

GIT FUNDAMENTALS



Overview

- Brief history of version control
- Overview of Git
- Installing Git
- Configuring Git

A Brief History of Version Control

- **First Generation**
 - Single-file
 - No networking
 - e.g. SCCS, RCS
- **Second Generation**
 - Multi-file
 - Centralized
 - e.g. CVS, VSS, SVN, TFS, Perforce
- **Third Generation**
 - Changesets
 - Distributed
 - e.g. Git, Hg, Bazaar, BitKeeper
- **Further reading**
 - http://www.ericSink.com/vcbe/html/history_of_version_control.html

Advantages of DVCS

- Different topologies
 - Centralized
 - Developers push changes to one central repository
 - Hierarchical
 - Developers push changes to subsystem-based repositories
 - Sub-system repositories are periodically merged into a main repository
 - Distributed
 - Developers push changes to their own repository
 - Project maintainers pull changes into the official repository
- Backups are easy
 - Each clone is a full backup

Advantages of DVCS

- **Reliable branching/merging**
 - Feature branches
 - Always work under version control
 - Applying fixes to different branches
- **Full local history**
 - Compute repository statistics
 - Analyze regressions
- **New ideas**
 - Deployment
 - `git push heroku prod_branch`

About Git

- Created by Linus Torvalds, who also created Linux
- Prompted by Linux-BitKeeper separation
- Started in 2005
- Written in Perl and C
- Runs on Linux, OS X, Windows, and many other operating systems
- Design goals
 - Speed
 - Simplicity
 - Strong branch/merge support
 - Distributed
 - Scales well for large projects



Installing Git

- Windows
 - msysGit (<http://msysgit.github.com>)
- Mac OSX
 - brew install git
 - DMG (<http://git-scm.com/download/mac>)
- Linux
 - apt-get install git-core (Debian/Ubuntu distros)
 - yum install git-core (Fedora distros)
 - For other distros, check your package manager

Configuring Git

- System-level configuration
 - `git config --system`
 - Stored in `/etc/gitconfig` or `c:\Program Files (x86)\Git\etc\gitconfig`
- User-level configuration
 - `git config --global`
 - Stored in `~/.gitconfig` or `c:\Users\<NAME>\.gitconfig`
- Repository-level configuration
 - `git config`
 - Stored in `.git/config` in each repo

<https://git-scm.com/book/en/v2/Customizing-Git-Git-Configuration>

WORKING LOCALLY WITH GIT

Overview

- Creating a local repository
- Adding files
- Committing changes
- Viewing history
- Viewing a diff
- Working copy, staging, and repository
- Deleting files
- Cleaning the working copy
- Ignoring files with .gitignore