Git Intro

Information mostly from Pro Git

Attribution

- Slides attributed to Dr. Cyndi Rader. The original version can be found at http://eecs.mines.edu/Courses/csci306/CHAPTERS/Git/GitIntro.ppt
- Figures and info for this lecture come primarily from Pro Git, available: http://www.git-scm.com/book/en/v2
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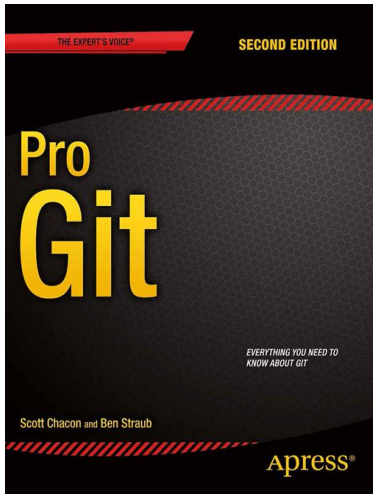
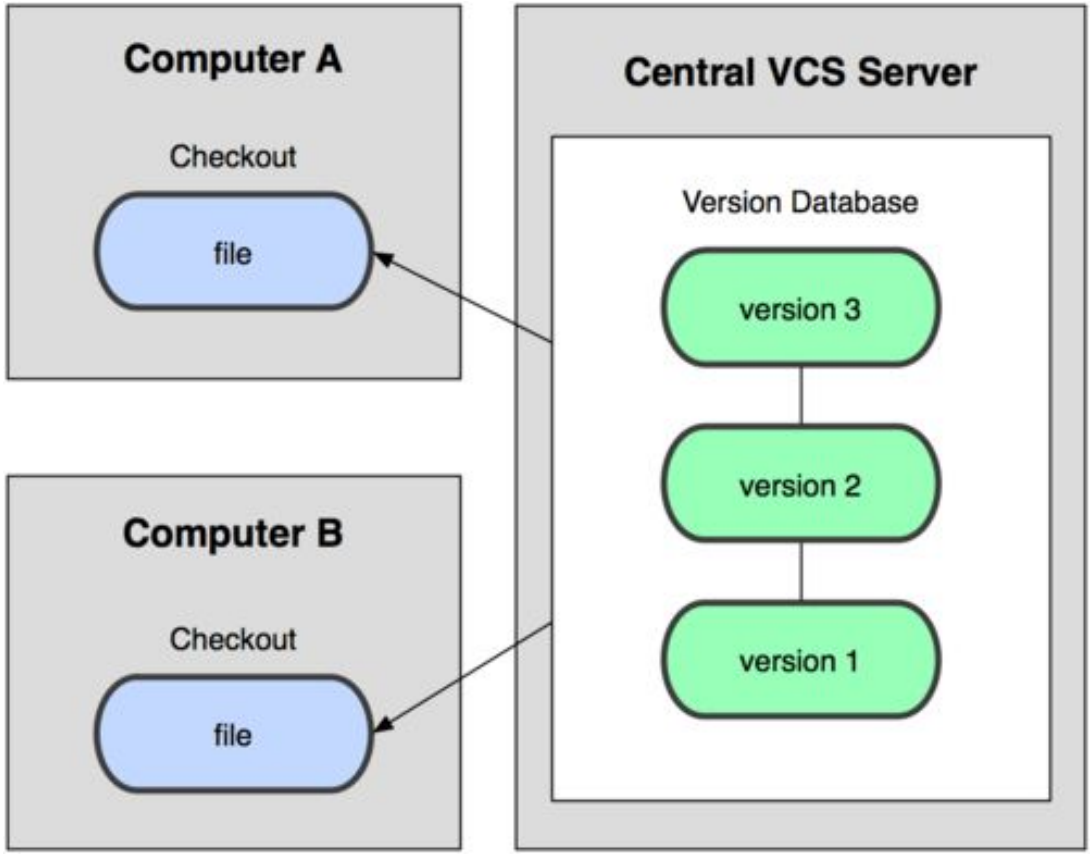


Book available online for free at: http://git-scm.com/book/en/v2

What is version control?

