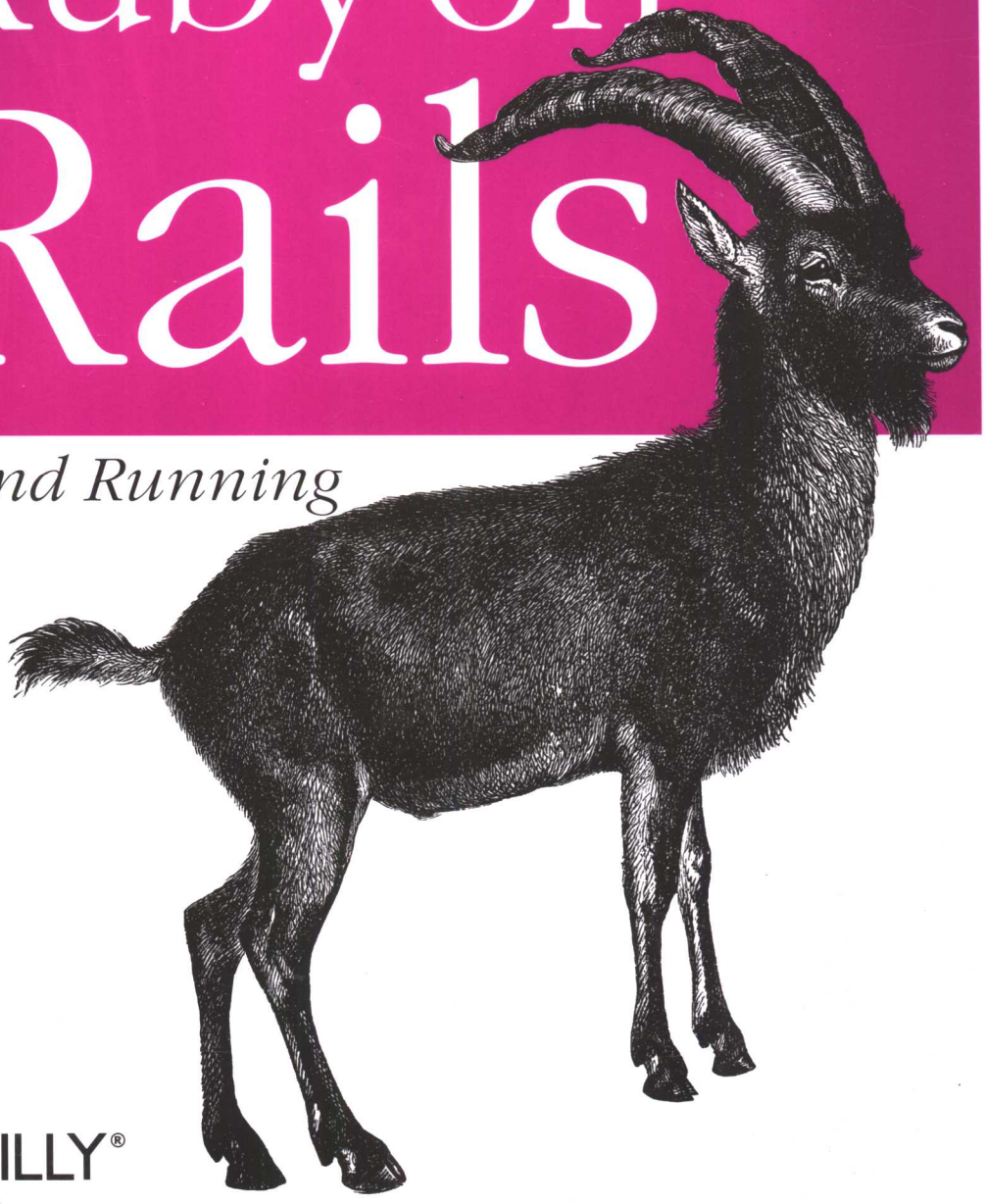
Ruby on Rails: Up and Running（影印版）

Ruby on Rails

Up and Running



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Bruce A. Tate & Curt Hibbs 著

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Preface

The Ruby on Rails phenomenon is sweeping through our industry with reckless disregard for established programming languages, longstanding conventions, or commercial support. You can get a whole lot of information on Ruby on Rails from articles on the Web, excellent books, and even formal coursework. However, there's something missing. How does an established programmer, armed with nothing more than a little Ruby knowledge, go just beyond the basics, and be productive in Rails?

