Getting Git

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#citrt #RefreshCache

What is Git?

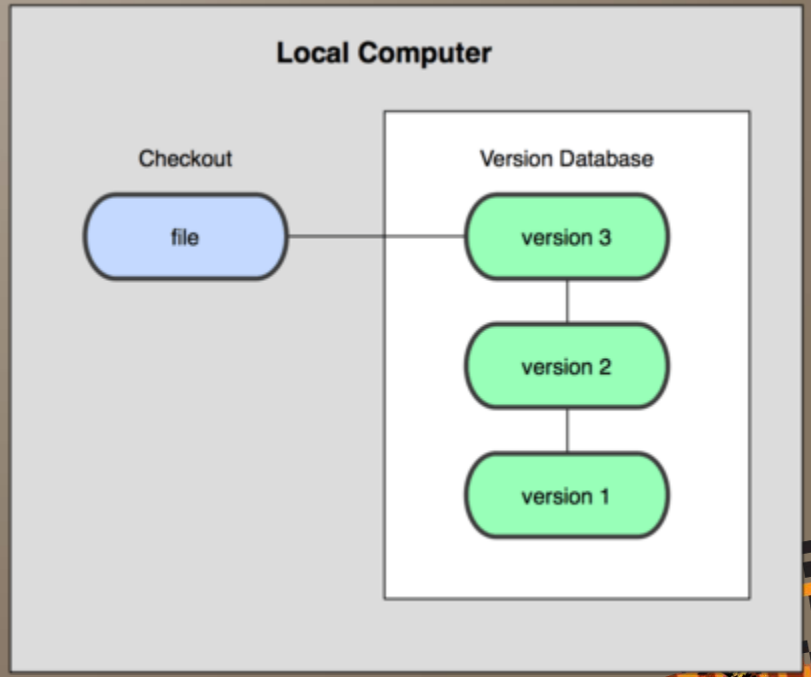
Git is a distributed version control system.

What is Version Control?

- A system that records changes to a file or a set of files over time, allowing you to recall specific versions later.
- Three types
  - Local
  - Centralized
  - Distributed

Localized

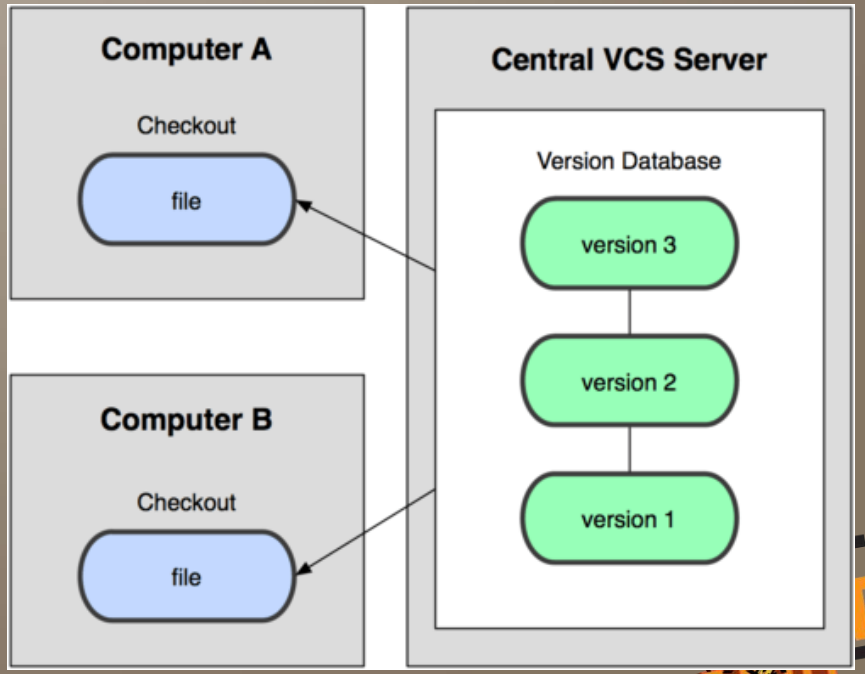
- Database local to a user or machine that keeps track of file changes/versions.
- Designed for single user.
- Single point of failure.
- Example rcs.