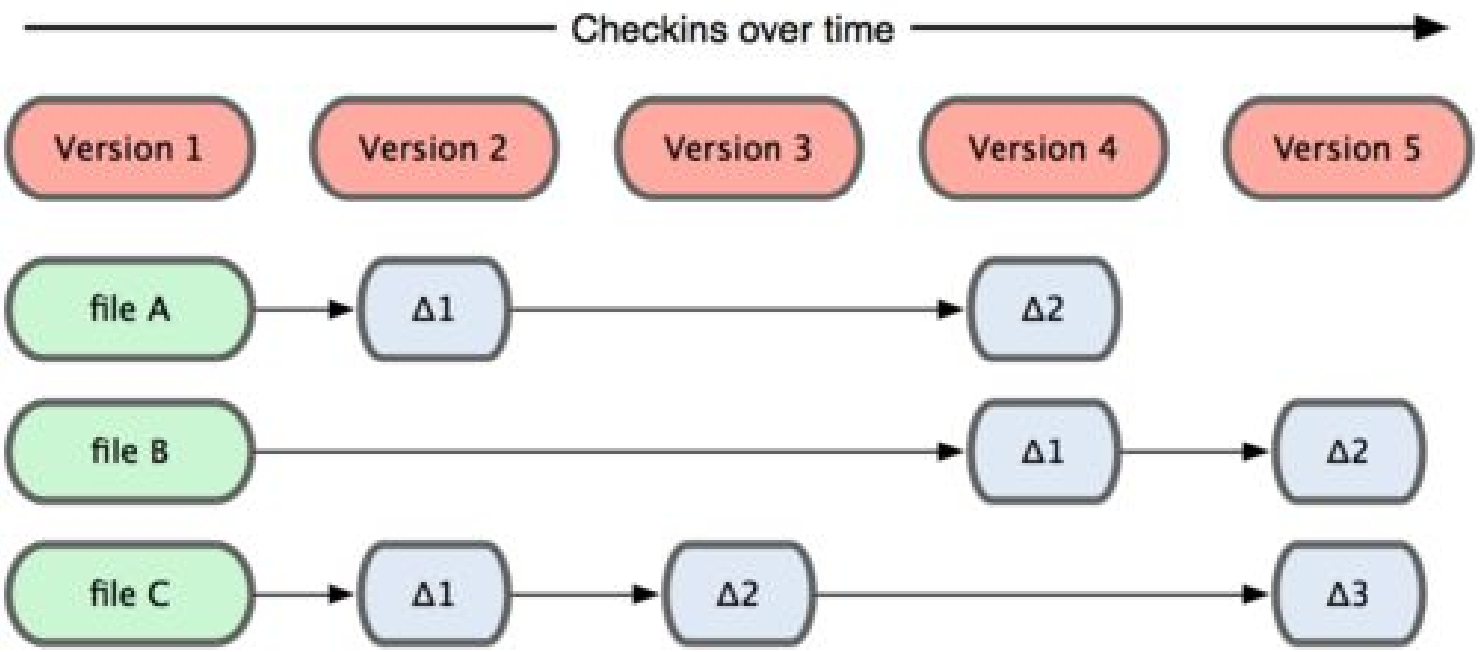
- Basic functionality:
  - keep track of changes made to files (allows roll-backs)
  - merge the contributions of multiple developers
- Benefits:
  - facilitates backups (allows you to go back to a previous state)
  - increased productivity (vs manual version control)
  - encourages experimentation (branching)
  - helps to identify/fix conflicts
  - makes source readily available – less duplicated effort

