Building Services With webmachine

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Chef

- Infrastructure as code
- Describe server config using Ruby DSL
- Client/Server. Nodes (your servers) run chef-client, talk to Chef server
- It's awesome.

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Chef Server API

- Merb, Ruby, Unicorn, Nginx
- Stateless, horizontally scalable
- Talks to
  - CouchDB,
  - authorization service (Erlang),
  - Solr

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Typical Chef Server API Request

1. User public key for authentication
2. Node data from CouchDB (median 22K, 3rd Qu. 44K)
3. Authoirzation check
4. POST, GET, PUT, DELETE

How much RAM should it use?

60 req/sec × 44K =
2.7MB

2.7MB data + code + copies... 27MB?

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100MB

Concurrency?
One request per worker.

204 MB

per unicorn worker

12 workers per server

8 servers

$12 \times 204\ MB = 2.4\ GB$

$8 \times 2.4\ GB =$

19.2 GB

for pulling JSON out of a database and returning it

What is webmachine?

- RESTful behavior "engine"
- Graphical Debugger
- Good performance
- Battle tested in commercial products

webmachine: Major Concepts

- Resources
- Callbacks
- Routes

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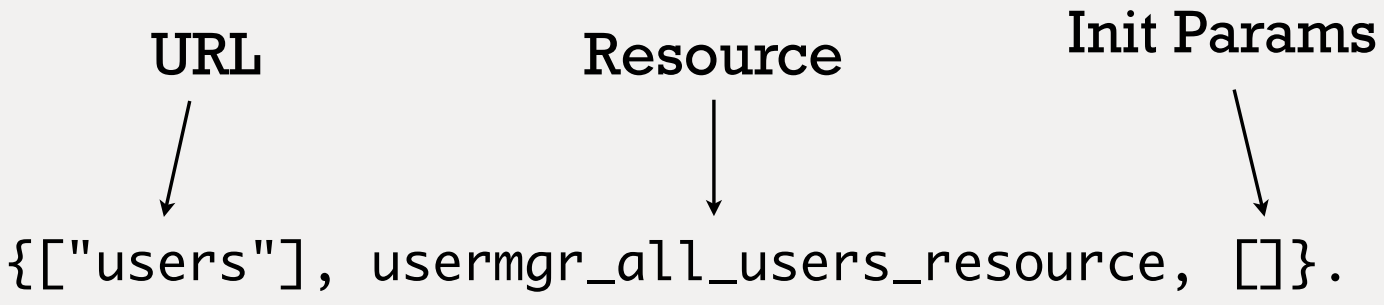
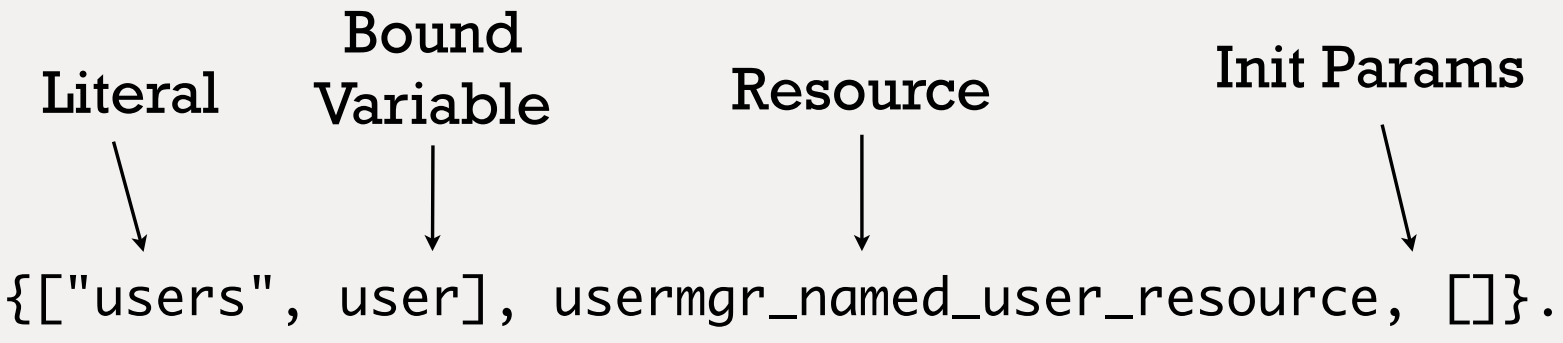
webmachine: Routes



webmachine: Routes



webmachine: Resources

- Corresponds to a single API endpoint
- Implemented as an Erlang module which...
  - Includes `webmachine.hrl`
  - Implements a public `init/1` function
  - .....at a minimum

webmachine: Callbacks

- Functions exported by the resource
- Each callback runs at a designated time
- ~ 30 possible callback functions
- Sane defaults automatically used

