GIT Tutorial (Beginners)

Using GitLab & Source Tree

Step by step hands on guide on git.

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Preface

There are lots of materials available for learning GIT. So mine is nothing new invention but it might be rather handy to people who first want to familarise themselvs with source control management using Git.

Most of the cases beginers worried about the command line interfaces specially who are not familier well with linux systems. Although git's real power lies on command line. But to start git from command line for a newbie might not be a good idea.

To find a workaround , I found couple of great tools around. They all are good . I choose 'Source Tree' from Altassian. Howerver others are also found good fit.

Git can be hosted in linux or windows server. I was trying to find something like github but a community edition so that interested people will host on their own server as well. I found GitLab then. But the constraint is on linux. It's not available on windows till. I consider the system administrators will understand this. However if any window lover want to go with the GitLab, there's still a chance to fit. In turnkeylinux I found stack for gitlab on virtual (specially for vmware). Though turnkey linux's virtual for GitLab is bit old, but hope users will survive and try to upgrade them on their own.

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Terms

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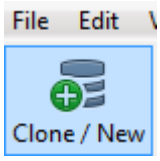
Getting Started

Command

git init

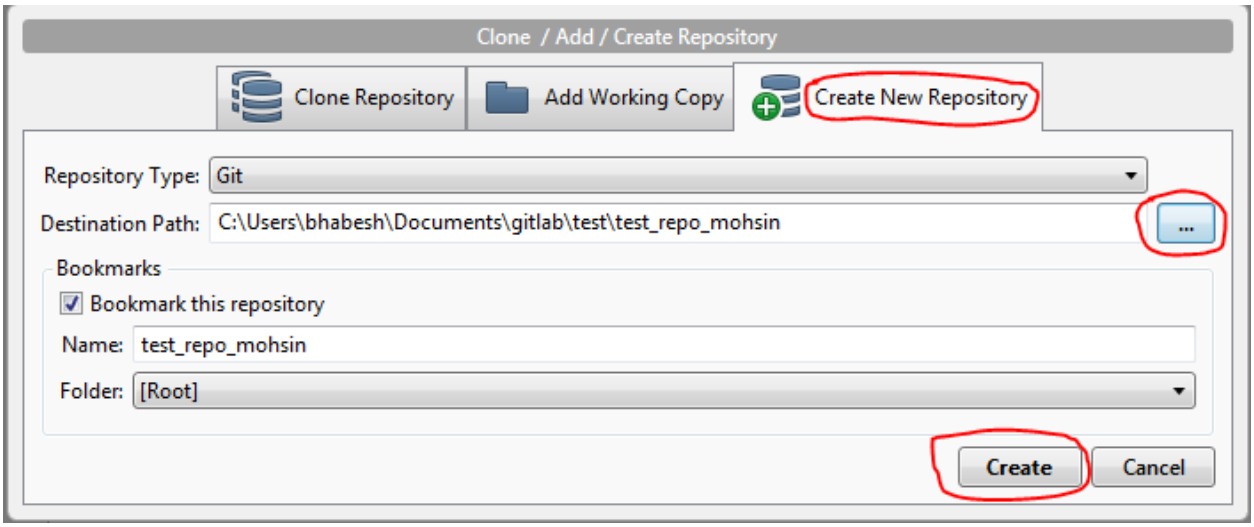
01. Setting up a 

repository (Local)

Steps

1. **Create a Directory** at your window machine test_repo_<your_name> (Example : test_repo_mohsin)
2. Click Clone/ New

Click Create New Repository



Select

Repository Type: Git

Destination Path : <Folder where you want your local repo>

Bookmark this repository: check the box

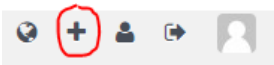
Click on **Create**

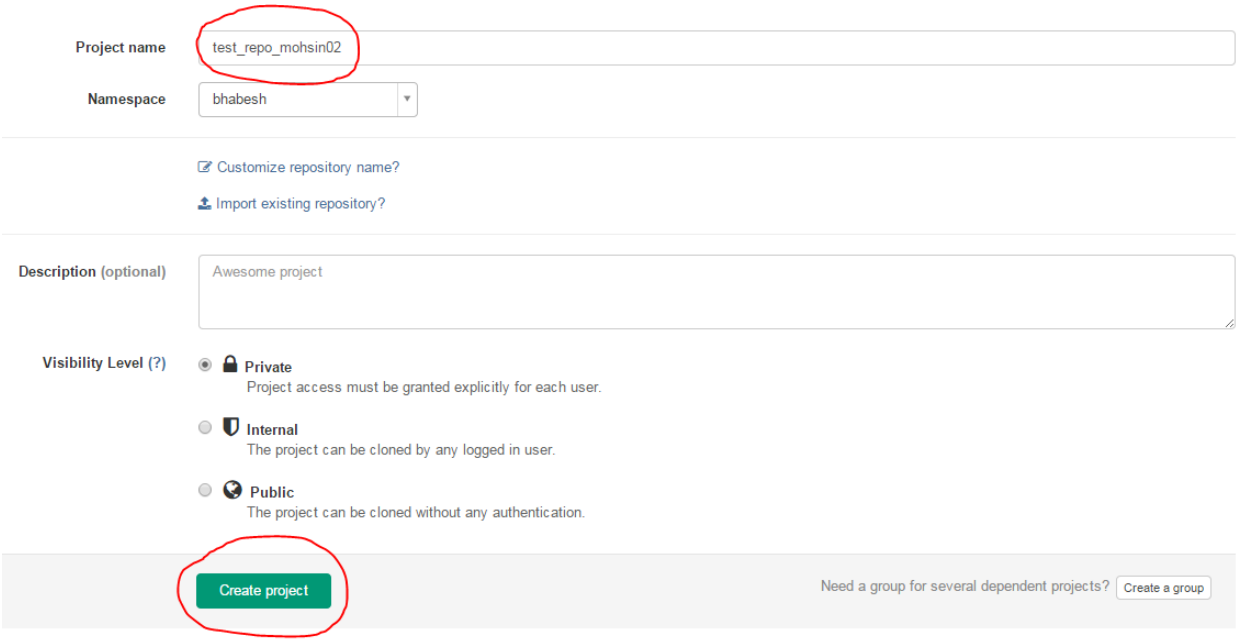
02.Setting up a repository (Remote)

Command

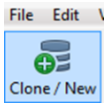
git clone

Steps

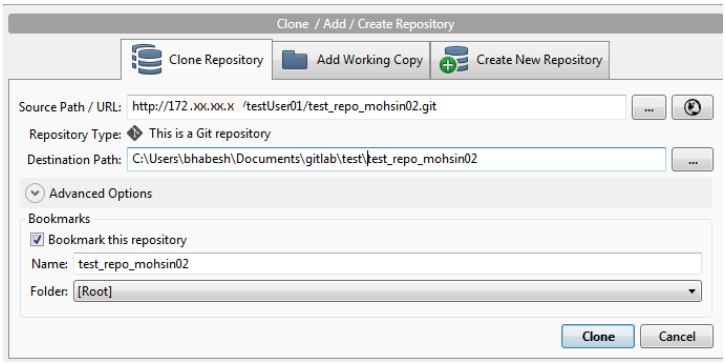
1. login to GitLab repository (e.g. http://172.30.14.42)
2. At dashboard, Click 
3. provide a justified name e.g. test_repo_<your name>02



4. Click **Create Project**
5. Click http and copy the url

6. In your local machine select Source Tree 
7. Click Clone / New 

8. Paste the url in at the Source Path / URL at the dialogue box and then click **Clone**



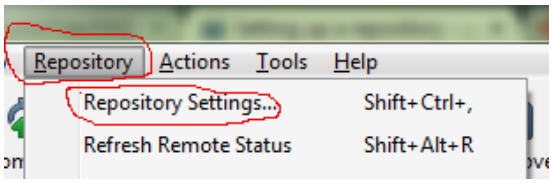
03.Configuration of Repository

Command

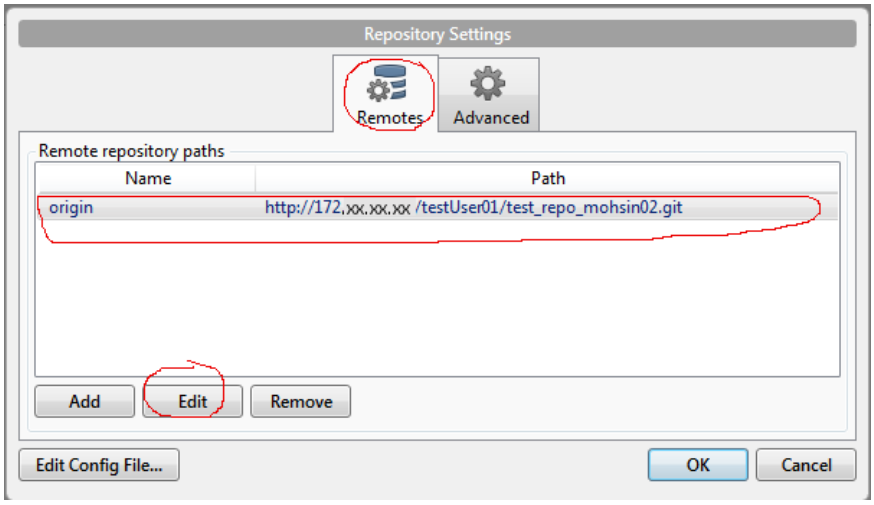
git config

Steps

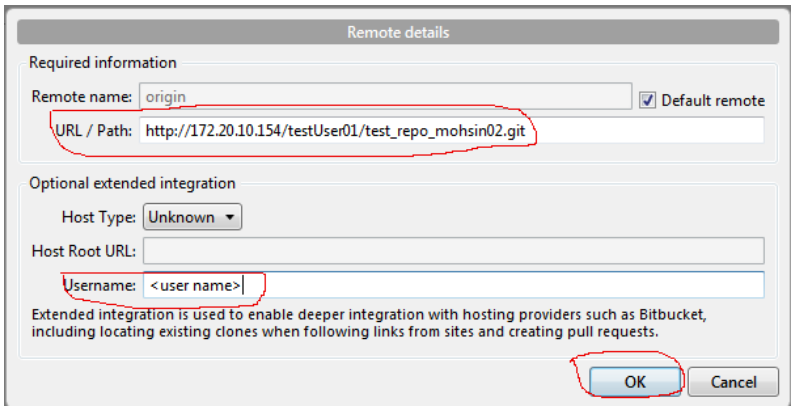
1. Select the repository using double click at the source tree
2. Click **Repository/Repository Settings..**



3. Click
   a) **Remote** tab ,
   b) Select the existing (required) row from **Remote repository paths**
   c) Click **Edit** button



4. Make sure that
   URL/Path : valid git url
   Username : git user name (active directory user name)
   Click **Ok**



04.Saving changes

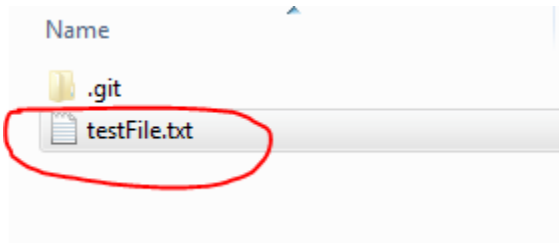
Command

git add

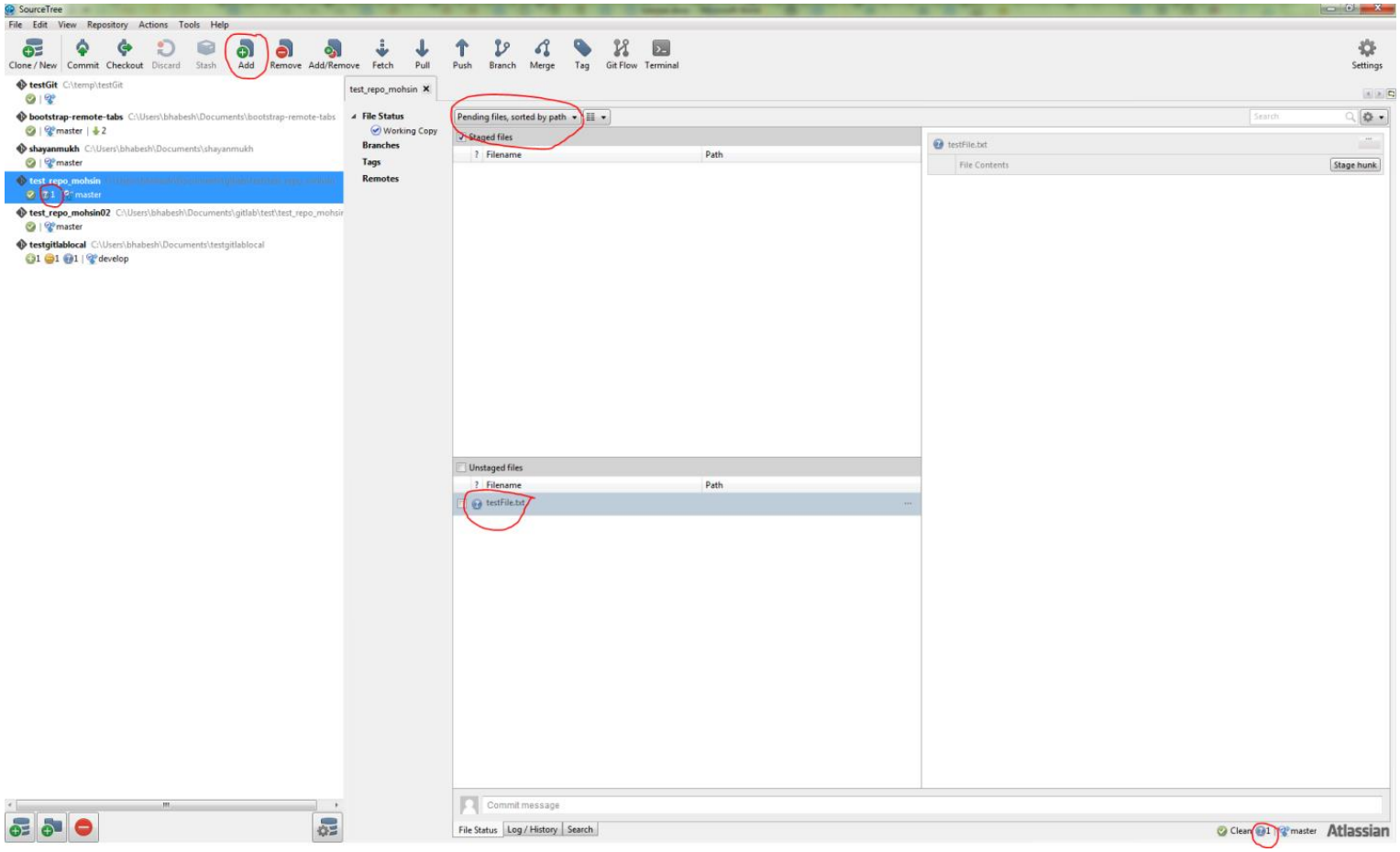
Git Add

Steps

1. Create a file (e.g. testFile.txt) in your repository directory

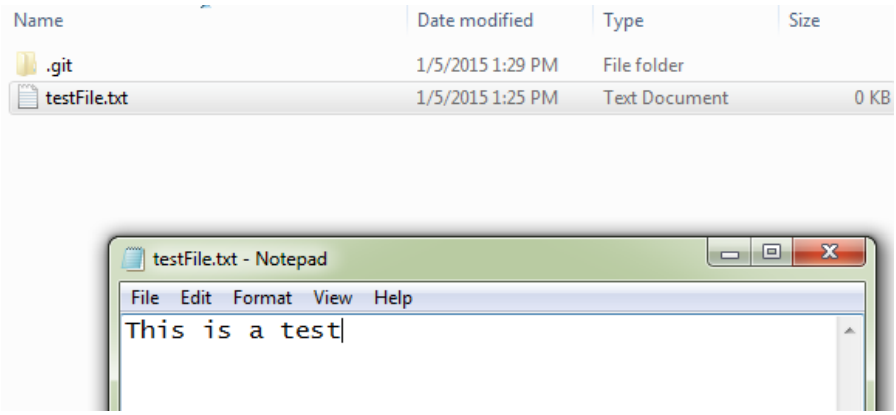


2. View changes in **SourceTree** ui
3. Click on the file (**purple** color) (e.g. testFile.txt) at 'Unstaged files' at right side of book mark pane

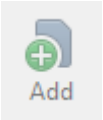


4. File will be added at staging

5. Open the file and add some text



6. File will again visible at 'Unstaged Files' area with **yellow** color
7. Select the file and click add (if needed)
8. Changes will be saved at staging area



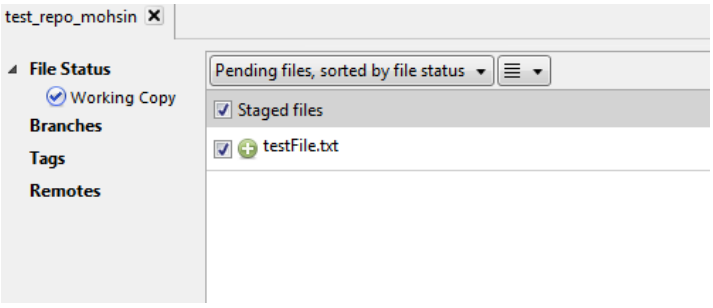
05.Git Commit

Command

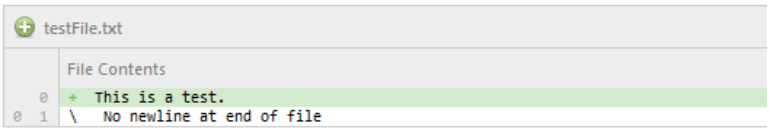
git commit

Steps

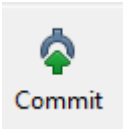
1. Select file/s from 'Staged Files'



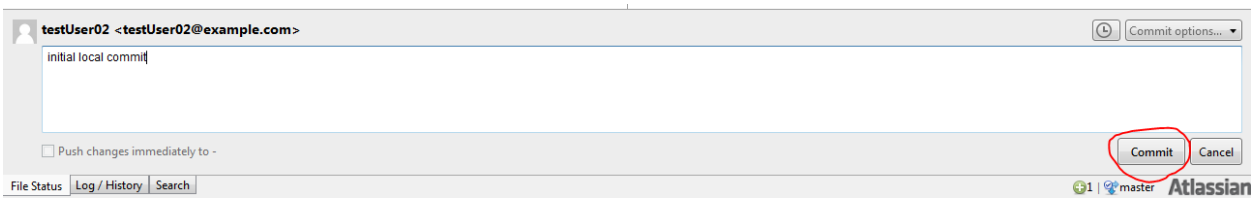
2. Check the changes



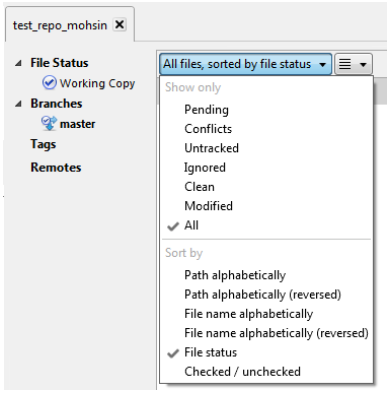
3. Click on commit

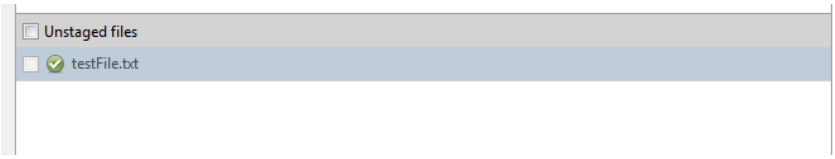


4. Give some comment/justification of commit in commit dialogue box and click **commit** button

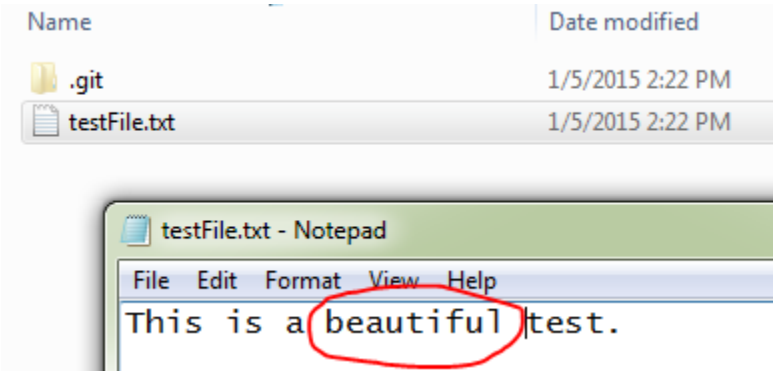


5. File will be committed. It can be viewed as below :

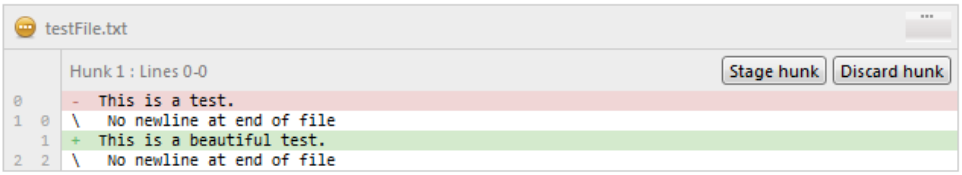




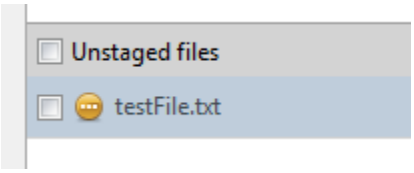
6. Modify some text



7. In SourceTree the changes are like this

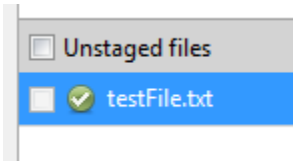


8. It is possible to stage only the portion or full file
9. Click the file at Unstage area ('**git add**' command will be applied) .

