



Introducció al control de versions amb GitHub

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Slashmobility

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Useu aquest link o el QR per descarregar la presentació:

<https://t.ly/ppoA7>



Agenda

Control de versions

Git: introducció

Configuracions

Repositori

Comandes i accions

Exemples

Treballant amb branques

Noves comandes

Introducció a GitHub

Sincronització

Altres funcionalitats

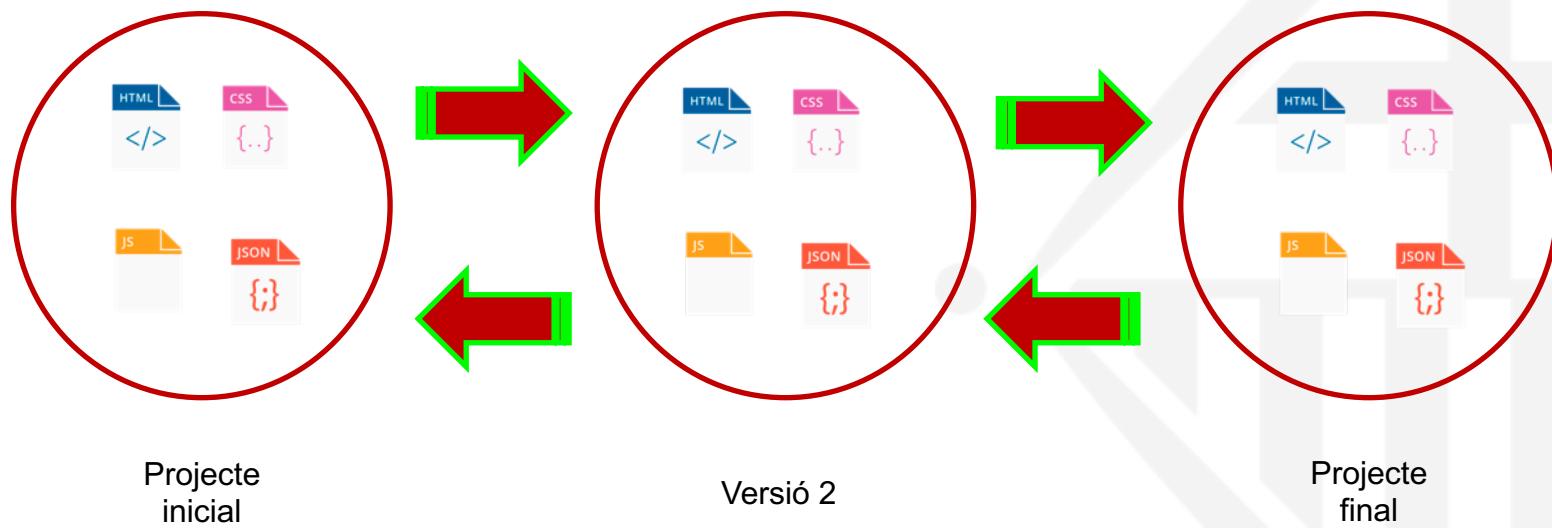
Flow

Control de versions

El control de versions es refereix a la pràctica de fer un seguiment i gestionar els canvis al codi de programari.

Un sistema de control de versions (VCS) permet restaurar versions anteriors d'una forma totalmente controlada.

Projectes



Avantatges

- Traçabilitat dels canvis realitzats en el codi: qui, quan...
- Simplifica la revisió del codi.
- Permet desfer canvis de forma senzilla.
- Manteniment de diverses versions del projecte.
- Facilitat el desenvolupament en equip.

Què és Git

Linus Torvalds creador de Linux va desenvolupar l'eina Git (2005).

Ja existien sistemes de controls de versions:

CVS (1990)

Microsoft Source Safe (1994)

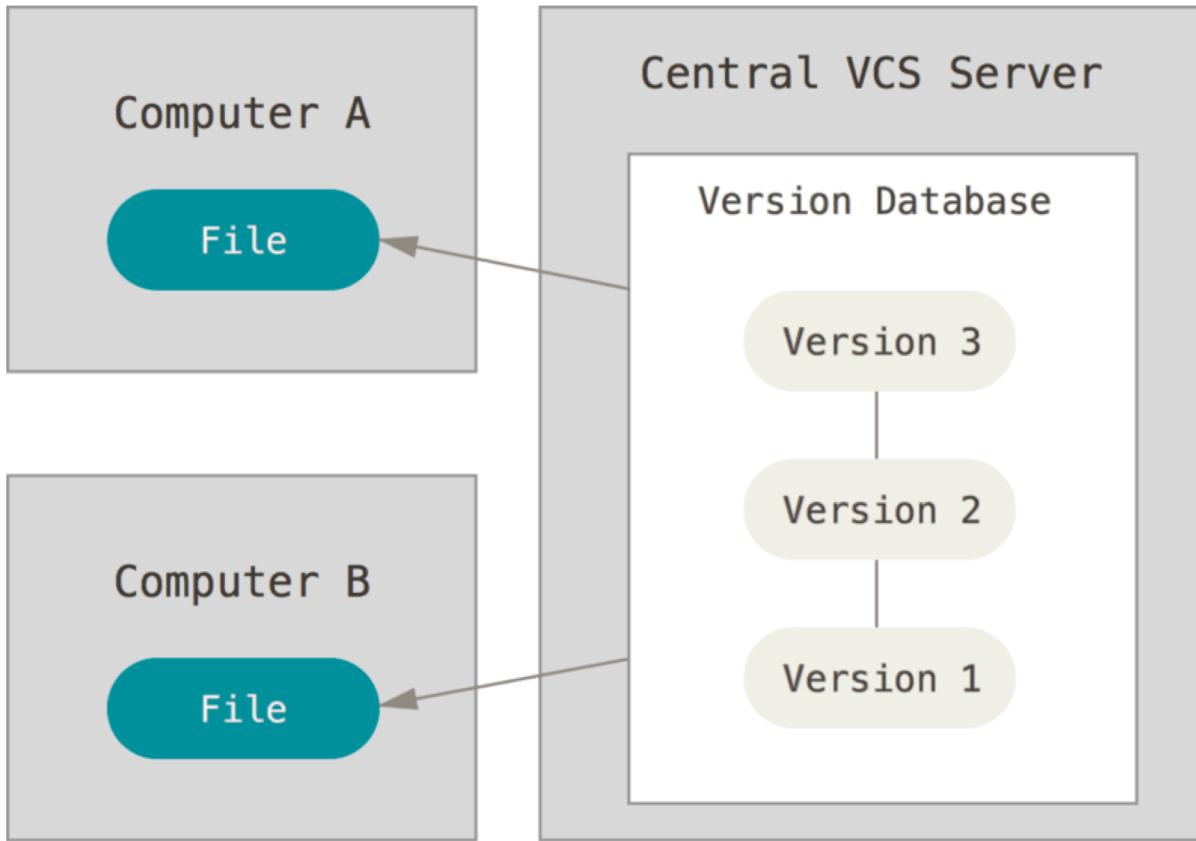
Subversion (2000)



