TorqueBox

Bob McWhirter

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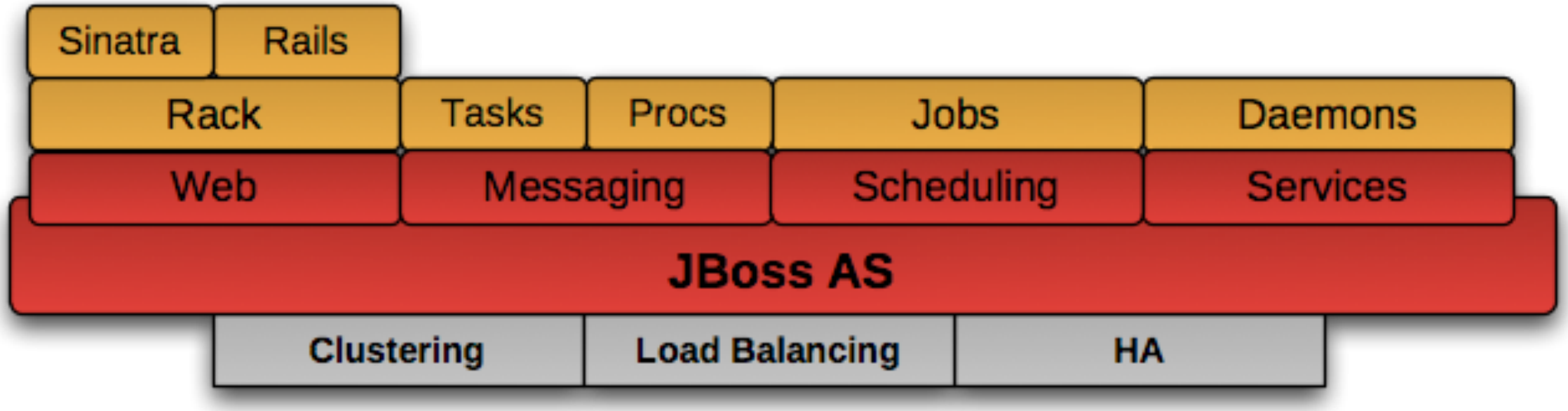
Bob McWhirter

- Project lead of TorqueBox
- JBoss Fellow
- Founder of The Codehaus
- Founder of Drools
- Been with Red Hat ~4 years

but it's a team.

What is TorqueBox?

The mating of **JRuby** to **JBoss AS**.


Sinatra
Rails
Rack
Tasks
Procs
Jobs
Daemons
Web
Messaging
Scheduling
Services
JBoss AS
Clustering
Load Balancing
HA

Goals

- Support Ruby web frameworks
  - Rails
  - Sinatra
  - Rack
- Go **beyond** the web
  - Messaging
  - Jobs
  - Services

But...

...Java already supports messaging, jobs and services.

That's right.

Why Ruby?

- No compilation
- Low ceremony
- Highly expressive
- Lots of shiny frameworks
- Few specifications (more fun!)
- Meta

Expressive

anything.rb

```
teams.
  collect(&:members).
  flatten.uniq.each &:promote!
```


Uhh...

com/foo/Anything.java

```
Set<Person> people = new HashSet<Person>();

for ( Team each : teams ) {
  people.addAll( each.getMembers() );
}

for ( Person each : people ) {
  each.promote();
}
```


Why *JRuby*

- Very fast runtime
- Real threads
- Java libraries
- Java tools
- Healthy community

Easy Install. Even on Windows

```
$ wget http://torquebox.org/torquebox-dev.zip
$ unzip torquebox-dev.zip

$ export TORQUEBOX_HOME=$PWD/torquebox-1*
$ export JBOSS_HOME=$TORQUEBOX_HOME/jboss
$ export JRUBY_HOME=$TORQUEBOX_HOME/jruby

$ export PATH=$JRUBY_HOME/bin:$PATH
```

Easy Install. Even on Windows

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Easy Install. Even on Windows

```
$ wget http://torquebox.or
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$ export TORQUEBOX_HOME=$P
$ export JBOSS_HOME=$TORQU
$ export JRUBY_HOME=$TORQUEBOX_HOME/jruby

$ export PATH=$JRUBY_HOME/bin:$PATH
```

Make sure the jruby found in your path is in $JRUBY_HOME/bin.

