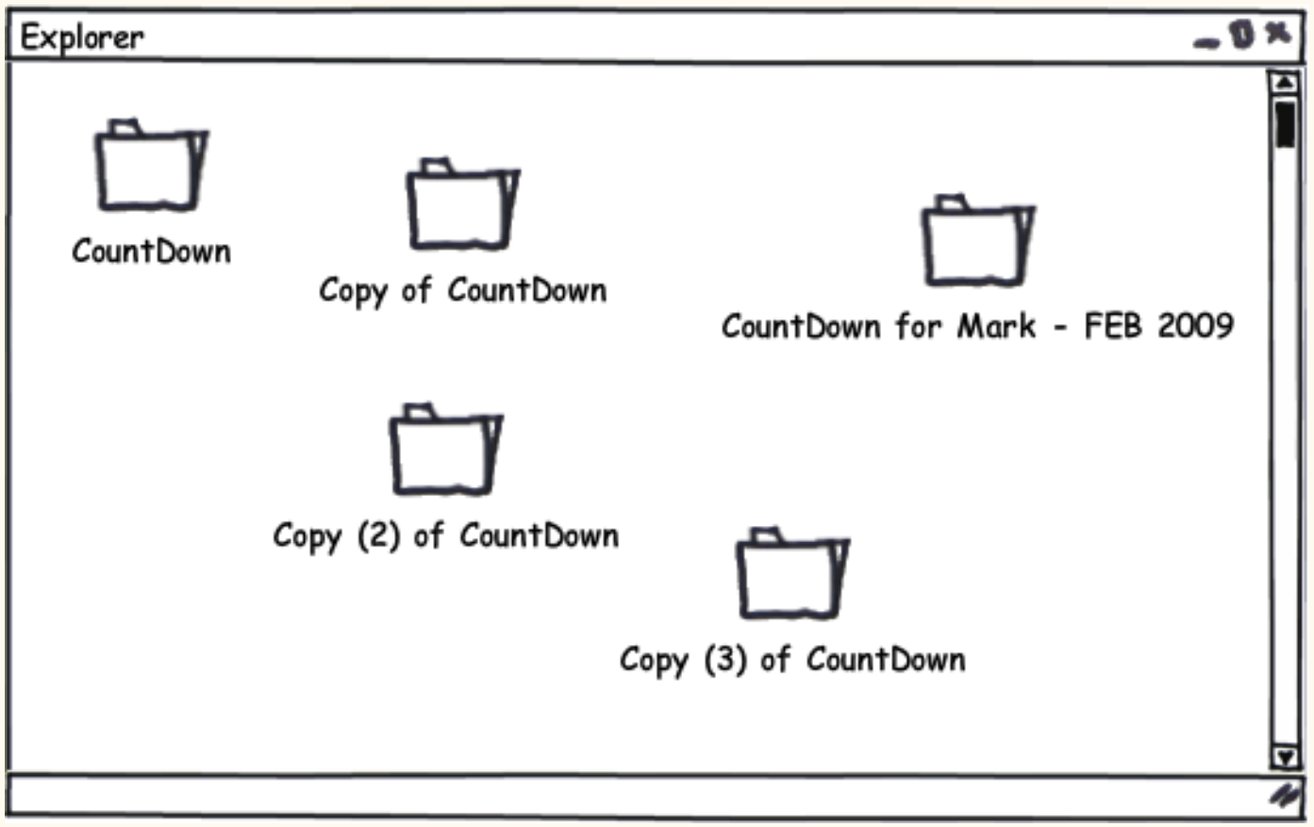
Version Control

Managing codebases since 1990

What's Version Control?

Version Control (VCS) is software you can use to track changes to a project over time, consolidate changes between contributors, and backup your work.

