

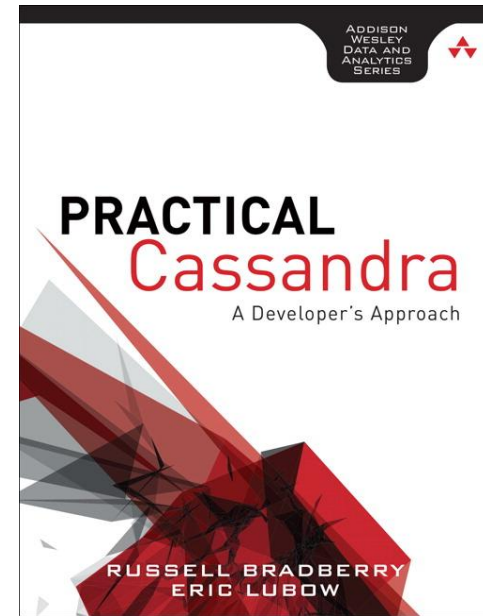
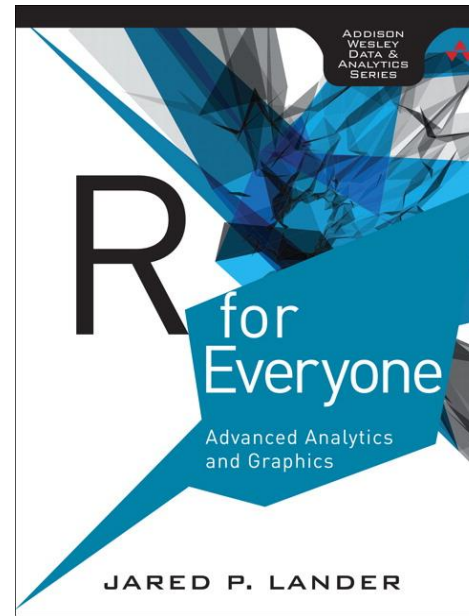
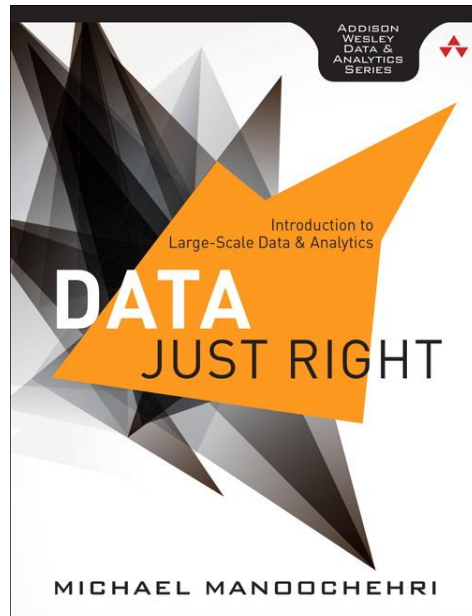
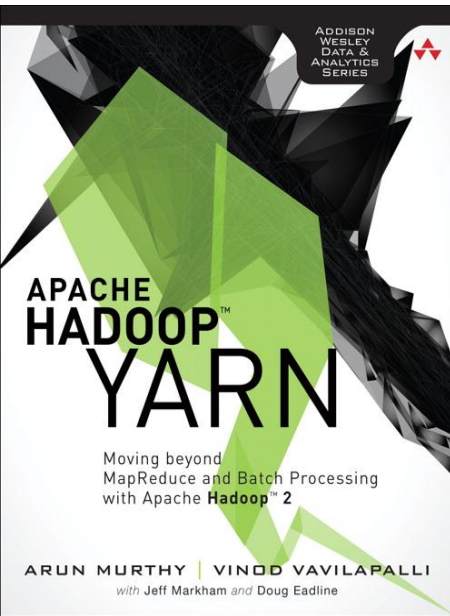
Introducing InfluxDB, an open source distributed time series database

Paul Dix
@pauldix
paul@errplane.com

About me

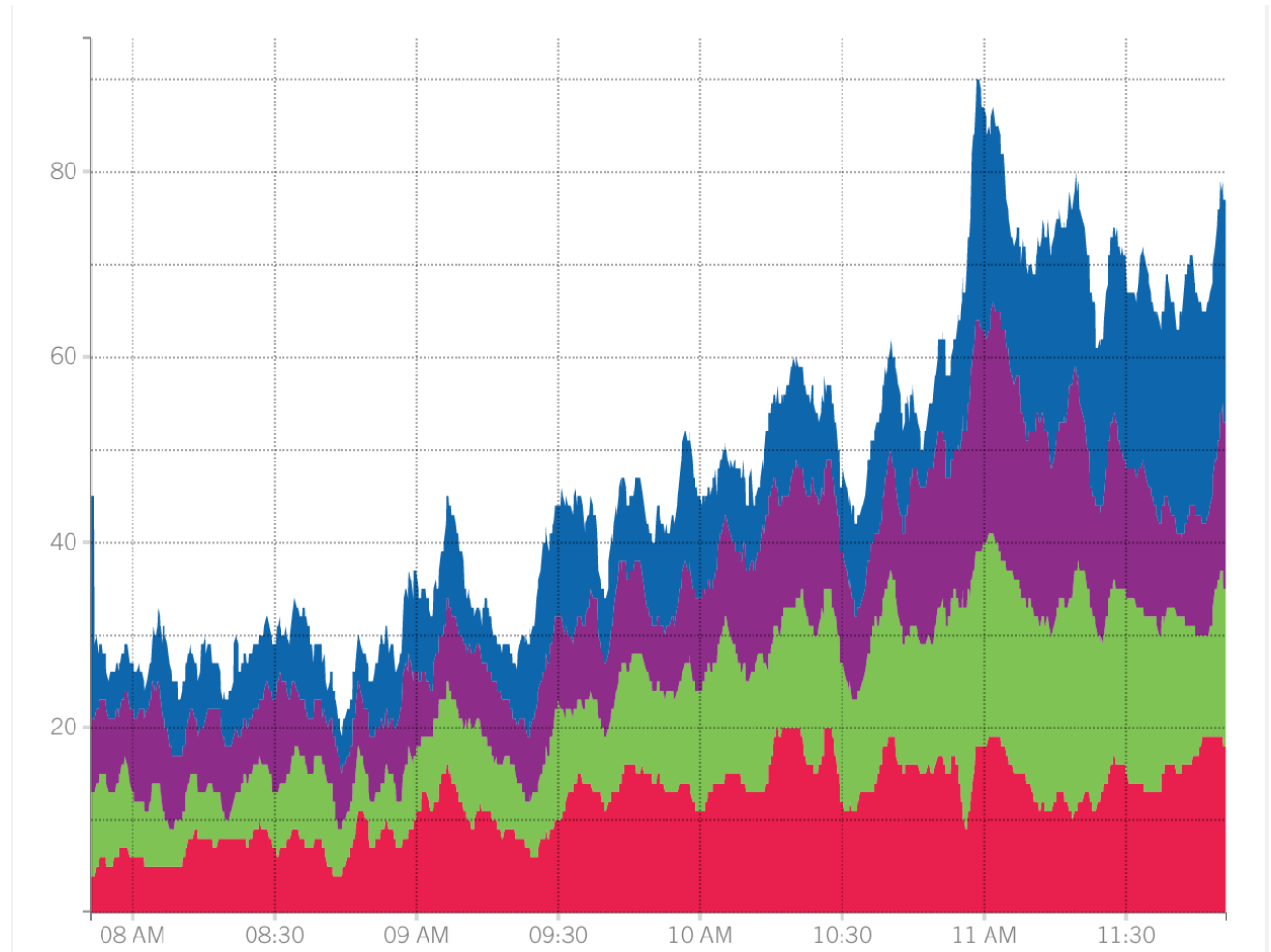
- Co-founder, CEO of Errplane (YC W13)
- Organizer of NYC Machine Learning
- Author of “Service Oriented Design with Ruby & Rails”

