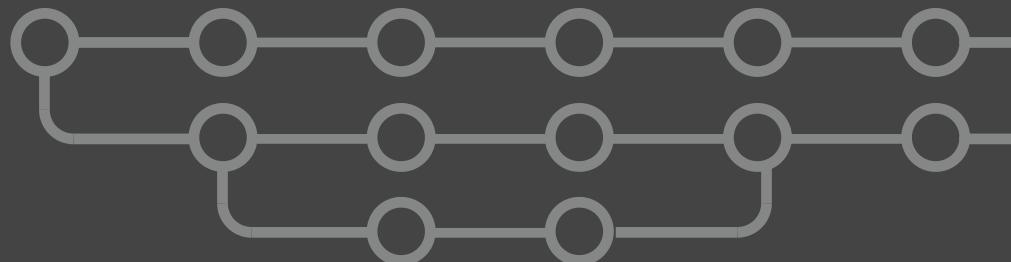


// GIT CONCEPTS

GIT IS NOT A SAVEPOINT



What is git?

Git is a popular distributed version control system that allows developers to manage source code changes, track versions, collaborate with others, and maintain a history of code revisions.

The author



// Basic usage

```
→ killer-app pwd  
/home/gianiaz/apps/killer-app  
→ killer-app ls -lah  
totale 8,0K  
drwxrwxr-x 2 gianiaz gianiaz 4,0K mar 31 15:31 .  
drwxrwxr-x 3 gianiaz gianiaz 4,0K mar 31 15:31 ..  
  
→ killer-app git init  
Inizializzato repository Git vuoto in /home/gianiaz/apps/killer-app/.git/
```

We have now an empty (and *local*) repository!

Let's do some tweaks:

```
→ git config --global user.email gianiaz@gmail.com
→ cat ~/.gitconfig
[user]
    email = gianiaz@gmail.com
→ git config --global user.name "Giovanni Lenoci"
→ cat ~/.gitconfig
[user]
    email = gianiaz@gmail.com
    name = Giovanni Lenoci
```

Where git stores its data?

```
→ killer-app git:(main) ✘ ls -lah
totale 16K
drwxrwxr-x 3 gianiaz gianiaz 4,0K mar 31 15:42 .
drwxrwxr-x 3 gianiaz gianiaz 4,0K mar 31 15:31 ..
drwxrwxr-x 7 gianiaz gianiaz 4,0K mar 31 15:31 .git
```

What's inside .git directory?

```
→ killer-app git:(main) ✘ cd .git
→ .git git:(main) ls -la
totale 40
drwxrwxr-x 7 gianiaz gianiaz 4096 mar 31 15:31 .
drwxrwxr-x 3 gianiaz gianiaz 4096 mar 31 15:42 ..
drwxrwxr-x 2 gianiaz gianiaz 4096 mar 31 15:31 branches
-rw-rw-r-- 1 gianiaz gianiaz 92 mar 31 15:31 config
-rw-rw-r-- 1 gianiaz gianiaz 73 mar 31 15:31 description
-rw-rw-r-- 1 gianiaz gianiaz 21 mar 31 15:31 HEAD
drwxrwxr-x 2 gianiaz gianiaz 4096 mar 31 15:31 hooks
drwxrwxr-x 2 gianiaz gianiaz 4096 mar 31 15:31 info
drwxrwxr-x 4 gianiaz gianiaz 4096 mar 31 15:31 objects
drwxrwxr-x 4 gianiaz gianiaz 4096 mar 31 15:31 refs
```

Let's create a killer content ;-)

```
→ killer-app git:(main) echo "#This app will make me rich" > README.md
→ killer-app git:(main) x ls -lah
totale 16K
drwxrwxr-x 3 gianiaz gianiaz 4,0K mar 31 15:48 .
drwxrwxr-x 3 gianiaz gianiaz 4,0K mar 31 15:31 ..
drwxrwxr-x 7 gianiaz gianiaz 4,0K mar 31 15:31 .git
-rw-rw-r-- 1 gianiaz gianiaz 28 mar 31 15:48 README.md
```

