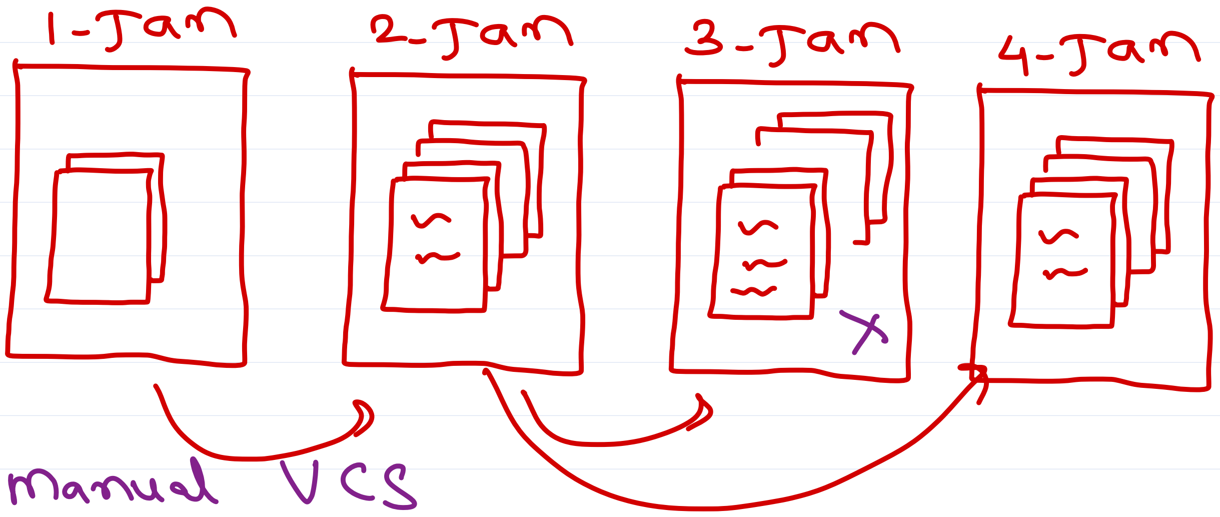
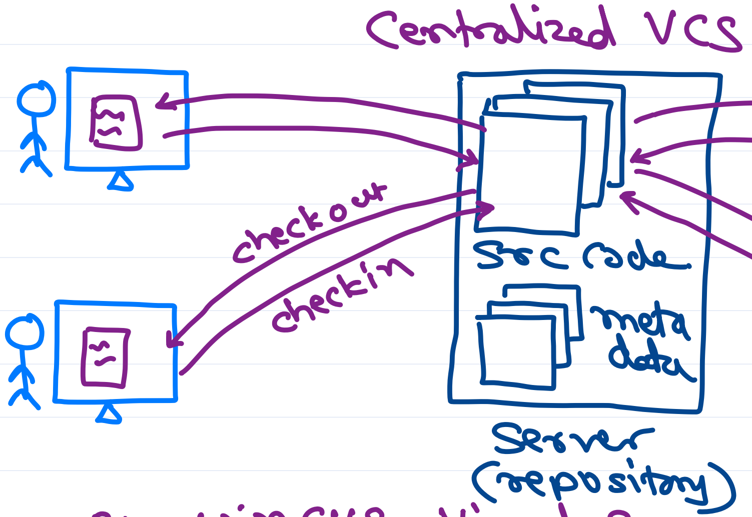
GIT

Trainer: Nilesh Ghule

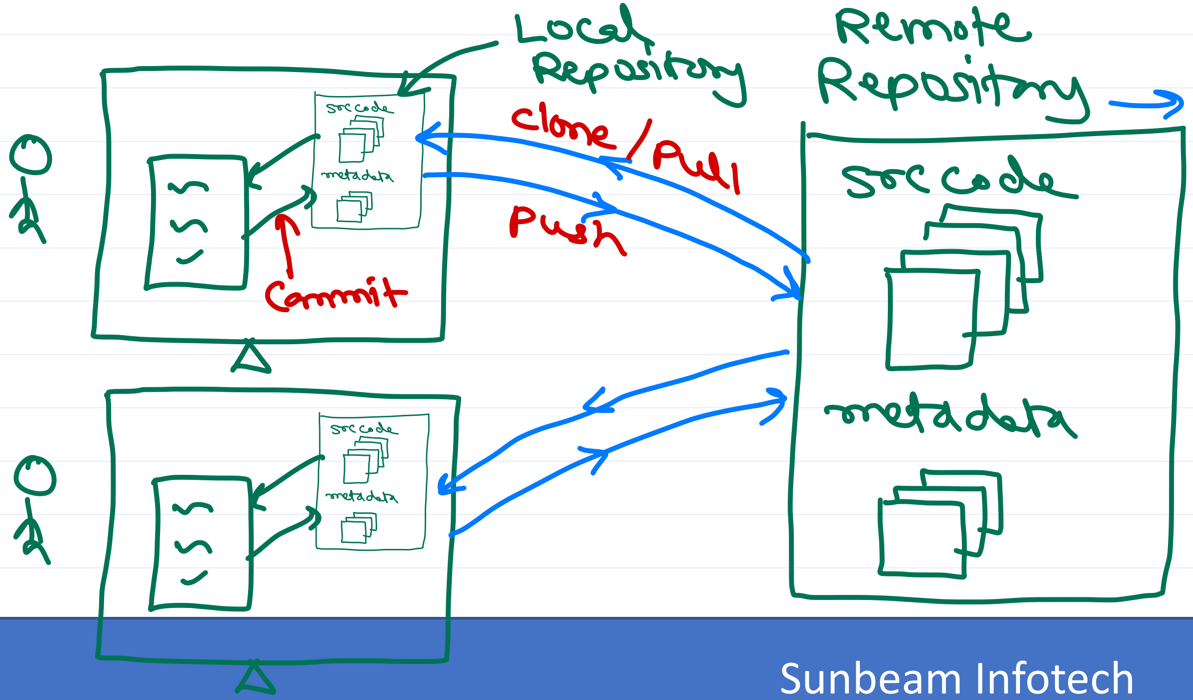
VCS



Manual VCS



e.g. winCVS, Visual Source Safe, ...