Series editor for Addison Wesley's “Data & Analytics”



What is a time series?

Metrics



33.15 +0.08 (0.24%)

Oct 25 - Close
NYSE real-time data - Disclaimer
Currency in USD

Range	33.01 - 33.49	Div/yield	0.12/1.45
52 week	29.52 - 36.43	EPS	2.32
Open	33.21	Shares	4.65B
Vol / Avg.	19.82M/22.63M	Beta	1.08
Mkt cap	154.01B	Inst. own	61%
P/E	14.29		

 +1 199

Compare: ☐ Dow Jones ☐ S&P 500 ☐ HPQ ☐ IBM ☐ MSFT ☐ CRM ☐ INTC ☐ CA ☐ SI

Zoom: [1d](#) [5d](#) [1m](#) [3m](#) [6m](#) [YTD](#) [1y](#) [5y](#) [10y](#) [All](#)

Oct 21, 2013 - Oct 25, 2013 +0.25 (0.76%)



[Settings](#) | [Technicals](#) | [Link to this view](#)

Volume delayed by 15 mins.

Audience Overview

Nov 4, 2013 - Nov 11, 2013

Email Export Add to Dashboard Shortcut



▼

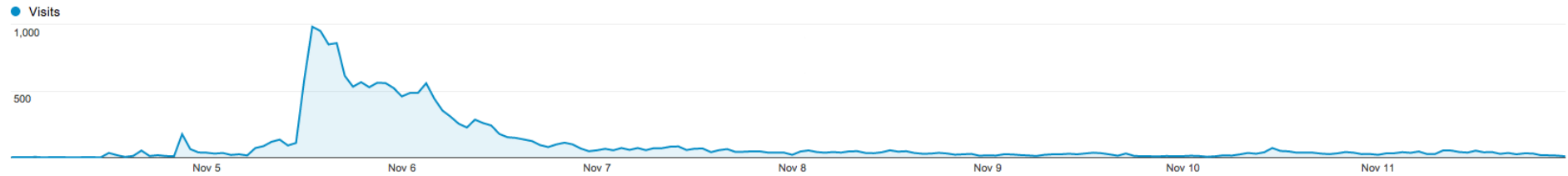
All Visits

100.00%

Overview

Visits vs. Select a metric

Hourly Day Week Month



15,886 people visited this site

Visits

19,324

Unique Visitors

15,886

Pageviews

46,613

Pages / Visit

2.41

Avg. Visit Duration

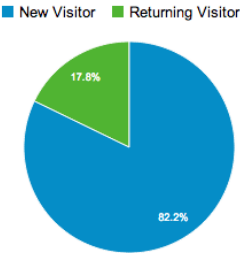
00:02:16

Bounce Rate

58.15%

% New Visits

82.11%



64.242.88.10 - - [07/Mar/2004:16:05:49 -0800] "GET /twiki/bin/edit/Main/Double_bounce_sender?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:16:06:51 -0800] "GET /twiki/bin/rdiff/TWiki/NewUserTemplate?rev1=1.3&rev2=1.2 HTTP/1.1" 200 4523
64.242.88.10 - - [07/Mar/2004:16:10:02 -0800] "GET /mailman/listinfo/hsdivision HTTP/1.1" 200 6291
64.242.88.10 - - [07/Mar/2004:16:11:58 -0800] "GET /twiki/bin/view/TWiki/WikiSyntax HTTP/1.1" 200 7352
64.242.88.10 - - [07/Mar/2004:16:20:55 -0800] "GET /twiki/bin/view/Main/DCCAndPostFix HTTP/1.1" 200 5253
64.242.88.10 - - [07/Mar/2004:16:23:12 -0800] "GET /twiki/bin/oops/TWiki/AppendixFileSystem?template=oopsmore%ml=1.12%ml2=1.12 HTTP/1.1" 200 11382
64.242.88.10 - - [07/Mar/2004:16:24:16 -0800] "GET /twiki/bin/view/Main/PeterThoeny HTTP/1.1" 200 4924
64.242.88.10 - - [07/Mar/2004:16:29:16 -0800] "GET /twiki/bin/edit/Main/Header_checks?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12851
64.242.88.10 - - [07/Mar/2004:16:30:29 -0800] "GET /twiki/bin/attach/Main/OfficeLocations HTTP/1.1" 401 12851
64.242.88.10 - - [07/Mar/2004:16:31:48 -0800] "GET /twiki/bin/view/TWiki/WebTopicEditTemplate HTTP/1.1" 200 3732
64.242.88.10 - - [07/Mar/2004:16:32:50 -0800] "GET /twiki/bin/view/Main/WebChanges HTTP/1.1" 200 40520
64.242.88.10 - - [07/Mar/2004:16:33:53 -0800] "GET /twiki/bin/edit/Main/Smtpd_etrn_restrictions?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12851
64.242.88.10 - - [07/Mar/2004:16:35:19 -0800] "GET /mailman/listinfo/business HTTP/1.1" 200 6379
64.242.88.10 - - [07/Mar/2004:16:36:22 -0800] "GET /twiki/bin/rdiff/Main/WebIndex?rev1=1.2&rev2=1.1 HTTP/1.1" 200 46373
64.242.88.10 - - [07/Mar/2004:16:37:27 -0800] "GET /twiki/bin/view/TWiki/DontNotify HTTP/1.1" 200 4140
64.242.88.10 - - [07/Mar/2004:16:39:24 -0800] "GET /twiki/bin/view/Main/TokyoOffice HTTP/1.1" 200 3853
64.242.88.10 - - [07/Mar/2004:16:43:54 -0800] "GET /twiki/bin/view/Main/MikeMannix HTTP/1.1" 200 3686
64.242.88.10 - - [07/Mar/2004:16:45:56 -0800] "GET /twiki/bin/attach/Main/PostfixCommands HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:16:47:12 -0800] "GET /robots.txt HTTP/1.1" 200 68
64.242.88.10 - - [07/Mar/2004:16:47:46 -0800] "GET /twiki/bin/rdiff/Know/ReadmeFirst?rev1=1.5&rev2=1.4 HTTP/1.1" 200 5724
64.242.88.10 - - [07/Mar/2004:16:49:04 -0800] "GET /twiki/bin/view/Main/TWikiGroups?rev=1.2 HTTP/1.1" 200 5162
