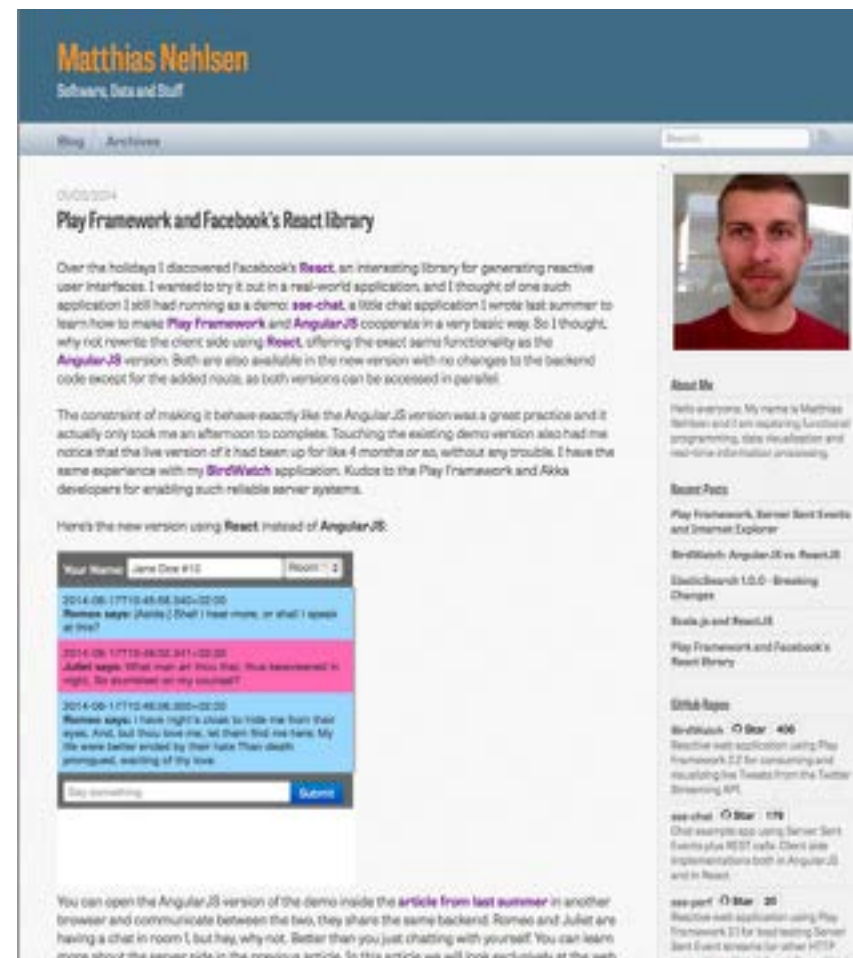
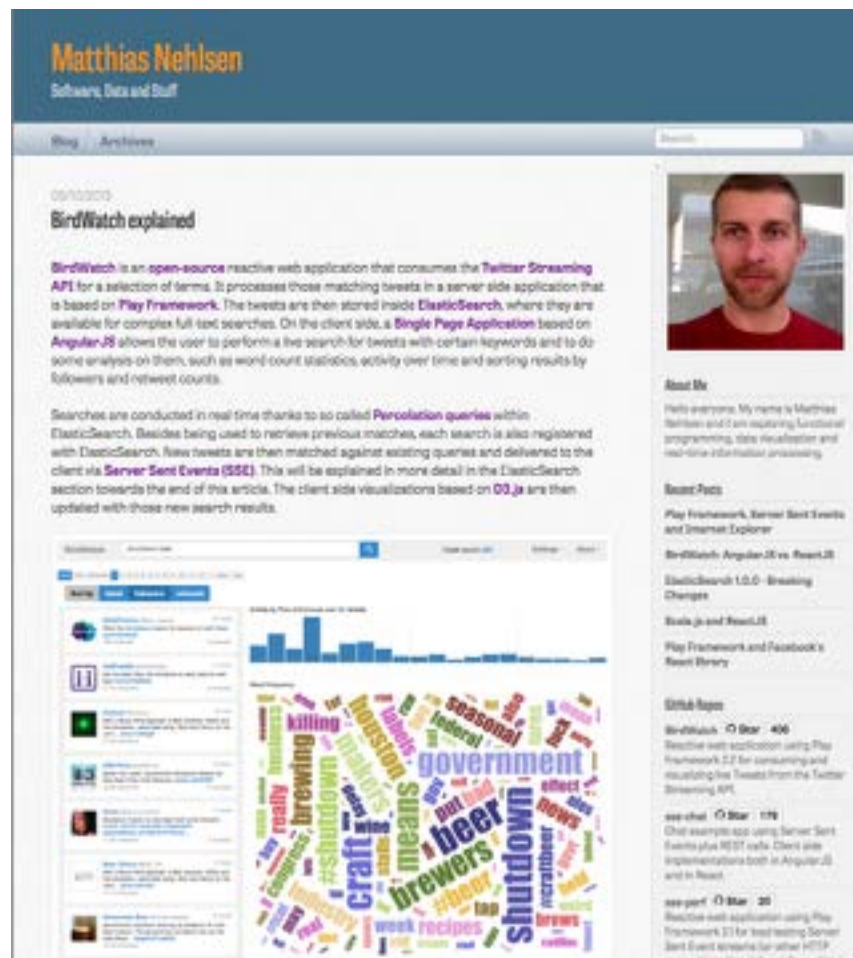
Juliet says: My ears have yet not drunk a hundred words
Of thy tongue's uttering, yet I know the sound.
Art thou not Romeo, and a Montague?

