MONASH University

FIT2107-Software Quality & Testing

Lecture 8 – GIT and Continuous Integration

6th October 2020

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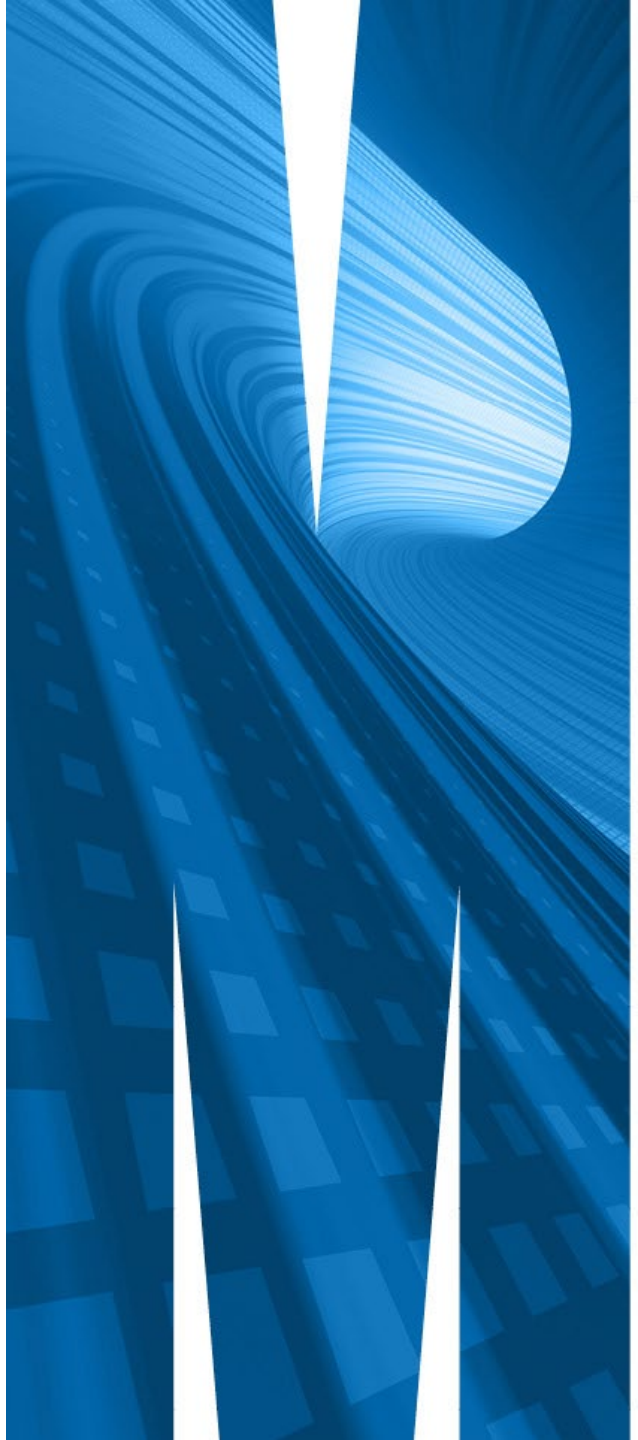


Announcement

- Quiz 4 is due this Friday.
- Check Moodle discussions for more announcements

Outline

- Part A
  - Introduction to GIT
  - How to use GIT?
  - Git Terminologies
    - Commit
    - Pull
    - Push
    - Clone
    - …
- Part B
  - continuous integration in Gitlab

PART A:
INTRODUCTION TO GIT

REFER TO MY READING RESOURCE & VIDEO ON
HOW TO USE GIT ON MOODLE.

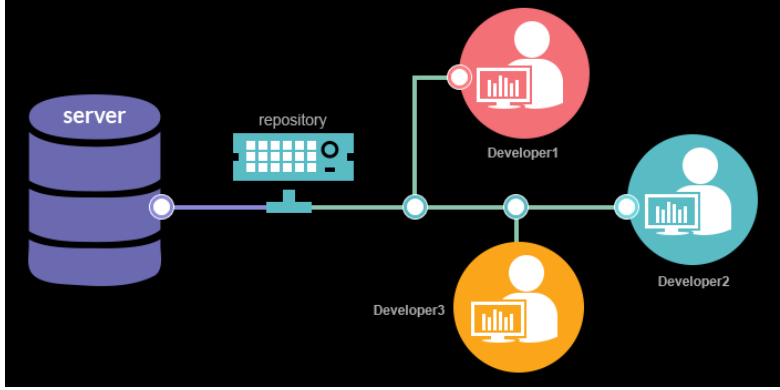
Software are Persistent?