With *Ruby on Rails: Up and Running*, we are not going to reiterate the reference manual or replace Google. Instead, we'll strive to give you the big picture of how Rails applications hold together and tell you where to go for the information that we don't cover in the chapters. You will see how Rails dynamically adds features to all database models, called Active Record objects. By understanding the big picture, you'll be able to make better use of the best reference manuals to fill in the details.

We won't try to make you digest a whole lot of words. Instead, we'll give you the theory in the context of an end-to-end application. We'll walk you through the creation of a simple project—one that is a little more demanding than a blog or shopping cart, but with a simple enough structure that a Rails beginner will be able to quickly understand what's going on.

We're not going to try to cover each new feature. Instead, we'll show you the ones we see as the backbone, forming the most important elements to understand. We will also cover migrations and Ajax in some detail, because you won't find too much information on those two frameworks yet.

In short, we're not trying to build a comprehensive Rails library. We're going to give you the foundation you need to get up and running.

Who Should Read This Book?

Ruby on Rails: Up and Running is for experienced developers who are new to Rails and possibly to Ruby. To use this book, you don't have to be a strong Ruby

programmer. We do expect you to be a programmer, though. You should know enough about your chosen platform to be able to write programs, install software, run scripts using the system console, edit files, use a database, and understand how basic web applications work.

Conventions Used in This Book

The following typographic conventions are used in this book:

Plain text
: Indicates menu titles, menu options, menu buttons, and keyboard accelerators (such as Alt and Ctrl).

Italic
: Indicates new terms, URLs, email addresses, filenames, file extensions, pathnames, directories, and Unix utilities.

`Constant width`
: Indicates commands, the contents of files, and the output from commands.

`Constant width bold`
: Shows commands or other text that should be typed literally by the user.

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: Shows text that should be replaced with user-supplied values.

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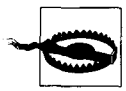

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You can get sample code at the main page for *Ruby on Rails: Up and Running*: *http://www.oreilly.com/catalog/rubyrails/*. You will find a ZIP file that contains the sample

project as it exists after each chapter, with each instance of the sample application numbered by chapter. If you want to skip a chapter, just download the right ZIP file.

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Platforms

Ruby on Rails is cross-platform, but Unix and Windows shells behave differently. For consistency, we use Windows throughout the book. You can easily run the examples on the Unix or Mac OS X operating systems as well. You'll see a couple of minor differences:

- On Windows, you can specify paths with either the forward slash (/) or backslash (\) character. We'll try to be consistent and use the forward slash to specify all paths.
- On Windows, to run the various Ruby scripts that make up Rails, you need to explicitly type `ruby`. On Unix environments, you don't. If you're running Unix, and you are instructed to type the command `ruby script/server`, feel free to omit the `ruby`.
- On Windows, to run a process in a separate shell, precede the command with `start`. On Unix and Mac OS X, append an ampersand (&) character to run the command in the background.

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As mentioned in the earlier section, we have a web site for this book where you can find code, errata (previously reported errors and corrections available for public view), and other book information. You can access this web site at:

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Acknowledgments

Writing a book is a demanding exercise, taking passion, commitment, and persistence. The authors on the cover get all of the glory (and possibly the blame). Many people contribute to a book. We'd like to mention the people who made writing this book such a fulfilling experience.

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CHAPTER 1

Zero to Sixty: Introducing Rails

Rails may just be the most important open source project to be introduced in the past 10 years. It's promoted as one of the most productive web development frameworks of all time and is based on the increasingly important Ruby programming language. What has happened so far?