The Details

Builds upon and requires JBoss AS 6.x.

Tight integration with the JBoss stack.

The Competition

Warbler, Trinidad, Unicorn, Thin, Passenger...

...all address only the web question.

Web

Run Ruby web-apps within the context of the Servlet container.

Without compilation.

A rails application

```
RAILS_ROOT/
  app/
    models/
      person.rb
    views/
      person/
        index.html.haml
        show.html.haml
    controllers/
      persons_controller.rb
lib/
  my-java-components.jar
config/
  database.yml
  torquebox.yml
```


Deploy!

```
$ rake torquebox:deploy
```


But continue editing

Deployment does **not** create archives (by default).

Continue live-editing of running app:

models,**views**, **controllers**...

Non-surprising.

Almost boring.

Web (Java Integration)

```
class SomeController

  def index
    session[:password] = 'sw0rdfish'
  end

end
```


Web (Java Integration)

```
public class SomeServlet
{
  public void doGet(HttpServletRequest req,
                    HttpServletResponse resp)
  {
    request.getSession().getValue("password");
  }
}
```


Clustering

Ruby applications participate fully in AS clustering.

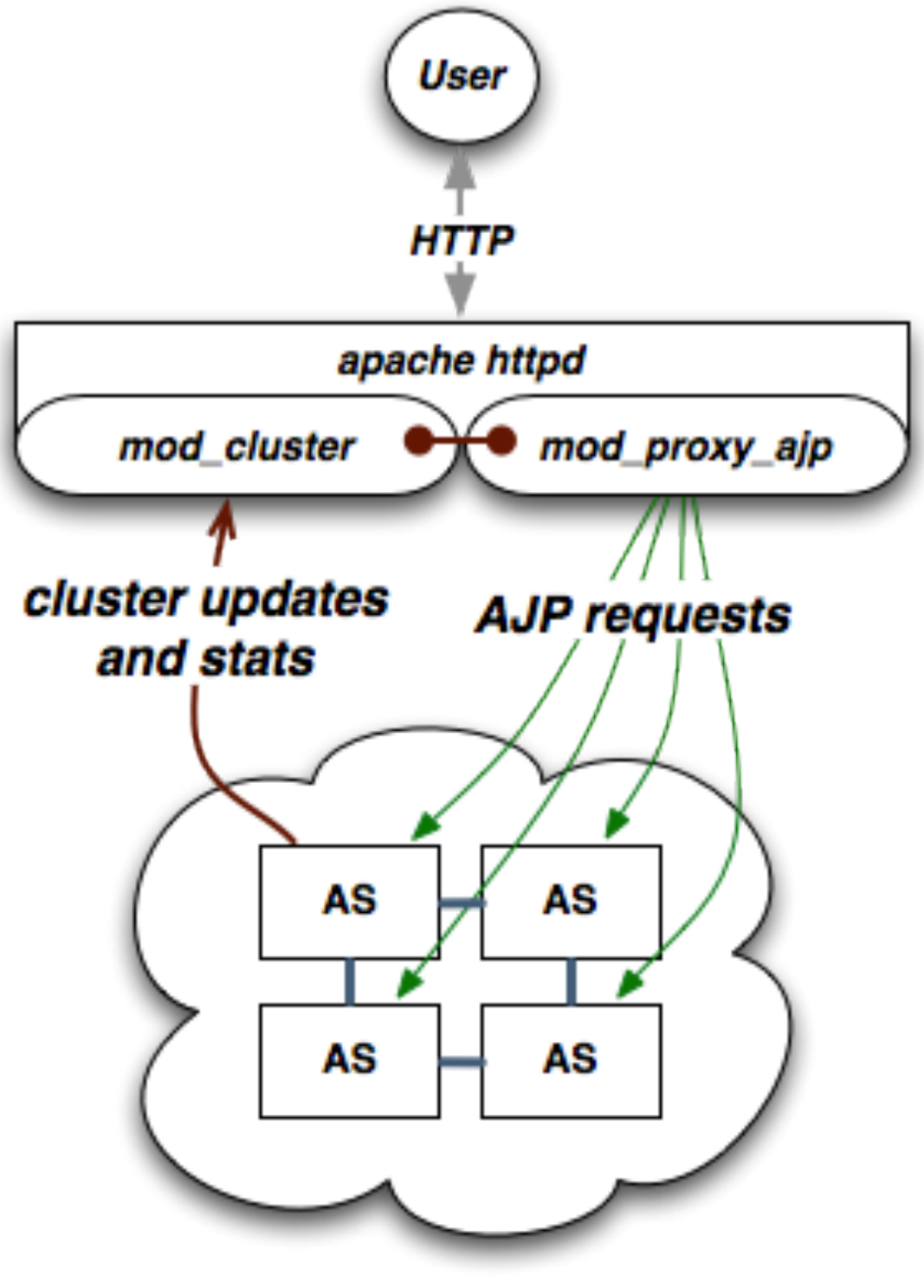
Can use JBoss **mod_cluster**.

