**Git**

1. Git is a distributed version control system
2. It is used for tracking changes done in a file
3. It helps to revert to the previous code when there is an error in new version without effecting the original source code
4. It stores information as snapshots

Features of git

1. Works on a distributed system

Users can work on the same code simultaneously without getting interfered by other

1. Reliable

No risk of data loss

1. Compatible with all OS

Rep created by other vcs can be accessed by rep

1. Branches like a tree
2. Fast

Architecture

Timeline

Description automatically generated

Working directory – this is created when a git project is cloned onto your local machine

And allows you to edit the source code copied.

Staging area – Post edit the next stage is staging area. Here we use git add command to add files.

It displays the preview for the next stage. In case further modifications are made in the working directory, the snapshots for these two layers will be different.

Local Repo

No further edits are done. We use git commit command.

**Git Commands**

1. Git init – converts a directory into an empty repository
2. Git clone – to create local copy of a remote repository
3. Git pull – to run the latest version of any repository
4. Git push – sends local commits to the respective remote repo
5. Git checkout – to switch to another branch
6. Git merge – to merge two or more branches
7. Git add – add files to staging area (used to add directories, files)
8. Git commit – allows to track the changes
9. Git status – returns present state of repo (file entered staging area)
10. Git branch – shows all the branches
11. Git checkout -b name – to create new branch
12. Git checkout -d name – to delete the branch
13. Git switch main – moves to main branch

**Docker**

Docker is a tool designed to make it easier to create, deploy and run applications by using containers.

Docker containers are lightweight alternatives to VM and uses the host OS

We don’t have to pre allocate any RAM in containers.

Architecture

Diagram

Description automatically generated

* Docker file builds a docker image and the image contains all the project code.
* We can run that image to create one or many docker container.
* This image can be uploaded on docker hub, from docker hub anyone can pull the image and build a container.
* Docker images – template used to create containers, contains all the dependencies.
* Docker containers – run time instance of docker image it contains everything that is needed to run application or a micro service, built from one or more images

Saas – it is an on-demand access to ready to use cloud hosted application software

E.g.: AWS cloud front, Gmail, Gdrive, Microsoft office 365

Paas – it is an on-demand access to complete ready to use cloud hosted platform for running, developing maintaining and managing applications.

E.g.: AWS RDS, AWS elastic beanstalk

Iaas – it is an on-demand access to cloud hosted physical and virtual servers, storage and networking the backend infra for running apps.

E.g.: AWS EC2, Amazon s3