



git

Tutorial

A quick guide to the Git version control software

Reece Broughton
and Riley Myers

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Download This Presentation

<https://git.cs.nmt.edu/rbroughton/git-presentation>

What is git?

- Git is a software collaboration tool (version control system).
- First developed by Linus Torvalds and initially released in 2005.

Designed for:

- Speed.
- Simplicity.
- Non-linear development. (thousands of parallel branches)
- Fully distributed.
- Large projects (Linux kernel)
- I like bullet points

Why should you use git?

- Collaboration of software is easy.
- Continuous integration (CI).
- Code review (merge requests).

Configuring Git

```
$ git config --global user.name "Reece Broughton"  
$ git config --global user.email "rbroughton@cs.nmt.edu"  
$ git config --global core.editor "atom --wait"  
$ git config --global -l
```

Starting a project in Git

```
~$ cd project-folder  
~/project-folder$ git init  
~/project-folder$ git status
```

Working with files in Git

```
$ git add *.c  
$ git add README  
$ git add . # Adds almost everything  
$ git commit -m "Initial commit"
```

Visualizing Branches?

```
$ git gui
```

```
$ git log --all --graph
```

Stackoverflow: Pretty git branch graphs

```
* 525a852 - (9 months ago) notification test - German Laullon (refs/remotes/origin/test_on_10.8)
* 58b5a57 - (9 months ago) morden Objective-c - German Laullon
* aefd39 - (9 months ago) first build. - German Laullon
* bff6661 - (9 months ago) Merge pull request #169 from taybin/patch-1 - German Laullon (HEAD, refs/remotes/origin/main)
| \
| * ef61b97 - (1 year, 2 months ago) Update Rakefile to work with ruby-1.9.2. - Taybin Rutkin
| * | 3b06317 - (9 months ago) Merge pull request #175 from barrywardell/master - German Laullon
| \ \
| * | 907e967 - (1 year, 3 months ago) Fix bug where submodules were incorrectly grouped when the first part of their path was
* | | dd1b324 - (9 months ago) Merge pull request #195 from jphalip/master - German Laullon
| \ \ \
| * | | 8ebb58c - (11 months ago) Added "Copy Reference to Clipboard" context menu item in sidebar. - Julien Phalip
| * | | 238a97a - (11 months ago) Fixed a tiny typo. - Julien Phalip
| * | | 3386fc7 - (11 months ago) Make sure the commit view gets refreshed when 'Stage' gets selected and the auto-refresh
| * | | 7fafdb8 - (11 months ago) Tweaked capitalization of words in contextual menu items. - Julien Phalip
| * | | 5958f5b - (11 months ago) Don't display all the files selected for deletion to avoid the confirmation sheet getting
| * | | 3575e87 - (11 months ago) Prevent large files from getting loaded in the commit view to prevent the app from freezing
| * | | 748621c - (11 months ago) Made the "(Un)stage lines" functionality in the commit view work only if the Command key is
| * | | d249fd6 - (11 months ago) When a branch gets selected in the sidebar, make sure its corresponding commit also gets
| * | | 839c9b6 - (11 months ago) Made the diff tables adapt nicely to the window's size. Fixes #50. - Julien Phalip
* | | | 8badd8a - (9 months ago) Merge pull request #196 from Kyriakis/master - German Laullon
| \ \ \ \
| * | | | af773ba - (11 months ago) No check for refs on remotes while deleting them - Robert Kyriakis
| | / / /
| * | | | 47a8a1a - (9 months ago) Merge pull request #197 from Uncommon/arcfix - German Laullon
| \ \ \ \
| * | | | d1a8ba9 - (11 months ago) fix for ARC errors and other warnings - David Catmull
| | / / /
| * | | b94240c - (9 months ago) [y so slow] :D - German Laullon
| / / /
```


Ignoring files in Git

`.gitignore`

Generate `.gitignore` files: www.gitignore.io

Modifying history in Git

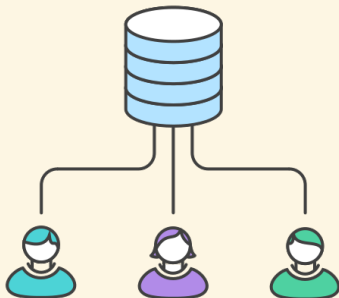
```
$ git commit --amend
```

```
$ git reset
```

```
$ git rebase -i
```