Source: http://git-scm.com/book/en/Getting-Started-About-Version-Control

Centralized

- Single server that contains the versioned files and a user checks out files from server.
- Downside – must be connected to server to checkout or commit.
- Examples: CVS, SVN, Visual Source Safe



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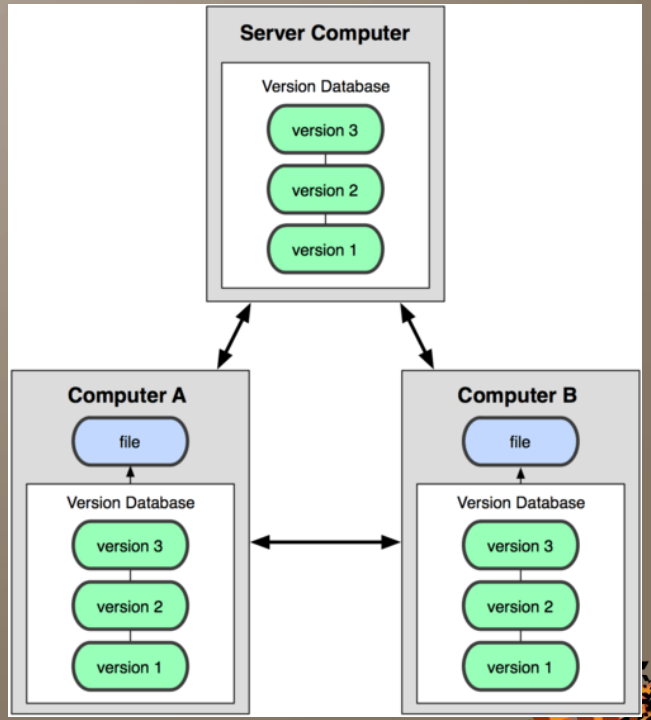
Distributed

- Clients mirror/clone remote repository to their machines.
- Each “pull”/checkout is essentially a copy of the remote server.
- Clients merge their changes back the remote/origin
- Examples: Git, Mercurial



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Why do I need version control?

- Allows a user/team to see how a file or project has progressed over time
- Allows a team to easily collaborate on a project
  - Users can work on the same project or even file at the same time
- A user can rollback a file/project to a specific commit or date in time
- Features can be developed independently from each other and merged together.

Why get Git?

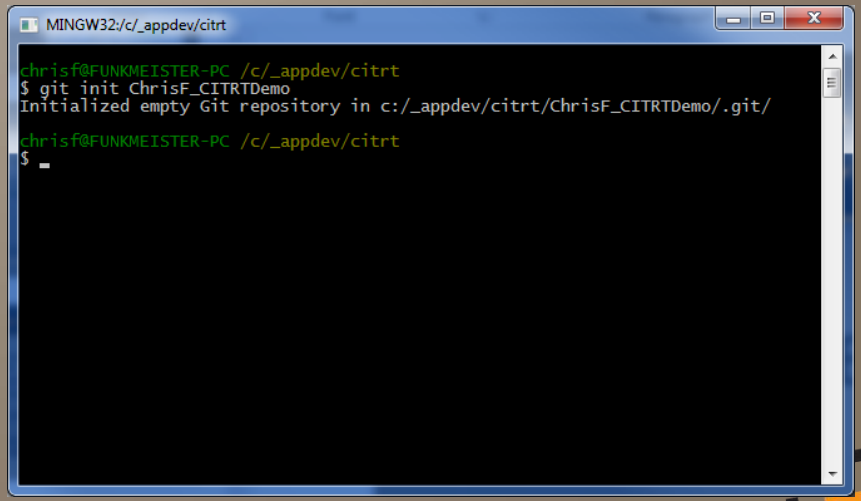
- Each user has a cloned copy of the repository
- Commits and checkouts are fast
- Can work disconnected from remote server
- Integrates with many Application Lifecycle Management (ALM) solutions
  - Github, BitBucket, Assemblia, Redmine (plugin)

Where to get it?

- Git (with Bash tools) – http://git-scm.com
- Gui Based tools - http://git-scm.com/download/gui/
  - SmartGit $79 (commercial) / Free (non-commercial)
  - SourceTree Free
  - GitHub for Windows/Mac/Unix
- We will cover command line and SmartGit

Creating a new repository

- Use git init to create an new repository
  - git init <repository name>



What happened?

