Git, Android Studio, and Beyond

How an open source tool integrates with an open source platform

The Cathedral and the Bazaar

- Differentiated Open Source from Free Software
- Inspired Netscape to create Mozilla project, which eventually lead to Firefox
- https://en.wikipedia.org/wiki/The_Cathedral_and_the_Bazaar
- http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/
- Enough eyeballs tame complexity

A Brief History of Open Source

- Linux
- Git
- The Cathedral and The Bazaar
- The spread of open source
- Android sits on Linux

My original intention for this presentation

- Android Studio app development
- Too big of a topic
- Started learning about Git, which I had never heard of
- Fit in with my interest about Open Source
- Much narrower topic, and still ties into Android Studio

Where did Linux come from

- Unix and Minix
- Linus Torvalds
- Open Source development
- Took off
- A multitude of versions
- On a multitude of platforms

The need for Git

- Former VCS used for Linux development was Bitkeeper, proprietary system.
- Need for a new VCS with better performance and right functionality
- Also Bitkeeper was starting to put restrictions on its free use
- Developed in 2005
- Many possible origins of the name Git
- About a month to really get up and running and performing the way intended
- But just 1 day to become self hosting

nglish

srpski

∂Edit links

Releases [edit]

Version	Original release date[citation needed]	Latest version	Release date[citation ne	
0.99	2005-07-11	0.99.9n	2005-12-15	
1.0	2005-12-21	1.0.13	2006-01-27	
1.1	2006-01-08	1.1.6	2006-01-30	
1.2	2006-02-12	1.2.6	2006-04-08	
1.3	2006-04-18	1.3.3	2006-05-16	
1.4	2006-06-10	1.4.4.5	2008-07-16	
1.5	2007-02-14	1.5.6.6	2008-12-17	
1.6	2008-08-17	1.6.6.3	2010-12-15	
1.7	2010-02-13	1.7.12.4	2012-10-17	
1.8	2012-10-21	1.8.5.6	2014-12-17	
1.9	2014-02-14	1.9.5	2014-12-17	
2.0	2014-05-28	2.0.5	2014-12-17	
2.1	2014-08-16	2.1.4	2014-12-17	
2.2	2014-11-26	2.2.3	2015-09-04	
2.3	2015-02-05	2.3.10	2015-09-29	
2.4	2015-04-30	2.4.12	2017-05-05	
2.5	2015-07-27	2.5.6	2017-05-05	
2.6	2015-09-28	2.6.7	2017-05-05	
2.7	2015-10-04	2.7.5	2017-05-05	
2.8	2016-03-28	2.8.5	2017-05-05	
2.9	2016-06-13	2.9.4	2017-05-05	
2.10	2016-09-02	2.10.3	2017-05-05	
2.11	2016-11-29	2.11.2	2017-05-05	
2.12	2017-02-24	2.12.3	2017-05-05	
2.13	2017-05-10	2.13.4	2017-08-01	
2.14	2017-08-04	2.14	2017-08-04	

Key dates for Linux and Git

- Linux 1991, developed on MINIX, announce August 25, 1991 on Usenet
- 1997 -- The Cathedral and the Bazaar first published
- Git first commit on April 7th, 2005, 1 day after it was initially announced, 4 days after the beginning of development
- Github originated October, 2007

Basic Git commands

- git add
- git commit
- git push
- git pull
- git log
- git status

Git web site and demo

- Home for git -- <u>https://git-scm.com/</u>
- Tutorial to try git and learn basics -- https://try.github.io/levels/1/challenges/1

1.7 · Adding All Changes

Great! You also can use wildcards if you want to add many files of the same type. Notice that I've added a bunch of .txt files into your directory below.

I put some in a directory named "octofamily" and some others ended up in the root of our "octobox" directory. Luckily, we can add all the new files using a wildcard with **git add**. Don't forget the quotes!