- By December 2006, you're likely to see more published books on Rails than any of Java's single flagship frameworks, including JSF, Spring, or Hibernate.
- The Rails framework has been downloaded at least 500,000 times in only its second year, as of May 2006. These statistics compare favorably with the most popular open source frameworks in any language.*
- The Rails community mailing lists get hundreds of notes a day, compared to dozens on the most popular web development frameworks in other languages.
- The Rails framework has caused an explosion in the use of the Ruby programming language, which has been relatively obscure until recently.
- The Rails buzz generates increasingly hot debates on portals that focus on other programming languages. The Java community in particular has fiercely debated the Rails platform.

You don't have to go far to find great overviews of Rails. You can watch several educational videos that show Rails in action, narrated by the founder David Heinemeier Hansson. You can watch him build simple working applications, complete with a backing database and validation, in less than 10 minutes. But unlike the many quick-and-dirty environments you've seen, Rails lets you keep the quick and leave the dirty behind. It lets you build clean applications based on the model-view-controller philosophy. Rails is a special framework.

* The number 500,000 is actually a conservative estimate. Download statistics for a popular delivery vehicle, called *gems*, make it easy to track the number of Rails distributions by gems, but many other distributions exist, such as the Locomotive distribution on Mac OS X. The real download statistics could easily be twice this number.

Sure, Rails has its limitations. Ruby has poor support for object-relational mapping (ORM) for legacy schemas; the Rails approach is less powerful than Java's approach, for example.* Ruby does not yet have flagship integrated development environments. Every framework has limitations, and Rails is no different. But for a wide range of applications, the strengths of Rails far outpace its weaknesses.

Rails Strengths

As you go through this book, you'll learn how Rails can thrive without all of the extensive libraries required by other languages. Ruby's flexibility lets you extend your applications in ways that might have been previously unavailable to you. You'll be able to use a Rails feature called *scaffolding* to put database-backed user interfaces in front of your customers quickly. Then, as you improve your code, the scaffolding melts away. You'll be able to build database-backed model objects with just a couple of lines of code, and Rails will fill in the tedious details.

The most common programming problem in today's typical development project involves building a web-based user interface to manage a relational database. For that class of problems, Rails is much more productive than any other web development framework either of us has ever used. The strengths aren't limited to any single groundbreaking invention; rather, Rails is packed with features that make you more productive, with many of the following features building on one other:

Metaprogramming

Metaprogramming techniques use programs to write programs. Other frameworks use extensive code generation, which gives users a one-time productivity boost but little else, and customization scripts let the user add customization code in only a small number of carefully selected points. Metaprogramming replaces these two primitive techniques and eliminates their disadvantages. Ruby is one of the best languages for metaprogramming, and Rails uses this capability well.†

Active Record

Rails introduces the Active Record framework, which saves objects to the database. Based on a design pattern cataloged by Martin Fowler, the Rails version of Active Record discovers the columns in a database schema and automatically attaches them to your domain objects using metaprogramming. This approach to wrapping database tables is simple, elegant, and powerful.

* For example, Hibernate supports three kinds of inheritance mapping, but Rails supports only single-table inheritance. Hibernate supports composite keys, but Rails is much more limited.

† Rails also uses code generation but relies much more on metaprogramming for the heavy lifting.

Convention over configuration
: Most web development frameworks for .NET or Java force you to write pages of configuration code. If you follow suggested naming conventions, Rails doesn't need much configuration. In fact, you can often cut your total configuration code by a factor of five or more over similar Java frameworks just by following common conventions.

Scaffolding
: You often create temporary code in the early stages of development to help get an application up quickly and see how major components work together. Rails automatically creates much of the scaffolding you'll need.

Built-in testing
: Rails creates simple automated tests you can then extend. Rails also provides supporting code called *harnesses* and *fixtures* that make test cases easier to write and run. Ruby can then execute all your automated tests with the `rake` utility.

