



Gerrit Fundamentals

Lesson 01

April 22, 2016	Proprietary and Confidential	• 1 •
----------------	------------------------------	-------



CONSULTING. TECHNOLOGY. OUTSOURCING

Lesson Objectives

- Introduction to Gerrit
- Understanding Gerrit environment
- How Gerrit works
- Installing and starting Gerrit server



Introduction to Gerrit

- **Gerrit** is a web-based code review tool built on top of the git version control system.
- Gerrit is a Git server, facilitating fine grained access control system, code review system as well as workflow.
- Gerrit has Google Web Toolkit based user interface and JGit is its Git implementation.

April 22, 2016

Proprietary and Confidential

- 3 -



Gerrit is a light weight framework, used for reviewing commits before they are accepted into the code base. Gerrit makes it simple for all committers on a project to ensure that changes are reviewed before they're actually applied.

Gerrit is a staging area where changes can be verified before becoming a part of the code base. It is very useful with distributed teams where review conversation can't happen face to face.

Gerrit is licensed under the Apache 2.0 license.

Home page of Gerrit is available at <https://www.gerritcodereview.com/>

Introduction to Gerrit (continued...)

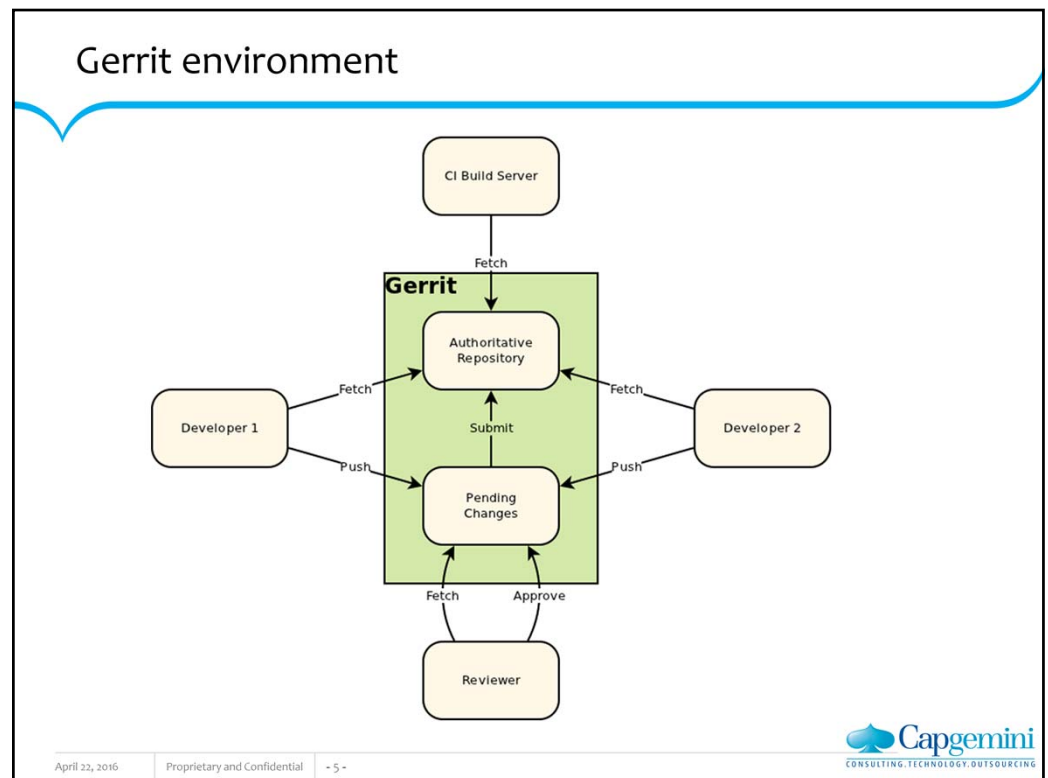
- In Gerrit review system, a *change*, is a code review / review request and each change is based on one commit.
 - Using Gerrit, developers can suggest a change.
 - Other developers review and suggest improvements.
 - Then the change can be updated with a new commit.
- Reviewers can merge the change to the target branch in the Git repository through Gerrit.

April 22, 2016

Proprietary and Confidential | - 4 -



Reviewers can also add comments to each changed line.



- Generally, GIT is used as a central code repository.
- GIT serves as the authoritative copy of the project contents.
- Everyone in the project fetches from and pushes to this GIT central repository.
- The build servers or other similar tools also get the source from the GIT central repository.
- Gerrit is deployed in place of this central repository and adds a concept: a store of pending changes.
- Everyone fetches from the authoritative repository but instead of pushing back to it, they push to this pending changes location.
- A change can only be submitted into the authoritative repository and become an accepted part of the project once the change has been reviewed and approved.
- Gerrit has a powerful access control model.
- Gerrit users can be granted access to push directly into the central repository, bypassing code review entirely.
- Gerrit can be used without code review, simply to host the repositories and controlling access.
- Generally it's just simpler and safer to go through the review process even for users who are allowed to directly push.
- Gerrit can prevent users from pushing directly to the Git repository. If you push to Gerrit, you use a certain path (*ref specification*) which tells Gerrit that you want to create a change.