Característiques Git

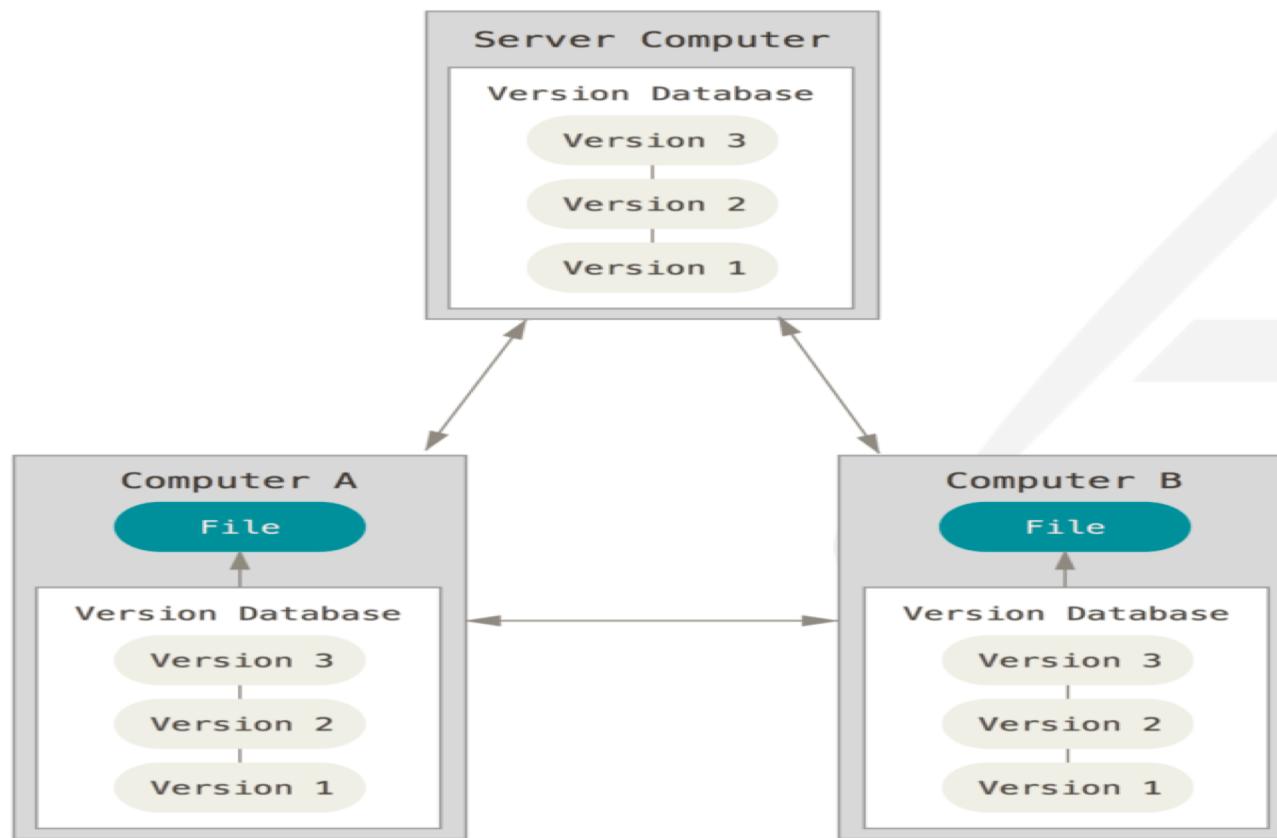
- VCS distribuït
- Integritat de les dades (hash)
- Treball amb branques
- Lleuger i ràpid (diferencials)
- Open source i gratuït
- Git és actualment el VCS més utilitzat (aprox. 80%)

Control versions centralitzat



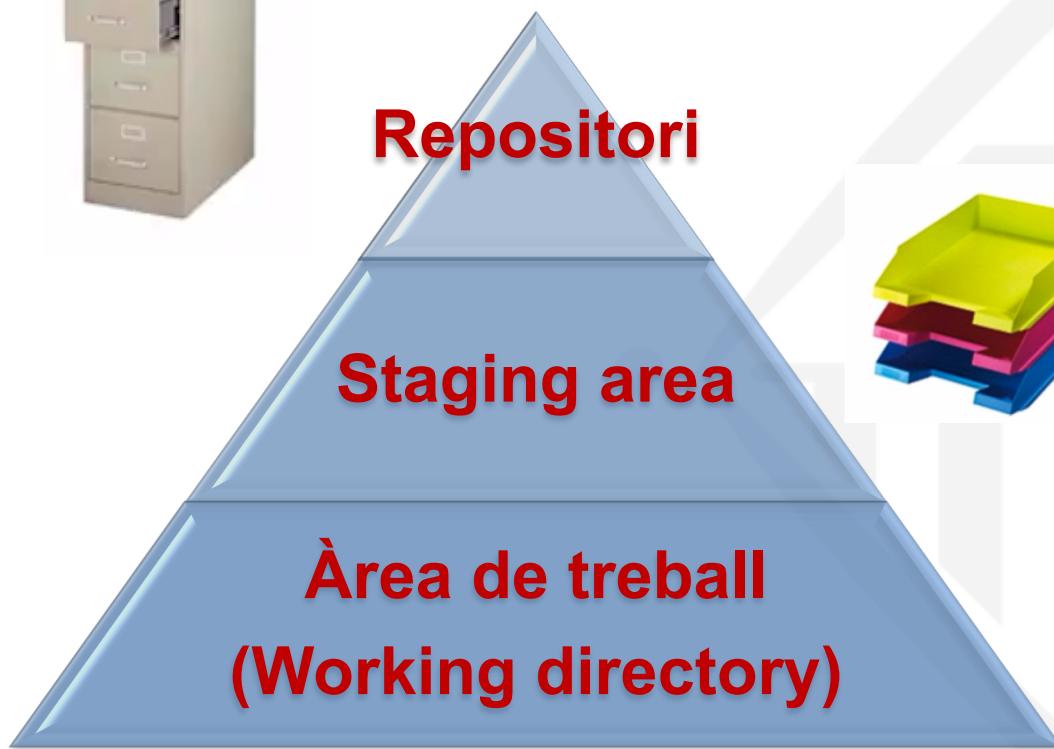
Exemples: CVS, subversion o Team Foundation

