Instant Websites using Ruby on Rails

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CoolTech Club
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Tonight's Discussion

- What is Ruby On Rails?
- Why would you use Ruby on Rails?
- What class of applications is is appropriate for?
- How does it differ from other approaches?

Zvents

- Concept to market 6 months/one programmer
- No performance issues
- Highly satisfied
- We’re hiring!

What is Ruby On Rails?

- What is Ruby?
  - Programming language
  - “successful combination of SmallTalk’s conceptual elegance, Python’s ease of use and learning, and Perls’ pragmatism”
    - Curtis Hibbs
- What is Ruby on Rails
  - A framework for developing web applications
  - Written in Ruby

Why Ruby?

- Interpreted, dynamic, flexibly typed language
- Easy to learn and maintain
- Single Inheritance + Mixins
- “Duck Typing”
- Language stays out of the way

Duck Typing

- “If it walks like a duck, and quacks like a duck, it’s duck”
- If an object responds to a message, it’s of an appropriate type.
- Method calls are viewed as messages
- Undefined methods can be handled by the object

Inheritance/Extending

- Single Inheritance
- Can mixin modules
  - Effectively multiple inheritance
- You can add methods to any class
  - String, Date, Thread
  - This is not extending the class, this modifies the original class for everyone!

Why Not Ruby?

- Performance
  - Similar to Perl and Python
  - This is not an issue for many websites.
- Threading model
  - Does not use native threads

Ruby on Rails

- Extremely productive web application framework developed by David Heinemeier Hansson
- MVC (Model / View / Controller)
- Open-source
- Low learning curve
  - A working app in literally minutes
- Version 1.0

Framework Means…

- Rails builds a skeleton, and you flesh it out.
- All layers designed to work together
- Many decisions are made for you.
  - Convention over Configuration
  - This is a good thing for new applications, but can be a bit of a burden if you need to adapt to legacy systems.

Convention over Configuration

- Manual configuration replaced with convention and reflection
  - Your data schema and code is the configuration
- Less configuration files, no compilation – changes take effect immediately (in development – restart required to pick up some changes in production)

What does Rails Do?

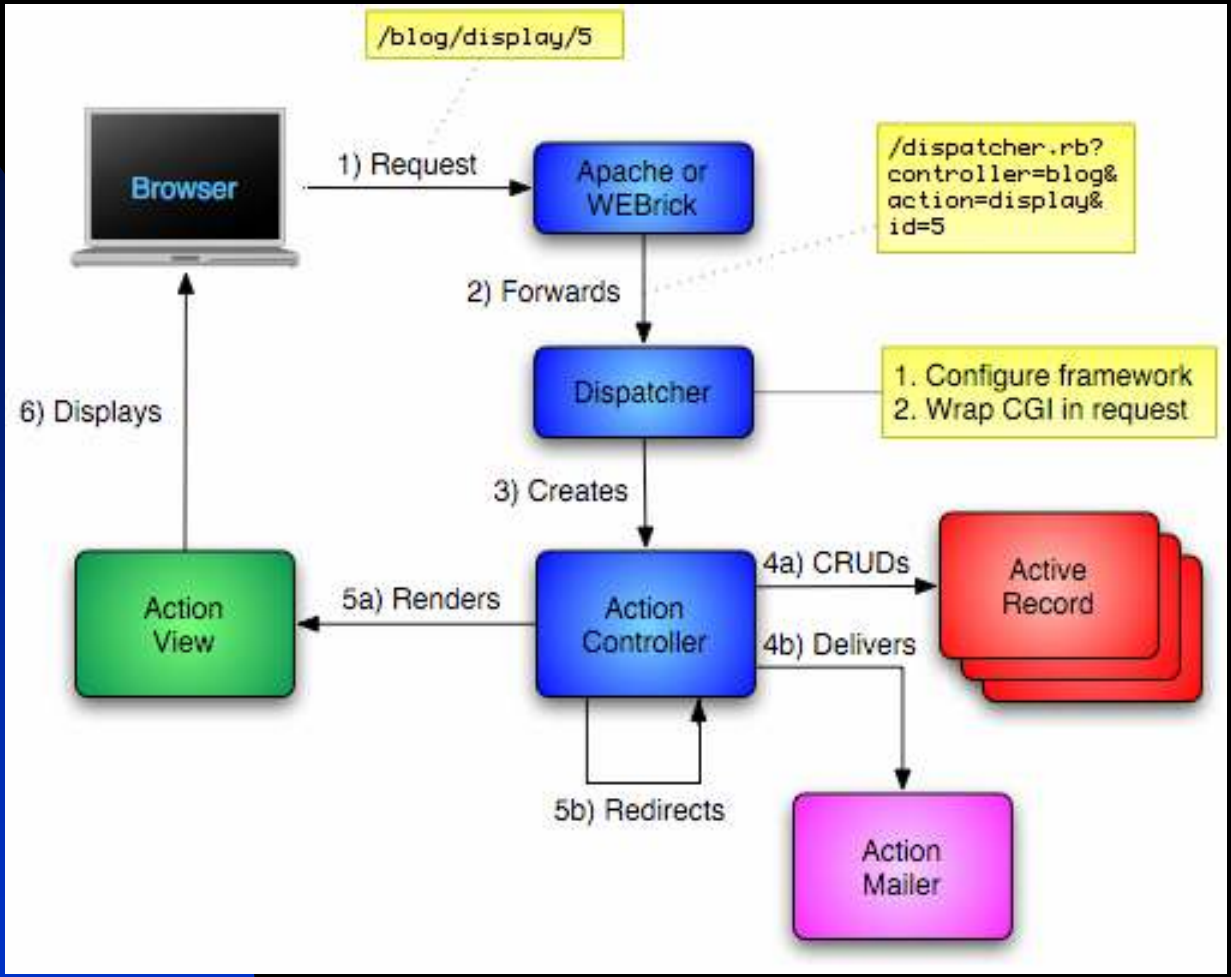
- It covers almost all of what you need to do for a typical web app, from creating the app, through deployment.