mod_cluster

A reverse proxy implemented as an Apache module with JBoss awareness.

Constantly gathers load statistics and deployment availability for intelligent request distribution.

mod_cluster


User
HTTP
apache httpd
mod_cluster
mod_proxy_ajp
cluster updates
and stats
AJP requests
AS
AS
AS
AS

mod_cluster

- Dynamic configuration
- Server-side load factor calculation
- Fine-grained web app lifecycle
- AJP (Apache JServ Protocol) is optional. HTTP[S] is also supported.

Let's go *beyond* the web...

Scheduled Jobs

Jobs

app/jobs/newsletter_sender.rb

```
class NewsletterSender

  def run()
    subscriptions = Subscription.find(:all)
    subscriptions.each do |e|
      send_newsletter( e )
    end
  end

end
```


Jobs

config/torquebox.yml

```
jobs:
  monthly_newsletter:
    description: first of month
    job: NewsletterSender
    cron: '0 0 0 1 * ?'

  sandbox:
    job: Sandbox
    cron: '*/5 * * * * ?'
```


Messaging, Part 1
(async tasks)

Tasks

app/tasks/email_task.rb

```
class EmailTask < TorqueBox::Messaging::Task

  def welcome(payload)
    person = payload[:person]
    person ||= Person.find_by_id(payload[:id])
    if person
      # send the email
      person.welcomed = true
      person.save!
    end
  end

end
```


Tasks

```
EmailTask.async(:welcome, payload )
```


Tasks

Call them from your **controllers**, **models**, and **observers**, or even other **tasks**. Even in non-Rails apps!

Messaging, Part 2 (backgroundable)

Regular Class

```
class Something

  def foo()
  end

  def bar()
  end

end
```


Blocking invocations

```
something = Something.new

something.foo

something.bar
```


Backgroundable

```
class Something

  include TorqueBox::Messaging::Backgroundable

  def foo()
  end

  def bar()
  end

end
```


Non-blocking invocations

```
something = Something.new

something.background.foo

something.background.bar
```


Choices

```
class Something

  include TorqueBox::Messaging::Backgroundable
  always_background :foo

  def foo()
  end

  def bar()
  end

end
```


Just do it right.

```
something = Something.new

something.foo
```


Messaging, Part 3 (low-level)

Destinations

config/torquebox.yml

```
queues:
  /queues/questions:
  /queues/answers:
    durable: false
topics:
  /topics/new_accounts
  /topics/notifications
```


Processors

config/torquebox.yml

```
messaging:
  /topics/print: PrintHandler
  /queues/popular:
    - PopularHandler
    - AdultObserver:
        filter: "age >= 18"
        concurrency:  5
/queues/students:
  PrintHandler:
    config:
      color: true
```


Processors

app/models/print_handler.rb

```
include TorqueBox::Messaging

class PrintHandler < MessageProcessor
  def initialize(opts)
    @color = opts['color']
  end
  def on_message(body)
    puts "Processing #{body} of #{message}"
  end
end
```


Queues

example

```
include TorqueBox
req = Messaging::Queue.new '/queues/questions'
res = Messaging::Queue.new '/queues/answers'

Thread.new do
  req.publish "What time is it?"
  puts res.receive( :timeout => 1000 )
end

puts req.receive
res.publish Time.now
```


