GIT and GITHUB

GIT:

- Version control software
- Open source
- git-scm.com

Goals of GIT

Simple

speed

Non linear

distributed

Large

GitHUB:

Collaboration software, hosts GIT repositories

Repository to store the files/projects/code

Entire linux code runs on GITHUB

GITHUB Workflow:

Branching:

Create a branch on master replica, as the changes should not be done on master

Master should always has to be deployable

Branch is exact copy of master

Commits

sort of making changes to branches.

Pull request

Open pull request on github

Comparing the change with master and show other people about your changes

Collaboration:

People may give suggestions or go ahead

Merge

Commits the branch

Cloning Repository:

Cloning is for making local copy from remote copy in GITHUB and working on a project

GITHUB is remote repository

Entire project can be copied to locally and work on it without internet access

Multiple people can work on GITHUB

When we push our changes to github, other users can pull the request and see them

GIT commands:

git clone https://github.com/username/repository

git branch feature-branch

git checkout featurebranch

git status

git add index.html

git commit

git push

git fetch

git merge

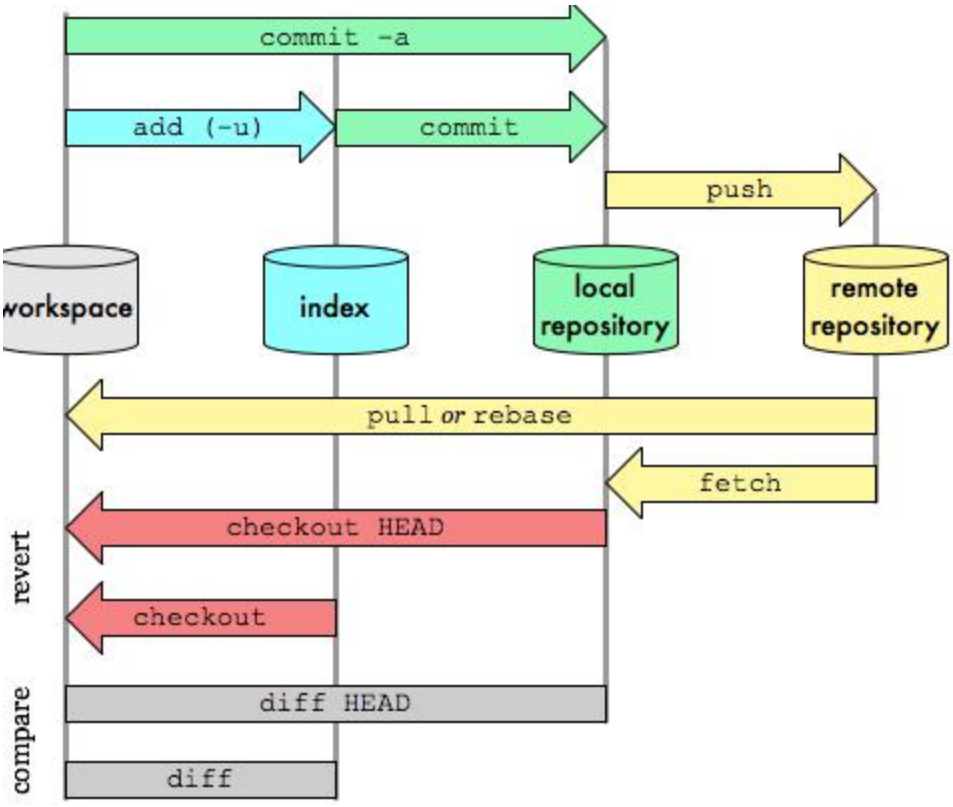
git pull

git diff

git stash

git rebase

GIT Work flow



With every commit we make there will be Commit id

When the commit was made date and time (parent commit)

Before the commit what was the previous commit etc

It is a 40 character SHA1 hash includes Bobs (reduced version of the code , files) and metadata

Git commit has 2 steps

2 step commit

Git add which files you want to add

Staging files will be added to staging area

Git commit all files will be included in github with 40 character sha1 hash

Git merge:

Remote- git hub

Locally – git merge

Merge conflicts:

When there is a change in same line in 2 branches

Try git status

And open the file in editor

Keep the change you want to keep

Rebase:

