

# Git With It

## *Learning Git*

<http://github.com/sl4mmy/presentations/tree/master>

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**Git (<http://git-scm.com/>) is  
really a database filesystem**

**NOT** (necessarily) a  
distributed version control  
system

**Although that **IS** the primary  
use**

**I emphasize this because...**

Git is **NOT** Subversion++

**Tilt your head and  
squint, they look  
similar...**

**But don't be fooled!**

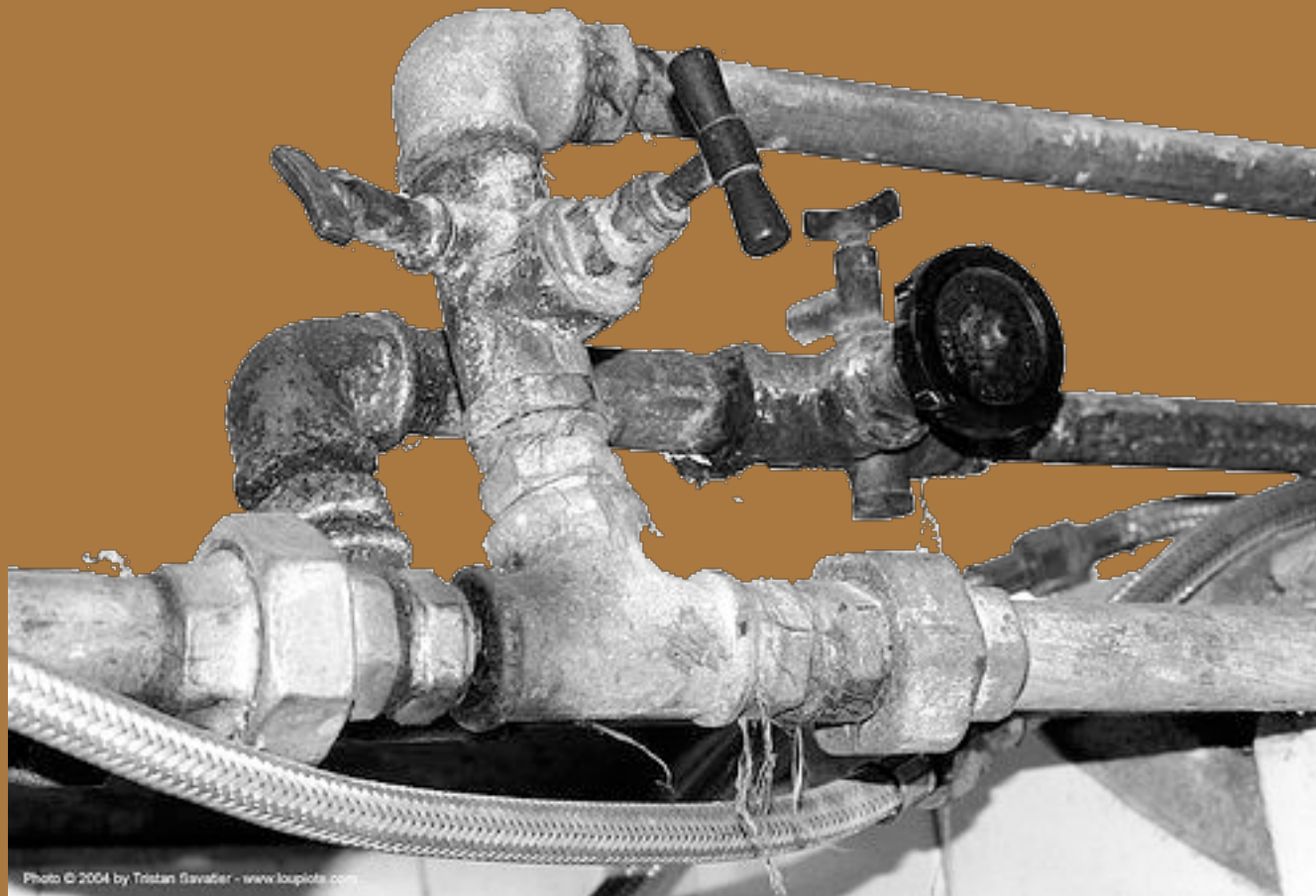


**Forget what you know,  
and let's start from scratch**

**Git is a suite of scripts and  
utilities**

**Loosely categorized  
into two groups**

# Plumbing



(<http://is.gd/udoh>)