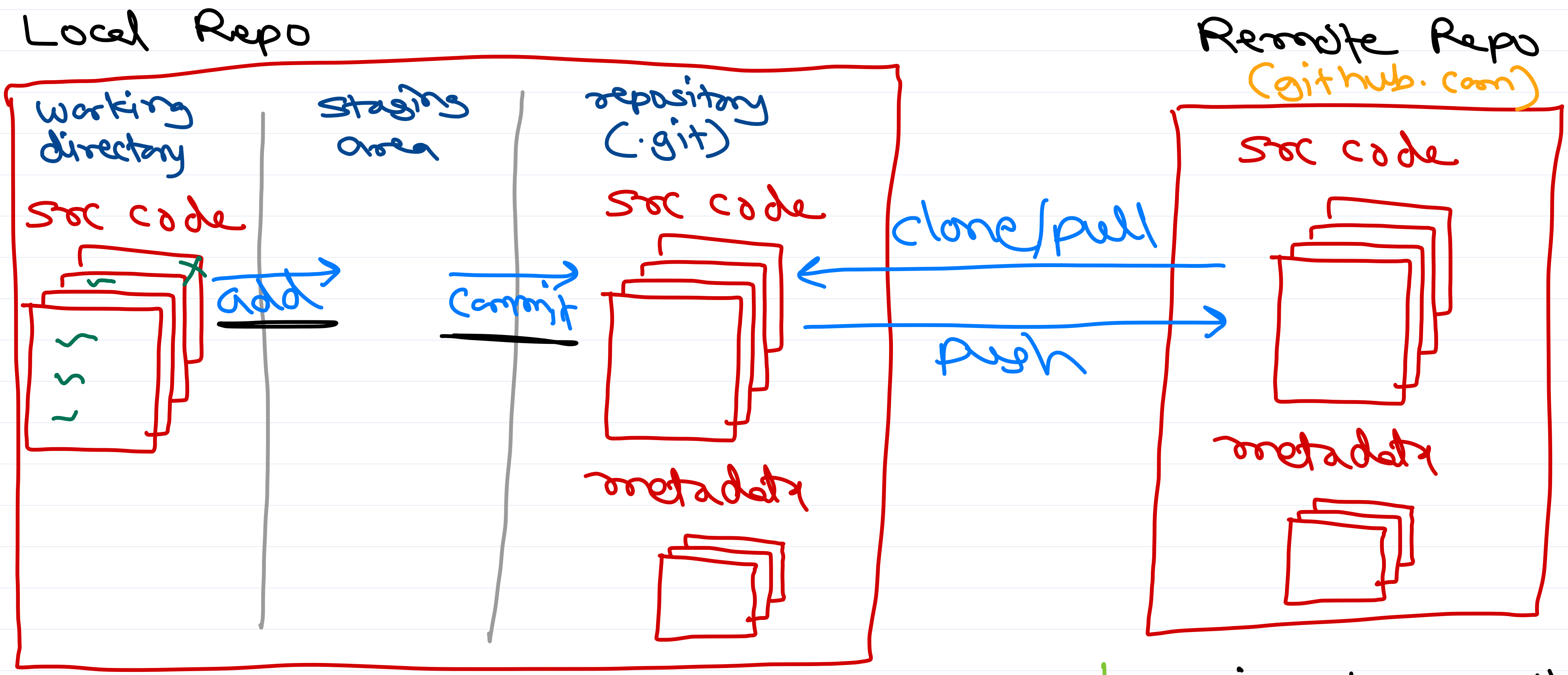


e.g. github.com,
gitlab.com,
bitbucket, ...

Distributed VCS

e.g. GIT

GIT

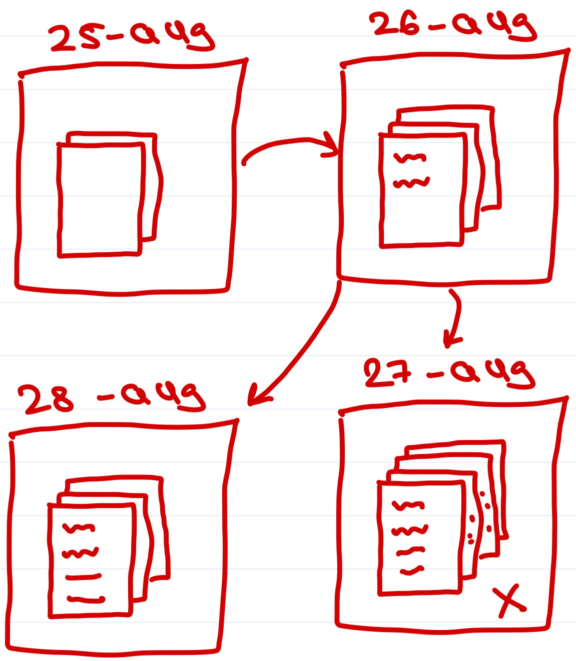


```
> git init
> git add path
> git commit -m "msg"
```

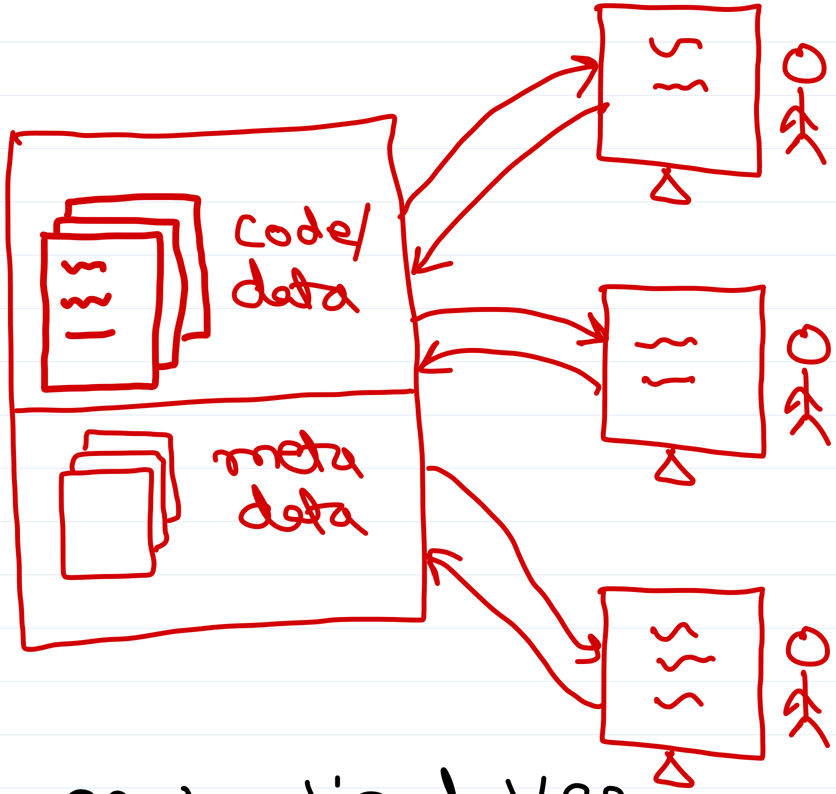
```
> git config ...
> git status
> git log
```

```
> git clone github url
> git pull
> git push
```

