Introducing Riak and Ripple

Sean Cribbs

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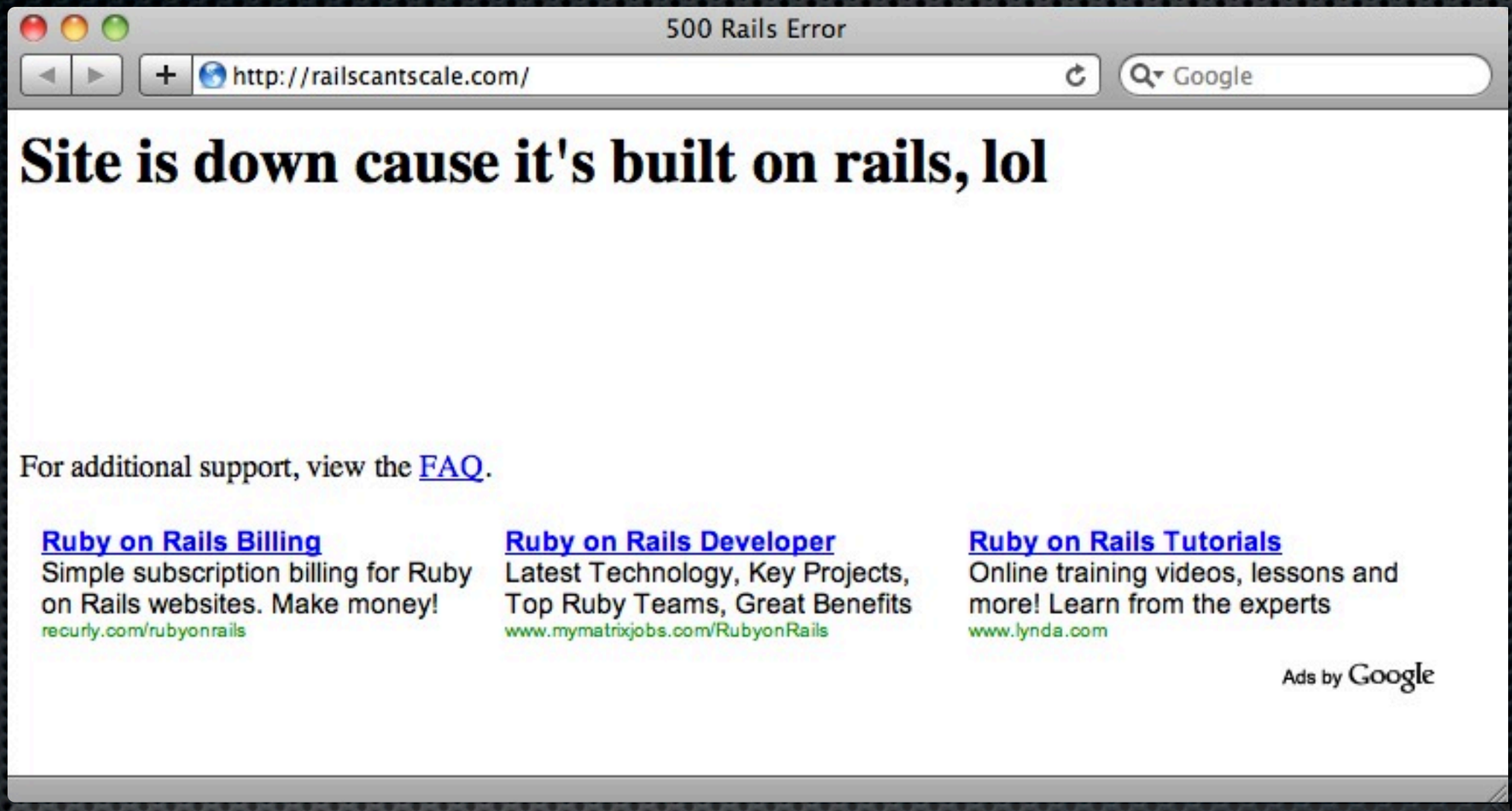
- March 2010 - Developer Advocate


500 Rails Error
http://railscantscale.com/
Google
Site is down cause it's built on rails, lol
For additional support, view the FAQ.
Ruby on Rails Billing
Simple subscription billing for Ruby on Rails websites. Make money!
recurly.com/rubyonrails
Ruby on Rails Developer
Latest Technology, Key Projects, Top Ruby Teams, Great Benefits
www.mymatrixjobs.com/RubyonRails
Ruby on Rails Tutorials
Online training videos, lessons and more! Learn from the experts
www.lynda.com
Ads by Google

Rails Can't Scale

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what does it mean?