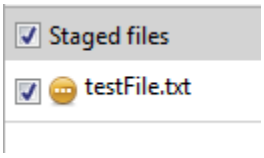


10. After add file will be staged and file color will change in two places
    a. In '**Unstaged files**' area

       Color will change from yellow to green (with icon changes to check)



    b. And in '**Staged files**' area will change from green to yellow (with icon changes)



11. Select the file and commit. File will be committed locally.

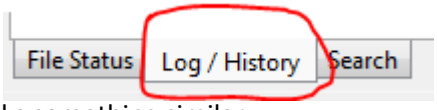
06.Viewing Old Commits

Command

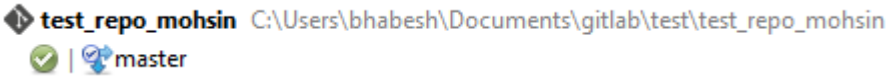
git checkout

Steps

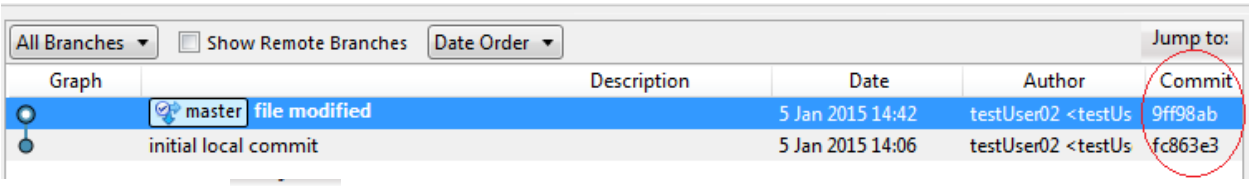
1. Click on log view



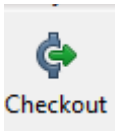
2. Book Mark Pane looks something similar



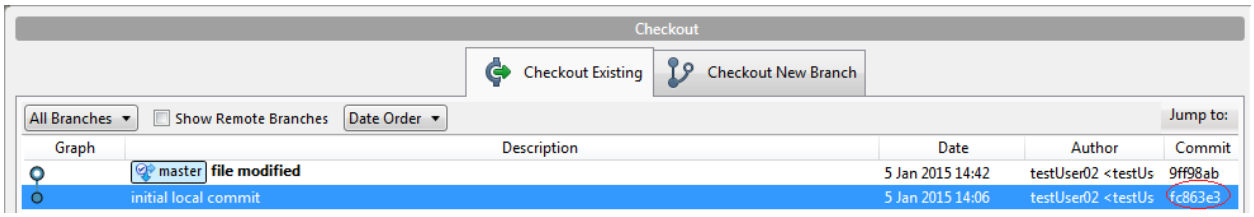
3. See the commit log



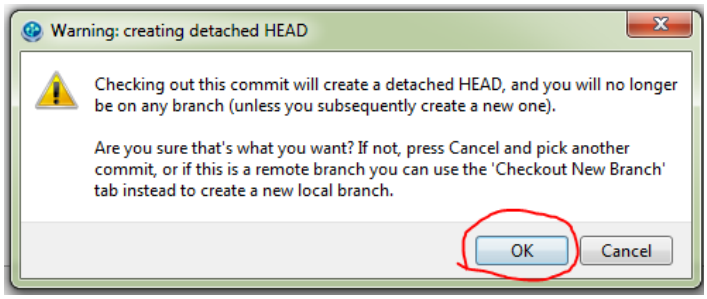
4. Click on **checkout**



5. Select the particular commit

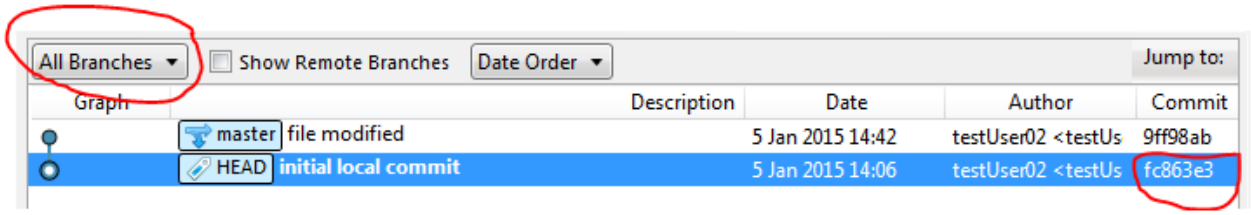


6. Creation of detached local branch dialogue appears. Click **OK**

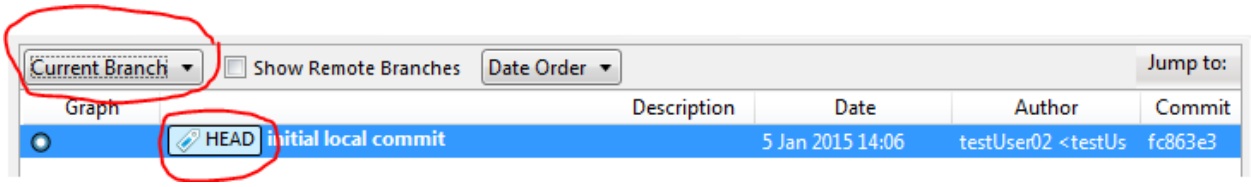


7. BookMark pane looks something similar

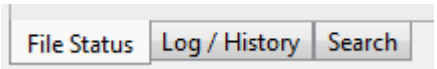
8. Right side pane for log :
   a. For all Branch



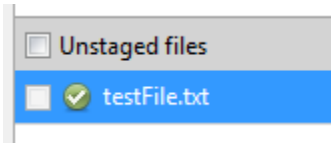
   b. For Current Branch



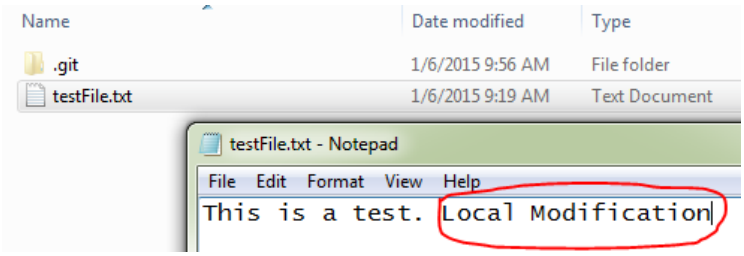
9. Click on **File Status**



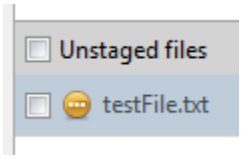
10. **Unstaged files** listing



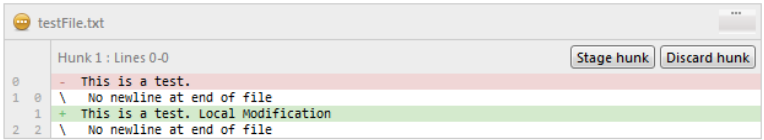
11. Open the file and modify



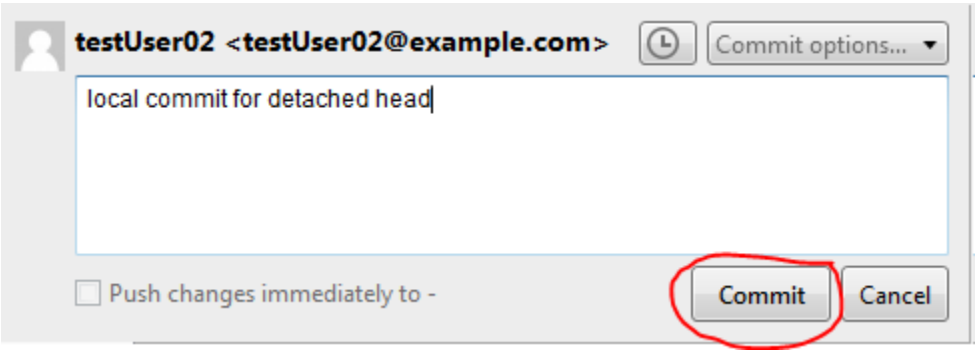
12. **Unstaged files** listing



13. Changes in file

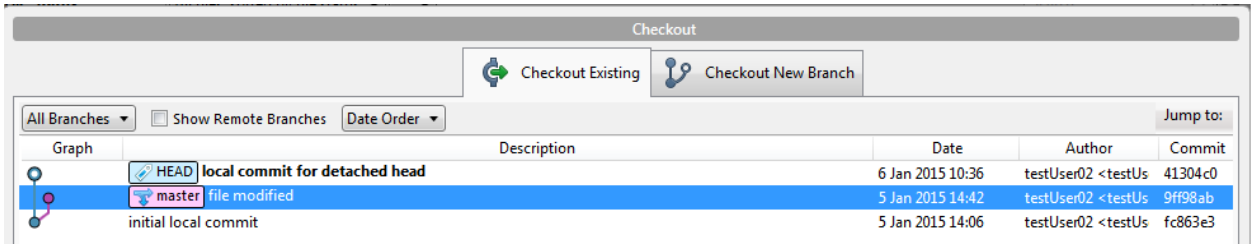


14. Check the file in **Unstaged files** pane to add to staged area
15. Click on **Commit**



16. Click on **CheckOut**

17. Select **Master**



18. Click **OK**
19. You will find your earlier work is not modified.
20. It proves checkout an earlier commit will not disturb the present master branch.
21. However this is not the case of checkout a file.

Undoing Changes

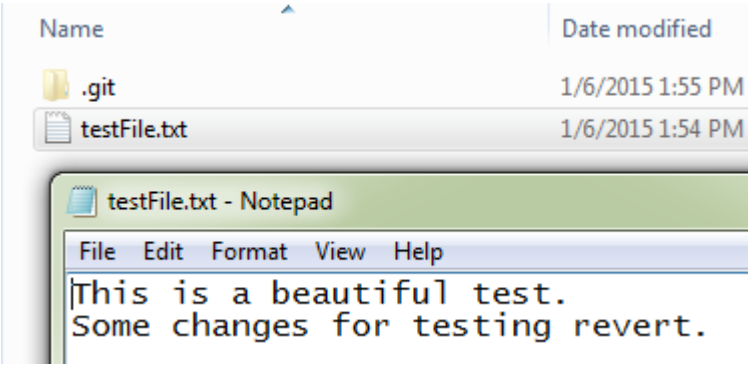
Command

git revert

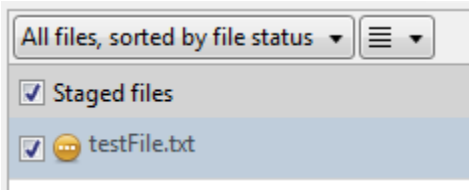
07.Revert

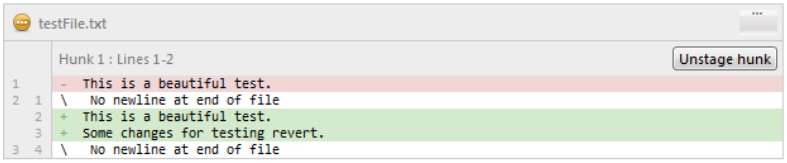
Steps

1. Open the file and do some changes

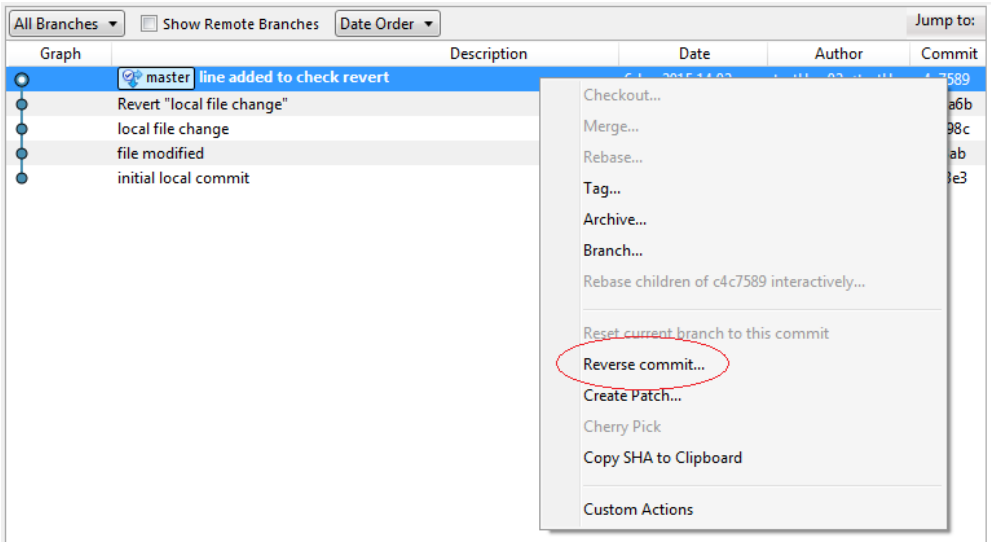


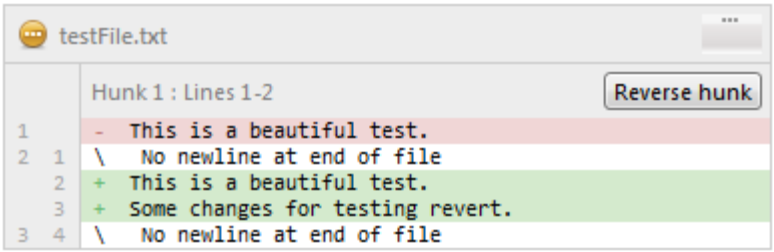
2. Commit it



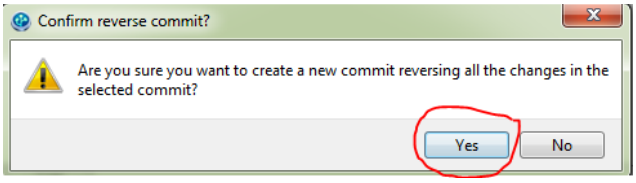


3. Select the recent commit , right click and select **Reverse commit**

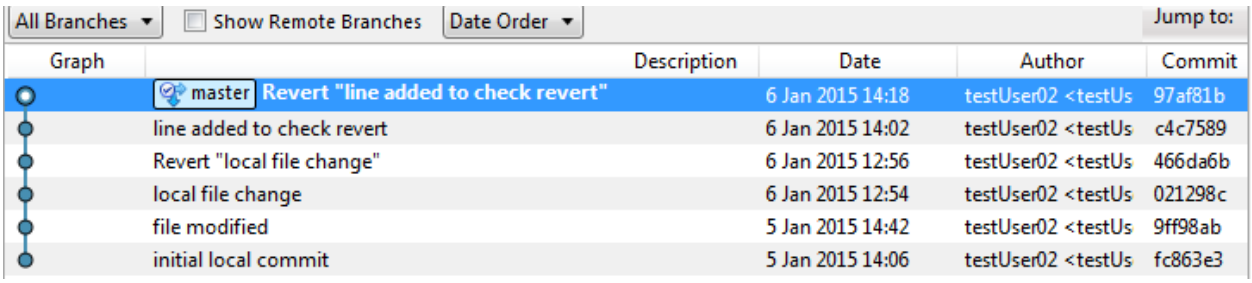


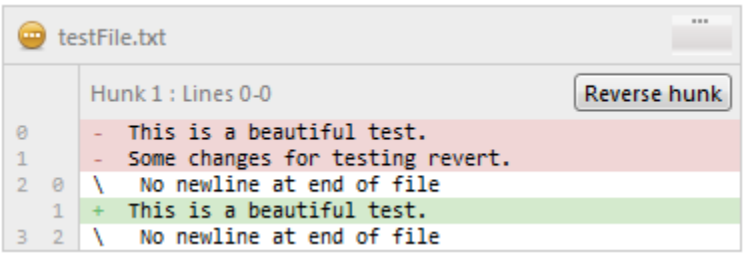


4. Click **Yes** on Dialogue box



5. The contents will be earlier commit stage





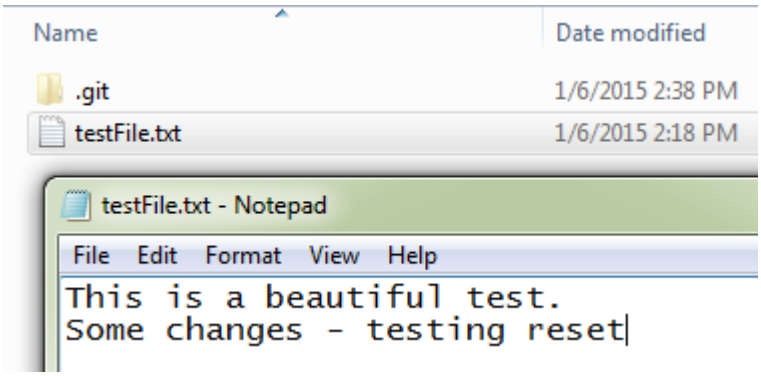
08.Reset

Command

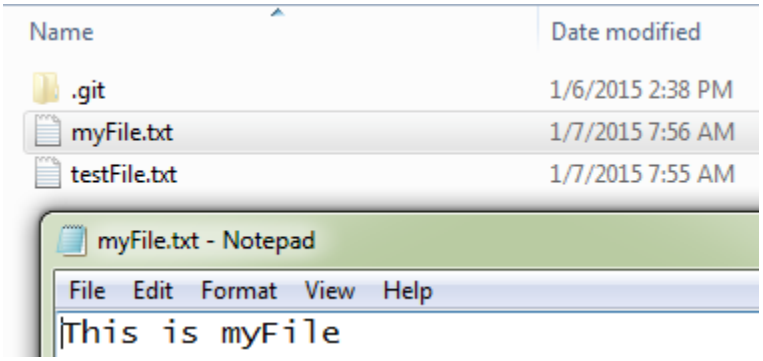
git reset

Steps

1. Modify testFile.txt



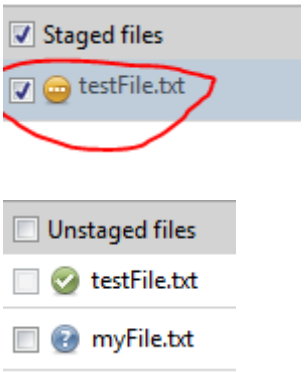
2. Add another File

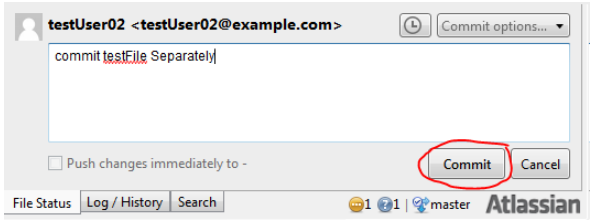


3. Add for staging

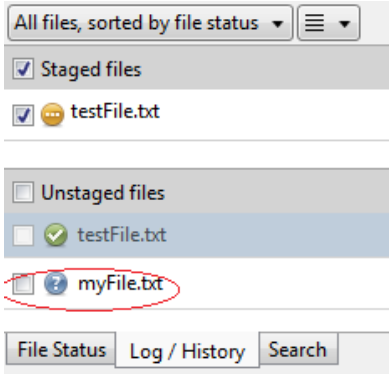
4. Reset the file (e.g. myFile.txt) .. **It will be unstaged**

5. Commit Files seperately

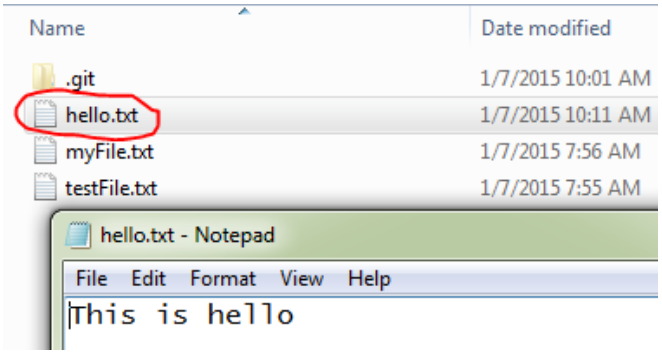


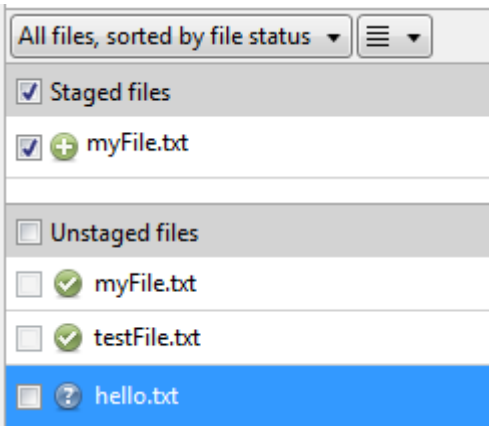


6. Add the other file from unstaging area

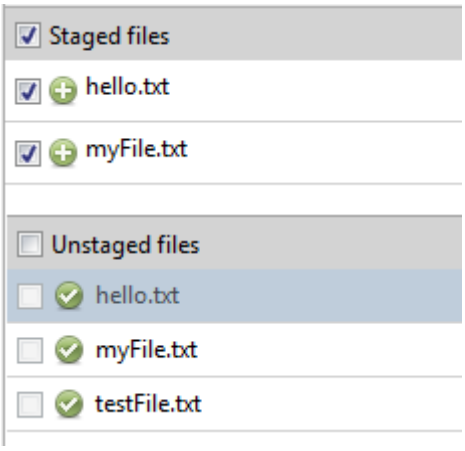


7. Create another file (e.g. hello.txt)

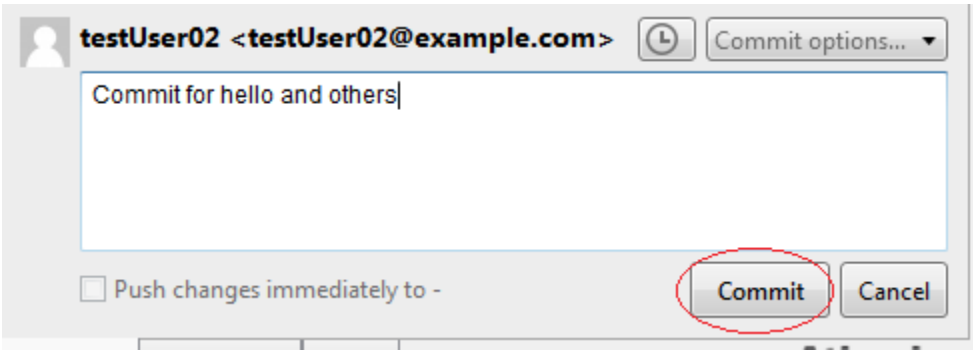




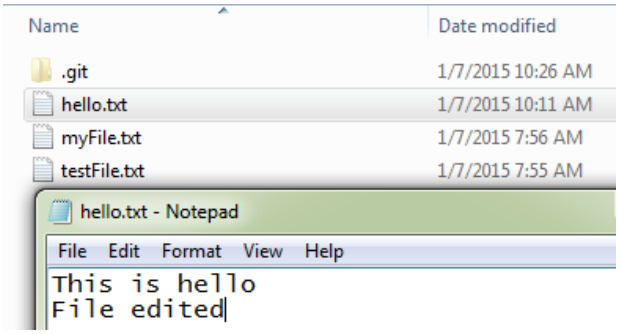
8. Now Add the file (from Upstaged to staged) : Click