Version Control System

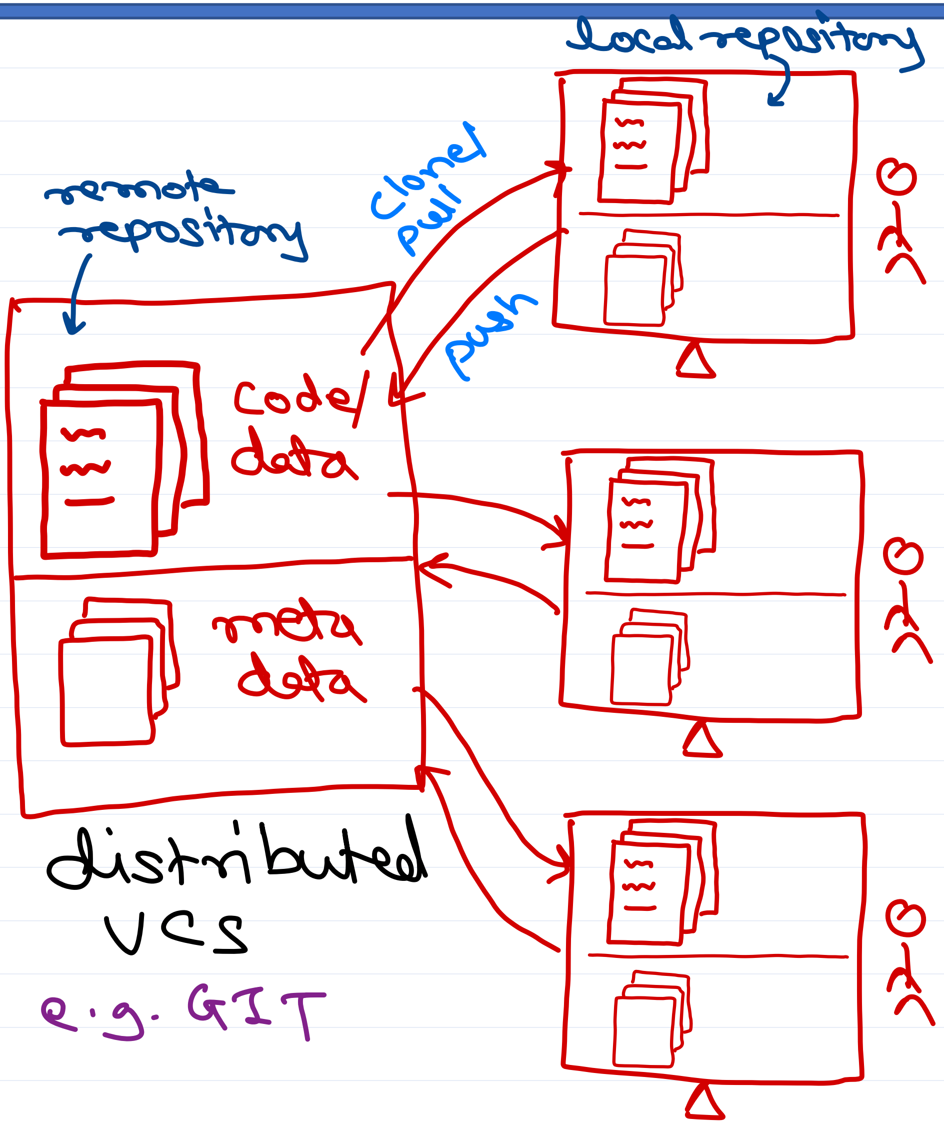


manual VCS



centralized VCS

e.g. WinCVS,
SourceSafe, etc.

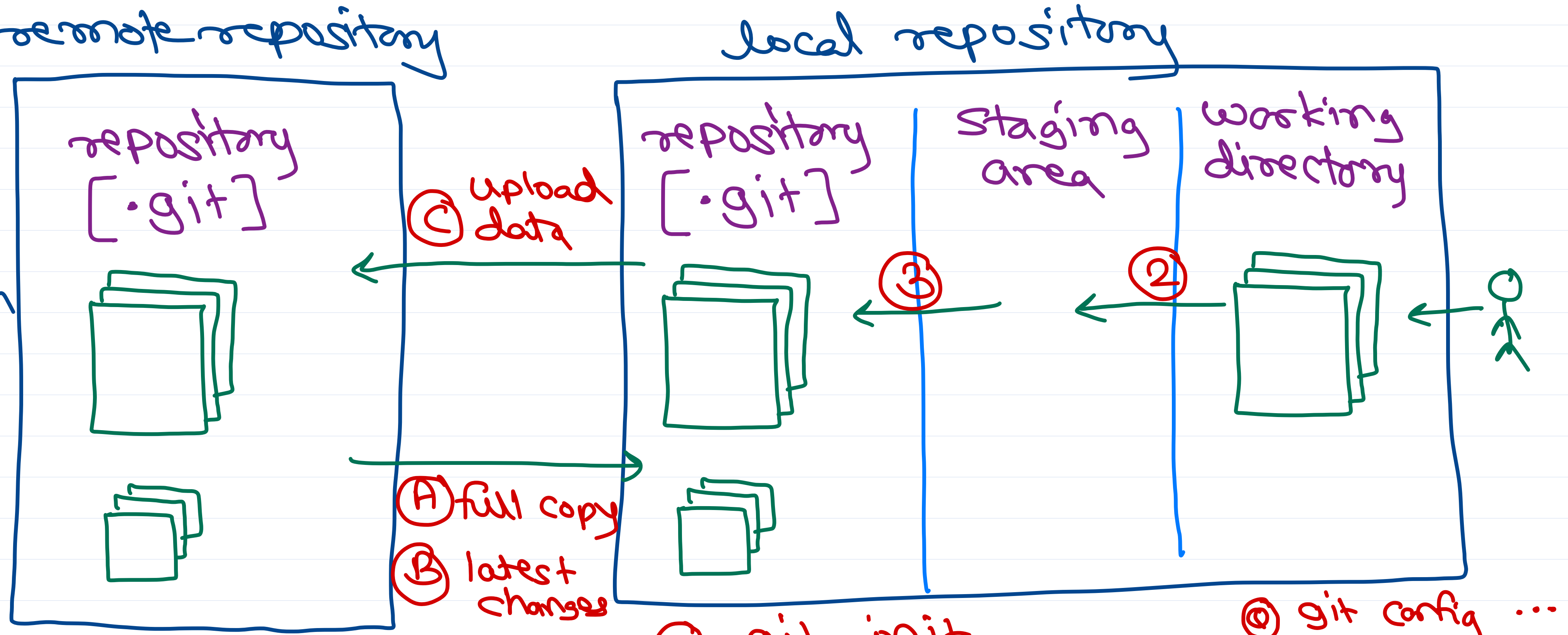


distributed VCS

e.g. GIT

GIT architecture

1 github.com*
2 gitlab.com
3 bitbucket..
...



A git clone url
B git pull
C git push

1 git init
2 git add path
3 git commit -m "..."

0 git config ...
* git status
* git log

MySQL

① server: program that provides some service e.g.
- ⓐ mysql server: RDBMS service
- ⓑ mongo server: NoSQL db service
- ⓒ webserver: runs web applns e.g. tomcat, IIS, ...

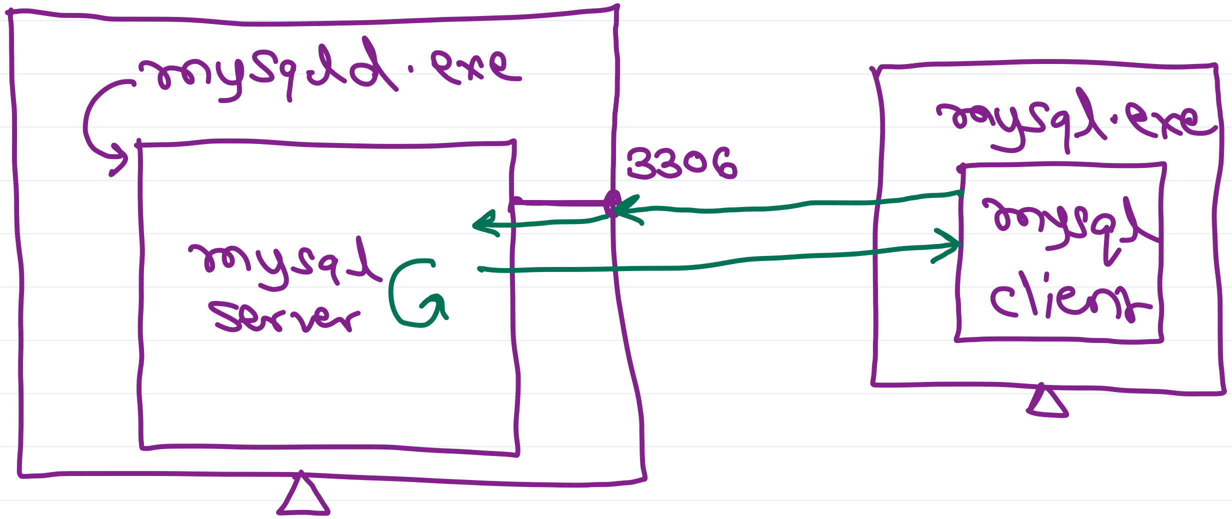
② server machine: high config machine that runs some server program.