in a few seconds

Romeo says: I have night's cloak to hide me from their eyes,
And, but thou love me, let them find me here;
My life were better ended by their hate
Than death prorogued, wanting of thy love.

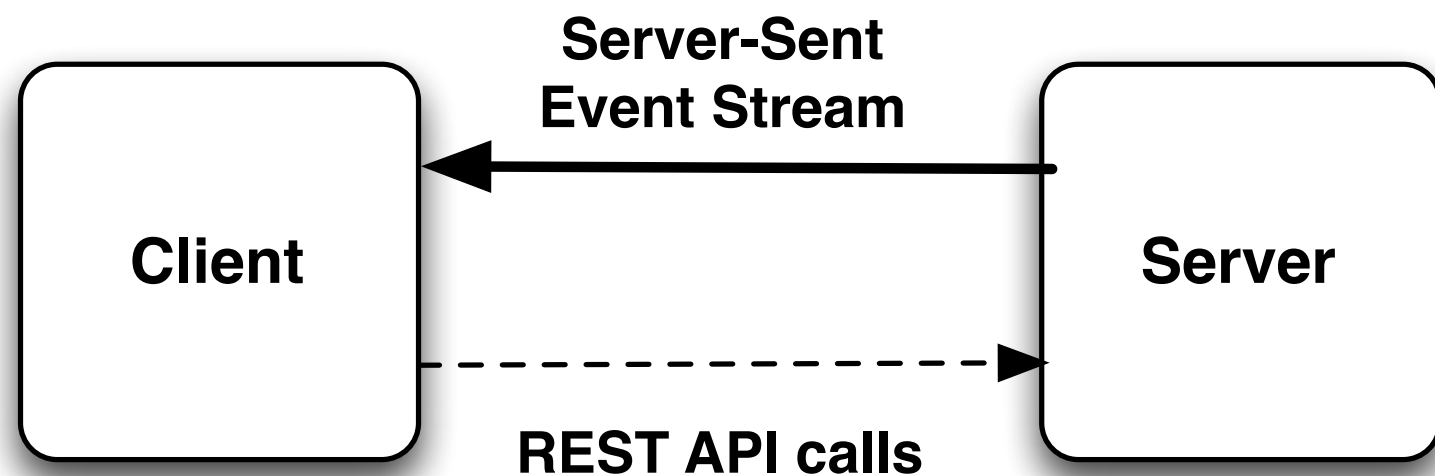
Say something

Submit



@matthiasnehlse

Two-way communication





Server-Sent Events

W3C Candidate Recommendation 11 December 2012

This Version:

<http://www.w3.org/TR/2012/CR-eventsource-20121211/>

Latest Published Version:

<http://www.w3.org/TR/eventsource/>

Latest Editor's Draft:

<http://dev.w3.org/html5/eventsource/>

Previous Versions:

<http://www.w3.org/TR/2012/WD-eventsource-20121023/>

<http://www.w3.org/TR/2012/WD-eventsource-20120426/>

<http://www.w3.org/TR/2011/WD-eventsource-20111020/>

<http://www.w3.org/TR/2011/WD-eventsource-20110310/>

<http://www.w3.org/TR/2011/WD-eventsource-20110208/>

<http://www.w3.org/TR/2009/WD-eventsource-20091222/>

<http://www.w3.org/TR/2009/WD-eventsource-20091029/>

<http://www.w3.org/TR/2009/WD-eventsource-20090423/>

Editor:

[Ian Hickson](#), Google, Inc.

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The bulk of the text of this specification is also available in the WHATWG [Web Applications 1.0](#) specification, under a license that permits reuse of the specification text.

Abstract

This specification defines an API for opening an HTTP connection for receiving push notifications from a server in the form of DOM events.

