

Extracted from:

# The dRuby Book

Distributed and Parallel Computing with Ruby

This PDF file contains pages extracted from *The dRuby Book*, published by the Pragmatic Bookshelf. For more information or to purchase a paperback or PDF copy, please visit <http://www.pragprog.com>.

Note: This extract contains some colored text (particularly in code listing). This is available only in online versions of the books. The printed versions are black and white. Pagination might vary between the online and printer versions; the content is otherwise identical.

Copyright © 2010 The Pragmatic Programmers, LLC.

All rights reserved.

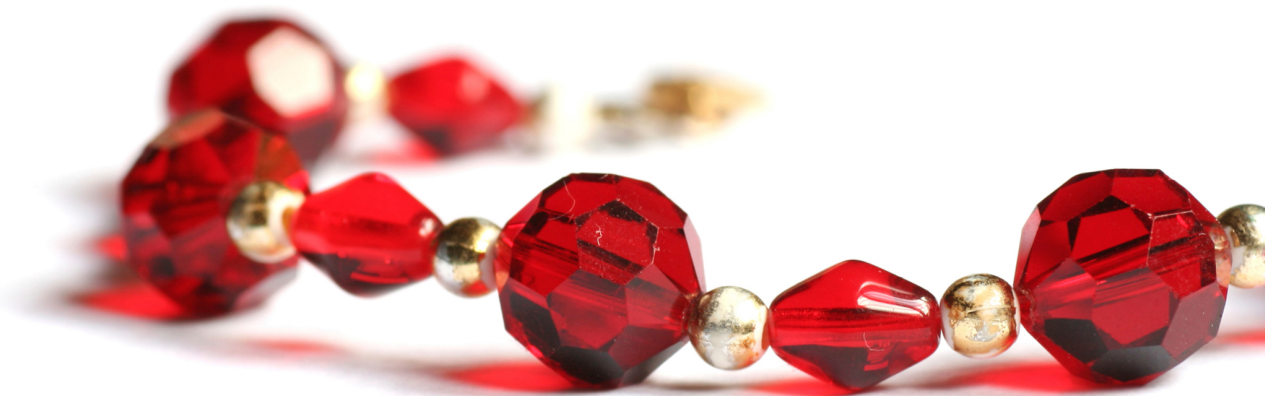
No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior consent of the publisher.

The Pragmatic Bookshelf

Dallas, Texas • Raleigh, North Carolina

# The dRuby Book

Distributed and Parallel  
Computing with Ruby



Masatoshi Seki

Translated by Makoto Inoue

Foreword by Yukihiro “Matz” Matsumoto





Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and The Pragmatic Programmers, LLC was aware of a trademark claim, the designations have been printed in initial capital letters or in all capitals. The Pragmatic Starter Kit, The Pragmatic Programmer, Pragmatic Programming, Pragmatic Bookshelf, PragProg and the linking *g* device are trademarks of The Pragmatic Programmers, LLC.

Every precaution was taken in the preparation of this book. However, the publisher assumes no responsibility for errors or omissions, or for damages that may result from the use of information (including program listings) contained herein.

Our Pragmatic courses, workshops, and other products can help you and your team create better software and have more fun. For more information, as well as the latest Pragmatic titles, please visit us at <http://pragprog.com>.

The team that produced this book includes:

Susannah Pfalzer (editor)  
Potomac Indexing, LLC (indexer)  
Kim Wimpsett (copyeditor)  
David J Kelly (typesetter)  
Janet Furlow (producer)  
Juliet Benda (rights)  
Ellie Callahan (support)

Original Japanese edition:

"dRuby niyoru Bunsan Web Programming" by Masatoshi Seki  
Copyright © 2005. Published by Ohmsha, Ltd

This English translation, revised for Ruby 1.9, is copyright © 2012 Pragmatic Programmers, LLC.

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior consent of the publisher.

Printed in the United States of America.

ISBN-13: 978-1-934356-93-7

Encoded using the finest acid-free high-entropy binary digits.

Book version: P1.0—March 2012

# Contents

---

<a href="#">Foreword</a>	?
<a href="#">Acknowledgments</a>	?
<a href="#">Preface</a>	?