Centralized Version Control

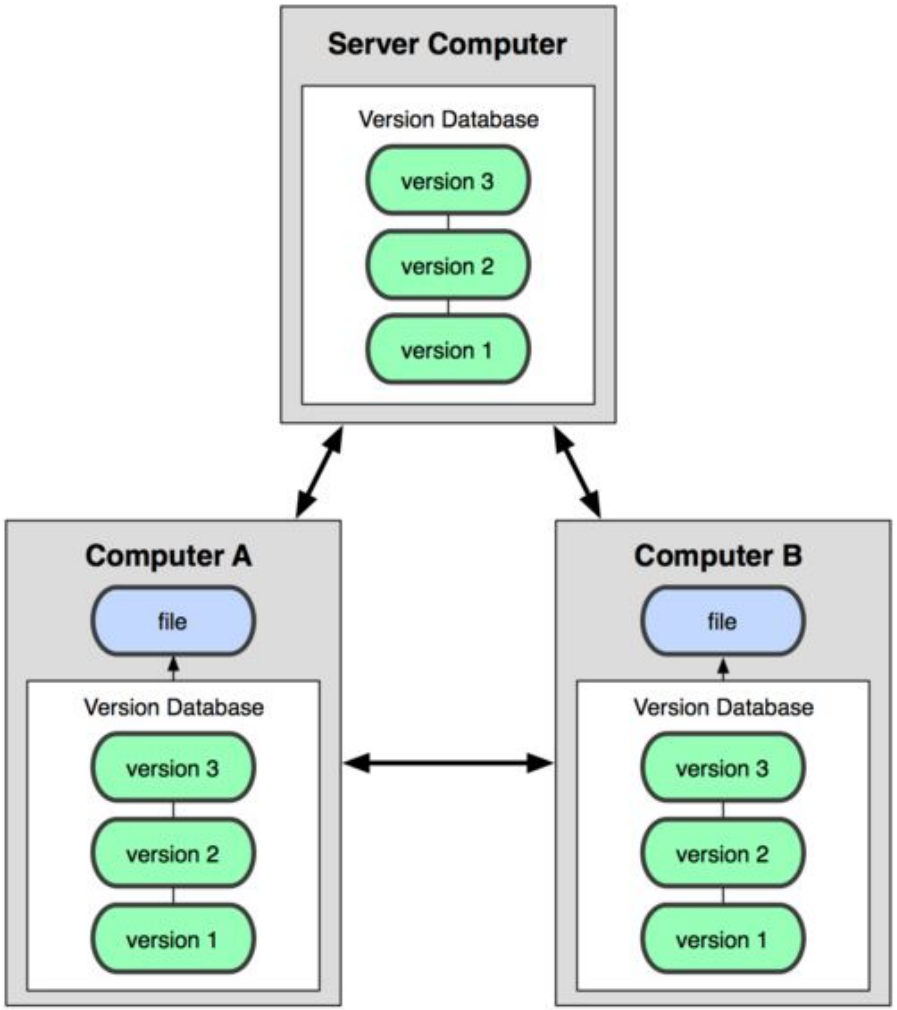


Subversion is like this

Centralized - Differences

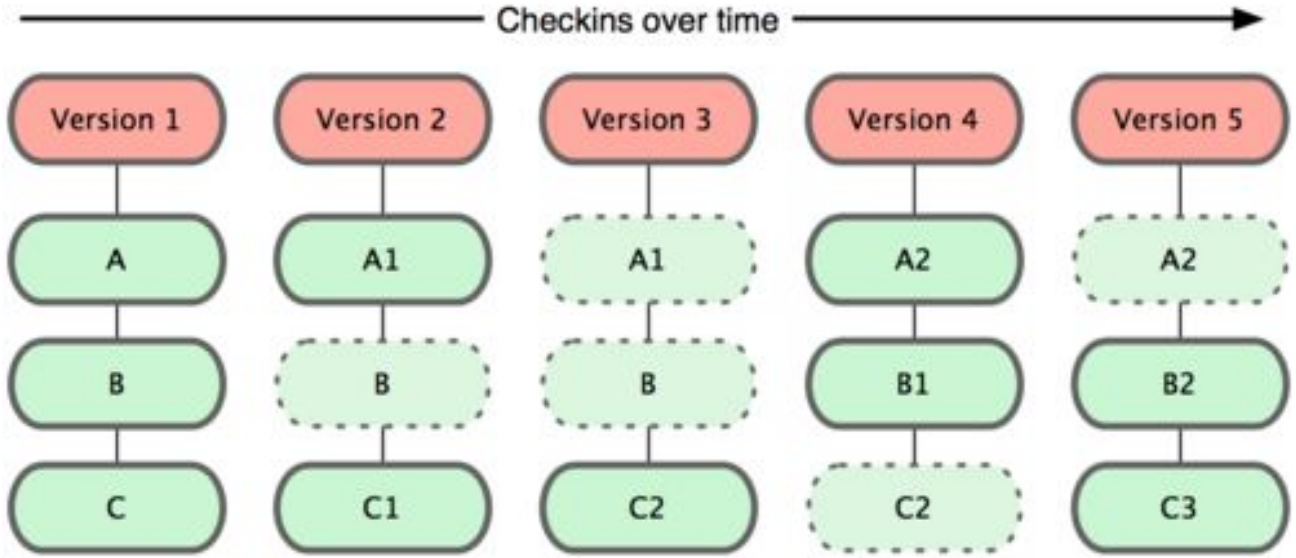


Distributed Version Control



e.g. Git, Mercurial,

Distributed - Snapshots



- Database is stored on your *local* machine
- Snapshots (“commits”) are stored in git database (~repository) in compressed format and referenced by SHA-1 hash rather than filename

Git key concepts

Introduction to git terminology

Key Concepts

