Git & Github Tutorial

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General

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- Git is a **V**ersion **C**ontrol **S**ystem

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- created in 2005 by Linus Torvalds

Terminology

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- Commit (History)

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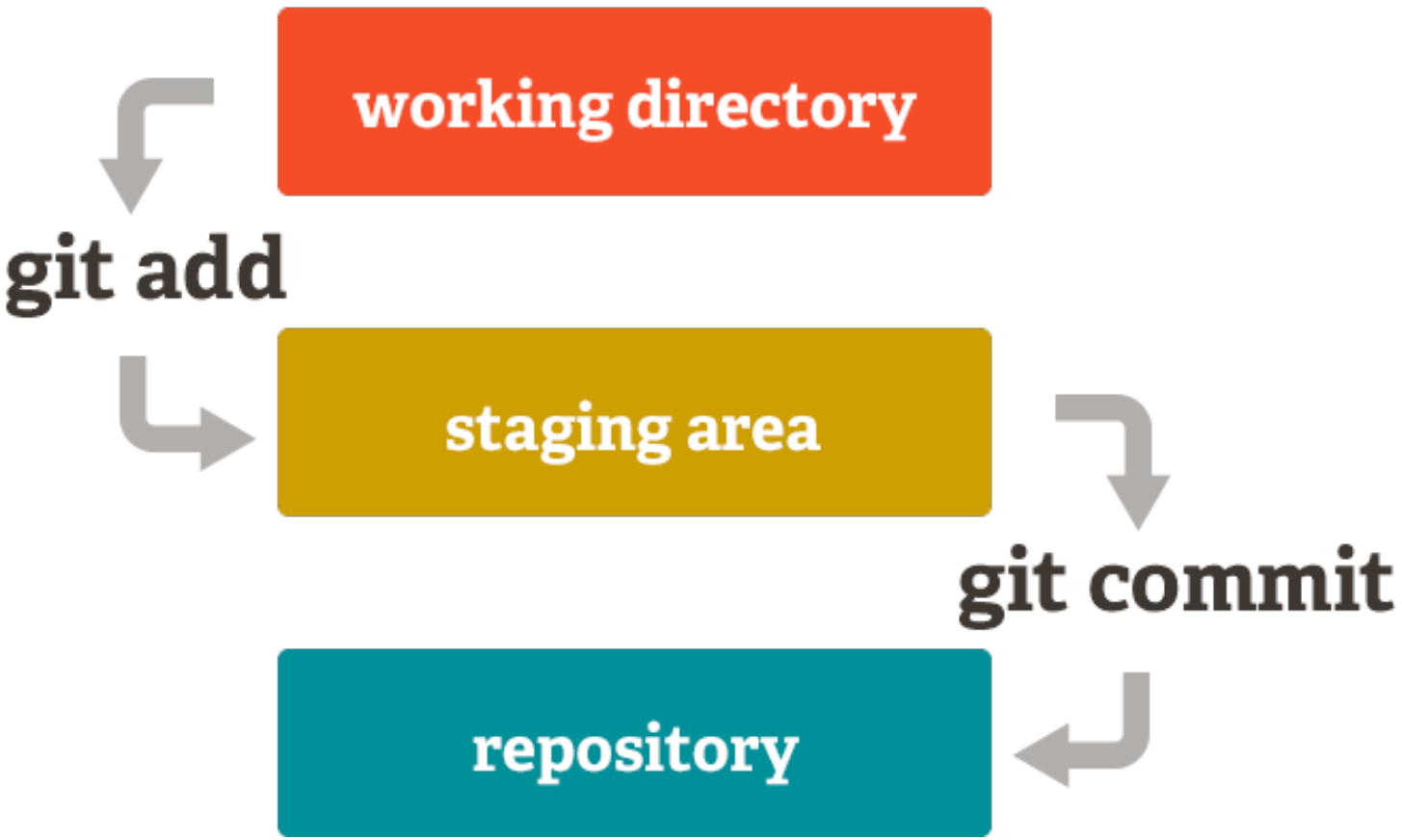
- Commit (History)
- (Remote) Repository