## Part I — Introducing dRuby

1.	<a href="#">Hello, dRuby</a>	?
1.1	<a href="#">Hello, World</a>	?
1.2	<a href="#">Building the Reminder Application</a>	?
1.3	<a href="#">Moving Ahead</a>	?
2.	<a href="#">Architectures of Distributed Systems</a>	?
2.1	<a href="#">Understanding Distributed Object Systems</a>	?
2.2	<a href="#">Design Principles of dRuby</a>	?
2.3	<a href="#">dRuby in the Real World</a>	?
2.4	<a href="#">Moving Ahead</a>	?

## Part II — Understanding dRuby

3.	<a href="#">Integrating dRuby with eRuby</a>	?
3.1	<a href="#">Generating Templates with ERB</a>	?
3.2	<a href="#">Integrating WEBrick::CGI and ERB with dRuby</a>	?
3.3	<a href="#">Putting Them Together</a>	?
3.4	<a href="#">Adding an Error Page</a>	?
3.5	<a href="#">Changing Process Allocation</a>	?
3.6	<a href="#">Moving Ahead</a>	?

4.	<b>Pass by Reference, Pass by Value</b>	?
4.1	Passing Objects Among Processes	?
4.2	Passing by Reference Automatically	?
4.3	Handling Unknown Objects with DRbUnknown	?
4.4	Moving Ahead	?
5.	<b>Multithreading</b>	?
5.1	dRuby and Multithreading	?
5.2	Understanding the Thread Class	?
5.3	Thread-Safe Communication Using Locking, Mutex, and MonitorMixin	?
5.4	Passing Objects via Queue	?
5.5	Moving Ahead	?

### Part III — Process Coordination

6.	<b>Coordinating Processes Using Rinda</b>	?
6.1	Introducing Linda and Rinda	?
6.2	How Rinda Works	?
6.3	Basic Distributed Data Structures	?
6.4	Toward Applications	?
6.5	Moving Ahead	?
7.	<b>Extending Rinda</b>	?
7.1	Adding a Timeout in a Tuple	?
7.2	Adding Notifications for New Events	?
7.3	Expressing a Tuple with Hash	?
7.4	Removing Tuples Safely with TupleSpaceProxy	?
7.5	Finding a Service with Ring	?
7.6	Examples of Ring Applications	?
7.7	Moving Ahead	?
8.	<b>Parallel Computing and Persistence with Rinda</b>	?
8.1	Computing in Parallel with rinda_eval	?
8.2	Concurrency in rinda_eval	?
8.3	Persisting a Tuple with PTupleSpace	?
8.4	Moving Ahead	?
9.	<b>Drip: A Stream-Based Storage System</b>	?
9.1	Introducing Drip	?
9.2	Drip Compared to Queue	?

9.3	<a href="#">Drip Compared to Hash</a>	?
9.4	<a href="#">Browsing Data with Key</a>	?
9.5	<a href="#">Design Goals of the API</a>	?
9.6	<a href="#">Moving Ahead</a>	?
10.	<a href="#">Building a Simple Search System with Drip</a>	?
10.1	<a href="#">Running the App</a>	?
10.2	<a href="#">Examining Each Component</a>	?
10.3	<a href="#">Crawling Interval and Synchronization with Indexer</a>	?
10.4	<a href="#">Resetting Data</a>	?
10.5	<a href="#">Using RbTree for Range Search</a>	?
10.6	<a href="#">Adding a Web UI</a>	?
10.7	<a href="#">Moving Ahead</a>	?
 <b>Part IV — Running dRuby and Rinda in a Production Environment</b>		
11.	<a href="#">Handling Garbage Collection</a>	?
11.1	<a href="#">Dealing with GC</a>	?
11.2	<a href="#">Using DRbIdConv to Prevent GC</a>	?
11.3	<a href="#">Moving Ahead</a>	?
12.	<a href="#">Security in dRuby</a>	?
12.1	<a href="#">dRuby's Attitude Toward Security</a>	?
12.2	<a href="#">Accessing Remote Services via SSH Port Forwarding</a>	?
12.3	<a href="#">Summary</a>	?
	<a href="#">Bibliography</a>	?
	<a href="#">Index</a>	?