How do these
Server-Sent Events
look like?

data: {"room":"room1","text":"O Romeo, Romeo! wherefore art thou Romeo? \nDeny thy father and refuse thy name; \nOr, if thou wilt not, be but sworn my love, \nAnd I'll no longer be a Capulet. ", "user":"Juliet", "time":"2014-06-17T11:26:18.340+02:00"}

data: {"room":"room1","text":"Neither, fair saint, if either thee dislike.", "user":"Romeo", "time":"2014-06-17T11:26:22.341+02:00"}

data: {"room":"room1","text":"What man art thou that, thus bescreened in night, \nSo stumblest on my counsel?", "user":"Juliet", "time":"2014-06-17T11:26:26.341+02:00"}

```
data: {"created_at": "Tue Jun 17 09:12:31 +0000 2014", "id": 478827517462061057, "id_str": "478827517462061057", "text": "RT @PeopleSoft_Info: New Video Feature Overview posted. Oracle's PeopleSoft Payment Request feature. http://t.co/sHxdgIFszM", "source": "<a href='\"http://tweetadder.com\"' rel='\"nofollow\"'>TweetAdder v4</a>", "truncated": false, "in_reply_to_status_id": null, "in_reply_to_status_id_str": null, "in_reply_to_user_id": null, "in_reply_to_user_id_str": null, "in_reply_to_screen_name": null, "user": {"id": 523900352, "id_str": "523900352", "name": "Mike Mansfield", "screen_name": "ILSmallBiz", "location": "Illinois (of course)", "url": null, "description": "If you believe that a thriving Small Business and Entrepreneurial community makes the great State of Illinois strong then support it by retweeting us!", "protected": false, "verified": false, "followers_count": 2852, "friends_count": 2949, "listed_count": 140, "favourites_count": 0, "statuses_count": 36806, "created_at": "Wed Mar 14 01:48:24 +0000 2012", "utc_offset": -10800, "time_zone": "Atlantic Time (Canada)", "geo_enabled": false, "lang": "en", "contributors_enabled": false, "is_translator": false, "profile_background_color": "C0DEED", "profile_background_image_url": "http://pbs.twimg.com/profile_background_images/448511732/ILSmallBizBackground.jpg", "profile_background_image_url_https": "https://pbs.twimg.com/profile_background_images/448511732/ILSmallBizBackground.jpg", "profile_background_tile": true, "profile_link_color": "0084B4", "profile_sidebar_border_color": "C0DEED", "profile_sidebar_fill_color": "DDEEFF", "profile_text_color": "333333", "profile_use_background_image": true, "profile_image_url": "http://pbs.twimg.com/profile_images/1895395333/ILSmallBiz_normal.gif", "profile_image_url_https": "https://pbs.twimg.com/profile_images/1895395333/ILSmallBiz_normal.gif", "default_profile": false, "default_profile_image": false, "following": null, "follow_request_sent": null, "notifications": null}, "geo": null, "coordinates": null, "place": null, "contributors": null, "retweeted_status": {"created_at": "Mon Jun 16 16:27:52 +0000 2014", "id": 478574692878409728, "id_str": "478574692878409728", "text": "New Video Feature Overview posted. Oracle's PeopleSoft Payment Request feature. http://t.co/sHxdgIFszM", "source": "<a href='\"http://twitter.com\"' rel='\"nofollow\"'>Twitter Web Client</a>", "truncated": false, "in_reply_to_status_id": null, "in_reply_to_status_id_str": null, "in_reply_to_user_id": null, "in_reply_to_user_id_str": null, "in_reply_to_screen_name": null, "user": {"id": 72696184, "id_str": "72696184", "name": "PeopleSoft", "screen_name": "PeopleSoft_Info", "location": "Pleasanton, CA", "url": "http://peoplesoftinfo.com", "description": "The Official Twitter Account for Oracle PeopleSoft", "protected": false, "verified": false, "followers_count": 3963, "friends_count": 2, "listed_count": 117, "favourites_count": 4, "statuses_count": 556, "created_at": "Tue Sep 08 23:03:02 +0000 2009", "utc_offset": -25200, "time_zone": "Pacific Time (US & Canada)", "geo_enabled": false, "lang": "en", "contributors_enabled": false, "is_translator": false, "profile_background_color": "FF0A2B", "profile_background_image_url": "http://pbs.twimg.com/profile_background_images/528051444/O_PeopleSoft_clr.gif", "profile_background_image_url_https": "https://pbs.twimg.com/profile_background_images/528051444/O_PeopleSoft_clr.gif", "profile_background_tile": false, "profile_link_color": "0084B4", "profile_sidebar_border_color": "BDDCAD", "profile_sidebar_fill_color": "DDFFCC", "profile_text_color": "333333", "profile_use_background_image": true, "profile_image_url": "http://pbs.twimg.com/profile_images/2147134506/O_PeopleSoft_clr_normal.jpg", "profile_image_url_https": "https://pbs.twimg.com/profile_images/2147134506/O_PeopleSoft_clr_normal.jpg", "default_profile": false, "default_profile_image": false, "following": null, "follow_request_sent": null, "notifications": null}, "geo": null, "coordinates": null, "place": null, "contributors": null, "retweet_count": 12, "favorite_count": 1, "entities": {"hashtags": [], "trends": [], "urls": [{"url": "http://t.co/sHxdgIFszM", "expanded_url": "http://youtu.be/ciQlJ_pnCxU", "display_url": "youtu.be/ciQlJ_pnCxU", "indices": [82, 104]}], "user_mentions": [], "symbols": []}, "favorited": false, "retweeted": false, "possibly_sensitive": false, "filter_level": "low", "lang": "en"}, "retweet_count": 0, "favorite_count": 0, "entities": {"hashtags": [], "trends": [], "urls": [{"url": "http://t.co/sHxdgIFszM", "expanded_url": "http://youtu.be/ciQlJ_pnCxU", "display_url": "youtu.be/ciQlJ_pnCxU", "indices": [103, 125]}], "user_mentions": [{"screen_name": "PeopleSoft_Info", "name": "PeopleSoft", "id": 72696184, "id_str": "72696184", "indices": [3, 19]}], "symbols": []}, "favorited": false, "retweeted": false, "possibly_sensitive": false, "filter_level": "medium", "lang": "en"}
```