③ client: program that consumes service.
- ⓐ mysql client
- ⓑ mongo client
- ⓒ web client

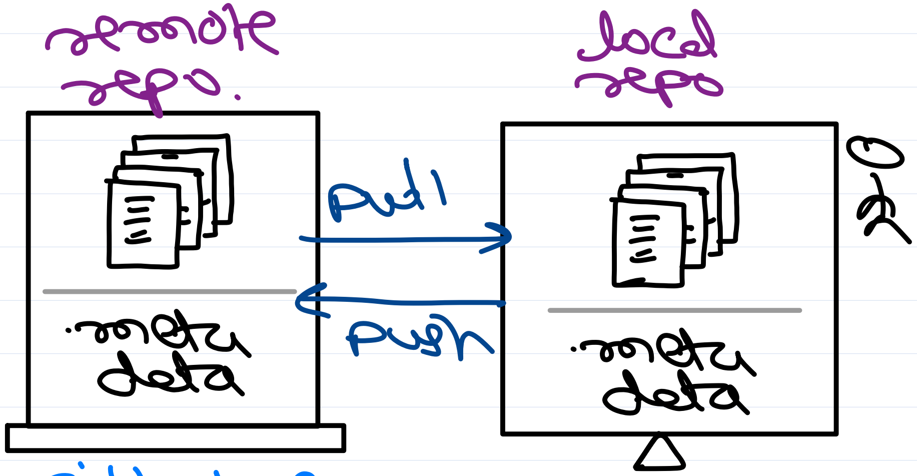
* client connects server over the network.

* one server can serve multiple clients.

program: set of instructions given to computer.
= executable file (.exe or .out)



GIT

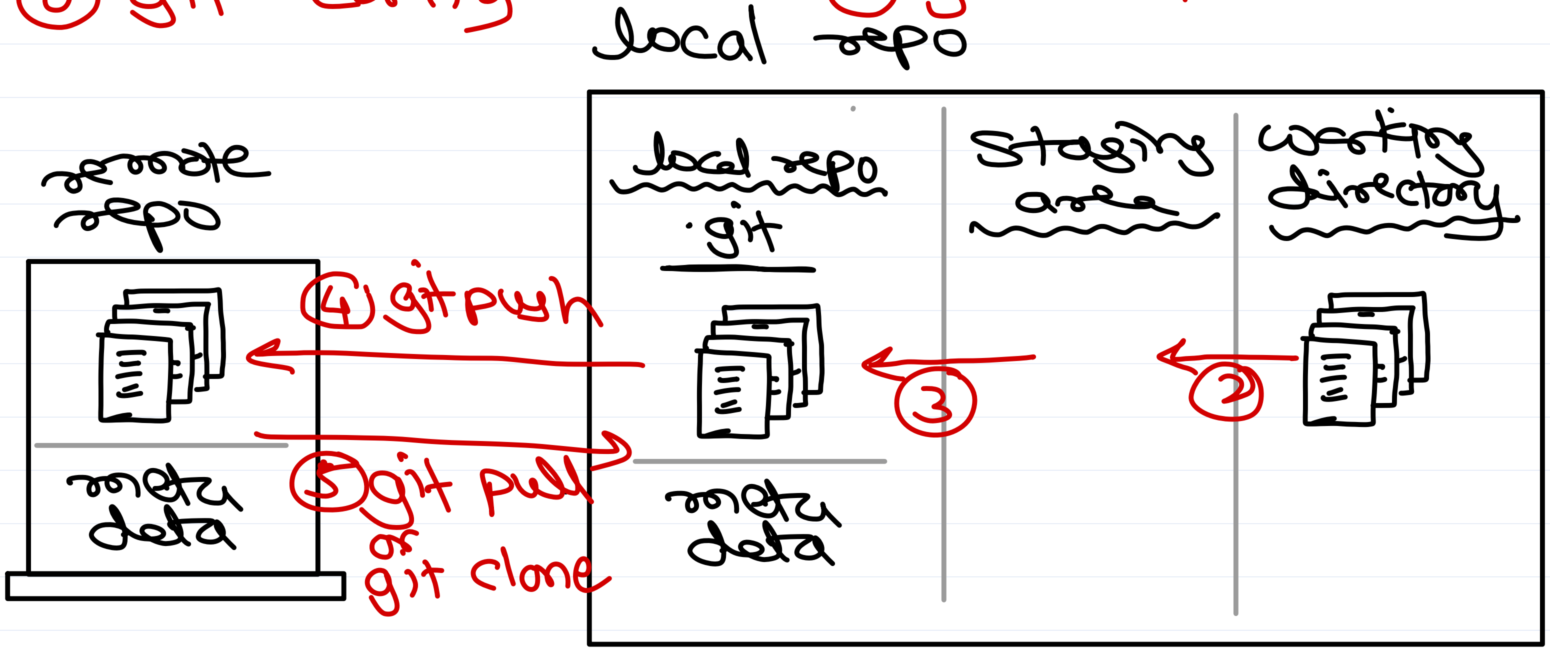


github.com
gitlab.com
bitbucket
⋮

GIT vendors/provider.

⓪ git config

① git init

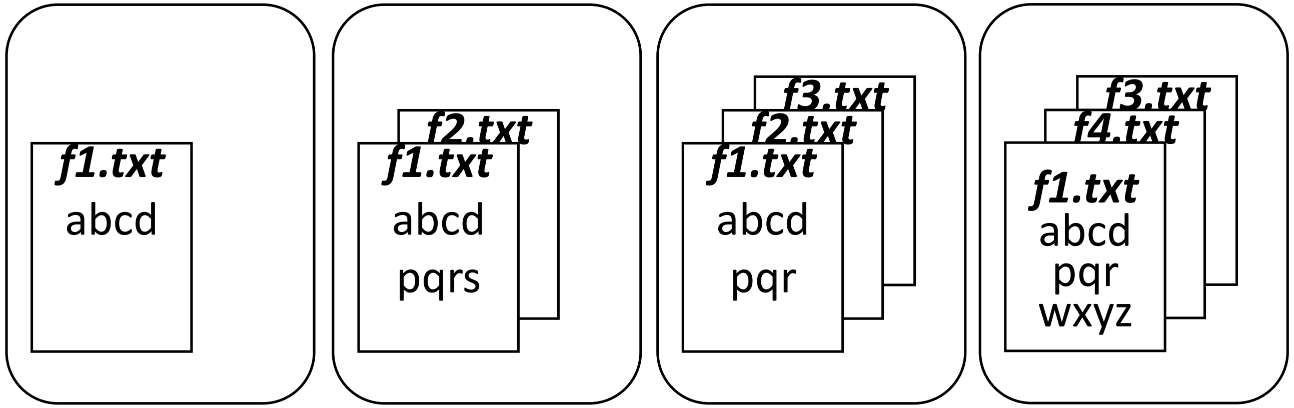


② git add filepath

③ git commit -m "why"