Control versions distribuït



Exemples: Git, Mercurial o Plastic SCM

Estats en Git



Instal·lació

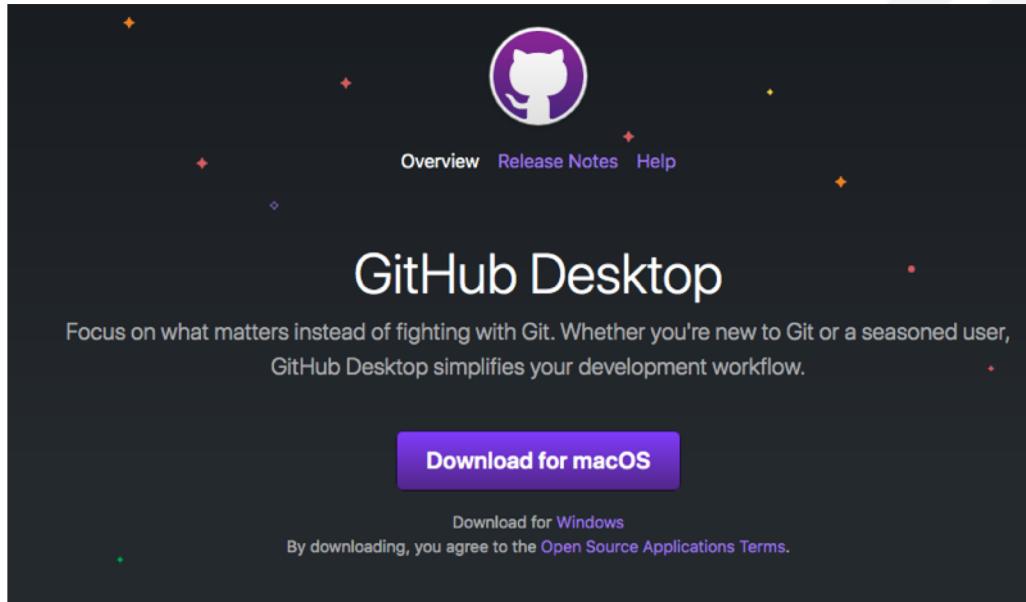
Opció git tools (eina + cli) <https://git-scm.com/download>

The screenshot shows the official Git website (<https://git-scm.com>). At the top left is the Git logo and the tagline "fast-version-control". A search bar is at the top right. The main content area features a diagram of six white boxes representing repositories connected by red and blue lines on a grid background, illustrating a distributed version control system. Below the diagram, a large section highlights Git's features: it is **free and open source**, **easy to learn**, has a **tiny footprint with lightning fast performance**, and includes **cheap local branching**, **multiple workflows**, and **staging areas**. The page is divided into several sections: **About** (advantages over other systems), **Documentation** (command reference, book, videos), **Downloads** (GUI clients, binary releases for Mac, Windows, Linux, etc.), and **Community** (bug reporting, mailing list, chat, development). A sidebar on the right lists links for **Mac GUIs**, **Tarballs**, **Windows Build**, and **Source Code**. At the bottom, there is a link to the book **Pro Git** by Scott Chacon and Ben Straub.

Instal·lació

Eines gràfiques (n'hi ha diverses)

GitHub Desktop <https://desktop.github.com>



Configuració

```
git config --global user.name "Anakin Skywalker"
```

```
git config --global user.email "darh.vader@empire.org"
```

També es poden donar configuracions a un repositori en concret (a dins la carpeta del repositori)

```
git config user.name "Anakin Skywalker"
```

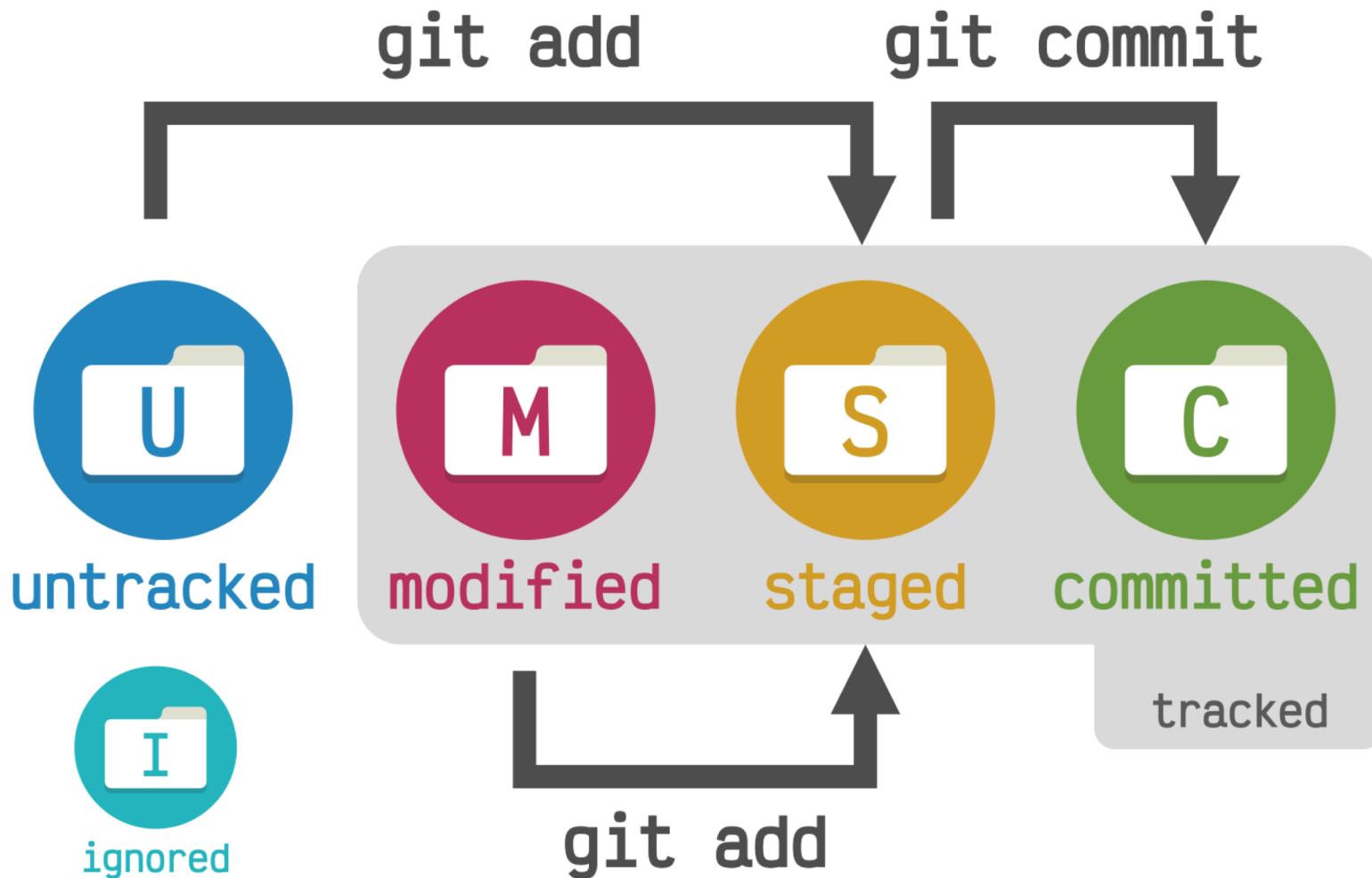
```
git config user.email "darh.vader@empire.org"
```