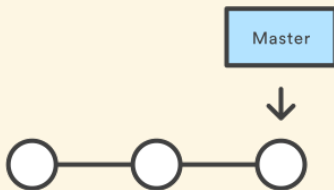
Github		https://github.com
Gitlab		https://gitlab.com
CS Git Server		https://git.cs.nmt.edu
Bitbucket		https://bitbucket.org

Centralized Workflow

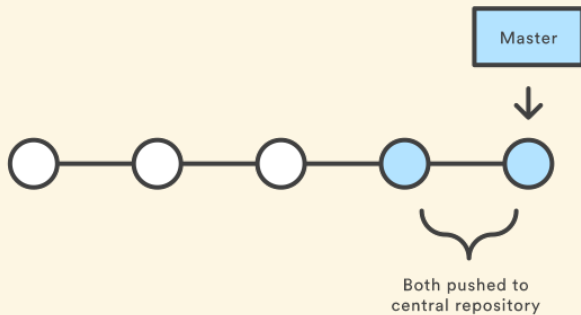


www.atlasian.com/.../comparing-workflows/#centralized-workflow

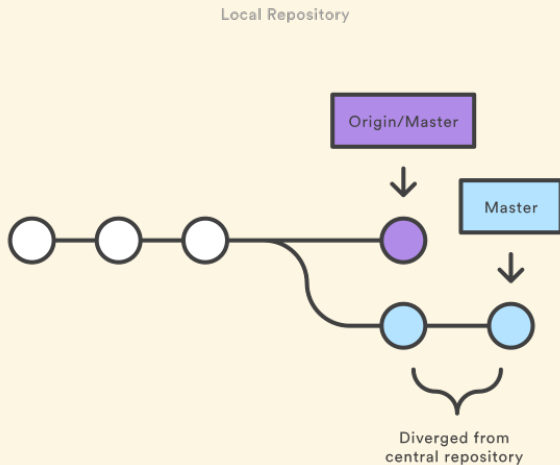
Centralized Workflow



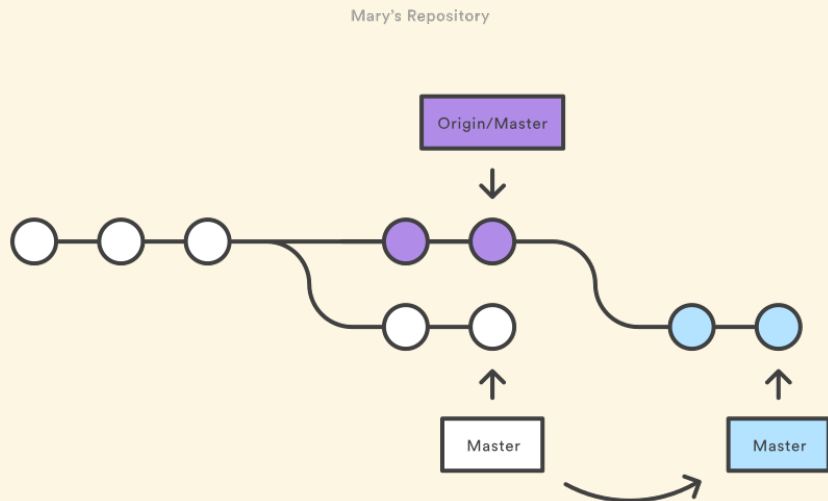
Centralized Workflow



Centralized Workflow



Centralized Workflow



Feature Branch Workflow

- One Central Repository.
- Multiple branches for each user/feature.
- Pull requests.
- Code review.

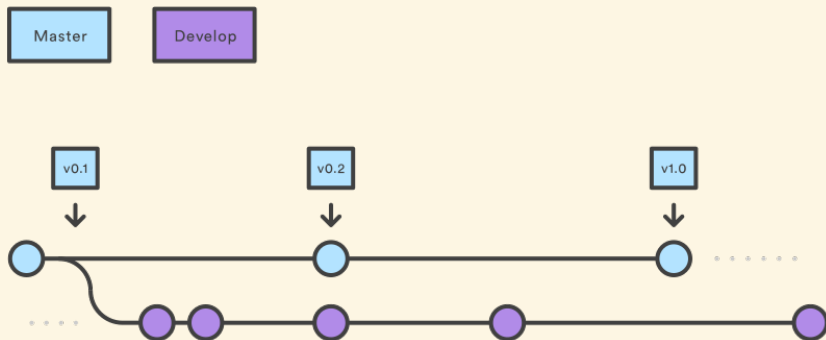
www.atlassian.com/.../feature-branch-workflow

