

# Play vs. Grails Smackdown

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## Changelog

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September 24, 2013: Updated **statistics** for **JavaOne**.

March 24, 2013: Updated **statistics** and **load tests** for **Devoxx France**.

June 24, 2012: **Play Performance Fix**.

June 19, 2012: Published for **ÜberConf**.

# Why a Smackdown?

Play 2 and Grails 2 are often hyped as the **most productive** JVM Web Frameworks.

*\* We wanted to know how they enhanced the Developer Experience (DX).*

# Happy Trails Requirements

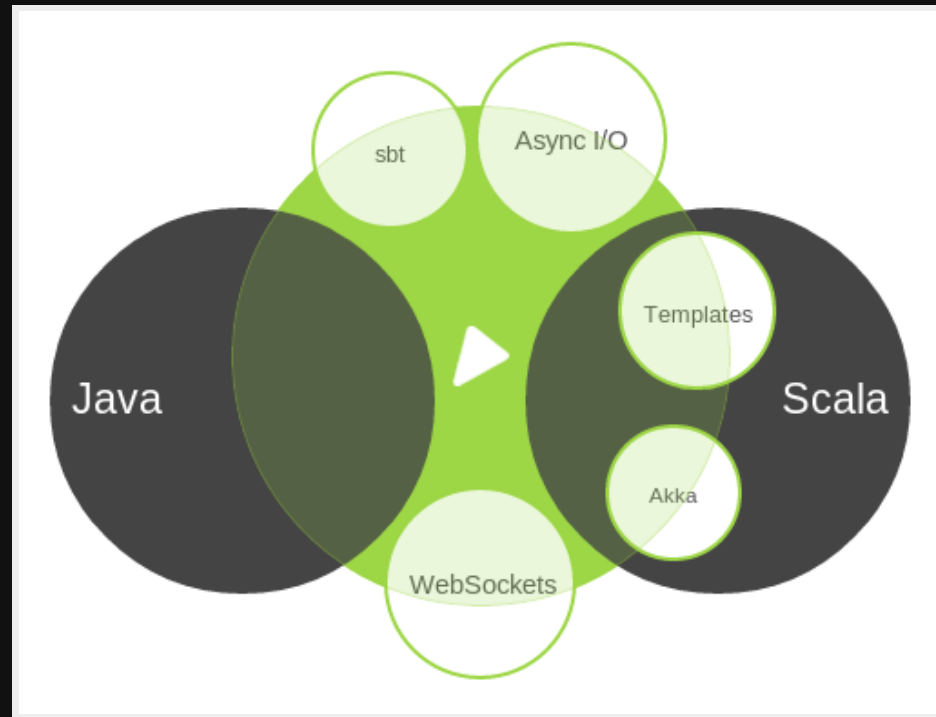
- Server-side Templates
- Play 2 with Java
- Form Validation
- Data Pagination
- Authentication
- Scheduled Jobs
- Atom / RSS
- Email Notifications
- Unit / Integration Tests
- Load Tests
- Performance Tests

Stretch Goals: Search, Photo Upload to S3

# Our Schedule

- Week 1 - Data Model Definition
- Week 2 - Data Layer & URL Design
- Week 3 - Controllers & Auth
- Week 4 - Views
- Week 5 - Misc Polish

# Intro to Play 2



*“Play Framework is based on a lightweight, stateless, web-friendly architecture. Built on Akka, Play provides predictable and minimal resource consumption (CPU, memory, threads) for highly-scalable applications.”*

# My Top 10 Favorite Features

1. Just hit refresh workflow
2. Type safety
3. RESTful
4. Stateless
5. Reactive
6. Asset Compiler
7. First-class JSON
8. Java & Scala
9. Templates in Activator
10. LinkedIn, Gawker, etc

# Intro to Grails 2



## GRAILS

the search is over.



**RAPID**

Have your next Web 2.0 project done in weeks instead of months. Grails delivers a new age of Java web application productivity.

**DYNAMIC**

Get instant feedback, see instant results. Grails is the premier dynamic language web framework for the JVM.

*“ Powered by Spring, Grails outperforms the competition. Dynamic, agile web development without compromises. ”*

# My Top 10 Favorite Features

1. Documentation
2. Clean URLs
3. GORM
4. IntelliJ IDEA Support
5. Zero Turnaround
6. Excellent Testing Support
7. Groovy
8. GSPs
9. Resource Optimizer
10. Instant Deployment on Heroku

# Our Setup

- **IntelliJ IDEA** for Development
- **GitHub** for Source Control
- **CloudBees** for Continuous Integration
- **Heroku** for Production

Later added: QA Person and BrowserMob

# Code Walk Through

We developed the same app, in similar ways, so let's look at the different layers.

- **Database**
- **URL Mapping**
- **Models**
- **Controllers**
- **Views**
- **Validation**
- **IDE Support**

- **Job**
- **Feed**
- **Email**
- **Photo Upload**
- **Testing**
- **Demo Data**
- **Configuration**
- **Authentication**



# Database - Grails

- Hibernate is the default persistence provider
- Create models, Hibernate creates the schema for you

**grails-app/conf/DataSource.groovy**

```
environments {
    development {
        dataSource {
            dbCreate = "create-drop" // one of 'create', 'create-drop', 'update', 'validate', ''
            url = "jdbc:postgresql://localhost:5432/happytrails"
        }
    }
}
```

# Database - Play

- EBean is the default persistence provider in Java projects
- Evolutions can be auto-applied
- Initial evolution sql is auto-created
- Subsequent changes must be versioned
- Auto-created schema file is database dependent
- Play 2 supports multiple datasources (Play 1 does not)

**conf/evolutions/default/2.sql**

```
# --- !Ups

ALTER TABLE account ADD is_admin boolean;

UPDATE account SET is_admin = FALSE;

# --- !Downs

ALTER TABLE account DROP is_admin;
```

# Database - Play

Using Heroku Postgres in production rocks!

- Postgres 9.1
- Dataclips
- Fork & Follow
- Multi-Ingres

# URL Mapping - Grails

grails-app/conf/UrlMappings.groovy

```
class UrlMappings {
    static mappings = {
        "/*$controller/$action?/$id?" {
            constraints {
                // apply constraints here
            }
        }
        "/"(controller: "home", action: "index")
        "/login"(controller: "login", action: "auth")
        "/login/authfail"(controller: "login", action: "authfail")
        "/login/denied"(controller: "login", action: "denied")
        "/logout"(controller: "logout")
        "/signup"(controller: "register")
        "/feed/$region"(controller: "region", action: "feed")
        "/register/register"(controller: "register", action: "register")
        "/register/resetPassword"(controller: "register", action: "resetPassword")
        "/register/verifyRegistration"(controller: "register", action: "verifyRegistration")
        "/forgotPassword"(controller: "register", action: "forgotPassword")
        "/region/create"(controller: "region", action: "create")
        "/regions"(controller: "region", action: "list")
        "/region/save"(controller: "region", action: "save")
        "/region/subscribe"(controller: "region", action: "subscribe")
    }
}
```

# URL Mapping – Play

conf/routes

```
GET      /                controllers.ApplicationController.index()
GET      /signup           controllers.ApplicationController.signupForm()
POST     /signup           controllers.ApplicationController.signup()

GET      /login          controllers.ApplicationController.loginForm()
POST     /login          controllers.ApplicationController.login()

GET      /logout         controllers.ApplicationController.logout()

GET      /addregion      controllers.RegionController.addRegion()
POST     /addregion      controllers.RegionController.saveRegion()

GET      /:region/feed   controllers.RegionController.getRegionFeed(region)

GET      /:region/subscribe controllers.RegionController.subscribe(region)
GET      /:region/unsubscribe controllers.RegionController.unsubscribe(region)

GET      /:region/addroute controllers.RegionController.addRoute(region)
POST     /:region/addroute controllers.RegionController.saveRoute(region)

GET      /:region/delete  controllers.RegionController.deleteRegion(region)

GET      /:region/:route/rate controllers.RouteController.saveRating(region, route, rating: java.lang.Integer)

POST     /:region/:route/comment controllers.RouteController.saveComment(region, route)

GET      /:region/:route/delete controllers.RouteController.deleteRoute(region, route)

GET      /:region/:route   controllers.RouteController.getRouteHtml(region, route)

GET      /:region         controllers.RegionController.getRegionHtml(region, sort ?= "name")
```

# Models - Grails

- All properties are persisted by default
- Constraints
- Mappings with hasMany and belongsTo
- Override methods for lifecycle events

grails-app/domain/happytrails/Region.groovy

```
package happytrails

class Region {
    static charactersNumbersAndSpaces = /[a-zA-Z0-9 ]+/
    static searchable = true

    static constraints = {
        name blank: false, unique: true, matches: charactersNumbersAndSpaces
        seoName nullable: true
        routes cascade:"all-delete-orphan"
    }

    static hasMany = [ routes:Route ]

    String name
    String seoName
}
```

# Models - Play

- EBean + JPA Annotations
- Declarative Validations (JSR 303)
- Query DSL
- Lazy Loading (except in Scala Templates)

app/models/Direction.java

```
@Entity
public class Direction extends Model {

    @Id
    public Long id;

    @Column(nullable = false)
    @Constraints.Required
    public Integer stepNumber;

    @Column(length = 1024, nullable = false)
    @Constraints.MaxLength(1024)
    @Constraints.Required
    public String instruction;

    @ManyToOne
    public Route route;
```

# Controllers - Grails

grails-app/controllers/happytrails/HomeController.groovy

```
package happytrails

import org.grails.comments.Comment

class HomeController {

    def index() {
        params.max = Math.min(params.max ? params.int('max') : 10, 100)
        [regions: Region.list(params), total: Region.count(),
         comments: Comment.list(max: 10, sort: 'dateCreated', order: 'desc')]
    }
}
```

# Controllers - Play

- Stateless - Composable - Interceptable
- Clean connection between URLs and response code

app/controllers/RouteController.java

```
@With(CurrentUser.class)
public class RouteController extends Controller {

    @Security.Authenticated(Secured.class)
    public static Result saveRating(String urlFriendlyRegionName, String urlFriendlyRouteName, Integer rating) {
        User user = CurrentUser.get();
        Route route = getRoute(urlFriendlyRegionName, urlFriendlyRouteName);

        if ((route == null) || (user == null)) {
            return badRequest("User or Route not found");
        }

        if (rating != null) {
            Rating existingRating = Rating.findByUserAndRoute(user, route);
            if (existingRating != null) {
                existingRating.value = rating;
                existingRating.save();
            }
            else {
                Rating newRating = new Rating(user, route, rating);
                newRating.save();
            }
        }

        return redirect(routes.RouteController.getRouteHtml(urlFriendlyRegionName, urlFriendlyRouteName));
    }
}
```

# Views - Grails

- Groovy Server Pages, like JSPs
- GSP Tags
- Layouts and Templates
- Optimized Resources

**grails-app/views/region/show.gsp**

```
<%@ page import="happytrails.Region" %>
<!doctype html>
<html>
<head>
    <meta name="layout" content="main">
    <g:set var="entityName" value="${message(code: 'region.label', default: 'Region')}" />
    <title><g:message code="default.show.label" args="[entityName]" /></title>
    <link rel="alternate" type="application/atom+xml" title="${regionInstance.name} Updates"
          href="${createLink(controller: 'region', action: 'feed', params: [region: regionInstance.seoName])}" />
</head>

<body>
<g:set var="breadcrumb" scope="request">
    <ul class="breadcrumb">
```

# Views - Play

- Scala Templates
- Composable
- Compiled

[app/views/region.scala.html](#)

```
@(region: Region, sort: String)

@headContent = {
  <link rel="alternate" type="application/rss+xml" title="@region.getName RSS Feed"
href="@routes.RegionController.getRegionFeed(region.getUrlFriendlyName)" />
}

@breadcrumbs = {
  <div class="nav-collapse">
    <ul class="nav">
      <li><a href="@routes.ApplicationController.index()">Hike</a></li>
      <li class="active"><a href="@routes.RegionController.getRegionHtml(region.
getUrlFriendlyName)">@region.getName</a></li>
    </ul>
  </div>
}

@main("Uber Tracks - Hike - " + region.getName, headContent, breadcrumbs) {

  <div class="btn-group">
```