Repositori

```
git init firstrepo  
cd firstrepo
```

```
[iMac-de-Carlos:firstrepo cam]$ ls -la  
total 0  
drwxr-xr-x  3 cam  staff  96  1 mar 11:47 .  
drwx-----+ 14 cam  staff  448  1 mar 09:59 ..  
drwxr-xr-x 14 cam  staff  448  1 mar 11:46 .git  
iMac-de-Carlos:firstrepo cam$
```

Cicle de vida



Accions bàsiques

- git add (afegir arxiu al stage)
- git status (veure estat actual)
- git commit (enviar al repositori)
- git diff (diferències treball / stage)
- git diff --staged (diferències stage / repo)
- git restore --staged (elimina canvis respecte stage)
- git rm --cached (treu del seguiment)
- git reset (treu del stage però sense perdre els canvis al working directory)

Accions bàsiques

- git checkout -- (elimina canvis àrea treball) també es pot fer amb git restore . (o indicar arxiu concret)
- git show (idcommit) veure detall commit
- git log (veure l'històric) --oneline (veure simplificat)
- git reset HEAD~1 (desfà darrer commit):
 - soft (no modifica working directory ni staged)
 - hard modifica working directory ni staged)
- git reset commit (desfà historia fins commit indicat)
- git revert HEAD (desfà darrer commit creant un de nou)
- git checkout idcomit . (revertir al commit)

Accions bàsiques

- Guardat temporal:

Guardado temporal de canvis si no s'ha fet git add:
git stash (s'eliminen del working directory)

Restaurar canvis stash:

git stash pop

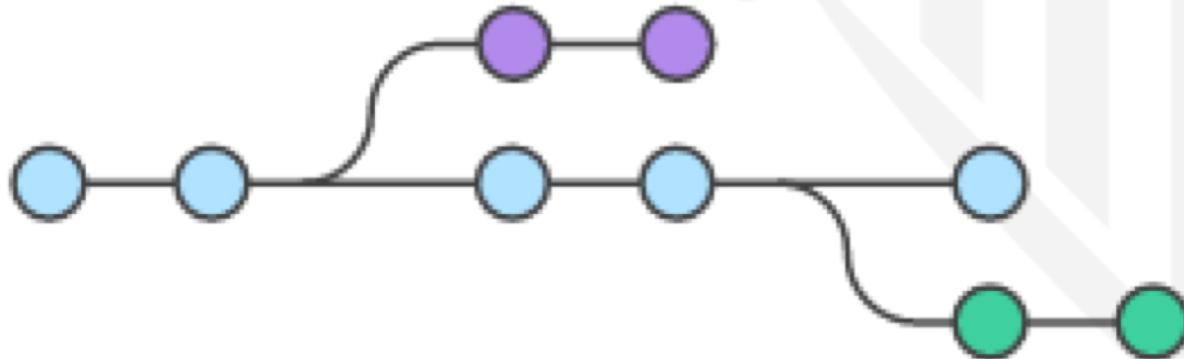
git stash apply

- Ignorar fitxers:

Arxiu .gitignore

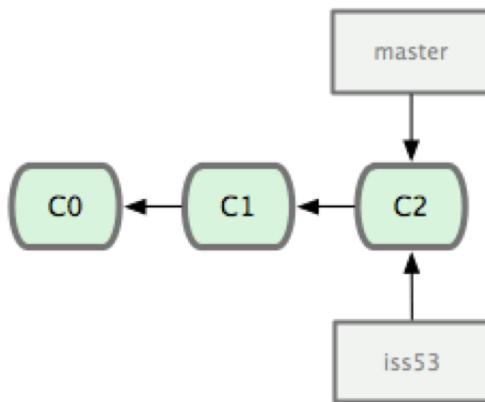
Branques

Una branca (branch) és una línia independent de desenvolupament: per tant, amb el seus propis working directory, staging area i project history (git directory).



Creant branques

git branch nova_branca: crea la nova branca en el punt del commit actual.



També es pot fer la creació i el salt d'un sol pas amb:

`git checkout -b nova branca`

git checkout nova_branca: canviem a la nova branca per començar a treballar amb ella.

Comparant branques

Una bona idea abans de pensar a fusionar una branca amb la master és comparar-les.