How Gerrit works

➤ Following steps describe typical flow of activities done by a developer who uploads a Gerrit review and a reviewer.

- Developer fetches or pulls in latest changes from Git repository
- Optionally but a recommended step is, developer creates new local branch based on origin/master branch. So independent branch per change to avoid unnecessary dependencies between commits (Gerrit reviews).
- Developer implements change(new feature, bug fix, documentation change) and creates commit in local repository with these modifications, this is repeated until needed.

April 22, 2016

Proprietary and Confidential | - 6 -



A change consists of one or more patch sets which are used to improve the first proposal based on review comments. One patch set corresponds to one Git commit. If sufficient rights have been granted, it is possible to bypass code review by pushing directly to *refs/heads/master*.

How Gerrit works (Continued ...)

After the changes, developer performs the following steps.

1. Push change to Gerrit review system to the refs/for/master refspec to create a change for the master branch.
2. If the developer receives improvement suggestions, then fetch the latest changes and rebase patch onto origin/master
3. Repeat the relevant steps until the patch is finally accepted and merged into the codebase (or until the change is completely rejected).
4. Finally the developer can delete your local branch.

April 22, 2016

Proprietary and Confidential - 7 -



Differences ...

Gerrit vs. Git

- In Gerrit scenario amending a commit is used to update the Gerrit change request.
- Using the amend operation on a published commit is usually discouraged in Git, in Gerrit it is the normal process.

4.3. Gerrit vs. GitHub workflow

The Gerrit review system is based on the assumption that each commit is reviewed separately, while at GitHub, a complete branch is reviewed and merging with the pull request.

How Gerrit works (Continued ...)

- Gerrit can prevent the users from pushing changes to the Git repository. The ref specification path is used to push into Gerrit.
- The push ref specification will be refs/for/master assuming the target of the change under review is the master branch.
- To commit into the review queue for the xyz branch the path to push to will be refs/for/xyz
- After the push to this ref specification, Gerrit creates a new change or makes an update of an existing one.
- Gerrit uses the *Change-Id* information in the commit message to identify if the push is a new commit or an update of an existing change.

April 22, 2016

Proprietary and Confidential | - 8 -



A change consists of one or more patch sets which are used to improve the first proposal based on review comments. One patch set corresponds to one Git commit. If sufficient rights have been granted, it is possible to bypass code review by pushing directly to *refs/heads/master*.

How Gerrit works (Continued ...)

Gerrit reviews

- **Verified Reviews** : This category of reviews is used when build and test the change introduced with the Gerrit change. It is done by an automated process such as a Jenkins / Hudson build server
- **Code-Reviews** : This category of reviews is used to vote on the quality of the implementation, code style, code conformity and that the overall design of the code is designed to the standards desired by the project.

April 22, 2016

Proprietary and Confidential

- 9 -



Review categories: Verified and Code-Review

Gerrit supports different categories (also known as labels) for review feedback.

In its default configuration it supports the *Code-Review* category.

In typical installations also the *Verified* category is installed.

Installing and starting Gerrit server

1. Download the Gerrit version from following link.
 - <http://gerrit-releases.storage.googleapis.com/index.html>
2. Copy the downloaded file in an empty directory
3. Open command prompt and move to the directory in step 2
4. Install and start Gerrit with the following command
 - `java -jar gerrit*.war init -d samplereview_site`
5. From a command shell switch to the folder “samplereview_site” and run following command to start the server.
 - `cd samplereview_site`
 - `java -jar bin/gerrit.sh start`

April 22, 2016

Proprietary and Confidential

- 10 -



- The download is in the form of a .war file. This can be directly deployed on the servlet container, like Jetty or Tomcat installation.
- The .war file is bundled with a Jetty web server. and it can be started directly for testing or rapid deployment.
- The description on the slide uses this approach.
- In case of step 4, The installation is done in the folder specified with the -d parameter, in this example “samplereview_site”.
- After the step 4, The installation procedure asks a few questions, in most cases pressing enter uses the default value which is typically fine for a test installation
- In case of Authentication method option, use *development_become_any_account* to enable general access to Gerrit. This is a suitable setting for testing. If started with this setting, you have a *Become* link in the web interface which allows you to login and to create a new account.
- Step 5 : On Microsoft Windows based systems you need to invoke the daemon directly. From a command shell switch to the folder samplereview_site and run the following command to start the server.
- Note : Step 5, starts Gerrit. To stop it again, kill the running process using **Ctrl+C** If something goes wrong, look into the logs folder. local Gerrit configuration can be found in the ./samplereview_site/etc/ folder.

Walkthrough

➤ Installing and starting Gerrit server



Add the notes here.

Summary

- Introduction to Gerrit
- Understanding Gerrit environment
- How Gerrit works
- Installing and starting Gerrit server



Add the notes here.