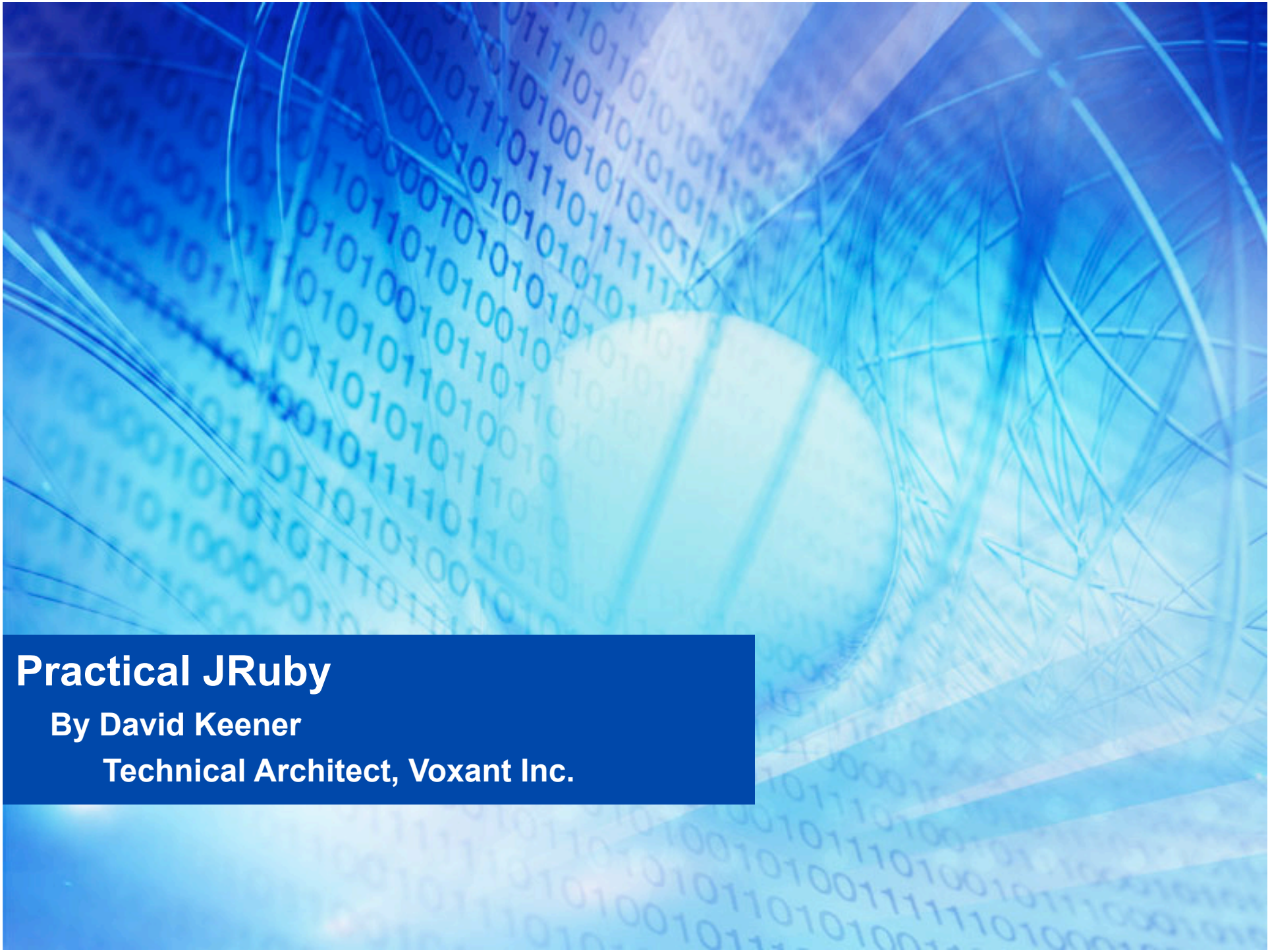


Practical JRuby

By David Keener

Technical Architect, Voxant Inc.

Overview

JRuby is an implementation of the Ruby programming language that runs on the Java Virtual Machine (JVM).