git diff --stat master branca

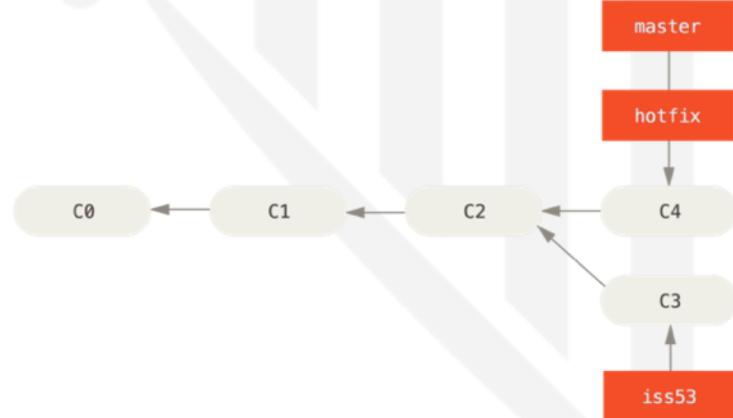
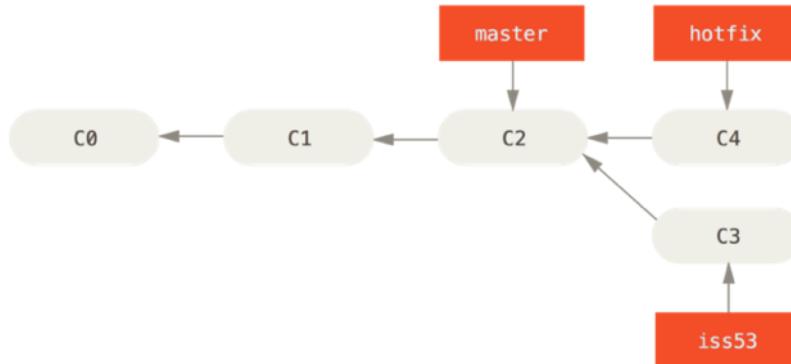
```
[iMac-de-Carlos-Alonso-Martinez:scripts carlos$ git diff --stat master dev
fun/countdown.sh | 26 ++++++++-----+
system/lamp.sh    |  4 +++
2 files changed, 29 insertions(+), 1 deletion(-)
iMac-de-Carlos-Alonso-Martinez:scripts carlos$ ]
```

Fusionant branques

Per fusionar (merge) una branca cap la branca **main**:

git checkout main (Hem d'estar a la branca destí)

git merge hotfix



Esborrant branques

Si en algun moment necessitem esborrar una branca:

- *git branch –d nom_branca*: esborra la branca si ja ha estat fusionada.
- *git branch –D nom_branca*: esborra la branca sense tenir en compte el seu estat (**aneu amb compte**).

Treballant amb branques remotes

Quan clonem un repositori que conté més d'una branca.

Si fem *git branch* només es veu master, però si fem *git branch -a* veiem totes les branques remotes també.

Per activar les branques en local, simplement cal fer:

git checkout nombranca

Treballant amb branques remotes

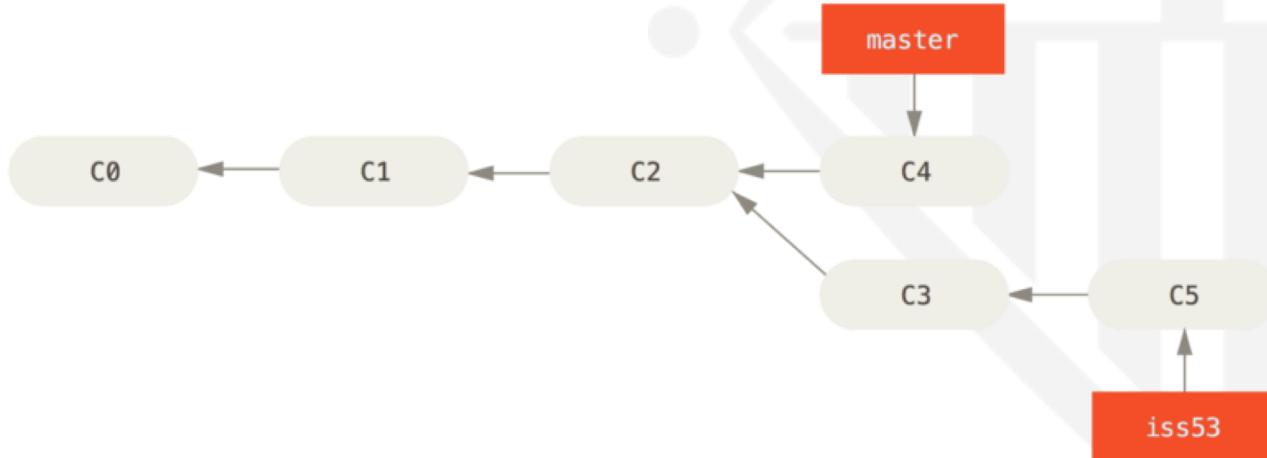
Al treballar amb una branca diferent de la main, la sincronització amb el servidor es fa exactament igual:

- git push remote branca
- git pull remote branca
- git fetch remote branca (baixa els canvis sense aplicar-los)

Branques: conflictes

Què passa si quan volem fusionar dues branques apareix un error?

Típicament perquè les dues branques contenen canvis.



Branques: conflictes

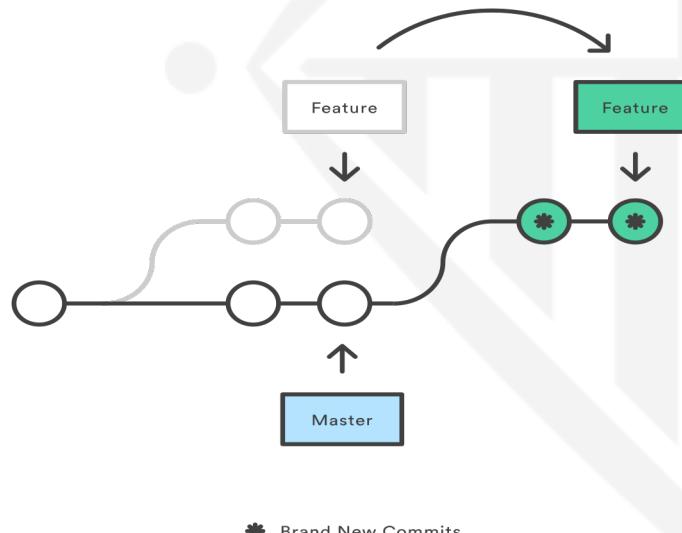
Al fer el *merge*, git intentarà solucionar els conflictes, però si per exemple en tots dos casos s'ha editat el mateix arxiu, ens generarà un avís de conflicte.

```
[iMac-de-Carlos-Alonso-Martinez:scripts carlos$ git merge dev
Auto-merging fun/countdown.sh
CONFLICT (content): Merge conflict in fun/countdown.sh
Automatic merge failed; fix conflicts and then commit the result.
iMac-de-Carlos-Alonso-Martinez:scripts carlos$ ]
```

Branques: rebase

Permet aplicar tots els canvis d'una branca sobre una altra.

Uneix les dues branques però fusionant els commits, de manera que es perd l'historial de les dues.



Git: noves comandes

La comanda git checkout té diverses funcionalitats, el que pot afavorir errors a l'hora d'utilitzar-se.

Comandes noves (v. 2.23.0):

git restore

git switch

git restore

És una nova opció quan estem treballant i hem de restaurar completament algun fitxer o projecte a un estat anterior.

Equivalència:

git checkout idcommit .

git restore --source idcommit .

També serveix per descartar canvis entre staged i working directory:

git restore .