Code

Conditional GETs

- Reduces server-to-client traffic
- Improves performance
- **A REAL PAIN** with webmachine

Conditional GETs

```
-export([generate_etag/2]).
.
.
.

generate_etag(Req, #state{data=Data}) ->
    mochihex:to_hex(crypto:md5(Data)).
```

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Compressed Content

- Reduces traffic
- Faster data transmission times
- Snappier user experience
- **A TOTAL NIGHTMARE** with webmachine

Compressed Content

```
-export([encodings_provided/2]).
.
.
.

encodings_provided(Req, State) ->
    [{“gzip”, fun(X) -> zlib:gzip(X) end},
     {“identity”, fun(X) -> X end}].
```

Code

DRYing Up Endpoints

Boilerplate: A Cautionary Tale

You write a couple of endpoints and they work great.

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Your users are happy.

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Your boss is happy.

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You're happy.

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Life is **GOOD.**

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Then....

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The world wakes up and notices your app.

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User signups increase by an order of magnitude.

API use goes through the roof.

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Servers catch fire. Network connections are choked with traffic.

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Boilerplate: A Cautionary Tale

"We need to monitor API performance", you say to your team.

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"We'll instrument all the endpoints to log to graphite!"

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Boilerplate: A Cautionary Tale

Now you have **N** problems.

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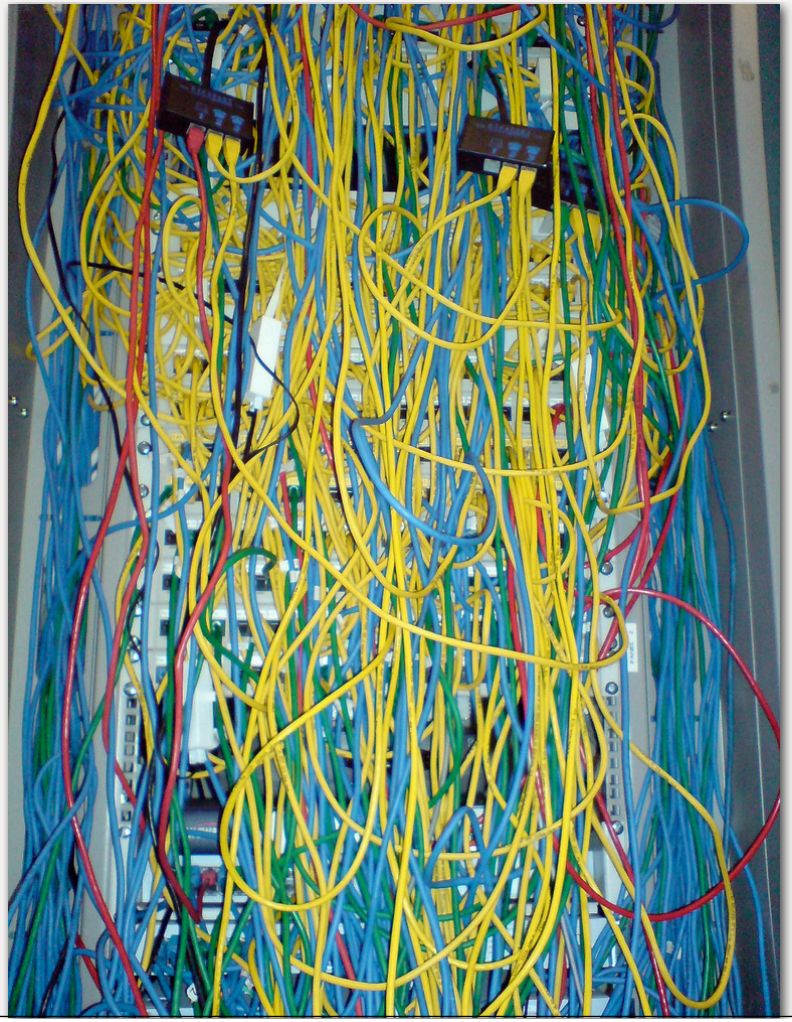

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Boilerplate Code Sucks

- Repetitive
- Copy pasta errors
- Repetitive
- PITA
- Repetitive

Introducing mixer

- Basic mixins for Erlang
- Reuse entire functions with minimal typing
- No runtime overhead (parse transform)
- Explicit and easy to reason about

Code

How did we do?

