git Crash Course

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Figures from Scott Chacon

What is git?

- "Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency."
  - Website: [1] http://git-scm.com/
- Replacement for SVN, CVS, SCCS, ...

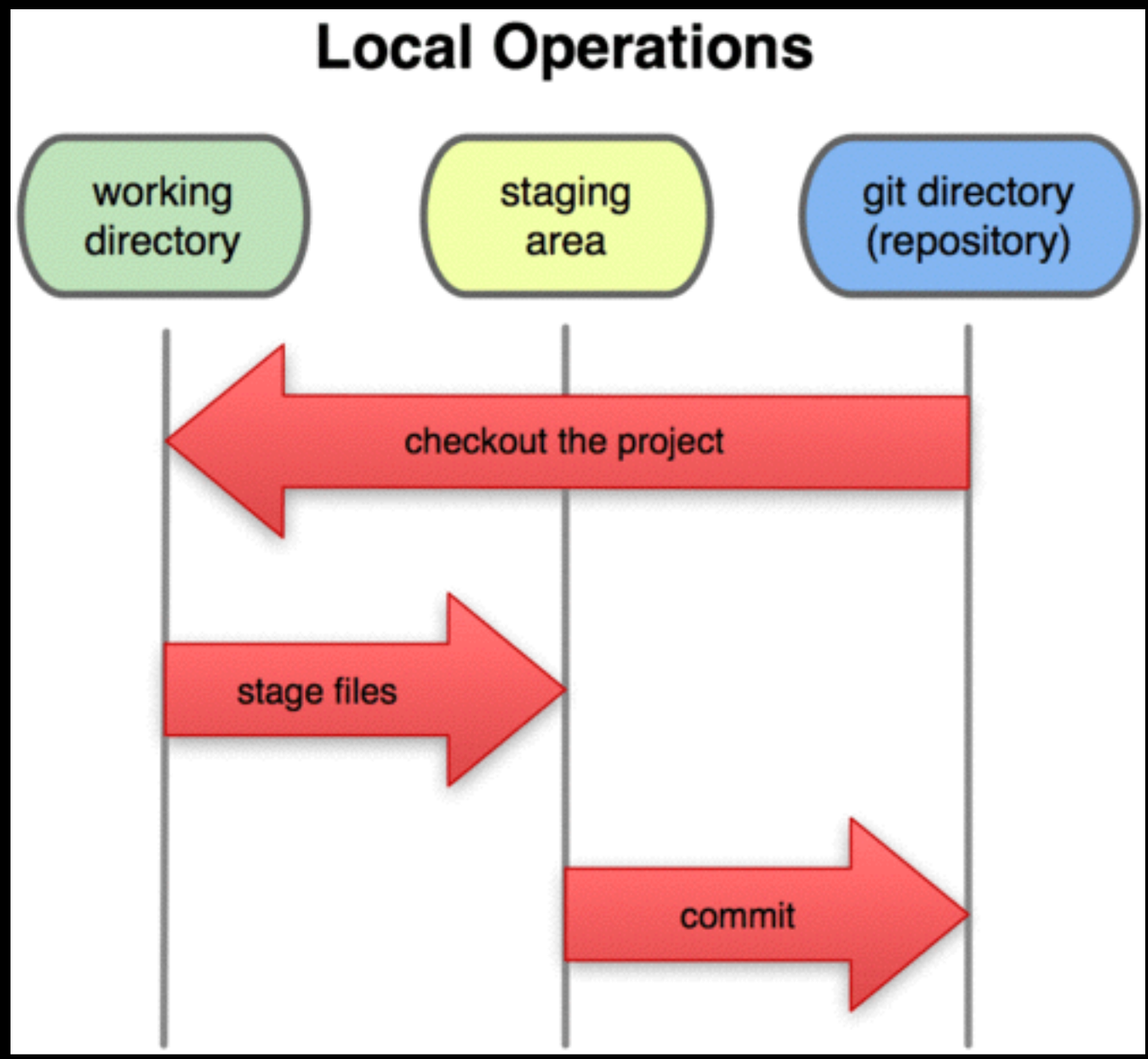
Why git{hub}?

