Introducing: git

Level up your VCS

Health Market Science [second showing]

“I'm an egotistical bastard, and I name all my projects after myself. First Linux, now git[1].”

Linus Torvalds

“I have an ego the size of a small planet” - Linus

[1] git (n): British slang for a stupid or unpleasant person

The Journey

- **SCM, DVCS**
- History
- Git
- Demonstration

SCM and DVCS

SCM

Software Configuration Management

Source Code Management

Centralized

CVS, SVN, Most Commercial Offerings

Distributed

Git, Darcs, Hg, Bazar, BitKeeper

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In the beginning...

*There was **no*** VCS for the Linux Kernel (!)

> “Only wimps use tape backup: _real_ men just upload their important stuff on ftp, and let the rest of the world mirror it ;) “ – Linus

BitKeeper first tried out by LinuxPPC project

Linus Adopts it “Best tool for the job”

Linux has VCS for the *first time* in Feb 2002 (rejoice!)

The Plot Thickens

BitKeeper by BitMover

- Free use for Open Source
- …so long as you don't work on another DVCS
- …or reverse engineer the wire protocol

In steps Andrew Tridgell

```
telnet bkserver bkport
help^M
```

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telnet bkserver bkport
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```

→ *Revoked*

A git is born

In Steps Linus Torvalds

- *Opinionated*
- ***Needed*** DVCS
- Safeguards against corruption
- High Performance (impatience is a virtue)

Started:	2005/04/03
Announced:	2005/04/06
Self Hosting:	2005/04/07 (4d!)
First Multi-branch Merge:	2005/04/18 (15d!)

The Journey

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Fundamentals of VCS

Initialize
Add Files
Commit
View History
Revert
Branch
Share [Push]
Update [Pull]

No Really, it’s different

“In many ways you can just see git as a filesystem — it's content-addressable, and it has a notion of versioning, but I really designed it coming at the problem from the viewpoint of a *filesystem* person (hey, kernels is what I do), and I actually have absolutely *zero* interest in creating a traditional SCM system. “