What's the state of my git repo?

```
→ killer-app git:(main) ✘ git status
Sul branch main

Non ci sono ancora commit

File non tracciati:
  (usa "git add <file>..." per includere l'elemento
   fra quelli di cui verrà eseguito il commit)

  README.md

non è stato aggiunto nulla al commit ma sono presenti file
non tracciati (usa "git add" per tracciarli)
```

Glossary

branch

A git branch is a separate version of the codebase that allows developers to work on features or fixes independently without affecting the main codebase until they are ready to merge them.

commit

A git commit is a snapshot of changes made to a repository at a specific point in time with a brief but descriptive message summarizing the changes made.

tracked/untracked files

files that are present/not present in the list of files to be committed

First commit

```
→ killer-app git:(main) ✘ git commit -m "First commit with Readme file"
[main (commit radice) 72180f0] First commit with Readme file
 1 file changed, 1 insertion(+)
 create mode 100644 README.md

→ killer-app git:(main) git status
Sul branch main
non c'è nulla di cui eseguire il commit, l'albero di lavoro è pulito
```



What shouldn't be committed

- Credentials
- Personal data
- Configuration that changes between environments
- Libraries (look at "What should be committed")
- Generated files (e.g. built bundles)

What should be committed

- Your code :-P
- composer.lock and package.lock
- .gitignore
- documentation (<https://www.writethedocs.org/guide/docs-as-code/>)

Let's open our code with phpstorm:

```
→ killer-app git:(contributors) ✘ git status
Sul branch contributors
File non tracciati:
  (usa "git add <file>..." per includere l'elemento fra quelli di cui verrà eseguito
   .idea/
non è stato aggiunto nulla al commit ma sono presenti file non tracciati (usa "git a
→ killer-app git:(contributors) ✘ touch .gitignore
```

.gitignore

```
→ killer-app git:(contributors) ✘ git add .gitignore
→ killer-app git:(contributors) ✘ git status
Sul branch contributors
Modifiche di cui verrà eseguito il commit:
(usa "git restore --staged <file>..." per rimuovere gli elementi dall'area di stag
nuovo file:          .gitignore

File non tracciati:
(usa "git add <file>..." per includere l'elemento fra quelli di cui verrà eseguito
.idea/
~/projects/personal/my-killer-app on my-new-branch ✘ > echo .idea/ >> .gitignore

~/projects/personal/my-killer-app on my-new-branch ✘ > git status
Sul branch my-new-branch
File non tracciati:
(usa "git add <file>..." per includere l'elemento fra quelli di cui verrà eseguito
.gitignore
```

// Let's open to the outside world

A new github repository (origin)

The screenshot shows the GitHub interface for creating a new repository. At the top, there is a navigation bar with links for Pull requests, Issues, Codespaces, Marketplace, and Explore. On the far right, there are icons for notifications, a plus sign, and a user profile. Below the navigation bar, the main title is "Create a new repository". A sub-instruction says, "A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository." Under the "Repository template" section, it says, "Start your repository with a template repository's contents." A dropdown menu is open, showing "No template". In the "Owner" field, the user "gianiaz" is selected. The "Repository name" field contains "my-killer-app" with a green checkmark icon. Below the repository name, a suggestion says, "Great repository names are short and memorable. Need inspiration? How about [cuddly-telegram](#)?" In the "Description (optional)" field, the text "A new beginning!" is entered. At the bottom, there are two radio button options: "Public" (unchecked) and "Private" (checked). A note under "Public" says, "Anyone on the internet can see this repository. You choose who can commit."

Search or jump to... / Pull requests Issues Codespaces Marketplace Explore

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Repository template

Start your repository with a template repository's contents.

No template ▾

Owner * gianiaz / **Repository name *** my-killer-app ✓

Great repository names are short and memorable. Need inspiration? How about [cuddly-telegram](#)?

Description (optional)

A new beginning!

Public
Anyone on the internet can see this repository. You choose who can commit.