**Who generates
this **stream**?**

**And what's this
Iteratee
thing?**



Enumeratee

Enumerator



Iteratee

all that jazz

james' blog about scala and all that jazz

<< Scaling Scala vs Java | Home | Comments complement code >>

Iteratees for imperative programmers

When I first heard the word iteratee, I thought it was a joke. Turns out, it wasn't a joke, in fact there are also enumerators (that's ok) and enumeratees (you're killing me). If you're an imperative programmer, or rather a programmer who feels more comfortable writing imperative code than functional code, then you may be a little overwhelmed by all the introductions to iteratees out there, because they all assume that you think from a functional perspective. Well I just learnt iteratees, and although I'm feeling more and more comfortable with functional programming every day, I still think like an imperative programmer at heart. This made learning iteratees very difficult for me. So while I'm still in the imperative mindset, I thought this a very good opportunity to explain iteratees from an imperative programmers perspective, taking no functional knowledge for granted. If you're an imperative programmer who wants to learn iteratees, this is the blog post for you. I'm going to specifically be looking at Play's Iteratee API, but the concepts learnt here will apply to all Iteratees in general.

So let's start off with explaining what iteratees, and their counterparts, are trying to achieve. An iteratee is a method of reactively handling streams of data that is very easily composable. By reactive, I mean non blocking, ie you react to data being available to read, and react to the opportunity to write data. By composable, I mean you write simple iteratees that do one small thing well, then you use those as the building blocks to write iteratees that do bigger things, and you use those as the building blocks to write iteratees to do even bigger things, and so on. At each stage, everything is simple and easy to reason

About

Hi! My name is James Roper, and I am a software developer with a particular interest in open source development and trying new things. I program in Scala, Java, PHP, Python and Javascript, and I work for Typesafe as a developer on Play framework. I also have a full life outside the world of IT, am a passionate Christian, enjoy playing a variety of musical instruments and sports, and currently I live in Sydney.



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Tags

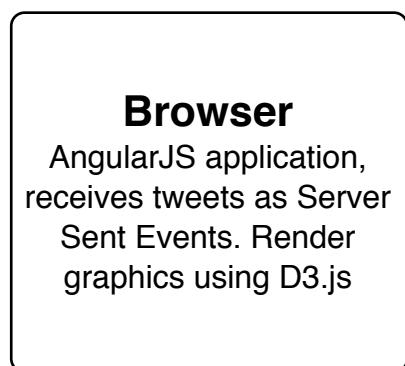
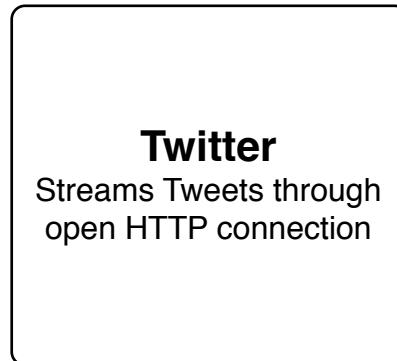
akka apache atlassian ayutthaya
bangkok beetag browser burma