→ git add '*.txt'



```
# Changes to be committed:
# (use "git rm --cached <file>..." to unstage)
#
#

Success!

$ git commit -m "Add cute octocat story"

[master (root-commit) 20b5ccd] Add cute octocat story
1 file changed, 1 insertion(+)
create mode 100644 octocat.txt
```

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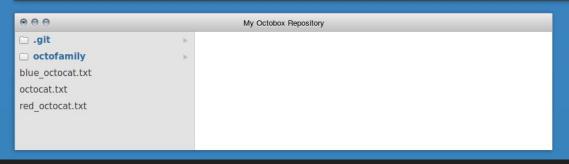
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Success!
$
```



Advice

Wildcards

We need quotes so that Git will receive the wildcard before our shell can interfere with it. Without quotes our shell will only execute the wildcard search within the current directory. Git will receive the list of files the shell found instead of the wildcard and it will not be able to add the files inside of the octofamily directory.

More git training resources

- https://try.github.io/wrap_up
- https://help.github.com/
- https://services.github.com/customized-training
- http://gitimmersion.com/
- http://rogerdudler.github.io/git-guide/

Linus Torvalds talks about Linux and Git

- Youtube TED talk -- https://www.youtube.com/watch?v=Vo9KPk-gqKk
- 20 minute talk where Linus Torvalds talks about his work, open source, Linux, git, and what makes him good at what he does

Some Linux numbers and facts

- 50 Core developers
- Roughly 1,000 contributors to each release
- Linux design tried initially to mimic Unix
- Git much more of a design from scratch
- Linux has a single kernel that runs on a multitude of processors -- from mobile devices to supercomputers

Mirror of Git project on Github

- A mirror of Git project, can't update it
- Cool from a historical perspective
- Very first commit (git doing a repository of it's own development) https://github.com/git/git/commits/master?after=20fed7cad40ed0b96232feb82

 8129e3a2ee9860d+48804
- April 7, 2005
- 10 years of Git interview with Torvalds https://www.linuxfoundation.org/blog/10-years-of-git-an-interview-with-git-creator-linus-torvalds/

Linux irony

- Linus Torvalds was trying to optimize Linux as a desktop operating system
- Even with the huge number and variety of distributions, it's never quite taken off in the desktop market
- However, other than the gaming platform market and desktops, linux dominates on most other computer platforms

Market share by category [edit]



This section needs to be **updated**. Please update this article to reflect recent events or newly available information. (January 2017)

Category	Source	Date	Linux	Unix and Unix-like (not incl. Linux)	Windows	In-house	Othe
Desktop, laptop (excluding Android and Chrome OS)	Net Applications ^[219]	August 2017	3.37% (Ubuntu, etc.)	5.94% (macOS)	90.7% (10, 8.1, 7)		
Smartphone, tablet	StatCounter Global Stats ^[220]	July 2017	70.27% (Android)	22.47% (iOS)	0.81% (Windows 10 Mobile, Windows Phone 8.1 and older)		6.43%
Server (web)	W3Techs ^[221]	Apr 2017	66.6-37% (of the known-for-sure lower bound of Linux share: Ubuntu 35.8%, Debian 31.9%, CentOS 20.6%, Red Hat (RHEL) 3.3%, Gentoo 2.7%, Fedora 0.9%)	c, 1% (BSD; Unix-like could be up to 30.18%, then "Unknown" needs to be known to be not Linux) 66.6% Unix-like share is mostly Linux; the "Unknown" part, there-of 43.1%, is assumed to be also Linux (for upper bound of that column), could be some non-Linux or e.g. any of the named Linux distributions in the Linux column.	33.5% (Windows Server 2016, W2K12, W2K8)		
Supercomputer	TOP500	June 2017	99.88% (Custom)	0.12% (IBM AIX)			
Mainframe	Gartner ^[213]	Dec 2008	28% (SLES, RHEL)	72% (z/OS) UNIX System Services			
Video game consoles (7th & 8th generation only)	VGChartz ^[222]	Aug 2017		35% (PS4, PS3, Vita, PSP)	16.69% (Xbox One, Xbox 360)	48.30% (Switch, Wii U, Wii, 3DS, DS)	0%
Embedded	UBM Electronics ^[223]	Mar 2012	29.44% (Android plus other non-Android Linux)	4.29% (QNX)	11.65% (WCE 7)	13.5% ("Inhouse/custom" is most popular, single choice)	41.1%

Note



About

The advantages of Git compared to other source control systems.



Documentation

Command reference pages, Pro Git book content, videos and other material.



Downloads

GUI clients and binary releases for all major platforms.



Community

Get involved! Bug reporting, mailing list, chat, development and more.



Pro Git by Scott Chacon and Ben Straub is available to read online for free. Dead tree versions are available on Amazon.com.









Mac Build



Companies & Projects Using Git





Microsoft twitter Linked in.

