Gitflow Workflow

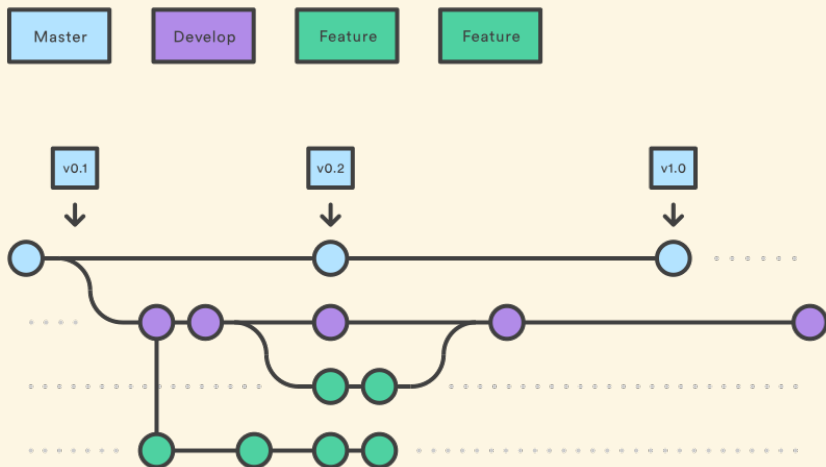
- For projects with scheduled release cycle.
- Almost the same as feature branch workflow.
- Assigns very specific roles to different branches and how they are to interact.

www.atlassian.com/.../gitflow-workflow

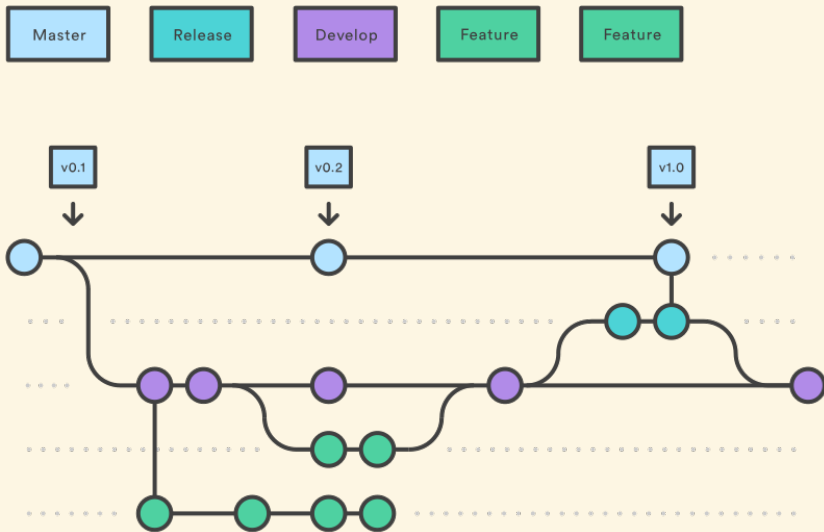
Gitflow Workflow



Gitflow Workflow



Gitflow Workflow



Forking Workflow



- Fundamentally different than other workflows.
- Every developer has a private-local and public-server-side repo.
- Project maintainer can accept commit from any developer.
- No write access needs to be granted to main repository.

www.atlassian.com/.../forking-workflow



"If that doesn't fix it, `git.txt` contains the phone number of a friend of mine who understands git. Just wait through a few minutes of 'It's really pretty simple, just think of branches as...' and eventually you'll learn the commands that will fix everything."

	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

"Merge branch 'asdfasjkfdlas/alkdjf' into sdkjfls-final"

>_Resources for Git

git-scm.com/book — *The book about Git.*

www.atlassian.com/git/tutorials/ — Atlassian git tutorials

docs.gitlab.com/ee/topics/git/index.html — Gitlab git references

guides.github.com — Github tutorials

ohshitgit.com — You borked it and you need to fix it

sethrobertson.github.io/GitFixUm/fixup.html — More fixing errors

learngitbranching.js.com — Tutorial on how to git