Concurrent.broadcast

Time for some
Scala code

BirdWatch

github.com/matthiasn



Play Application

TwitterClient Object

Supervisor Actor
checks connection to Twitter, starts new connection when necessary

checks status often

WS client

1. establish connection
 2. receive Byte arrays
 2. call Iteratee with each
- can be replaced -

TweetIteratee

1. receive new tweet
2. match against queries
3. push tweet with matches

Tweet Channel



Tweet Enumerator

Concurrent.broadcast

BirdWatch Controller

- serves HTML for page
- proxies ElasticSearch queries
- serves matching Tweets for current search as SSE

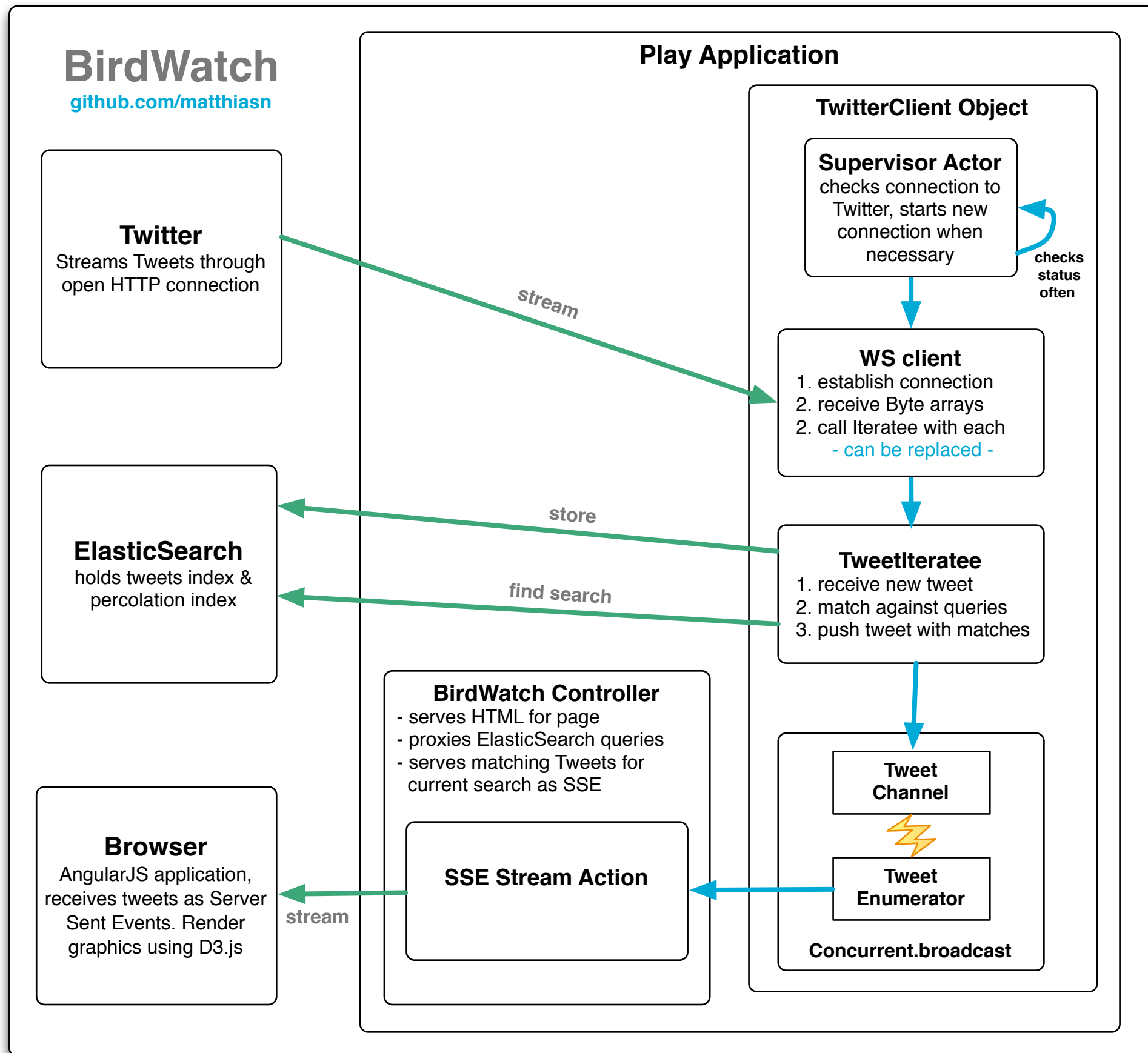
SSE Stream Action

stream

store

find search

stream



**What did he say,
Percolation
Query?**


```

25  /** Central hub for distributing chat messages */
26  val (chatOut, chatChannel) = Concurrent.broadcast[JsValue]
27
28  /** Controller action for POSTing chat messages */
29  def postMessage = Action(parse.json) { req => chatChannel.push(req.body); Ok }
30
31  /** Enumeratee for filtering messages based on room */
32  def filter(room: String) = Enumeratee.filter[JsValue] {
33    json: JsValue => (json \ "room").as[String] == room
34  }
35
36  /** Enumeratee for detecting disconnect of SSE stream */
37  def connDeathWatch(addr: String): Enumeratee[JsValue, JsValue] =
38    Enumeratee.onIterateeDone{
39      () => println(addr + " - SSE disconnected")
40    }
41
42  /** Controller action serving activity based on room */
43  def chatFeed(room: String) = Action { req =>
44    println(req.remoteAddress + " - SSE connected")
45    Ok.feed(chatOut
46      &> filter(room)
47      &> Concurrent.buffer(50)
48      &> connDeathWatch(req.remoteAddress)
49      &> EventSource()
50    ).as("text/event-stream")
51  }

```

```

26  /** Supervisor initiating Romeo and Juliet actors and scheduling their talking */
27  class Supervisor() extends Actor {
28