Queues

example

```
include TorqueBox
req = Messaging::Queue.new '/queues/questions'
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Queues

example

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include TorqueBox
req = Messaging::Queue.new '/queues/questions'
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end

puts req.receive
res.publish Time.now
```


Queues

“on the fly”

```
include TorqueBox

queue = Messaging::Queue.new '/queues/foo'
queue.create
  ...
queue.destroy
```


Topics

- behavior is different, but interface is the same.
- all subscribers of a **topic** see each message, but only one subscriber will see any message from a **queue**
- use TorqueBox::Messaging::Topic

Services

run along, lil’ daemon

Services

Long-running, non-web “daemons” that share the runtime environment and deployment lifecycle of your app.

Services

- Represented as a class with optional `initialize(Hash)`, `start()` and `stop()` methods, which should each return quickly.
- Typically will start a long-running loop in a thread and respond to external events.

Services

config/torquebox.yml

```
services:
  IrcBot:
    server: freenode.net
    channel: #torquebox
    publish: /topics/irc

MyMudServer:

SomeOtherService:
```


Services

app/{models,etc}/my_service.rb

```
class MyService
  def initialize opts={}
    name = opts[:publish]
    @queue = Messaging::Queue.new(name)
  end
  def start
    Thread.new { run }
  end
  def stop
    @done = true
  end
end
```


Services

app/{models,etc}/my_service.rb

```
class MyService
  def initialize opts={}
    name = opts[:publish]
    @queue = Messaging::Queue.new(name)
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    @done = true
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end
```


Services

app/{models,etc}/my_service.rb

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class MyService
  def initialize opts={}
    name = opts[:publish]
    @queue = Messaging::Queue.new(name)
  end
  def start
    Thread.new { run }
  end
  def stop
    @done = true
  end
end
```


Services

app/{models,etc}/my_service.rb

```
class MyService
  def initialize opts={}
    name = opts[:publish]
    @queue = Messaging::Queue.new(name)
  end
  def start
    Thread.new { run }
  end
  def stop
    @done = true
  end
end
```


Services

app/{models,etc}/my_service.rb

```
class MyService
  def run
    until @done
      @queue.publish(Time.now)
      sleep(1)
    end
  end
end
```


Services

app/{models,etc}/my_service.rb

```
class MyService
  def run
    until @done
      @queue.publish(Time.now)
      sleep(1)
    end
  end
end
```


Caching

~~Caching~~ NoSQL

Integration with **JBoss**

Infinispan, a distributed/ replicated object store.

Transparent Infinispan

Easily used for all of the implicit caching within Rails.

Replace in-memory, or **memcached** caches.

Opaque Infinispan

```
include ActiveSupport::Cache

myCache = TorqueBoxStore.new(:name => 'MyCache',
                             :mode => :replicated,
                             :sync => true)
```


INJECTION

(we must go deeper)

Injection?

Letting the container figure out how to help you wire up complex component models.

aka

Inversion of Control

Guice, PicoContainer, JBoss Microcontainer

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Java CDI

```
package com.mycorp;

@ApplicationScoped
class Something {
   @Inject
   private Else elsewise;
}

@ApplicationScoped
class Else {

}
```


CDI Injection

```
class MyService
  def initialize opts={}
    @thing = inject(com.mycorp.Something)
  end
end
```


CDI Injection

```
class MyService
  def initialize opts={}
    @thing = inject(com.mycorp.Something)
  end
end
```


But there's more than just CDI you can inject. There's also heroin, queues, topics and other things.

But *not really* heroin.

(Drugs are bad, m'kay?)

Destination Injection

```
class MyService
  def initialize opts={}
    @inbound  = inject( "/topics/questions" )
    @outbound = inject( "/queues/answers" )
  end
end
```


Destination Injection

```
class MyService
  def initialize opts={}
    @inbound  = inject( "/topics/questions" )
    @outbound = inject( "/queues/answers" )
  end
end
```


JNDI Injection

```
class MyService
  def initialize opts={}
    @factory = inject("java:comp/env/jdbc/myDS")
  end
end
```


JNDI Injection