- git coordinates actions across multiple developers.
- git maintains all previous versions
  - It's nearly impossible to lose committed changes.
- github maintains backups "in the cloud"
- Other github niceties: code reviews, wikis, issue tracking, unit testing, …

Demo

The Three File States

- Committed: File stored in the (local) git repo
- Modified: File has been changed, but hasn't been stored.
- Staged: File marked for inclusion in the next commit

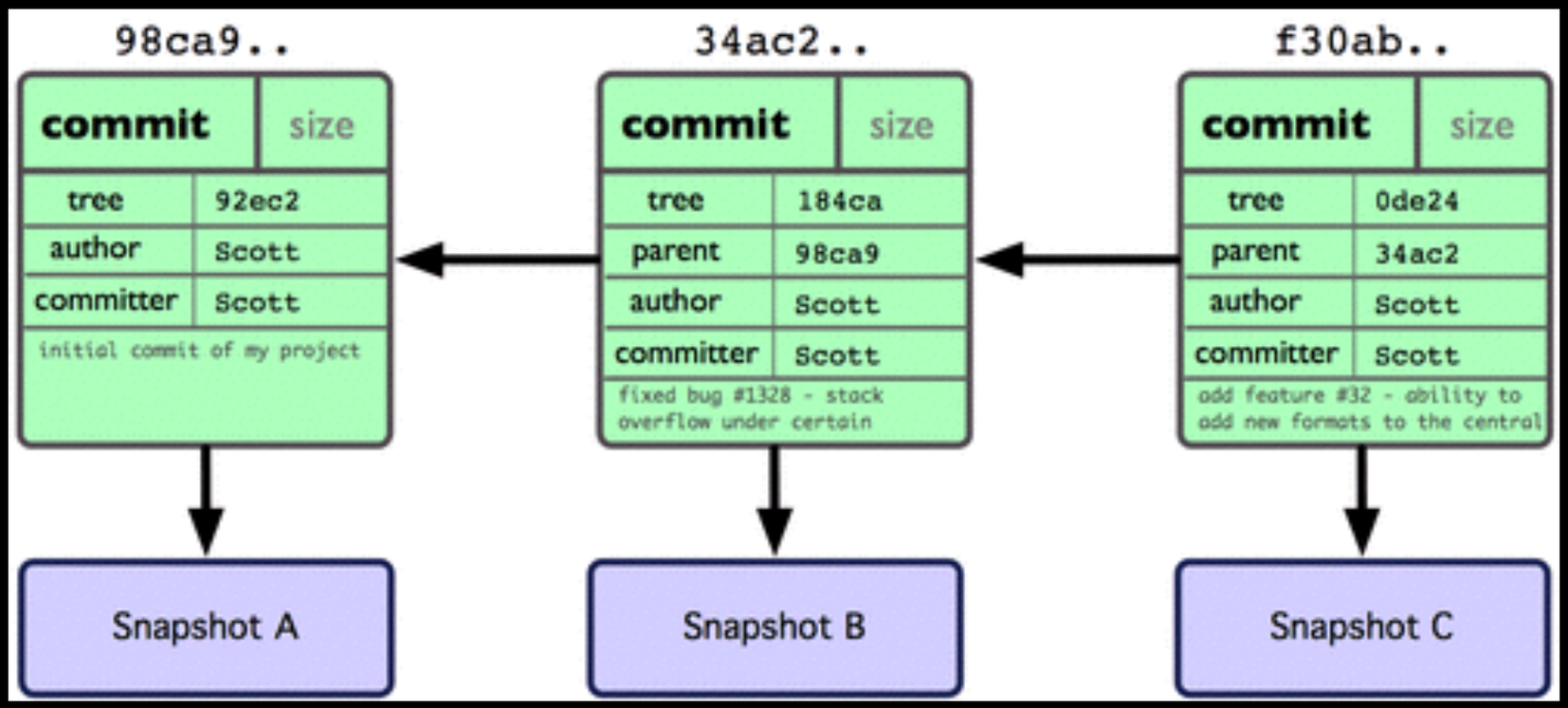


git commands

- git add: Stage a file for commit
- git commit: Commit staged files
- git merge origin/master: Merge changes from origin/master branch into current branch.