29      val juliet = context.actorOf(Props(new Chatter("Juliet", Quotes.juliet)))
30      context.system.scheduler.schedule(1 seconds, 8 seconds, juliet, ChatActors.Talk)
31
32      val romeo = context.actorOf(Props(new Chatter("Romeo", Quotes.romeo)))
33      context.system.scheduler.schedule(5 seconds, 8 seconds, romeo, ChatActors.Talk)
34
35      def receive = { case _ => }
36  }
37
38  /** Chat participant actors picking quotes at random when told to talk */
39  class Chatter(name: String, quotes: Seq[String]) extends Actor {
40
41      def receive = {
42          case ChatActors.Talk => {
43              val now: String = DateTime.now.toString
44              val quote = quotes(Random.nextInt(quotes.size))
45              val msg = Json.obj("room" -> "room1", "text" -> quote, "user" -> name, "time" -> now )
46
47              ChatApplication.chatChannel.push(msg)
48          }
49      }
50  }

```



```

63 /** Serves Tweets as Server Sent Events over HTTP connection TODO: change to POST */
64 def tweetFeed(q: String) = Action.async {
65   req =>
66     LogstashLogger.logRequest(req, "/tweetFeed?q=" + q, 200, 0)
67
68   val query = Json.obj("query" -> Json.obj("query_string" -> Json.obj("default_field" -> "text",
69     "default_operator" -> "AND", "query" -> ("(" + q + ") AND lang:en"))),
70     "timestamp" -> dtFormat.print(new DateTime(DateTimeZone.UTC)))
71
72   /** identify queries by hash, only store unique queries once */
73   val md = MessageDigest.getInstance("SHA-256")
74   val queryID = md.digest(q.getBytes).map("%02x".format(_)).mkString
75
76   WS.url(PercolationQueryURL + queryID).put(query).map {
77     res => Ok.feed(TwitterClient.jsonTweetsOut
78       &> matchesFilter(queryID)
79       &> Concurrent.buffer(1000)
80       &> matchesToJson
81       &> connDeathWatch(req, new DateTime(DateTimeZone.UTC))
82       &> EventSource()).as("text/event-stream")
83   }
84 }

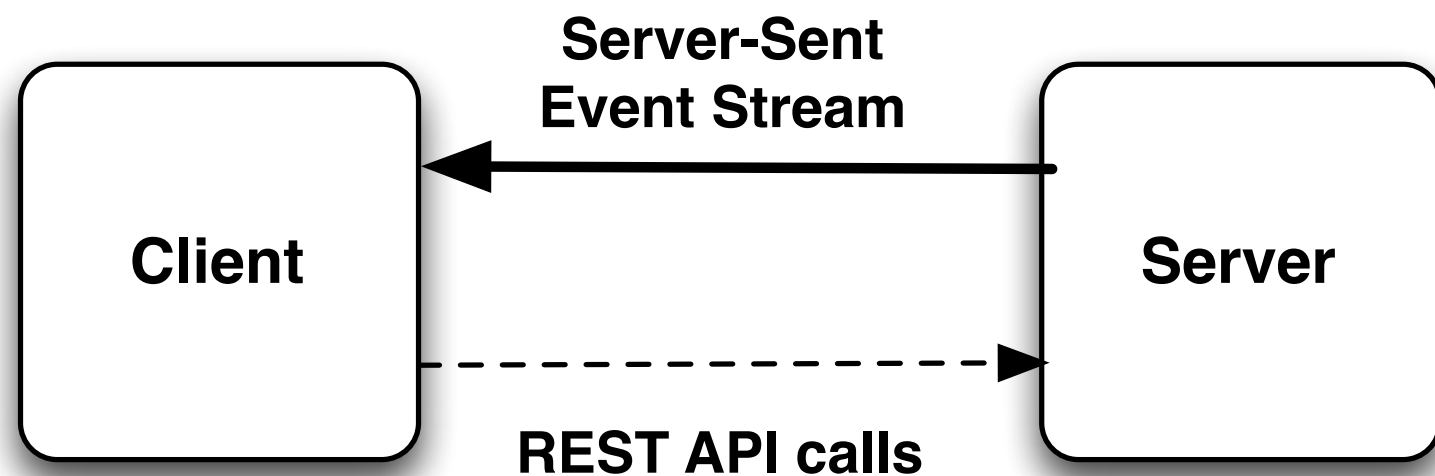
```