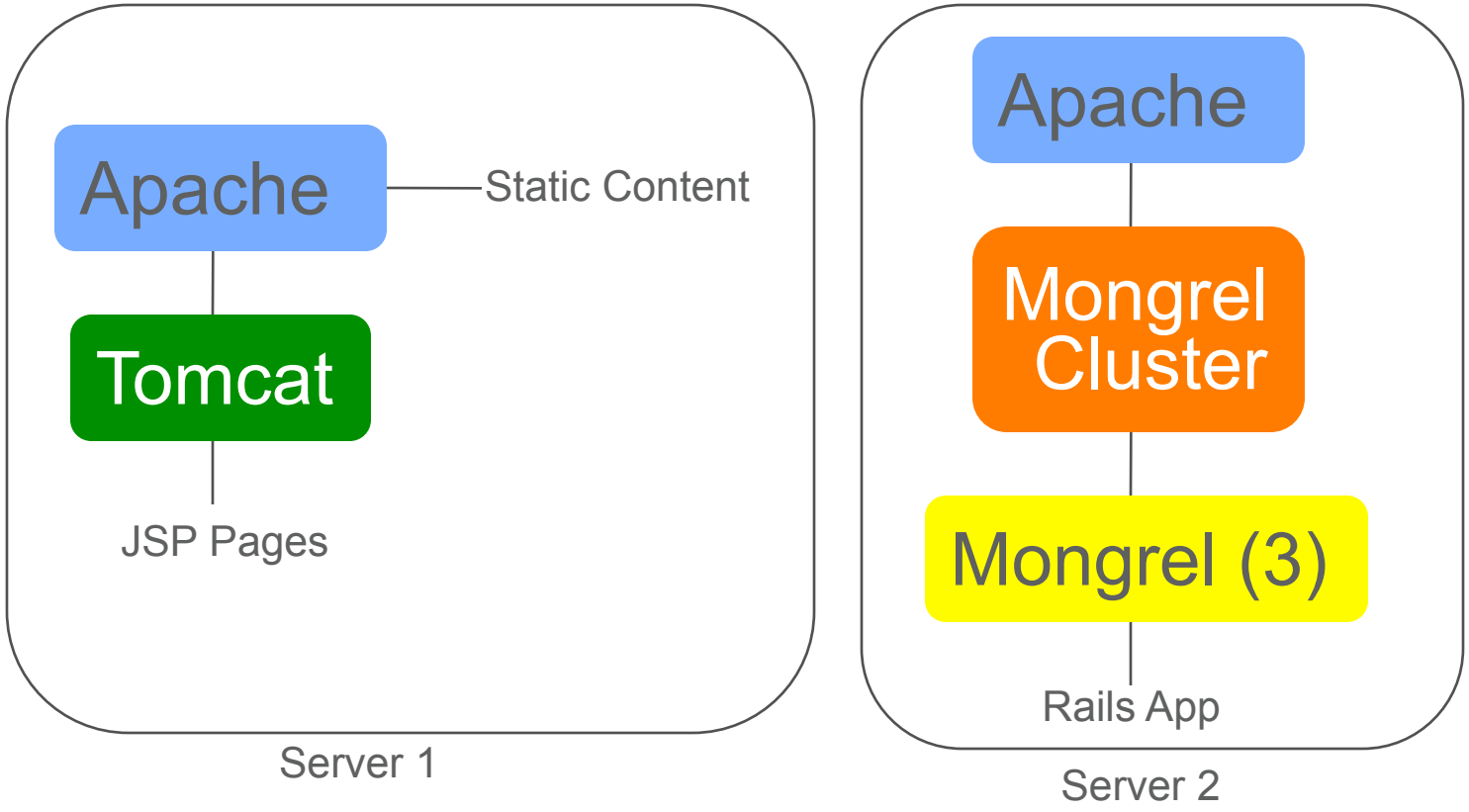
By the end of this presentation, you will be able to answer questions like:

- What is JRuby?
- Why would you want to use it?
- How can JRuby be useful to the enterprise?
- Where do you get it?
- How is using JRuby different than using Ruby?
- How can you deploy JRuby applications?