Git rebase to change the history

Below are commits

A B C D

E F

The changes look like A E B F C D

But if you want the history to be like

A B C D E F

Use rebase

How to undo last commit:

git revert

creating a new commit with opposite changes

other commands:

git reset

git commit-amend

git cherry-pick

Command line:

To clone the project

Create user id and password on the git hub site

Then create a new repository on github

Then clone that repository using

git clone https://github.vp.com/user1-git/EXCITE

git config --global user.email santoshdevops1@gmail.com

git config --global user.name santosh

from a linux machine:

1. add the ssh key of the linux machine to git hub

   Go to https://github.vp.com/settings/ssh

   Click on Ssh keys

   Add a new key

   Copy key from machine and paste it on github

   [root@reviewb .ssh]# ***git clone ssh://github.vp.com/santosh-chennuri/EXCITE***

   Cloning into 'EXCITE'...

   remote: Counting objects: 15, done.

   remote: Total 15 (delta 0), reused 0 (delta 0), pack-reused 15

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

   [root@reviewb .ssh]# ls -lrt

   total 16

   -rw-------. 1 root root 405 Nov 29 12:08 authorized_keys

   -rw-r--r--. 1 root root 405 Dec 29 09:53 id_rsa.pub

```
-rw-------. 1 root root 1675 Dec 29 09:53 id_rsa
-rw-r--r--. 1 root root 3428 Jan  1 08:28 known_hosts
drwxr-xr-x. 3 root root   72 Jan  1 08:30 EXCITE
[root@reviewb .ssh]#
```

```
sangit@VP089-PBXCEE7 MINGW64 ~ (master)
$ cd EXCITE/

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ pwd
/c/Users/VP_ADMIN/EXCITE

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ ls -lrt
total 1
-rw-r--r-- 1 sangit 197121 27 Nov 15 05:56 README.md

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ cat README.md
# EXCITE
Sample project

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$
```

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git status
On branch master
Your branch is up-to-date with 'origin/master'.
nothing to commit,working tree clean

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$
```

Modify the read me file

And git status shows the uncommitted change in red

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git status
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 checkout -- <file>..." to discard changes in working directory)

        modified:  README.md

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

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$
```

Add a new file to the directory and git status shows it

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git status
```

```
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 checkout -- <file>..." to discard changes in working directory)

        modified:   README.md

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

        file-added

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

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$


sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$ git add README.md

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$ git status
On branch master
Your branch is up-to-date with 'origin/master'.

Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   README.md

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

file-added

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git add file-added
warning:LF will be replaced by CRLF in file-added.
The file will have its original line endings in your working directory.

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$echo $?
0

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git status
On branch master
Your branch is up-to-date with 'origin/master'.
Changes to be committed:
 (use "git reset HEAD <file>..." to unstage)

	modified: README.md
	new file: file-added

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git commit -m "made the changes "
[master f74d55f]made the changes
 2files changed, 2insertions(+)
 create mode 100644 file-added

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git commit
On branch master
Your branch is ahead of 'origin/master' by 1commit.
(use "git push" to publish your local commits)
nothing to commit, working tree clean

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

To add all the files at once

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git add --all

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$

To commit all the files at once

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$pwd
/c/Users/VP_ADMIN/EXCITE

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git commit --all
On branch master
Your branch is ahead of 'origin/master' by 1commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$
```

Example: git commit –all –m “adding all the files”

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git commit --all -m "commiting all the changes"
On branch master
Your branch is ahead of 'origin/master' by 1commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git log
commit f74d55fd058515567a34f8d53c7a64baeb63e81c
Author: sangit1 <sanchenn@in.vp.com>
Date:  Tue Nov 15 06:08:20 2016 +0530

    made the changes
```

commit 4ae15896e770acb13543f739d6d9641aeb5854c2

Author: User1K.Git <user1.git@in.vp.com>

Date: Tue Nov 15 05:55:39 2016 +0530

Initial commit
commit f74d55fd058515567a34f8d53c7a64baeb63e81c 40 character sha1 code commit code

push the changes to master

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

$ git push

Counting objects: 4, done.

Delta compression using up to 4 threads.

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

Writing objects: 100% (4/4), 366 bytes | 0 bytes/s, done.