- A new (empty) repository was created with a single branch called “Master”
  - This is your main-line or Trunk branch
  - As a rule “Master” should always contain production code. (The code that is currently deployed).
  - It is highly discouraged to commit directly to the “Master” branch.

…there is an exception

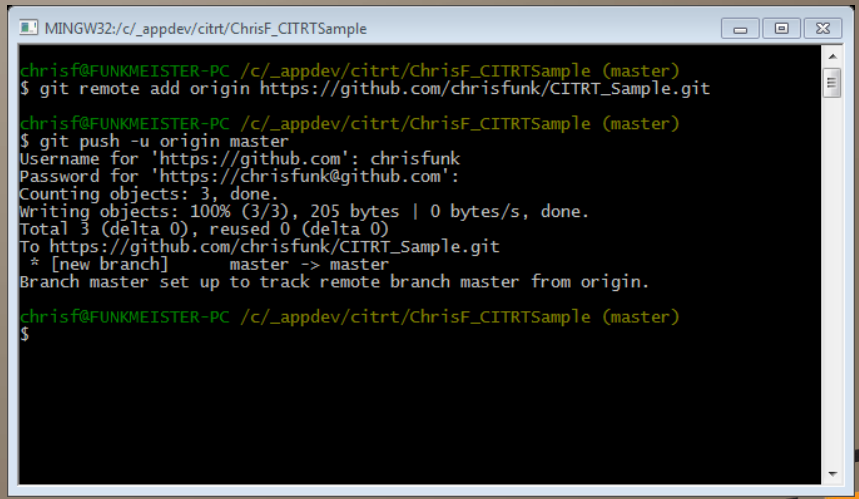
- For your initial commit it is ok to commit your initial .gitignore and Readme and license files to master.
- .gitingore -> a file that contains files/directories that should be ignored by source control.
  - If you don’t know what to ignore… there are templates.

Create Origin Repository

- Origin = the primary remote repository
- You can have an on premise Git server or use a hosting/ALM provider.
- Will use GitHub as our example
- GitHub Demo

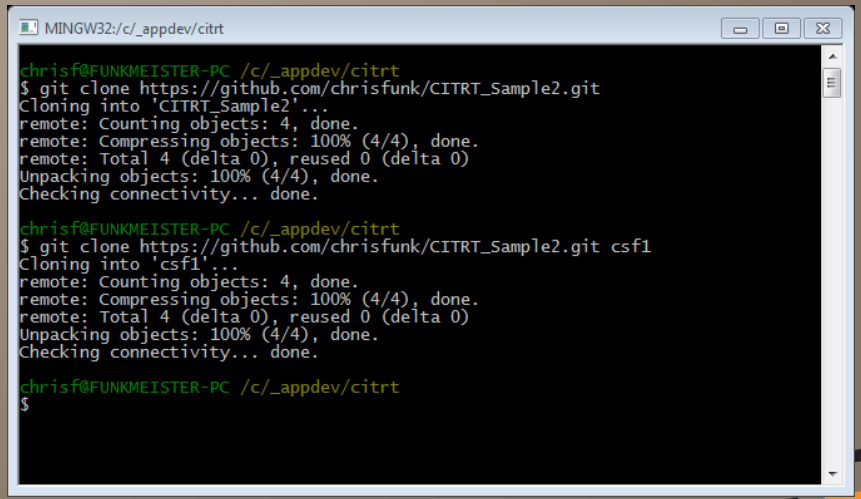
Connecting to Origin

- Add origin bookmark
  - git remote add <bookmark> <path>
- Push master branch to origin
  - git push –u <bookmark> <branch>