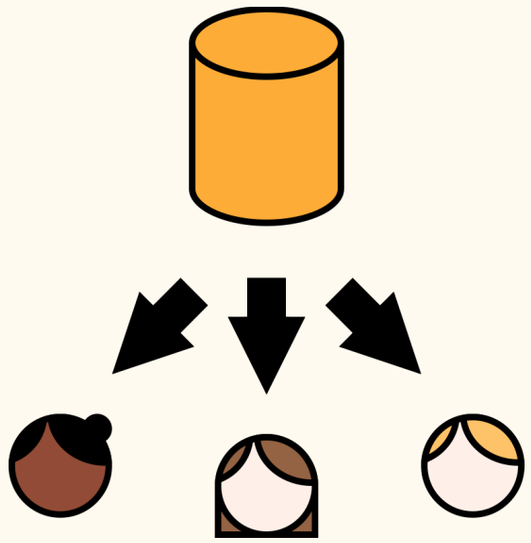
If you don't use a VCS, you could end up like this:



Types of Version Control

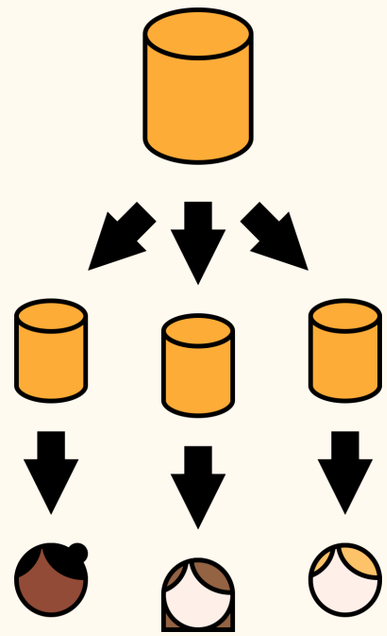
Centralized (CVCS)

- Changes tracked against central remote repository
- Cannot maintain local tree
- Helpful for large projects