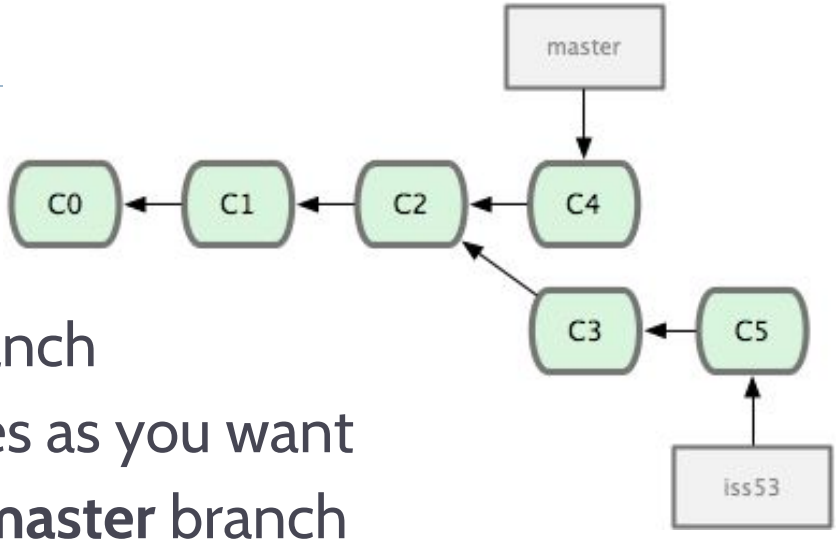
- Snapshot
  - Record of what all your files look like at a given point in time
  - You decide when to take a snapshot and of which files
  - You can go back to visit any snapshot
- Commit
  - The act of creating a snapshot (verb)
  - Also the result of this act (noun)
  - Composed of:
    - The changed files
    - A reference to the commit stored before it (“parent commit”)
    - An identifier (a 40 bit hash code, such as ab2d2ec5f6afc9776c52b3ad6b7c2de3ca5ede)