64.242.88.10 - - [07/Mar/2004:16:50:54 -0800] "GET /twiki/bin/rdiff/Main/ConfigurationVariables HTTP/1.1" 200 59679
64.242.88.10 - - [07/Mar/2004:16:52:35 -0800] "GET /twiki/bin/edit/Main/Flush_service_name?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12851
64.242.88.10 - - [07/Mar/2004:16:53:46 -0800] "GET /twiki/bin/rdiff/TWiki/TWikiRegistration HTTP/1.1" 200 34395
64.242.88.10 - - [07/Mar/2004:16:54:55 -0800] "GET /twiki/bin/rdiff/Main/NicholasLee HTTP/1.1" 200 7235
64.242.88.10 - - [07/Mar/2004:16:56:39 -0800] "GET /twiki/bin/view/Sandbox/WebHome?rev=1.6 HTTP/1.1" 200 8545
64.242.88.10 - - [07/Mar/2004:16:58:54 -0800] "GET /mailman/listinfo/administration HTTP/1.1" 200 6459
lordgun.org - - [07/Mar/2004:17:01:53 -0800] "GET /razor.html HTTP/1.1" 200 2869
64.242.88.10 - - [07/Mar/2004:17:09:01 -0800] "GET /twiki/bin/search/Main/SearchResult?scope=text&ex=on&search=Joris%20*Benschop[^A-Za-z] HTTP/1.1" 200 4284
64.242.88.10 - - [07/Mar/2004:17:10:20 -0800] "GET /twiki/bin/oops/TWiki/TextFormattingRules?template=oopsmore%ml=1.37%ml2=1.37 HTTP/1.1" 200 11400
64.242.88.10 - - [07/Mar/2004:17:13:50 -0800] "GET /twiki/bin/edit/TWiki/DefaultPlugin?t=1078688936 HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:17:16:00 -0800] "GET /twiki/bin/search/Main/?scope=topic&ex=on&search=g HTTP/1.1" 200 3675
64.242.88.10 - - [07/Mar/2004:17:17:27 -0800] "GET /twiki/bin/search/TWiki/?scope=topic&ex=on&search=d HTTP/1.1" 200 5773
lj1036.inktomisearch.com - - [07/Mar/2004:17:18:36 -0800] "GET /robots.txt HTTP/1.0" 200 68
lj1090.inktomisearch.com - - [07/Mar/2004:17:18:41 -0800] "GET /twiki/bin/view/Main/LondonOffice HTTP/1.0" 200 3860
64.242.88.10 - - [07/Mar/2004:17:21:44 -0800] "GET /twiki/bin/attach/TWiki/TablePlugin HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:17:22:49 -0800] "GET /twiki/bin/view/TWiki/ManagingWebs?rev=1.22 HTTP/1.1" 200 9310
64.242.88.10 - - [07/Mar/2004:17:23:54 -0800] "GET /twiki/bin/statistics/Main HTTP/1.1" 200 808
64.242.88.10 - - [07/Mar/2004:17:26:30 -0800] "GET /twiki/bin/view/TWiki/WikiCulture HTTP/1.1" 200 5935
64.242.88.10 - - [07/Mar/2004:17:27:37 -0800] "GET /twiki/bin/edit/Main/WebSearch?t=1078669682 HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:17:28:45 -0800] "GET /twiki/bin/oops/TWiki/ResetPassword?template=oopsmore%ml=1.4%ml2=1.4 HTTP/1.1" 200 11281
64.242.88.10 - - [07/Mar/2004:17:29:59 -0800] "GET /twiki/bin/view/TWiki/ManagingWebs?skin=print HTTP/1.1" 200 8806
64.242.88.10 - - [07/Mar/2004:17:31:39 -0800] "GET /twiki/bin/edit/Main/UvscanAndPostFix?topicparent=Main.WebHome HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:17:35:35 -0800] "GET /twiki/bin/view/TWiki/KlausWriessnegger HTTP/1.1" 200 3848
64.242.88.10 - - [07/Mar/2004:17:39:39 -0800] "GET /twiki/bin/view/Main/SpamAssassin HTTP/1.1" 200 4081
64.242.88.10 - - [07/Mar/2004:17:42:15 -0800] "GET /twiki/bin/oops/TWiki/RichardDonkin?template=oopsmore%ml=1.2%ml2=1.2 HTTP/1.1" 200 11281
64.242.88.10 - - [07/Mar/2004:17:46:17 -0800] "GET /twiki/bin/rdiff/TWiki/AlWilliams?rev1=1.3&rev2=1.2 HTTP/1.1" 200 4485
64.242.88.10 - - [07/Mar/2004:17:47:43 -0800] "GET /twiki/bin/rdiff/TWiki/AlWilliams?rev1=1.2&rev2=1.1 HTTP/1.1" 200 5234
64.242.88.10 - - [07/Mar/2004:17:50:44 -0800] "GET /twiki/bin/view/TWiki/SvenDowideit HTTP/1.1" 200 3616
64.242.88.10 - - [07/Mar/2004:17:53:45 -0800] "GET /twiki/bin/search/Main/SearchResult?scope=text&ex=on&search=Office%20*Locations[^A-Za-z] HTTP/1.1" 200 7771