```
(master) GitAndMore s git help
usage: git [--version] [--help] [-C <path>] [-c name=value]
          [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
          [-p | --paginate | --no-pager] [--no-replace-objects] [--bare]
          [--qit-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
          <command> [<args>]
These are common Git commands used in various situations:
start a working area (see also: git help tutorial)
   clone
             Clone a repository into a new directory
             Create an empty Git repository or reinitialize an existing one
   init
work on the current change (see also: git help everyday)
  add
             Add file contents to the index
             Move or rename a file, a directory, or a symlink
  mv
             Reset current HEAD to the specified state
  reset
             Remove files from the working tree and from the index
   rm
examine the history and state (see also: git help revisions)
             Use binary search to find the commit that introduced a bug
   bisect
             Print lines matching a pattern
   grep
             Show commit logs
   loa
             Show various types of objects
   show
   status
             Show the working tree status
grow, mark and tweak your common history
             List, create, or delete branches
   branch
             Switch branches or restore working tree files
   checkout
             Record changes to the repository
   commit
```

diff Show changes between commits, commit and working tree, etc Join two or more development histories together merge Forward-port local commits to the updated upstream head rebase Create, list, delete or verify a tag object signed with GPG tag collaborate (see also: git help workflows) fetch Download objects and refs from another repository Fetch from and integrate with another repository or a local branch pull Update remote refs along with associated objects push 'git help -a' and 'git help -g' list available subcommands and some concept guides. See 'git help <command>' or 'git help <concept>' to read about a specific subcommand or concept.

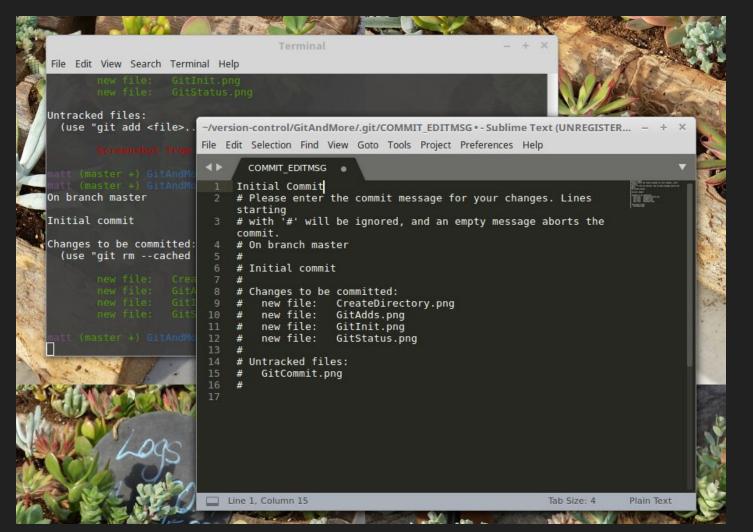
```
File Edit View Search Terminal Help
available git commands in '/usr/lib/git-core'
                             merge-octopus
                             merge-one-file
merge-ours
 annotate
                             merge-recursive
 apply
archive
                             merge-resolve
                             merge-subtree
                             merge-tree
mergetool
 bisect--helper
 blame
 branch
                             mktree
 bundle
 cat-file
                             name-rev
 check-attr
                             notes
 check-ignore
                             pack-objects
 check-mailmap
                             pack-redundant
 check-ref-format
                             pack-refs
 checkout
                             patch-id
 checkout-index
                            prune-packed
pull
 cherry-pick
 citool
                             push
                             quiltimport
 clone
                             read-tree
 column
                             rebase
 commit
                             receive-pack
                             reflog
 commit-tree
                             relink
 config
 count-objects
                             remote
 credential
                             remote-ext
 credential-cache
