Community Experience Distilled

Learning Gerrit Code Review

Leverage the power of Gerrit Code Review to make software development more cooperative and social

Luca Milanesio

[PACKT] PUBLISHING open source* community experience distilled

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BIRMINGHAM - MUMBAI

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About the Author

Luca Milanesio is the Director and cofounder of GerritForge, the leading Git and Gerrit competence center for the enterprise. His background includes over 20 years of experience in development management, software configuration management, and software development lifecycle in large enterprises worldwide. Just prior to GerritForge LLP, Luca was the Technical Director and Senior Product Executive of the Security and Compliance platform for Electronic Payments at Primeur in Italy and UK. Since starting GerritForge LLP, Luca contributed to the Gerrit community and allowed the introduction of enterprise Code Review workflow in large enterprises worldwide including major telecoms, banks, and industries.

Luca Milanesio is the author of *Git Patterns and Anti-Patterns*, an essential guide for scaling Git to the enterprise with 16 patterns and anti-patterns, including Hybrid SCM, Git champions, blessed repository, per-feature topic branches, and ALM integration.

I would like to thank Shawn Pearce and Google Inc. for having created and funded the Gerrit Code Review project, which allowed the Android operating system to be really the result of a collaborative effort of multiple companies and developers, and inspired many more development teams in the adoption of Code Review. Many thanks to the people that worked around the writing and publication of this book: Edwin and Fredrik for the extensive content review, Sarah for the copyediting, Mohammed the Commissioning Editor, Amigya the Project Coordinator, and all the other Packt staff that participated in the making of this book.

I would like to give a special thanks, and dedicate this book to my beloved wife Emilija and my daughter Nina, who have inspired and supported me throughout the days and nights while writing, and for making every single day of my life worth living.

About the Reviewers

Edwin Kempin is one of the maintainers of the Gerrit Code Review project. He joined the Gerrit development in 2010.

Since 2004 Edwin is working as a software engineer at SAP AG. As a member of the Java development infrastructure team, his main focus is the adoption of Git and Gerrit at SAP AG.

> I would like to thank the Gerrit community for all the fantastic collaboration. Each day it's exciting to work on this project!

Fredrik Luthander has been working with software configuration management since 2000 and with Gerrit since 2009. He has worked mainly as an SCM systems admin and trainer. He has also been involved in designing and teaching/rolling out CM practices with both large and small software projects.

Fredrik is currently a self-employed SCM consultant, with prior experience from two enterprise-sized companies and their software projects. He is involved as a contributor in the Gerrit open source project since 2010.

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Preface

Today, developing software is more than a globally distributed activity: agile methodologies that worked well enough with co-located teams, need to be empowered with additional tools, in order to allow the developers to share, discuss, and cooperate more socially.

With the rise of the adoption of Git, a version control system designed by *Linus Torvalds* in 2005 for the Linux open source project, major steps have been made to get developers to work and share code in a more open way. GitHub and Gerrit Code Review are the cornerstones of the social coding revolution, having driven respectively the success of the most popular open source code repository and the development of Android, the most successful mobile OS open source project.

This book looks at the Code Review workflow's benefits in an agile development team, and provides simple steps for leveraging them. It guides through the installation steps of Gerrit by showing the most typical setup and configuration schemes used in private networks and over the Internet. It includes a simple set of recipes and samples on how to configure and use it in conjunction with your existing authentication and continuous integration systems. By following this book's instruction, you will be able to install a fully configured Gerrit server ready to be used for your development team.

You will also learn how to effectively use Gerrit with GitHub, in order to have a more consistent Code Review, in addition to the social collaboration tools provided by the GitHub platform. Using the two tools together, you will be able to reuse your existing accounts and integrate your GitHub community into the development lifecycle, keeping in touch with external contributors.

Learning Gerrit Code Review will teach you everything you need to know to install, configure, and to start using Gerrit Code Review in your daily development. It will introduce the concept and the spirit of collaboration and collective code ownership with co-located and remote collaborators.

What this book covers

Chapter 1, *Introducing Code Review*, introduces the basic concepts and terminology of Gerrit Code Review, along with its benefits, roles, and responsibilities of the development team.

Chapter 2, *Setting Up and Quick-start*, explains in detail the Gerrit setup and configuration of an initial sandbox environment. We will take our first steps with Gerrit by creating an initial administrator account, one repository, and we will also start pushing our first change for review.

Chapter 3, *User Authentication*, explains how Gerrit integrates with existing user registries for performing authentication and user's profile registration. We will understand how the authentication process works, and what are the possibilities for configuring it to connect to LDAP, OpenID, or any other third party authentication system.

Chapter 4, *SSH and HTTPS Access*, explains how to enforce the security of our Gerrit installation using stronger security protocols, such as SSH and HTTPS to control the Code Review actions from a Git client.

Chapter 5, *Editing Your Project Permissions*, explains us how to effectively use project templates and groups, in order to organize role-based access for our repositories. In order to start organizing the projects and teams for a Code Review, we will need to explore the Gerrit permissions scheme and the association of ACLs (Access Control Lists) to Git ref-specs.

Chapter 6, *Changes and Code Review Workflow*, provides an overview of how Code Review workflow works with Gerrit by going step-by-step through an initial change review. We will explain the jargon used by reviewers and how to interact with the reviewers and contributors.

Chapter 7, *Merge Strategies and Concurrency*, analyzes the different situations of concurrent dependent changes under review, and how Gerrit helps you to manage them with the project merge strategies.

Appendix A, *Using Gerrit with GitHub*, provides a step-by-step example of how to connect Gerrit to an external GitHub server, and provides guidance on how to use the Gerrit Code Review workflow and GitHub side by side.

Appendix B, *Automation with Jenkins*, takes us through the steps needed to configure Jenkins for fetching code directly from Gerrit changes during the review phase, enabling the automation of a series of validations against the code.

Appendix C, Git basics, provides the reader with a basic knowledge of the concepts and common terms of the Git version control system, which allows beginners to quickly get set up and use Git.

What you need for this book

This book is a guide to set up and use Gerrit Code Review and assumes that you have already installed a server with the following characteristics:

- Linux server (recommended) or Windows server with Cygwin extensions
- Oracle Java JDK 6 or later
- Git version 1.6 or later
- Apache HTTP server 2.2 or later (optional)
- Jenkins 1.424 or later (optional)

Alternatively, the book can be used as a reference on how to use a Gerrit instance of an open source project available on the Internet, for example, `https://gerrit-review.googlesource.com`, or available for private and public projects on the cloud, for example, `http://gerrithub.io`.

Who this book is for

This book is for team leaders, developers, or SCM managers who are willing to improve collaboration by introducing Gerrit Code Review.

A basic knowledge of the Git version control and its commands is required. Appendix C provides the reader with the basic Git concepts and commands, while the book provides a rich set of Gerrit Code Review examples and configuration recipes ready to be used for getting started quickly and effectively.

Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text are shown as follows: "We can create then our first change on the `hello-project` we cloned in our initial sandbox."

Any command-line input or output is written as follows:

```
$ echo "Change C" > change-c.txt
$ git add change-c.txt
$ git commit -m "Change C"
[…]
$ git push origin HEAD:refs/for/master
[…]
remote: New Changes:
remote:   https://myhost.mydomain.com:8443/10
remote:
To ssh://jdoe@myhost.mydomain.com:29418/hello-project
 * [new branch]      HEAD -> refs/for/master
```

New terms and **important words** are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: "clicking the **Next** button moves you to the next screen."

> Warnings or important notes appear in a box like this.

> Tips and tricks appear like this.

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