- Yes!
- Software can have a VERY long life.
- Developers need to retrieve and modify VERY old versions of software on occasion.

Day to Day as a Developer

- Software is built by teams of people working on the system simultaneously.
- Simultaneous changes.
- Integrations
  - ensure that the changes that each developer makes are shared with their colleagues quickly.
  - Continuous Integration
- Track Changes.
- Development
- Testing
- Enhancements
- Agile

Version Control Systems (VCS)

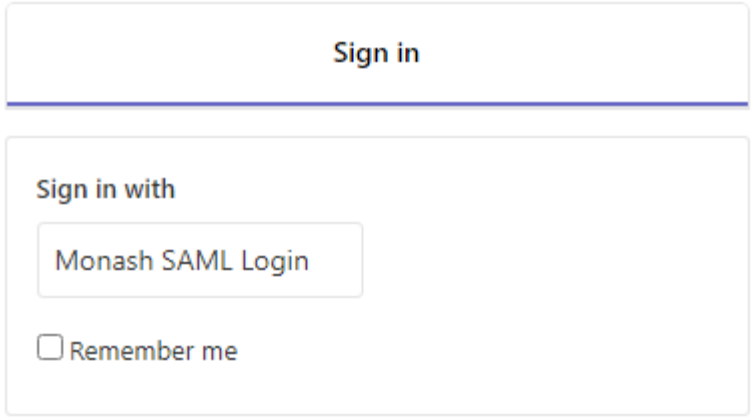


- Software responsible for managing changes
- Configuration Management.
- Standalone
  - CVS
  - SVN
- Distributed
  - GIT
  - BitBucket

GIT

- GIT was developed in 2005 by Linus Torvalds for Linux Kernels.
- Traditionally, one central server maintained a copy of all revisions.
  - developers only kept a copy of the particular version they were working on at any given moment.
- In GIT every client can act as a server!
- https://git-scm.com/
- Github
- BitBucket
- Gitlab
- Almost all major IDEs support VCS.

GIT Infotech



- Monash provides it own Git Server
- https://git.infotech.monash.edu/
- Customised GitLab.
- Project Repositories are provided.

- https://www.alexandriarepository.org/module/introduction-to-version-control-with-git/

GIT Terminologies/Commands

- CLONE
  - You clone the Git repository as a working copy.
  - It is also called a local copy.
- PULL
  - Update the working/local copy by taking other developers changes.
- COMMIT
  - Commit changes i.e. update the changes to the local copy.
- PUSH
  - push the changes to the remote repository.
- And many other…

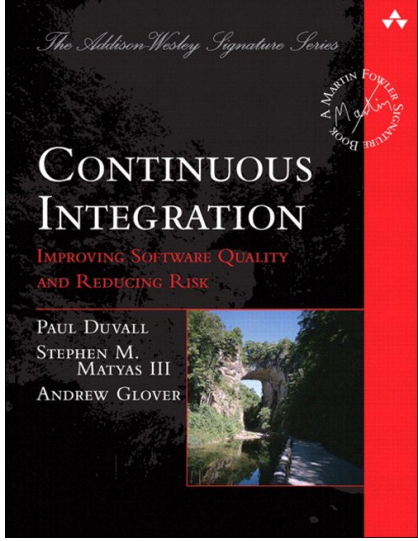
Common Git Commands

- $git config
- $git init
- $git clone <path>
- $git add <file_name>
- $git commit
- $git status
- $git remote
- $git checkout <branch_name>
- $git branch
- $git push
- $git pull
- $git merge <branch_name>
- $git diff
- $git reset
- $git revert
- $git tag
- $git log

PART B:

CONTINUOUS INTEGRATION IN GIT

Continuous Integration (CI)



- Continuous Integration (CI) is a development practice where developers integrate code into a shared repository frequently, preferably several times a day.
- Each integration can then be verified by an automated build and automated tests.
- While automated testing is not strictly part of CI it is typically implied.
- Continuous Integration doesn’t get rid of bugs, but it does make them dramatically easier to find and remove.

CI on GIT

- Trigger an automated build of the system when a new revision is checked in
- Run tests (and possibly analyse test coverage) on the new build.
- Make the results of running those tests conveniently available.
- How??
  - YML which stands for YAML Ain't Markup Language
  - .gitlab-ci.yml


QUESTIONS
ANSWERS