# Validation - Grails

grails-app/controllers/happytrails/RouteController.groovy

```
def save() {
    def routeInstance = new Route(params)
    if (!routeInstance.save(flush: true)) {
        render(view: "create", model: [routeInstance: routeInstance])
        return
    }

    flash.message = message(code: 'default.created.message', args: [message(code: '
route.label', default: 'Route'), routeInstance.name])
    redirect(action: "show", id: routeInstance.id)
}
```

grails-app/views/route/create.gsp

```
<g:hasErrors bean="${routeInstance}">
    <div class="alert alert-error" role="alert">
        <g:eachError bean="${routeInstance}" var="error">
            <div <g:if test="${error in org.springframework.validation.FieldError}"
>data-field-id="${error.field}"</g:if><g:message error="${error}" /></div>
            </g:eachError>
        </div>
    </g:hasErrors>
```

# Validation - Play

app/controllers/RouteController.java

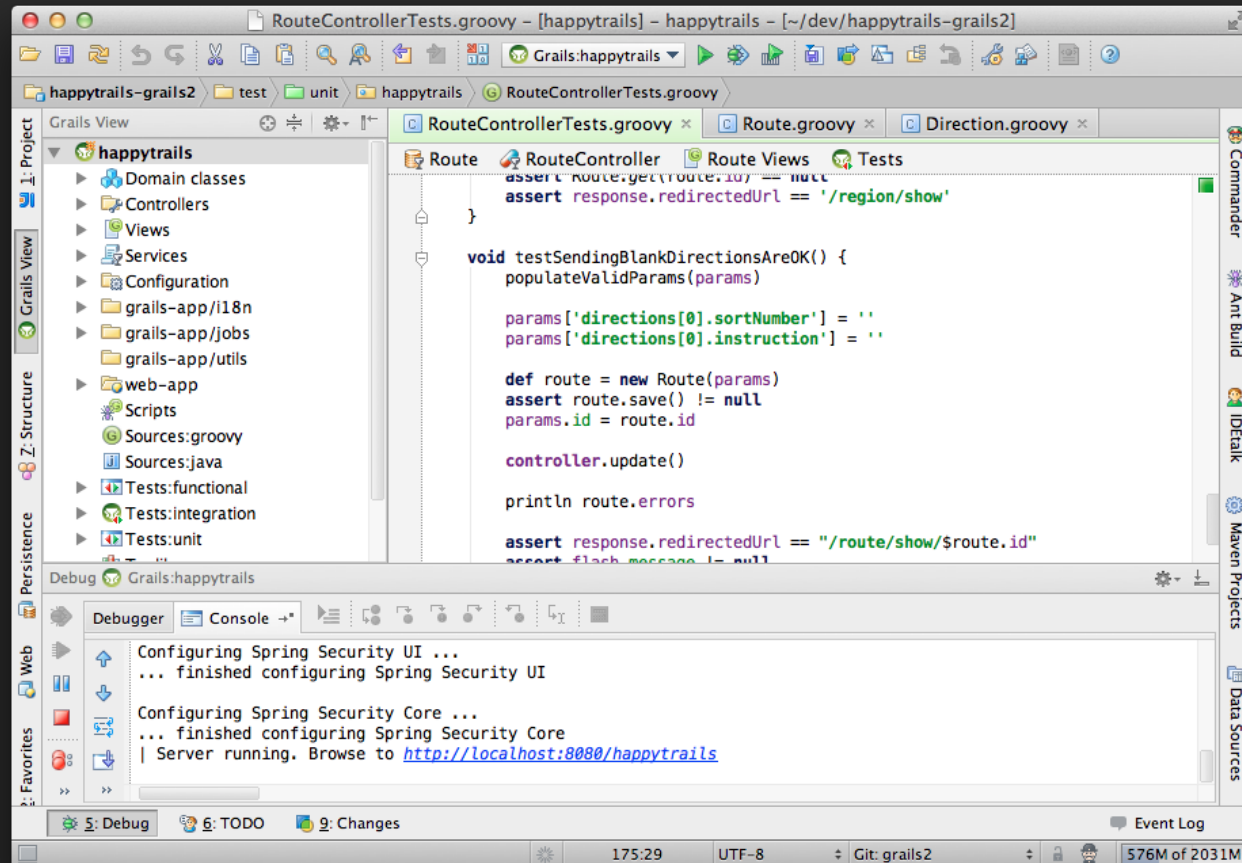
```
public static Result signup() {
    Form<User> signupForm = form(User.class).bindFromRequest();
    if (signupForm.hasErrors()) {
        return badRequest(views.html.signupForm.render(signupForm));
    }
}
```

app/views/signupForm.scala.html

```
@if(signupForm.hasGlobalErrors) {
    <p class="error alert alert-error">@signupForm.globalError.message</p>
}

@helper.form(action = routes.ApplicationController.signup(), 'class -> "form-horizontal") {
    @helper.inputText(signupForm("fullName"), '_label -> "Full Name")
    @helper.inputText(signupForm("emailAddress"), '_label -> "Email Address")
    @helper.inputPassword(signupForm("password"), '_label -> "Password")
    <div class="controls">
        <input type="submit" class="btn btn-primary" value="Create Account"/>
    </div>
}
```

# IDE Support - Grails



*IntelliJ Rocks!*

# IDE Support - Play

- \$ play idea
- \$ play eclipsify
- Java!!!
- Debugging Support via Remote Debugger
- Limited Testing within IDE

# Job - Grails

grails-app/jobs/happytrails/DailyRegionDigestEmailJob.groovy

```
package happytrails

import org.grails.comments.Comment

class DailyRegionDigestEmailJob {
    def mailService

    static triggers = {
        //simple repeatInterval: 50001 // execute job once in 5 seconds
        cron name:'cronTrigger', startDelay:10000, cronExpression: '0 0 7 ? * MON-FRI'
    // 7AM Mon-Fri
    }

    def execute() {
        List<RegionUserDigest> digests = getRegionUserDigests()
        for (digest in digests) {

            String message = createMessage(digest)

            println "Sending digest email to " + digest.user.username
        }
    }
}
```

# Job - Play

- Plain old `static void main`
- Independent of web app

**app/jobs/DailyRegionDigestEmailJob.java**

```
public class DailyRegionDigestEmailJob {  
    public static void main(String[] args) {  
        Application application = new Application(new File(args[0]), DailyRegionDigest  
EmailJob.class.getClassLoader(), null, Mode.Prod());  
  
        Play.start(application);  
  
        List<RegionUserDigest> regionUserDigests = getRegionUserDigests();  
    }  
}
```

# Feed - Grails

1. grails install-plugin feeds
2. Add feed() method to controller

**grails-app/controllers/happytrails/RegionController.groovy**

```
def feed = {
    def region = Region.findBySeoName(params.region)
    if (!region) {
        response.status = 404
        return
    }

    render(feedType: "atom") {
        title = "Happy Trails Feed for " + region.name
        link = createLink(absolute: true, controller: 'region', action: 'feed', p
arams: ['region', region.seoName])
        description = "New Routes and Reviews for " + region.name
        region.routes.each() { route ->
            entry(route.name) {
                link = createLink(absolute: true, controller: 'route', action: 'sh
ow', id: route.id)
                route.description
            }
        }
    }
}
```

# Feed - Play

- No direct RSS/Atom support
- Dependency: "rome" % "rome" % "1.0"

**app/jobs/DailyRegionDigestEmailJob.java**

```
Region region = Region.findByUrlFriendlyName(urlFriendlyRegionName);

SyndFeed feed = new SyndFeedImpl();
feed.setFeedType("rss_2.0");

feed.setTitle("Uber Tracks - " + region.getName());
feed.setLink("http://hike.ubertracks.com"); // todo: externalize URL
feed.setDescription("Updates for Hike Uber Tracks - " + region.getName());

List entries = new ArrayList();

for (Route route : region.routes) {

    SyndEntry entry = new SyndEntryImpl();
    entry.setTitle("Route - " + route.getName());
```

# Email – Grails

**grails-app/jobs/happytrails/DailyRegionDigestEmailJob.groovy**

```
println "Sending digest email to " + digest.user.username
mailService.sendMail {
    to digest.getUser().username
    subject "Updates from Åber Tracks " + digest.regions
    body message
}
```

\* powered by the **mail plugin** (built-in)

# Email - Play

- SendGrid Heroku Add-on
- Dependency:  
"com.typesafe" %% "play-plugins-mailer" % "2.0.2"

**app/jobs/DailyRegionDigestEmailJob.java**

```
MailerAPI mail = play.Play.application().plugin(MailerPlugin.class).email();
mail.setSubject("Uber Tracks Region Updates");
mail.addRecipient(regionUserDigest.user.getEmailAddress());
mail.addFrom("noreply@ubertracks.com");
mail.send(emailContent);
```

**conf/prod.conf**

```
smtp.host=smtp.sendgrid.net
smtp.port=587
smtp.ssl=true
smtp.user=${SENDGRID_USERNAME}
smtp.password=${SENDGRID_PASSWORD}
```

# Photo Upload - Grails

# Photo Upload - Play

- Amazon S3 for Persistent File Storage

**app/models/S3Photo.java**

```
PutObjectRequest putObjectRequest = new PutObjectRequest(bucket, key, inputStream, objectMetadata);
putObjectRequest.withCannedAcl(CannedAccessControlList.PublicRead);

if (S3Blob.amazonS3 == null) {
    Logger.error("Cloud not save Photo because amazonS3 was null");
}
else {
    S3Blob.amazonS3.putObject(putObjectRequest);
}
```

**app/controllers/RegionController.java**

```
Http.MultipartFormData.FilePart photoFilePart = request().body()
    .asMultipartFormData().getFile("photo");
```

# Testing - Grails

- Unit Tests with @TestFor and @Mock
- Test URL Mappings with UrlMappingsUnitTestMethodMixin
- Integration Testing with GroovyTestCase
- Functional Testing with Geb

test/unit/happytrails/RouteTests.groovy

```
package happytrails

import grails.test.mixin.*

@TestFor(Route)
class RouteTests {

    void testConstraints() {
        def region = new Region(name: "Colorado")
        def whiteRanch = new Route(name: "White Ranch", distance: 12.0, location: "Golden, CO", region: region)
        mockForConstraintsTests(Route, [whiteRanch])

        // validation should fail if required properties are null
        def route = new Route()
        assert !route.validate()
        assert "nullable" == route.errors["name"]
    }
}
```

# Testing - Play

- Standard JUnit
- Unit Tests & Functional Tests
- FakeApplication, FakeRequest, inMemoryDatabase
- Test: Controllers, Views, Routing, Real Server, Browser

test/ApplicationControllerTest.java

```
@Test
public void index() {
    running(fakeApplication(inMemoryDatabase()), new Runnable() {
        public void run() {
            DemoData.loadDemoData();

            Result result = callAction(routes.ref.ApplicationController.index());
            assertEquals(status(result), OK);
            assertEquals(contentAsString(result), DemoData.CRESTED_BUTTE_COLORADO_REGION);
            assertEquals(contentAsString(result), "<li>");
        }
    });
}
```

# Demo Data - Grails

grails-app/conf/BootStrap.groovy

```
import happytrails.User
import happytrails.Region
import happytrails.Route
import happytrails.RegionSubscription

class BootStrap {

    def init = { servletContext ->

        if (!User.count()) {
            User user = new User(username: "mraible@gmail.com", password: "happyhour",
                                name: "Matt Raible", enabled: true).save(failOnError: true)
            User commentor = new User(username: "mraible+comments@gmail.com", password: "happyhour",
                                      name: "Fitz Raible", enabled: true).save(failOnError: true)

            Region frontRange = new Region(name: "Colorado Front Range").save(failOnError: true)
            // Add routes
            def whiteRanch = new Route(name: "White Ranch", distance: 10, location: "Golden, CO",
                                      description: "Long uphill climb", region: frontRange).save(failOnError: true)

            // Add comments
            whiteRanch.addComment(commentor, "Coming down is the best!")

            // Add a few ratings
            whiteRanch.rate(user, 3)
```

