Git Tutorial

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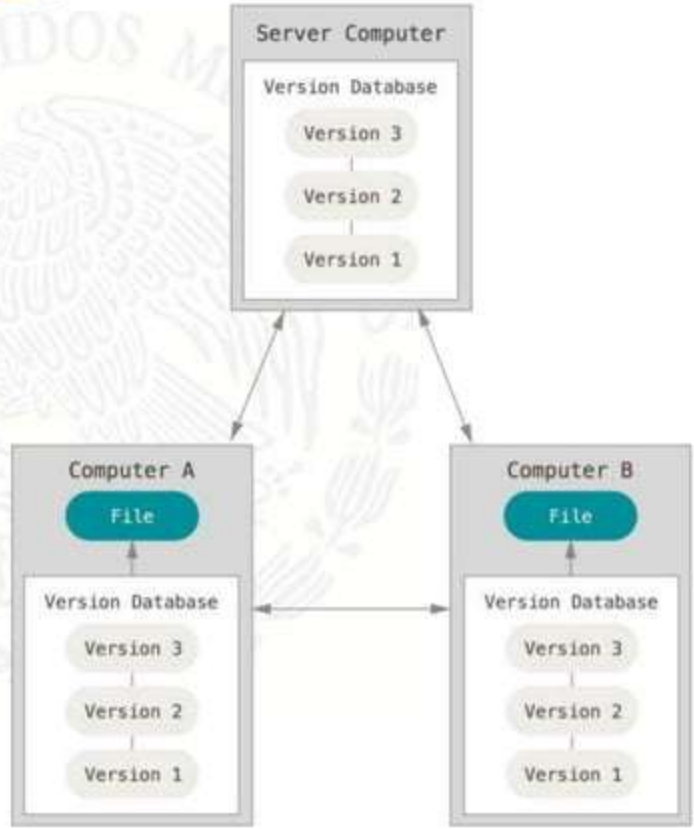
Definition

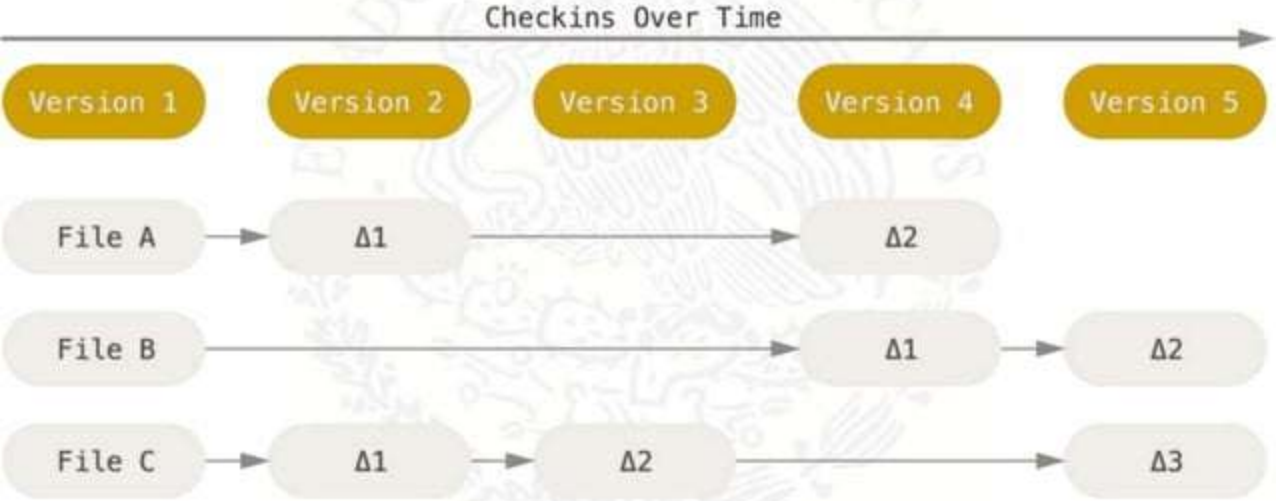
Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