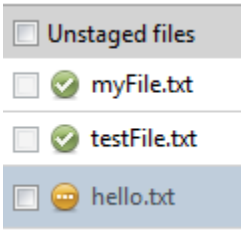


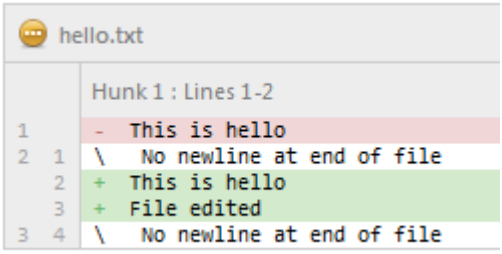
9. Commit :



10. Edit the newly committed file (e.g. hello.txt) again :

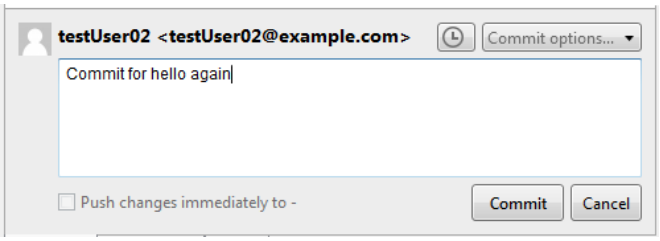




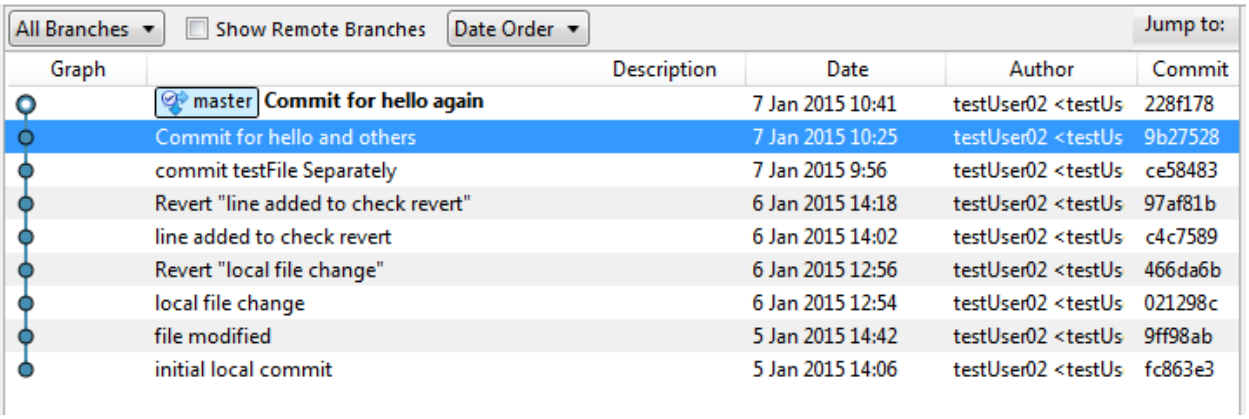


11. Add the file to staging a 

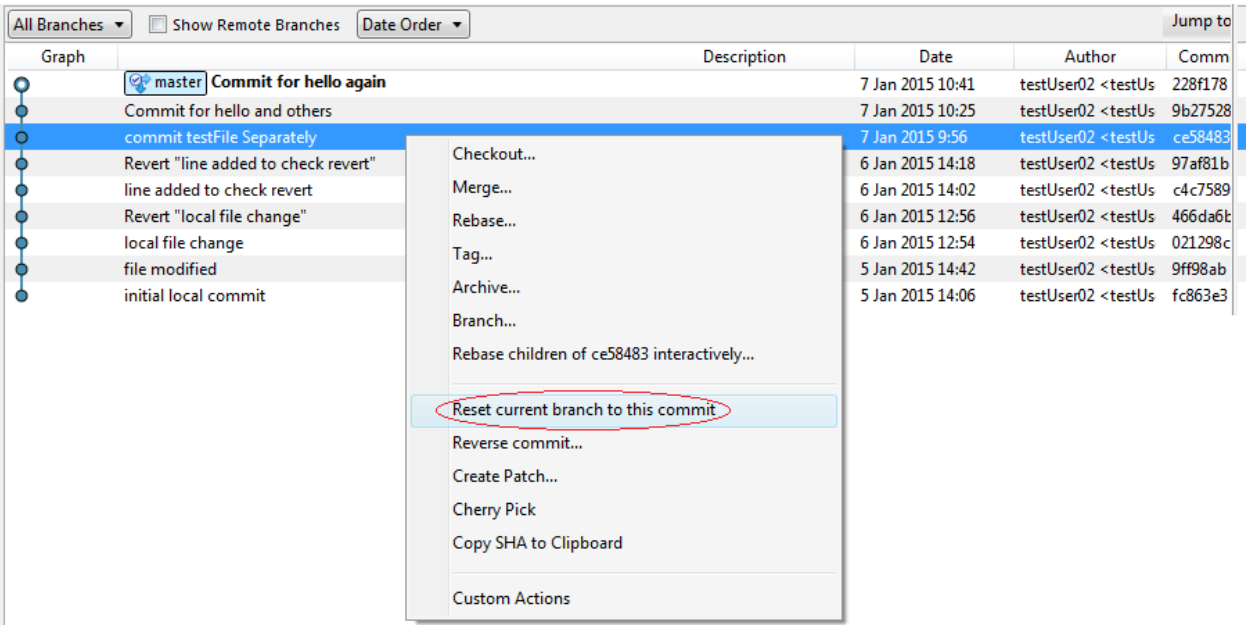
12. Commit : 



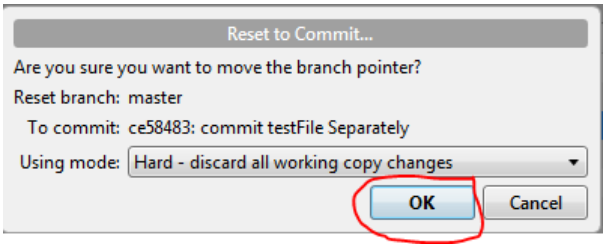
13. Commit logs :

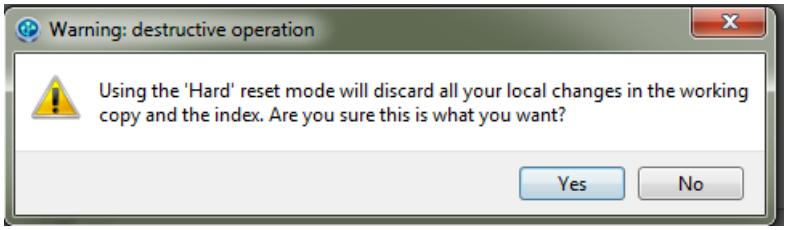


14. To Reset right click particular commit (e.g. two commits before) and select (**Reset current branch to this commit**)



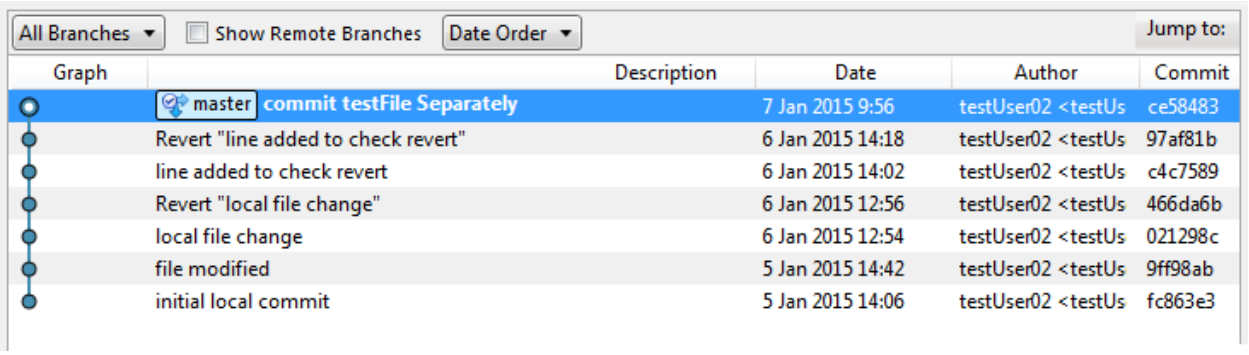
15. Click **OK** to Warning notice





16. Commit Logs : (**addition and modification lost**)

Current status lost



Collaborating

Syncing

11.Remote

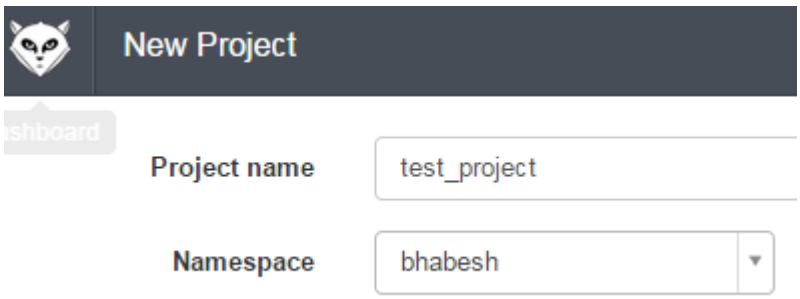
Command

git remote

Remote connections are more like bookmarks rather than direct links into other repositories

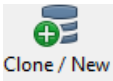
Steps

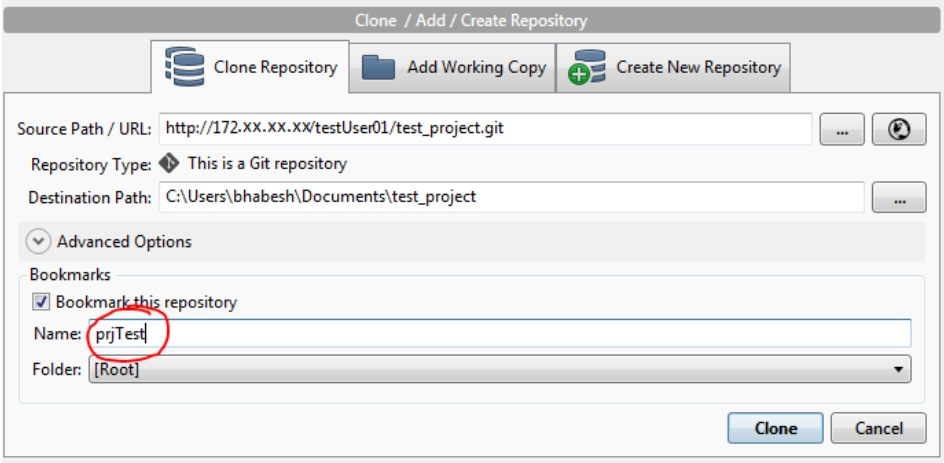
1. Create a project (similar to Section 02.) (e.g. **test_project**) from hosted gitLab



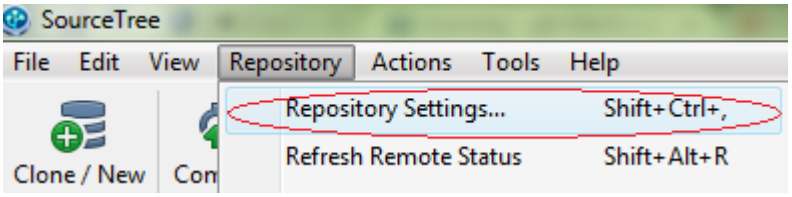
2. Copy the **url**

3. Click **Clone/New**

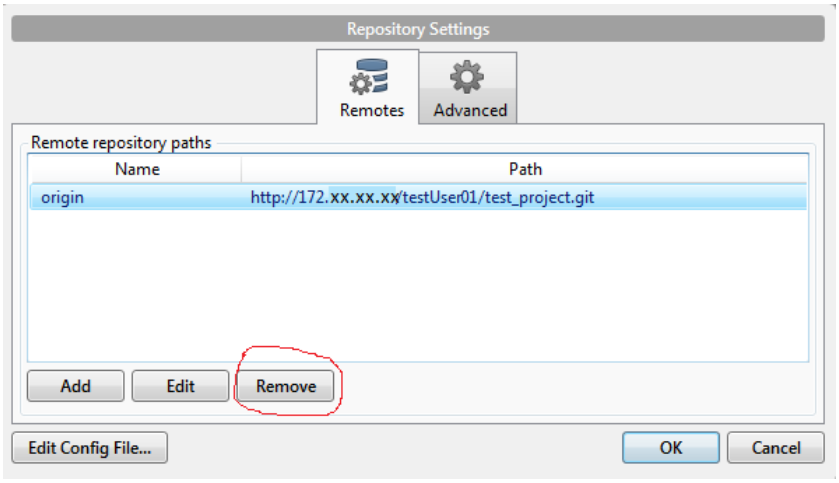




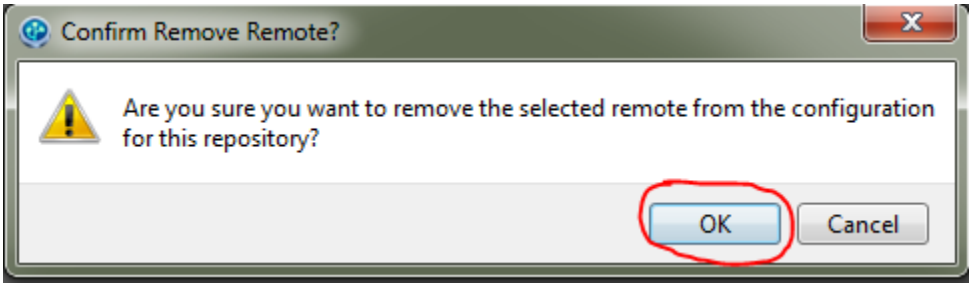
4. Click **Repository / Repository Settings…**



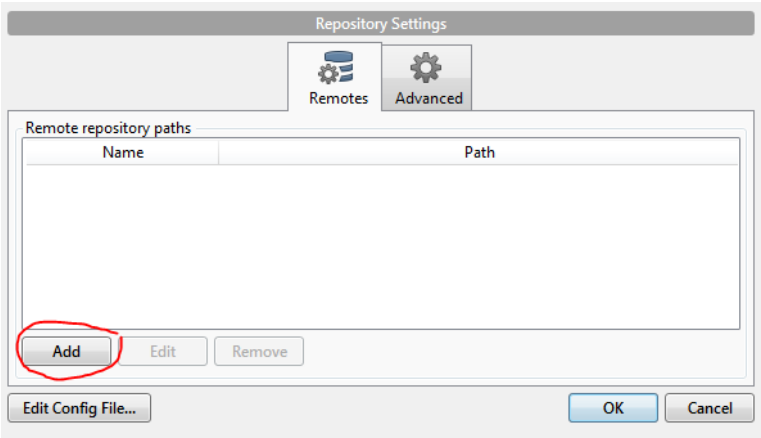
5. Repository settings view as below :



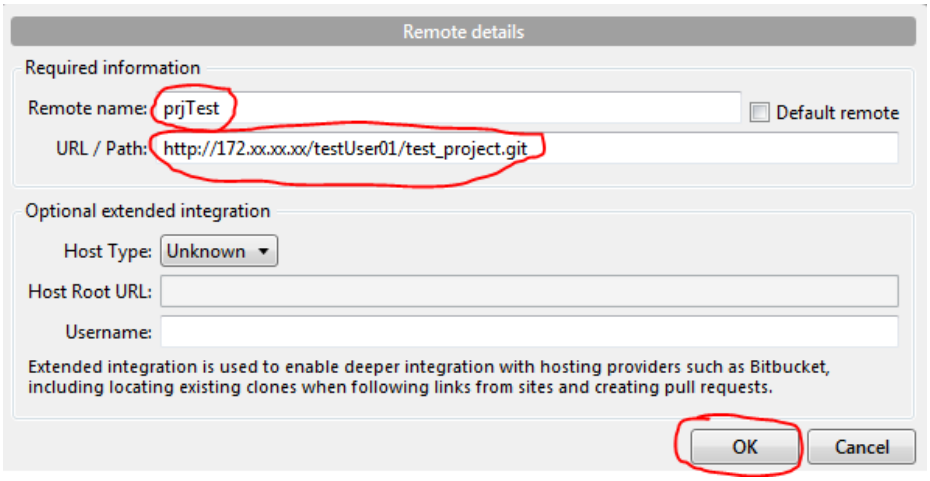
6. Remove the entry **origin** (to understand the concept for the time being)



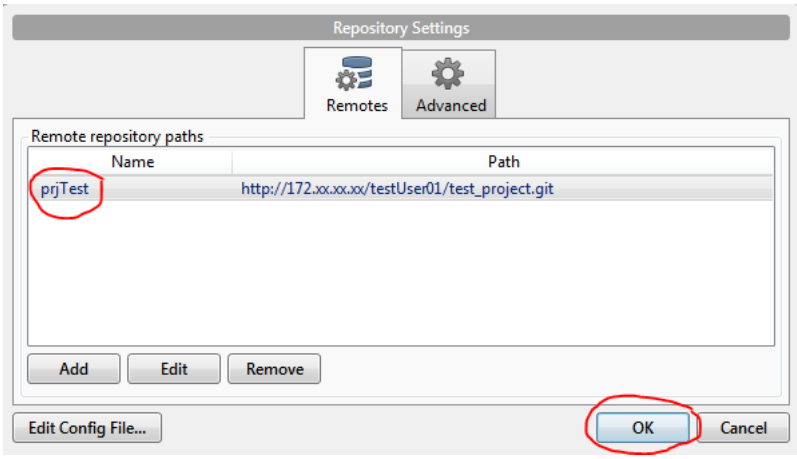
7. Click **Add**



8. Fill it accordingly



9. Repository settings should look something similar :



10. Click **Ok**

12.Push

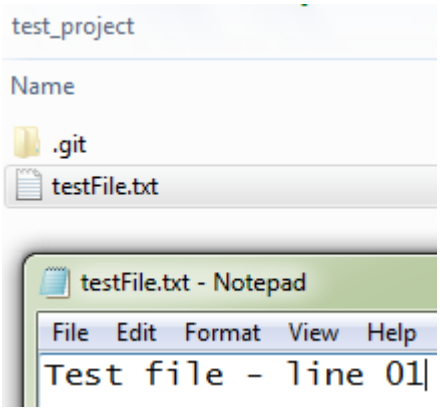
Transfer commits from local repository to a remote repo.