Private

Let's add our new origin:

```
git remote add origin git@github.com:gianiaz/my-killer-app.git  
git branch -M main  
git push -u origin main
```

And now we can push our code on github:

```
→ killer-app git:(main) git push  
fatal: The current branch main has no upstream branch.  
To push the current branch and set the remote as upstream, use
```

```
git push --set-upstream origin main
```

To have this happen automatically for branches without a tracking upstream, see 'push.autoSetupRemote' in 'git help config'.

```
→ killer-app git:(main) git push --set-upstream origin main
```

Enumerazione degli oggetti in corso: 3, fatto.

Conteggio degli oggetti in corso: 100% (3/3), fatto.

Scrittura degli oggetti in corso: 100% (3/3), 258 byte | 258.00 KiB/s, fatto.

3 oggetti totali (0 delta), 0 riutilizzati (0 delta), 0 riutilizzati nel file pack

To github.com:gianiaz/my-killer-app.git

* [new branch] main -> main

branch 'main' set up to track 'origin/main'.

How is it possible?

Git knows me.

But how?

1. Generate an ssh key with:

```
ssh-keygen -t rsa -b 4096 -C "mailYouRegisteredwith@example.com"
```

2. Go to your profile

The screenshot shows a GitHub user profile for "Giovanni Lenoci". The top navigation bar includes a user icon, the name "Giovanni Lenoci", a link to "Your personal account", and a "Switch to another account" dropdown.

The left sidebar contains the following sections:

- Public profile** (selected)
- Account
- Appearance
- Accessibility
- Notifications

Access

- Billing and plans
- Emails
- Password and authentication
- Sessions
- SSH and GPG keys
- Organizations
- Moderation

The main content area displays the "Public profile" settings:

Public profile

Name
Giovanni Lenoci
Your name may appear around GitHub where you contribute or are mentioned. You can remove it at any time.

Public email

gianiaz@gmail.com Remove
You can manage verified email addresses in your [email settings](#).

Bio

Nerd, php developer, symfony lover

You can @mention other users and organizations to link to them.

Pronouns

Don't specify

3. Add your key

The screenshot shows the GitHub account settings interface. On the left, there's a sidebar with various account management options like Public profile, Account, Appearance, Accessibility, and Notifications. Below that is a 'Access' section with Billing and plans, Emails, Password and authentication, Sessions, and the currently selected 'SSH and GPG keys'. Under 'SSH and GPG keys', there are links for Organizations and Moderation. At the bottom of this sidebar are sections for Code, planning, and automation and Repositories.

The main content area is titled 'SSH keys / Add new'. It has fields for 'Title' (empty), 'Key type' (set to 'Authentication Key'), and a 'Key' input field containing placeholder text: 'Begins with 'ssh-rsa', 'ecdsa-sha2-nistp256', 'ecdsa-sha2-nistp384', 'ecdsa-sha2-nistp521', 'rsa-sha2-nistp256@openssh.com', or 'sk-ssh-ed25519@openssh.com''. At the bottom is a green 'Add SSH key' button.

Your personal account  Switch to another account ▾

Public profile

Account

Appearance

Accessibility

Notifications

Billing and plans

Emails

Password and authentication

Sessions

SSH and GPG keys

Organizations

Moderation

Add SSH key

Code, planning, and automation

Repositories

SSH keys / Add new

Title

Key type

Authentication Key

Key

Begins with 'ssh-rsa', 'ecdsa-sha2-nistp256', 'ecdsa-sha2-nistp384', 'ecdsa-sha2-nistp521', 'rsa-sha2-nistp256@openssh.com', or 'sk-ssh-ed25519@openssh.com'

This also work on a private repository for the same reason

```
~/projects/personal > git clone git@github.com:gianiaz/my-killer-app.git
Clone in 'my-killer-app' in corso...
remote: Enumerating objects: 9, done.
remote: Counting objects: 100% (9/9), done.
remote: Compressing objects: 100% (4/4), done.
Ricezione degli oggetti: 100% (9/9), fatto.
remote: Total 9 (delta 0), reused 3 (delta 0), pack-reused 0
```

Fetch from origin

```
→ killer-app git:(contributors) ✘ git fetch
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Decompressione degli oggetti in corso: 100% (3/3), 689 byte | 689.00 KiB/s, fatto.
Da github.com:gianiaz/my-killer-app
 * [nuovo branch] fixes-for-readme -> origin/fixes-for-readme
→ killer-app git:(contributors) ✘
```