Git areas


working directory
git add
staging area
git commit
repository

Use your Github user in Git

Use your Github user in Git

- set your username and e-mail

```
$ git config --global user.name "<username>"
$ git config --global user.email <e-mail>
```

Ignoring files

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- contains patterns
- `*` matches anything
- postceding `/` matches a folder
- preceding `/` matches only in the root folder
- preceding `!` negates the pattern (i.e. includes files)

What do the following rules exclude?

```
/src/
!/src/working/
```

Local repositories

Local repositories

- create new local repository

  ```
  $ git init
  ```

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  ```
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- clone a remote repository

  ```
  $ git clone <URL>
  ```

Staging and committing

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- stage changes

  `$ git add (--all / <files>)`

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  `$ git commit -m "<Message>"`

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  `$ git add (--all / <files>)`
- commit all the staged changes

  `$ git commit -m "<Message>"`
- Commit messages are important!

Display changes and commits

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- see changes in code

  ```
  $ git diff <commit1> <commit2> <files>
  ```

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  $ git status
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Display changes and commits

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  ```
  $ git diff <commit1> <commit2> <files>
  ```

- see staged changes

  ```
  $ git status
  ```

- see commit history

  ```
  $ git log
  ```

Remote repositories

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- add remote repository

```
$ git remote add <Name> <URL>
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- not needed when repository was cloned
- set remote repository as up-stream

  ```
  $ git branch -u <Name> <Branch>
  $ git push -u <Name> <Branch>
  ```

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  $ git push -u <Name> <Branch>
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- push all commits to remote repository

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  ```

- push all commits to remote repository

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  $ git push
  ```

- pulls all commits from remote repository

  ```
  $ git pull
  ```

Tagging versions

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- list tags

```
$ git tag --list
```

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- tag a commit

  ```
  $ git tag -a <version> -m "<message>"<commit>
  ```

Tagging versions

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- tag a commit