Ruby&
Java

A Real-Life Scenario

One Web site at AOL, unified on look-and-feel…
…a perfect candidate for JRuby



Part 1: JRuby in Perspective

Ruby Ecosystem

Libs/Tools

- Small pool of 3rd-party libraries / tools
- Killer App: Rails web framework

Language

- Elegant, flexible, fully object-oriented
- Concise and powerful
- Facilitates agile development

Platform

- Threads and garbage collection weak
- Slow, but getting faster….
- Not as proven and reliable as Java

Java Ecosystem

Libs/Tools

- Lots of 3rd-party libraries / tools
- Maelstrom of over-engineered, under-integrated frameworks

Language

- Functional, but cumbersome
- Does not promote agile development

Platform

- JVM is proven and reliable
- Compiled code is faster than Ruby
- Threads, garbage collection - excellent

JRuby

Libs/Tools

- Lots of 3rd-party libraries / tools
- Rails framework for Agile Development

Language(s)

- Dynamic coding capability with Ruby
- Access to Java code whenever needed

Platform

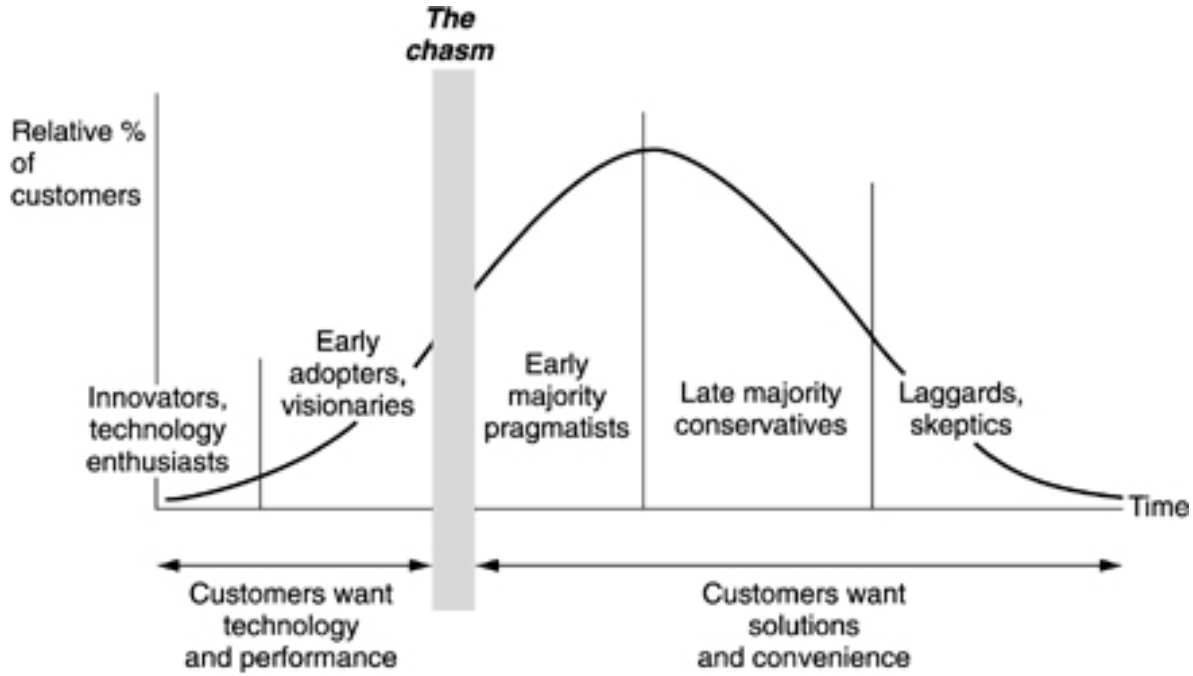
- Proven and reliable platform with JVM
- JRuby generally faster than Ruby 1.8.6 with the Matz Ruby Interpreter (MRI)

Why Use JRuby?