Total 4 (delta 0), reused 0 (delta 0)

To https://github.vp.com/user1-git/EXCITE

4ae1589..f74d55f master -> master

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

$

To create a new branch and switch to to it:

git checkout -b <branch>

To switch to a branch

git checkout <branch>

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)

$ git checkout -b branch1

Switched to a new branch 'branch1'

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$ git branch

* branch1

master

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$

Change a file in the branch

And add

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$git add --all

warning:LF will be replaced by CRLF in file-added.

The file will have its original line endings in your working directory.

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$git status

On branch branch1

Changes to be committed:

(use "git reset HEAD <file>..." to unstage)

modified: file-added

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$git branch

*branch1

master

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

$

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (branch1)

```
$git push --set-upstream origin branch1
Total 0 (delta 0), reused 0 (delta 0)
To https://github.vp.com/user1-git/EXCITE
 * [new branch]      branch1 -> branch1
Branch branch1 set up to track remote branch branch1 from origin.

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$
```

```
sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$git commit --all -m "committing changes to branch called branch1"
[branch1 8ab53f1] committing changes to branch called branch1
 1 file changed, 1 insertion(+)

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$
```

```
sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$git status
On branch branch1
Your branch is ahead of 'origin/branch1' by 1 commit.
  (use "git push" to publish your local commits)
nothing to commit, working tree clean

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$git push --set-upstream origin branch1
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 347 bytes | 0 bytes/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.vp.com/user1-git/EXCITE
```

```
 f74d55f..8ab53f1 branch1 -> branch1
Branch branch1 set up to track remote branch branch1 from origin.

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (branch1)
$ git checkout master
Switched to branch 'master'
Your branch is up-to-date with 'origin/master'.

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ git pull
remote: Counting objects: 1, done.
remote: Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (1/1), done.
From https://github.vp.com/user1-git/EXCITE
   f74d55f..fa3eba8  master     -> origin/master
Updating f74d55f..fa3eba8
Fast-forward
 file-added | 1 +
 1 file changed, 1 insertion(+)

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ git branch --delete branch1
Deleted branch branch1 (was 8ab53f1).

sangit@VP089-PBXCEE7 MINGW64 ~/EXCITE (master)
$ git branch --delete branch1
Deleted branch branch1 (was fa3eba8).
```

```
sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$git branch
*master

sangit@VP089-PBXCEE7MINGW64 ~/EXCITE (master)
$
```

How to merge branch with the master:

git checkout -b br2 creates a new branch br2

create a file, touch filebr2

modify the file filebr2

git add filebr2

git commit filebr2

git status

move back to master

git checkout master

git merge br2 merges branch2 with the master brahnch

git push will push all changes to github/remote repository

To configure the linux client

Install git on linux machine with internet access

Make sure it pings

[root@rscthydnet1 .ssh]# git clone ssh://github.vp.com/user1-git/EXCITE

Cloning into 'EXCITE'...

remote: Counting objects: 15, done.

remote: Compressing objects: 100% (11/11), done.

```
remote: Total 15 (delta 0), reused 10 (delta 0), pack-reused 0
Receiving objects: 100% (15/15), done.
[root@rscthydnet1 .ssh]# ls -lrt
total 16
-rw-r--r--. 1 root root  409 Nov 15 12:44 id_rsa.pub
-rw-------. 1 root root 1679 Nov 15 12:44 id_rsa
-rw-r--r--. 1 root root  191 Nov 15 12:53 known_hosts
-rw-r--r--. 1 root root  138 Nov 15 13:07 config
drwxr-xr-x. 3 root root   68 Nov 15 13:09 EXCITE
[root@rscthydnet1 .ssh]# cd EXCITE/
[root@rscthydnet1 EXCITE]# ls -lrt
total 12
-rw-r--r--. 1 root root 47 Nov 15 13:09 README.md
-rw-r--r--. 1 root root 59 Nov 15 13:09 Gittest.txt
-rw-r--r--. 1 root root 73 Nov 15 13:09 file-added
[root@rscthydnet1 EXCITE]#
[root@rscthydnet1 EXCITE]#
```

Staging is a step before the commit process in **git**. That is, a commit in **git** is performed in two steps: **staging** and actual commit. As long as a changeset is in the **staging area**, **git** allows you to edit it as you like (replace **staged** files with other versions of **staged** files, remove changes from **staging**, etc.)