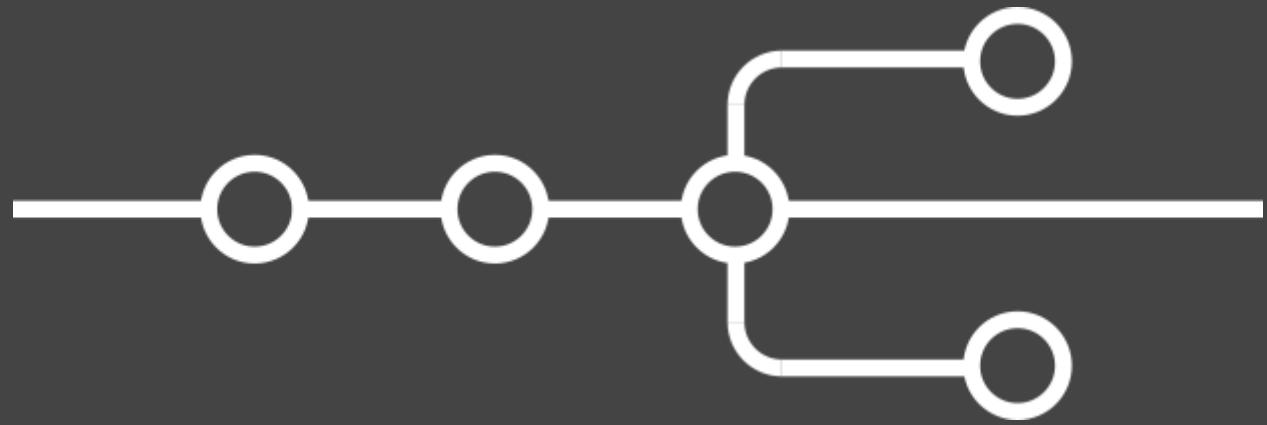
// Branches and stashes

Branches

Let's create a new branch:

```
~/projects/personal/my-killer-app on main ✓ > git checkout -b "add-contributors"
Si è passati a un nuovo branch 'add-contributors'

~/projects/personal/my-killer-app on add-contributors ✓ >
```



Stash

We start by creating our file:

```
→ killer-app git:(add-contributors) echo "* Giovanni Lenoci <gianiaz@gmail.com>" >>
→ killer-app git:(add-contributors) x git status
Sul branch contributors
File non tracciati:
  (usa "git add <file>..." per includere l'elemento fra quelli di cui verrà eseguito
  CONTRIBUTORS.md

non è stato aggiunto nulla al commit ma sono presenti file non tracciati (usa "git a
→ killer-app git:(add-contributors) x

→ killer-app git:(add-contributors) x git add CONTRIBUTORS.md
→ killer-app git:(add-contributors) x git stash save "They interrupted me"
Directory di lavoro è stato indice salvati: On contributors: They interrupted me
→ killer-app git:(add-contributors) git status
Sul branch contributors
non c'è nulla di cui eseguire il commit, l'albero di lavoro è pulito

→ killer-app git:(add-contributors) x git stash list
stash@{0}: On contributors: They interrupted me
(END)
```

```
~/projects/personal/my-killer-app on main ✓ > git checkout -b "urgent-bugfix"
Si è passati a un nuovo branch 'urgent-bugfix'

~/projects/personal/my-killer-app on urgent-bugfix ✓ >
```



Git
rebase



Git
Merge

What is merge?



What is rebase

What is git rebase? From a content perspective, rebasing is changing the base of your branch from one commit to another making it appear as if you'd created your branch from a different commit. Internally, Git accomplishes this by creating new commits and applying them to the specified base

Conflicts

A conflict arises when two separate branches have made edits to the same line in a file, or when a file has been deleted in one branch but edited in the other.