                             remote-fd
 credential-cache--daemon remote-ftp
                             remote-ftps
 credential-store
 daemon
                             remote-http
 describe
                             remote-https
                             remote-testsvn
 diff-index
                             replace
                             request-pull
 difftool
 difftool--helper
                             reset
 fast-export
                             rev-list
 fast-import
                             rev-parse
 fetch
                             revert
 fetch-pack
 filter-branch
                             send-pack
 fmt-merge-msg
for-each-ref
                             sh-i18n--envsubst
                             shell
 format-patch
                             show
                             show-branch
 gc
get-tar-commit-id
                             show-index
                             show-ref
                             stage
                             stash
 qui--askpass
                             status
 hash-object
                             stripspace
 help
                             submodule
 http-backend
                             submodule--helper
 http-fetch
 http-push
                             symbolic-ref
                             tag
unpack-file
unpack-objects
 imap-send
 index-pack
```

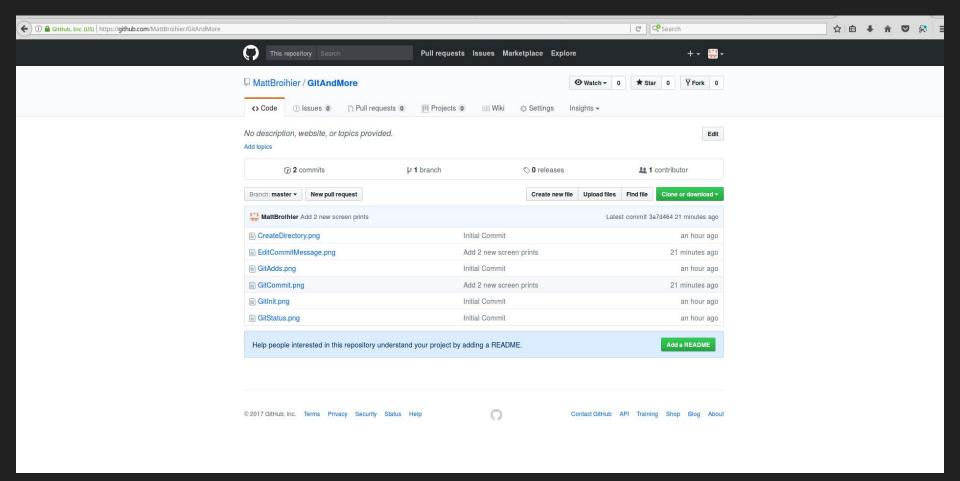
init-db

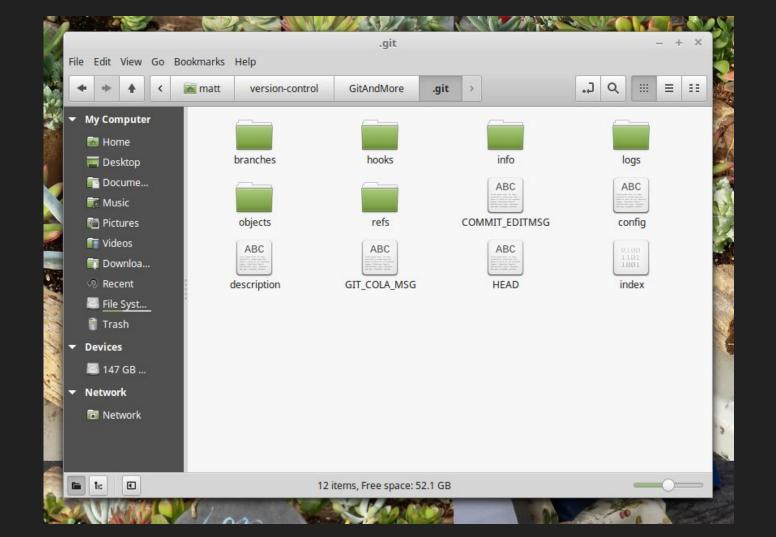
update-index

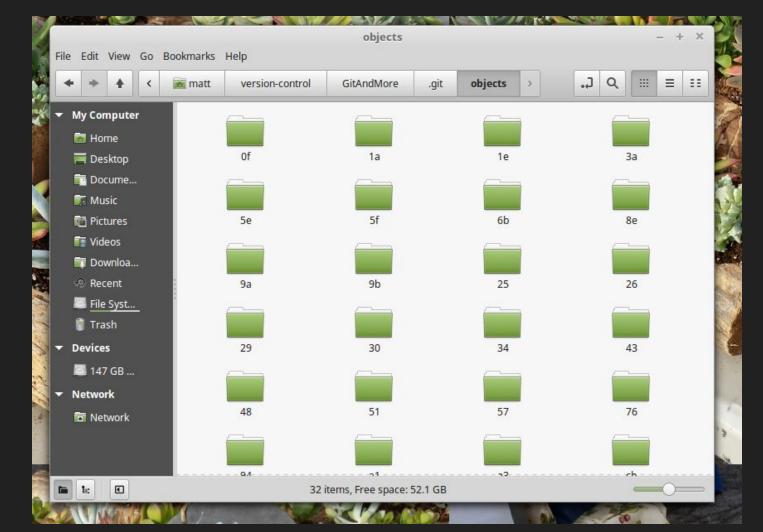
Basic Git concepts

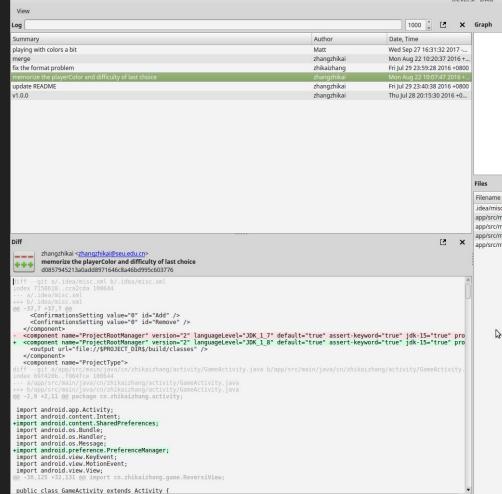
- Repository
- Branch
- Fork
- Pull request
- Merge

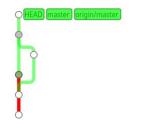