Version control system

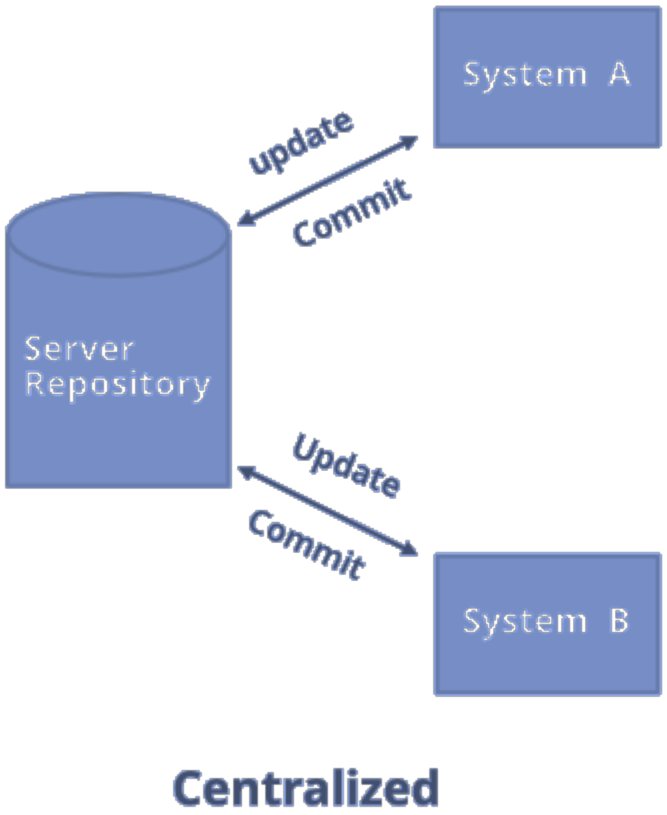
- For management of documents/source code
- Logical way to organize and control revisions of the code.
- Tracks/controls changes in code.
- Also known as
  - Revision control system
  - Source code control system
- Two types:
  - Centralized VCS
    - e.g. CVS, SVN, Bazaar, …
  - Distributed VCS
    - e.g. Git, Mercurial, Arch, …



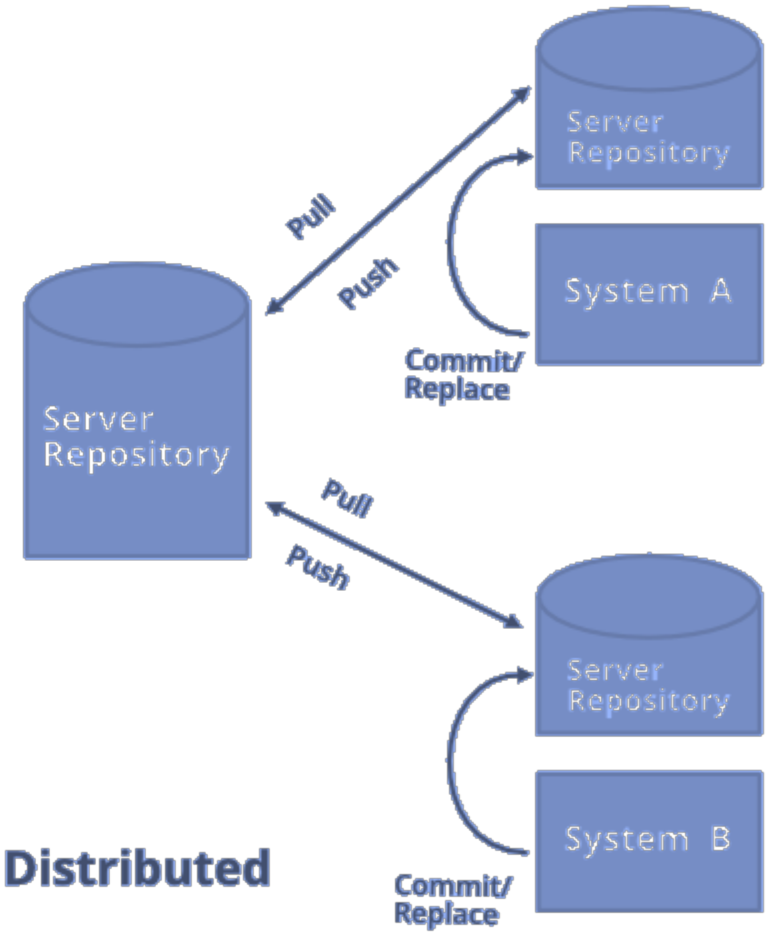
https://medium.com/@kamilmasyhur/what-do-you-know-about-version-control-system-vcs-6a1e1922c970