Changes from all commits ▾ Jump to... ▾ +316 -255 ■■■■■

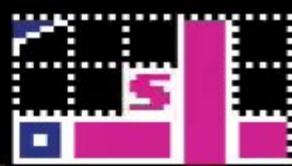
Unified Split

Review changes ▾

	past, invalid		when updating ownCloud.
13	-updates were a significant source of errors when updating ownCloud.	13	
14		14	
15	FAQ	15	FAQ
16	---	16	---
17		17	
18	Why Did ownCloud Add Code Signing?	18	Why Did ownCloud Add Code Signing?
19	~~~~~	19	~~~~~
20		20	
21	-By supporting Code Signing we add another layer of security by ensuring that	20	+By supporting Code Signing we add another layer of security which ensures that
22	-nobody other than authorized persons can push updates for applications, and	21	+nobody, other than authorized individuals, can push updates for applications.
23	-ensuring proper upgrades.	22	+This ensures proper upgrades.
24		23	
25	Do We Lock Down ownCloud?	24	Do We Lock Down ownCloud?
26	~~~~~	25	~~~~~
27		26	
28	-The ownCloud project is open source and always will be. We do not want to make	27	+The ownCloud project is open source and always will be.
29	-it more difficult for our users to run ownCloud. Any code signing errors on	28	+We do not want to make it more difficult for our users to run ownCloud.
30	-upgrades will not prevent ownCloud from running, but will display a warning on	29	+Any code signing errors on upgrades will not prevent ownCloud from running, but will display a warning on the Admin page.
31	-the Admin page. For applications that are not tagged "Official" the code signing	30	+For applications that are not tagged "Official" the code signing process is optional.
32	-process is optional.	31	
33		32	
34	Not Open Source Anymore?	33	Not Open Source Anymore?
35	~~~~~	34	~~~~~
36		35	
37	-The ownCloud project is open source and always will be. The code	35	+The ownCloud project is open source and always will be.