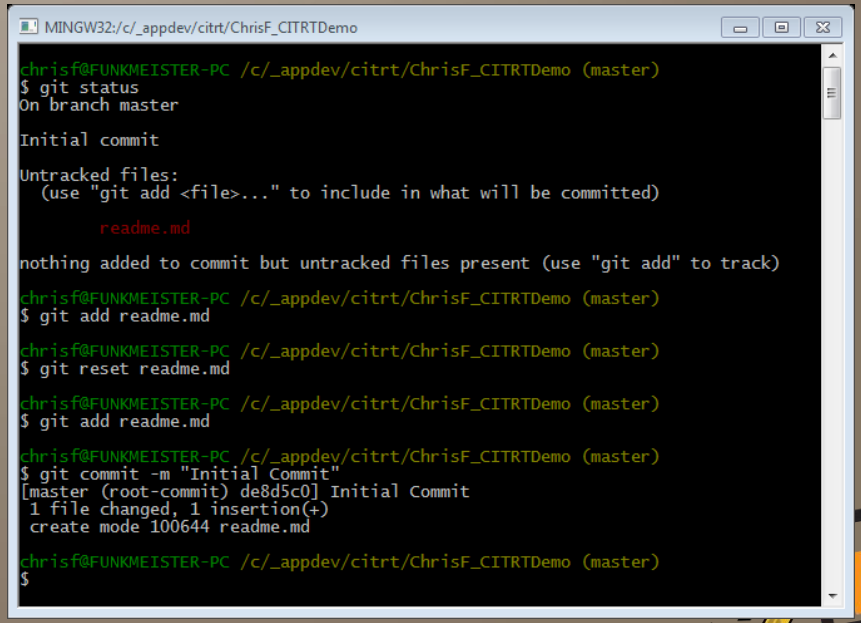
Cloning an existing repository

- Clone = copy existing repository from Git server.
  - git clone <url> <local path>
  - Local path is optional; by default creates new folder with repository name.
- Depending on repository size it can take some time.



Staging and Committing Files

- `git status` – Lists files to be committed
- `git add <file>` - stages file for commit (all new files must be staged)
- `git reset <file>` cancels stage
- `git commit` commits staged/updated files



Branches

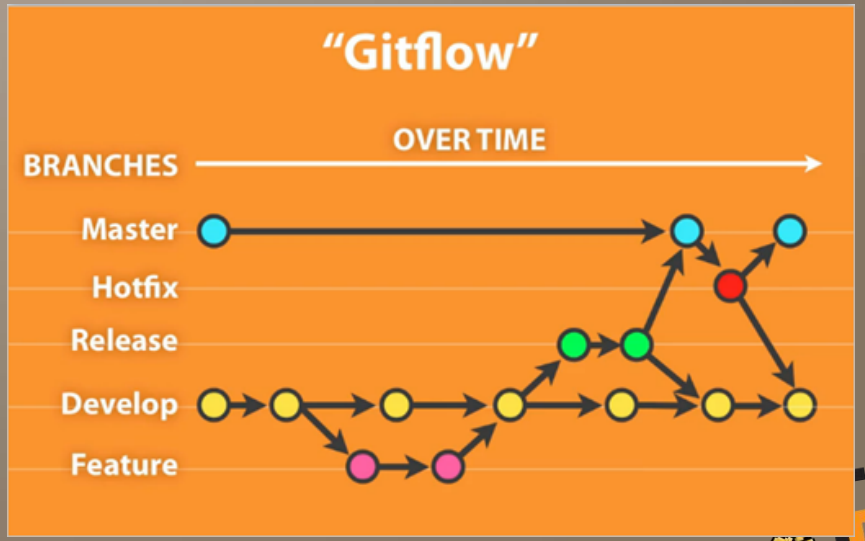
- Branch = A branch represents an independent line of development.
  - i.e. I am working on a check-in block and Maxim is working on refactoring a giving block
  - We can work independently on separate branches and then merge into a parent branch when complete.

Branching (cont)

- There are many methodologies with branching, I recommend GitFlow.
- Two branches live in perpetuity (Master and Develop)
  - Master = what is currently in production.
  - Develop = In development/WIP branch
- Rest of branches have limited lifespan.