# Demo Data - Play

app/Global.java

```
public void onStart(Application application) {  
    //Ebean.getServer(null).getAdminLogging().setDebugGeneratedSql(true);  
  
    S3Blob.initialize(application);  
  
    // load the demo data in dev mode if no other data exists  
    if (Play.isDev() && (User.find.all().size() == 0)) {  
        DemoData.loadDemoData();  
    }  
  
    super.onStart(application);  
}
```

# Configuration - Grails

grails-app/conf/Config.groovy

```
grails.app.context = "/"
grails.project.groupId = appName // change this to alter the default package name and
Maven publishing destination
grails.mime.file.extensions = true // enables the parsing of file extensions from URLs
into the request format
grails.mime.use.accept.header = false
grails.mime.types = [html: ['text/html', 'application/xhtml+xml'],
    xml: ['text/xml', 'application/xml'],
    text: 'text/plain',
    js: 'text/javascript',
    rss: 'application/rss+xml',
    atom: 'application/atom+xml',
    css: 'text/css',
    csv: 'text/csv',
    all: '*/*',
    json: ['application/json', 'text/json'],
    form: 'application/x-www-form-urlencoded',
    multipartForm: 'multipart/form-data'
]
```

# Configuration - Play

- Based on the TypeSafe Config Library
- Override config with Java Properties:  
-Dfoo=bar
- Environment Variable substitution
- Run with different config files:  
-Dconfig.file=conf/prod.conf

**conf/prod.conf**

```
include "application.conf"

application.secret=${APPLICATION_SECRET}

db.default.driver=org.postgresql.Driver
db.default.url=${DATABASE_URL}
applyEvolutions.default=true
```

# Authentication - Grails

Spring Security UI Plugin, *"I love you!"*

**grails-app/conf/Config.groovy**

```
grails.mail.default.from = "Bike Ãber Tracks <bike@ubertracks.com>"

grails.plugins.springsecurity.ui.register.emailFrom = grails.mail.default.from
grails.plugins.springsecurity.ui.register.emailSubject = 'Welcome to Ãber Tracks!'
grails.plugins.springsecurity.ui.forgotPassword.emailFrom = grails.mail.default.from
grails.plugins.springsecurity.ui.forgotPassword.emailSubject = 'Password Reset'

grails.plugins.springsecurity.controllerAnnotations.staticRules = [
    '/user/**': ['ROLE_ADMIN'],
    '/role/**': ['ROLE_ADMIN'],
    '/registrationCode/**': ['ROLE_ADMIN'],
    '/securityInfo/**': ['ROLE_ADMIN']
]

// Added by the Spring Security Core plugin:
grails.plugins.springsecurity.userLookup.userDomainClassName = 'happytrails.User'
grails.plugins.springsecurity.userLookup.authorityJoinClassName = 'happytrails.UserRole'
grails.plugins.springsecurity.authority.className = 'happytrails.Role'
```

# Authentication - Play

- Uses cookies to remain stateless

app/controllers/Secured.java

```
public class Secured extends Security.Authenticator {  
  
    @Override  
    public String getUsername(Context ctx) {  
        // todo: need to make sure the user is valid, not just the token  
        return ctx.session().get("token");  
    }  
}
```

app/controllers/RegionController.java

```
@Security.Authenticated(Secured.class)  
public static Result addRegion() {  
    return ok(views.html.regionForm.render(form(Region.class)));  
}
```

# Application Comparison

- YSlow
- PageSpeed
- Lines of Code
- Load Testing
- Which Loads Faster?
- Security Testing

# YSlow

The screenshot shows a web browser window with the address bar displaying `bike.ubertracks.com`. The page has a green header with the text "Über Tracks" and navigation links for "Bike" and "Regions". A "Login or Sign Up" link is in the top right. Below the header, a welcome message reads: "Welcome to Happy Trails, where all your dreams will come true." The main content area features two large images: "Colorado Western Slope" and "Moab". To the right, a "Recent Comments" section lists several comments.

Overlaid on the page is the YSlow extension interface. The top bar of the extension shows the title "chrome-extension://ninejjcohidippngpapiilnmkgllmakh/yslow.html#1" and navigation tabs: "Home", "Grade", "Components", and "Statistics". The "Rulesets" dropdown is set to "YSlow(V2)". The main section displays a "Grade A" performance score with an overall performance score of 95. The URL being tested is `http://bike.ubertracks.com/`. Below the grade, there are filters for "ALL (23)" and categories: "CONTENT (6)", "COOKIE (2)", "CSS (6)", "IMAGES (2)", "JAVASCRIPT (4)", and "SERVER (6)". Social sharing buttons for "Share" and "Tweet" are also present.

The "Components" tab is active, showing a list of optimization suggestions:

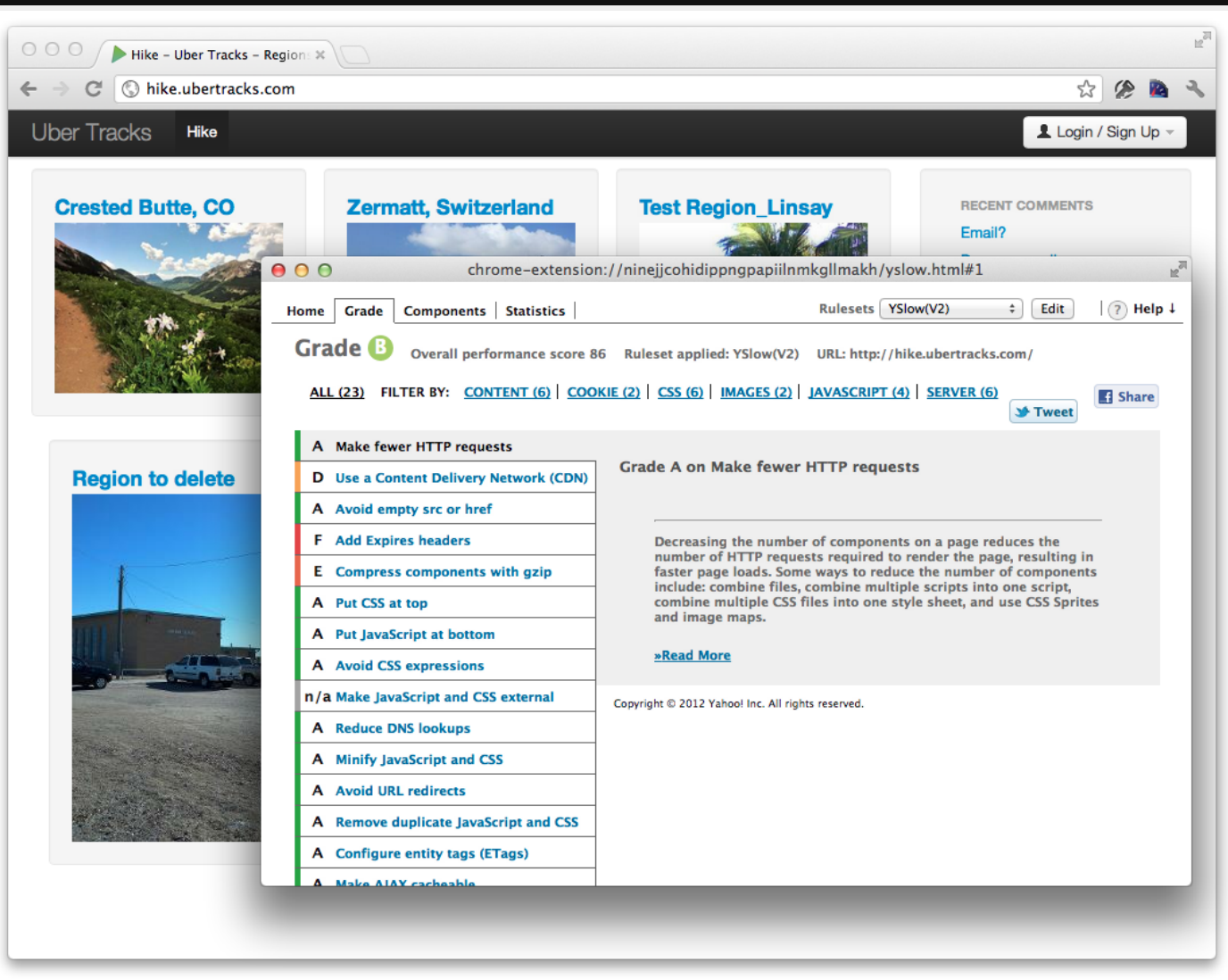
- A Make fewer HTTP requests
- F Use a Content Delivery Network (CDN)
- A Avoid empty src or href
- A Add Expires headers
- B Compress components with gzip
- A Put CSS at top
- A Put JavaScript at bottom
- A Avoid CSS expressions
- n/a Make JavaScript and CSS external
- A Reduce DNS lookups
- A Minify JavaScript and CSS
- A Avoid URL redirects

On the right side of the components list, there is a detailed explanation for the "Grade A on Make fewer HTTP requests" rule:

Decreasing the number of components on a page reduces the number of HTTP requests required to render the page, resulting in faster page loads. Some ways to reduce the number of components include: combine files, combine multiple scripts into one script, combine multiple CSS files into one style sheet, and use CSS Sprites and image maps.

A link to "»Read More" is provided below the explanation. At the bottom of the extension window, a copyright notice reads: "Copyright © 2012 Yahoo! Inc. All rights reserved."

At the bottom of the browser window, a "Region Retest to update" button is visible.



### Crested Butte, CO



### Zermatt, Switzerland



### Test Region\_Linsay



### RECENT COMMENTS

Email?

### Region to delete



chrome-extension://ninejjcohidippngpapiilnmkgllmakh/yslow.html#1

Home **Grade** Components | Statistics | Rulesets YSlow(V2) Edit Help

**Grade B** Overall performance score 86 Ruleset applied: YSlow(V2) URL: http://hike.ubertracks.com/

ALL (23) FILTER BY: [CONTENT \(6\)](#) [COOKIE \(2\)](#) [CSS \(6\)](#) [IMAGES \(2\)](#) [JAVASCRIPT \(4\)](#) [SERVER \(6\)](#) [Share](#) [Tweet](#)

A	Make fewer HTTP requests
D	Use a Content Delivery Network (CDN)
A	Avoid empty src or href
F	Add Expires headers
E	Compress components with gzip
A	Put CSS at top
A	Put JavaScript at bottom
A	Avoid CSS expressions
n/a	Make JavaScript and CSS external
A	Reduce DNS lookups
A	Minify JavaScript and CSS
A	Avoid URL redirects
A	Remove duplicate JavaScript and CSS
A	Configure entity tags (ETags)
A	Make AJAX cacheable

**Grade A on Make fewer HTTP requests**

Decreasing the number of components on a page reduces the number of HTTP requests required to render the page, resulting in faster page loads. Some ways to reduce the number of components include: combine files, combine multiple scripts into one script, combine multiple CSS files into one style sheet, and use CSS Sprites and image maps.

[»Read More](#)

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# PageSpeed

The screenshot displays a web browser window with the URL `bike.ubertracks.com`. The website has a green header with 'Über Tracks', 'Bike', and 'Regions' tabs, and a 'Login or Sign Up' link. The main content area features four landscape images with captions: 'Colorado Western Slope', 'Moab', 'Grand Valley', and 'Colorado Front Range'. A 'Recent Comments' sidebar on the right lists several comments by 'Matt Raible' and 'Fitz Raible'. Below the browser window, the PageSpeed Insights tool interface is visible. It includes a toolbar with 'Elements', 'Resources', 'Network', 'Scripts', 'Timeline', 'Profiles', 'Audits', 'Console', and 'PageSpeed' tabs. The 'PageSpeed' tab is active, showing an 'Overview' section with a score of 93 out of 100. A 'Suggestion Summary' section follows, indicating that there are no high or medium priority suggestions for this site.

Welcome to Happy Trails! | [Über Tracks](#)

[Bike](#) [Regions](#) [Login or Sign Up](#)

Welcome to Happy Trails, where all your dreams will come true.