Linus Torvalds

No Really, it's different

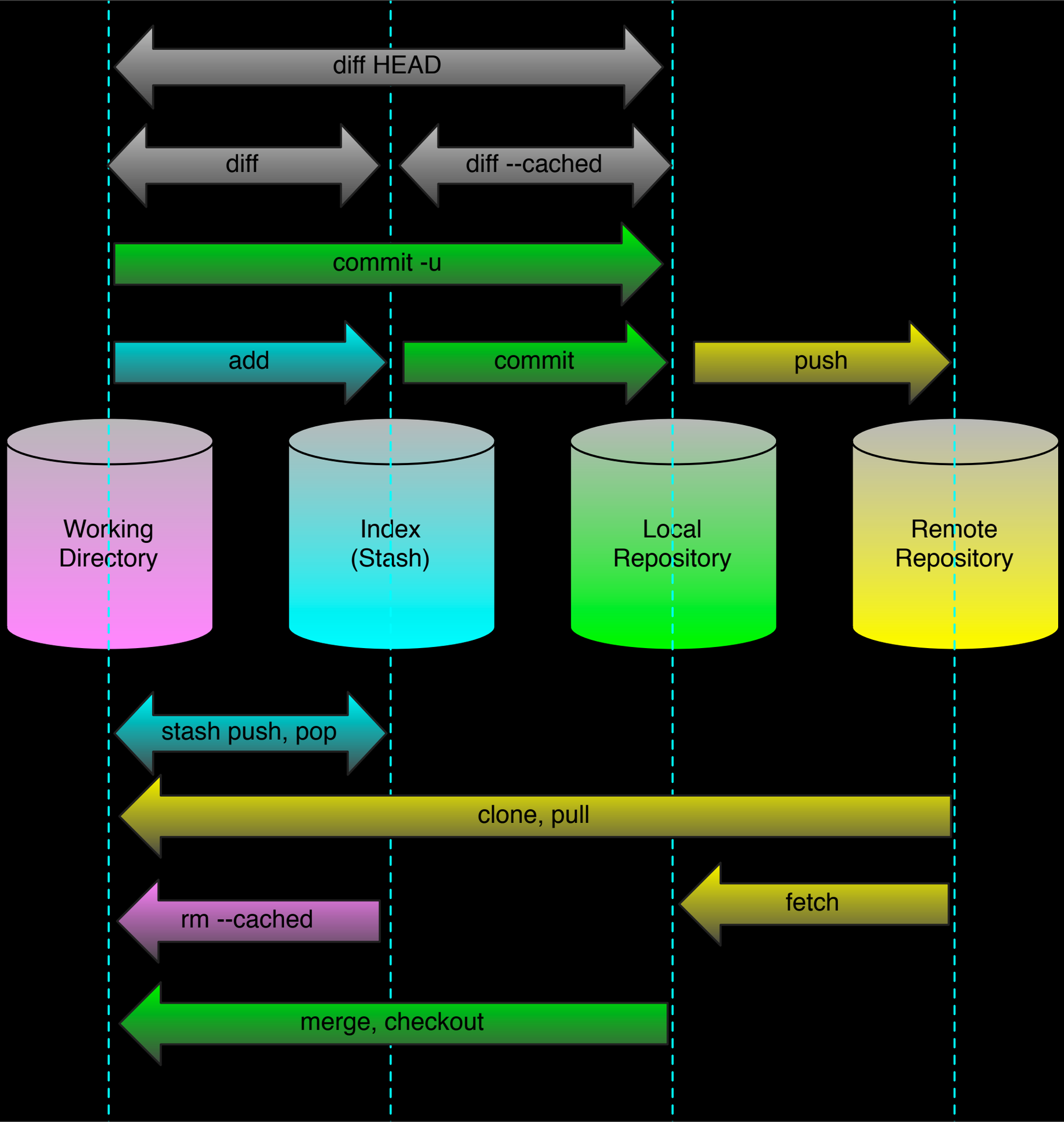
Tracks Content via SHA-1 hash

Working Area

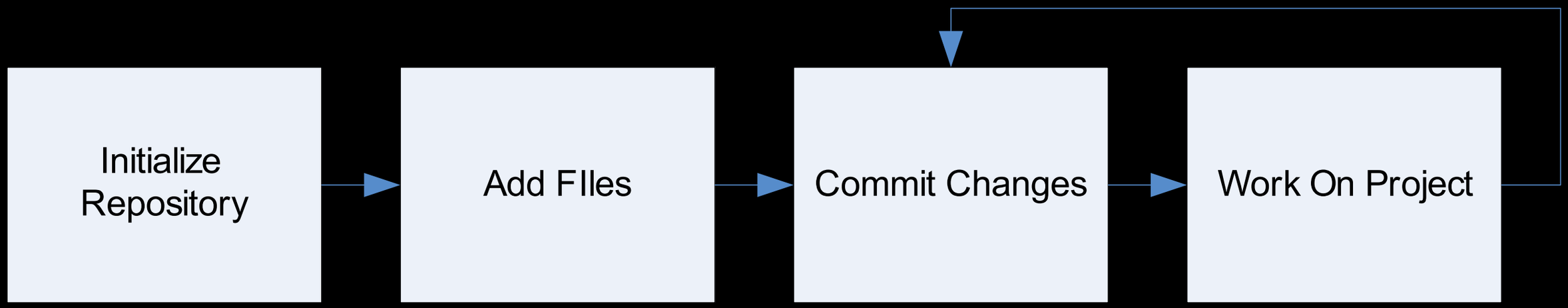
Index (Staging Area)

Repositories (http, ssh, local, nfs, git)

Stash


diff HEAD
diff
diff --cached
commit -u
add
commit
push
Working Directory
Index (Stash)
Local Repository
Remote Repository
stash push, pop
clone, pull
rm --cached
fetch
merge, checkout