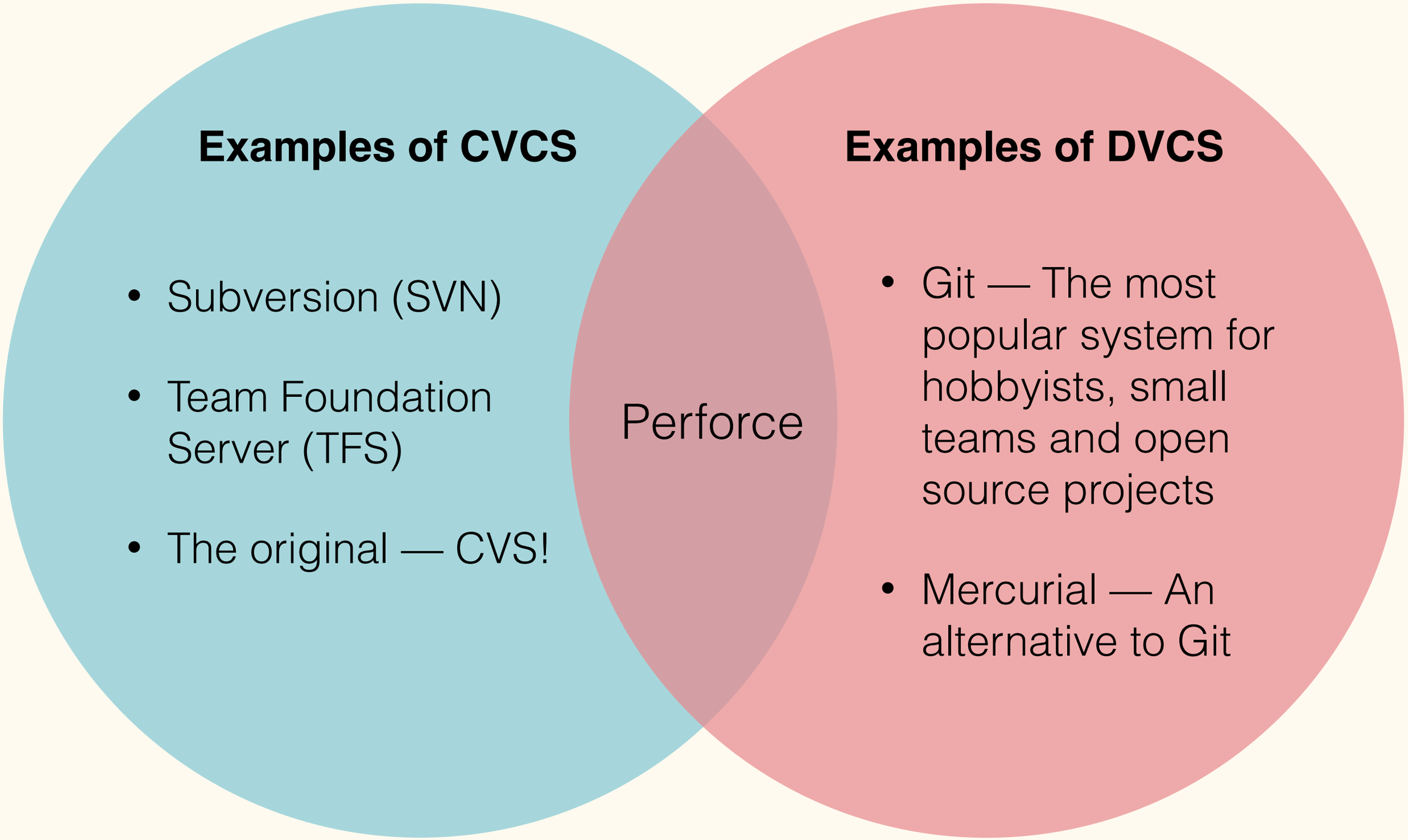


Distributed (DVCS)

- Local tree synced to remote tree
- Great for projects with many contributors, inconsistent network access, and a reliance on derivation



Types of Version Control



- Developed in 2005 to replace the VCS for the Linux project

- Popularity soared in 2008 after the release of GitHub, a social coding and remote source code host

Git - CLI Workflow

(CLI - Command Line Interface)

- Git was designed for the command prompt
- Basic Commands
  - git status
  - git add .
  - git diff --cached
  - git commit -m “<message>”
  - git pull --rebase
  - git push

```
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git status
On branch dev
Your branch is up-to-date with 'origin/dev'.
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   app/404.html
        modified:   app/src/helpers/ErrorHelper.js

no changes added to commit (use "git add" and/or "git commit -a")
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git add .
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git status
On branch dev
Your branch is up-to-date with 'origin/dev'.
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   app/404.html
        modified:   app/src/helpers/ErrorHelper.js

aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git diff --cached
diff --git a/app/404.html b/app/404.html
index bc718ea..f76309b 100644
--- a/app/404.html
+++ b/app/404.html
@@ -4,6 +4,6 @@
    <title>404</title>
 </head>
 <body>
-<p>heck</p>
+<p>Something hecked up. Try reloading at http://learnVCS.github.io/learnVCS</p>
 </body>
 </html>
\ No newline at end of file
diff --git a/app/src/helpers/ErrorHelper.js b/app/src/helpers/ErrorHelper.js
index 1be260a..6a87a1b 100644
--- a/app/src/helpers/ErrorHelper.js
+++ b/app/src/helpers/ErrorHelper.js
@@ -1,21 +1,19 @@
-var blanketResponse = 'Something terrible happened';
+var errors = {
+       default: 'Something terrible happened',
+       400: 'Bad data. Contact an admin',
+       401: 'Invalid credentials',
```

Git - CLI Workflow

(CLI - Command Line Interface)

- `git status` — Displays the current status of the repo
- `git add .` — Stages all changed and untracked files

```
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git status
On branch dev
Your branch is up-to-date with 'origin/dev'.
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
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Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   app/404.html
        modified:   app/src/helpers/ErrorHelper.js
```

Git - CLI Workflow

(CLI - Command Line Interface)

- git diff — Compares all changes to the current HEAD

```
+        default: 'Something terrible happened',
+        400: 'Bad data. Contact an admin',
+        401: 'Invalid credentials',
+        403: 'Rate limit exceeded',
+        404: 'Repository not found',
+};

 var ErrorHelper = {
        appropriateResponse: function (errorCode) {
-               switch(errorCode)
-               {
-                       case 404:
-                       return 'Repo could not be found';
-                       case 401:
-                       return 'Access not authorized';
-                       default:
-                       return blanketResponse;
-               }
```

Git - CLI Workflow

(CLI - Command Line Interface)

- git commit -m “<message>”

```
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev*
$ git commit -m "Updated 404.html and enhanced error responses"
[dev 94c158e] Updated 404.html and enhanced error responses
 2 files changed, 10 insertions(+), 12 deletions(-)
```

Common Gotchas

- Be as descriptive as possible in your commit messages. Once pushed, this history cannot be changed easily!