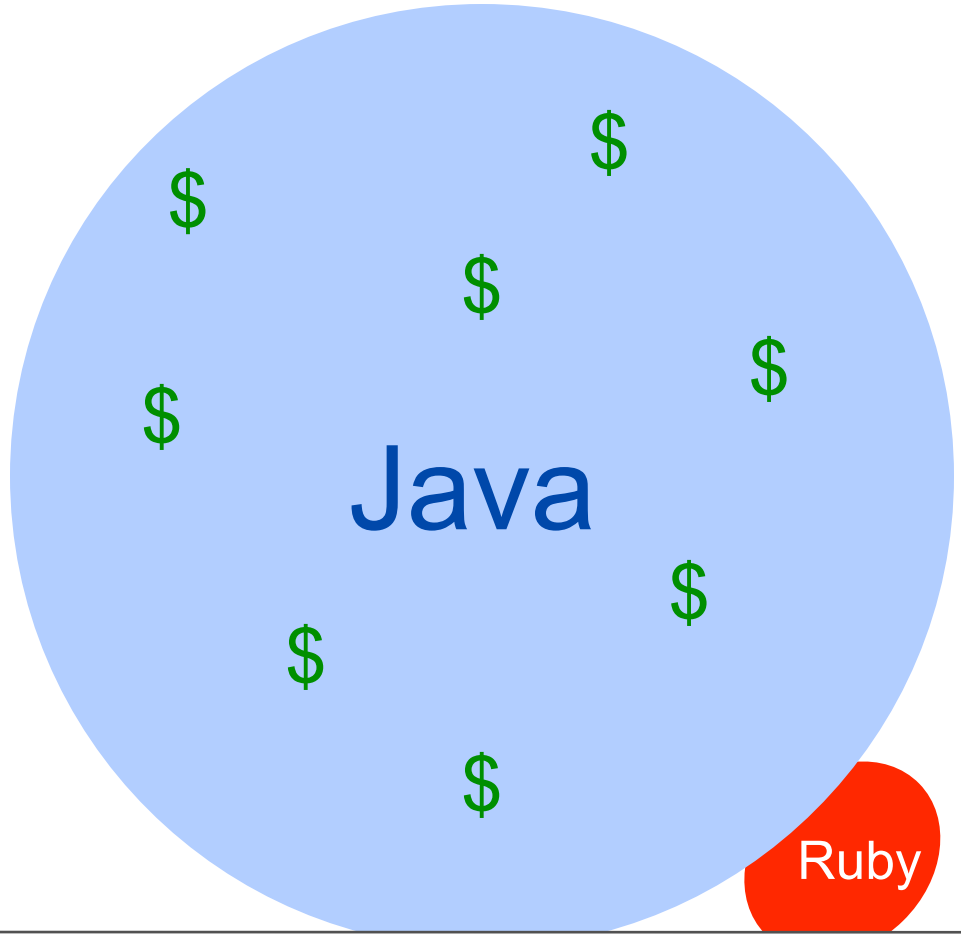
- Gain the agility of using a dynamic scripting language instead of a compiled language
- Gain the ability to use 3rd-party libs in both Ruby and Java
- Can leverage existing Java code in Ruby/Rails
- Easier integration of Rails apps into many enterprises
- Deploy Rails applications as War files

Adoption Paradigm

Rails is in a unique place, just to the left of the “Chasm”. Its capacity for successful delivery of real business applications will probably be a key factor in crossing into “the enterprise.”



The Reality of the Market



* Not to scale

Part 2: JRuby Setup

JRuby Installation

- Download and install JRuby
  - Download: http://dist.codehaus.org/jruby/
  - Instructions: http://wiki.jruby.org/wiki/Getting_Started
- Add JRuby “bin” directory to PATH
- Set environment variables:
  - JAVA_HOME
  - JRUBY_HOME
  - ANT_HOME (if compiling JRuby from source)

JRuby Commands

- jruby
- jirb
- gem (or jgem)
- rake
- rdoc

Etc.

Installation Tip #1

JRuby has many of the same commands as Ruby, e.g. – “gem”. To run JRuby commands, use the –S option:

```
jruby –S gem install will_paginate
```

But…

- Install JRuby in a different directory tree than Ruby (MRI)

Installation Tip #2

JRuby changes often!

Use a soft link to point to the current version.