	Erlang	Ruby
idle	19MB	100MB
loaded	75MB	204MB

Erlang	Ruby
600MB	19.2GB

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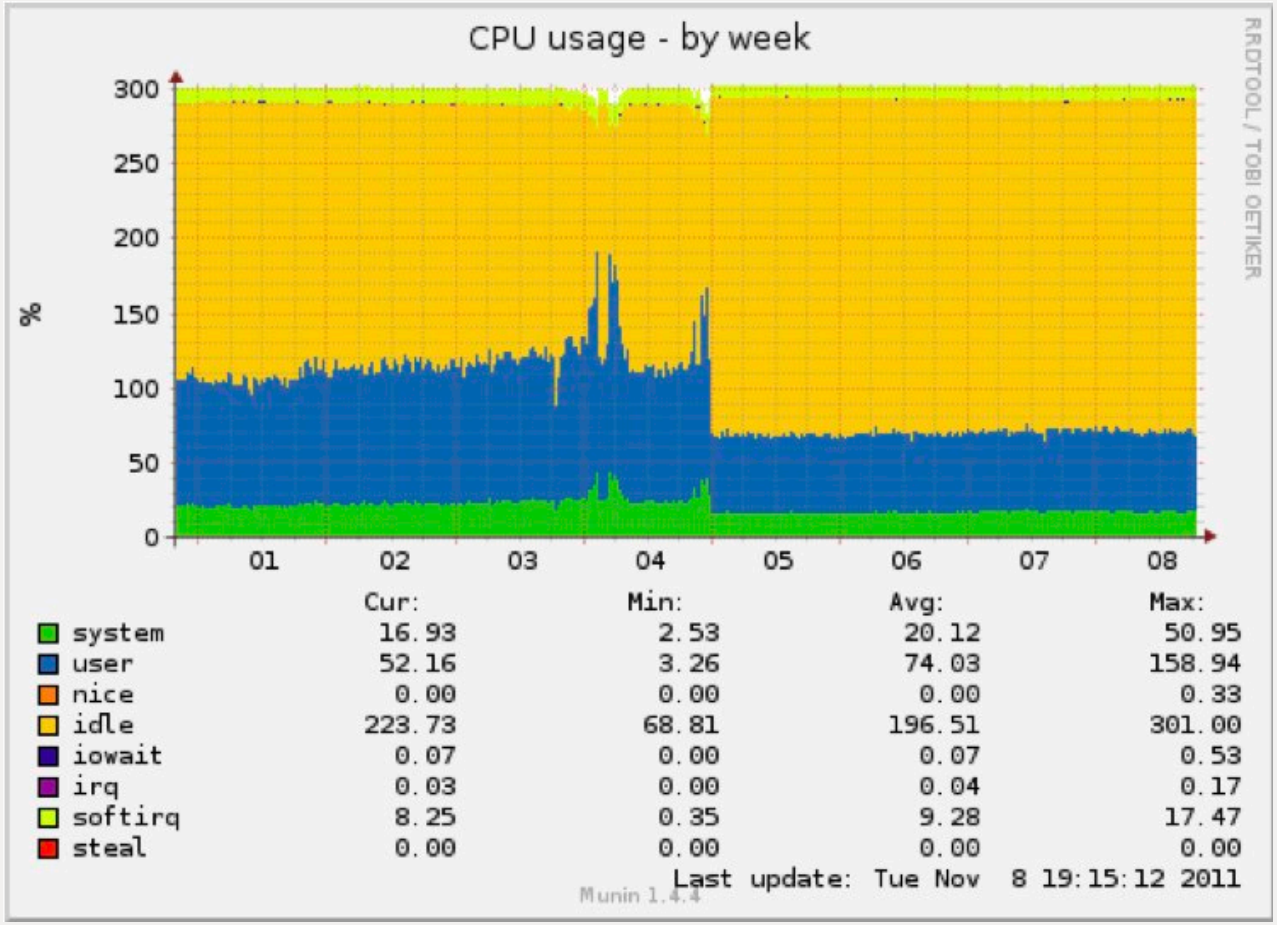
CPU Usage on Chef Server



Thank You

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