Some of what Rails does

- Builds The MVC Application Skeleton
- Code Generation
- ORM
- UI
  - Templates
  - Javascript/Ajax Helpers
- Logging
- Deployment
- Testing/Benchmarking, etc.

MVC Application

- Rails generates a nicely laid out MVC application
- Saves wasting time on deciding how to build the app.
- Generates code/scaffolding for Models/Views/Controllers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Browser
1) Request
Apache or WEBrick
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1. Configure framework
2. Wrap CGI in request
6) Displays
3) Creates
Action View
5a) Renders
Action Controller
4a) CRUDs
Active Record
4b) Delivers
5b) Redirects
Action Mailer

Getting started

- Generate an application skeleton with one command:

```
$rails ctc
```

```
create  app/controllers
create  app/helpers
create  app/models
create  app/views/layouts

…
```

- Start the web server (Rails comes with one bundled)

```
$ ruby script/server
```

Getting started

- Connect with your browser http://localhost:3000/
- Create a 'Hello World' page:

```
$ rm public/index.html
$ ruby script/generate controller welcome
$ vi app/views/welcome/index.html
```

- Make the welcome page the default route

```
$ vi config/routes
```

- Set up your databases

```
$ vi config/database.yml
```

Rails Environments

- Rails has 3 environments
  - Development
  - Test
  - Production
- Always running within the context of one of these environments
- Determines database
- Affects behavior of framework (e.g., mail delivery and caching disabled in test, etc.)

Database/ORM

- ActiveRecord
  - Dynamically mapped from the database
  - Maps in-memory Ruby objects to persistent database store
  - Unlike hibernate, schema definition is not duplicated in code.

Creating a Model Object

```
$ ruby script/generate model Commercial
      exists  app/models/
      exists  test/unit/
      exists  test/fixtures/
      create  app/models/commercial.rb
      create  test/unit/user_test.rb
      create  test/fixtures/commercials.yml
```

What do we get?

- Empty class or surprising functionality?

```
class Commercial < ActiveRecord::Base
end
```

- Automatically mapped to users table using pluralization rules

```
CREATE TABLE commercials (
  id INT(32) UNSIGNED NOT NULL AUTO_INCREMENT,
  firstname CHAR(64)  DEFAULT “”,
  lastname CHAR(64)  DEFAULT “”,
  PRIMARY KEY(id)
);
```

```
$ ruby script/console
> c = Commercial.new
=> #<Commercial:0x392d660
   @attributes={“id"=>nil, “firstname"=>"“,
   “lastname"=>""}, @new_record=true>
>> quit
```

- script/console allows you to access Rails objects from the command line
- Same mechanism can be used to scripts within the Rails environment

Extending Model Objects

- Add methods to model class

```
class Commercial < ActiveRecord::Base
    def full_name
      return self.firstname + " " + self.lastname
    end
end
```