  ```
  $ git tag -a <version> -m "<message>"<commit>
  ```

- push all tags

  ```
  $ git push origin --tags
  ```

Branches

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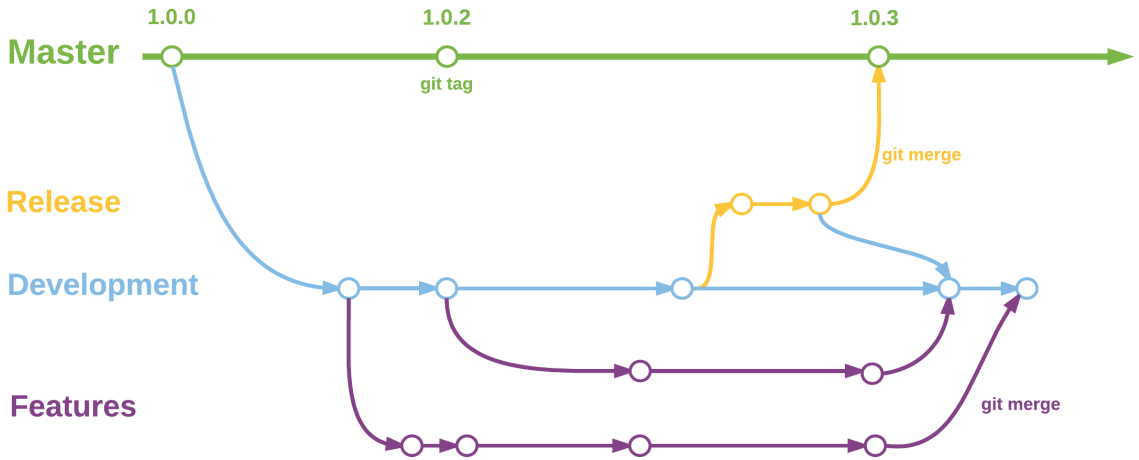


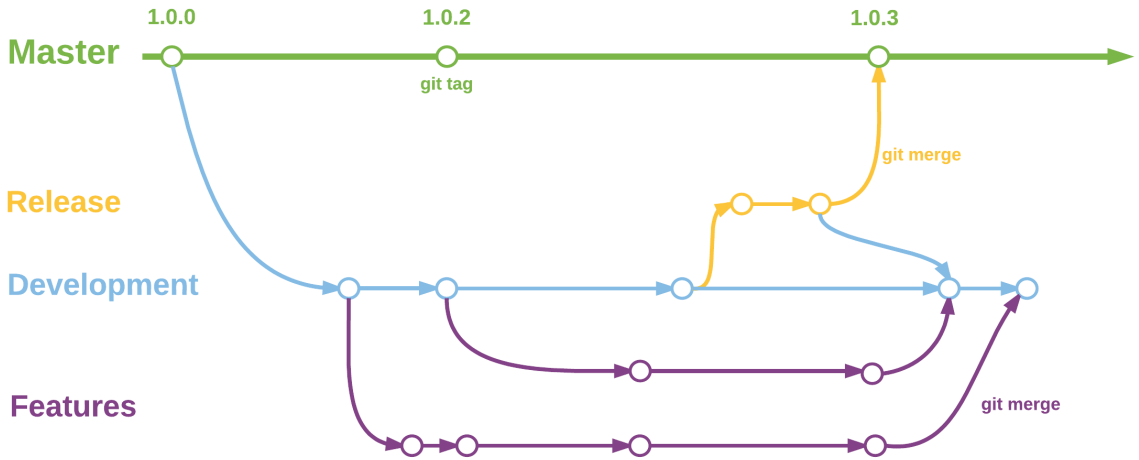
official release history with commits tagged with version numbers

integration branch for features

release branch that will get merged to master

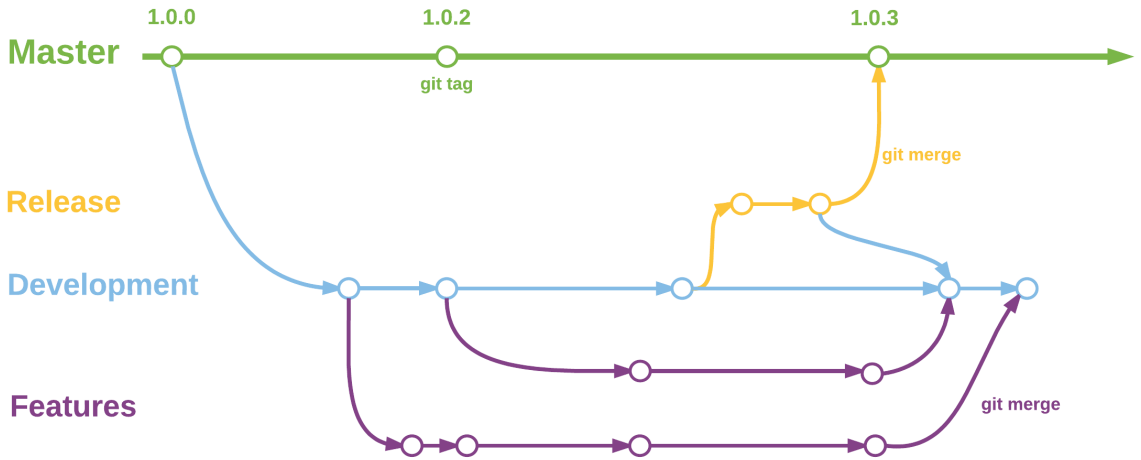
local branches for each feature that will get merged back to development branch

Branches



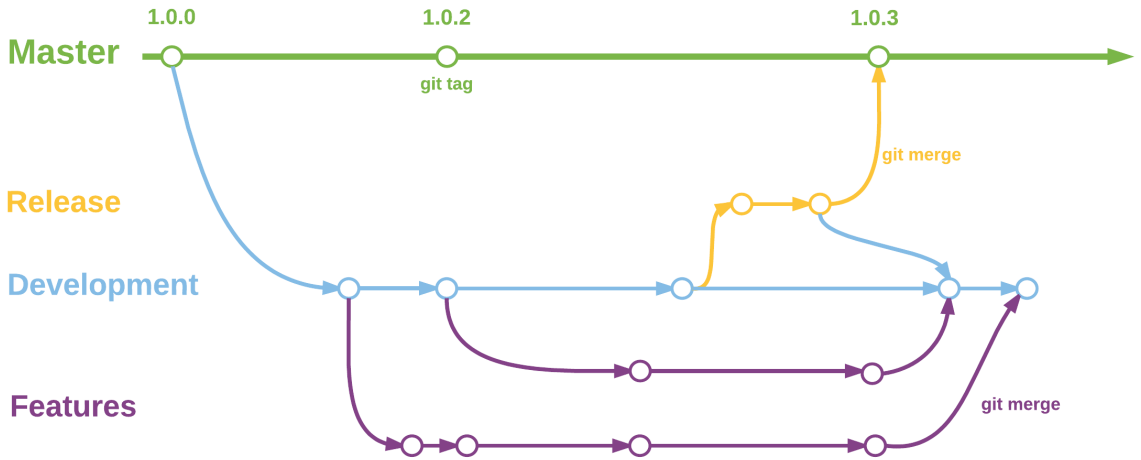
- different directions the project is heading of into

Branches



- different directions the project is heading of into
- different features (feature branches)

Branches



- different directions the project is heading of into
- different features (feature branches)
- can be merged again

merging

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- bringing two branches back together

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$ git merge <branchname>
```