Version control system

Centralized VCS

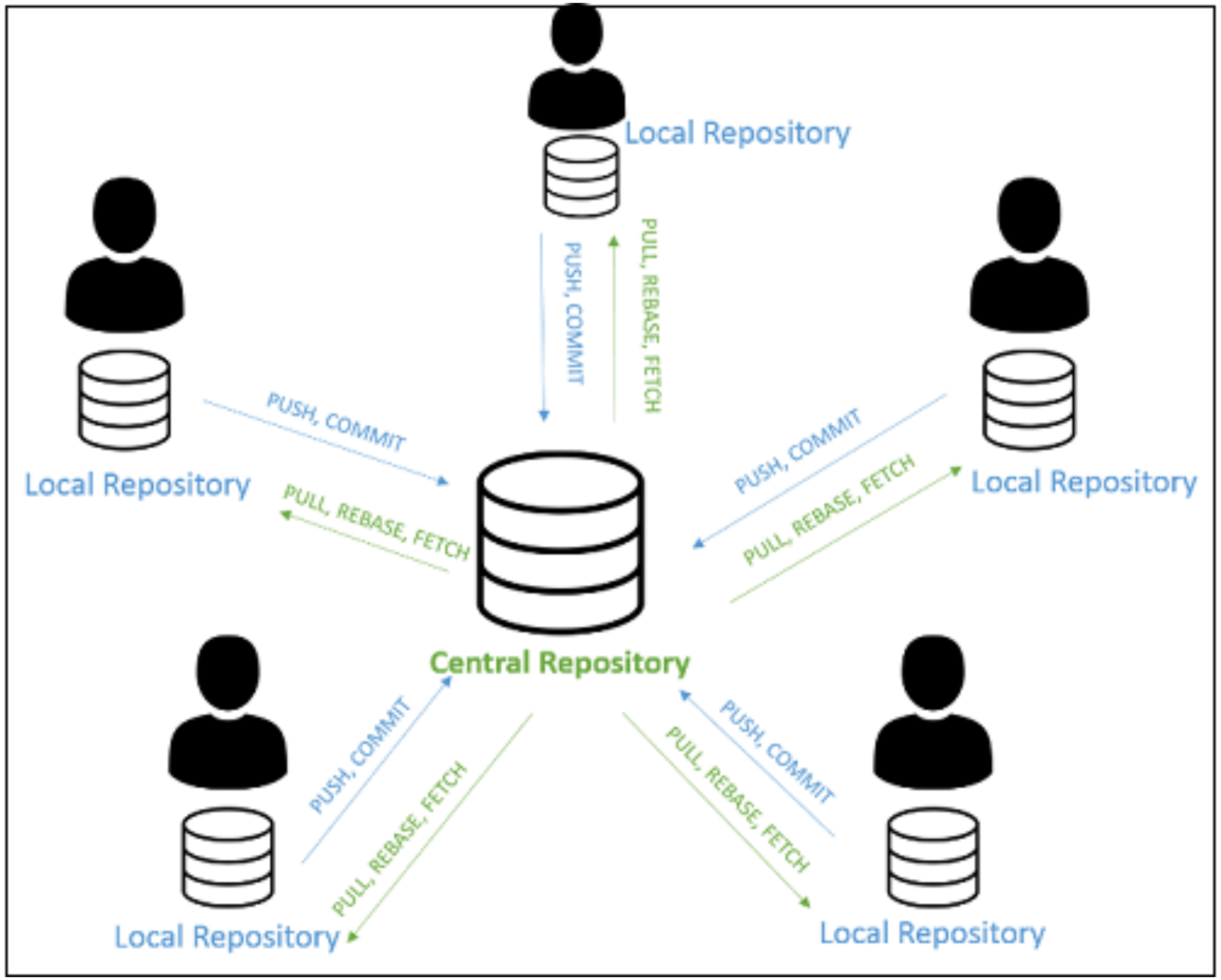


Distributed VCS



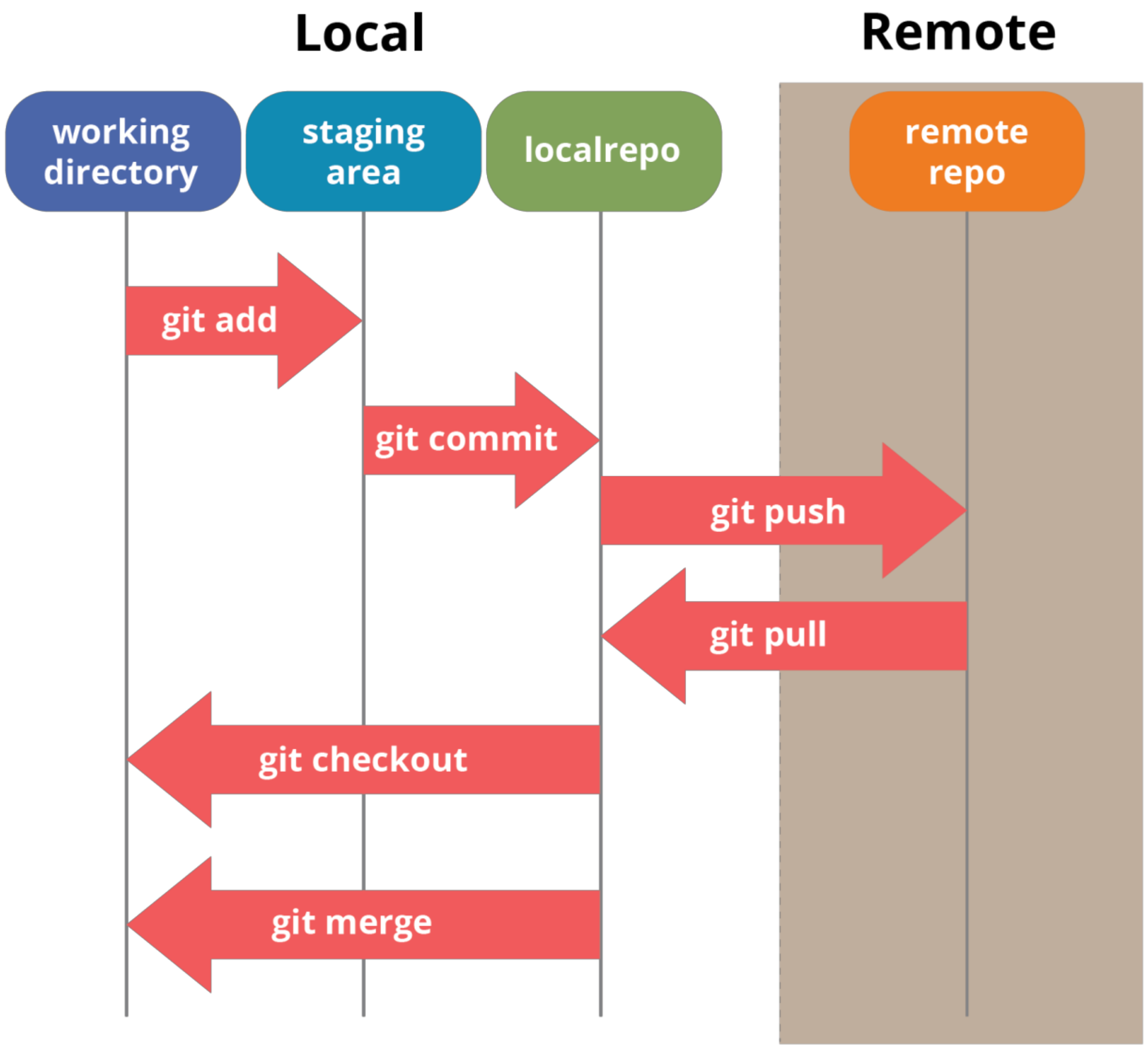
GIT

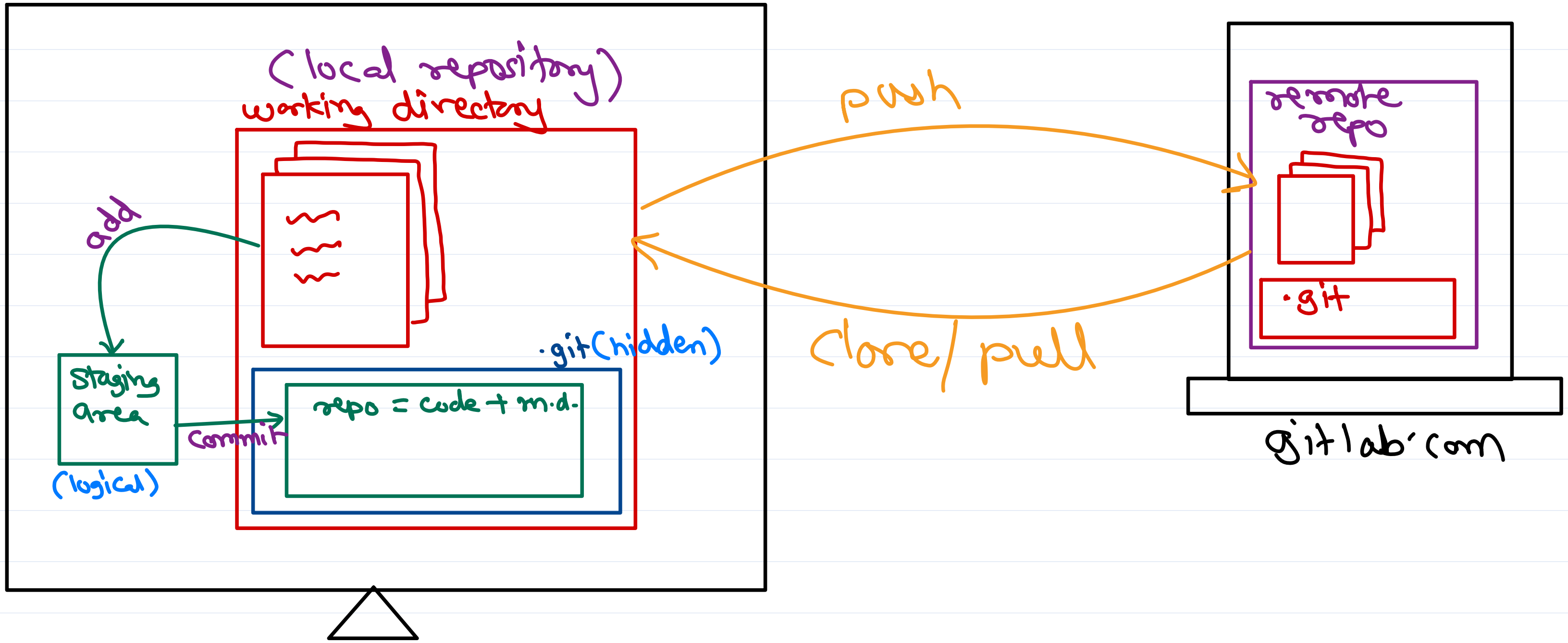
- Distributed VCS & SCM.
- Designed by developed by Linus Torvalds to manage Linux kernel source code.
- Open source software.
- Free under GPL.
- Development
  - Began on 3-Apr-2005.
  - Announced on 6-Apr.
  - Became self-hosing on 7-Apr.
  - First branch merging on 18-Apr.
  - Achieved performance goals on 29-Apr.
  - Began kernel (2.6.12) management from 16-Jun.