Ruby ~~Rails~~ Can't Scale

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MySQL
~~Ruby~~ ~~Rails~~ Can't Scale

what does it mean?

insert straw man here

~~MySQL~~ ~~Ruby~~ ~~Rails~~ Can't Scale

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Mythbusting “scalability”

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- **scalability = bang for your buck (ROI)**

Scaling goes both ways

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- **Up** - high traffic, “Big Data”, multi-datacenter

Scaling goes both ways

twitter YAHOO! Google™

- **Up** - high traffic, “Big Data”, multi-datacenter
- **Down** - laptop, set-top, mobile

How do you scale?

How do you scale?

- Vertically - get bigger, expensive machines

How do you scale?

- Vertically - get bigger, expensive machines
- Horizontally - get more commodity machines

What is Riak?

(the horizontal scaling bits)

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  - masterless, peer-to-peer replication
  - consistent hashing
  - eventual consistency
  - failover - quorums, hinted handoff

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-- Ted Neward, 2004/6

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slippery slope

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slippery slope diminishing returns

Impedance mismatch

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- Object = identity, state, behavior, encapsulation

Pick your poison

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  - Active Record
- Make the database fit the objects
  - OODBMS, Graph DBs

Middle ground

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  - No JOINs - denormalized / composed
  - Loosely structured
  - Friendly transport formats, e.g. JSON

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- No SQL - query with Javascript Map-Reduce

“DevOps” - agile infrastructure

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programming your infrastructure

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programming your infrastructure
rapid “cloud” deployments

Befriend your sysadmin

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- Integrate with existing infrastructure

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- Reduce the amount of hands-on work

Befriend your sysadmin

- Integrate with existing infrastructure
- Reduce the amount of hands-on work
- Have a growth plan

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- Web-shaped storage
  - Store data in its original format
    - It's just HTTP - same techniques apply
      - load balancing, proxy caches, round-robin DNS
- No node is special - grow horizontally
- Get some sleep, fix it in the morning

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- Data-Shredding MapReduce Ninjas

http://downloads.basho.com/riak/

hg clone http://hg.basho.com/riak/

gem install ripple

git clone git://github.com/seancribbs/ripple.git

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- DELETE /riak/bucket/key (D)

CRUD Demo

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- </riak/bucket/key>; riaktag=”tag”

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- Example:

Link-walking

- GET /riak/bucket/key/[bucket,tag,keep]*
  - bucket = scope to a bucket
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    - keep = return results (last one always)
    - “_” means match anything
- Example:
  - GET /riak/artists/TheBeatles/albums,_,1/tracks,_,1

Links Demo

Riak Map-Reduce

I believe I did, Bob.

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- Some similarities to Hadoop and CouchDB
- High data-locality
- Phases can be Javascript or Erlang

Map-Reduce Terminology

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- **Phase:** a single map or reduce function application
- **Map:** phase applied to each item - filter, transform
- **Reduce:** phase applied to the collection - collate, aggregate, compute

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Map Built-ins

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- Riak.mapValuesJson

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  - Each can receive a static argument
  - Each can return intermediate results

Map-Reduce on HTTP

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- Job is a JSON object

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- POST /mapred

A simple M/R job

```
{“inputs”: “goog”,
 “query”: [{“map”:
          {“language”:”javascript”,
           “name”: “Riak.mapValuesJson”,
           “keep”: true}]}
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{“inputs”: “goog”,
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Riak::MapReduce.new(c).add(‘goog’).
     map(‘Riak.mapValuesJson’, :keep => true).run
```

Another M/R Job

```
{“inputs”: “stocks”,
 “query”: [{“map”:{“language”:”javascript”,
                   “name”: “App.extractTickers”,
                   “arg”: “GOOG”,
                   “keep”: false},
           {“reduce”:{“language”:”javascript,
                      “name”: “Riak.reduceMin”,
                      “keep”: true}]}
```

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Map-Reduce Demo

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- Dynamic finders

Ripple TODO

- **Associations**
- **Indexes**
- Use a property/method as the key
- Dynamic finders
- Session/cache stores

Ripple Demo

sean@basho.com

@seancribbs

“seancribbs” on Freenode IRC #riak

Questions?

http://wiki.basho.com

riak-users@lists.basho.com