InfluxDB @InfluxDB

1h

Looks like someone made a PHP library for **InfluxDB**!
github.com/crodas/InfluxP.... Thanks @crodas!

Expand



Paul Dix @pauldix

11 Nov

My response to @obfuscurity's impressions of **InfluxDB**:
obfuscurity.com/2013/11/My-Imp... Feedback welcome :)

Retweeted by Brody Berg

Expand



Jason Dixon @obfuscurity

11 Nov

Answers from @pauldix on my review of **InfluxDB**.
obfuscurity.com/2013/11/My-Imp...

Expand



Mat Schaffer @matschaffer

10 Nov

Some high potential for #monitoringlove here influxdb.org too bad I can't find the ops documentation. Anyone had to scale it yet?

Expand



Jason Dixon @obfuscurity

11 Nov

My impressions of **InfluxDB**. obfuscurity.com/2013/11/My-Imp...
#monitoringlove

Favorited 14 times

Expand



Abe Stanway @abestanway

10 Nov

Academics, take note: this is what peer review looks like in 2013
groups.google.com/forum/#!topic/... cc @xaprb @pauldix #influxdb

Expand



John Nunemaker @jnunemaker

10 Nov

I am excited about **influxdb**. Hoping to play with it soon.
speakerdeck.com/auxesis/influx...

Expand

Events

- Measurements
- Exceptions
- Page Views
- User actions
- Commits
- Deploys
- Things happening in time...

Analytics

operations, developers, users, business

**Things you want to ask
questions about,
visualize, or summarize
over time.**

Actually a summarization

33.15 +0.08 (0.24%)

Oct 25 - Close

NYSE real-time data - Disclaimer

Currency in USD

Range	33.01 - 33.49	Div/yield	0.12/1.45
52 week	29.52 - 36.43	EPS	2.32
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Vol / Avg.	19.82M/22.63M	Beta	1.08
Mkt cap	154.01B	Inst. own	61%
P/E	14.29		



Compare: ☐ Dow Jones ☐ S&P 500 ☐ HPQ ☐ IBM ☐ MSFT ☐ CRM ☐ INTC ☐ CA ☐ SI

Zoom: [1d](#) [5d](#) [1m](#) [3m](#) [6m](#) [YTD](#) [1y](#) [5y](#) [10y](#) [All](#)

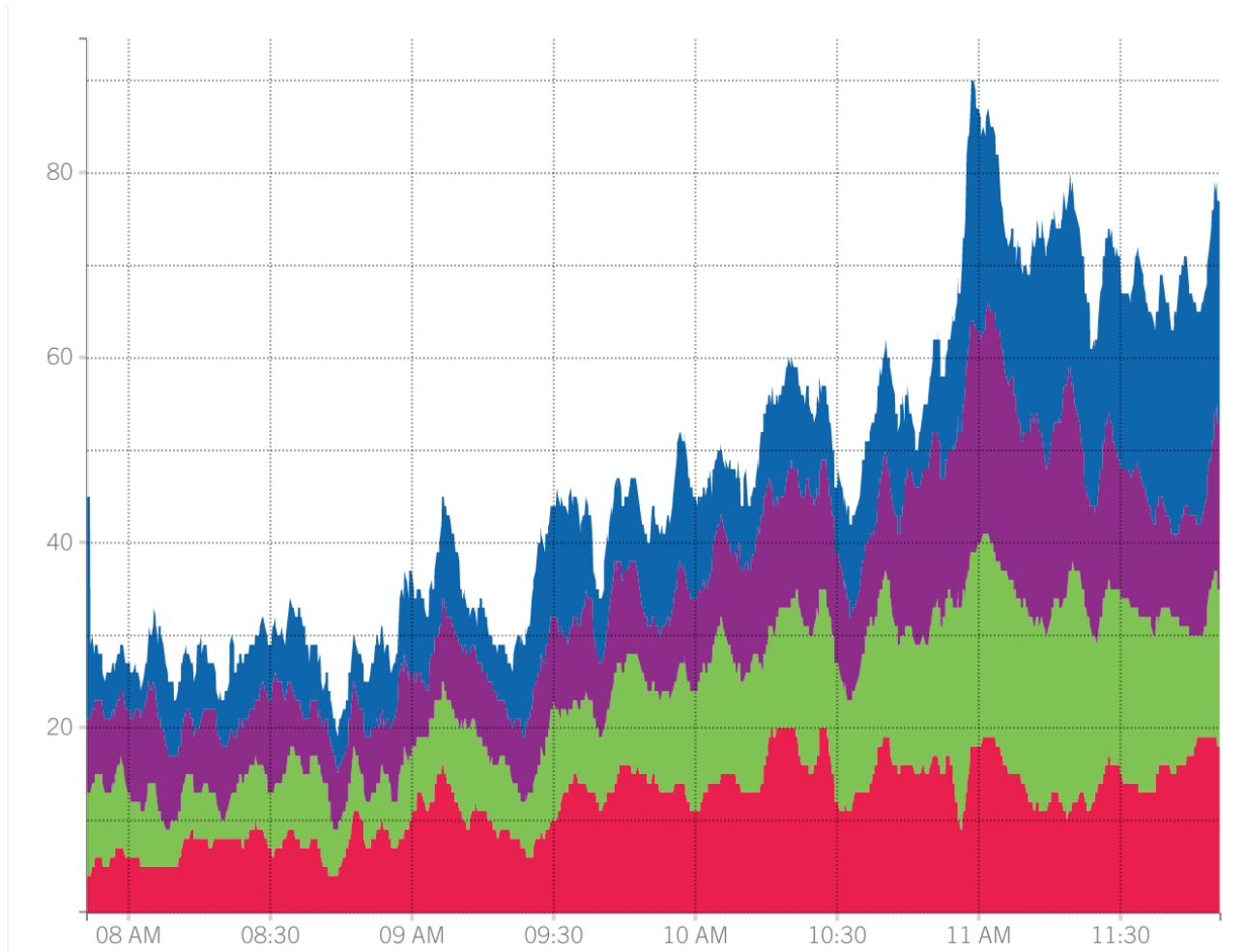
Oct 21, 2013 - Oct 25, 2013 +0.25 (0.76%)