https://git-scm.com/

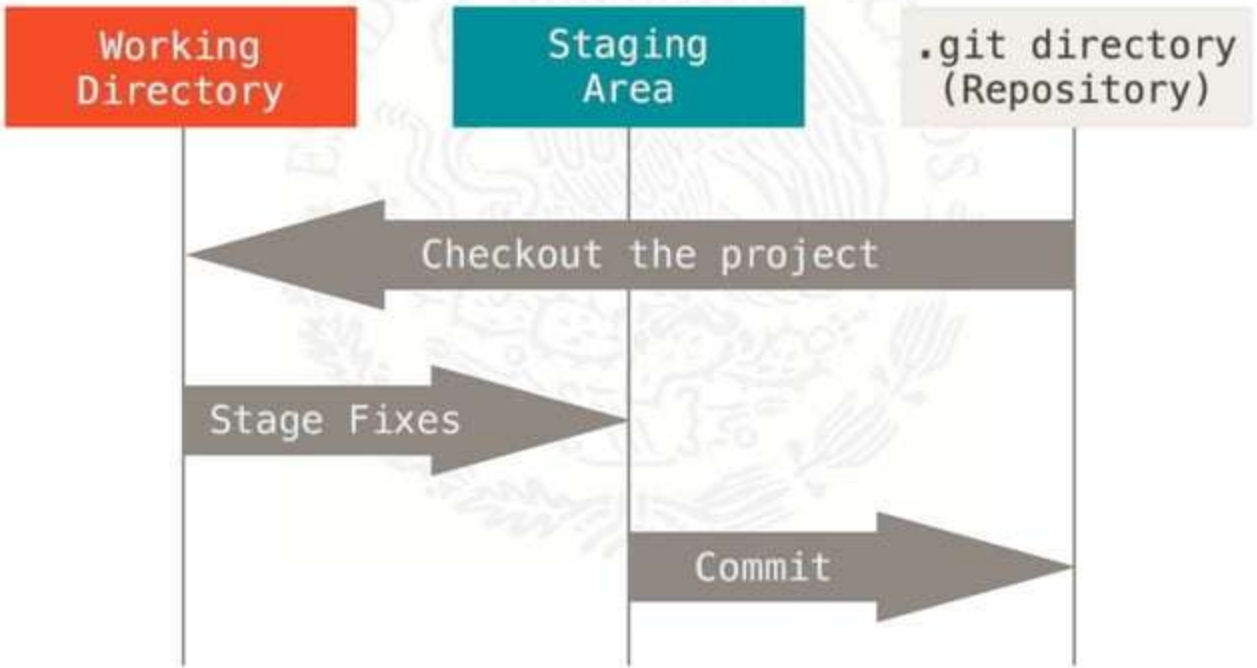
What's Git?


Server Computer
Version Database
Version 3
Version 2
Version 1
Computer A
File
Version Database
Version 3
Version 2
Version 1
Computer B
File
Version Database
Version 3
Version 2
Version 1

Versions over the time



The Three State



Installing Git

Windows, Mac and Linux has installers

Additional in Linux you can use:

$sudo yum install git-all
$sudo apt-get install git-all

Configuring Git

In Linux the main file configuration its in: /etc/gitconfig

Personal configuration are in the home directory of the users: ~/.gitconfig or ~/.config/git/config

Configuring your identity

The first step is configuring your personal information:

```
git config --global user.name "Juan Carlos Olivares"
git config --global user.email "jcolivares@itmorelia.edu.mx"
```

Configuring your identity

git config list

Shows all the configuration vars in local and global way

git help <command>

shows the help for this command

Initializing a repository

In the shell, we neet to change to our source directory. In this directory we used the next command:

```
git init
```

For initializing the git repository.

Iniatilizing the repository

If the directory has file or not, we can check the statusof the repository with the comand: git status

The command list if exist files which where modified in the last review.

Checking the status of repository

The command: git status

Shows the files that are modified which aren´t in the stage area.

We can adding these files with the command: git add <filename>

Passing files to the stagin area

The commad: git add –A

Adds all the files in the staging area. Te
command: git diff <filename>

Shows the changes in this file.

Passing to the version area

The last area is the commit of the changes, we can do this with the following command: git commit –m "nameordescriptionofthechanges"

After this we obtain and ID for the commit. This ID permits to return to the diferent versions of the repository.