- Model methods determine how you (programmer) interact with model objects

Assocations

- Define the relationship between objects

```
class Commercial < ActiveRecord::Base
  has_many :comments
end

class Comment < ActiveRecord::Base
  belongs_to :commercial
end
```

Assocations

- Adds methods to access associated objects

```
commercial = Commercial.find(id)
commercial.comments.each{|c|
  puts c.name
}
```

- Can model one-to-one, many-to-one and many-to-many relationships

Validations

- Specify constraints on the object
- Object can't be saved if not valid
- Built-in validations
  :validates_presence_of
  :validates_length_of
  :validates_uniqueness_of
  :validates_format_of
  …
- Define your own named validations
- Arbitrary code in validation method

Callbacks

- Automatically execute code on object lifecycle events (create, validate, save, update, destroy)
- Before and After hooks

  before_save

  after_save

  before_destroy

  after_destroy

  …

Callbacks

```
class Commercial < ActiveRecord::Base
    def before_create
            self.created_at ||= Time.now
    end

    def before_update
            self.updated_at ||= Time.now
    end
end
```

Transaction Support

- Database transaction support

```
Account.transaction do
        david.withdrawal(100)
        mary.deposit(100)
end
```

- Database and model object transactions

```
 Account.transaction(david,mary) do
     david.withdrawal(100)
     mary.deposit(100)
 end
```

Finding Objects

- Find by id

  Commercial.find(id)

- Dynamic finders

  Commercial.find_by_name(“monster.com”)

  Commercial.find_all_by_name(“monster.com”)

- Find By SQL

  Commercial.find_by_sql(“SELECT * FROM commercials WHERE name = ‘monster.com’”)

Finding Objects

- Complex finders with eager loading

```
name = some_dynamic_value
Commercial.find(:all, :conditions => [“name = ?”,
    name], :include => :comments, :order =>
    “created_at DESC”)
```

- Finds can be scoped to an association

```
c = Commercial.find(1)
c.comments.find(:all, :conditions =>
    [“created_at > ?”, Time.now – 1.day])
```

Find works on associations too

- Same finder can be used to search for objects scoped to a specific association

```
c = Commercial.find(1)
c.comments.find(:all, :conditions =>
    [“created_at > ?”, Time.now – 1.day])
```