[Settings](#) | [Technicals](#) | [Link to this view](#)

Volume delayed by 15 mins.

Also a summarization



What about...

“...order by some_time_col”

**Why a database for time
series?**

**Billions of data points.
Scale horizontally.**

**HTTP native.
API to build on.**

**Built in tools for
downsampling and
summarizing**

**Automatically clear out
old data if we want**

**Process or monitor data
as it comes in, like Storm**

Visualize and Summarize

- Graphs & dashboards
- Last 10 minutes
- Last 4 hours
- Last 24 hours
- Past week
- Past month
- YTD
- All Time

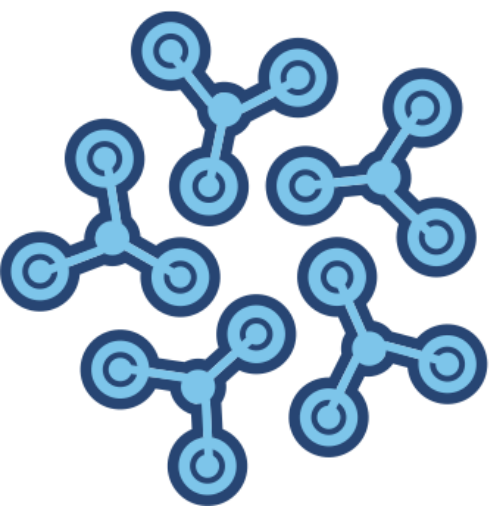
Data Collection

- Statsd - <https://github.com/etsy/statsd/>
- CollectD - <http://collectd.org/>
- Heka - <https://github.com/mozilla-services/heka>
- I2met - <https://github.com/ryandotsmith/I2met>
- Libraries
- Framework integrations
- Cloud integrations (AWS, OpenStack)
- Third-party integrations

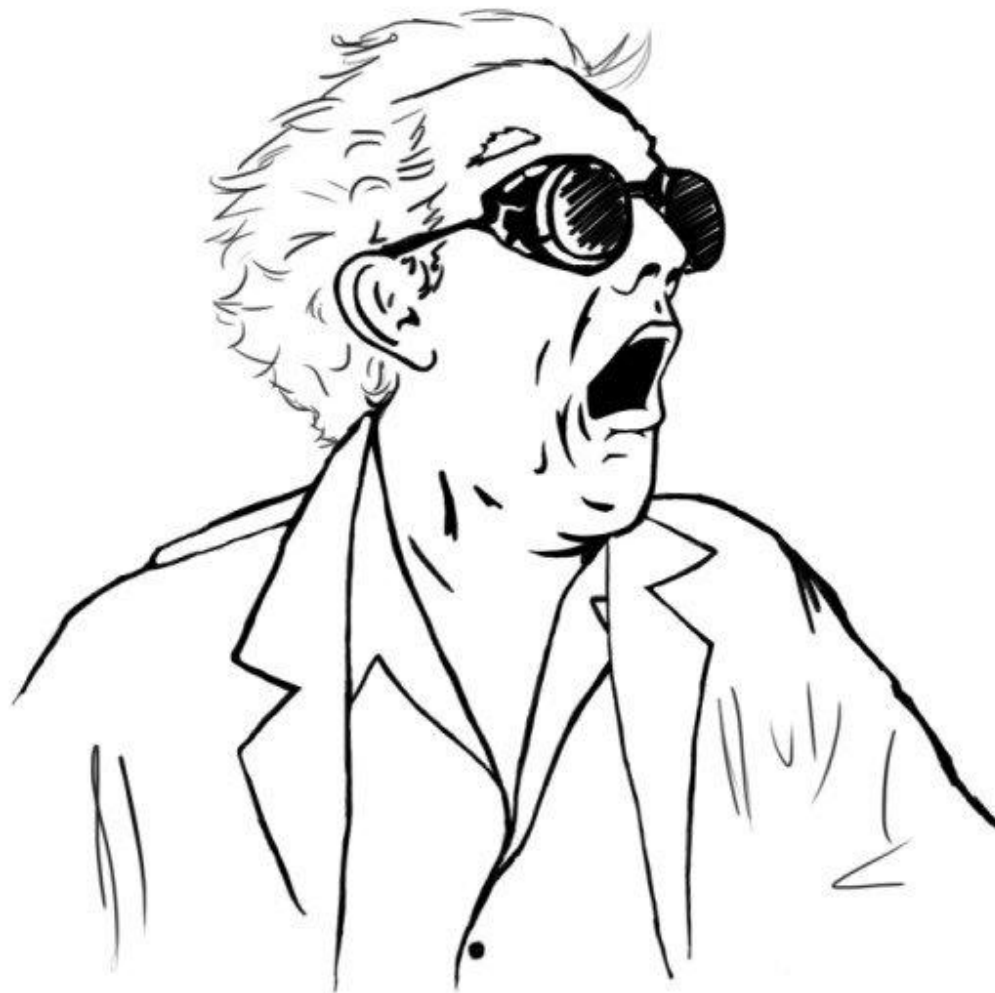
Existing Tools

- RRDTool (metrics)
- Graphite (metrics)
- OpenTSDB (metrics + events)
- Kairos (metrics + events)
- and others...