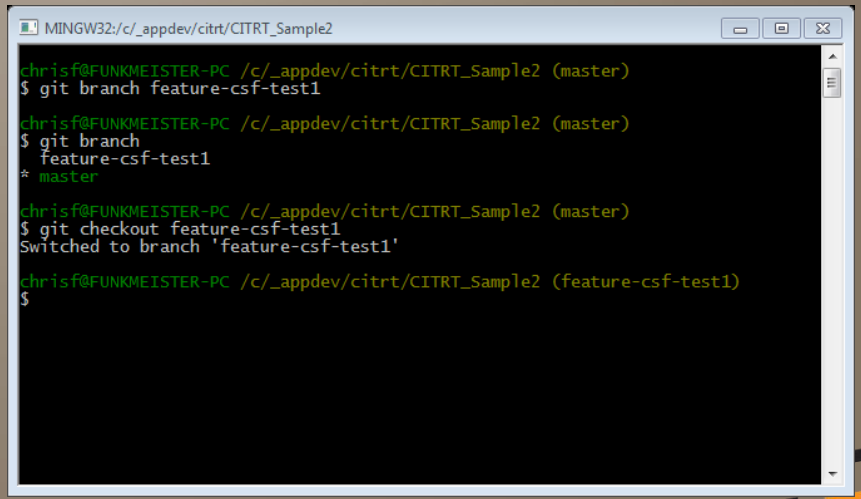
Branching - GitFlow

- Feature – feature that is in development (feature-{identifier})
- Release – Release candidate (rel-{identifier})
- Hotfix – Emergency update that can't wait for next release cycle (hotfix-{identifier})



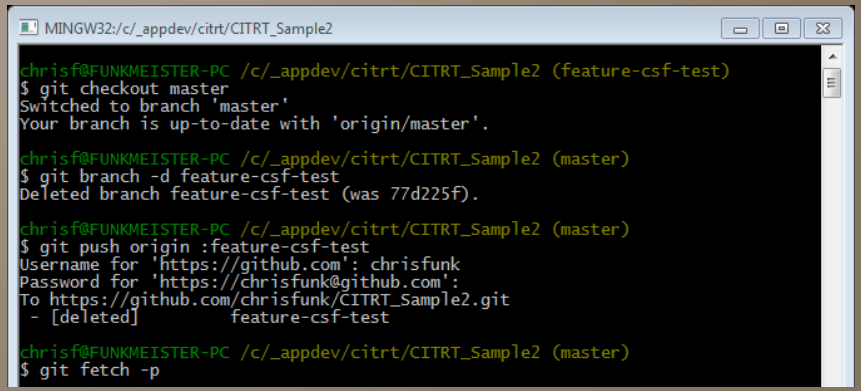
Working with Branches

- Create a new branch
  - git branch <name>
- Checkout – make head/working branch)
  - git checkout <name>
- Create & checkout
  - git checkout <name> -b



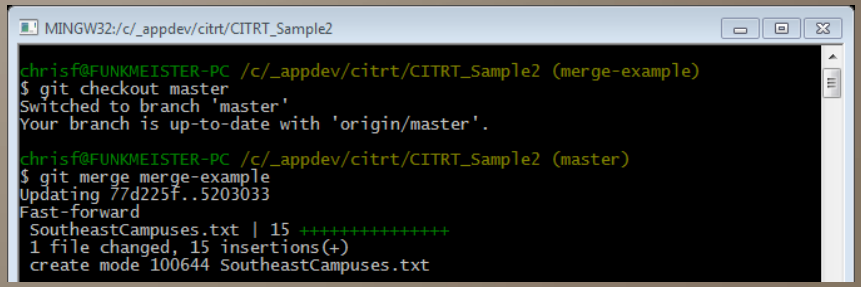
Working with Branches

- Delete a branch (make sure head is a different branch)
  - git branch –d <branch>
- To delete from origin
  - git push origin :<old branch name>



Merging

- Checkout the branch that you want to merge **to**
  - git checkout <branch>
- Perform the merge
  - git merge <branch>



There’s an easier way

- There are GUI based tools to work with Git.
- SmartGit demo

Using an ALM Tool

- There are several ALM tools on the market
  - ALM = Application Lifecycle Management
- They allow you to track issues/feature requests
- View commit history
- Some include Wiki functionality
- GitHub is the most popular for open source
- SECC is moving to Bitbucket b/c they allow free private repositories.

Learning tools

- Github provides a tutorial for learning Git
  - https://help.github.com/articles/set-up-git/
  - Training Kit - https://training.github.com/kit/
  - Try Git (online) – https://try.github.io
- Git command cheat sheet
  - https://training.github.com/kit/downloads/github-git-cheat-sheet.pdf
- Git-SCM site http://git-scm.org