Git

Git is a version control system

Maintains version of each change

Each participant will have his own local copy

2 types of version control system

1. Centralized (if it goes down problem)

1.1 VCS

1.2 CVS

1.3 Clearcase

2. Distributed (entire project comes in local machine)

2.1 Git (Free opensource, Fast, light weight, uses SHA algorithm, uses branching/create/merge)

Git Terminology

Clone project on local machine from remote repository

Stage changes

Commit

Push remote repository

Pull

Head points to latest commit

Brew install git

Git ---version

Git Configuration (provide configuration option to git)

Git config --local

Git config --global

Git config –-system

Git stores this info in .gitconfig

Git Configuration

git config --global user.name "pushkar"

git config user.name

pushkar

git config --global user.email "pushkar.chauhan@itcinfotech.com"

git config user.email

pushkar.chauhan@itcinfotech.com

Git In Action

git init

Initialized empty Git repository in /Users/pushkarchauhan91/Documents/workspaces/workspace\_sts\_bharath\_devops/git/gitrepos/firstgitrepo/.git/

ls .git

HEAD config description hooks info objects refs

vi index.html

git status

On branch master

No commits yet

Untracked files:

(use "git add <file>..." to include in what will be committed)

index.html

nothing added to commit but untracked files present (use "git add" to track)

git branch

git add index.html

git status

On branch master

No commits yet

Changes to be committed:

(use "git rm --cached <file>..." to unstage)

new file: index.html

git rm --cached index.html

rm 'index.html'

pushkarchauhan91@pushkarchauhan91s-MacBook-Air firstgitrepo % git status

On branch master

No commits yet

Untracked files:

(use "git add <file>..." to include in what will be committed)

index.html

nothing added to commit but untracked files present (use "git add" to track)

git commit -m "initial version"

[master (root-commit) 01f1378] initial version

1 file changed, 5 insertions(+)

create mode 100644 index.html

git status

On branch master

nothing to commit, working tree clean

Git Log

git log

commit 01f13785f5ae3d483b32ecec260eb9ec43739290 (**HEAD -> master**)

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:53:53 2020 +0530

initial version

vi index.html

git add .

git status

On branch master

Changes to be committed:

(use "git restore --staged <file>..." to unstage)

modified: index.html

git commit -m "completed first quote"

[master db73d09] completed first quote

1 file changed, 1 insertion(+), 1 deletion(-)

git status

On branch master

nothing to commit, working tree clean

git log

commit db73d0941f21965c818e550322aabc5907245650 (**HEAD -> master**)

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:59:01 2020 +0530

completed first quote

commit 01f13785f5ae3d483b32ecec260eb9ec43739290

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:53:53 2020 +0530

initial version

Git Diff (compare two commits)

git diff db73d0941f21965c818e550322aabc5907245650 01f13785f5ae3d483b32ecec260eb9ec43739290

**diff --git a/index.html b/index.html**

**index c81cd5b..8f81ae4 100644**

**--- a/index.html**

**+++ b/index.html**

@@ -1,5 +1,5 @@

<html>

<body>

-<h1>All power is within you. You can do anything and everything</h1>

+<h1>All power is within you</h1>

</body>

</html>

#Switching commit ids

git diff 01f13785f5ae3d483b32ecec260eb9ec43739290 db73d0941f21965c818e550322aabc5907245650

**diff --git a/index.html b/index.html**

**index 8f81ae4..c81cd5b 100644**

**--- a/index.html**

**+++ b/index.html**

@@ -1,5 +1,5 @@

<html>

<body>

-<h1>All power is within you</h1>

+<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

git log --oneline

db73d09 (**HEAD -> master**) completed first quote

01f1378 initial version

Revert Changes / Undo Changes

1. Before Staging
2. After Staging
3. After Commit
4. Before Staging (git checkout index.html)

git status

On branch master

nothing to commit, working tree clean

vi index.html

cat index.html

<html>

<body>

<h1>All power is within you. and everything</h1>

</body>

</html>

git status

On branch master

Changes not staged for commit:

(use "git add <file>..." to update what will be committed)

(use "git restore <file>..." to discard changes in working directory)

modified: index.html

no changes added to commit (use "git add" and/or "git commit -a")

git checkout index.html

Updated 1 path from the index

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

1. After Staging (git reset HEAD index.html, git checkout index.html)

git status

On branch master

nothing to commit, working tree clean

vi index.html

git status

On branch master

Changes not staged for commit:

(use "git add <file>..." to update what will be committed)

(use "git restore <file>..." to discard changes in working directory)

modified: index.html

no changes added to commit (use "git add" and/or "git commit -a")

git add .

git reset HEAD index.html

Unstaged changes after reset:

M index.html

cat index.html

<html>

<body>

<h1> within you. You can do anything and everything</h1>

</body>

</html>

git checkout index.html

Updated 1 path from the index

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

1. After Commit

1 - Undo commit and keep all files staged:

git reset --soft HEAD~;

2 - Undo commit and unstage all files:

git reset HEAD~;

3 - Undo the commit and completely remove all changes:

git reset --hard HEAD~;

Git Secret Folder

ls .git

COMMIT\_EDITMSG HEAD config description hooks index info logs objects refs

cd .git

cat COMMIT\_EDITMSG

completed first quote

cat HEAD

ref: refs/heads/master

cat config

[core]

repositoryformatversion = 0

filemode = true

bare = false

logallrefupdates = true

ignorecase = true

precomposeunicode = true

cd hooks

ls

applypatch-msg.sample post-update.sample pre-merge-commit.sample pre-receive.sample

commit-msg.sample pre-applypatch.sample pre-push.sample prepare-commit-msg.sample

fsmonitor-watchman.sample pre-commit.sample pre-rebase.sample update.sample

cd ..

cat index

DIRC\_J?Z??\_J?Z???????c?ո !??\_??8?

????

index.htmlTREE-1 0

?.?vvu1?~K?F?z{?**%**

Git Branch

git branch

\* master

git branch dev

git checkout dev

Switched to branch 'dev'

git branch

\* dev

master

ls

index.html

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

vi index.html

git status

On branch dev

Changes not staged for commit:

(use "git add <file>..." to update what will be committed)

(use "git restore <file>..." to discard changes in working directory)

modified: index.html

no changes added to commit (use "git add" and/or "git commit -a")

git add .

git commit -m "added second quote"

[dev 69e46f3] added second quote

1 file changed, 1 insertion(+)

git status

On branch dev

nothing to commit, working tree clean

git log

commit 69e46f3d13acb3fc853d26a4f081deaa1a7e16c0 (**HEAD -> dev**)

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 13:25:32 2020 +0530

added second quote

commit db73d0941f21965c818e550322aabc5907245650 (**master**)

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:59:01 2020 +0530

completed first quote

commit 01f13785f5ae3d483b32ecec260eb9ec43739290

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:53:53 2020 +0530

initial version

git checkout master

Switched to branch 'master'

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

Git Merge (git merge dev)

git branch

dev

\* master

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

</body>

</html>

git merge dev

Updating db73d09..69e46f3

Fast-forward

index.html | 1 +

1 file changed, 1 insertion(+)

git status

On branch master

nothing to commit, working tree clean

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of your destiny</h2>

</body>

</html>

git log

commit 69e46f3d13acb3fc853d26a4f081deaa1a7e16c0 (**HEAD -> master**, **dev**)

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 13:25:32 2020 +0530

added second quote

commit db73d0941f21965c818e550322aabc5907245650

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:59:01 2020 +0530

completed first quote

commit 01f13785f5ae3d483b32ecec260eb9ec43739290

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 12:53:53 2020 +0530

initial version

Resolve Merge Conflict

git branch

dev

\* master

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of your destiny</h2>

</body>

</html>

git checkout dev

Switched to branch 'dev'

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of your destiny</h2>

</body>

</html>

vi index.html

git add .

git commit -m "some changes"

[dev 8dacc8e] some changes

1 file changed, 1 insertion(+), 1 deletion(-)

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator o</h2>

</body>

</html>

git branch bugfix

git checkout bugfix

Switched to branch 'bugfix'

vi index.html

git add .

git commit -m "fixed the defect"

[bugfix ee1d3df] fixed the defect

1 file changed, 1 insertion(+), 1 deletion(-)

git branch

\* bugfix

dev

master

git checkout dev

Switched to branch 'dev'

vi index.html

git add .

git commit -m "updated quote 2"

[dev 56e25eb] updated quote 2

1 file changed, 1 insertion(+), 1 deletion(-)

git branch

bugfix

\* dev

master

git merge bugfix

Auto-merging index.html

CONFLICT (content): Merge conflict in index.html

Automatic merge failed; fix conflicts and then commit the result.

vi index.html

vi index.html

git status

On branch dev

You have unmerged paths.