Something missing...



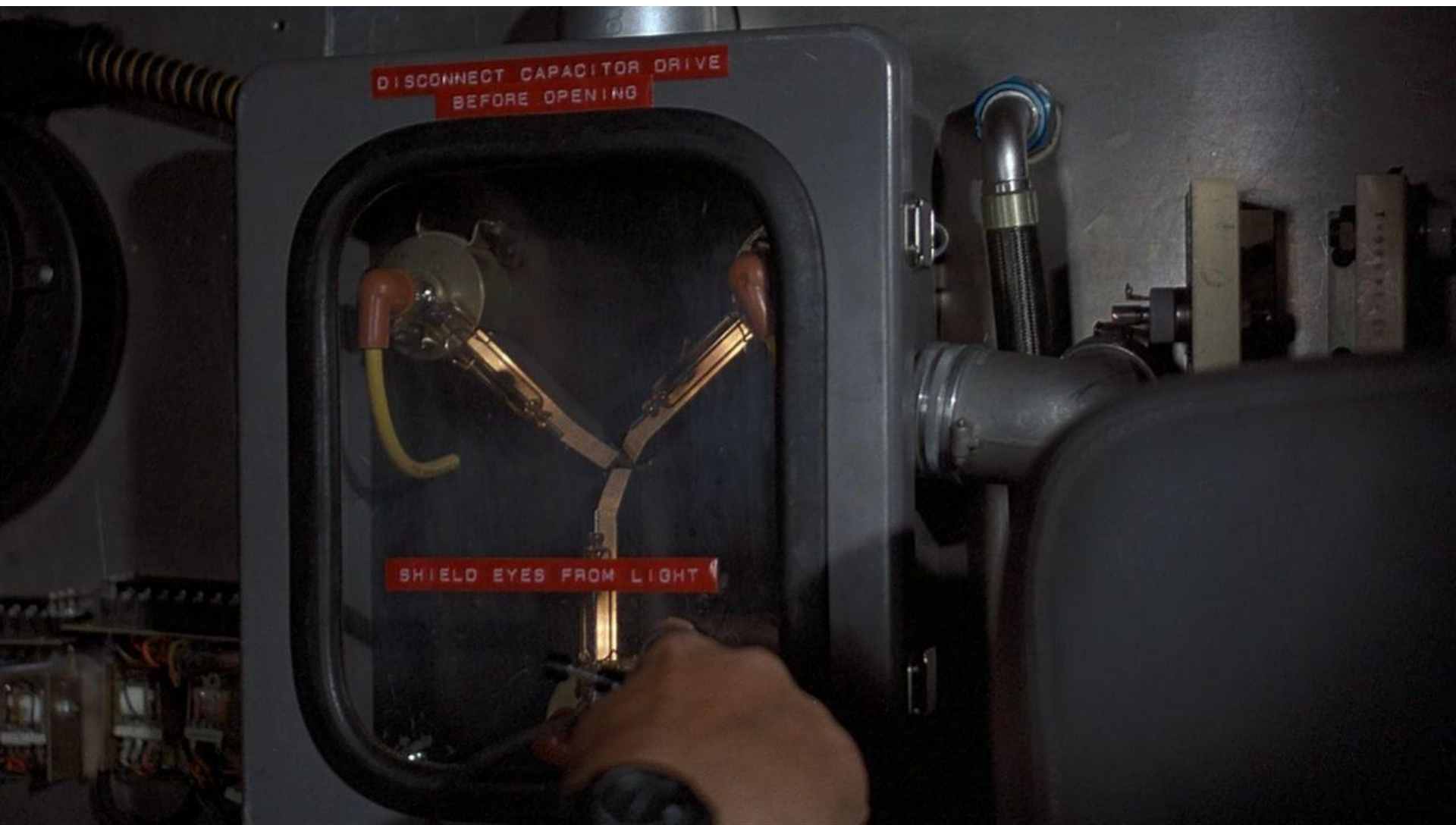
InfluxDB

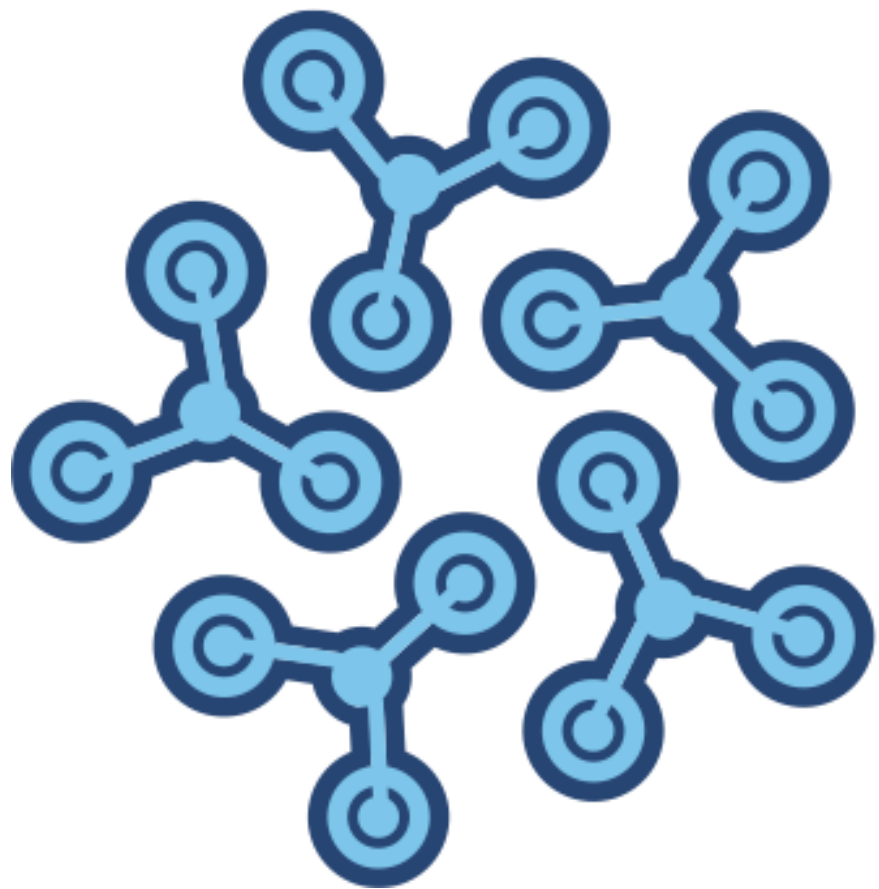


1.21 gigawatts ???

DISCONNECT CAPACITOR DRIVE
BEFORE OPENING

SHIELD EYES FROM LIGHT





Infl

**InfluxDB: harness
lightning, get 1.21
gigawatts.**

InfluxDB

- Written in Go
- Uses LevelDB for storage (may change)
- Self contained binary
- No external dependencies
- Distributed (in December)

HTTP Native

- Read/write data via HTTP
- Manage via HTTP
- Security model to allow access directly from browser

How data is organized

- Databases (like in MySQL, Postgres, etc)
- Time series (kind of like tables)
- Points or events (kind of like rows)

Security

- Cluster admins
- Database admins
- Database users
 - read permissions
 - only certain series
 - only queries with a column having a specific value (e.g. `customer_id=32`)
 - write permissions
 - only certain series
 - only with columns having a specific value

InfluxDB Setup

- <http://play.influxdb.org>
- OSX
 - brew update && brew install influxdb
- <http://influxdb.org/download>
- Ubuntu
 - sudo dpkg -i influxdb_latest_amd64.deb
- RedHat
 - sudo rpm -ivh influxdb-latest-1.i686.rpm

Examples, but sadly no R
:(

HTTP API docs at
<http://influxdb.org/docs/api/http>

**[https://github.com](https://github.com/influxdb/influxdb-r)
[/influxdb/influxdb-r](https://github.com/influxdb/influxdb-r)**

fork, write sweet code, submit PR, be loved
and adored FOREVER

Create a database

```
curl -X POST \  
  'http://localhost:8086/db?u=root&p=root' \  
  -d '{"name":"mydb", "replicationFactor": 3}'