Git - CLI Workflow

(CLI - Command Line Interface)

- git pull --rebase
- git push

Common Gotchas

- **Always pull before you push!**
- Rebasing before merging can help reduce merge conflicts

```
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev
$ git pull --rebase
git pushCurrent branch dev is up to date.
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev
$ git push
fatal: unable to access 'https://github.com/learnVCS/learnVCS/': Failed to connect to github.com port 443: Operation timed out
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev
$ git push
Counting objects: 7, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (7/7), 954 bytes | 0 bytes/s, done.
Total 7 (delta 3), reused 0 (delta 0)
To https://github.com/learnVCS/learnVCS
   424c764..94c158e  dev -> dev
aaronsky at Alum-Clam in ~/Repos/learnVCS on dev
$
```

Git - GUI Workflow

- Supports Git and Mercurial
- Integration with GitHub, Bitbucket and GitLab
- Full support for everything you can do in the command line
- https://www.sourcetreeapp.com/

- Built in support for TFS and Git
- Integration with GitHub and Visual Studio Online
- Support for common commands

GitHub

- Remote code hosting service
- Host your projects publicly for free and privately for a fee
  - Students get one free private repository
- Designed for social coding, many features for collaboration

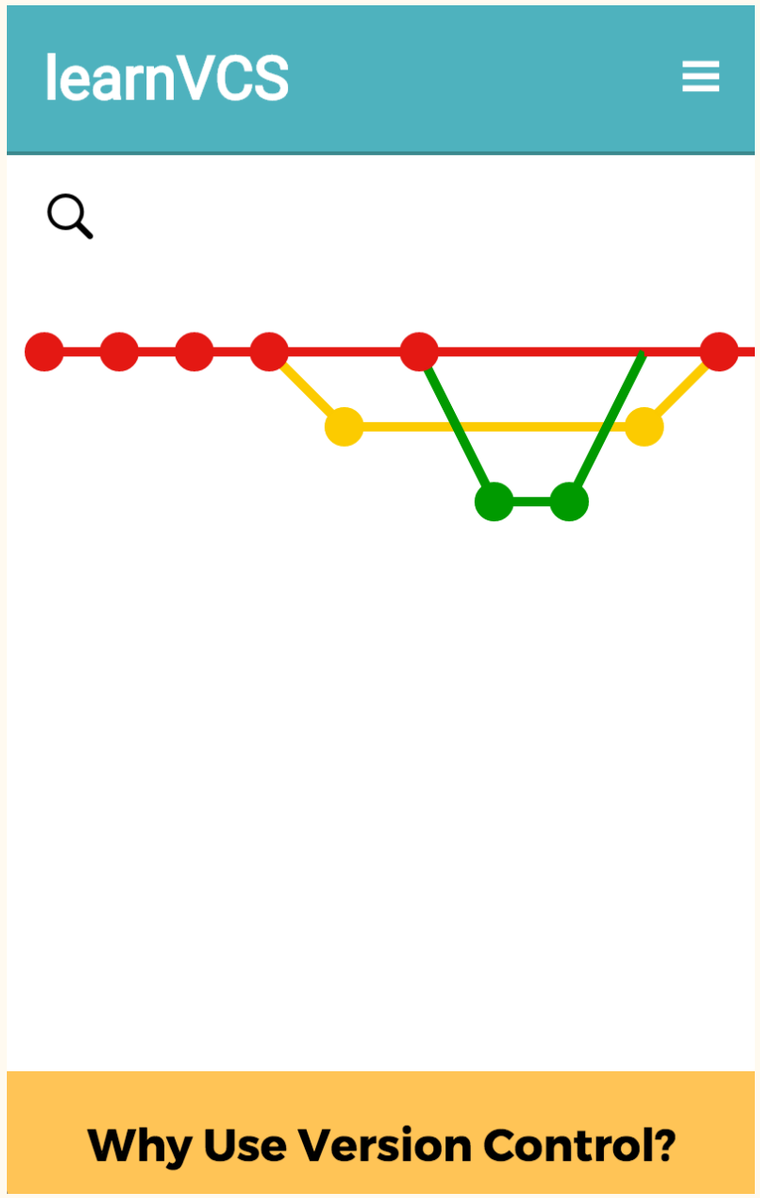
Classroom for **GitHub**

- Instructors can use this to create groups of repositories for an assignment and monitor progress.

- https://classroom.github.com/

learnVCS

- http://learnvcs.github.io/
- Created to address gaps in version control education in the IGM curriculum
- Interactive visualizations of projects hosted on GitHub
- Links to some of the best resources for learning more about version control and how to use tools like Git, Subversion, and more



Slides by the learnVCS team

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