Clonning an Existing Repository

When te repository already exits we can get from the server through a clone process. We can apply this:

git clone <urltogitfile.git>

We need the credentials for the access

Upload changes in the remote repository

We can upload the commits to the remote with the following commands: git push origin master

Before this we need to configure the remote repository with this command: git remote add origin <urltoreposfile.git>

Downloads changes in the repository

We can donwload to the local repositroy the changes applied to the remote repository with this command:

```
git pull origin master
```

This command is recomended before working with the git repository.

Donwload/Upload changes

For doing the changes we need the authentification. For https security you must provide the user and password of your git server account. For ssh we need to generate a ssh key with the command ssh-key.

Download/Upload changes

We need to put the public key in the remote server.

Some of the most popular free git remote repositories are github, gitlab, bitbucket among others.

Adittional commands

We can discard the changes of any file with: git checkout -- <filename>

In the file .gitignore we can add any files or extension file that we want to ignore.

Aditional commands

We can check the diferences bettwen commits using: git diff

Aditional we can check the chances in one file with: git diff <filename>

Adittional Commands

We can delete file with: git rm <filename>

We can move files with: git mv <filename>

Logs in Git

We can check the logs in git with the command: git log

We can use git log --pretty=format:"%h %s" –graph for a better support

Tagging

A tag is a special version in the repository that contains some commits. We can checks the tags with: git tag

We can add tags with: git tag -a v1.4 -m "my version 1.4"