JRuby Timeline

May 1, 2009:	1.3 RC1
Mar 16, 2009:	1.2
Dec 17, 2008:	1.1.6
Jul 19, 2008:	1.1.3
May 27, 2008:	1.1.2
Apr 22, 2008:	1.1.1
Apr 5, 2008:	1.1
Dec 15, 2008:	1.0.3
Nov 1, 2007:	1.0.2
Aug 23, 2007:	1.0.1
Jun 7, 2007:	1.0

Testing the Installation

- Basic testing

  $ jruby power.rb

- Run the JRuby tests

  $ cd $JRUBY_HOME

  $ ant test

powers.rb

```
def powers(count)
  (0..count).each{ |i| puts 2**i }
end

powers(10)
```

Installing Gems

- Install gems with:
  - jruby –S gem install mongrel
  - jgem install mongrel
- Most gems work fine, except…
  - Gems that require a native C library
- Mongrel and Hpricot are gems that do native libraries in an agnostic fashion, with either C or Java, so they work fine

Important Gems

- jgem install rails
- jgem install ActiveRecord-JDBC
  - JRuby supports MySQL out-of-the-box
  - Anything else, you need this gem
  - Database support is better than Ruby
- jgem install mongrel

An IDE for Java and Ruby

You might not need an IDE for Ruby…

But you do for Java.

Just accept it and move on.

Part 3: Working With Java

Java Integration

How do you tell JRuby that you want to use Java?

1. Explicitly require the Java features

   require ‘java’

2. Direct reference to a Java class

   obj = Java::com.keenertech.HelloWorld

What about Dual-Purpose Code?

What if you have code that needs to run in both Ruby and JRuby?

- Need to detect whether you're using JRuby…

```
jruby = defined?(JRUBY_VERSION)
```

- Take different actions based on whether you're in JRuby

- Technique compliments of Ola Bini

Yes, You Need CLASSPATH

- In general, the classes you're going to use should before be available in the CLASSPATH before you run JRuby
- You can add Jar files to the CLASSPATH dynamically

  - require 'keenertech.jar'

- Does not work for certain types of classes, e.g. – drivers

Referencing a Java Class

include class “com.keenertech.HelloWorld”

- Creates a local constant with the same name as the Java class
- Can create a name that clashes with Ruby classes
- Most useful for your home-grown classes

JString = java.lang.String

- Only for “java”, “javax”, “org” and “com”.

Ruby-ized Java

- In most cases, parentheses aren't needed
- Ruby-ized method aliases

  DoStuffNow -> do_stuff_now
- Ruby-ized variable aliases
- Getters/setters become attribute accessors

  getName -> name
- to_java method – a conversion workhorse

Interfaces

- Can create an instance of an interface
- Can import an interface like a Ruby module
- Any methods not implemented will result in method_missing being called