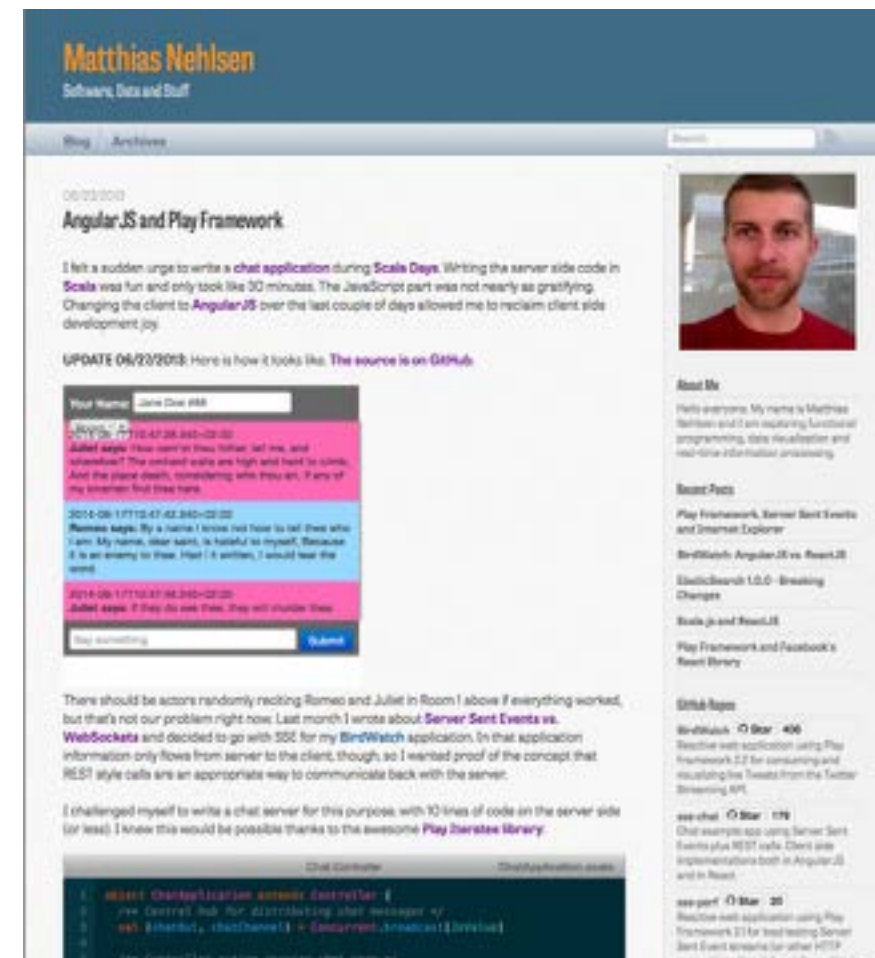
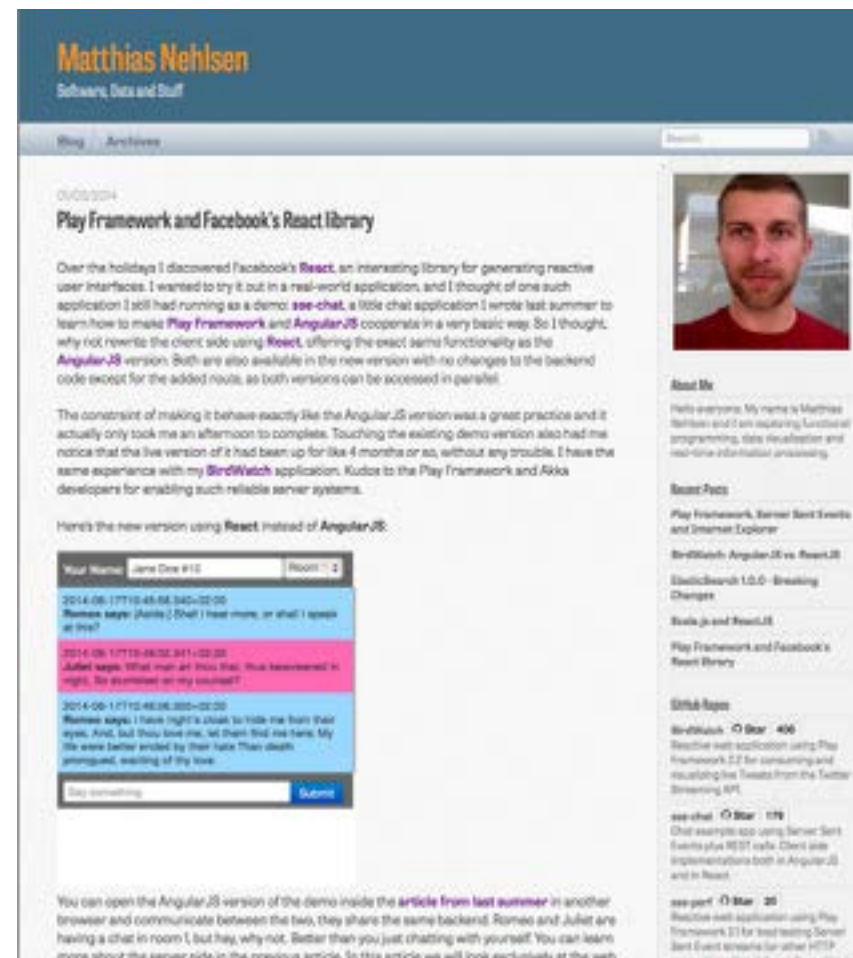
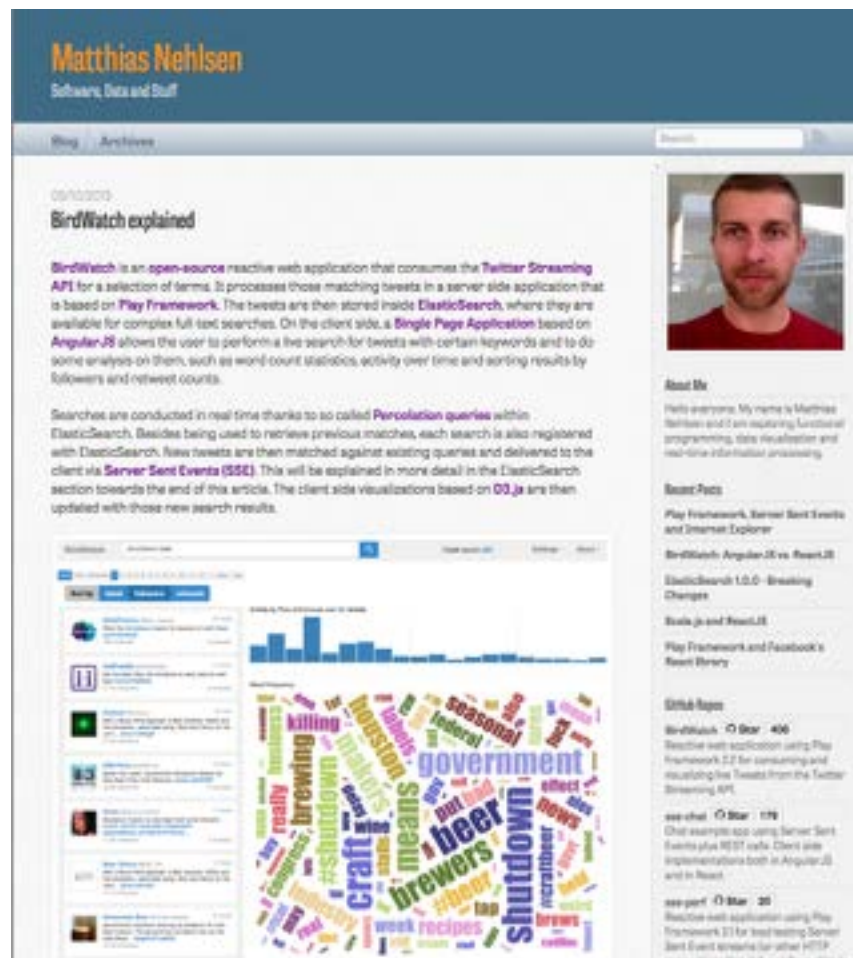
Why oh why
not
WebSockets?

When would I
use
WebSockets?

What's not to like?

Two-way communication





@matthiasnehlse







<https://github.com/matthiasn/potluck-recipes>

Thank you!

@matthiasnehlse