**Colorado Western Slope**

**Moab**

**Grand Valley**

**Colorado Front Range**

**Recent Comments**

- "Coming down is the best!" --*Fitz Raible*
- "Adding a comment" --*Matt Raible*
- "Added a rating" --*Matt Raible*
- "Added a rating" --*Matt Raible*
- "trying to post 5" --*Matt Raible*
- "trying to post 5 again" --*Matt Raible*
- "and then there were 6" --*Matt Raible*
- "Post again" --*Matt*

**Overview**

The page [Welcome to Happy Trails! | Über Tracks](#) got an overall PageSpeed Score of **93** (out of 100). [Learn more](#)

**Suggestion Summary**

Click on the rule names to see suggestions for improvement.

- High priority.** These suggestions represent the largest potential performance wins for the least development effort. However, there are no high priority suggestions for this site. Good job!
- Medium priority.** These suggestions may represent smaller wins or much more work to implement. However, there are no medium priority suggestions for this site. Good job!

Hike - Uber Tracks - Regions

hike.ubertracks.com

☆ ↻ 🔍 ⚙

Uber TracksHike

Login / Sign Up

Crested Butte, CO

Zermatt, Switzerland

Test Region\_Linsay

RECENT COMMENTS

Email?

Does an email come through on Admin?

Testing that an email comes through!

Add a comment

Via User

Region to delete

Iteration 2

ElementsResourcesNetworkScriptsTimelineProfilesAuditsConsolePageSpeed

Search PageSpeed

RefreshClear

Overview

High priority (1)

Enable compression

Medium priority (2)

Leverage browser caching

Serve scaled images

Low priority (5)

Defer parsing of JavaScript

Optimize images

Minify HTML

Specify image dimensions

Overview

The page [Hike - Uber Tracks - Regions](#) got an overall PageSpeed Score of **49** (out of 100). [Learn more](#)

Suggestion Summary

Click on the rule names to see suggestions for improvement.

High priority.

These suggestions represent the largest potential performance wins for the least development effort. You should address this item first:

[Enable compression](#)

Medium priority.

These suggestions may represent smaller wins or much more work to implement. You should address these items next:

# Lines of Code

```
1. bash
mraible:happytrails-grails2 mraible$ cloc grails-app test
  85 text files.
  85 unique files.
  36 files ignored.

http://cloc.sourceforge.net v 1.56  T=0.5 s (98.0 files/s, 5058.0 lines/s)
-----
Language             files      blank      comment      code
-----
Groovy                49         524         190         1815
-----
SUM:                  49         524         190         1815
-----
mraible:happytrails-grails2 mraible$
```

```
1. bash
mraible:happytrails-play2 mraible$ cloc app conf test
  49 text files.
  49 unique files.
   4 files ignored.

http://cloc.sourceforge.net v 1.56  T=0.5 s (90.0 files/s, 5942.0 lines/s)
-----
Language             files      blank     comment      code
-----
Java                  29         528         60         1784
HTML                  11          65          0          298
SQL                   3           58          0          148
Scala                 2           9           0           21
-----
SUM:                  45         660         60         2251
-----
mraible:happytrails-play2 mraible$
```

# Load Testing with BrowserMob

The screenshot displays the Neustar Web Performance Management dashboard. The browser address bar shows the URL <https://home.wpm.neustar.biz/#home>. The dashboard features a navigation bar with tabs for Home, Monitoring, Load Testing, Scripting, and Alerting. A sidebar on the left contains a 'CHAT NOW' button. The main content area is divided into three sections: 'Get Started', 'Design / Select Scripts', and 'Activate & Monitor'. Below these are sections for 'Monitors' and 'Load Tests', each with a '+ New Monitor' or '+ New Load Test' button. The 'Monitors' section lists two monitors for 'bike.ubertracks.com' and 'hike.ubertracks.com', both with a 15-minute interval. The 'Load Tests' section lists two load tests: 'Hike Load Test' and 'Bike Load Test', both with a date finished of Jun 14, 2012. At the bottom, there are sections for 'Your Monitoring Packages' and 'Your Load Test Packages', both showing an active package.

Neustar | Home

<https://home.wpm.neustar.biz/#home>

Neustar Web Performance Management

Home Monitoring Load Testing Scripting Alerting

[Buy Monitoring](#) [Buy LoadTest](#)

**Get Started**

WEB SERVICES SQL

Identify the resources you need to monitor and determine the application workflows to load test.

**Design / Select Scripts**

Write or select from any of our pre-designed test and monitoring scripts, using the familiar JavaScript syntax

**Activate & Monitor**

Activate scripts and get detailed monitoring and load test reports through our intuitive interface.

**Monitors** [+ New Monitor](#)

**Load Tests** [+ New Load Test](#)

**bike.ubertracks.com** 15 INTERVAL  
Checked: 2012-06-14T08:18:46.00

**hike.ubertracks.com** 15 INTERVAL  
Checked: 2012-06-14T08:16:48.00

**Your Monitoring Packages** [+ Add Package](#)

**Monitoring Trial (30 Days)** ACTIVATED ON JUN 13, 2012 06:58:12 AM

**Hike Load Test** Date finished: Jun 14, 2012 04:01:00 AM

**Bike Load Test** Date finished: Jun 14, 2012 03:04:00 AM

**Your Load Test Packages** [+ Add Package](#)

**Pay As You Go** ACTIVE ACTIVATED ON JUN 13, 2012 06:58:11 AM

neustar Copyright © 2012 Neustar Inc. All Rights Reserved. [Terms & Conditions](#) [Privacy Policy](#) Sales: 1.888.367.4812 Support: 1.888.367.4820

# Load Testing - 1 Dyno

Test Stats	
Transactions:	<u>9,317</u>
Failures:	<u>7</u>
Objects:	<u>102,452</u>

Bike (Grails)

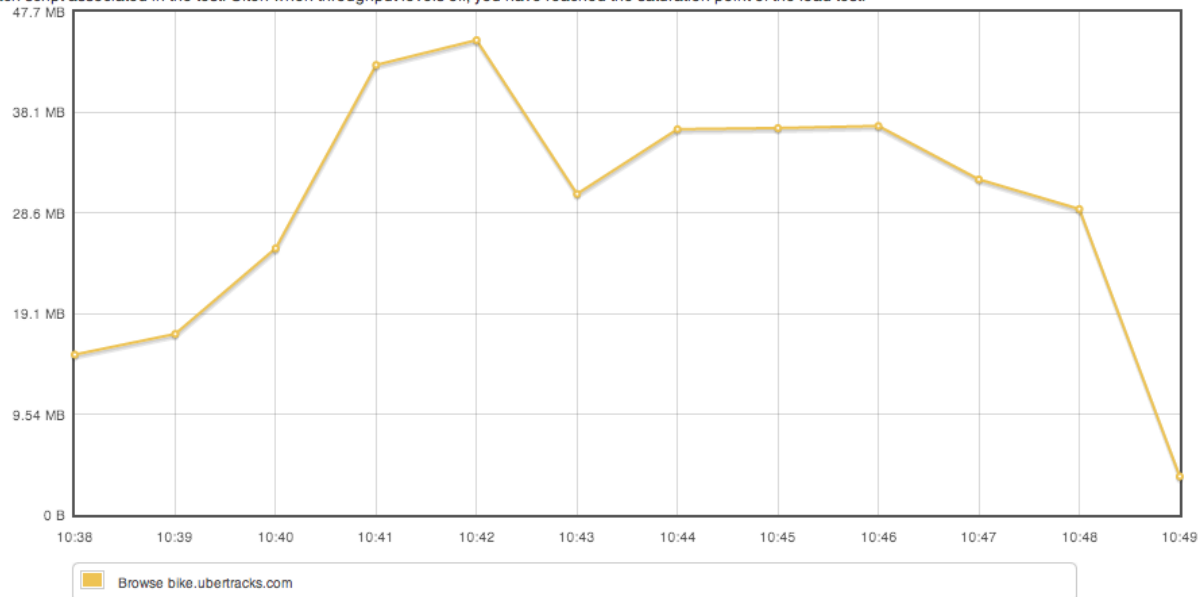
Test Stats	
Transactions:	<u>6,395</u>
Failures:	<u>8</u>
Objects:	<u>63,912</u>

Hike (Play)

# Load Testing - 1 Dyno

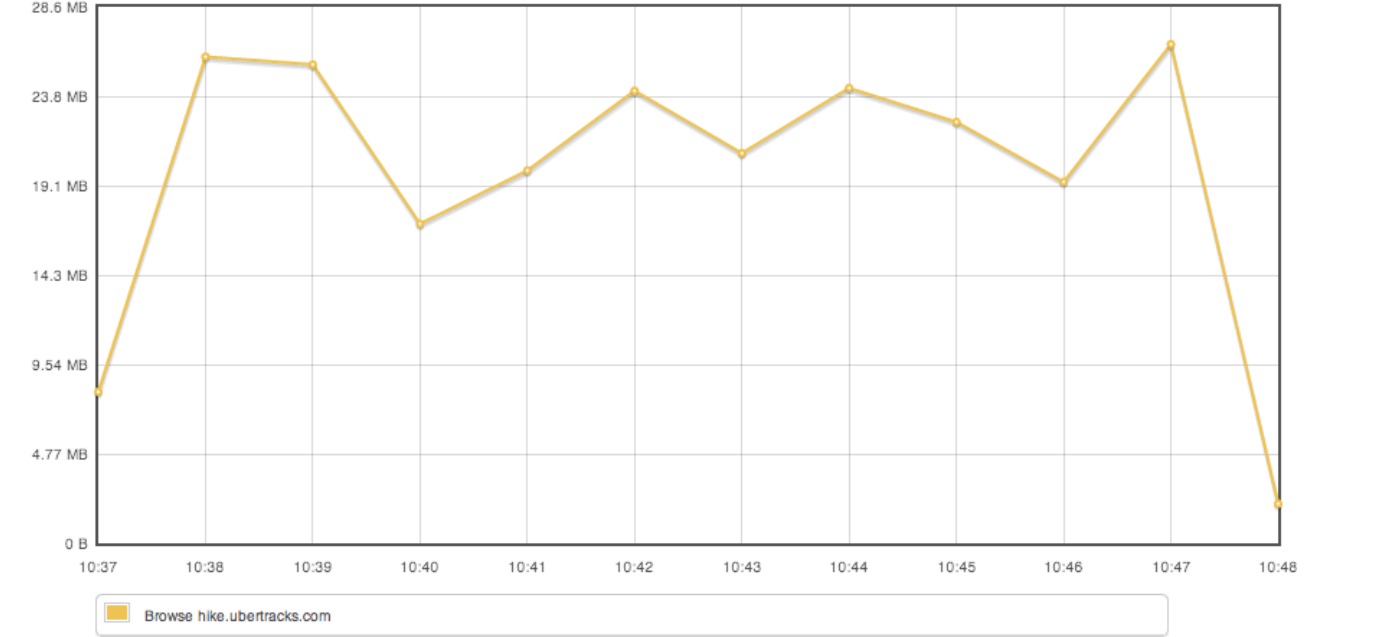
## Data Throughput

Data throughput displays how many bytes were received by transactions that completed during each minute of the test, both as a total number of bytes as well as broken down by each script associated in the test. Often when throughput levels off, you have reached the saturation point of the load test.



Data Throughput

Data throughput displays how many bytes were received by transactions that completed during each minute of the test, both as a total number of bytes as well as broken down by each script associated in the test. Often when throughput levels off, you have reached the saturation point of the load test.