ENERGY 99

010



GIT
IS NOT
A SAVEPPOINT



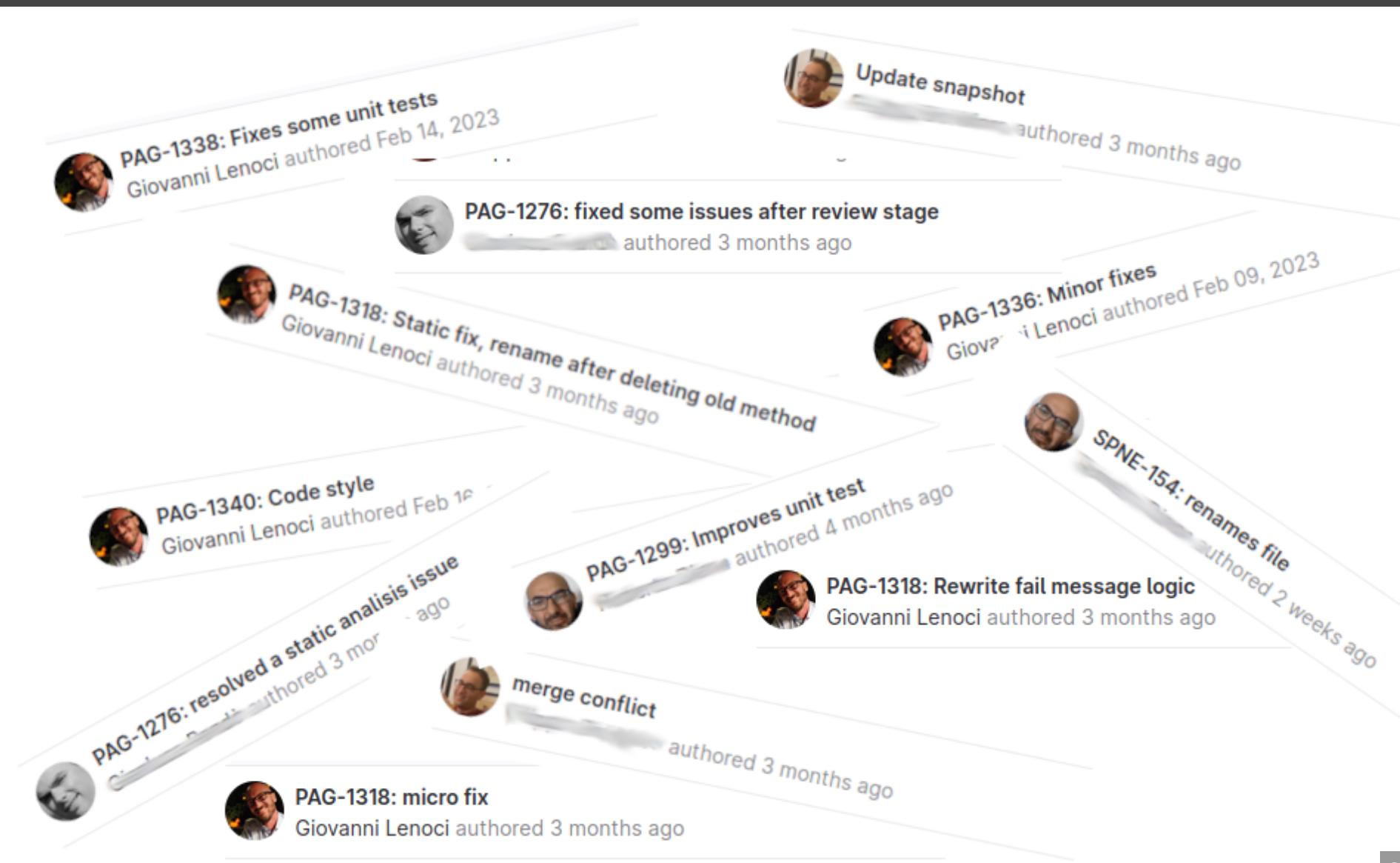
Git is not a savepoint

Atomic commits

Why atomic?

Because an atom can't be divided!

An example of bad commit messages



Conventional commits

The Conventional Commits specification is a lightweight convention on top of commit messages.

It provides an easy set of rules for creating an explicit commit history.

The commit message should be structured as follows:

```
<type>[optional scope]: <description>  
[optional body]  
[optional footer(s)]
```

es.

New Feature: \$ISSUE_CODE: Add to the XapiClient the delete method

Emoji for conventional commit

gitm 😜 ji

An emoji guide for your commit messages

★ GitHub

Tweet



Your new development career awaits. Check out the latest listings.

ADS VIA CARBON

Search your gitmoji...

Ctrl K



:art:

Improve structure /
format of the code.



:zap:

Improve performance.



:fire:

Remove code or files.



:bug:

Fix a bug.

27 Apr, 2023 3 commits



[SPNE-155] 🚨 Test: add purchase-log.handler

Giovanni Lenoci authored 2 hours ago



[SPNE-155] 🚨 Test: add test for logs controller

Giovanni Lenoci authored 5 hours ago



[SPNE-155] 🔧 Refactor: rename of purchase-id request dto and usage in controller

Giovanni Lenoci authored 5 hours ago

21 Apr, 2023 2 commits



[SPNE-155] ✨ New feature: expose new route for asking logs for a purchase request id

Giovanni Lenoci authored 6 days ago



[SPNE-155] ✨ New feature: add query.request and response and relative... ⋮

Giovanni Lenoci authored 6 days ago

20 Apr, 2023 3 commits



[SPNE-155] 🔧 Refactor: Introduces a new AbstractPurchaseId request...