El restore es pot fer de tot el projecte . o d'un arxiu determinat.

git switch

Forma alternativa de crear i canviar entre branques.

Equivalència:

git switch -c nova_branca = git checkout -b nova_branca

git switch nova_branca = git checkout nova_branca

git switch -c local --track remota = git checkout remota

Repositoris remots

- Serveis a Internet on s'allotgen repositoris utilitzant protocol Git.
- Diverses opcions:

GitHub



GitLab



Bitbucket



Azure Repos



AWS CodeCommit



GitHub

- El servei de repositoris més popular.
- Adquirit 2019 per Microsoft.

Pricing
Plans for all developers

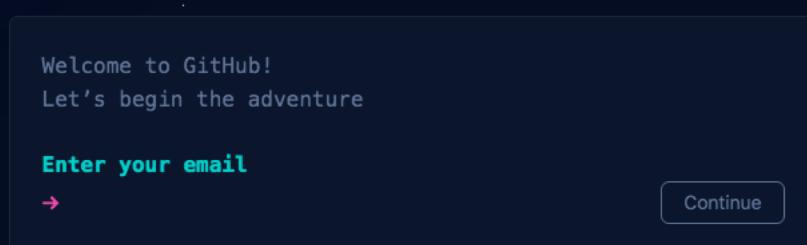
NEW GitHub is now free for teams
GitHub Free gives teams private repositories with unlimited collaborators at no cost.

[Try GitHub Free](#)

| Free | Team | Enterprise | GitHub One |
|--|---|--|--|
| Basics for teams and developers | Advanced collaboration and support for teams | Security, compliance, and flexible deployment for enterprises | All of our best tools, support, and services |
| <ul style="list-style-type: none">∞ Unlimited public/private repositories∞ Unlimited collaborators✓ 2,000 Actions minutes/month Free for public repositories✓ 500MB of GitHub Packages storage Free for public repositories✓ Community Support | <ul style="list-style-type: none">◀ Everything included in Free✓ Required reviewers✓ 3,000 Actions minutes/month Free for public repositories✓ 2GB of GitHub Packages storage Free for public repositories✓ Code owners | <ul style="list-style-type: none">◀ Everything included in Team✓ SAML single sign-on✓ 50,000 Actions minutes/month Free for public repositories✓ 50GB of GitHub Packages storage Free for public repositories✓ Advanced auditing | <ul style="list-style-type: none">◀ Everything included in Enterprise✓ Community-powered security✓ Actionable metrics✓ 24/7 support✓ Continuous learning |
| \$0 /month | \$4 per user/month | \$21 per user/month | Learn more |
| Join for free | Continue with Team | Contact Sales | Contact Sales |



GitHub: registre



The image shows the GitHub registration process. A dark blue rectangular box contains the registration form. At the top left is the GitHub logo (a white octocat icon). At the top right is a link "Already have an account? [Sign in →](#)". Inside the box, the text "Welcome to GitHub! Let's begin the adventure" is displayed. Below it, the instruction "Enter your email" is followed by a text input field containing "→". To the right of the input field is a "Continue" button. At the bottom of the page, a small note states: "By creating an account, you agree to the [Terms of Service](#). For more information about GitHub's privacy practices, see the [GitHub Privacy Statement](#). We'll occasionally send you account-related emails."

Welcome to GitHub!
Let's begin the adventure

Enter your email
→

Continue

By creating an account, you agree to the [Terms of Service](#). For more information about GitHub's privacy practices, see the [GitHub Privacy Statement](#). We'll occasionally send you account-related emails.

Repositori nou

Overview

Repositories 38

Stars 0

Followers 19

Following 2

Search repositories...

Type: All ▾

Language: All ▾

New



individual-work

Module 2 for Campus advisors

Updated 2 days ago

Repositori nou

Create a new repository

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

Owner



carlesalonso ▾

Repository name *

/ myfirstrepo ✓

Great repository names are short and memorable. Need inspiration? How about silver-octo-rotary-phone?

Description (optional)

Public

Anyone can see this repository. You choose who can commit.

Private

You choose who can see and commit to this repository.

Skip this step if you're importing an existing repository.

Initialize this repository with a README

This will let you immediately clone the repository to your computer.

Add .gitignore: None ▾

Add a license: None ▾



Create repository

Col·laboradors

Es poden convidar altres usuaris a col·laborar en el repositori.

Permisos canvien entre repositoris individuals o d'organitzacions.

The screenshot shows the 'Who has access' section of a GitHub repository settings page. On the left, a sidebar lists repository management options: General, Access (selected), Collaborators (highlighted in blue), Code and automation, Branches, Tags, Rules, Actions, Webhooks, Environments, Codespaces, Pages, Security, Code security and analysis, Deploy keys, and Secrets and variables. The main area is titled 'Who has access' and shows two sections: 'PRIVATE REPOSITORY' (Only those with access to this repository can view it.) and 'DIRECT ACCESS' (1 has access to this repository. 0 collaborators. 1 invitation.). A 'Manage' button is located between them. Below this is a 'Manage access' section with a 'Select all' checkbox, a search bar ('Find a collaborator...'), and a list of users. A user named 'Carlos Alonso' is listed with a status of 'Awaiting calonsmar's response'. Buttons for 'Pending Invite' and 'Remove' are next to his name. A green 'Add people' button is at the top right of this section. Navigation arrows ('Previous' and 'Next') are at the bottom of the list.

Col·laboradors

Notifications

Type to search

Inbox 1 All Unread Filter notifications Group by: Date

Saved Done

Clear out the clutter. Get the most out of your new inbox by quickly and easily marking all of your previously read notifications as done.

Select all

carlesalonso/Intro_PowerShell Invitation to join carlesalonso/Intro_PowerShell from carlesalonso

ProTip! When viewing a notification, press `shift u` to mark it as Unread.

carlesalonso invited you to collaborate

Accept invitation Decline

Owners of Intro_PowerShell will be able to see:

- Your public profile information
- Certain activity within this repository
- Country of request origin
- Your access level for this repository
- Your IP address

Is this user sending spam or malicious content? Block carlesalonso

Repositori nou: README.md

carlesalonso / myfirstrepo

Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Actions Projects 0 Wiki Security 0 Insights Settings

myfirstrepo / README.md Cancel

Edit file Preview changes Spaces 2 Soft wrap

```
1 # My first repo
2 ## Repo demo per BCN Activa
3
4 Els README.md utilitzen format **Markdown**
5
6 Aquí se sol indicar una descripció del projecte, etc.
7
```

Markdown

El format d'escriptura dels arxius readme.md és [Markdown](#) que és similar al popular HTML.