(fix conflicts and run "git commit")

(use "git merge --abort" to abort the merge)

Unmerged paths:

(use "git add <file>..." to mark resolution)

both modified: index.html

no changes added to commit (use "git add" and/or "git commit -a")

git add .

git commit -m "resolved merge conflict"

[dev 3bab943] resolved merge conflict

Delete a Branch

git branch

bugfix

\* dev

master

git branch -d bugfix

Deleted branch bugfix (was ee1d3df).

git branch

\* dev

master

Create a Remote Repository

git remote -v

git remote add origin https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

git remote -v

origin https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git (fetch)

origin https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git (push)

git push -u origin master

Enumerating objects: 9, done.

Counting objects: 100% (9/9), done.

Delta compression using up to 4 threads

Compressing objects: 100% (6/6), done.

Writing objects: 100% (9/9), 846 bytes | 423.00 KiB/s, done.

Total 9 (delta 1), reused 0 (delta 0)

remote: Resolving deltas: 100% (1/1), done.

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

\* [new branch] master -> master

Branch 'master' set up to track remote branch 'master' from 'origin'.

Push

git branch

\* master

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of you destiny</h2>

</body>

</html>

vi index.html

git add .

git commit -m "added 3rd quote"

[master c8f8735] added 3rd quote

1 file changed, 1 insertion(+)

git pull

Already up to date.

git push -u origin master

Enumerating objects: 15, done.

Counting objects: 100% (15/15), done.

Delta compression using up to 4 threads

Compressing objects: 100% (9/9), done.

Writing objects: 100% (13/13), 1.18 KiB | 605.00 KiB/s, done.

Total 13 (delta 5), reused 0 (delta 0)

remote: Resolving deltas: 100% (5/5), completed with 1 local object.

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

69e46f3..c8f8735 master -> master

Branch 'master' set up to track remote branch 'master' from 'origin'.

Pull

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of you destiny</h2>

<h3>faith, fath, faith in god and self</h3>

</body>

</html>

git pull

remote: Enumerating objects: 5, done.

remote: Counting objects: 100% (5/5), done.

remote: Compressing objects: 100% (2/2), done.

remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0

Unpacking objects: 100% (3/3), done.

From https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo

c8f8735..13c2035 master -> origin/master

Updating c8f8735..13c2035

Fast-forward

index.html | 2 +-

1 file changed, 1 insertion(+), 1 deletion(-)

cat index.html

<html>

<body>

<h1>All power is within you. You can do anything and everything</h1>

<h2>You are the creator of you destiny</h2>

<h3>faith, fath, faith in god and self tahts is secret of greatness</h3>

</body>

</html>

Resolve Merge Conflict on same branch

vi index.html

git add .

git commit -m "updated quote one"

[master d0b7edb] updated quote one

1 file changed, 1 insertion(+), 2 deletions(-)

git push

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

! [rejected] master -> master (fetch first)

error: failed to push some refs to 'https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git'

hint: Updates were rejected because the remote contains work that you do

hint: not have locally. This is usually caused by another repository pushing

hint: to the same ref. You may want to first integrate the remote changes

hint: (e.g., 'git pull ...') before pushing again.

hint: See the 'Note about fast-forwards' in 'git push --help' for details.

git pull

remote: Enumerating objects: 5, done.

remote: Counting objects: 100% (5/5), done.

remote: Compressing objects: 100% (2/2), done.

remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0

Unpacking objects: 100% (3/3), done.

From https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo

13c2035..d5db763 master -> origin/master

Auto-merging index.html

CONFLICT (content): Merge conflict in index.html

Automatic merge failed; fix conflicts and then commit the result.

vi index.html

git add .

git commit -m "resolved merge conflict"

[master c13cdf3] resolved merge conflict

git push -u origin master

Enumerating objects: 10, done.

Counting objects: 100% (10/10), done.

Delta compression using up to 4 threads

Compressing objects: 100% (4/4), done.

Writing objects: 100% (6/6), 597 bytes | 597.00 KiB/s, done.

Total 6 (delta 1), reused 0 (delta 0)

remote: Resolving deltas: 100% (1/1), completed with 1 local object.