# Load Testing - 5 Dynos

Test Stats	
Transactions:	<u>11,361</u>
Failures:	<u>2</u>
Objects:	<u>124,962</u>

Bike (Grails)

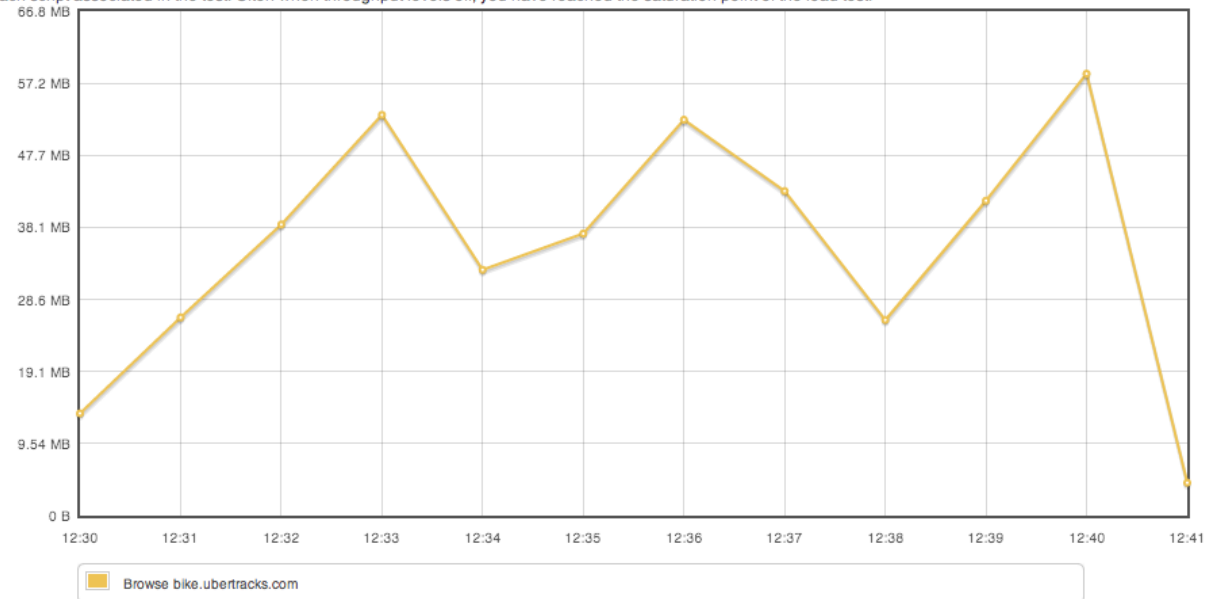
Test Stats	
Transactions:	<u>12,900</u>
Failures:	<u>4</u>
Objects:	<u>128,986</u>

Hike (Play)

# Load Testing - 5 Dynos

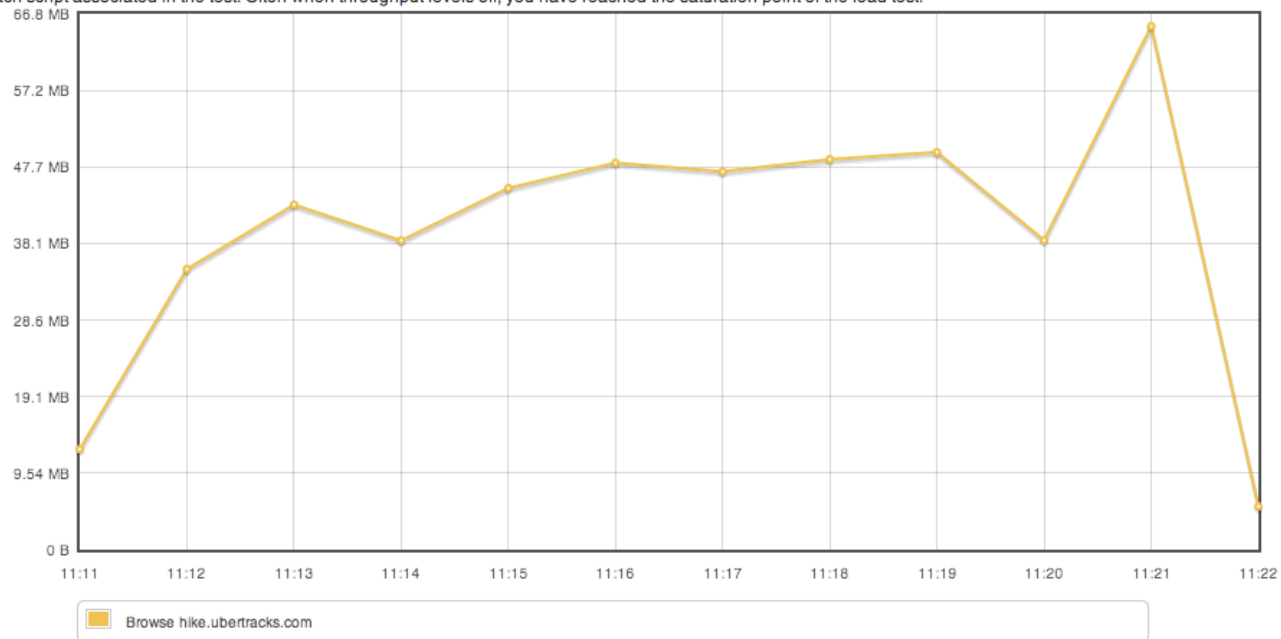
## Data Throughput

Data throughput displays how many bytes were received by transactions that completed during each minute of the test, both as a total number of bytes as well as broken down by each script associated in the test. Often when throughput levels off, you have reached the saturation point of the load test.

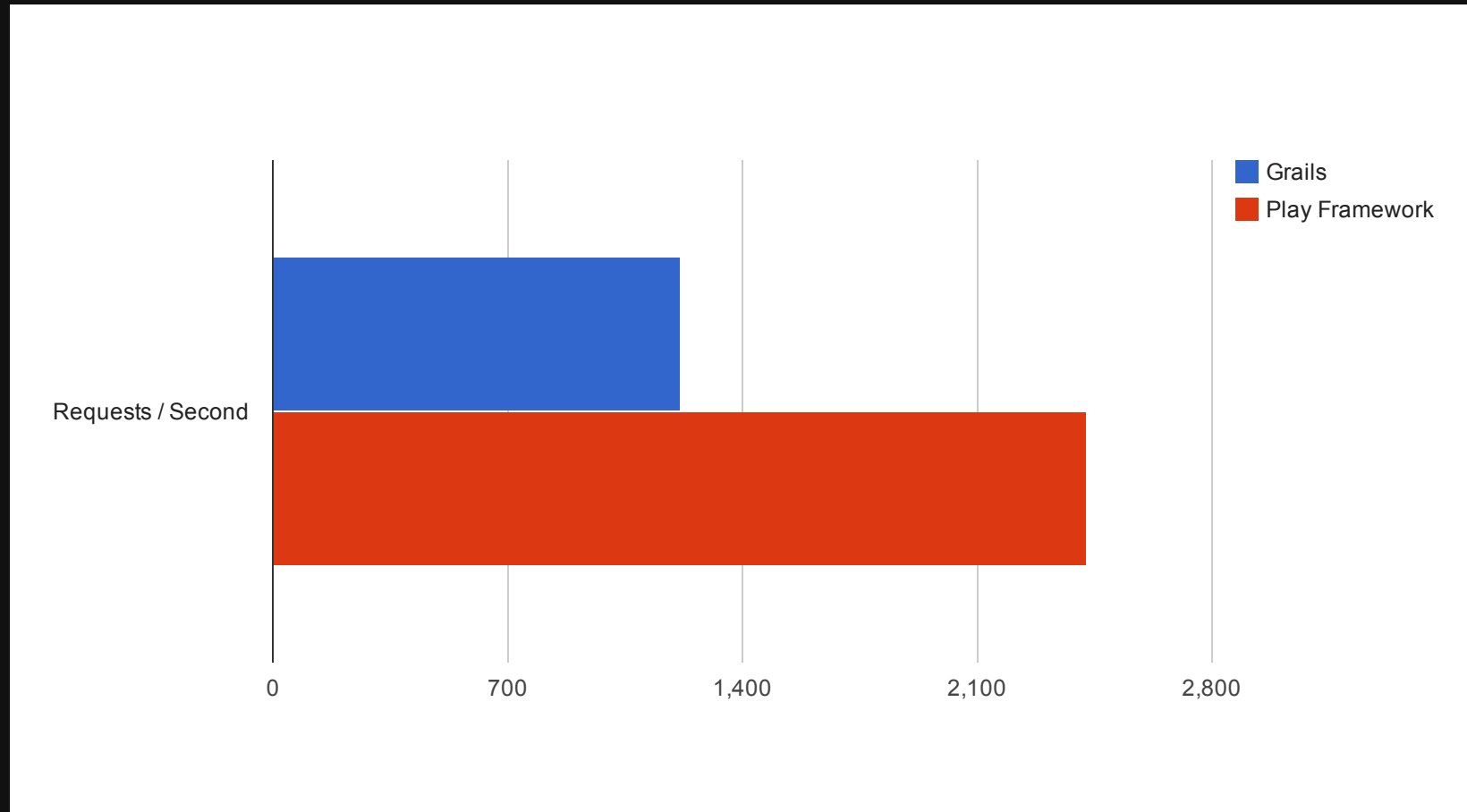


## Data Throughput

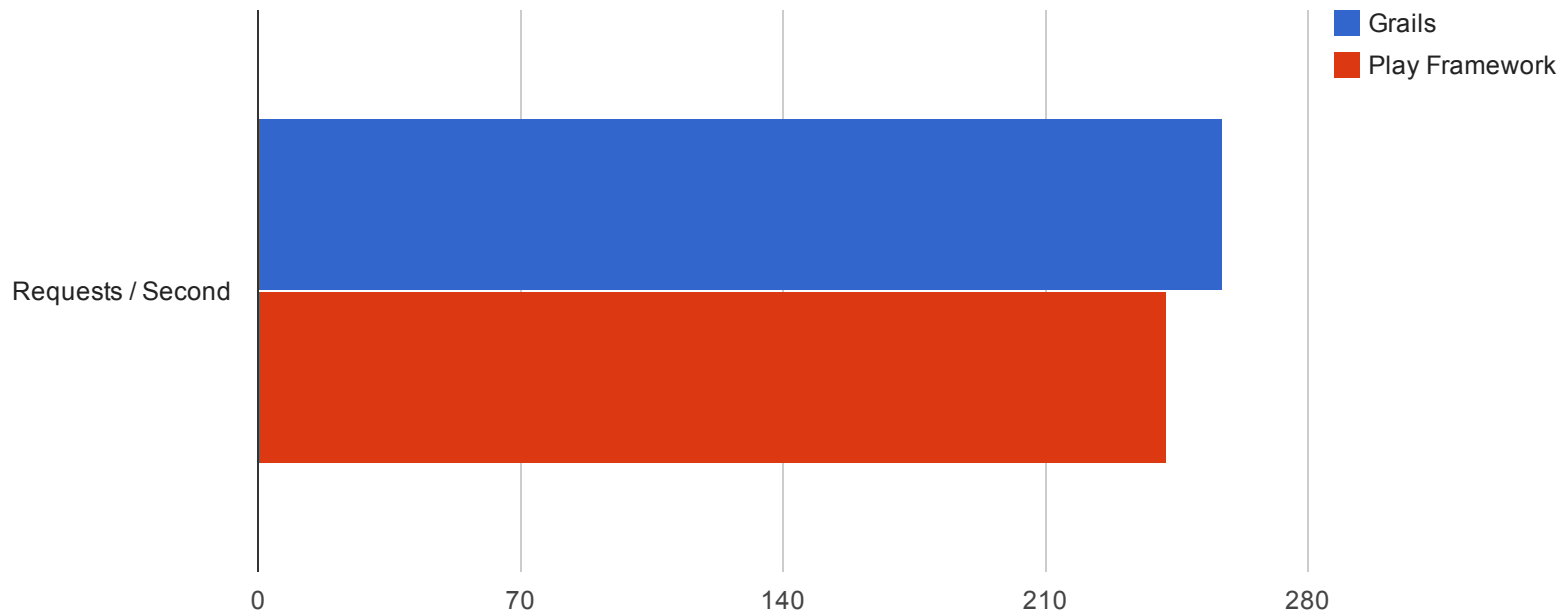
Data throughput displays how many bytes were received by transactions that completed during each minute of the test, both as a total number of bytes as well as broken down by each script associated in the test. Often when throughput levels off, you have reached the saturation point of the load test.