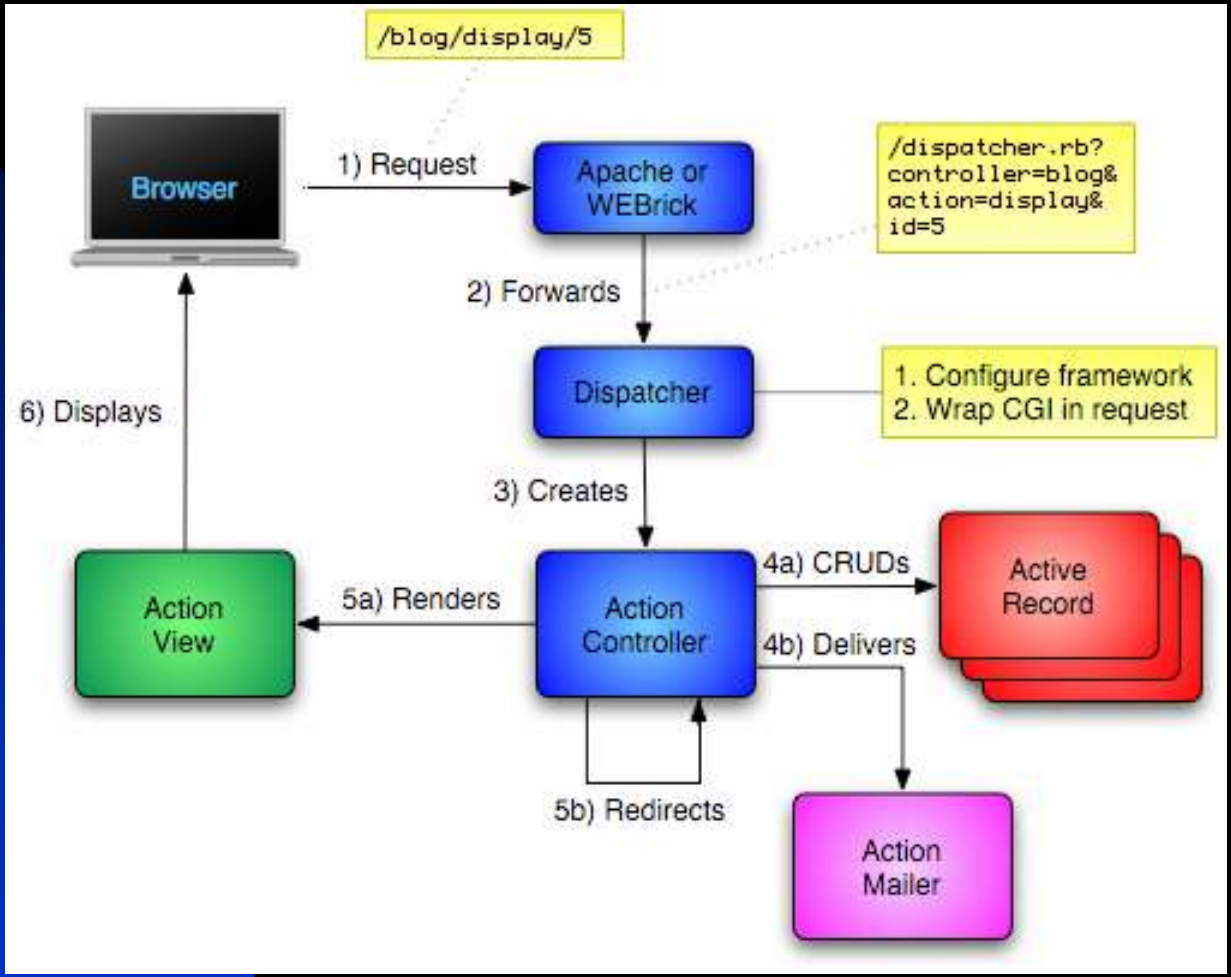
Controller

- Handles incoming requests to web application
- May interact with model object(s) if necessary to satisfy this request
- Renders a view which is sent back as a response
- Controller methods define how a user interacts with application

Controller

```
class CommercialController < ActionController::Base
    def show
        @commercial = Commercial.find(@params['id'])
    end

    def delete
        @commercial = Commercial.find(@params['id'])
        @commercial.destroy
    end
end
```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Creating Controller and View

- `ruby script/generate scaffold Meeting`
- Builds a controller and several views
- Basic CRUD Application

Views

- Generates HTML/XML/Email that is sent back to in response to a request
- RHTML templates very similar is concept to ASP and JSP
- Helpers make Javascript and AJAX easy to use
- Rails comes bundled with prototype.js and script.aculo.us libraries

Views

app/views/commercial/show.rhtml:

```
<h1>Commercial: <%= @commercial.name %></h1>
<% for comment in @commercial.comments %>
    <%= comment.text %><br/>
<% end %>
```