Key Concepts

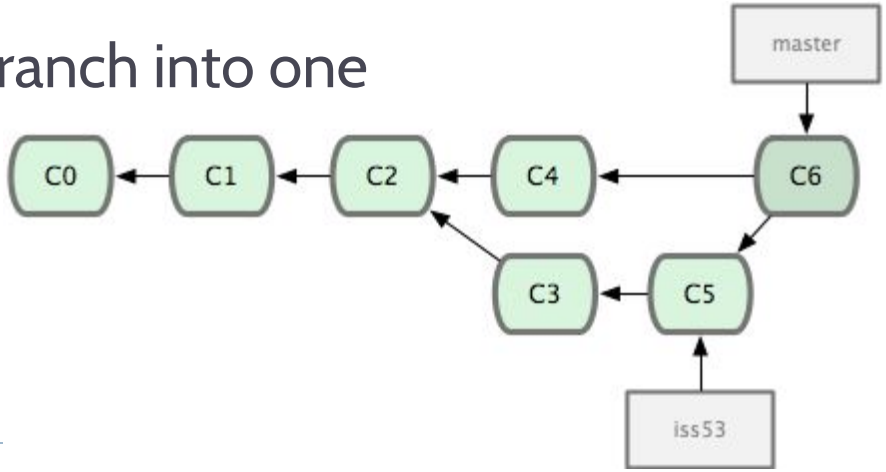
- Repository
  - A collection of all the commits (i.e. the files and their history)
  - Local or remote (e.g. on GitHub)
- Cloning
  - Copying a remote repo to local one
- Pulling
  - Downloading commits from a remote repo to local one
- Pushing
  - Uploading commits from your local repo to a remote one

Key Concepts

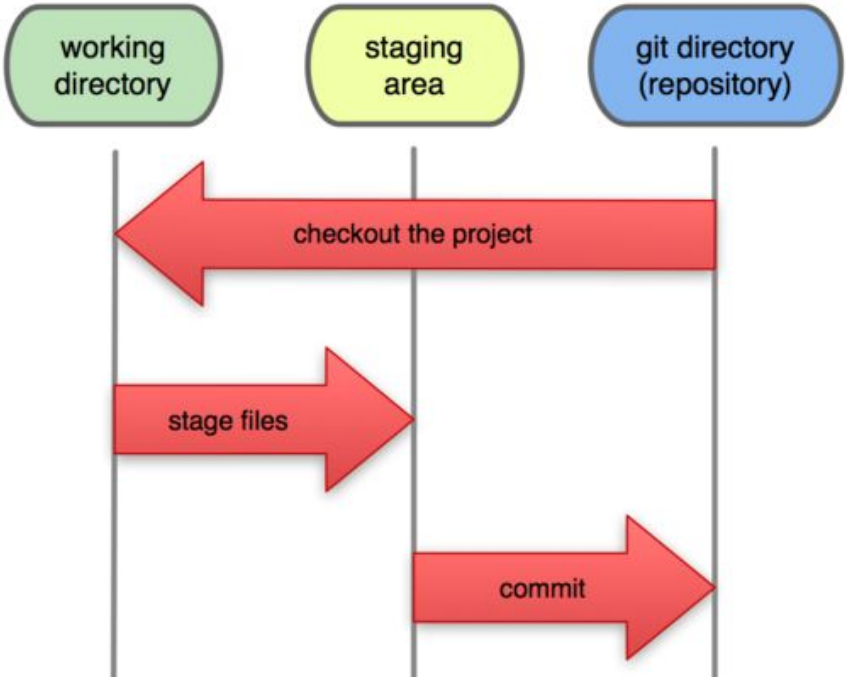
- Branch
  - All commits reside in some branch
  - You can have as many branches as you want
  - The main branch is called the **master** branch



- Merging
  - Combining changes of two branch into one



Local Operations



Initializing	Putting a directory under version control	$ cd <dir> $ git init
Staging	Telling Git what files to include in the next commit	$ git add
Committing	Storing the staged snapshot	$ git commit
Checking out	Retrieving a stored snapshot to working directory	$ git checkout

Learning basic commands

Using Codecademy online course

Learning local workflow

- Take the Learn Git course on Codecademy: https://www.codecademy.com/courses/learn-git

- Need top sign-up (email, Google, FB)
- Takes < 2 hours