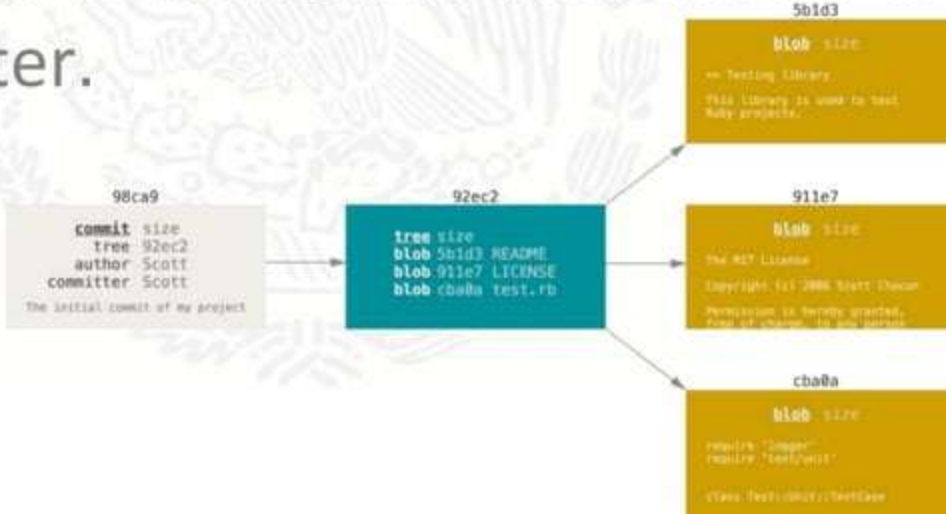
Tagging

We can check all the changes in the tag with: git show <tag>

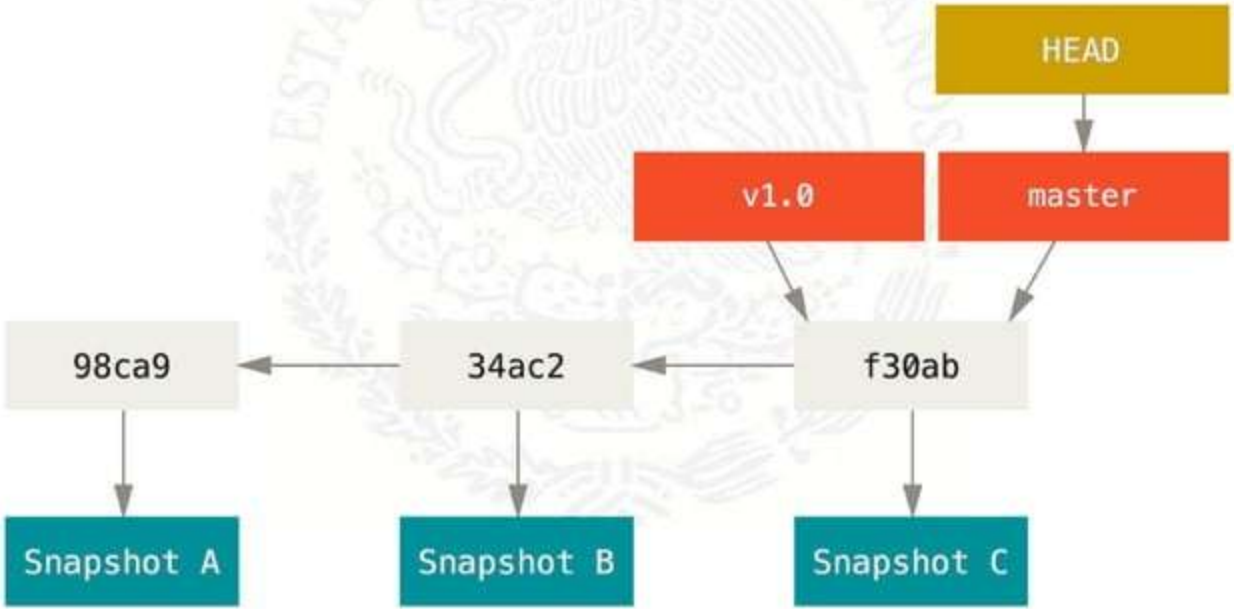
The push command doesn't upload the tags automatically. We can use: git push origin <tag>

Branches

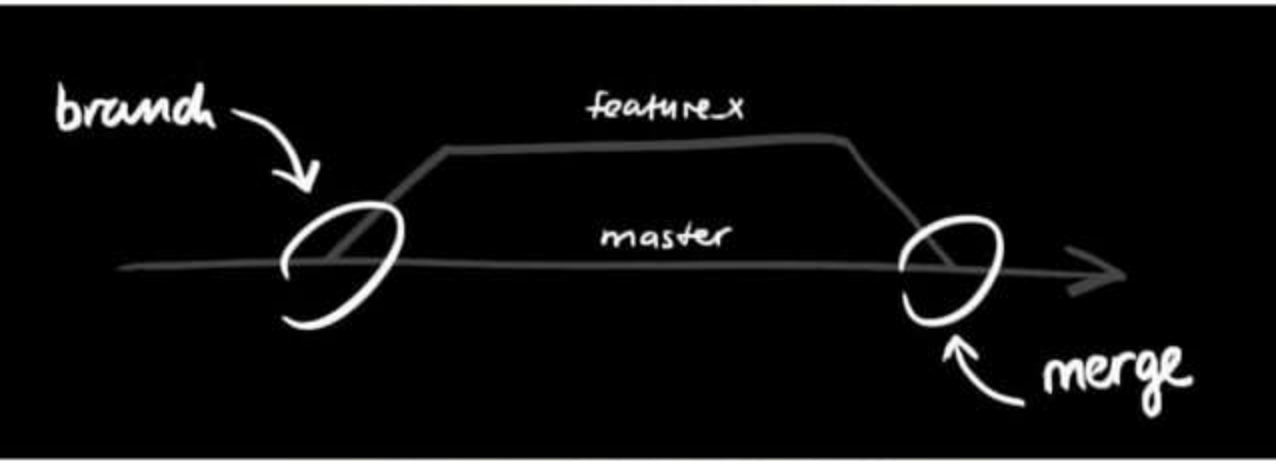
A branch in Git is simply a lightweight movable pointer to one of these commits. The default branch name in Git is master.



Branches


HEAD
v1.0
master
98ca9
34ac2
f30ab
Snapshot A
Snapshot B
Snapshot C

Branches



Branches

We can add branches with: git checkout –b <branch>
or git branch <branch>

We can change between branches with: git checkout <branch>

Branches

We need to push the changes in the remote repository with: git push origin <branch>

We can merge two branches in one with: git merge <branch>

Merge branches

When we merge two branches, git automatically resolve conflicts between changes in the file. In the case when a file is modified exactly in the sames line we need to resolve conflict manually though deleting the lines in conflict.

Questions?

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