```

Add a user

```
curl -X POST\  
'http://.../db/mydb/users?u=root&p=root' -d \  
'{"name":"paul", "password": "foo", "admin": true}'
```


Write points

```
curl -X POST \  
'http://localhost:8086db/mydb/series?u=paul&p=pass' \  
-d '[{"name":"foo", "columns":["val"], "points": [[3]]}]'
```

Querying

```
curl \
'http://...:8086/db/mydb/series?u=paul&p=pass&q=...'
```

SQL(ish) Query Language

```
select * from user_events  
where time > now() - 4h
```

JSON data returned

```
[{  
  "name": "foo",  
  "columns": [  
    "time", "sequence_number", "val1", "val2"  
  ],  
  "points": [  
    [1384295094, 3, "paul", 23],  
    [1384295094, 2, "john", 92],  
    [1384295094, 1, "todd", 61]  
  ]  
}, {...}]
```

```
select count(state) from user_events  
group by time(5m), state  
where time > now() - 7d
```

```
select percentile(value, 90) from response_times  
group by time(30s)  
where time > now() - 1h
```

Continuous Queries (downsampling)

```
select percentile(value, 90) from response_times  
group by time(5m)  
into response_times.percentiles.90
```

Continuous queries for real-time processing & monitoring

Regexes

```
select * from events
```

```
where email =~ /\.*gmail\.com/
```

```
select percentile(value, 99)
from /stats\.* /
into :series_name.percentiles.99
```

```
select count(value)  
from seriesA merge seriesB
```

Querying

- Functions
 - count, min, max, mean, distinct, median, mode, percentiles, derivative, stddev
- Where clauses
- Group by clauses (time and other columns)
- Periodically delete old raw data