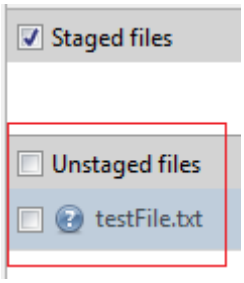
Command

git push

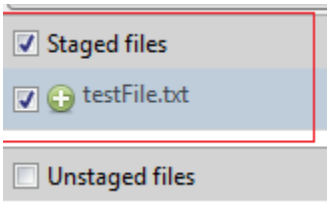
Steps

1. Create a file (e.g. **testFile.txt**) in your project (e.g. **test_project**)





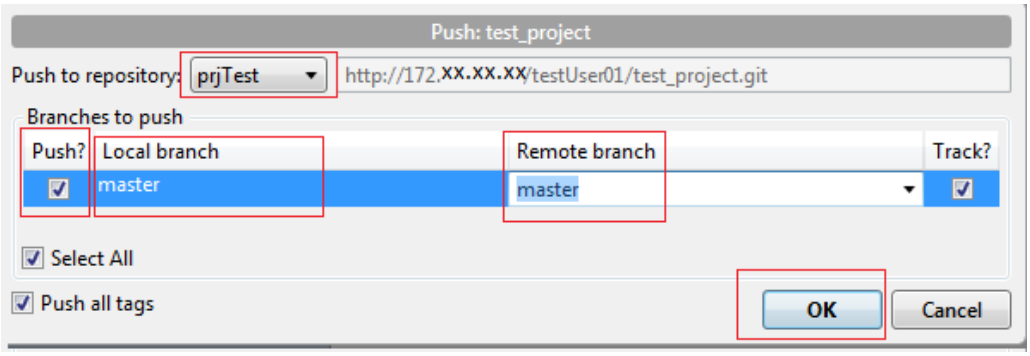
2. Add the file from '**Unstaged files'** to '**Staged files'** using **Add**



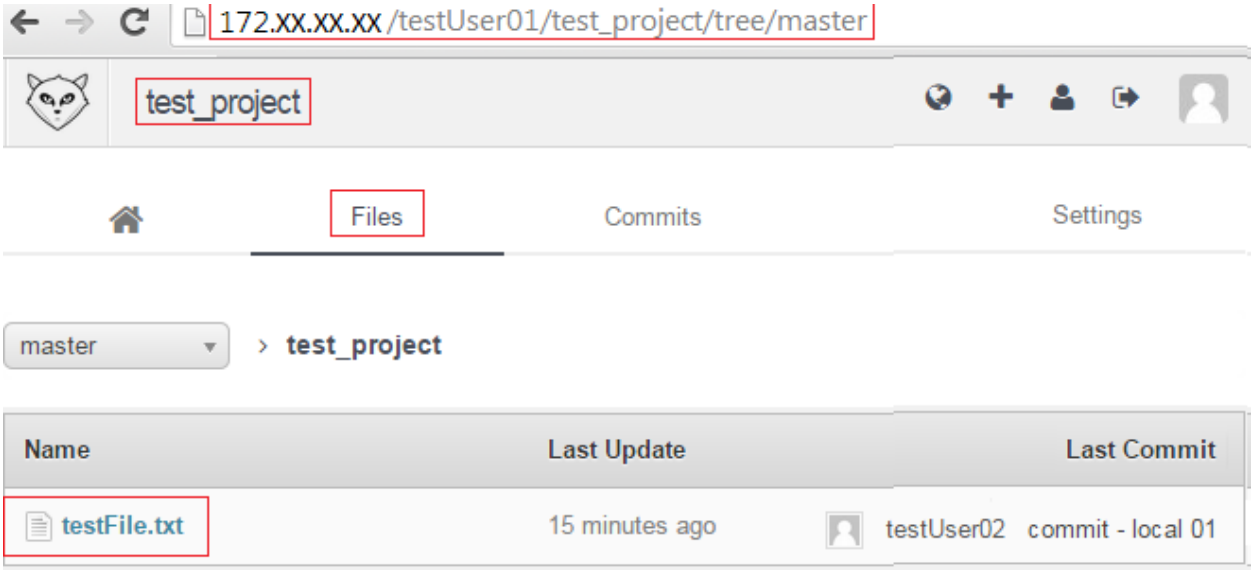
3. Commit to the local repository

4. Click '**Push'**

5. In push dialogue box make sure you select (type) **master** as your remote and local branch



6. Using GitLab interface, we can see the remote commit as shown below :



7.

13.Fetch

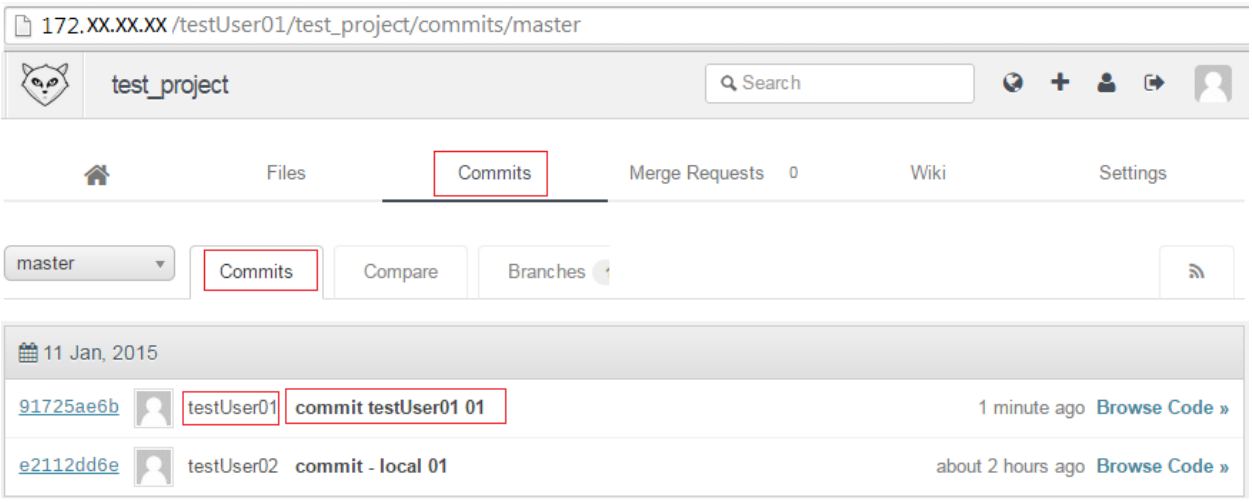
This command imports commits from a remote repository into the local repository.

Command

git fetch

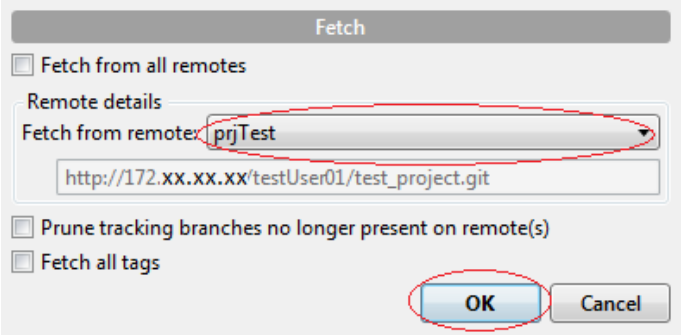
Steps

1. Let some **other user** modify the file , commit, and then push the changes to the remote repository (irrespective of any tool)

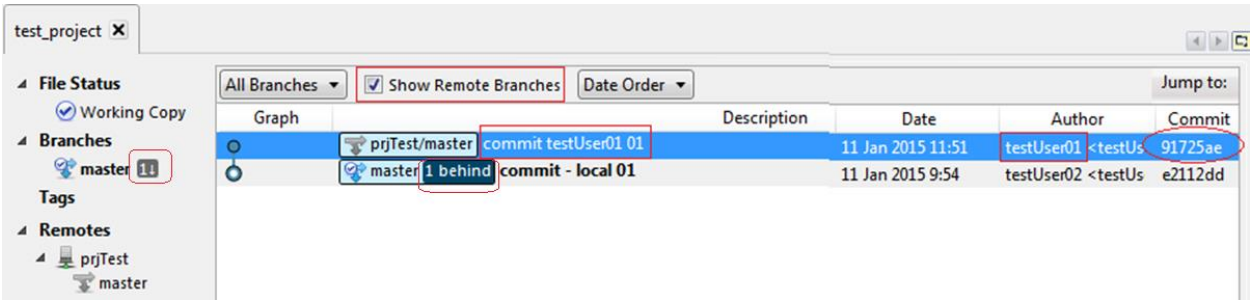


2. Click on **Fetch** 

3. Fetch dialogue box will appear



4. Right side pane looks something like below :



Till date the modified file is not in local repository but the **fetch** brings the commit from remote repository to local.

13.Pull

Merging upstream changes into local repository

*(It's a combined command of **git fetch** and **git merge**)*

Command

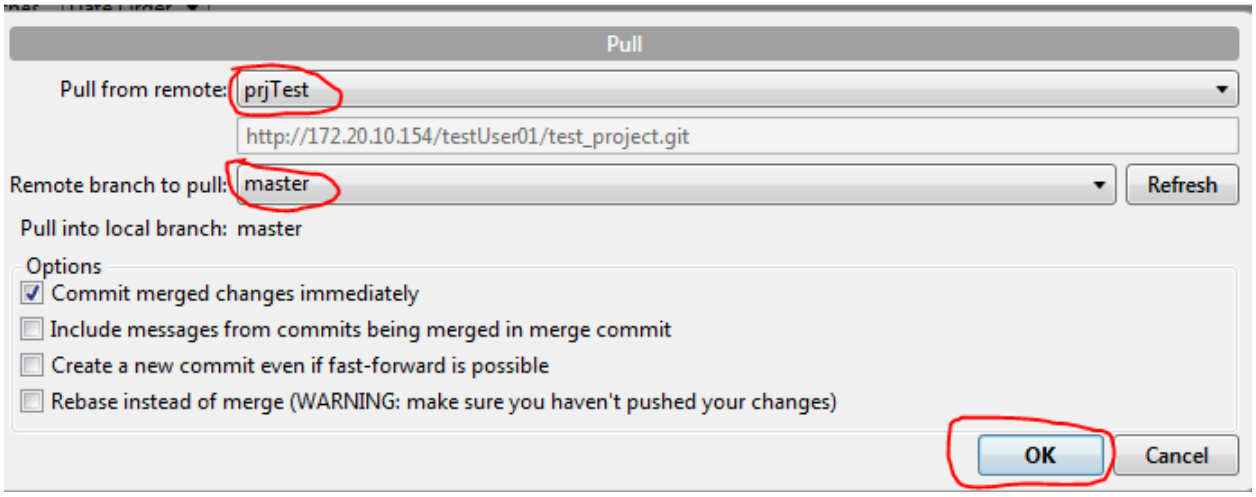
git pull

Steps

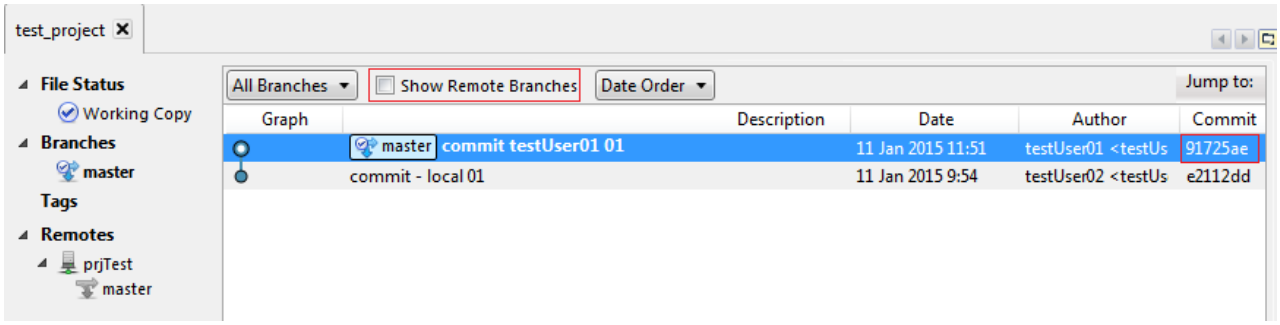
1. Click '**Pull** '

(Check the numeric degit above . It shows changes in remote)

2. Click ok in the dialogue box



3. Log/history pane should look something like below :



Now the modified file from the remote repository is in local along with the commit

Using Branch

Command

git branch

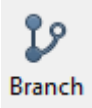
Branch

A branch represents an independent line of development. Branches serve as an abstraction for the edit/stage/commit process

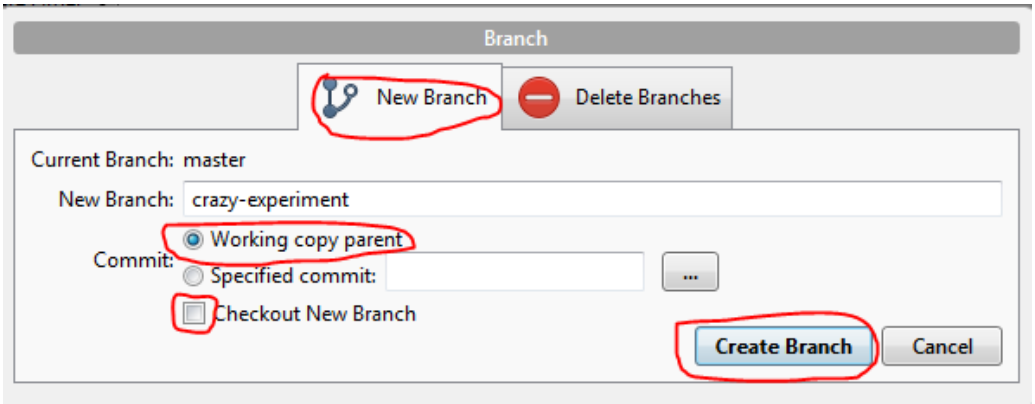
Create a Branch

Steps

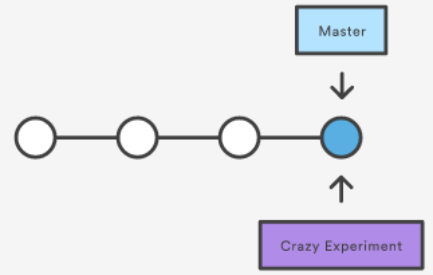
1. Click **Branch**



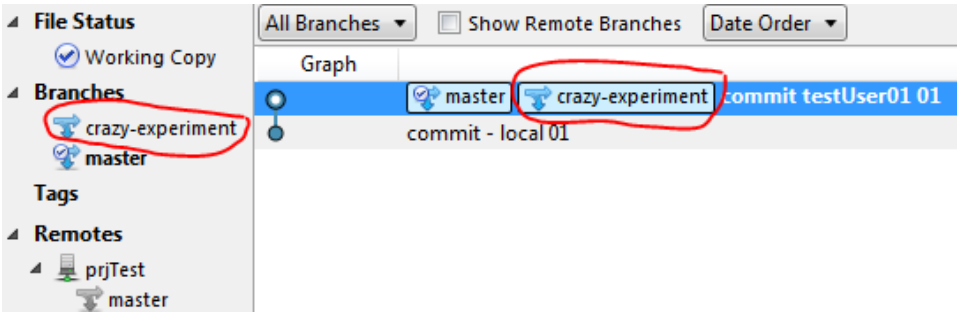
2. Write a branch name (e.g. crazy-experiment). Uncheck the **Checkout New Branch** checkbox



3. A branch with pointer to working copy will create.

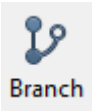


4. To working with this branch one should use the **checkout**

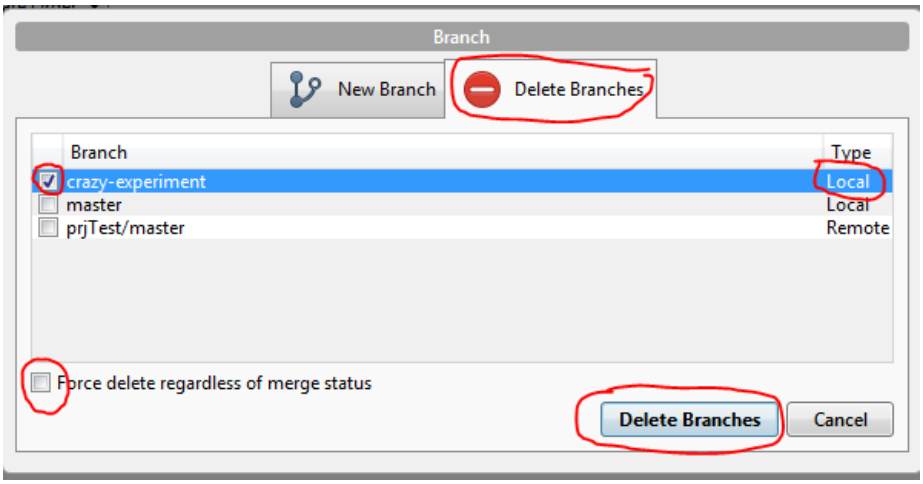


Delete a Branch

Steps

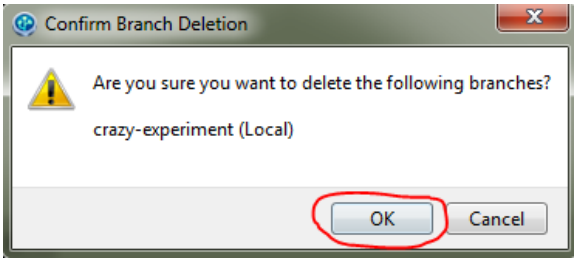
1. Click **Branch** 

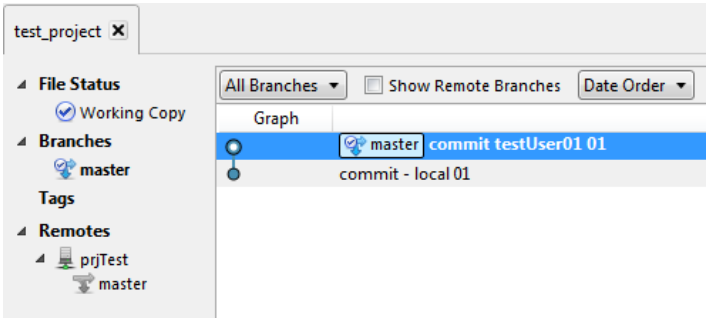
2. Select the branch to be deleted (e.g. crazy-experiment)



3. Make sure about the type of the branch (local/remote)
4. If the branch is not merged then will get error. Force delete enables to delete the branch and no concern with merge status.
5. Click **Delete Branches**

6. Click **OK** button





Checkout

Command

gitcheckout

The **git checkout** command lets you navigate between the branches created by **git branch**

There is two way to use **checkout** in this regards

A. Using of Checkout **after** creating a Branch
B. Creation of Branch at the time of **Checkout**

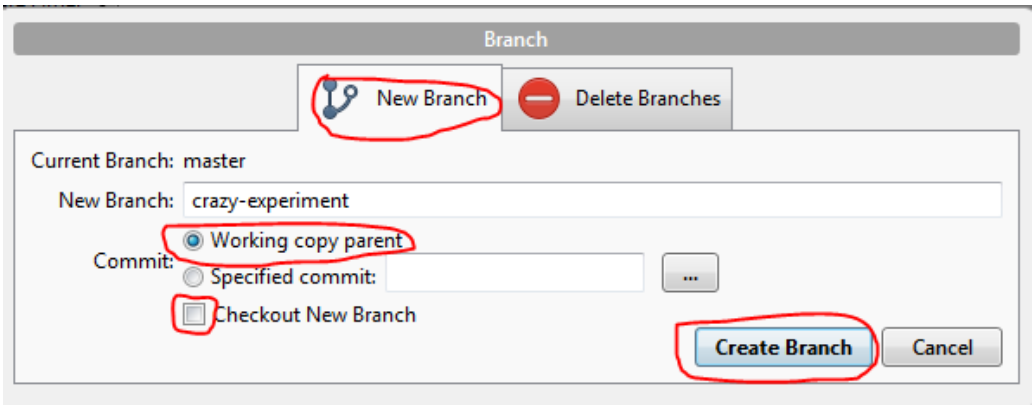
Let's discuss both the steps

A. Using of Checkout **after** creating a Branch

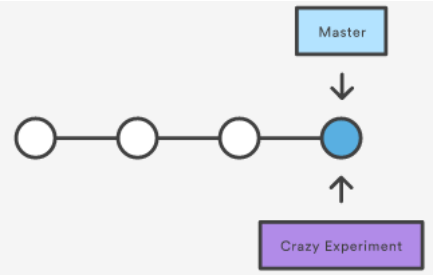
Steps

1. Click **Branch** 

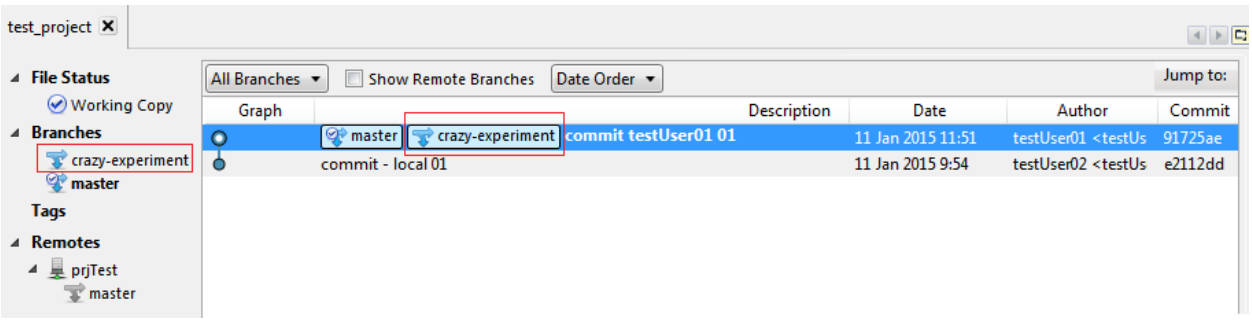
2. Write a branch name (e.g. crazy-experiment). Uncheck the **Checkout New Branch** checkbox