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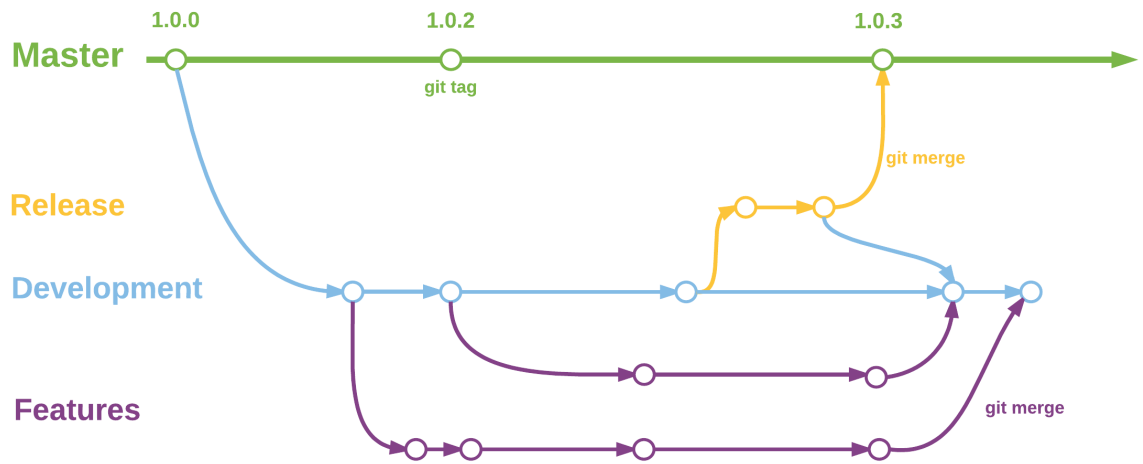

conflict resolving

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- conflicts happen when two people edit the same line

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```
To help you with git,
<<<<<<< HEAD
this line has many infos
=======
I write many different tutorials
>>>>>>> conflicting branch
```

- resolve them manually by editing the files

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To help you with git,
<<<<<<< HEAD
this line has many infos
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I write many different tutorials
>>>>>>> conflicting branch
```

- resolve them manually by editing the files

- `git add <conflicting-file>`

rebasing

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- reapply commits on top of another base tip

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- keeps the git history straight

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- allows for `--ff-only` merge

```
$ git merge --ff-only <branchname>
```