Lone Developer



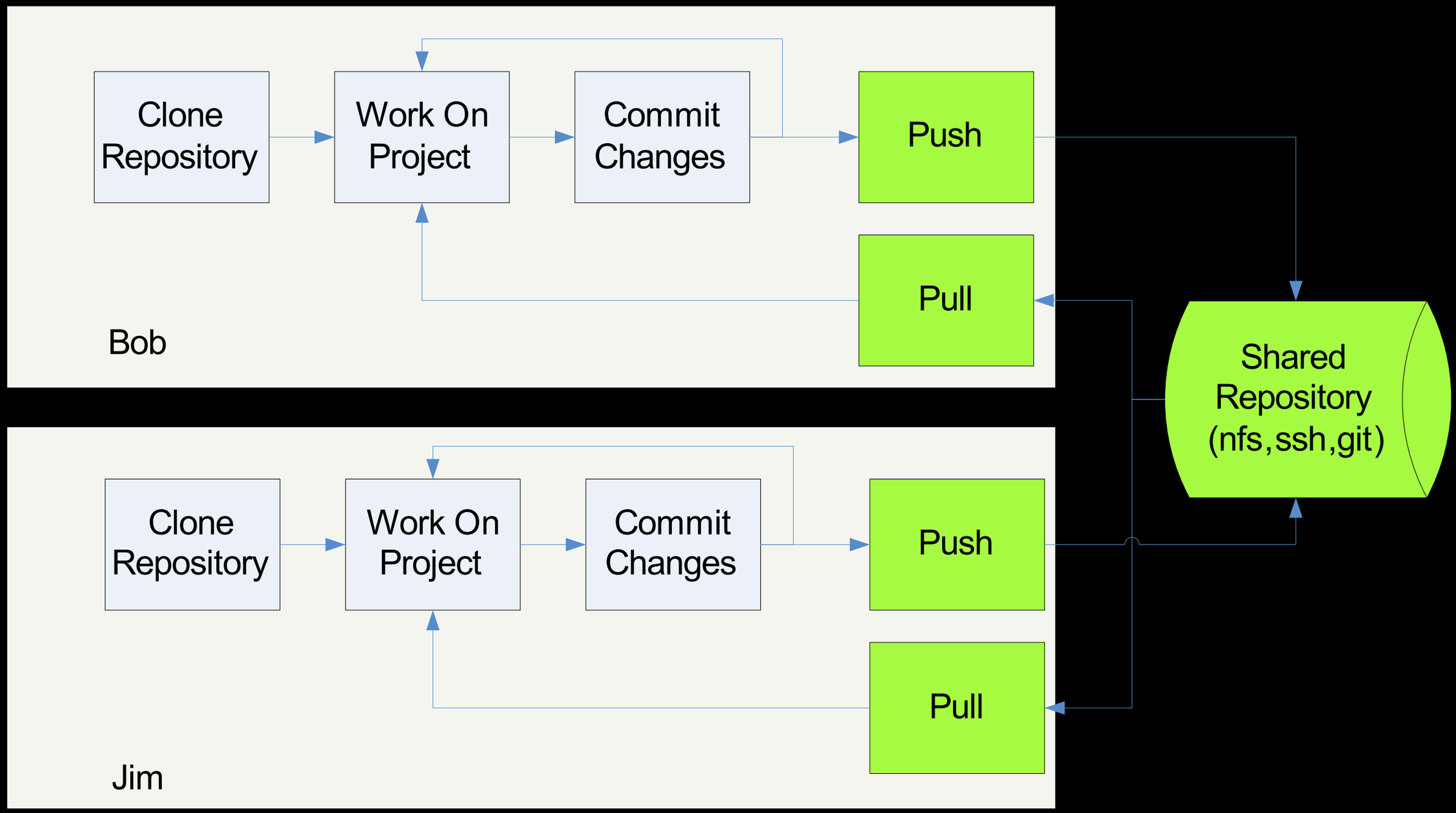
init (or clone)

loop...

commit -a

...recur

Dev Team


Clone Repository
Work On Project
Commit Changes
Push
Pull
Bob
Shared Repository (nfs,ssh,git)
Clone Repository
Work On Project
Commit Changes
Push
Pull
Jim

git-svn

git-svn clone

git-svn dcommit

git-svn rebase

(svn duplicates a lot of data, this makes the initial clone slow, but you only pay once)

Branching shall set you free

Start a feature

clone

branch ‘feature’, work, add, commit

Oops, need to fix a bug

checkout master, branch ‘bug’

checkout bug, work, commit, merge master

checkout master, merge ‘bug’ (delete)

Finish the feature

checkout ‘feature’

merge master, work, commit

checkout master

merge ‘feature’

Tools and Features

```
gitk
git log --color --graph
.git/info/exclude and .gitignore
git grep ‘java.util.Map’ $(git tag -l)
```

Relative Versions

```
git diff HEAD^
git diff HEAD^^^^^
git diff HEAD~5 HEAD~10
```

Tools and Features

```
git blame <<file>>
git clean
git bisect
git add --interactive
git archive \
  --prefix=java-memcached-client \
  --format=tar 2.3 | \
gzip java-memcached-client-2.3.tgz
git gui
git instaweb
```

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- **Demonstration**

Demonstration

(run off to a putty terminal, don’t forget to start X, try not to make [too much of] a fool of yourself)

Should You Adopt Git?

NO!

You just moved to {svn,Hg,darcs,*}

People Don’t like Change

Some Tools Still Immature

(honestly I couldn’t come up with any technical reasons)

Should You Adopt Git?

YES! (can't stop you)

Fantastic for local use

- $HOME and /etc

git-svn

It's *fast*

- Happy Developers == more productive
  - (if you buy into that sort of thing)

Conclusion

Fast

Geek Chic

DVCS Different

Powerful

Easier Than it seems

(did I mention it's fast?)

```
kyle@ppt:~ $ git commit -a -m 'finished presentation'

[detached HEAD a835269] finished presentations
 2 files changed, 3 insertions(+), 3 deletions(-)
kyle@ppt:~ $ git push

Counting objects: 5, done.
Delta compression using 2 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 297 bytes, done.
Total 3 (delta 2), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
To /home/git-repo/git-presentation/
   3fd2b39..867372e  master -> master
kyle@ppt:~ $ ^D
```

References

http://www.youtube.com/watch?v=4XpnKHJAok8
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http://git-scm.com/
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http://code.google.com/p/tortoisegit/
http://osteele.com/archives/2008/05/my-git-workflow
http://confluence.atlassian.com/display/CRUCIBLE/Crucible+Git+Plugin
http://code.google.com/p/msysgit/

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