Aquest [link](#) teniu una guia d'estil per utilitzar aquest format als vostres arxius descriptius.

```
# Introducció a Docker 2023

<!-- insert Docker logo here -->

! [Docker logo] (https://logos-marcas.com/wp-content/uploads/2021/03/Docker-Logo.png)

## Primera sessió

* Instalar Docker:
  * [Instalar WSL] (https://docs.microsoft.com/en-us/windows/wsl/install)
  * [Instalar actualización de Kernel de Linux] (https://docs.microsoft.com/es-es/windows/wsl/install-manual#step-4---download-the-linux-kernel-update-package)
  * [Instalar Docker Desktop en Windows] (https://docs.docker.com/desktop/windows/install/)

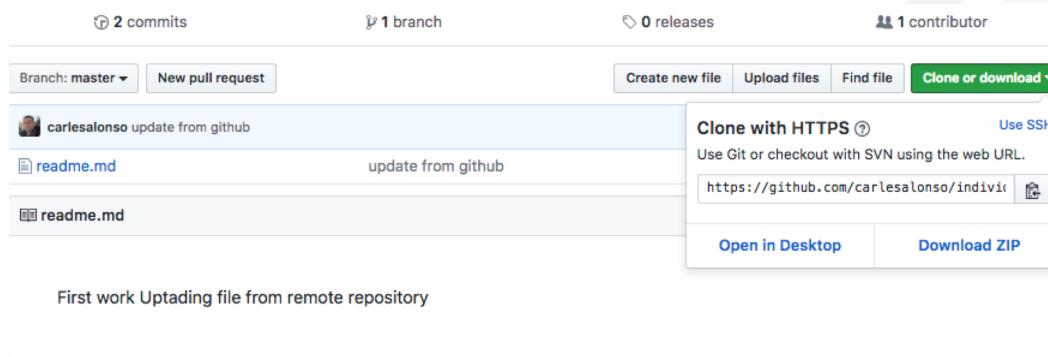
* Hello World en Docker `docker run hello-world`

* Comandes bàsiques:
  * `docker ps`
  * `docker run`
  * `docker rm`
  * `docker logs`
  * `docker exec`
```

Sincronització repositoris

git clone *ruta* (per clonar un existent)

git remote add *remote ruta*



Podem associar més d'un repositori remot al nostre repositori local.

Sincronització repositoris

git push origin master (puja master)

git fetch origin (baixa sense fusionar)

git pull origin master (baixa i fusiona)

Treballant amb projectes existents

Der un fork d'un repositori al que tinguem permís o sigui públic (es fa una còpia al nostre espai).

A screenshot of a GitHub repository page for 'calonsmar/scripts'. The page shows basic repository statistics: 30 commits, 1 branch, 0 releases, and 3 contributors. At the top right, there are buttons for 'Watch' (1), 'Star' (0), 'Fork' (4), and a green arrow points to the 'Fork' button. Below the stats, there are buttons for 'Branch: master', 'New pull request', 'Create new file', 'Upload files', 'Find file', and 'Clone or download'.

Pull Request

Petició al propietari del repositori per actualitzar el repositori original.

The screenshot shows a GitHub repository interface. At the top, there is a button labeled "Add topics". Below it, two statistics are displayed: "72 commits" with a circular icon containing a "P" and "1 branch" with a circular icon containing a "B". A large green progress bar spans most of the screen below these stats. At the bottom left, there is a dropdown menu set to "Branch: master" and a button labeled "New pull request". A message at the bottom states, "This branch is 34 commits behind bertvv:master."

Altres serveis GitHub

- GitHub ofereix força serveis afegits a la gestió de repositoris:
 - Issues
 - GitHub Pages (pàgina web associada a l'usuari i també pels diferents projectes).
 - Wiki per la documentació.
 - Gestió de projectes

Issues

Issues (propostes) per crear notes per:

Identificar errors en el codi i fer el seguiment.

Proposar millores o noves característiques.

Fer un seguiment de les tasques a realitzar en el repositori.

Al text dels Issues es poden mencionar usuaris de GitHub, fer referència a línies de codi, inserir fragments de codi o crear llistes de tasques que poden marcar-se com completades.

Issues

Issues 2 Pull requests Actions Projects 1 Wiki Security Insights Settings

Label issues and pull requests for new contributors

Now, GitHub will help potential first-time contributors [discover issues](#) labeled with [good first issue](#)

[Dismiss](#)

Filters ▾ Q is:issue is:open

Labels 9 Milestones 1

New issue

2 Open 1 Closed

Author ▾ Label ▾ Projects ▾ Milestones ▾ Assignee ▾ Sort ▾

Corregir error ortogràfic [bug](#) [documentation](#)



#2 opened yesterday by carlesalonso

Incorporar full CSS [enhancement](#)

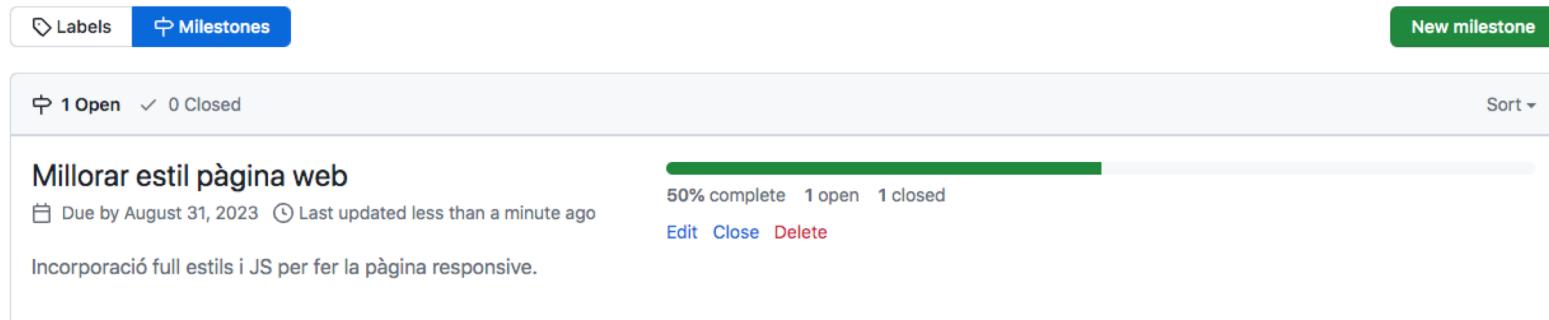
#1 opened yesterday by carlesalonso ↗ Millorar estil pà...