**n.: low-level Git utilities upon  
which other tools are built**

# Porcelain



(<http://is.gd/uds2>)

**n.: high-level Git utilities suitable  
for day-to-day use by humans**

```
# http://is.gd/udi6  
$ git help # When in doubt  
...  
$ git help <command>  
...
```

```
# http://is.gd/udj2
$ git config --global user.name \
  'Your Name'
$ git config --global user.email \
  'email@ad.dr'
```

```
$ git config --global -l # List  
user.name=Your Name  
user.email=email@ad.dr
```



```
$ cat ~/.gitconfig # .ini format
[user]
    name = Your Name
    email = email@ad.dr
```

```
$ mkdir proj  
$ cd proj  
$ ls -CFa # Nothing up my sleeves  
./      ../
```

```
# http://is.gd/udA6
```

```
$ git status
```

```
fatal: Not a git repository (or any  
of the parent directories): .git
```

```
# http://is.gd/udjH  
$ git init # Create new repository  
Initialized empty Git repository  
in /path/to/proj/.git/  
$ ls -CFa  
./      ../      .git/
```

**Voilà!**

**The .git directory **IS** the  
repository**

```
$ git status
# On branch master
#
# Initial commit
#
nothing to commit (create/copy
files and use "git add" to track)
```

```
$ ls -CFa .git/ # It's a normal dir
./  HEAD  config  hooks/  objects/
../  branches/  description  info/
refs/
```



```
# For the curious...
$ ls -lFa .git/
HEAD      # Name of chk'd out branch
branches/
config     # Project-specific config.
description # Project name
hooks/     # Hook scripts
info/      # Private local config.
objects/   # Git's object data store
refs/      # Aliases to branch tips
```

**Little of interest in a  
empty/new repository**

```
$ touch project.txt
$ git status
...
# Untracked files:
#   (use "git add <file>..." to
include in what will be committed)
#
# project.txt
nothing added to commit but
untracked files present (use "git
add" to track)
```

```
# http://is.gd/ue0o
$ git add project.txt
$ git status
...
# Changes to be committed:
#   (use "git rm --cached
<file>..." to unstage)
#
# new file:   project.txt
#
```

```
$ find .git/objects -type f  
.git/objects/  
e6/9de29bb2d1d6434b8b29ae775ad8c2e4  
8c5391
```

**Git stores content Zlib  
compressed**

**And keyed by its SHA1 hash**

**The data store is organized  
as:**



**.git/objects/**

**↳ first 2 chars of SHA1/**

**↳ last 38 chars of SHA1**

```
# http://is.gd/ue0M
```

```
$ git hash-object project.txt
```

```
e69de29bb2d1d6434b8b29ae775ad8c2e48  
c5391
```

```
$ find .git/objects -type f
```

```
.git/objects/
```

```
e69de29bb2d1d6434b8b29ae775ad8c2e4  
8c5391
```

```
# http://is.gd/ue0S
$ git commit -m 'Created
project.txt'
[master (root-commit) ab8ce60]
Created project.txt
 0 files changed, 0 insertions(+),
0 deletions(-)
 create mode 100644 project.txt
```

```
$ git status
# On branch master
nothing to commit (working
directory clean)
# http://is.gd/ue7m
$ git log --pretty=short
commit ab8ce60...
Author: Your Name <email@ad.dr>
```

*Created project.txt*

```
$ find .git/objects -type f  
.git/objects/ab/8ce60...  
.git/objects/cb/db3a2...  
.git/objects/e6/9de29...
```

# Three objects?!

# <http://is.gd/ueWg>

```
$ git cat-file -t e69de29  
blob
```

```
$ git cat-file -t cbdb3a2  
tree
```

```
$ git cat-file -t ab8ce60  
commit
```

```
$ git cat-file blob e69de29
# http://is.gd/ueZ4
$ git ls-tree cbdb3a2
100644 blob e69de29... project.txt
$ git cat-file commit ab8ce60
tree cbdb3a2...
author Your Name <email@ad.dr> ...
committer Your Name <email@ad.dr>..

Created project.txt
```

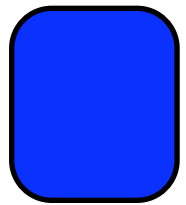


# **Git stores content as blobs**

**Git also stores trees, which  
point to blobs (and other  
trees)**

**And Git stores commits,  
which point to a single tree  
(and zero or more parent  
commits)**

**There are also tags, which  
point at a single tree**



**blob**

# **Git tracks changes to content trees**