# Load Testing - 2 Dynos (March 2013)



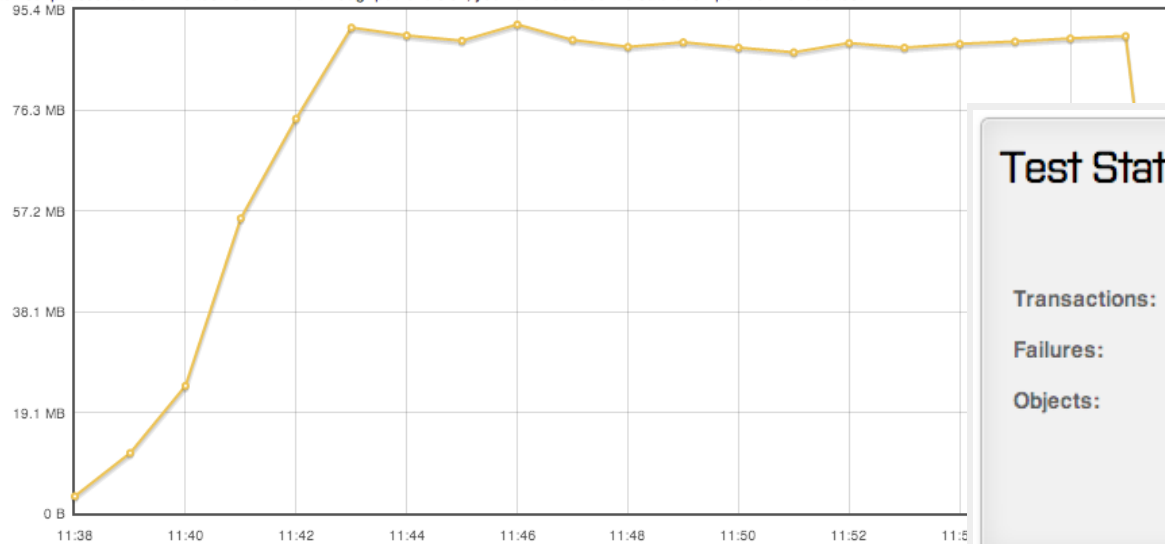
# Load Testing - 2 Dynos (Sept 2013)



# Load Testing - 5 Dynos + 100 users

## Data Throughput

Data throughput displays how many bytes were received by transactions that completed during each minute of the test, both as a total number of bytes as well as broken down by each script associated in the test. Often when throughput levels off, you have reached the saturation point of the load test.



Check bike.ubertracks.com

## Test Stats

Transactions: 10,372  
Failures: 1  
Objects: 82,971

# Which Loads Faster?

Which loads faster?

whichloads faster.com

http://bike.ubertracks.com

http://hike.ubertracks.com

GO

Über Tracks Bike Regions

Matt Raible

Welcome to Happy Trails, where all your dreams will come true.

Moab

Colorado Front Range

BIKE Region Lindsay\_1

Über Tracks Hike

Login / Sign Up

CRESTED BUTTE, CO

ZERMATT, SWITZERLAND

RECENT COMMENTS

erer

foo

hallo meine Freunde

Good directions.

Very easy instructions.

I just wasn't clear on where to start.

← 61% faster

287 ms / 460 ms

share this test!

more

Average over 10 runs:

← 61% faster

287 ms / 460 ms

# Which Actually Loads Faster?


Which loads faster? - Google Chrome


whichloadsfafter.com About Settings Features: Repeat Rage Grab my data Splash screen

http://bike.ubertracks.com http://hike.ubertracks.com → GO

Über Tracks Bike Regions Login or Sign Up Uber Tracks Hike James Ward


Welcome to Happy Trails, where all your dreams will come true.


**Moab**  


**Colorado Front Range**  


**BIKE Region**  
Linsay\_1

**Message for Region**

**Grand Valley**  


**Colorado Western Slope**  



**Recent Comments**


"Test Comment"  
--yohan\_y  
"User is logged in"  
--Linsayjune  
"Making a  
Linsayjune  
"Add a comment to get email"  
--Matt Raible  
"From user" --  
Linsaytestnew  
"THIS IS A COMMENT FROM USER LINSAY" --  
Linsaytestnew  
"post comment"  
--Linsaytestnew  
"add comment"  
Linsaytestnew  
"Is comment displayed?" --  
Linsaytestnew

**78% faster →**  
422 ms / 237 ms

share this test! more

**Average over 5 runs:**  
24% faster →  
472 ms / 382 ms

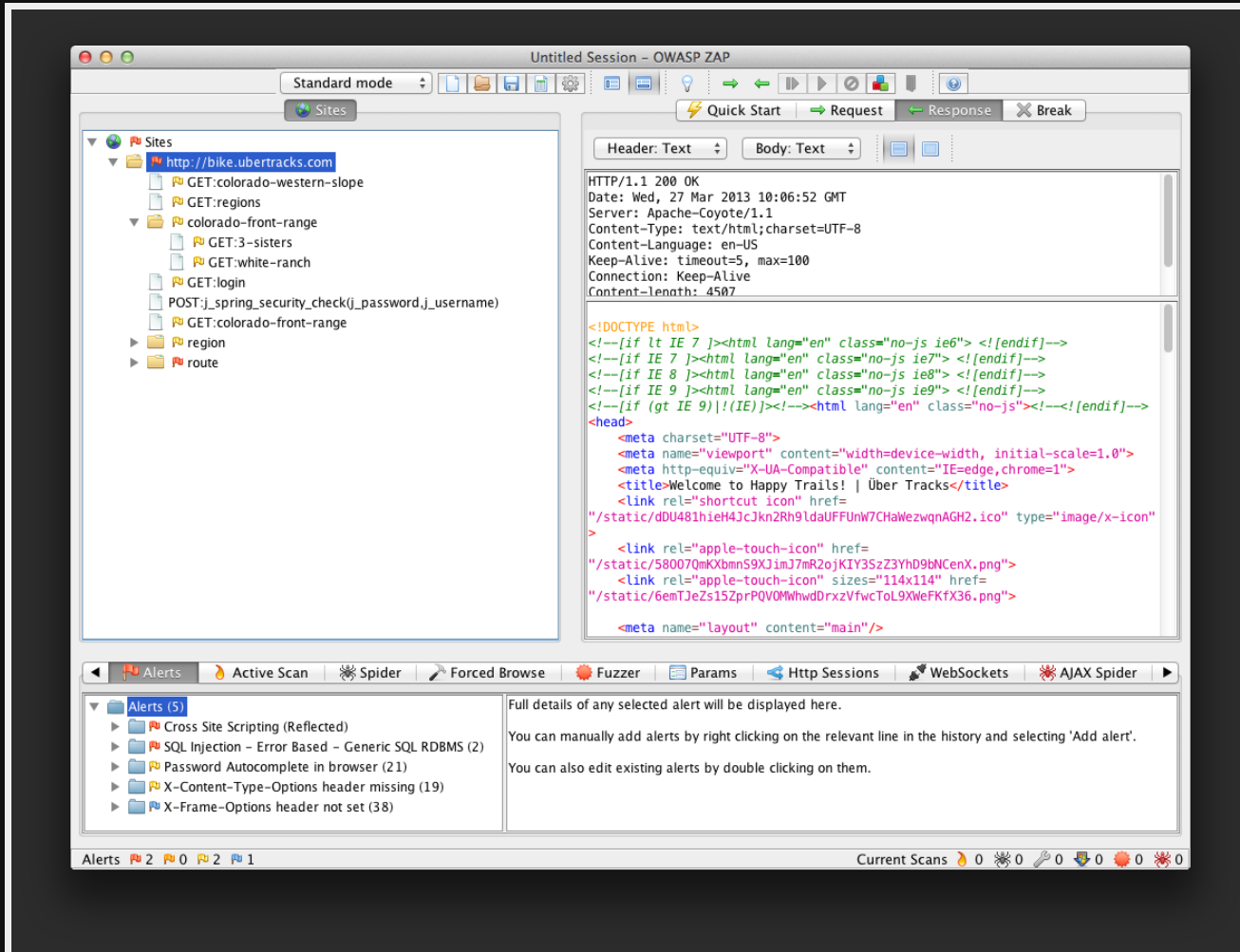
**Crested Butte, CO**  


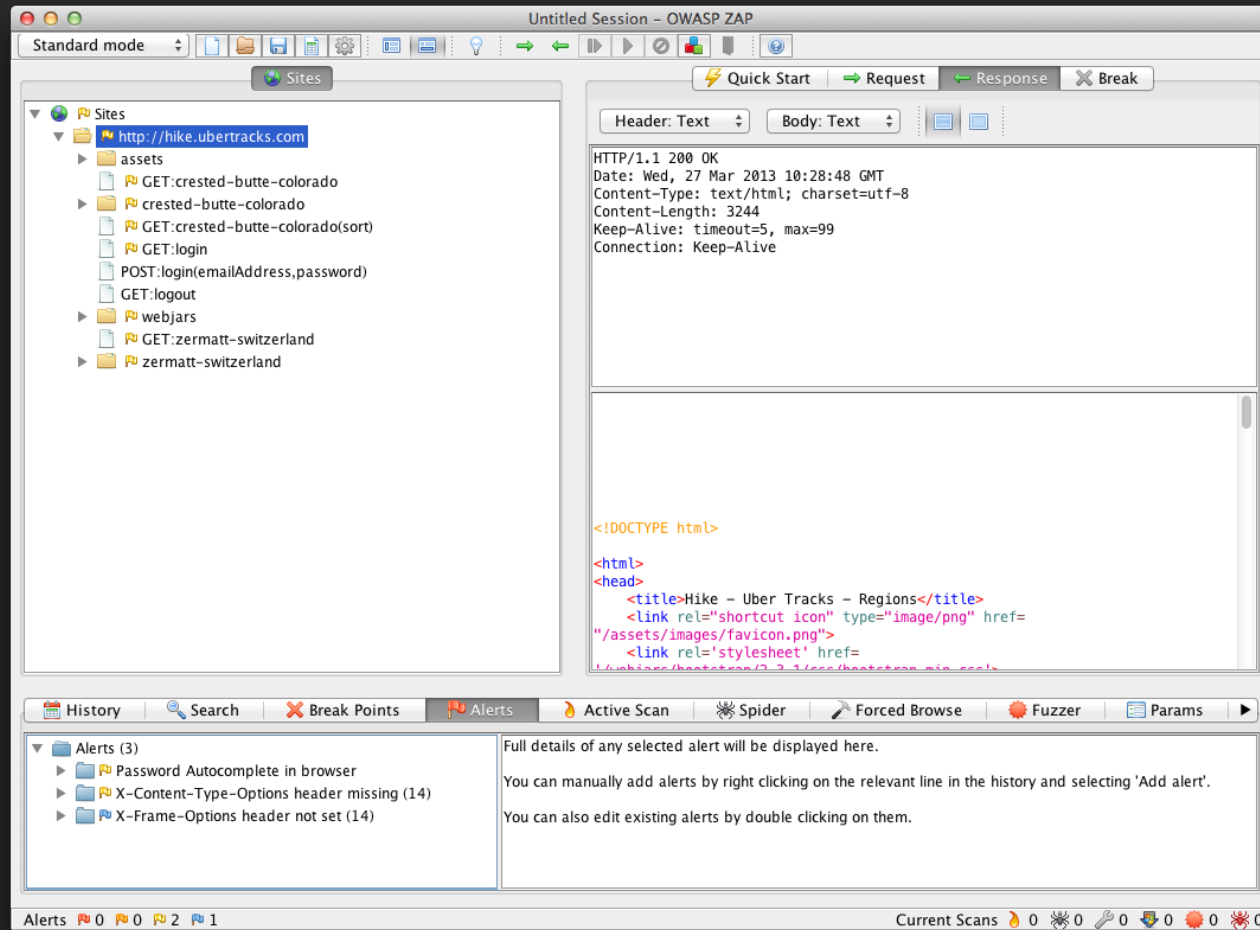
**Zermatt, Switzerland**  


**RECENT COMMENTS**

erer  
foo  
hallo meine Freunde  
Good directions.  
Very easy instructions. I just wasn't clear on where to start.