💡 ProTip! Exclude everything labeled [bug](#) with [-label:bug](#).

Milestones (fites)

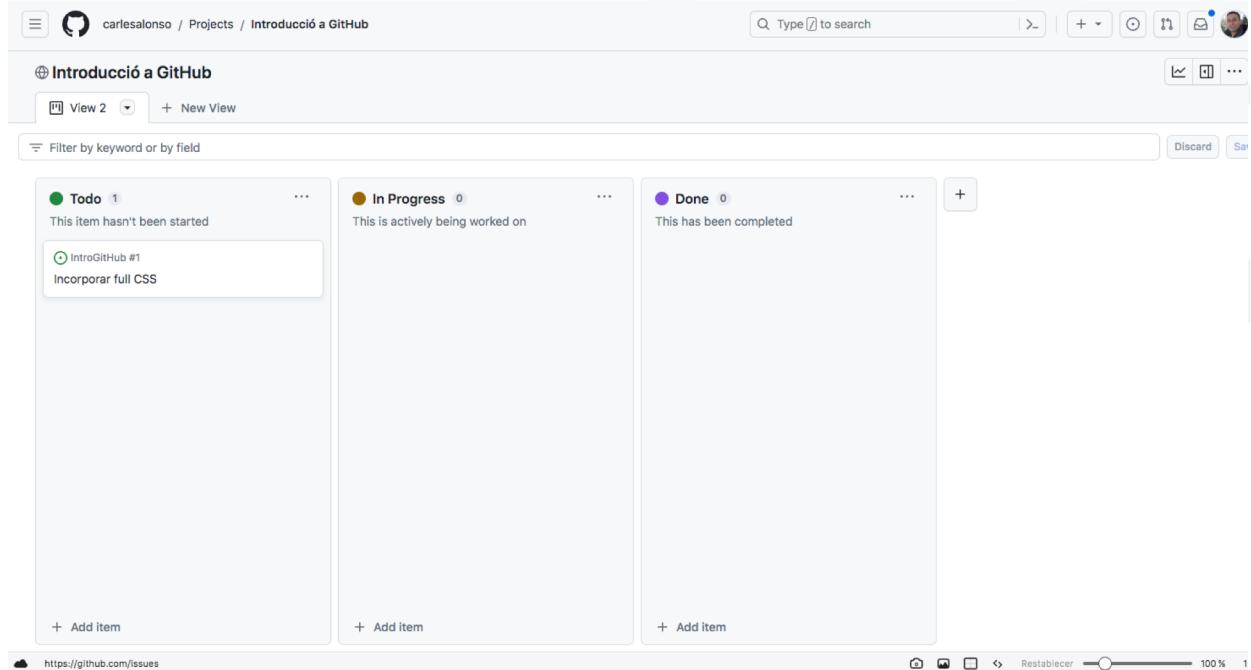
Els milestones permeten agrupar propostes (issues) i pull request.

Permet visualitzar el progrés de les accions.



Projectes

GitHub incorpora un gestor de projectes que es pot associar a diversos repositoris. Diferents tipus de vistes: Kanban, taula, roadmap.



Wiki

Permet associar una wiki a un repositori

The screenshot shows a GitHub repository interface for the user 'carlesalonso / Intro_PowerShell'. The 'Wiki' tab is selected in the navigation bar. The main content area displays a page titled 'Guia PowerShell' with the following text:

Autor: Carlos Alonso Martínez 2019

[Introducció](#)
[Començant amb PowerShell](#)
[Clients PowerShell](#)
[PowerShell en mode administrador](#)
[La comanda de PowerShell: cmdlet](#)
[Àlies](#)
[Aprendent cmdlets](#)
[L'ajuda de PowerShell](#)

On the right side, there is a sidebar with a 'Pages 1' section containing a search bar and a list of links corresponding to the wiki pages in the main content.

GitHub Pages

- Servei d'allotjament web estàtic (sense lògica de servidor ni base de dades).
- Fins a 1 GB d'allotjament ([límits d'ús](#)).
- Dues possibilitats:
 - Associat al compte d'usuari.
 - Associat a un dipòsit.
- Tecnologies: HTML, CSS i JavaScript. També podeu publicar fitxers per a la seva descàrrega.
- Possibilitat d'utilitzar Jekyll, un gestor de contingut estàtic amb funcionalitats semblants a WordPress.

GitHub Pages

General

Access

Collaborators

Moderation options

Code and automation

Branches

Tags

Rules

Actions

Webhooks

Environments

Codespaces

Pages

Security

Code security and analysis

Deploy keys

Secrets and variables

Integrations

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is live at <https://carlesalonso.github.io/bcnactiva2021web/>

Visit site

...

Build and deployment

Source

Deploy from a branch

Branch

Your GitHub Pages site is currently being built from the main branch. [Learn more about configuring the publishing source for your site.](#)

main / (root) Save

Learn how to [add a Jekyll theme](#) to your site.

Custom domain

Custom domain

Custom domains allow you to serve your site from a domain other than carlesalonso.github.io. [Learn more about configuring custom domains.](#)

Save Remove

GitHub Pages

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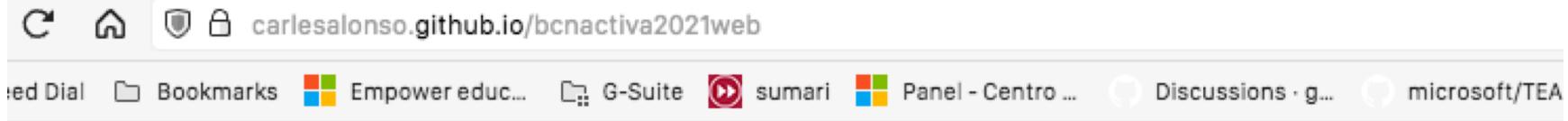
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Save Remove

GitHub Pages



bcnactiva2021web

Exemple Web bàsica

Més

- **GitHub Actions:** sistema de CI que permet desplegar el repositori de forma automatitzada.
- **Codespaces:** entorns de desenvolupament i prova al cloud.

Flow

- Per treballar amb branques, és convenient usar una metodologia (flow), especialment quan es treballa en equip.
- Diverses aproximacions:
 - Git flow
 - GitHub flow
 - Trunk based development

Per seguir...

- <https://www.atlassian.com/git/tutorials>
- <https://git-scm.com/book/en/v2>
- <https://lab.github.com>
- <https://gitexplorer.com>
- <http://codehero.co/series/git-desde-cero.html>

Altres dubtes?

GRÀCIES!!



barcelona.cat/barcelonactiva