3. A branch with pointer to working copy will create.

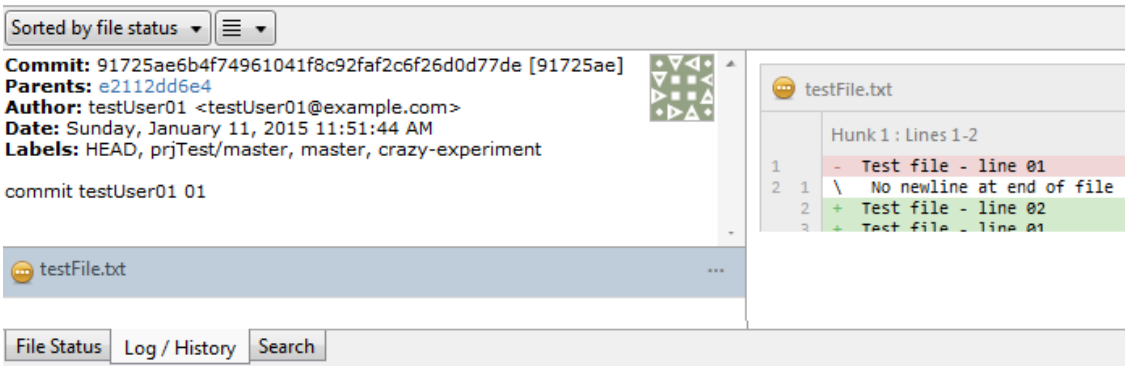


4. To working with this branch one should use the **checkout**

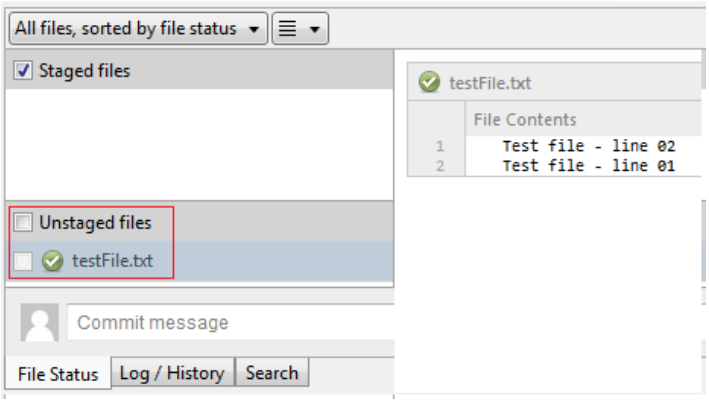


5. Different views

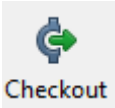
a. **Log / History**

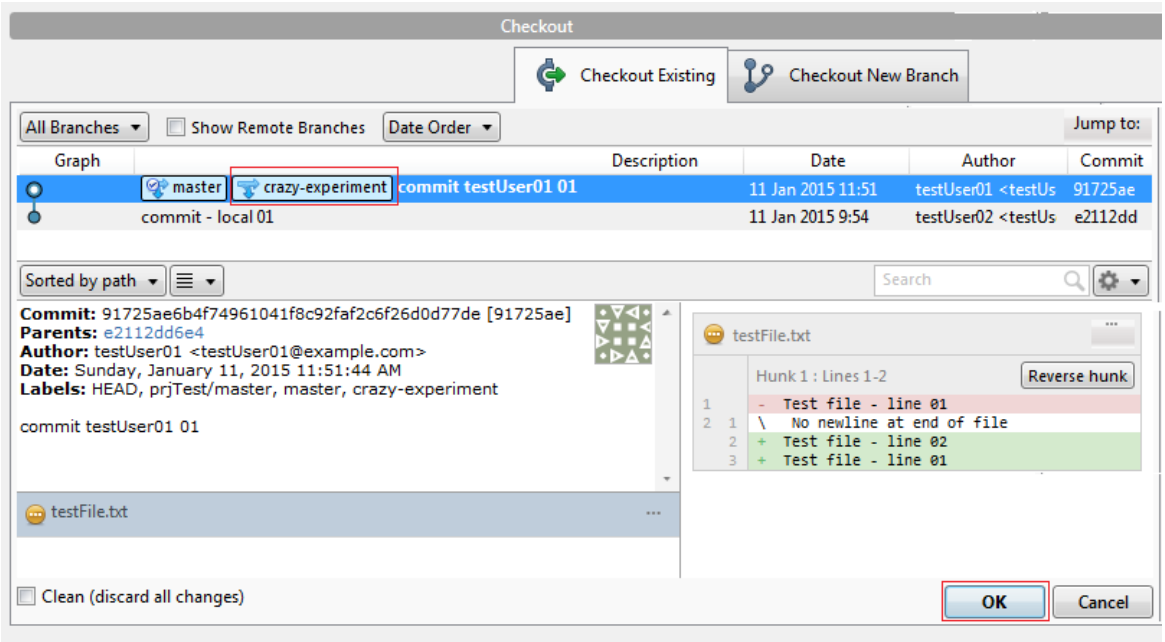


b. **File Status**

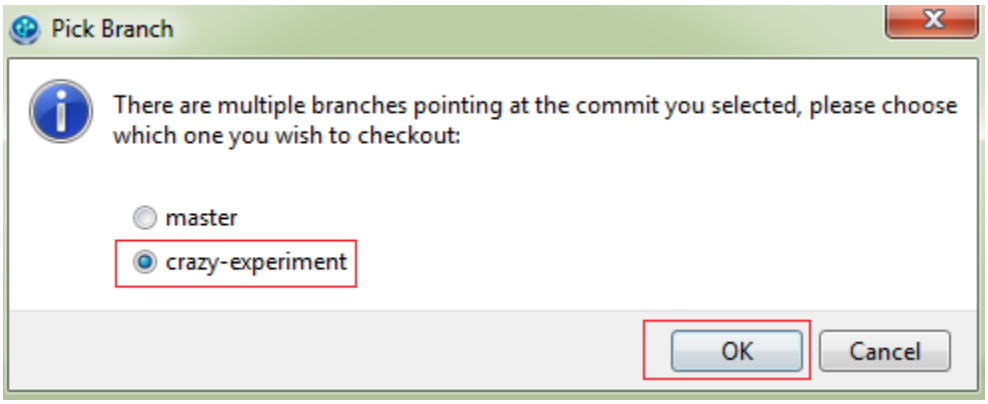


6. Click on **Checkout**

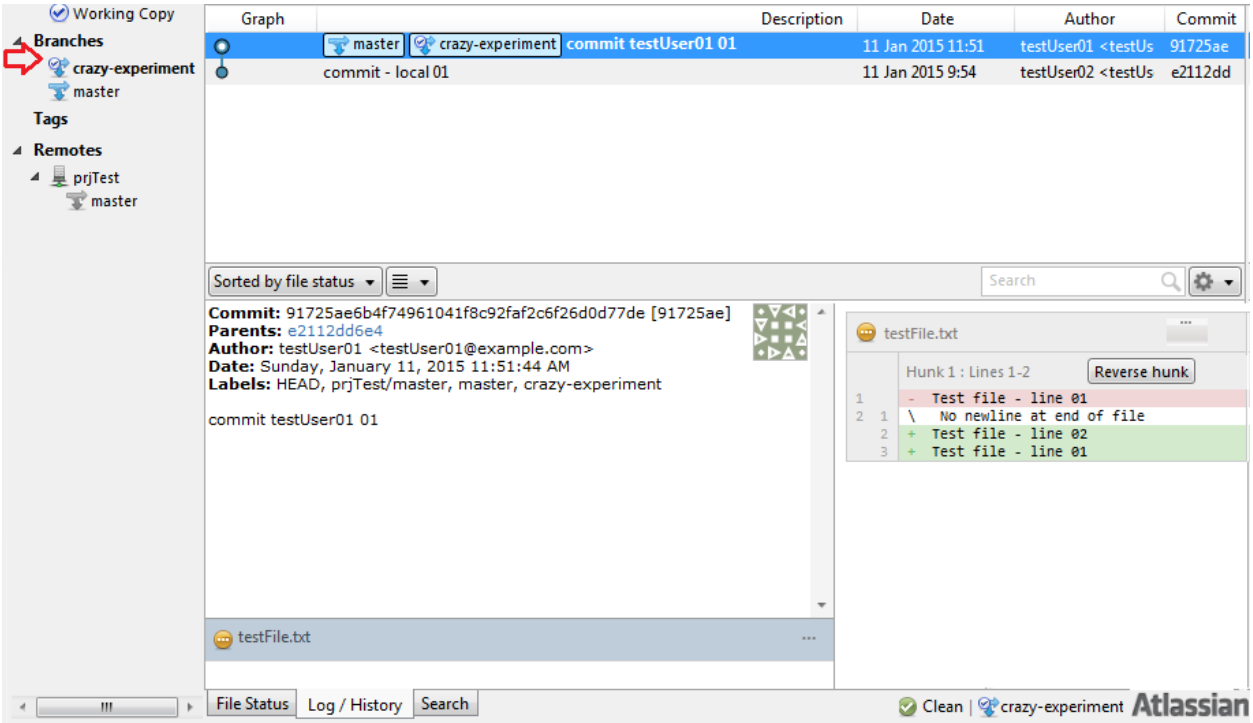




7. Select the branch at **Pick Branch** dialogue and click **OK**



8. After **checkout** the little arrow (with check mark) (i.e.) will be shifted to the new branch (i.e. **crazy-experiment)**

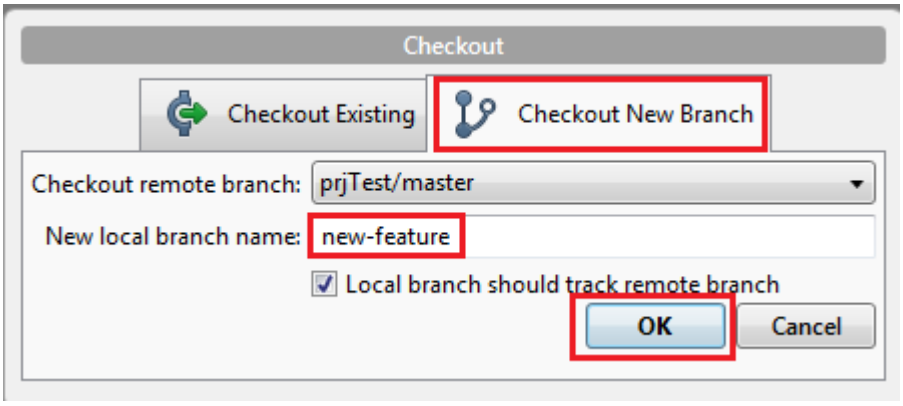


B. Creation of *Branch* **at the time** of *Checkout*

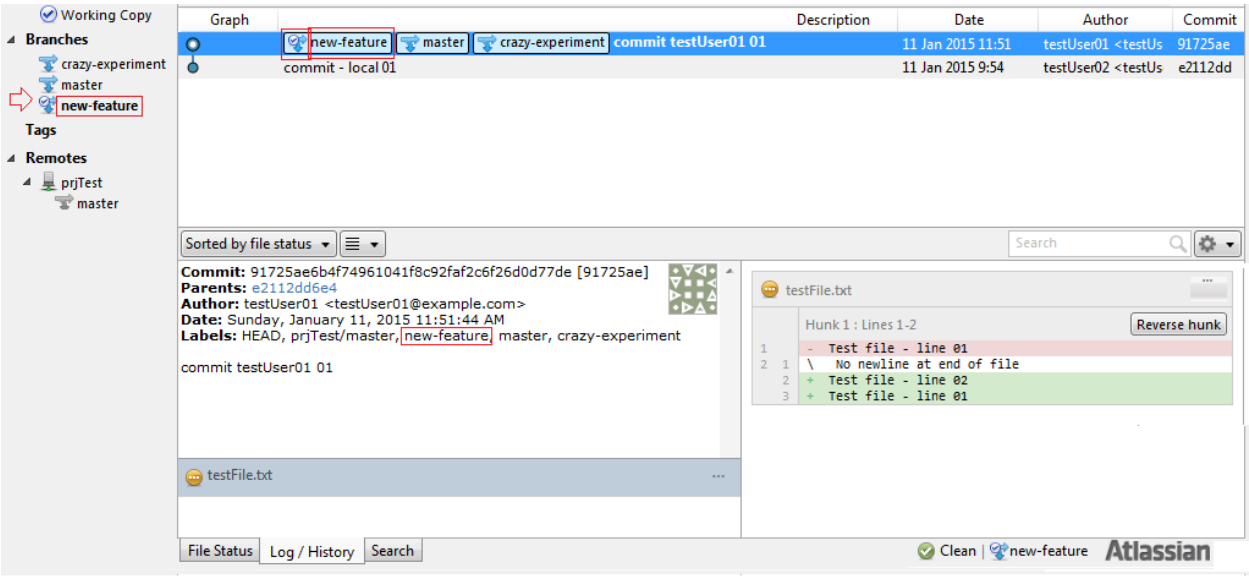
Steps

1. Click **Checkout**

Give a new local branch name (e.g. **new-feature**)



2. A new branch will be created and set. The little arrow will point the newly created branch



Merge

Command

git merge

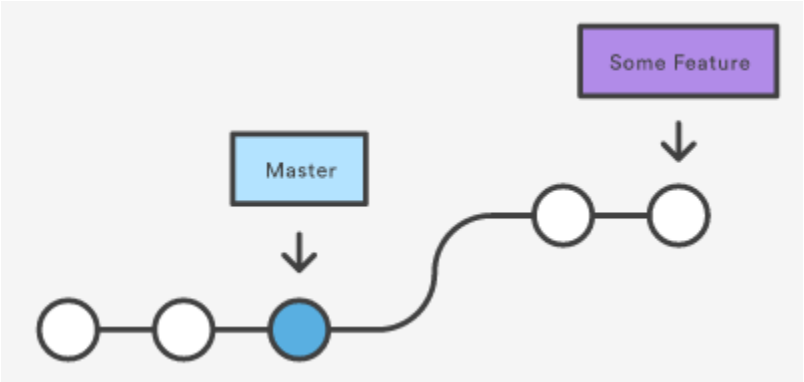
Merging is Git's way of putting a forked history back together again.

The **git merge** command lets you take the independent lines of development created by git branch and integrate them into a single branch.

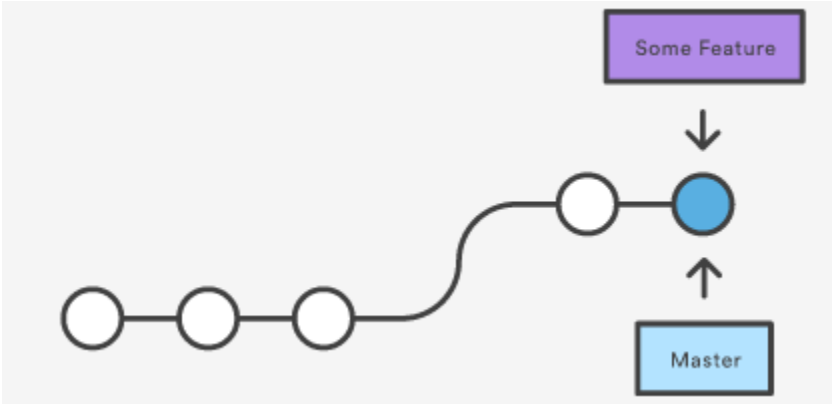
A **fast-forward merge** can occur when there is a linear path from the current branch tip to the target branch.

Instead of "actually" merging the branches, all Git has to do to ***integrate*** the histories is move (i.e., "fast forward") the **current branch** tip up to the **target branch** tip. This effectively combines the histories, since all of the commits reachable from the target branch are now available through the current one.

Before merging



After merging

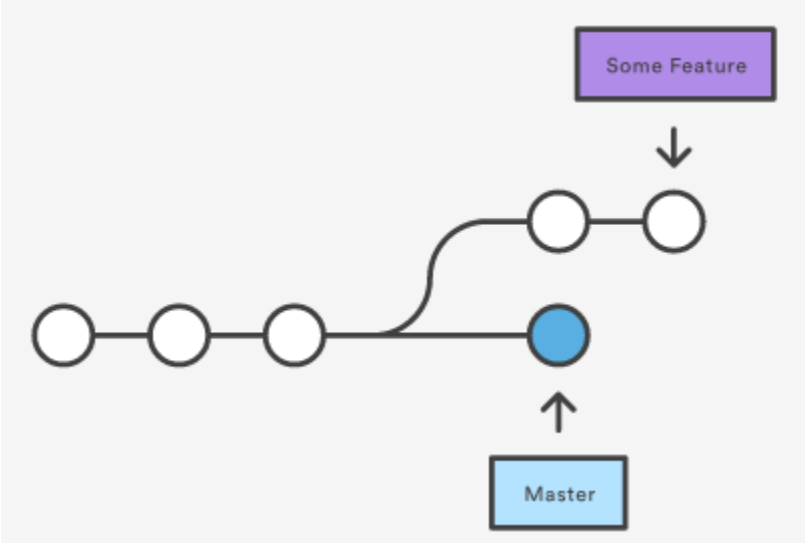


3-Way-Merge

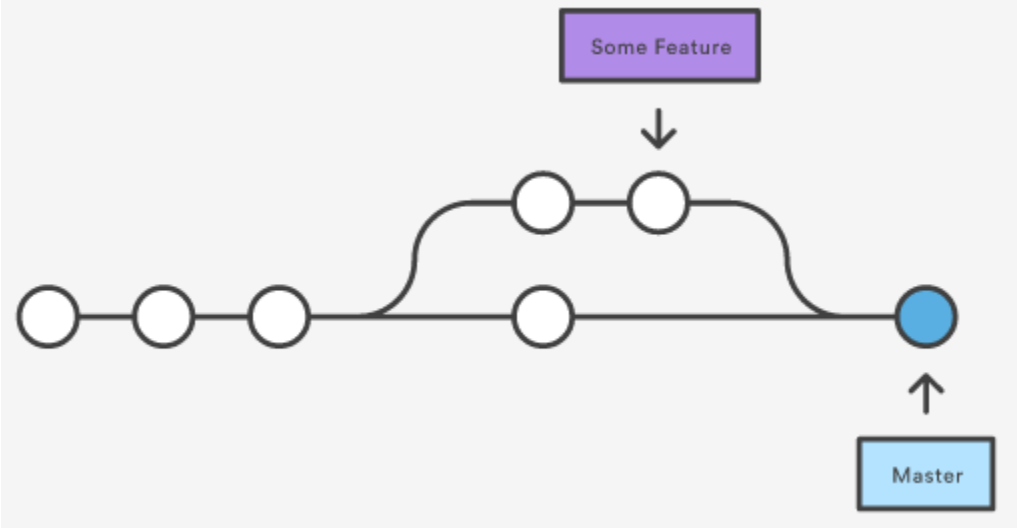
a fast-forward merge is not possible if the branches have diverged.

When there is not a linear path to the target branch, Git has no choice but to combine them via a **3-way merge**. 3-way merges use a dedicated commit to tie together the two histories. The nomenclature comes from the fact that Git uses three commits to generate the merge commit: the two branch tips and their common ancestor.

Before merging



After merging



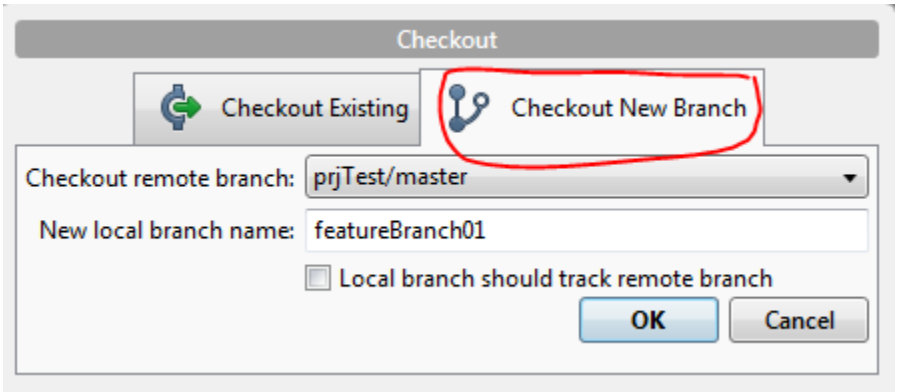
Fast-Forward Merge

Steps

Start a new feature

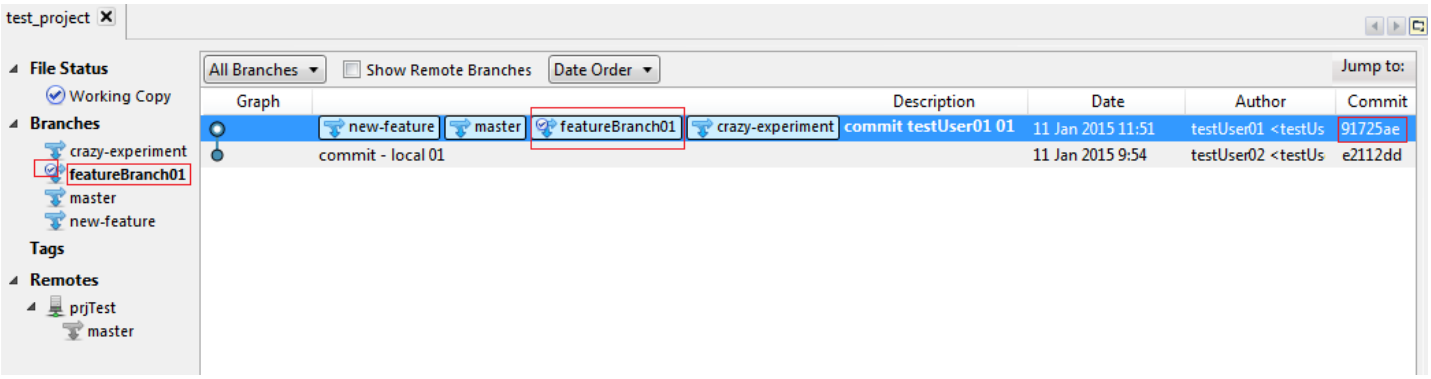
1. Click **Checkout** 

   Click **Checkout New Branch** tab

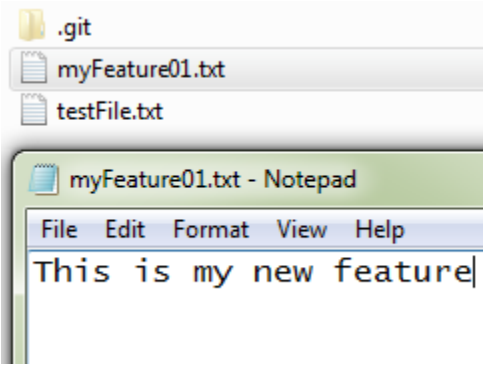


   Give a suitable name of the branch (e.g. **featureBranch01)**
   Click **OK**

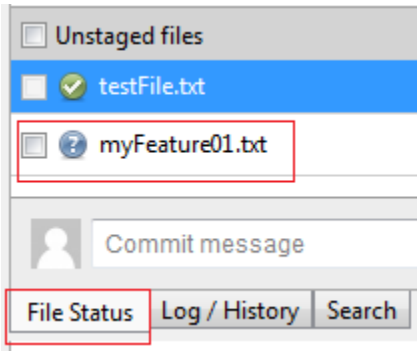
2. Newly created branch looks like below :