Three environments: development, testing, and production
: Rails gives you three default environments: development, testing, and production. Each behaves slightly differently, making your entire software development cycle easier. For example, Rails creates a fresh copy of the Test database for each test run.

There's much more, too, including Ajax for rich user interfaces, partial views and helpers for reusing view code, built-in caching, a mailing framework, and web services. We can't get to all of Rails' features in this book; however, we will let you know where to get more information. But the best way to appreciate Rails is to see it in action, so let's get to it.

Putting Rails into Action

You could manually install all of the components for Rails, but Ruby has something called *gems*. The `gem` installer accesses a web site, Ruby Forge, and downloads an application unit, called a gem, and all its dependencies. You can install Rails through gems, requesting all dependencies, with this command:*

```
gem install rails --include-dependencies
```

That's it—Rails is installed. There's one caveat: you also need to install the database support for your given database. If you've already installed MySQL, you're done. If

* If you want to code along with us, make sure you've installed Ruby and gems. Appendix A contains detailed installation instructions.

MVC and Model2

In the mid-1970s, the MVC (model-view-controller) strategy evolved in the Smalltalk community to reduce coupling between business logic and presentation logic. With MVC, you put your business logic into separate domain objects and isolate your presentation logic in a view, which presents data from domain objects. The controller manages navigation between views, processes user input, and marshals the correct domain objects between the model and view. Good programmers have used MVC ever since, implementing MVC applications using frameworks written in many different languages, including Ruby.

Web developers use a subtly different variant of MVC called *Model2*. Model2 uses the same principles of MVC but tailors them for stateless web applications. In Model2 applications, a browser calls a controller via web standards. The controller interacts with the model to get data and validate user input, and then makes domain objects available to the view for display. Next, the controller invokes the correct view generator, based on validation results or retrieved data. The view layer generates a web page, using data provided by the controller. The framework then returns the web page to the user. In the Rails community, when someone says MVC, they're referring to the Model2 variant.

Model2 has been used in many successful projects spread across many programming languages. In the Java community, Struts is the most common Model2 framework. In Python, the flagship web development framework called Zope uses Model2. You can read more about the model-view-controller strategy at *http://en.wikipedia.org/wiki/Model-view-controller*.

not, go to *http://rubyonrails.org* for more details on Rails installation. Next, here's how to create a Rails project:

```
> rails chapter-1
      create
      create  app/controllers
      create  app/helpers
      create  app/models
      create  app/views/layouts
      create  config/environments
      create  components
      create  db
      create  doc
      create  lib

...
      create  test/mocks/development
      create  test/mocks/test
      create  test/unit
      create  vendor
...
```

```
      create  app/controllers/application.rb
      create  app/helpers/application_helper.rb
      create  test/test_helper.rb
      create  config/database.yml
...
```

We truncated the list, but you get the picture.

Organization

The directories created during installation provide a place for your code, scripts to help you manage and build your application, and many other goodies. Later, we'll examine the most interesting directories in greater detail. For now, let's take a quick pass through the directory tree in the project we created:

app
: This application organizes your application components. It's got subdirectories that hold the view (*views* and *helpers*), controller (*controllers*), and the backend business logic (*models*).

components
: This directory holds *components*—tiny self-contained applications that bundle model, view, and controller.

config
: This directory contains the small amount of configuration code that your application will need, including your database configuration (in *database.yml*), your Rails environment structure (*environment.rb*), and routing of incoming web requests (*routes.rb*). You can also tailor the behavior of the three Rails environments for test, development, and deployment with files found in the *environments* directory.

db
: Usually, your Rails application will have model objects that access relational database tables. You can manage the relational database with scripts you create and place in this directory.

doc
: Ruby has a framework, called *RubyDoc*, that can automatically generate documentation for code you create. You can assist *RubyDoc* with comments in your code. This directory holds all the *RubyDoc*-generated Rails and application documentation.

lib
: You'll put libraries here, unless they explicitly belong elsewhere (such as vendor libraries).