# Pen Testing with OWASP ZAP

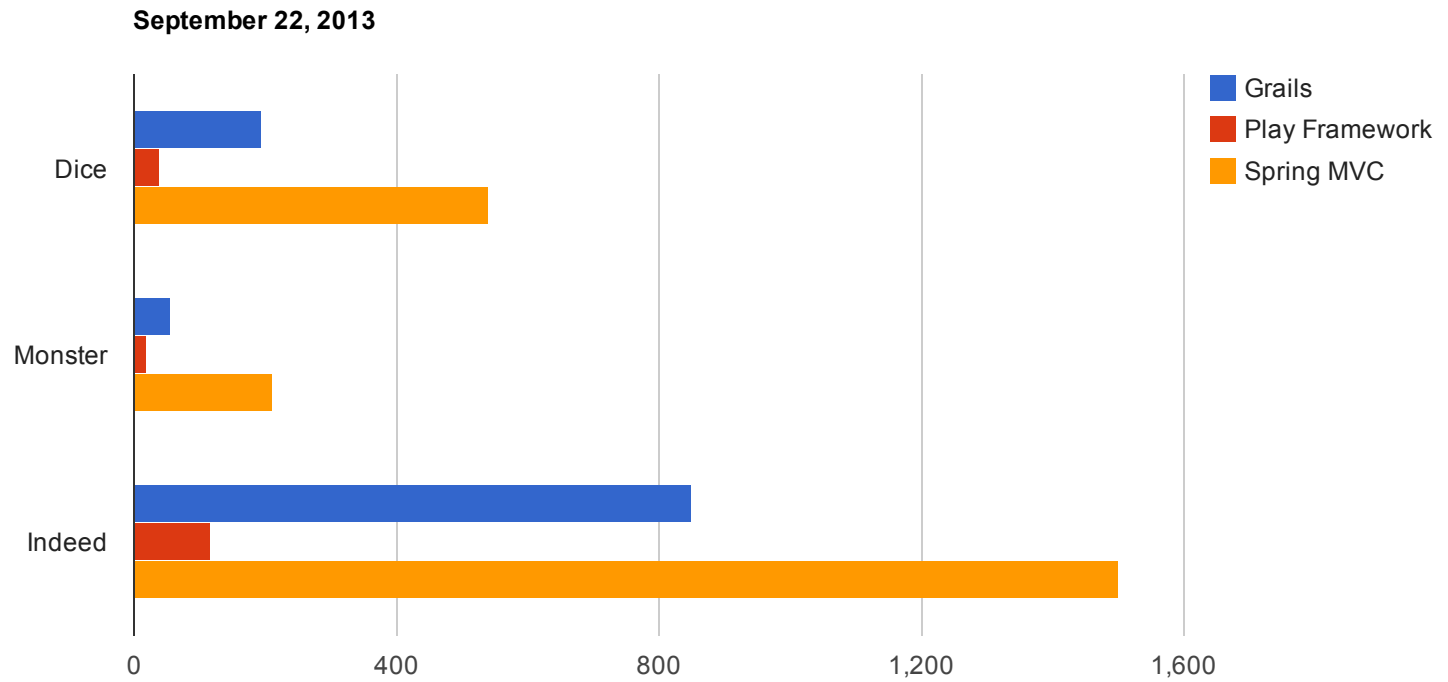




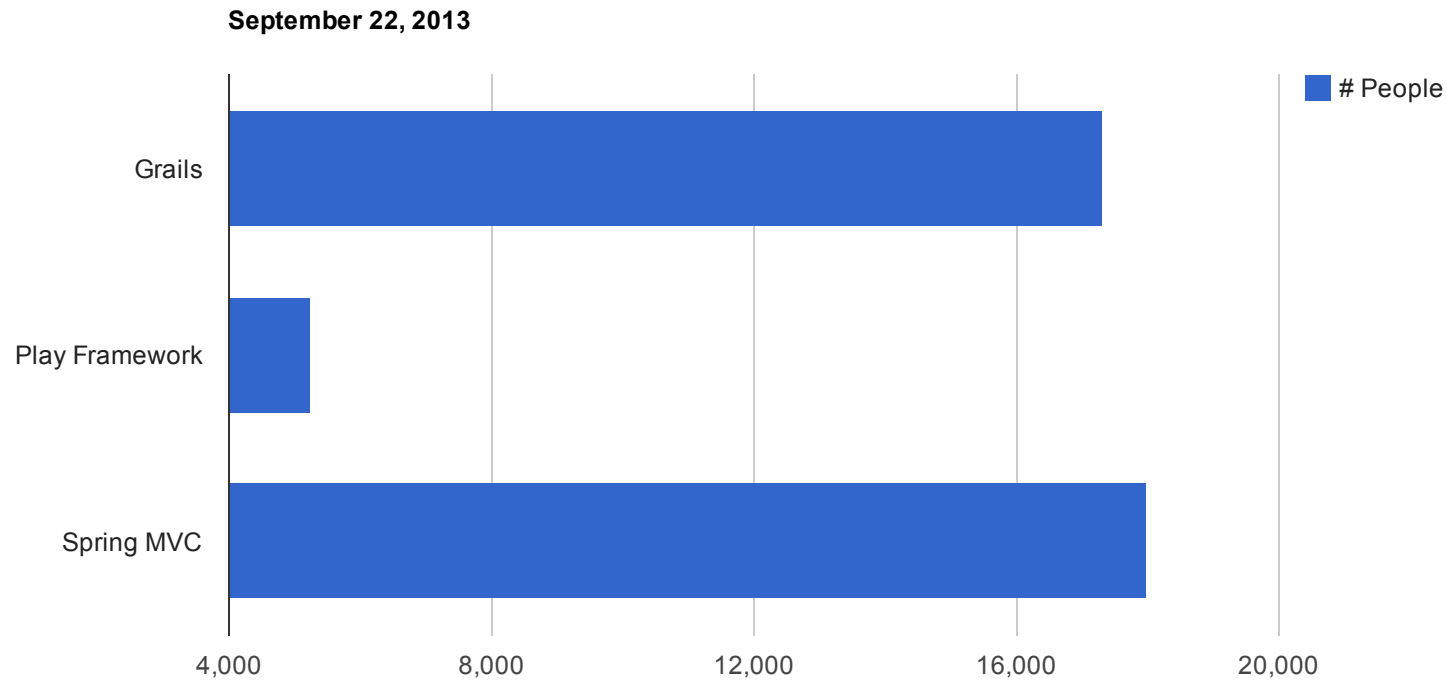
# Grails 2 vs. Play 2

- **Jobs**
- **LinkedIn Skills**
- **Google Trends**
- **Indeed**
- **Mailing List Traffic**
- **Books on Amazon**
- **2012 Releases**
- **Stack Overflow**
- **Hacker News**

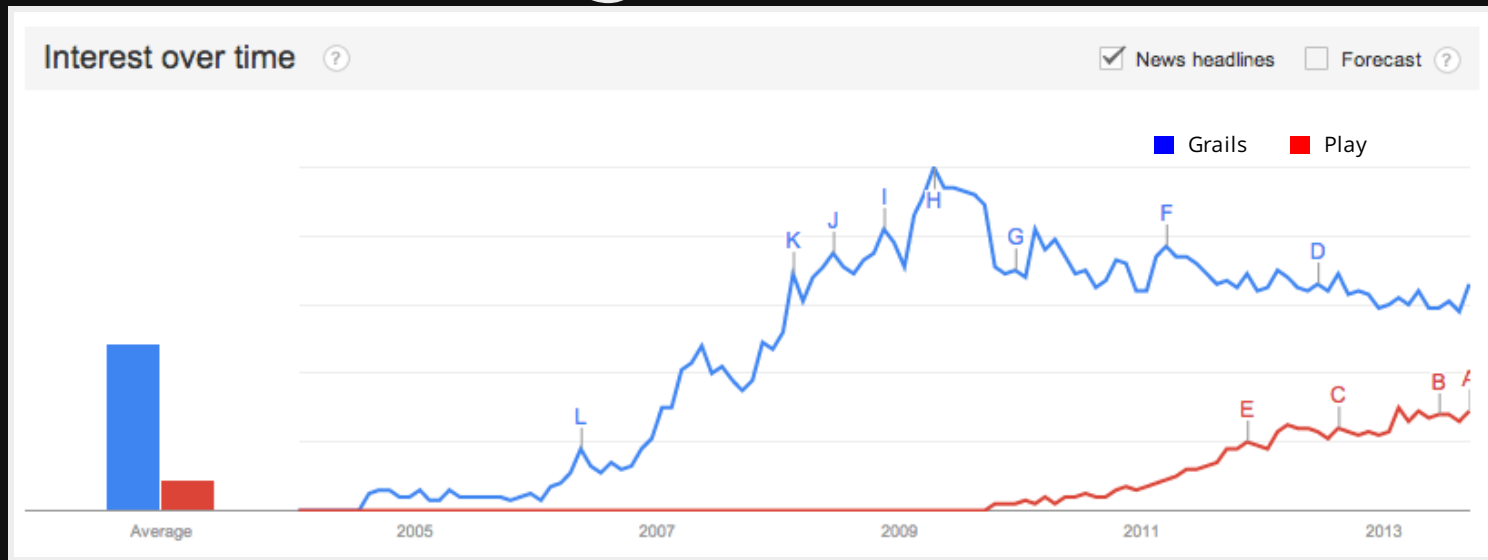
# Jobs



# LinkedIn Skills

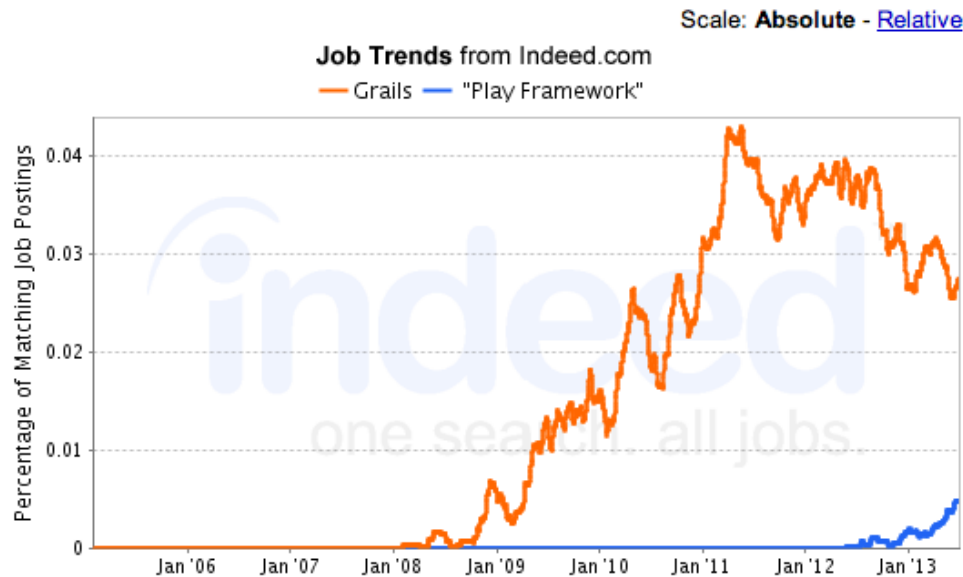


# Google Trends



# Indeed Job Trends

## Grails, "Play Framework" Job Trends



Indeed.com searches millions of jobs from thousands of job sites.  
This job trends graph shows the percentage of jobs we find that contain your search terms.