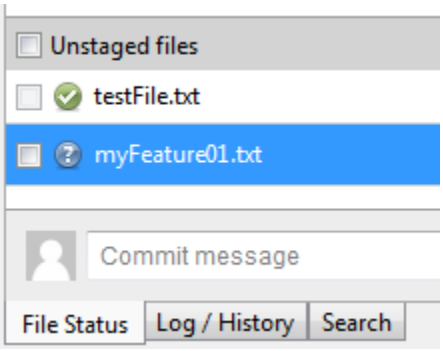
3. Create a file



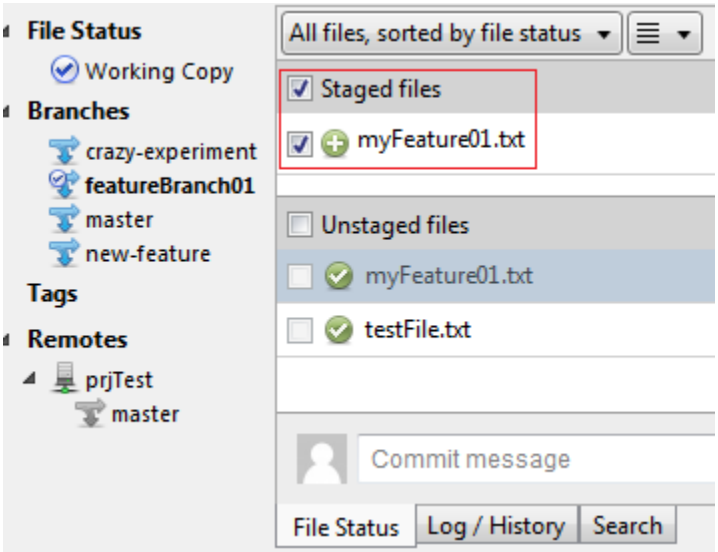
4. Newly created file will be in unstaged area



5. Select the file and click **Add for adding** 



6. File will be added to the staging area

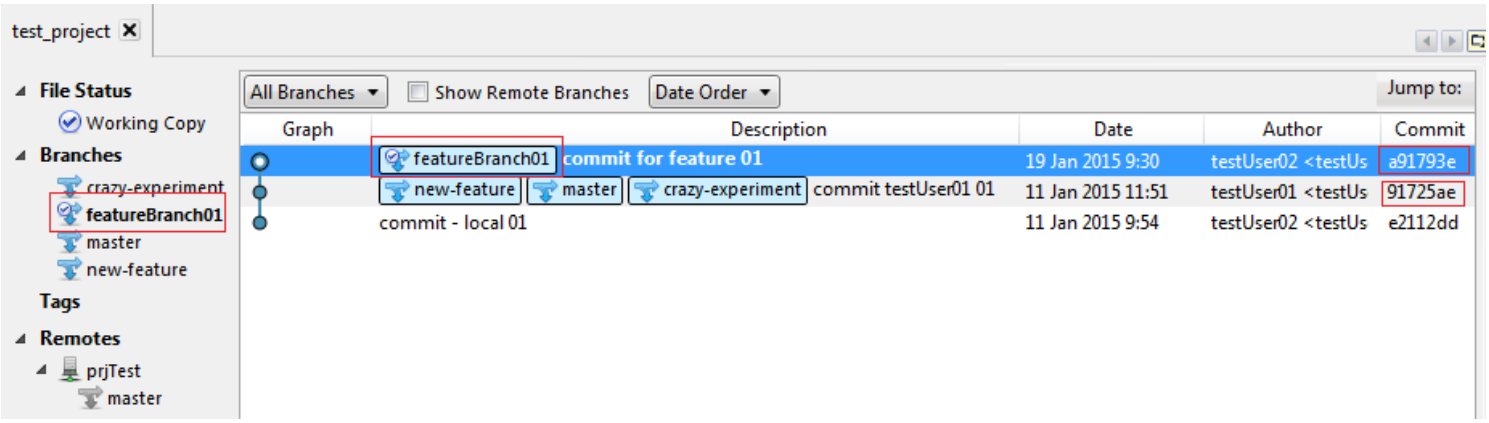


7. Click on **Commit** 

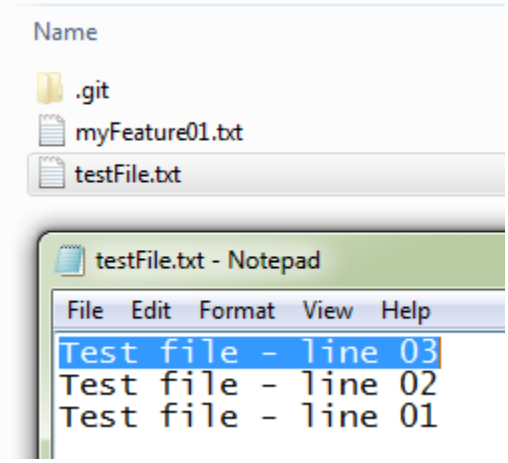
8. Write comment into the comment box

Click **Commit**

9. Log/History looks something given below

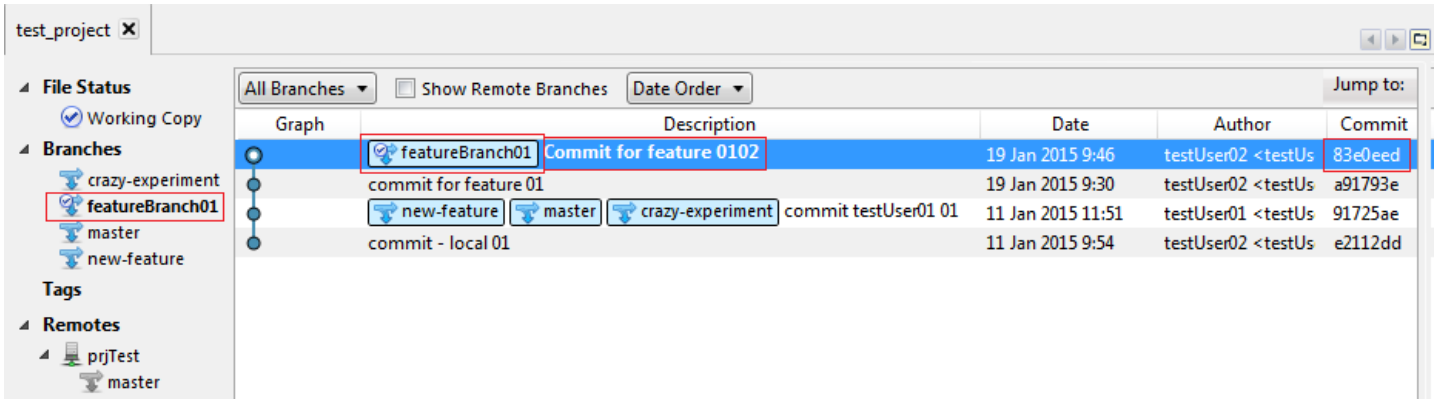


10. Modify some other file



11. Add the file and commit it as described before

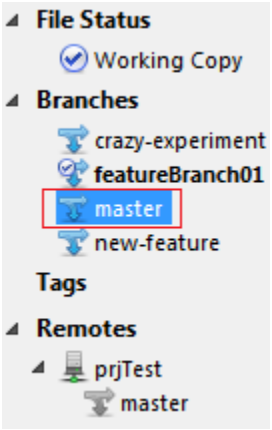
12. Log / History looks something like :



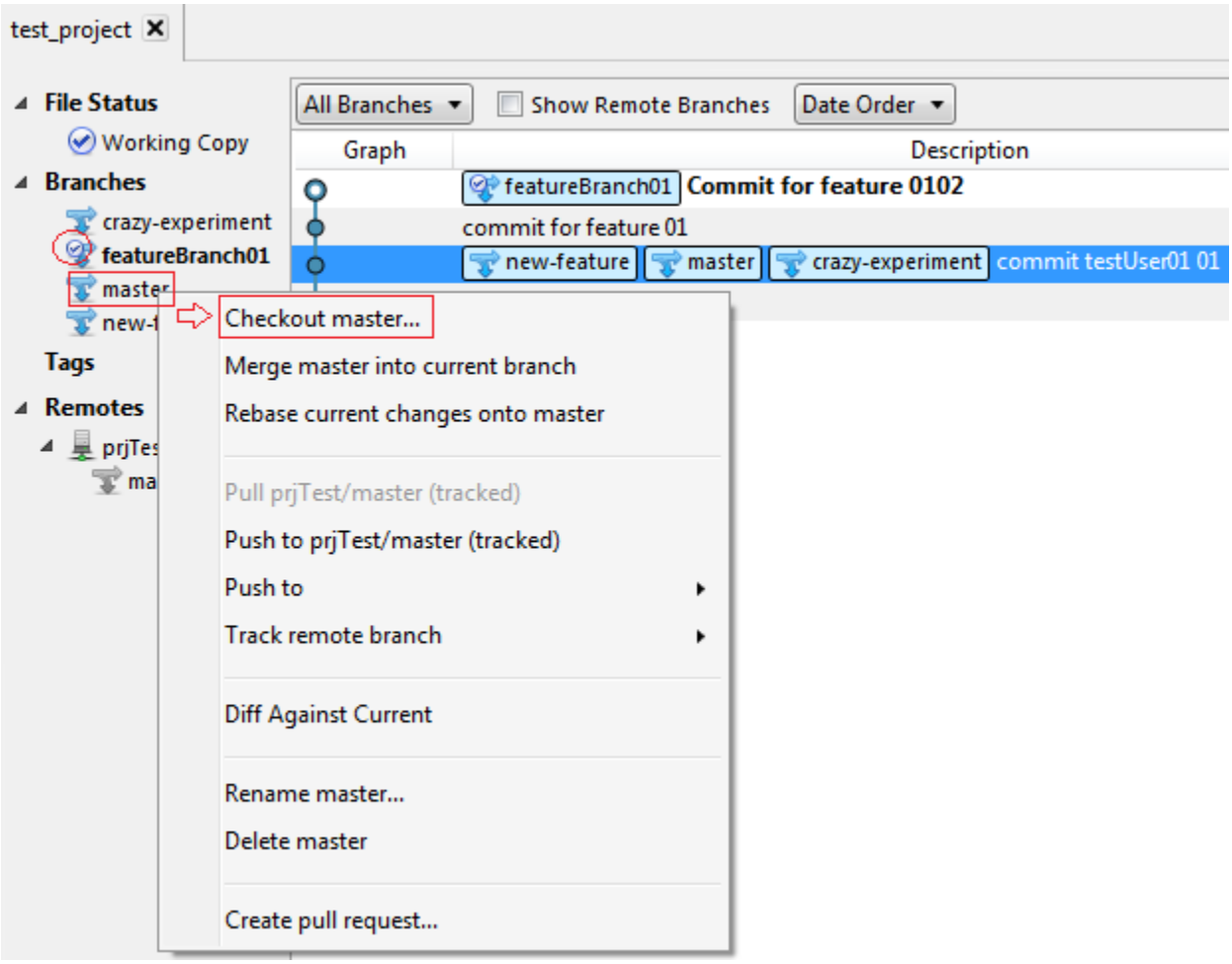
Merge in the new-feature branch

13. Checkout master

Select **Master** from Branches

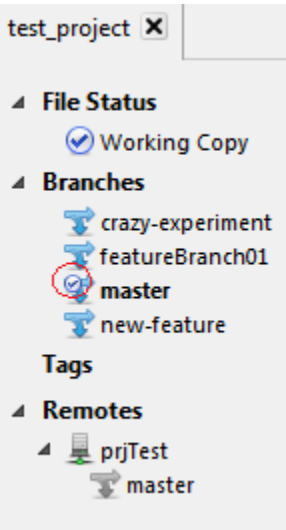


Right click after selecting master

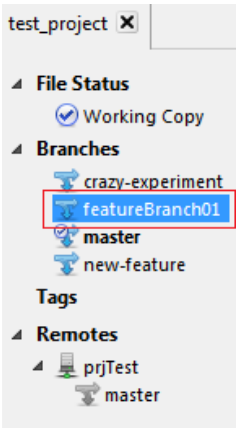


Click **Checkout master**

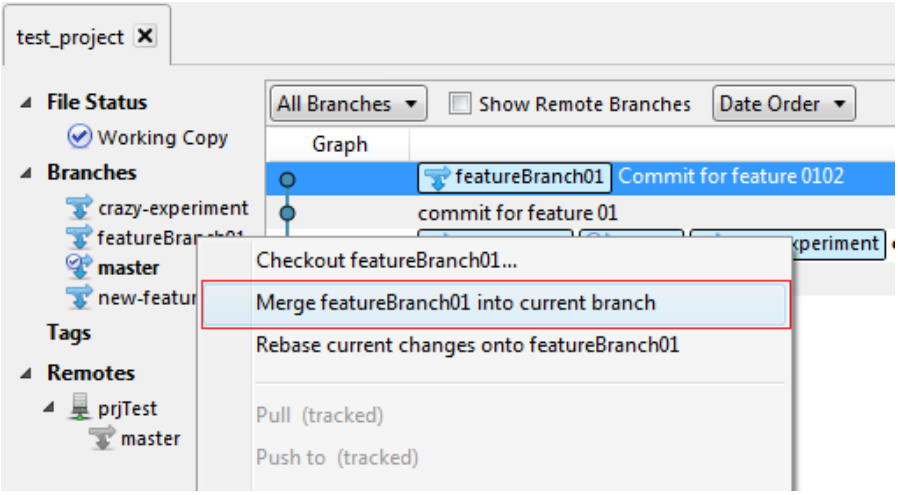
Branch view are shown below (mind the little arrow – shifted to master)



14. Select the **branch** you want to merge with master

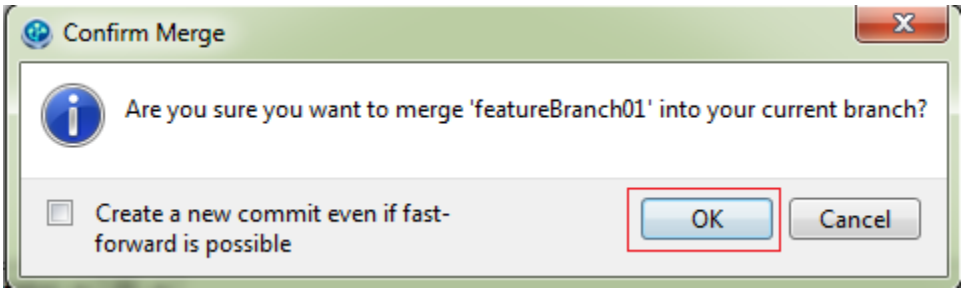


15. Right Click on selected branch

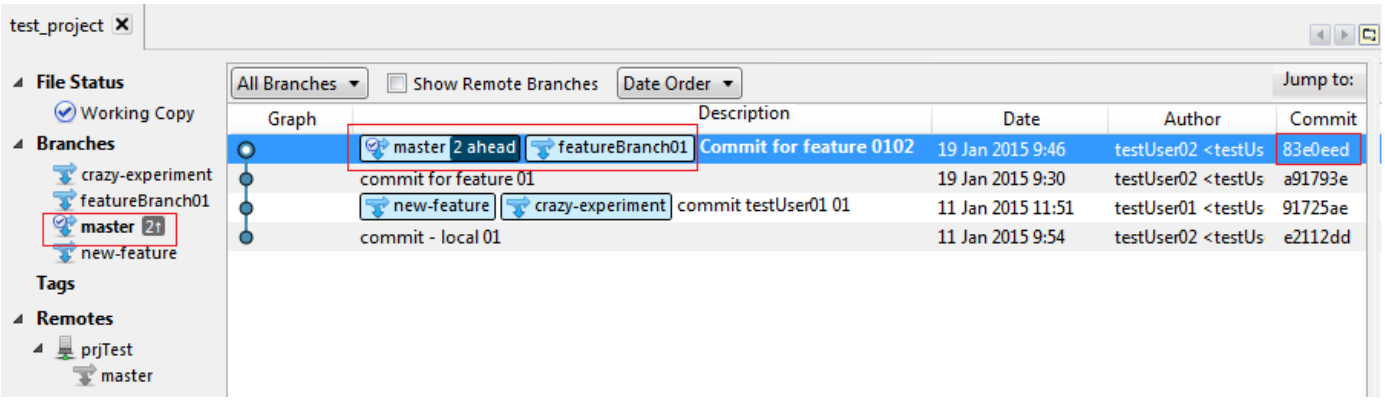


16. Click on the second option from the pull down menu i.e. **Merge <branch name> into current branch**

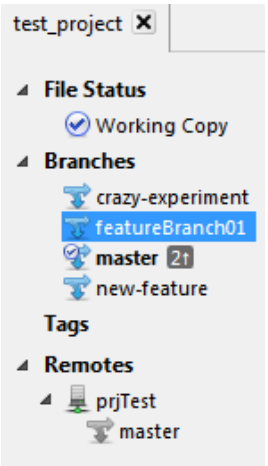
17. Click **OK** to the **Confirm Merge** dialogue box



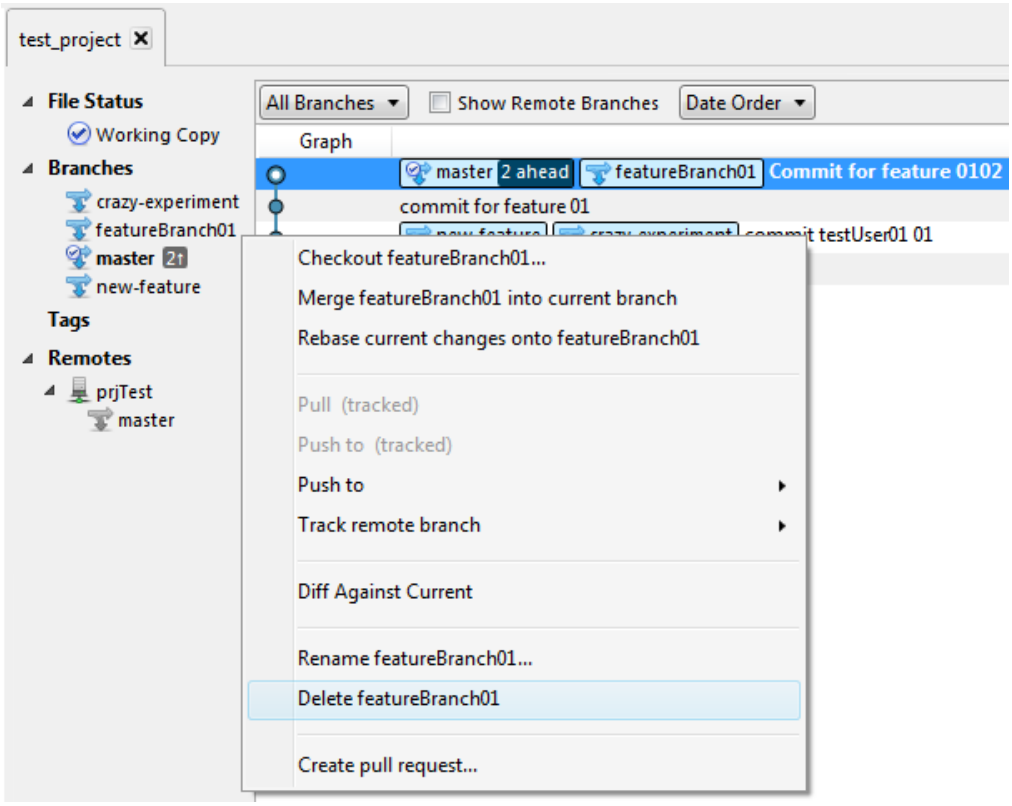
18. Log / History view will be something as shown below :