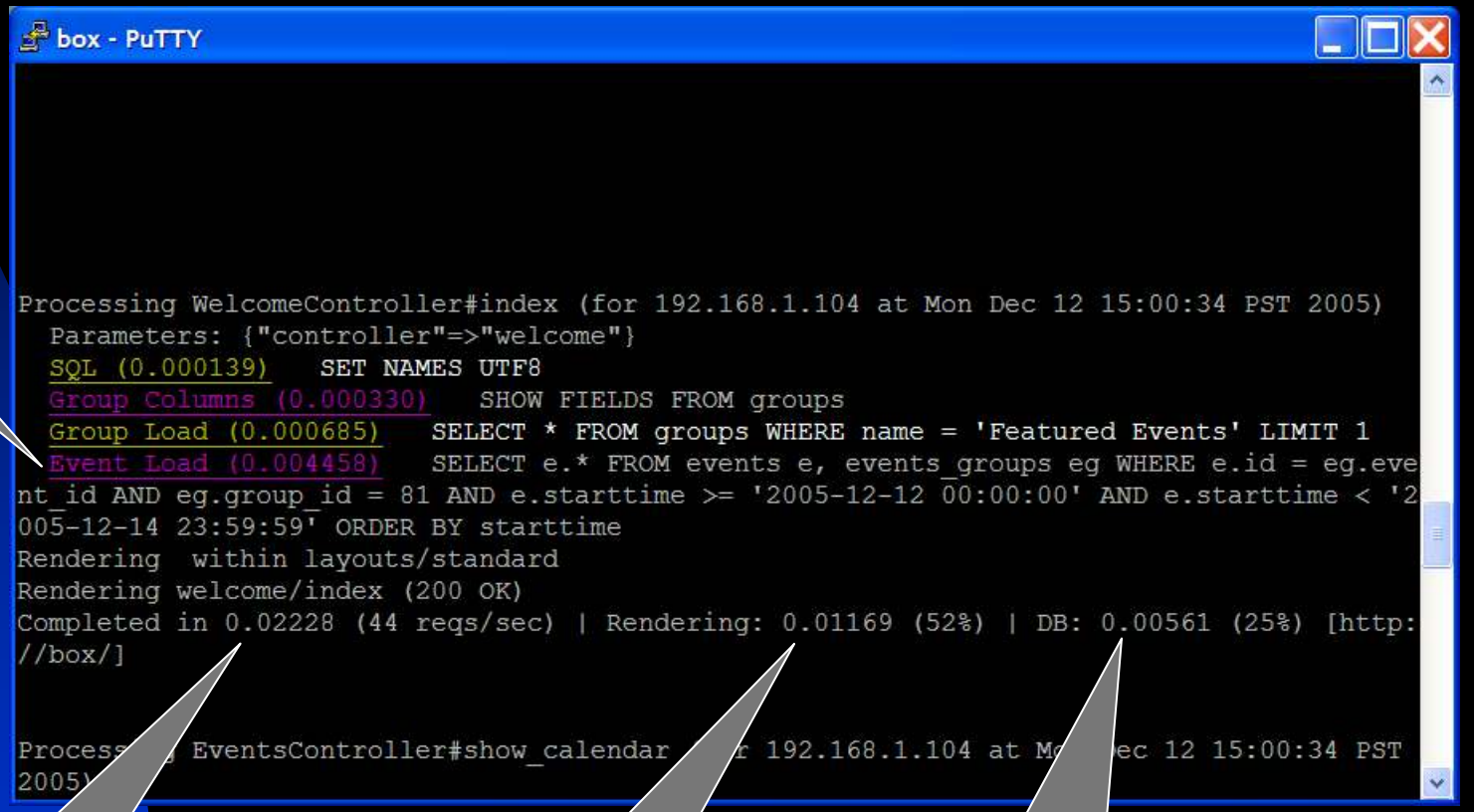
- Where's the rest of the page with the <HTML> and <BODY> tags?
  - Layouts wrap the view

Logging

- Rails logs provide a wealth of information out of the box
- Log levels adjusted depending on current Rails Environment

Log File

Execution times for all SQL.



Total page time

Render time

Total DB time

Breakpoints

- Breakpoints can be inserted anywhere in your code path
- Connect to the breakpoint by running:

```
$ ruby script/breakpointer
```

Testing

- Rails includes test framework
- Rails generates test code skeleton
- Unit and functional tests
- Simulated HTTP
  - get :index, post :update_password
  - assert_response :success
- Fixtures
- Mock Objects

Mock Objects

- Mock objects can be very easy, using Ruby

```
require 'models/purchase_order'
class PurchaseOrder
  def accept
    return true
  end
end
```

Use the real object

Override only the methods you need to.

Simple Code Statistics

- rake stats
- Delivers simple code stats including:
  - LOC
  - Class and Method counts
  - Test to code ratio

Web Services

- Built-in mechanism to deliver SOAP and XML/RPC web services
- Basically as easy as writing a controller
- Roll your own REST API using XML builder templates instead of the standard RHTML templates

Automated Deployment

- Switchtower is Rails' Deployment Tool
- Deploys code directly out of your repository
- Database migrations
- Transactional
- Can roll back changes, if necessary

Is that it?

- There's MUCH more, but we don't have time for it tonight:
  - Cookies and session management
  - Caching
  - Pagination
  - Form helpers
  - ActionMailer
  - AJAX helpers
  - Etc.

Why Use Ruby on Rails?

- Agile
  - Fast Time to Market
  - Quick changes
  - Quick to Learn
- Complete solution
  - Don’t have to worry about
    - What will I do for logging, deployment, testing….

Why Not Use Rails?

- CPU speed
  - Ruby is currently not a fast language
  - Neither was Java when it started
  - Bottleneck in many web apps is database or IO bandwidth
  - If your app is CPU bound Ruby may not be the right choice
- If your app is not a good fit with the framework

Documentation

- Buy The Books

- There is much less good online documentation than there is with Java.

Try it yourself!

- Download and install
  - http://rubyonrails.org/
- Watch the videos
  - http://rubyonrails.org/screencasts

Reminder

- Did I mention that we're hiring?