Giovanni Lenoci authored 6 days ago ⋮



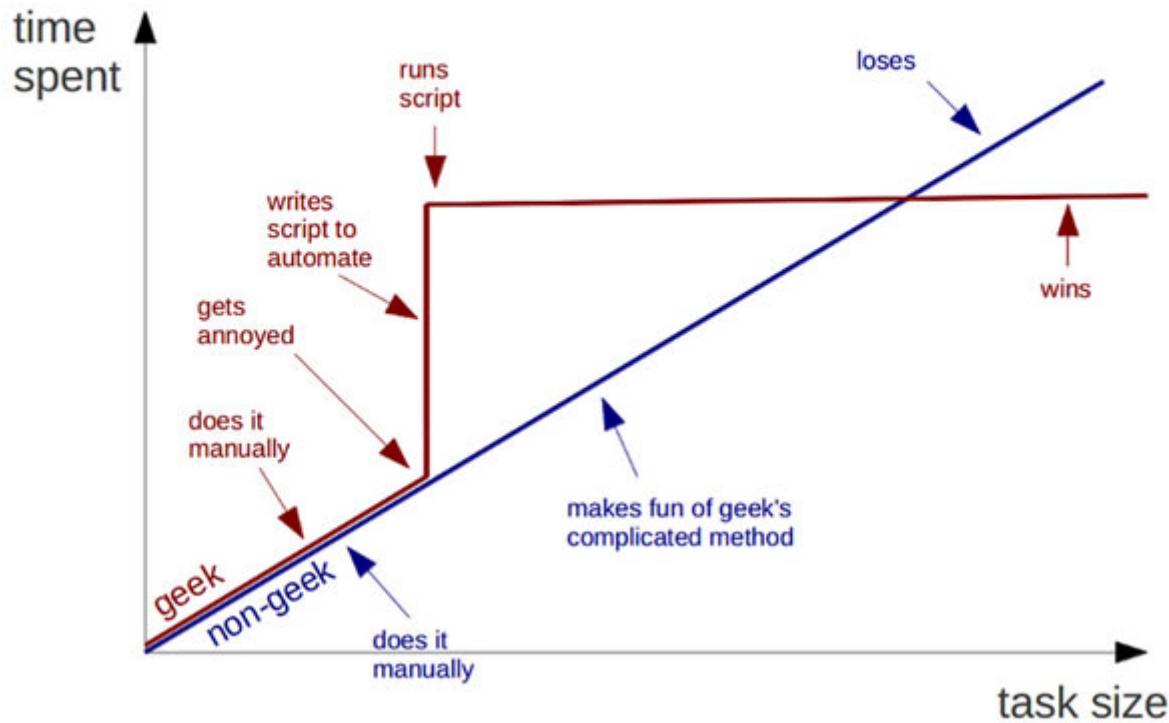
[SPNE-155] 🔧 Refactor: Create new PurchaseStatusIdRequestDto and uses...

Giovanni Lenoci authored 6 days ago ⋮

An example of a better commit history

Geeks and Repetitive Tasks

Geeks and repetitive tasks



We want to write less and do more:

From this.

```
git commit -m "T add purchase-log.handler"
```

To this.

```
commit c2ecbe11aad7d0cce5c39e70e68e2481eb2b3f29 (HEAD -> SPNE-155-expose-logs, origi
Author: Giovanni Lenoci <giovanni.lenoci@facile.it>
Date:   Thu Apr 27 12:26:00 2023 +0200

[SPNE-155] :rotating_light: Test: add purchase-log.handler
```

[Here you can find](#) a summary table of what we want to achieve. And here you can find the [prepare-commit-message script](#) which must be put in `.git/hooks` directory

Rebase > Merge (but with a condition)

Rebase allows you to integrate the changes from one branch into another.

Pros

- Code history remains flat and readable
- Manipulating a single commit is easy

Cons

- It's more work
- Rebase rewrite history

1. Rebase -i

🚧 Add .gitignore	6251bf6	🔗
Giovanni Lenoci committed 6 minutes ago		
✨ New feature: Adds Mapper Class	a5c474a	🔗
Giovanni Lenoci committed 5 minutes ago		
✨ New feature: Add My controller	68e447e	🔗
Giovanni Lenoci committed 3 minutes ago		
⚡ Refactor: adds mapper as a dependency of my controller	0bf36c7	🔗
Giovanni Lenoci committed 3 minutes ago		
⚡ Refactor: Add myMethod to Mapper necessary to controller	d749bda	🔗
Giovanni Lenoci committed 2 minutes ago		
🔴 Test: Mapper	3aa9ba1	🔗
Giovanni Lenoci committed 1 minute ago		
🔴 Test: Controller	bd1df8a	🔗
Giovanni Lenoci committed now		