19. Now select the newly created branch (i.e. **featureBranch01**)

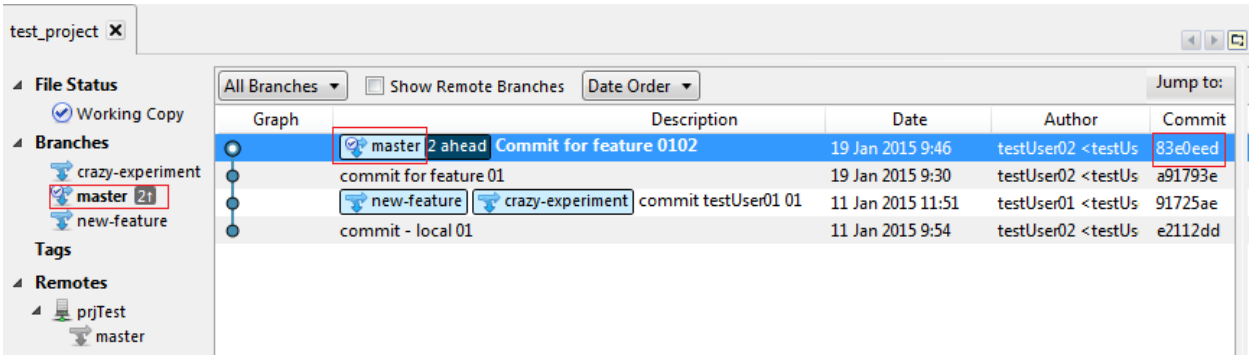


20. Right click and from pull down menu click on **Delete <branch name** i.e. featureBranch01**>**



21. Now click **OK** to confirm the delete

After delete Log / History view will be look something like this

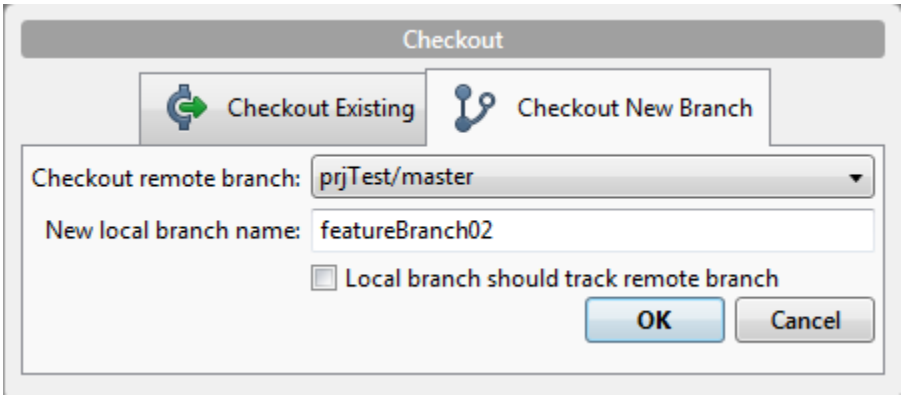


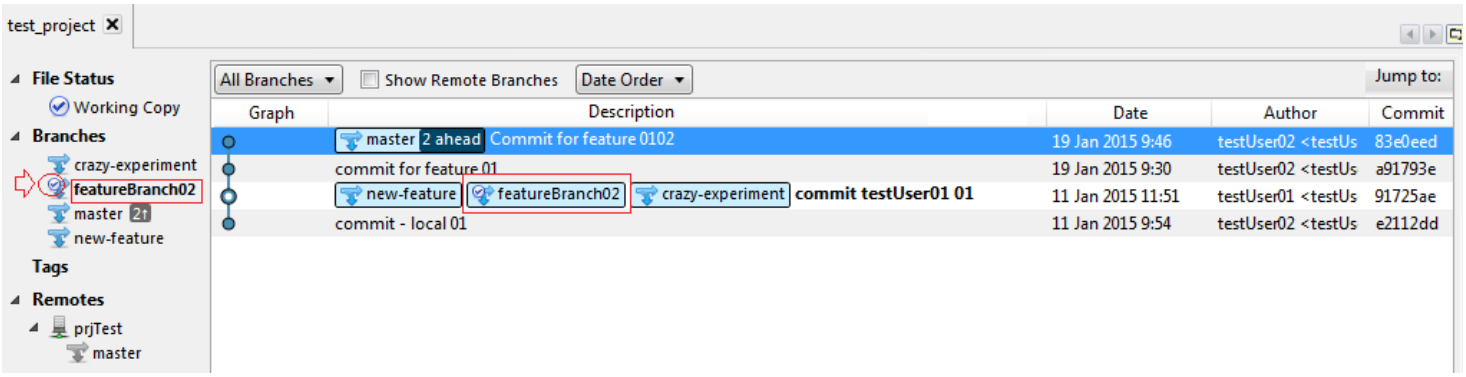
3-Way Merge

Steps

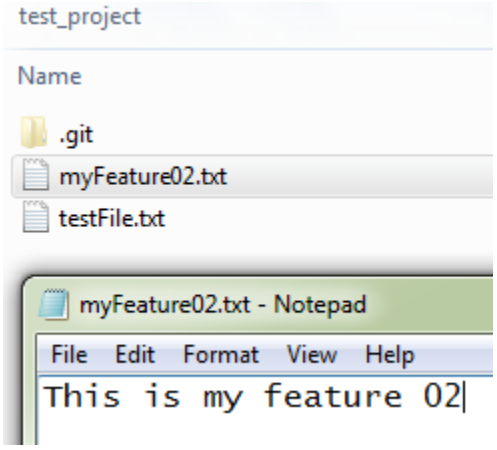
Start new feature

1. Create a new branch as discussed earlier (e.g. featureBranch02) using checkout 

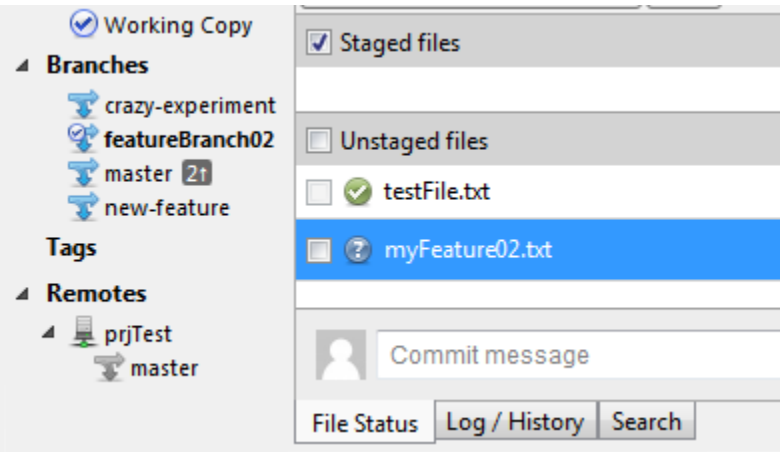




2. Create a new file (e.g. myFeature02.txt)

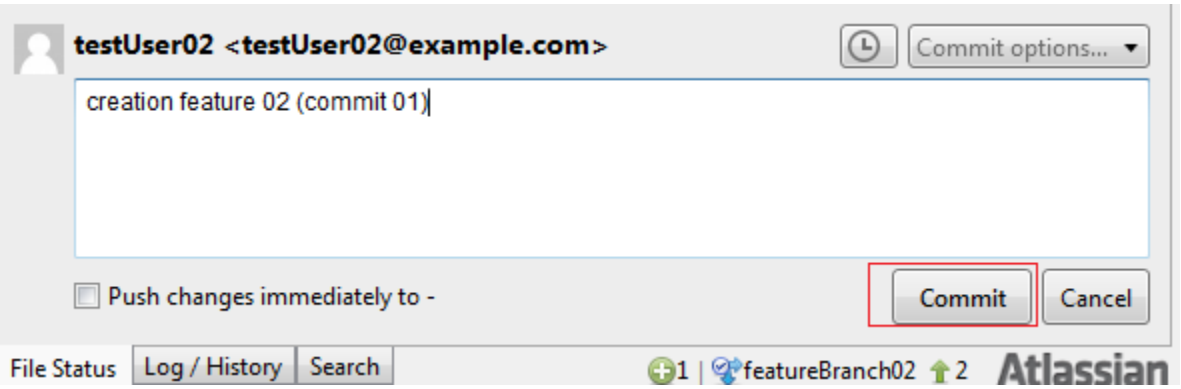


3. File will be Unstaged area

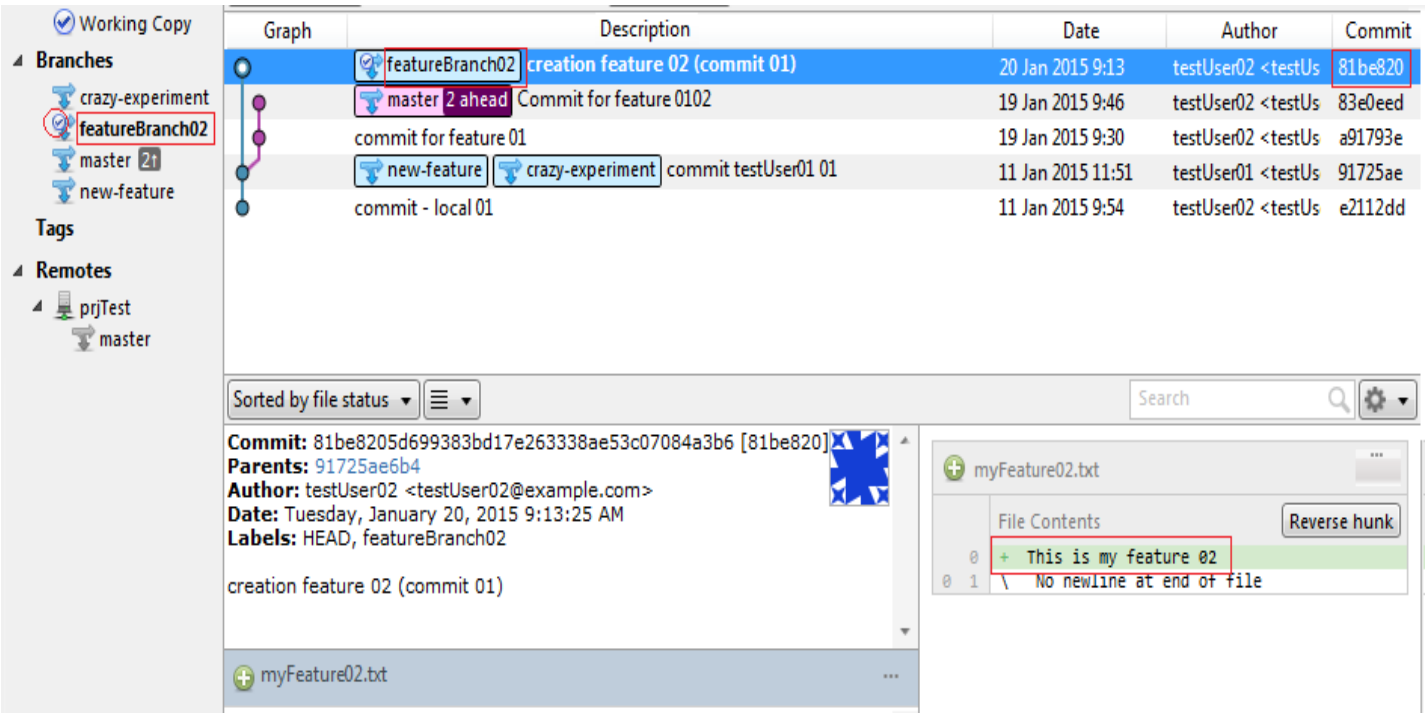


4. Add the file to staged area using **Add** 

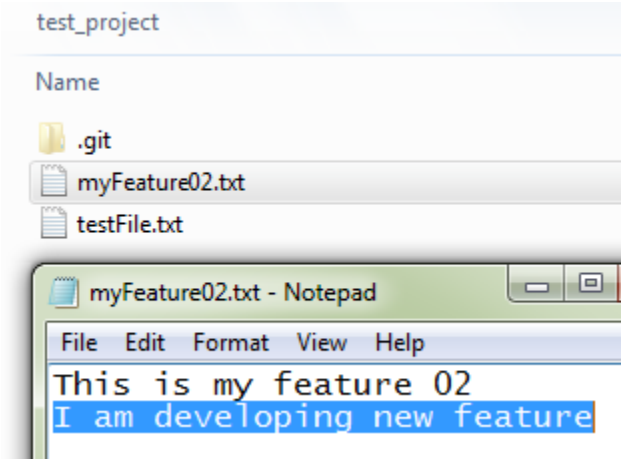
5. Commit the file using 



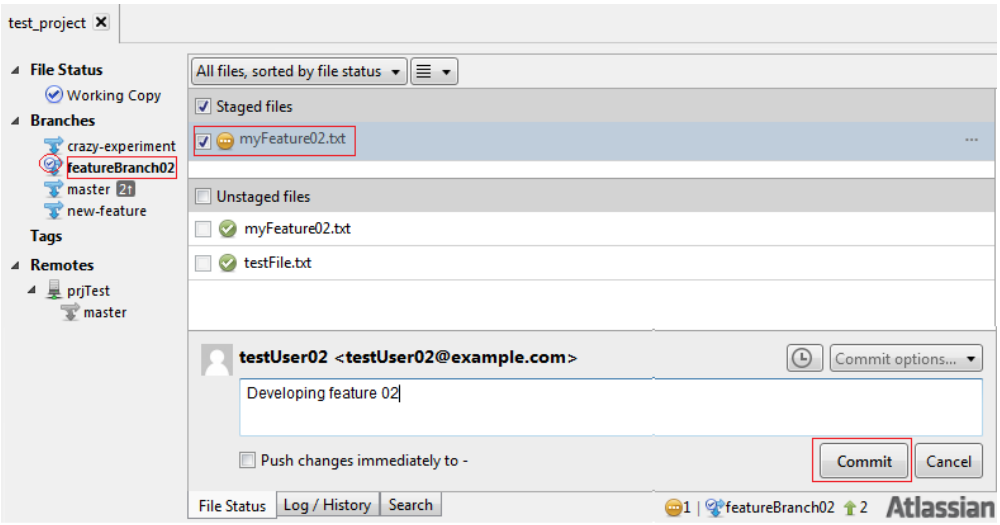
6. Log / History view

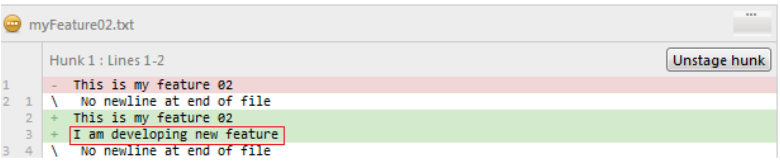


7. Modify the newly created text file (e.g. myFeature02.txt)

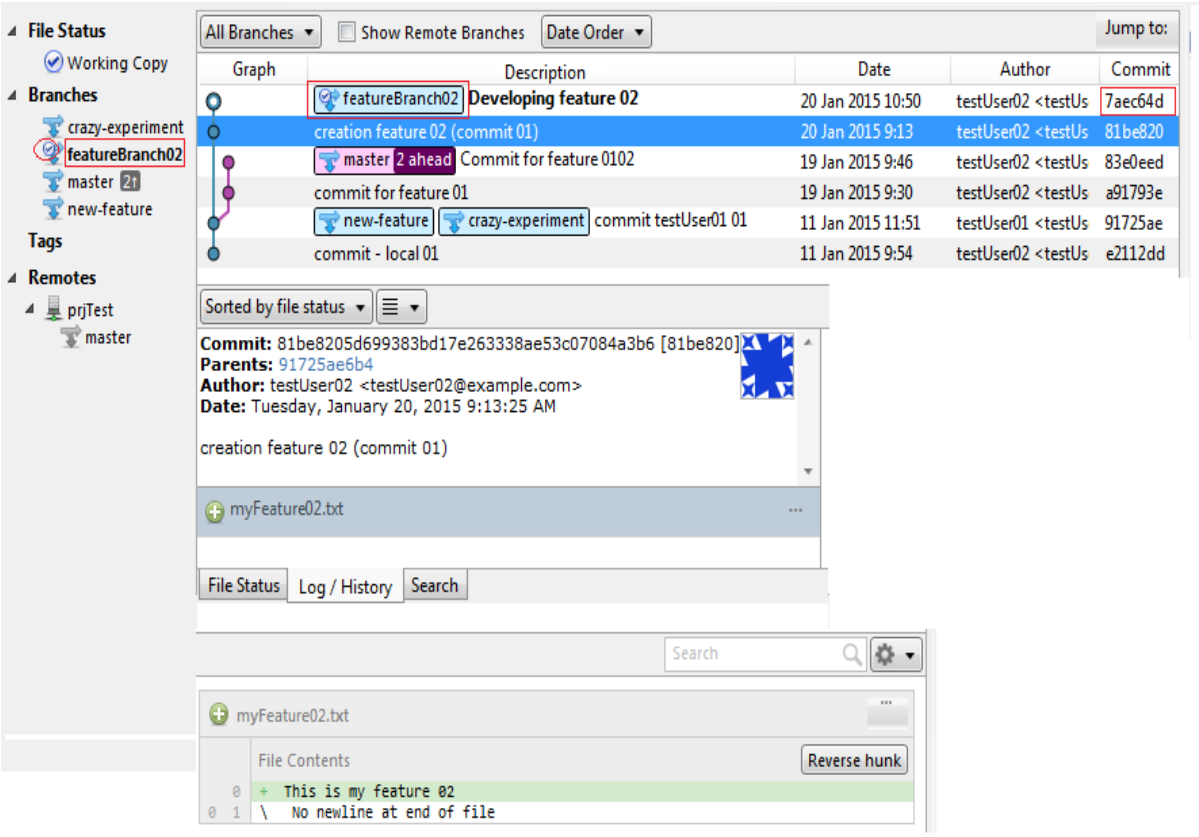


8. Add the file using Add 



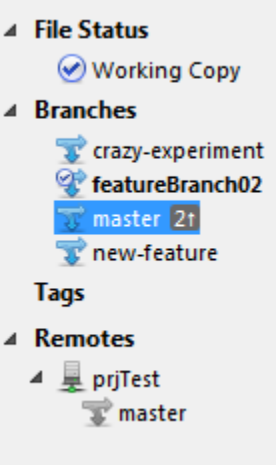


9. Commit the changes
   After commit the Log/History view

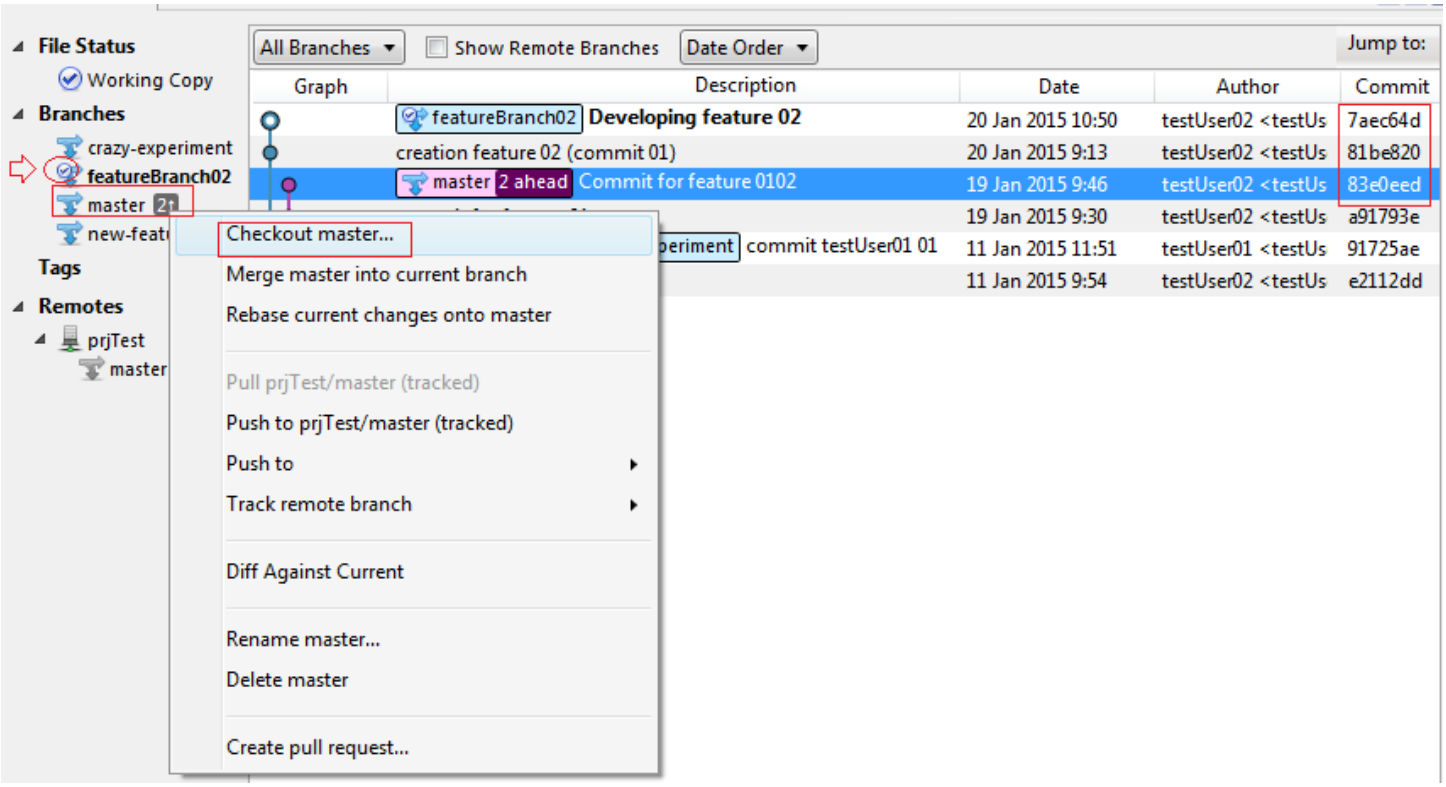


Merge in the new-feature branch

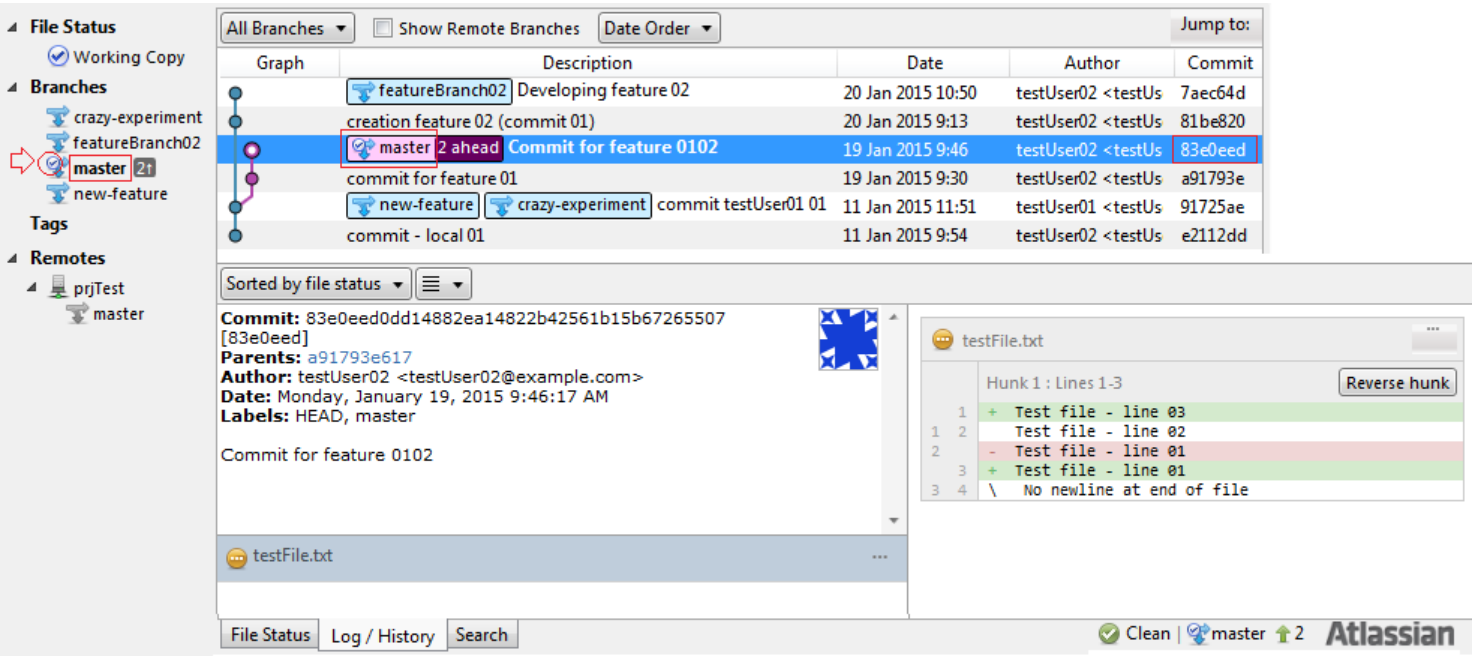
10. Point to **master**
    a. Select **Master**