git pull -> gets all latest commits to local repos, to working copy

git push copies local files to remote repos

git fetch copies remote commits to local repos, but not to working copy

git remote update updates local copy with remote changes

workspace

index

local repos

remore repos

#git fetch

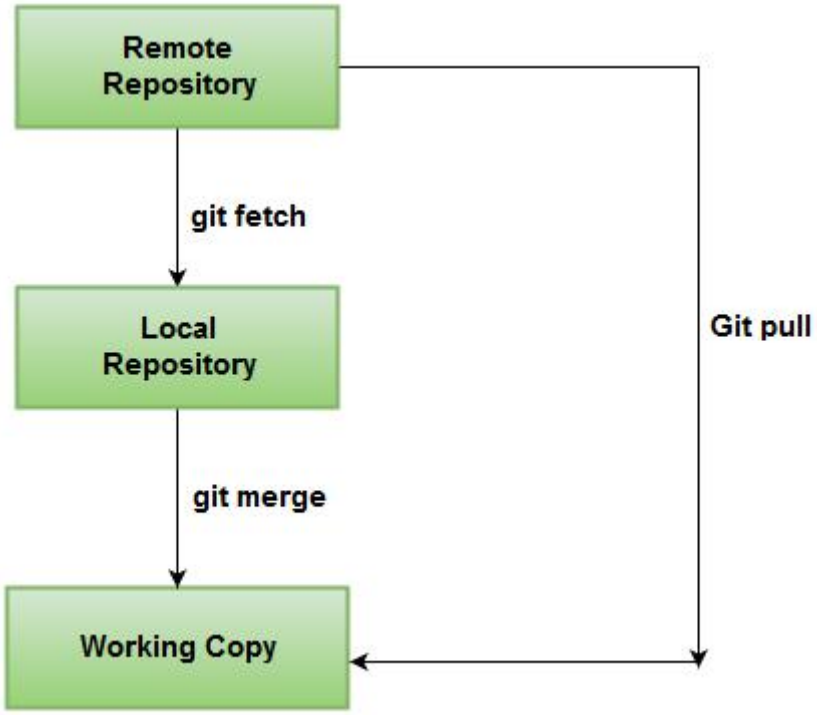
#*git diff origin*

```
diff --git a/file b/file
index 332e8fc..3d5eaf4 100644
---a/file
+++b/file
@@ -4,4 +4,3 @@ hi
 abc
 xyz
 this is for pull
-this is for push
```

git merge

git pull = git fetch + git merge

its always recommended to do git fetch , review changes and then do merge



To delete the local branch use:

$ git branch -d branch_name

To delete the branch from the remote repository:

git push origin --delete <branch_name>

Master is local branch

Origin is remote brach

The below a and b does same thing

a)

mkdir repo

cd repo

git init

git remote add origin git://github.com/cmcculloh/repo.git

git fetch --all

git pull origin master

b)

git clone git://github.com/cmcculloh/repo.git

git stash - temporary storage box for the changes you are not ready to commit

git branch

git stash

git checkout -b newbr

change something save changes

git stash --> puts all changes in a box

there is something wrong with master , so we need to go back to master and do some changes

git checkout master --> correct it

then go back to branch newbr

git stash pop --index

git diff

create a fle and modify

git add .

git diff --cached --> difference between staging and committed version

git diff - working and staged version

git commit

git diff HEAD - working dir and commit dir

Git rebase:

To check the history of commits:

git log --graph --all oneline

To check files in a branch:

$ git ls-tree -r --name-only master

build.xml

cloud.png

file
file123

file12345

file123890

file89089

fle67890898989

index.html

index.html.j2

$git ls-tree -r --name-only branch123

build.xml

cloud.png

file
file123

file12345

file123890

file89089

fle67890898989

index.html

index.html.j2

to find out difference between 2 files in 2 diff branches

ADMINIBM@IBM847-PC0BY40UMINGW64 /123/sample (branch123)

$git diff master:file branch123:file

To remove a file

git rm -f file

git reset HEAD file unstage changes

git rebase:

D E

A B C

F

Git clone

Git add .

Git commit .

git remote add origin https://github.com/santoshdevops/sample2.git

git push -u origin master

add 2 files and commit

$git log --graph --all --oneline

*aa4d11c Second

* 5525681first