A not so good commit history

2.Rebase -i

git rebase -i HEAD~7

```
GNU nano 6.2                  /home/glenoci/projects/personal/my-killer-app/.git/rebase-merge/git-rebase-todo
pick 6251bf6 :construction: Add .gitignore
pick a5c474a :sparkles: New feature: Adds Mapper Class
pick 68e447e :sparkles: New feature: Add My controller
pick 0bf36c7 :hammer: Refactor: adds mapper as a dependency of my controller
pick d749bda :hammer: Refactor: Add myMethod to Mapper necessary to controller
pick 3aa9ba1 :rotating_light: Test: Mapper
pick bd1df8a :rotating_light: Test: Controller

# Rebase di 3e46bc8..bd1df8a su 3e46bc8 (7 comandi)
#
# Comandi:
# p, scegli <commit> = usa commit
# r, reword <commit> = usa commit, ma modifica il messaggio di commit
# e, edit <commit> = usa commit, ma fermati per modificare
# s, squash <commit> = usa il commit, ma si fonde con il commit precedente
# f, correzione [-C | -c] <commit> = come "squash" ma mantiene solo il precedente
#           messaggio di registro di commit, a meno che non venga utilizzato -C, nel qual caso
#           mantieni solo il messaggio di questo commit; -c è uguale a -C ma
#           apre l'editor
# x, exec <command> = esegui il comando (il resto della riga) usando la shell
# b, break = fermati qui (continua rebase più tardi con 'git rebase --continue')
# d, drop <commit> = rimuovi commit
# l, label <label> = etichetta HEAD corrente con un nome
# t, reset <label> = reimposta HEAD su un'etichetta
# m, unisci [-C <commit> | -c <commit>] <etichetta> [# <una riga>]
# . creare un commit di unione utilizzando i commit di unione originali
# . messaggio (o l'oneline, se non era presente alcun commit di unione originale
# . specificato); usa -c <commit> per riformulare il messaggio di commit
#
# Queste linee possono essere riordinate; vengono eseguiti dall'alto verso il basso.
#
# Rimuovendo una riga da qui IL COMMIT CORRISPONDENTE ANDRÀ PERDUTO.
#
# Ciò nonostante, se rimuovi tutto, il rebase sarà annullato.
```

3.Rebase -i

~/projects/personal/my-killer-app on my-new-branch ✘ > git rebase -i HEAD~7

[15:27:26]

1

4.Push --force

A meme image featuring Obi-Wan Kenobi from Star Wars. He has his signature white beard and is looking slightly to the right with a serious expression. A lightsaber hilt with a red blade is positioned behind his head, angled upwards. The background is dark with some city lights visible.

BE CAREFUL WITH

GIT PUSH --FORCE

5. A better history #2

The screenshot shows a GitHub commit history for a repository. The commits are listed in chronological order from top to bottom:

- Add .gitignore** (Giovanni Lenoci committed 44 minutes ago) - This commit has a copy icon, a commit hash `6251bf6`, and a diff icon.
- New feature: Adds Mapper Class con metodo1 e metodo2** (Giovanni Lenoci committed 5 minutes ago) - This commit has a copy icon, a commit hash `af20150`, and a diff icon.
- New feature: Add My controller che usa il mapper** (Giovanni Lenoci committed 4 minutes ago) - This commit has a copy icon, a commit hash `0c6a60b`, and a diff icon.

A new history

Git Workflows

Centralized workflow

Best suited for small teams transitioning from a centralized version control system like SVN. All team members work on a single branch, usually main, and push their changes directly to the central repository.

Forking workflow

Commonly used in open-source projects, this workflow allows external contributors to work without direct access to the main repository. Developers create a fork (a personal copy) of the main repository, make changes in their fork, and then submit a pull request or merge request to have their changes integrated into the main repository.

Git flow workflow

This workflow is best for projects with a structured release cycle. It introduces two long-lived branches: main for production-ready code and develop for integrating features. Additional branches like feature, release, and hotfix are used for specific purposes, ensuring a strict and organized development process.

Feature branch workflow

Developers create separate branches for each feature or bugfix, keeping the ‘main’ branch stable. When a feature is complete, the developer submits a pull request or merge request to integrate the changes back into the main branch after a code review.

Bibliography

- Is now git legit - Pauline Vos
- Conventional commits
- Make Atomic Git Commits
- Emoji for conventional commit
- My proposal for conventional commits
- Prepare commit message bash script
- Git workflows