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

d5db763..c13cdf3 master -> master

Branch 'master' set up to track remote branch 'master' from 'origin'.

Git Fetch (will just check if is there any change in local and remote) vs Git pull(will actually update local repo with remote repo changes)

git fetch

remote: Enumerating objects: 5, done.

remote: Counting objects: 100% (5/5), done.

remote: Compressing objects: 100% (2/2), done.

remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0

Unpacking objects: 100% (3/3), done.

From https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo

c13cdf3..553f311 master -> origin/master

cat index.html

<html>

<body>

<h1>All power is within you</h1>

</body>

</html>

git pull

Updating c13cdf3..553f311

Fast-forward

index.html | 3 +++

1 file changed, 3 insertions(+)

pushkarchauhan91@pushkarchauhan91s-MacBook-Air firstgitrepo % cat index.html

<html>

<body>

<h1>All power is within you</h1>

deded

fefr

</body>

</html>

Git Reset (reset to particular commit) VS Git Revert

git log

commit 553f311b53a56cc76dfab02c684656264acf4133 (**HEAD -> master**, **origin/master**)

Author: Pushkar6891 <pushkarchauhan91@gmail.com>

Date: Mon Jul 20 14:24:43 2020 +0530

Update index.html

random changes

commit c13cdf30e59c3f25e7db60201e47c70e1c0fa0a3

Merge: d0b7edb d5db763

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 14:21:12 2020 +0530

resolved merge conflict

commit d5db7631bf2c245e386e34f8434c99176bee4482

Author: Pushkar6891 <pushkarchauhan91@gmail.com>

Date: Mon Jul 20 14:20:00 2020 +0530

Update index.html

updated quote 1

git reset --hard d5db7631bf2c245e386e34f8434c99176bee4482

HEAD is now at d5db763 Update index.html

git push -f

Total 0 (delta 0), reused 0 (delta 0)

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

+ 553f311...d5db763 master -> master (forced update)

Git Revert (revert is favoured over reset)

git log

commit d5db7631bf2c245e386e34f8434c99176bee4482 (**HEAD -> master**, **origin/master**)

Author: Pushkar6891 <pushkarchauhan91@gmail.com>

Date: Mon Jul 20 14:20:00 2020 +0530

Update index.html

updated quote 1

commit 13c2035b248afb956b889bd73adcf7adf9f69447

Author: Pushkar6891 <pushkarchauhan91@gmail.com>

Date: Mon Jul 20 14:15:34 2020 +0530

Update index.html

commit c8f8735c0fa311f88499766de1188cc4bccbbcef

Author: pushkar <pushkar.chauhan@itcinfotech.com>

Date: Mon Jul 20 14:12:14 2020 +0530

added 3rd quote

commit 3bab94326a0f16a206711e3a2c9ca07dc5bb07d2

Merge: 56e25eb ee1d3df

Author: pushkar <pushkar.chauhan@itcinfotech.com>

git revert head

[master d3ac1c0] Revert "Update index.html"

1 file changed, 1 insertion(+), 1 deletion(-)

git push

Enumerating objects: 5, done.

Counting objects: 100% (5/5), done.

Delta compression using up to 4 threads

Compressing objects: 100% (2/2), done.

Writing objects: 100% (3/3), 350 bytes | 350.00 KiB/s, done.

Total 3 (delta 1), reused 0 (delta 0)

remote: Resolving deltas: 100% (1/1), completed with 1 local object.

To https://github.com/Pushkar6891/Udemy\_Bharath\_firstgitrepo.git

d5db763..d3ac1c0 master -> master

Concept of Cherry Picking

GitStash

vi index.html

ls

index.html

vi second.html

git stash

Saved working directory and index state WIP on master: d3ac1c0 Revert "Update index.html"

git branch

\* master

git stash pop

On branch master

Your branch is up to date with 'origin/master'.

Changes not staged for commit:

(use "git add <file>..." to update what will be committed)

(use "git restore <file>..." to discard changes in working directory)

modified: index.html

Untracked files:

(use "git add <file>..." to include in what will be committed)

second.html

no changes added to commit (use "git add" and/or "git commit -a")

Dropped refs/stash@{0} (e0c08c6ccf7ef6954d4e04843f613c70b7d7a768)

Install git on linux

yum install git