

PH502: Scientific Programming Concepts

Irish Centre for High End Computing (ICHEC)

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- The second useful utility is version control.
- If many people are working on a project then it is important that everyone has access to the latest version.
- Also if mistakes are made or files deleted, files can be rolled back or replaced.
- Many online software teams use version control.

- Version control is especially important when software is being maintained by a group.
- Each author has a local set of files and a snap shot of the files contained in a repository. If changes are made to the files then they differ from the repository snap shot. The repository can be updated giving a new snap shot. A record of modifications are maintained within the repository enabling a return to previous versions.
- There are a number of version control packages: cvs, svn, git, mercurial, bazaar, monotone and libresource. At ICHEC we use git.
- Here we will focus on the command line interface to “git”. A git repository can be created within a directory. All files and subdirectories that are part of the repository will be version controlled.

- Below is a table of some git commands. These can be used to maintain a local git repository.

Command	Function
git init	create repository
git add/rm	add remove files in repo
git commit	commit the modifications to the repo
git tag	tag the current committed version
git checkout	take file from repo
git log	check the committed changes to the repo
git diff	see changes from the repo version
git status	shows file changes from repo

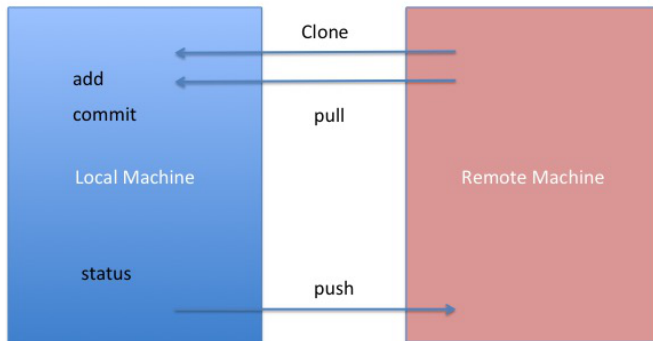
- It is possible to have the repository in a different location. In this case both the local repository and remote one need to be aligned.

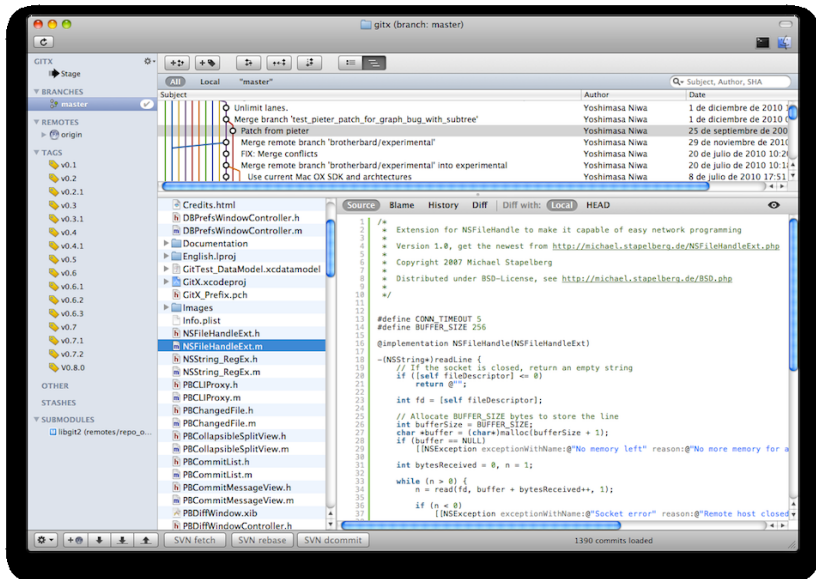
Additional commands are:

Command	Function
git clone	clone central repo locally
git pull	get latest version from central repo
git push	synchronize local repo with centre

- An example of using git

```
# Make sure up to date with remote repo
git pull
# Edit prog.c and make but changes cause error
# Return to the original
git checkout prog.c
# Edit and make, this time successful
# Commit changes and push to remote repo
git commit -m "Fixed bug" prog.c
git push origin master
```





- on the command line: 'git --help' or 'man git'
- Git documentation: git-scm.com/documentation
- Online courses at Udacity, Coursera
- GitLab: free private git repository host