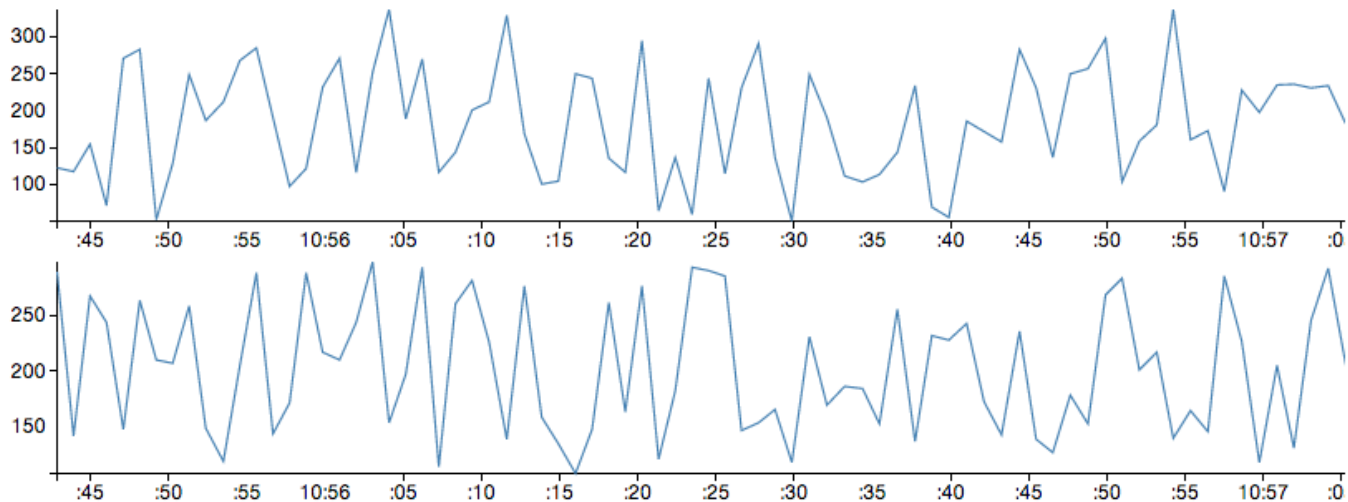
Built in UI

Read Points

Query

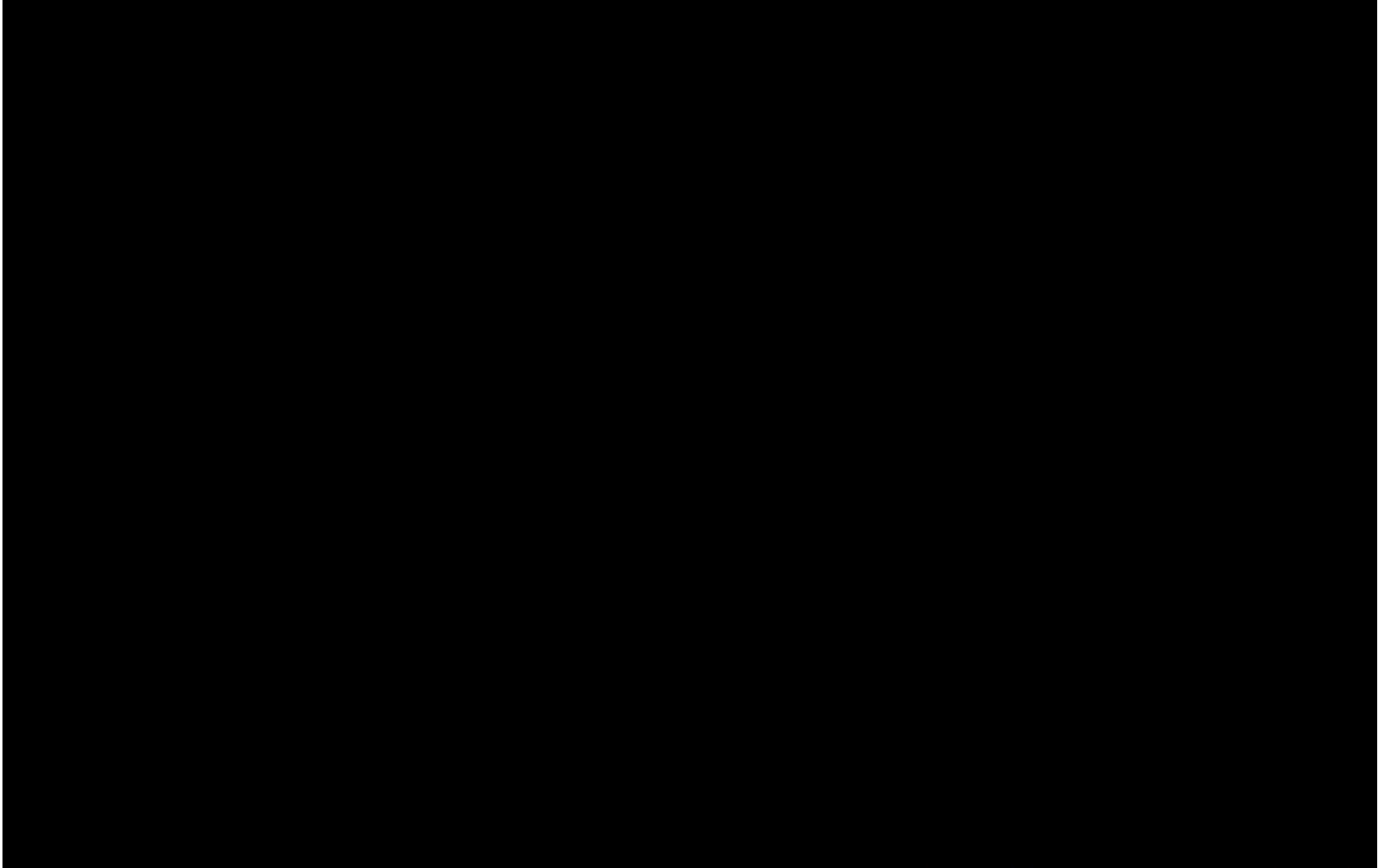
Execute Query

data



time	sequence_number	bar	foo
1384185425284	29696	182	205
1384185424149	29695	234	293
1384185423055	29694	231	246
1384185421955	29693	236	130
1384185420878	29692	235	205

CLI



Libraries

- Ruby
- Frontend JS
- Node
- Python
- PHP
- Go (soon)
- Java (soon)

Ideas to come...

- Custom functions
 - Embedded LUA, YARN like interface, or both?
- Custom real-time queries
 - define custom logic and InfluxDB will feed it data
- Queries triggering web hooks
 - pair with custom functions for monitoring/anomaly detection

Project Status

- Based on work at <https://errplane.com>
 - 2 billion points per month
- <http://influxdb.org>
- Code available at <https://github.com/influxdb>
- API finalized in the next month
- Clustered version in December
- Production ready by end of year

**We're available for
consulting/help**

We need your help

- API, what else would you like to see?
- Client libraries
- Visualization tools
- Data collection integrations
- Comments/feedback on the mailing list
- <http://influxdb.org/overview/>

Share the love

- Star or watch the project on <http://github.com/influxdb/influxdb>
- Tweet, blog, shout, whisper
- Participate in discussions on mailing list

Come to the hackfest

- Monday, December 2nd at Pivotal
- <http://meetup.com/nyc-influxdb-user-group>

**OSS lives and dies by
adoption/popularity**

MongoDB has 4,406 stars

MongoDB valued at \$1.2B

**Each star worth
\$272,355.00**

**Help InfluxDB get to 10k
stars!**

go forth and build!

Thanks!

@pauldix
paul@errplane.com