Terminologies

- GIT repository
  - Directory containing code and its metadata (.git).
- GIT working
  - Working area
  - Staging area
  - Repository
- Commits
  - Hold a state of repository.
  - GIT maintains commit history.
- Local vs Remote repository
- Remote repository operations
  - clone, pull, push.




(local repository)
working directory
add
staging area
(logical)
commit
.git(hidden)
repo = code + m.d.
push
clone/ pull
remote repo
.git
gitlab.com

Git installation & setup

- On Ubuntu
  - sudo apt-get install git
- List global settings
  - git config --global --list
- Set up global properties
  - git config --global user.name <your name>
  - git config --global user.email <your email>
  - git config --global core.editor <editor app>
- GIT user details are associated with each commit done by the user.

- On Windows
  - Download and install GIT.
    - https://git-scm.com/downloads
  - Installed components
    - GIT bash
    - git-gui + gitk
  - GIT Bash
    - git command
    - bash commands
    - vim editor
- In editor/IDE
  - All leading IDEs have GIT support.
  - VS Code, Eclipse, …

GIT commands

- terminal> git init

- terminal> git status
- terminal> git status –s

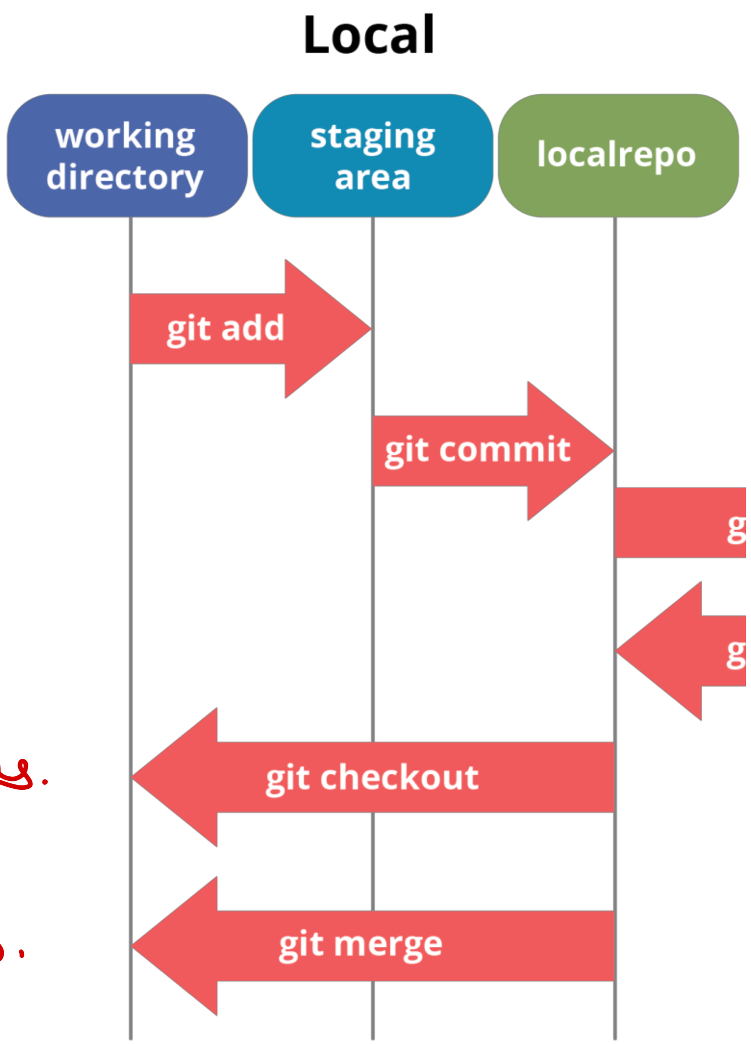
- terminal> git add <file-path>
- terminal> git add <dir-path>

- terminal> git commit –m "message"

- terminal> git diff (track changes that are not staged)
- terminal> git checkout <file-path> (discard changes & get last committed version)
- terminal> git reset (unstage the changes)
- terminal> git reset --hard (unstage the changes and replace with last committed version)

advanced commands.

ignore for now.