```
class MyService
  def initialize opts={}
    @factory = inject("java:comp/env/jdbc/myDS")
  end
end
```


JBossMC Injection

```
class MyService
  def initialize opts={}
    @heroin = inject( "SomeMCBean" )
  end
end
```


JBossMC Injection

```
class MyService
  def initialize opts={}
    @heroin = inject( "SomeMCBean" )
  end
end
```


Why MC Beans?

All internal plumbing of **JBoss AS** is stitched together using MC.

Grab the **`WebServer`**, the **`CacheManager`**, whatevs.

But that's not all!

BackStage

Dashboard to inspect and control Ruby components.

And a RESTful API.

TorqueBox::Backstage

Apps | Queues | Topics | Msg. Processors | Jobs | Services

Name	App	Status	Messages	Delivering
ExpiryQueue	n/a	Running	0	0
DLQ	n/a	Running	0	0
/queues/a-kitchen-sink-queue	n/a	Running	7	0
MessageProducerTask	kitchen-sink	Paused	0	0
Backgroundable	kitchen-sink	Running	0	0

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StompBox

Easy **Heroku**-esque `git`-based deployments.

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Stomp Box :: Dashboard

Repositories Managed

ballast-sinatra
master →

ballast-sinatra
test →

buyappalachian.org
torquebox →

Pushes Received

	Date	Status	Commit	Reposit
Push	February 09 - 16:13	received deploy	2dee90f	buyappala

Commits

Lance
fb656070c7e8370d1ca8ccd47b9392fc26ce20b6
2011-02-09T13:12:20-08:00
Add tmp dir for auto deployment

Lance
2dee90fff7d87821126734889623e7cd9a06bd76
2011-02-09T13:12:50-08:00
Merge branch 'torquebox' of github.com:lance/buyappalachian.org into torquebox

Push	February 09 - 14:44	undeployed deploy	351e092	buyappala

Commits

Lance Ball
351e0923cc9fe021b28b98011239115c3c95ca78
2011-02-09T11:44:45-08:00
Use specific liquid version

Push	February 08 - 16:53	undeployed deploy	012e814	buyappala

Commits

Lance Ball

But how does it perform?

BENchmarks

Real-world Rail application:

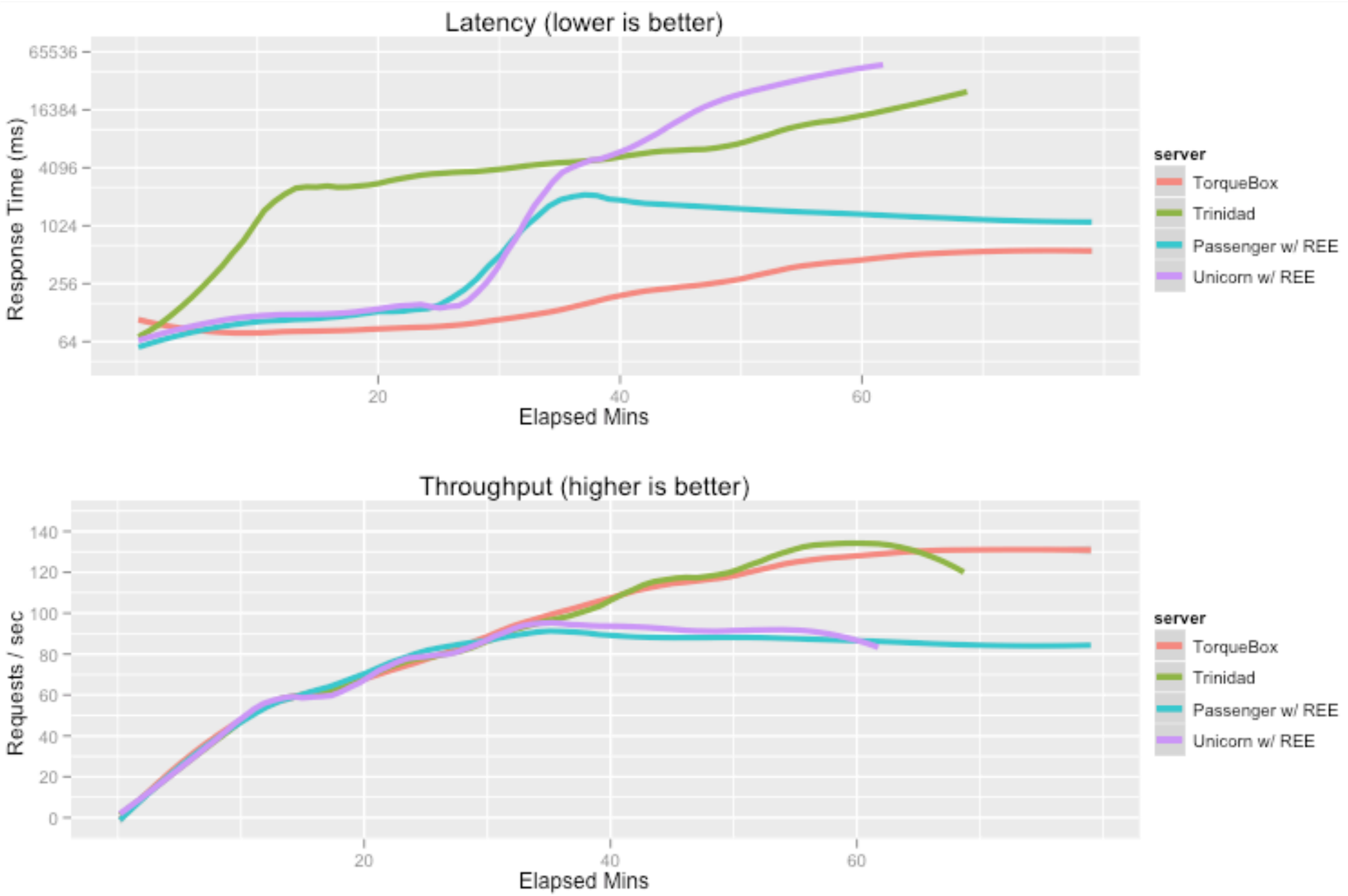
Redmine

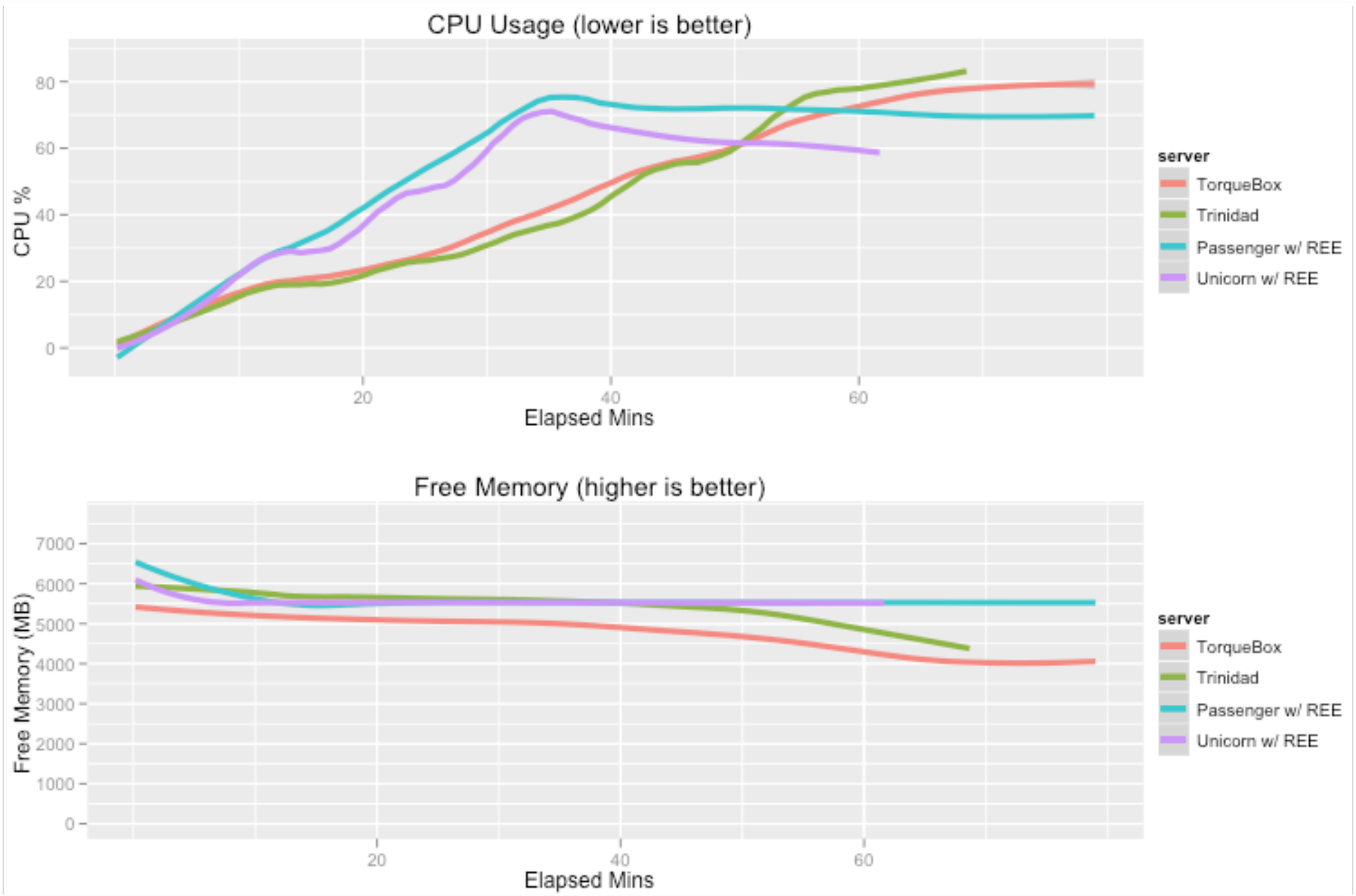
Comparisons:

TorqueBox, Trinidad, Passenger, Unicorn, Glassfish, Thin

Runtimes:

JRuby, MRI, RubyEE


Latency (lower is better)
Response Time (ms)
65536
16384
4096
1024
256
64
20
40
60
Elapsed Mins
server
TorqueBox
Trinidad
Passenger w/ REE
Unicorn w/ REE
Throughput (higher is better)
Requests / sec
140
120
100
80
60
40
20
0
20
40
60
Elapsed Mins
server
TorqueBox
Trinidad
Passenger w/ REE
Unicorn w/ REE


CPU Usage (lower is better)
CPU %
80
60
40
20
0
20
40
60
Elapsed Mins
server
TorqueBox
Trinidad
Passenger w/ REE
Unicorn w/ REE
Free Memory (higher is better)
Free Memory (MB)
7000
6000
5000
4000
3000
2000
1000
0
20
40
60
Elapsed Mins
server
TorqueBox
Trinidad
Passenger w/ REE
Unicorn w/ REE

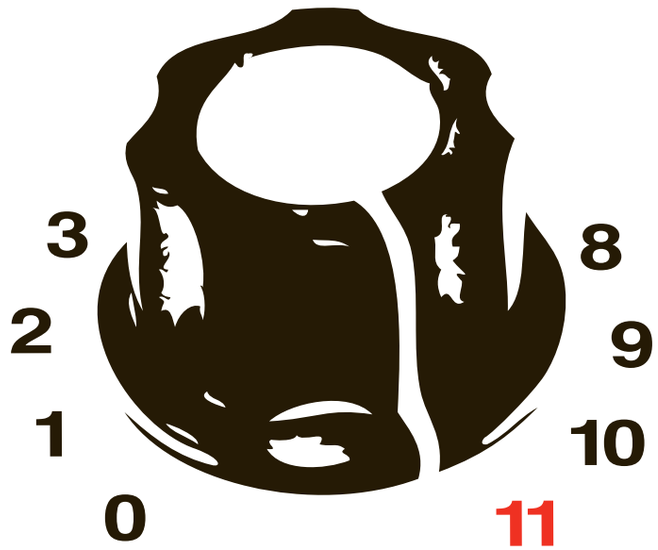
Roadmap

AS7
Authentication
Transactions
Drools/jBPM/etc
Mobicents

Resources

- http://torquebox.org/
- http://github.com/torquebox
- #torquebox on FreeNode
- @torquebox

Thanks, and don't forget to pick up some stickers.



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