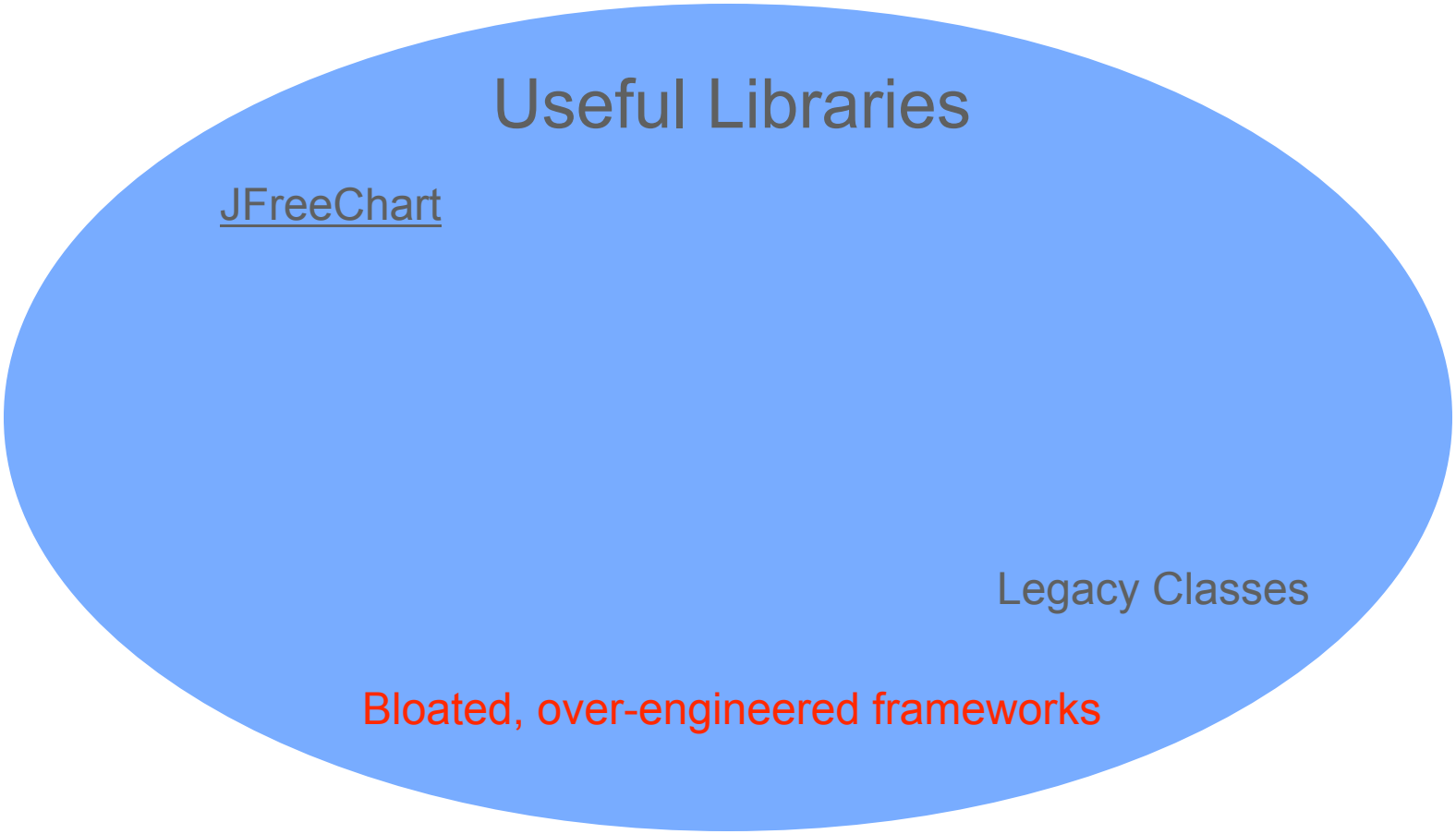
Packaging Rails as a War File

- goldspike
  - Seems to be the preferred way
- warbler

Both still a little rocky sometimes

Part 4: Java Third Party Libs

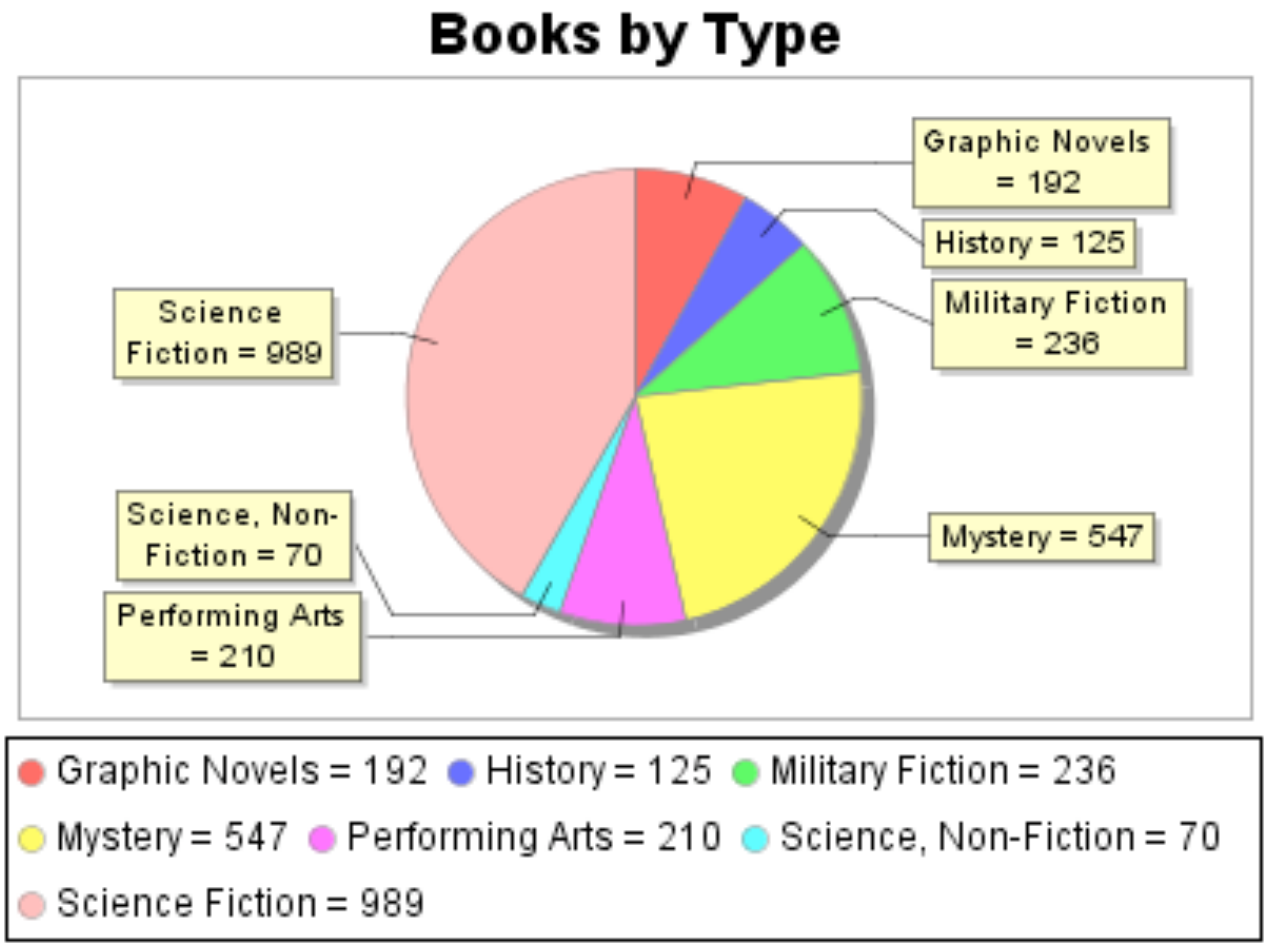
The Java Ecosystem



What Is JFreeChart?

- Open source Java charting class library
- Easy to use; with well-documented API
- Supports dozens of chart types
- Real-time chart generation
- Extensive customization of charts
- Can output charts in numerous formats
- Mature technology – supported and enhanced since 2000

A Typical Chart



Supported Chart Types

- Pie Charts
- Exploded Pie Charts
- Area Charts
- Stacked Area Charts
- Candlestick Charts
- Time Series Charts
- Gantt Charts
- Dual Axis Charts
- Histograms
- Time Series Charts
- Line Charts
- Bar Charts
- Layered Bar Charts
- Stacked Bar Charts
- Statistical Bar Charts
- Waterfall Charts
- Meter Charts
- Ring Charts
- Scatter Plots
- Etc.

Prerequisites for Use

- Java 2 Platform (JDK 1.3 or later)
- JFreeChart 1.0.4 (as of February 9, 2007)
- (Optional) Web Container, e.g. – Tomcat, WebLogic, etc.

- It’s prerequisites are less than JRuby. So, if you can use JRuby, you can use JFreeChart.

Where Do You Get It?

JFreeChart Home Page

- http://www.jfree.org/jfreechart/

JFreeChart Documentation

- Free Installation Manual (PDF)
- Generated API Documentation

  - http://www.jfree.org/jfreechart/api/gjdoc/index.html
- Developer Manual (PDF)

  - Costs $48.75 for PDF download (well worth it!)

Steps to Produce a Chart

① Determine type of chart to be produced

② Get the raw data for the chart

③ Store data in JFreeChart Dataset object

④ Create a Chart object – Of desired chart type and passing in the Dataset object

⑤ Customize Chart object as needed

⑥ Output generated chart in desired format

Other Ways to Use JFreeChart

- ChartUtilities class allows charts to be output in many formats, written to files, written to streams, etc.
- Charts can easily be incorporated into servlets (as just shown), or applets or applications

Summary

The benefits of JRuby are:

- Access to Ruby and Java 3rd party libs
- Ability to leverage legacy Java code
- JVM is a proven an reliable platform
- Corporate IT staffs already trained and set up to support JVM (Apache, Tomcat, etc.)
- Dynamic coding ability offers agility as a competitive advantage