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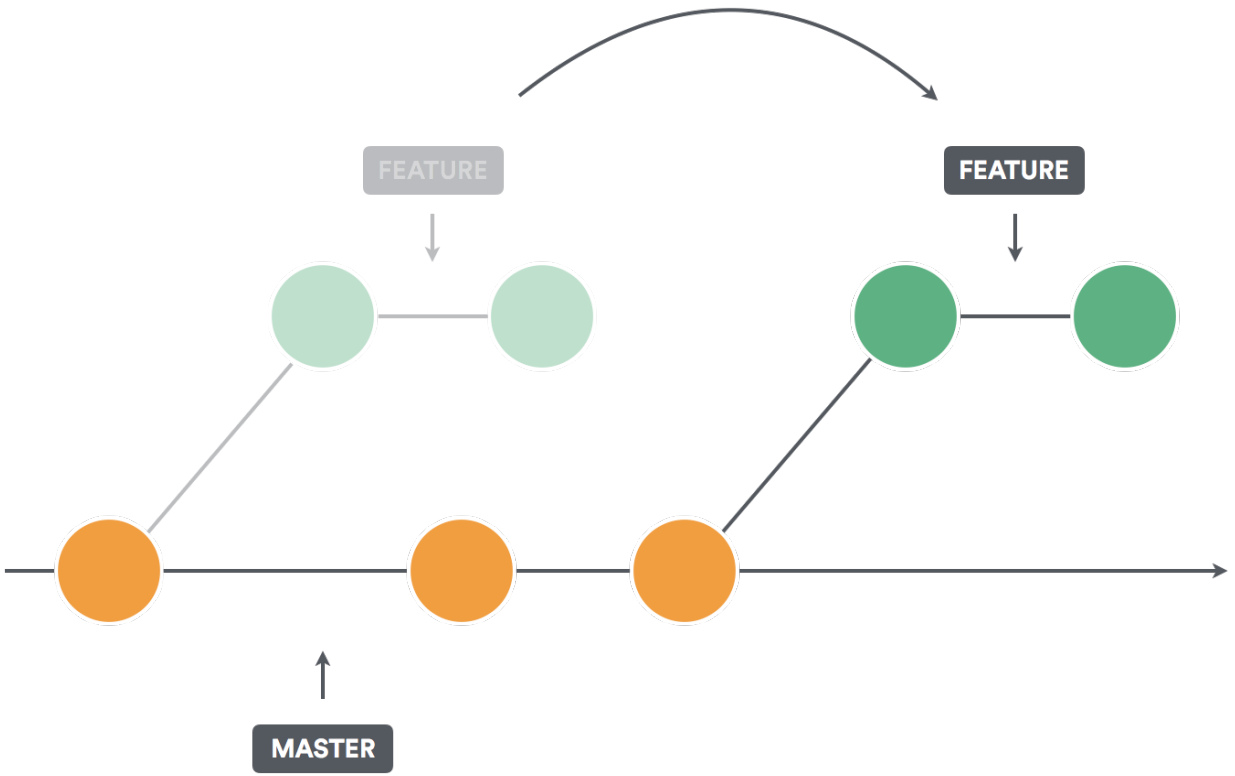
- allows for `--ff-only` merge

```
$ git merge --ff-only <branchname>
```



Rewriting history

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- `$ git rebase -i HEAD~<number>`
  `<number>` is the number of commits you want to go back and edit

Rewriting history

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```
$ git rebase -i HEAD~<number>
```

```
pick ce28e71 change gitignore intellij
pick 4067bbb Add chapter about tags
pick 78580c3 Change some slides
pick 1641359 Complete my slides
pick 091611d add current pdf version
pick db3e8b4 add Daniels part to slides

# Rebase 3a4a271..db3e8b4 onto 3a4a271 (7 commands)
#
# Commands:
# p, pick <commit> = use commit
# r, reword <commit> = use commit, but edit the commit message
# e, edit <commit> = use commit, but stop to amend
# s, squash <commit> = use commit, but meld into previous commit
# These lines can be re-ordered; they are executed from top to bottom.
#
# If you remove a commit here THAT COMMIT WILL BE LOST.
```

GitHub (& others)

GitHub (& others)

complete copy

branch protection

pull requests

issues
forks
statistics