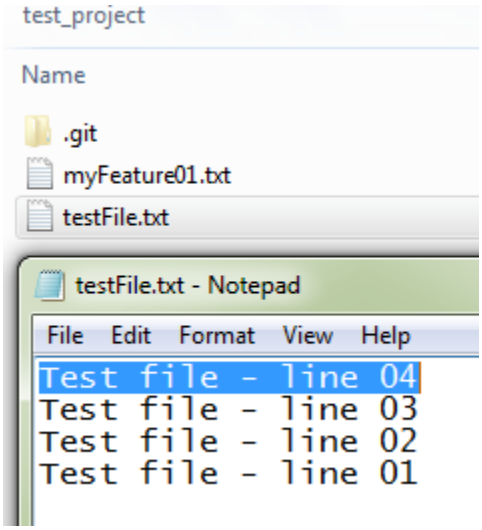
    b. Right Click; and Click **Check Out Master** from the pull down menu



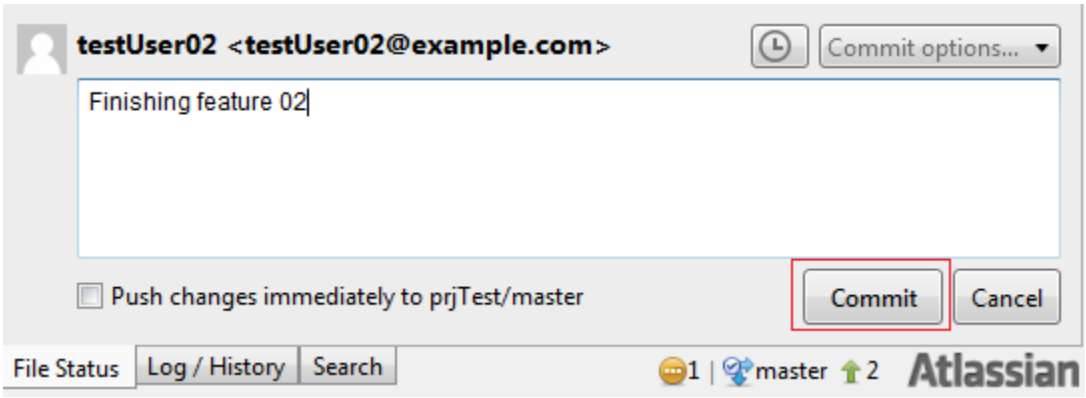
c. Log / History view



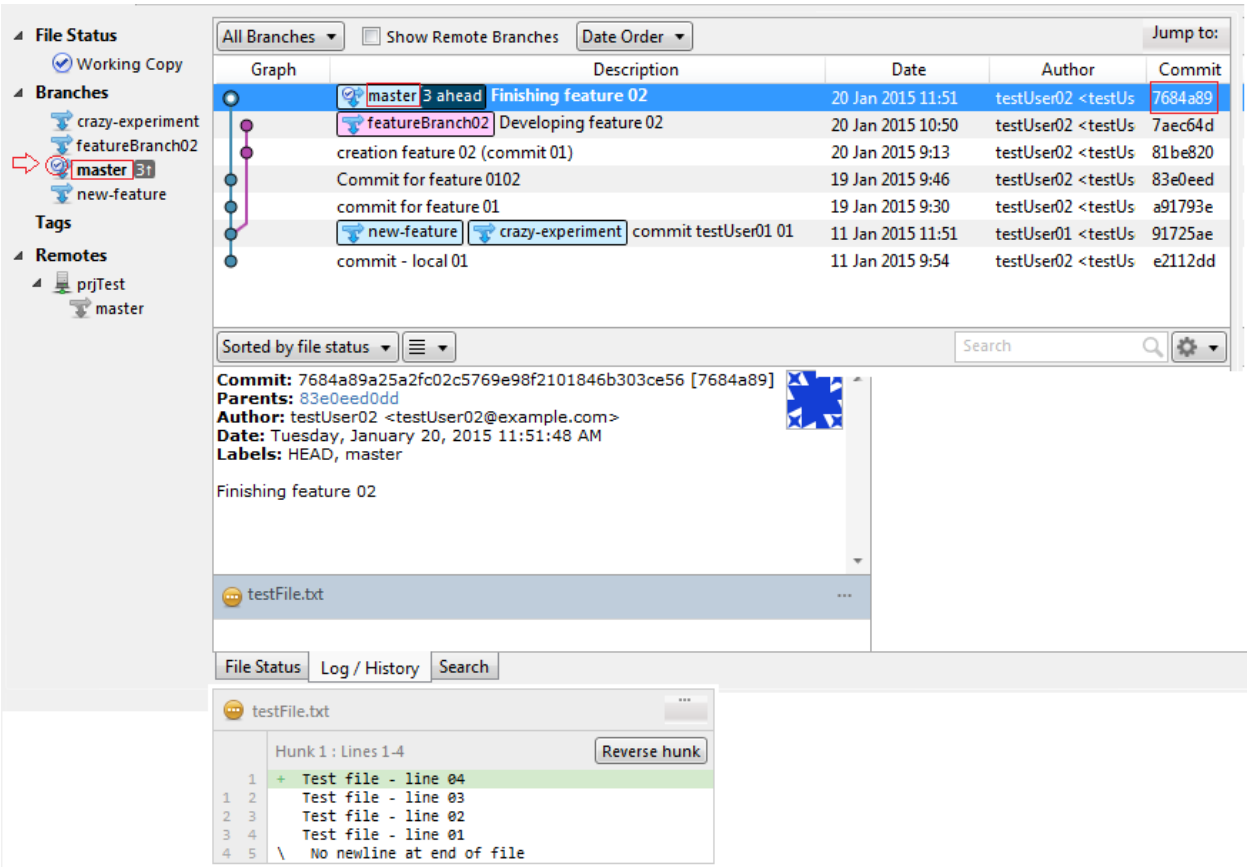
11. Save some changes in any file (e.g. testFile.txt)



12. Add the changes using **Add**
13. Commit the master using **commit**

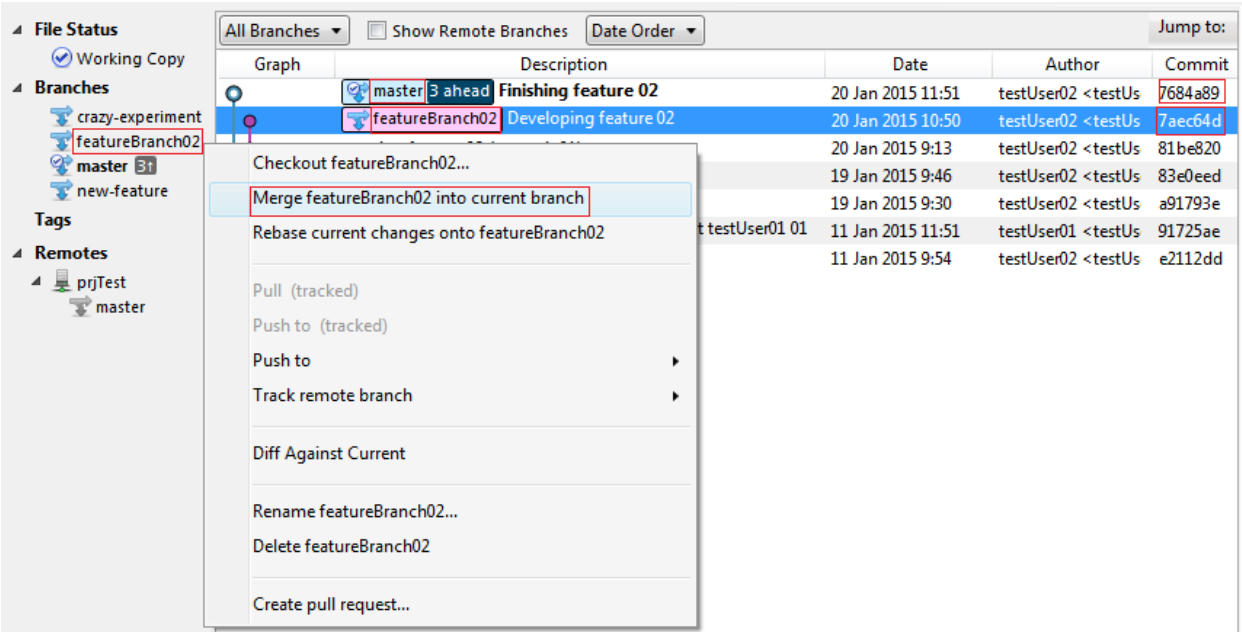


14. Log / History status

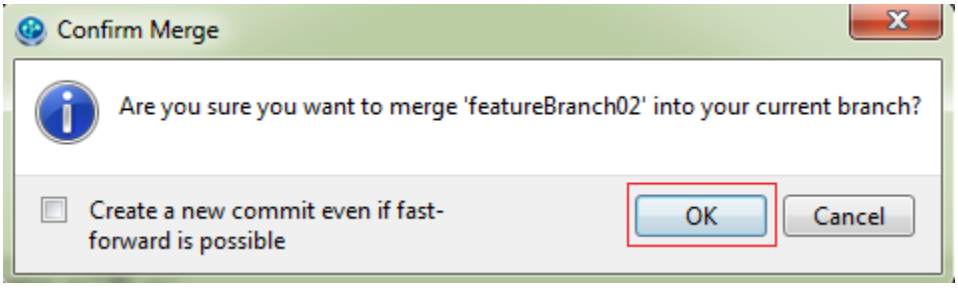


Merge with earlier created branch (e.g. featureBranch02)
Select the required branch (e.g. featureBranch02)

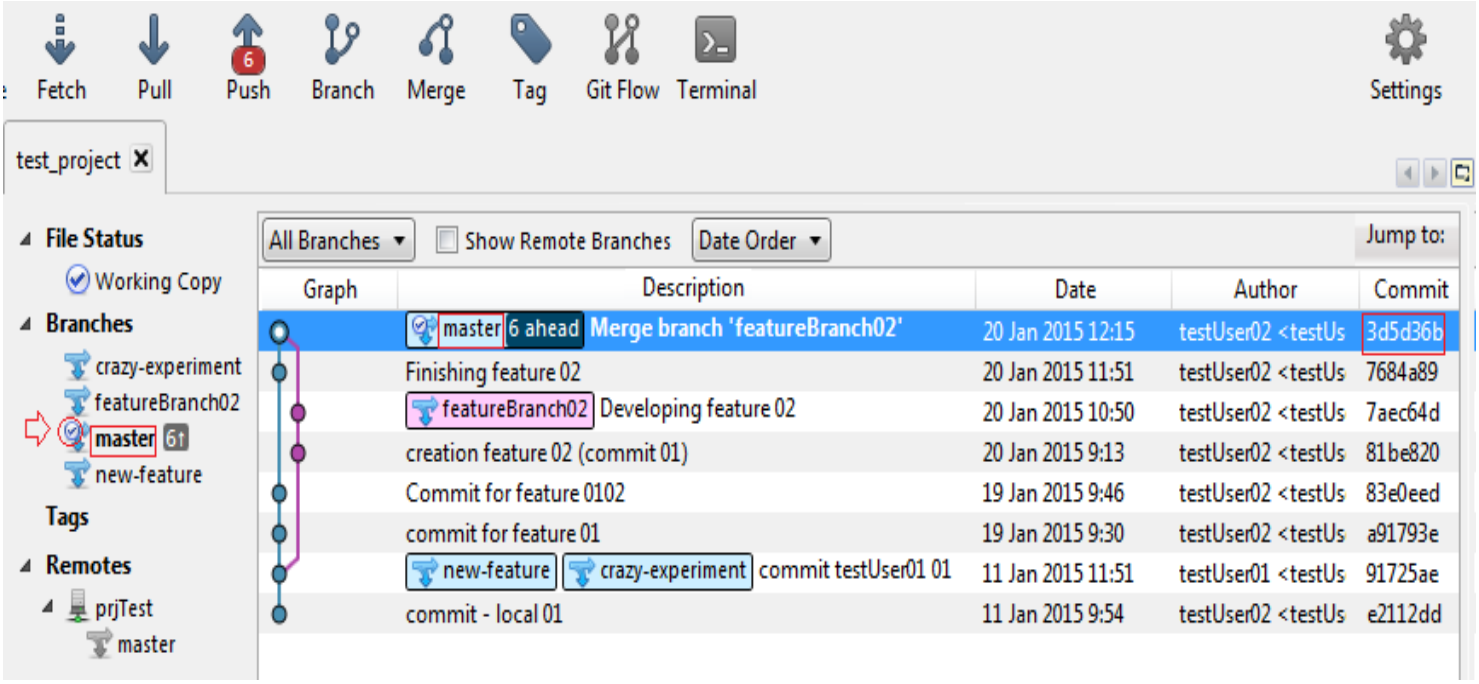
15. Right click and from pull down menu select **Merge <branch name> into current branch** (e.g. here branch name used is featureBrach02)



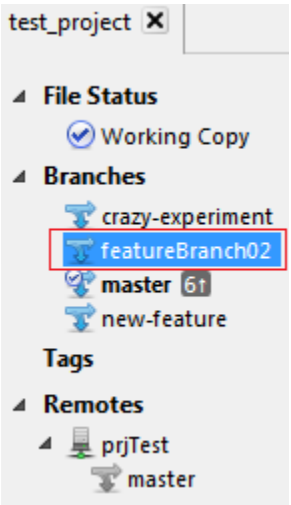
16. Click on **OK** on Confirm Message dialogue



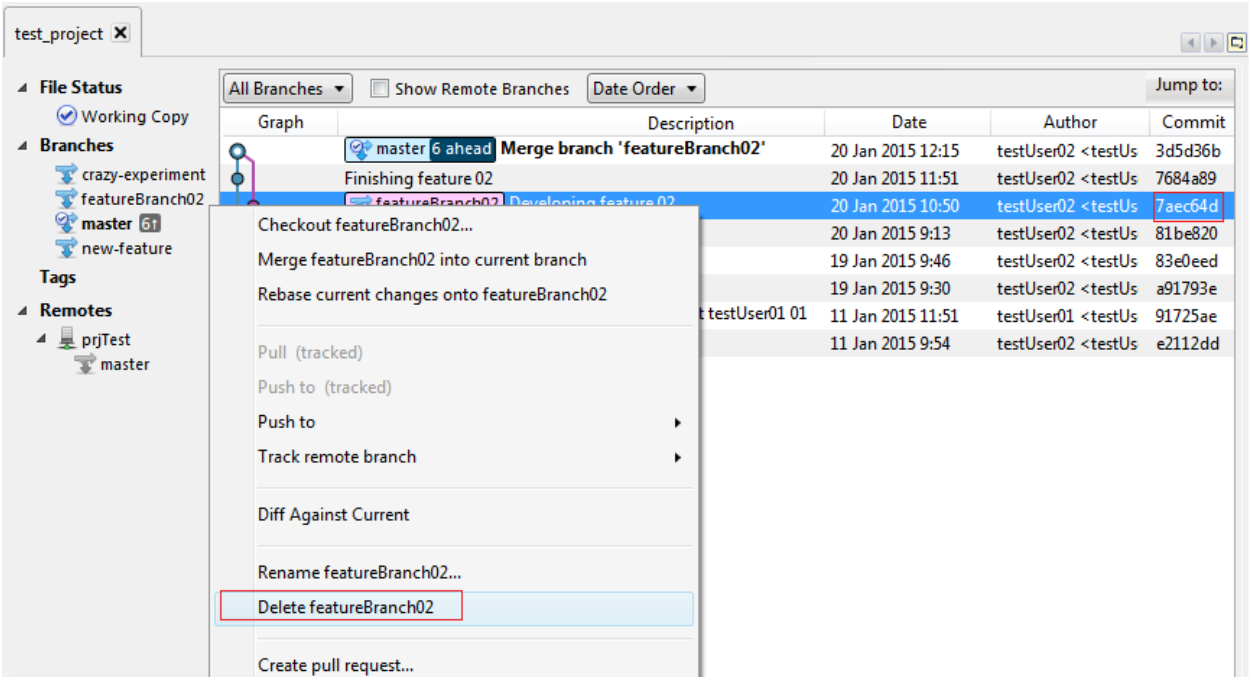
17. Log/History View



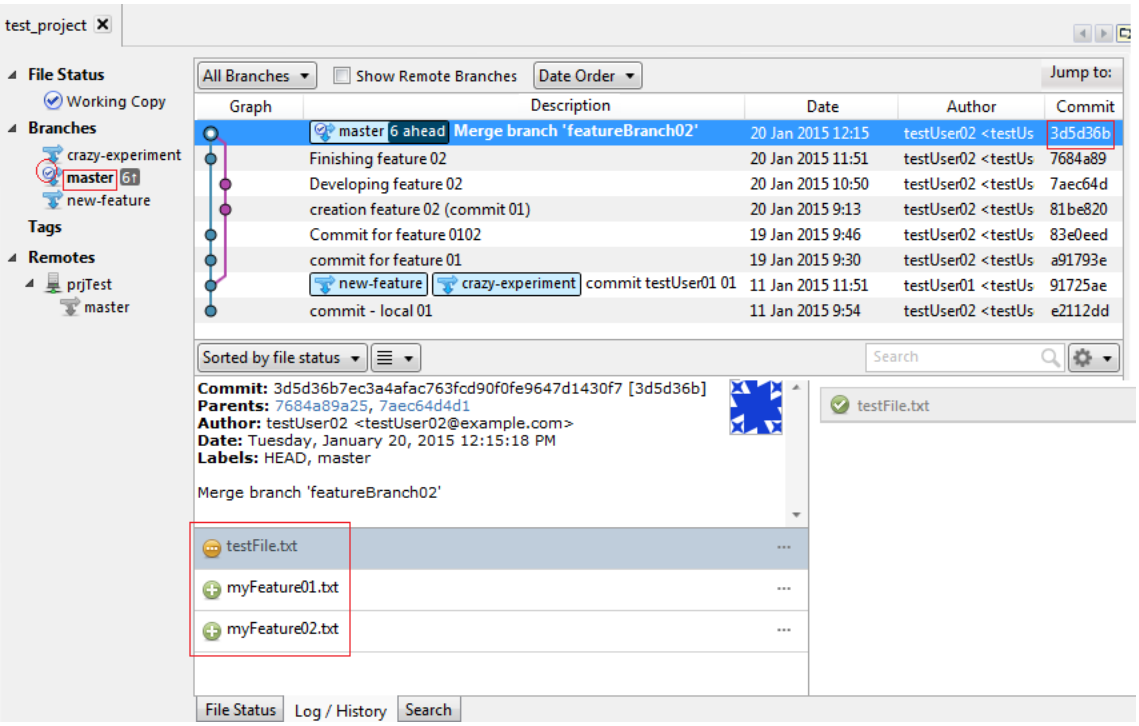
18. You might delete the branch you created earlier (e.g. featureBranch02)
19. Select the branch to be deleted (e.g. featureBranch02)



20. Right click and from pull down menu select **Delete <branch name>** (e.g. branch name for this example is featureBranch02)



21. Click on **OK** to confirm branch deletion
22. Log / History View



References :

1. https://www.atlassian.com/git/tutorials/
2. http://git-scm.com/
3. http://www.sourcetreeapp.com/
4. https://about.gitlab.com/