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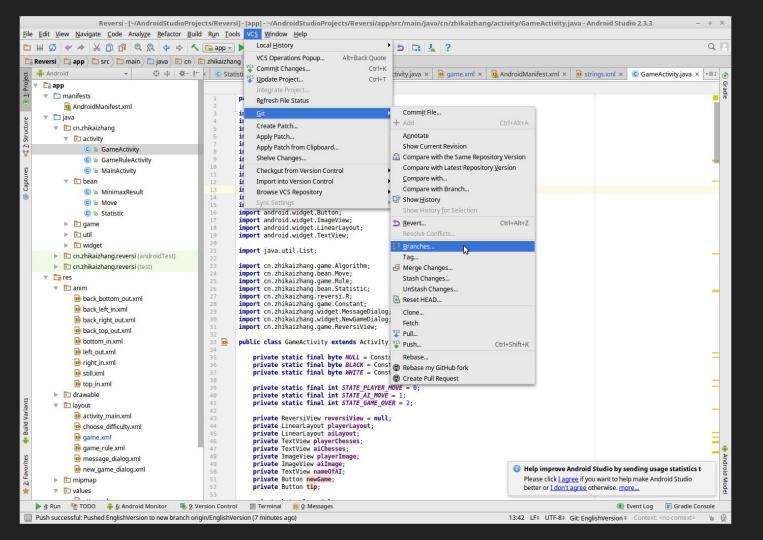
Files				
Filename	Additions	Deletions		
.idea/misc.xml	1	1		
app/src/main/java/cn/zhikaizhang/activity/GameActivity.java	241	229		
app/src/main/java/cn/zhikaizhang/activity/MainActivity.java	8	2		
app/src/main/java/cn/zhikaizhang/widget/NewGameDialog.java	10	3		
app/src/main/res/layout/new_game_dialog.xml	1	0		

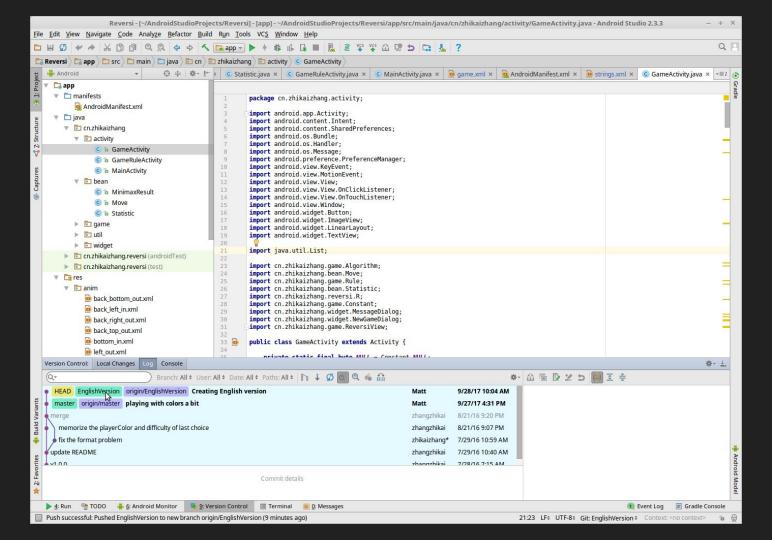
25 facts about Linux on it's 25th birthday

https://medium.freecodecamp.org/linux-is-25-yay-lets-celebrate-with-25-rad-facts-about-linux-c8d8ac30076d

What is a pull request?







Git gui tools

- A bunch out there, here are a couple
- https://github.com/git-cola/git-cola/
- Within Git Cola (DAG) https://git-cola.github.io/share/doc/git-cola/html/git-dag.html

```
Linus Torvalds
                     Fri Apr 8 15:31:19 2005 -0...
                                      Terminal
File Edit View Search Terminal Help
         cd version-control/git
bash: cd: version-control/git: No such file or directory
         cd version-control/Git
           git clone https://github.com/git/git.git
Cloning into 'git'...
remote: Counting objects: 232648, done.
remote: Total 232648 (delta 0), reused 0 (delta 0), pack-reused 232648
Receiving objects: 100% (232648/232648), 93.65 MiB | 10.38 MiB/s, done.
Resolving deltas: 100% (171398/171398), done.
Checking connectivity... done.
           git status
fatal: Not a git repository (or any of the parent directories): .git
 ort 61 5 cd ...
  tt version-control $ cd git
 att (master) 👊 🕏 git status
On branch master
Your branch is up-to-date with 'origin/master'.
nothing to commit, working directory clean
 att (master) qit s git clone https://github.com/git/git.git
```