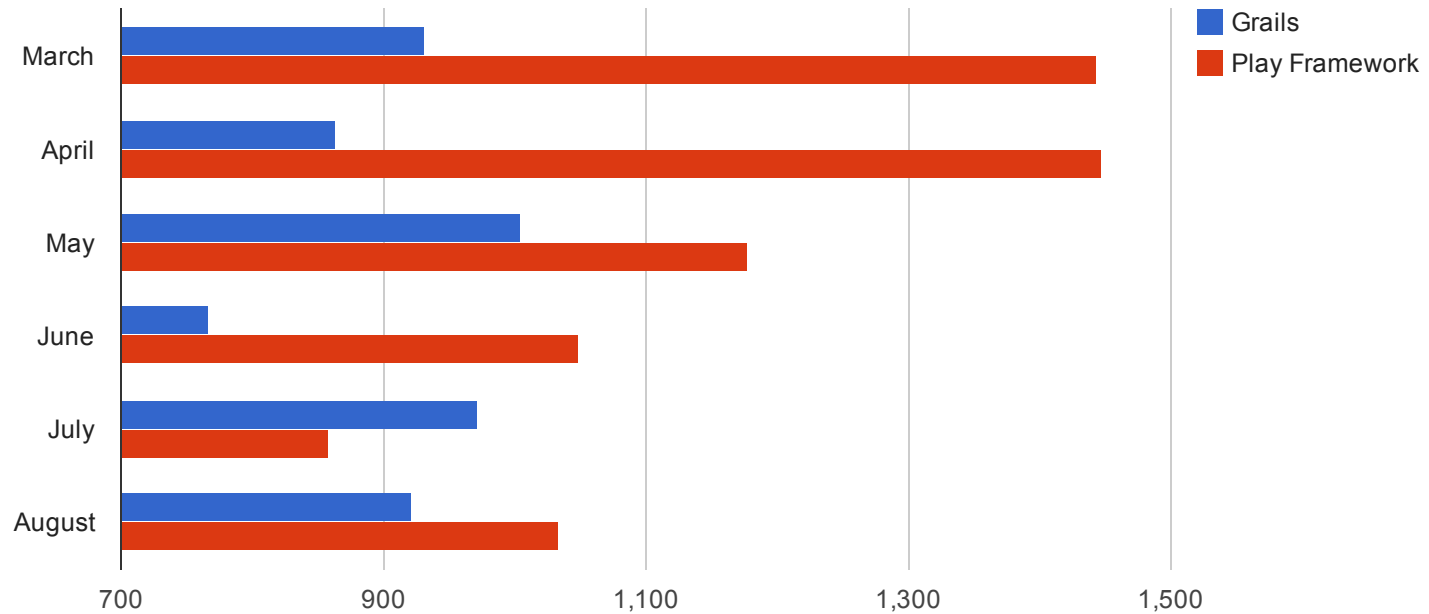
► [Email to a friend](#)

► [Post on your blog/website](#)

### Top Job Trends

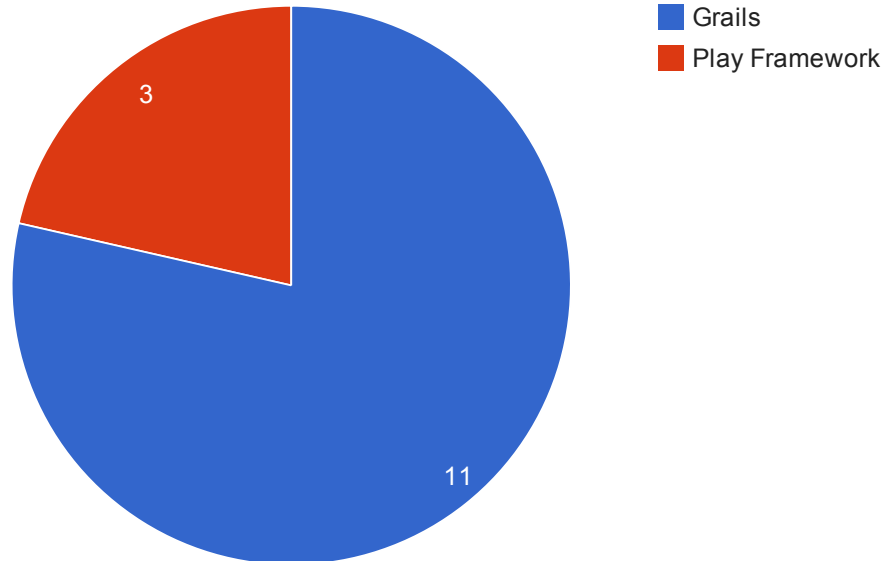
1. [HTML5](#)
2. [MongoDB](#)
3. [iOS](#)
4. [Android](#)
5. [Mobile app](#)
6. [Puppet](#)
7. [Hadoop](#)
8. [jQuery](#)
9. [PaaS](#)
10. [Social Media](#)

# User Mailing List Traffic

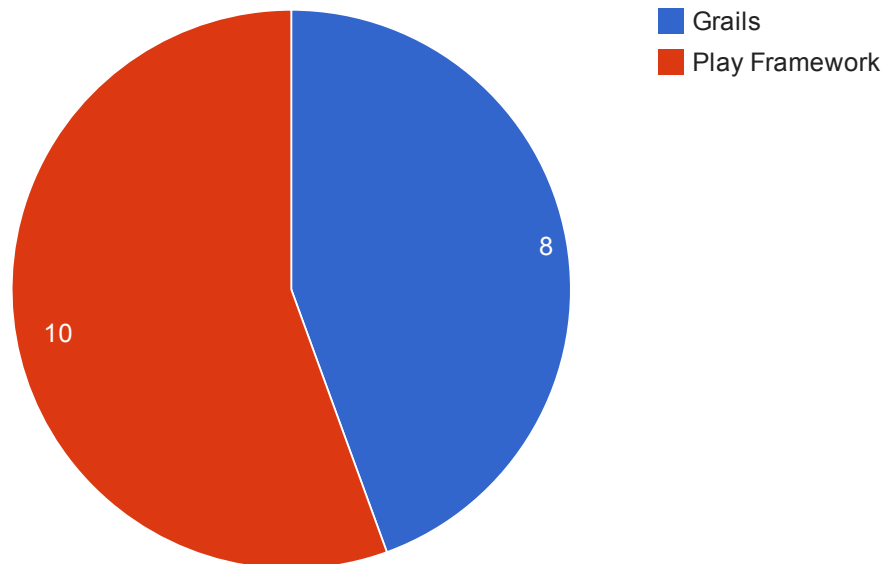


# Books on Amazon

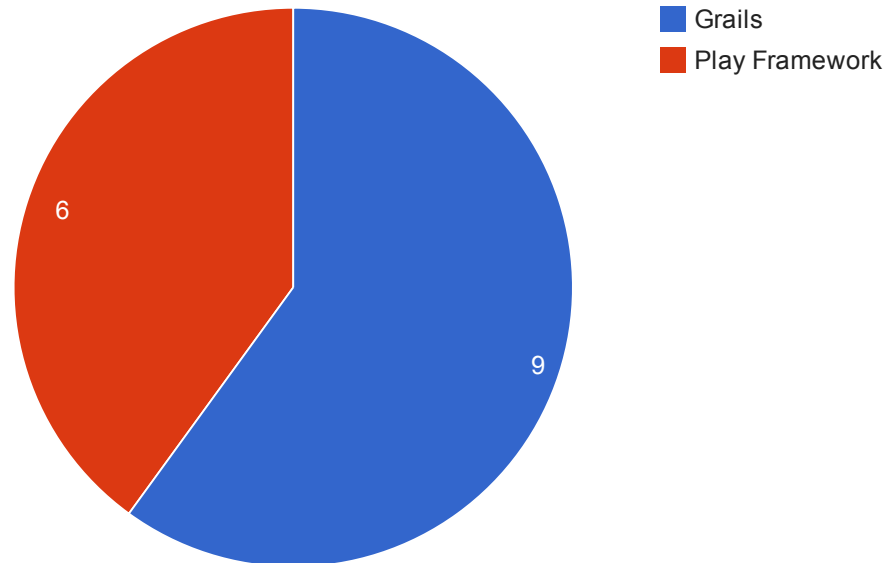
September 2013



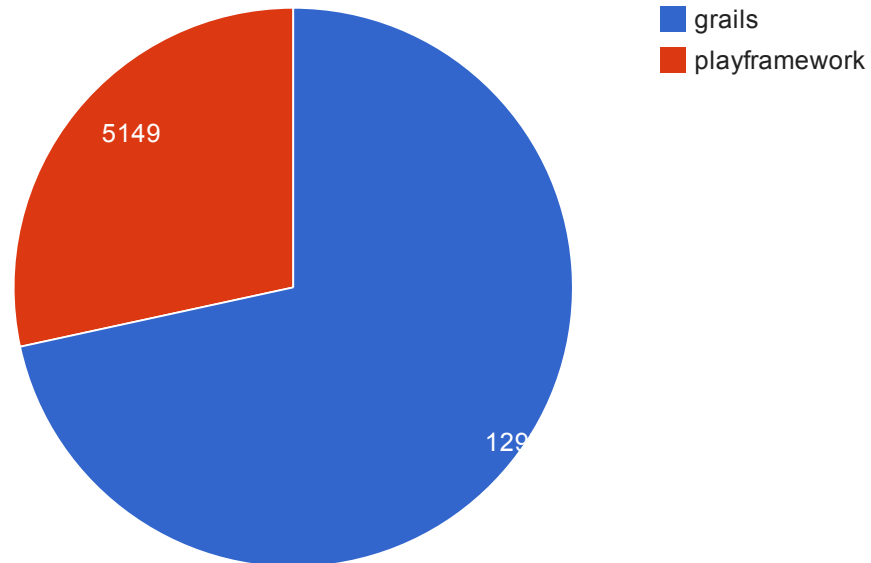
# 2013 Releases



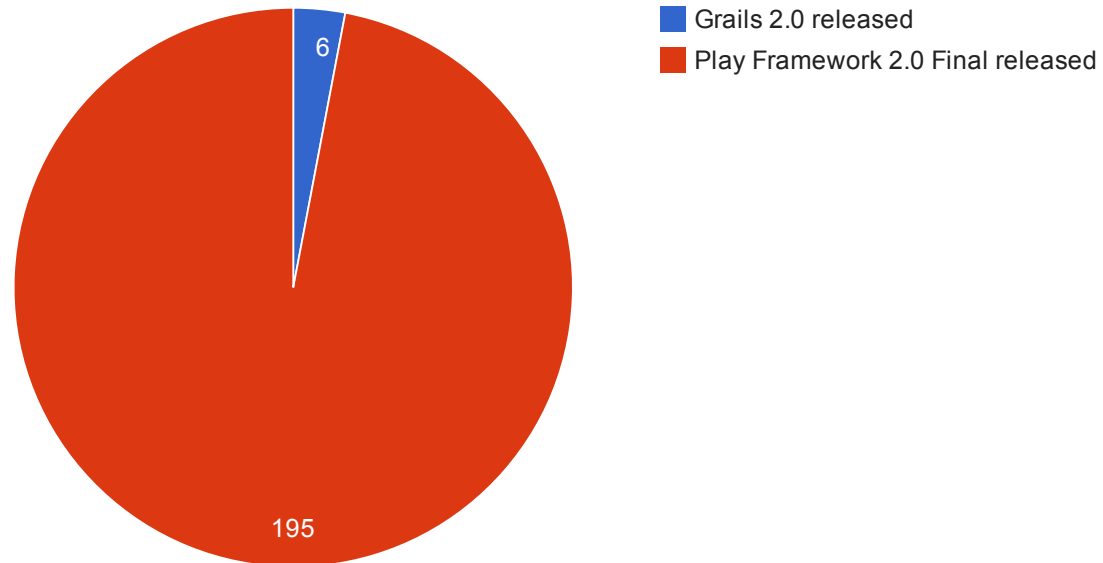
# 2012 Releases



# StackOverflow Questions



# Hacker News



# Conclusions: Code

- From a code perspective, very similar frameworks.
- Code authoring good in both.
- Grails Plugin Ecosystem is excellent.
- TDD-Style Development easy with both.
- Type-safety in Play 2 was really useful, especially routes and upgrades.

# Conclusions: Statistical Analysis

- Grails has better support for FEO (YSlow, PageSpeed)
- Grails has less LOC! (4 more files, but 20% less code)
- Apache Bench with 10K requests (2 Dynos):
  - Requests per second: {Play: 242, Grails: 257}
- Caching significantly helps!

# Conclusions: Ecosystem Analysis

- "Play" is difficult to search for.
- Grails is more mature.
- Play has momentum issues.
- LinkedIn: more people know Grails than Spring MVC.
- Play *had* 3x user mailing list traffic, but gap is narrowing.
- We had similar experiences with documentation and questions.
- Outdated documentation is a problem for both.
- Play has *way* more hype!

# Questions?

- <http://ubertracks.com>
- Source:
  - <https://github.com/jamesward/happytrails>
  - Branches: grails2, play2\_java
  - Presentation\*: master/preso
- Contact Us:
  - [jamesward.com](http://jamesward.com)
  - [raibledesigns.com](http://raibledesigns.com)

\* Presentation created with [Reveal.js](#), [Google Charts](#) and [GitHub Files](#).

# Action!

*Learn something new\*!*



\* Or prove that we're wrong...