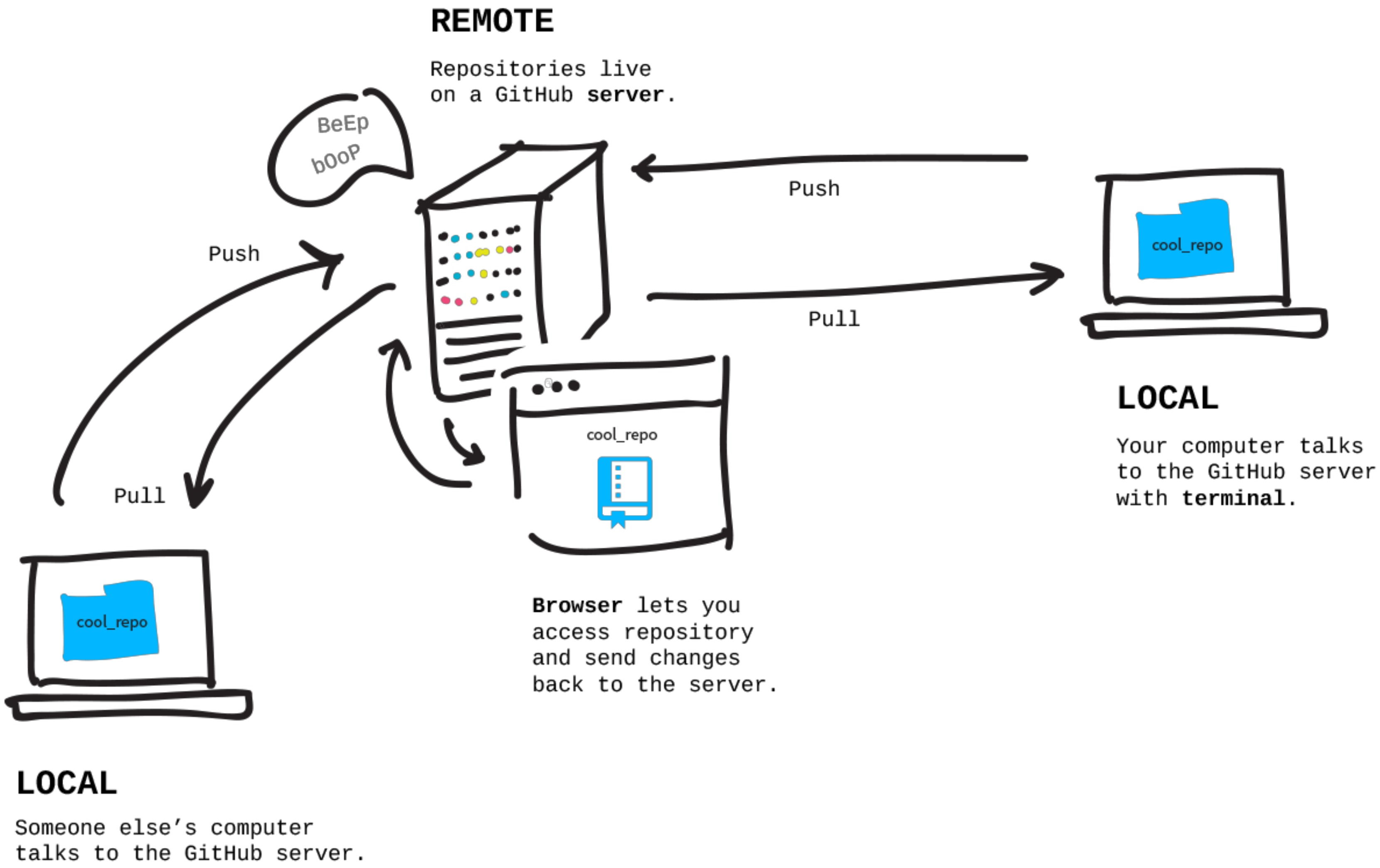


.gitignore

- List directories or files to be ignored for git repository.
- Used to ensure that binaries, IDE metadata files and other undesired files are not maintained in git repository.

GIT Remote repository

- To maintain code repository at centralized location (for code sharing).
- Can be in intranet or internet.
- Popular vendors
  - github.com
  - gitlab.com
  - bitbucket.org



REMOTE

Repositories live on a GitHub **server**.

Browser lets you access repository and send changes back to the server.

LOCAL

Your computer talks to the GitHub server with **terminal**.

LOCAL

Someone else’s computer talks to the GitHub server.

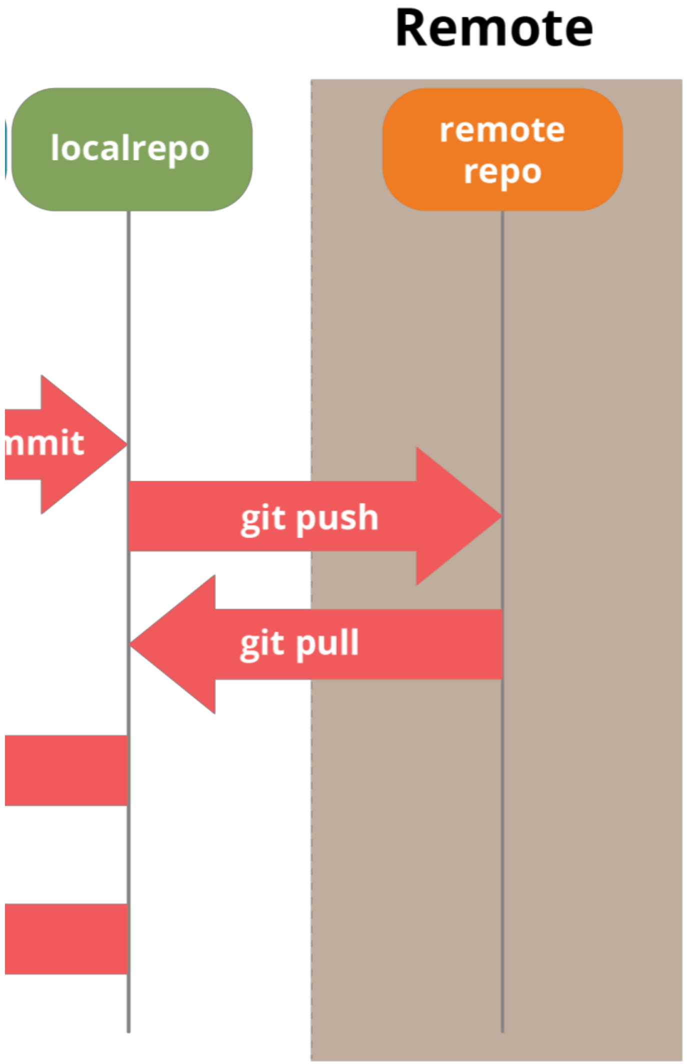
GIT commands

- git remote add origin <remote url>
- git remote -v

- git clone <url>

- git push origin <branch>
- git push

- git pull origin <branch>
- git pull



GIT workflow

- Create project on gitlab.
- Clone repository on local machine.
- Add/modify code locally.
- Commit code in local repository.
- Push code to gitlab repository.
- Other developers can pull your code.

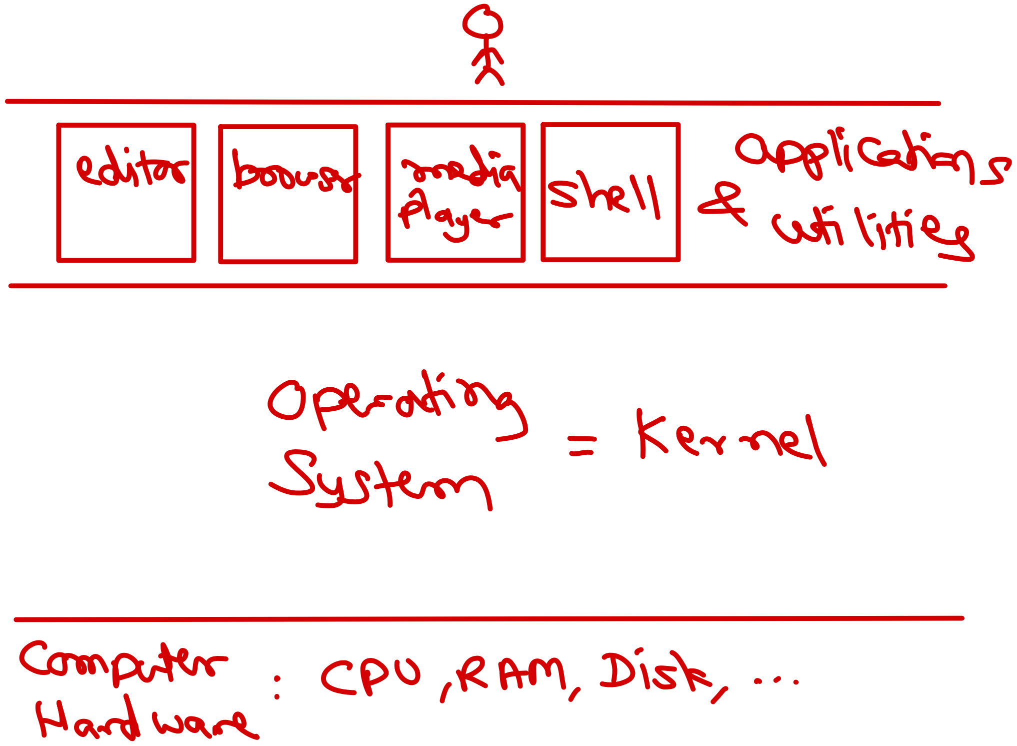
GitLab

- gitlab project repository
  - Members
  - Invite members (member id/email id)
  - Choose role (Developer/Maintainer)

- gitlab protected branches
  - Default branch is main
  - main branch is protected

- gitlab roles
  - Maintainer
  - Developer

Operating System


editor
browser
media player
shell
& applications
utilities
Operating System = Kernel
Computer Hardware : CPU, RAM, Disk, ...

OS Functions:

1. Process Mgmt
2. CPU scheduling
3. Memory Mgmt
4. File & IO Mgmt
5. Hardware abstraction

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6. Networking
7. Security
8. User Interfacing

Thank you!

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