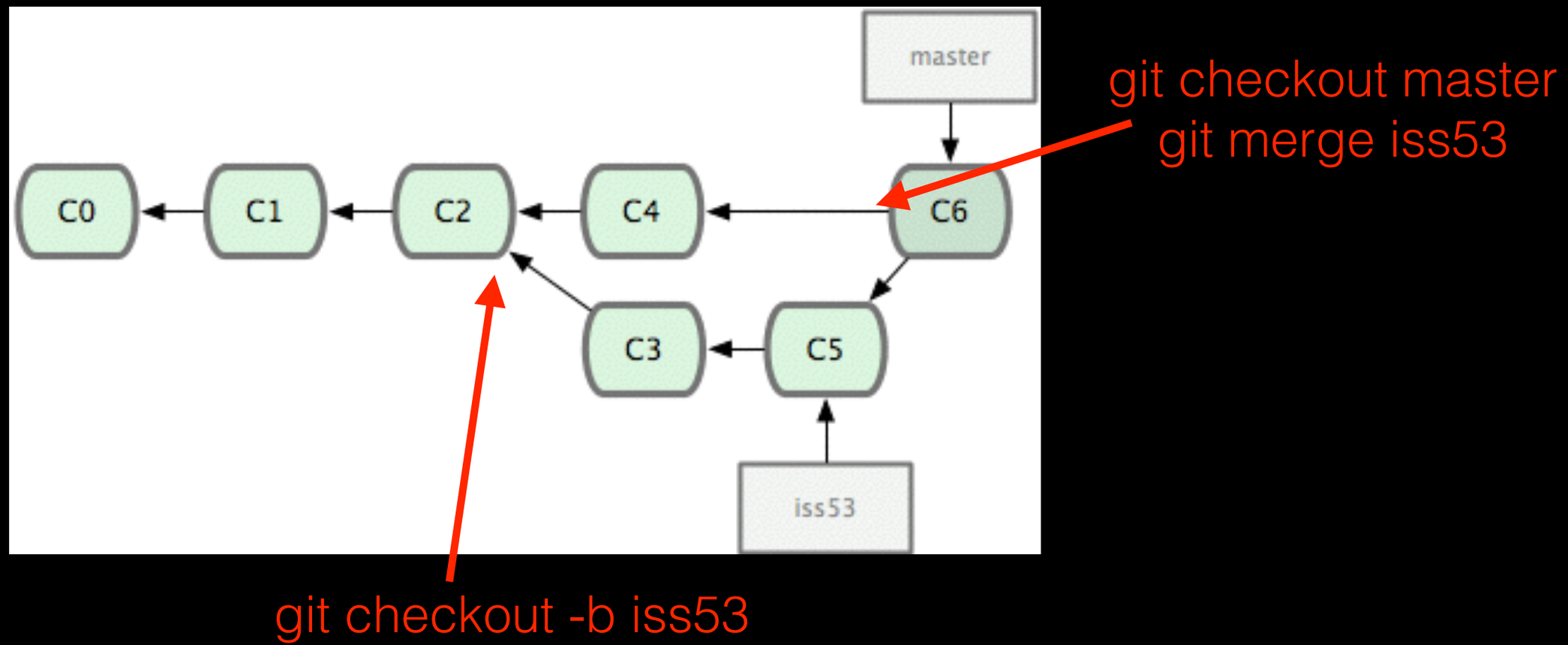
Branches

- git maintains a directed-acyclic graph of file system snapshots

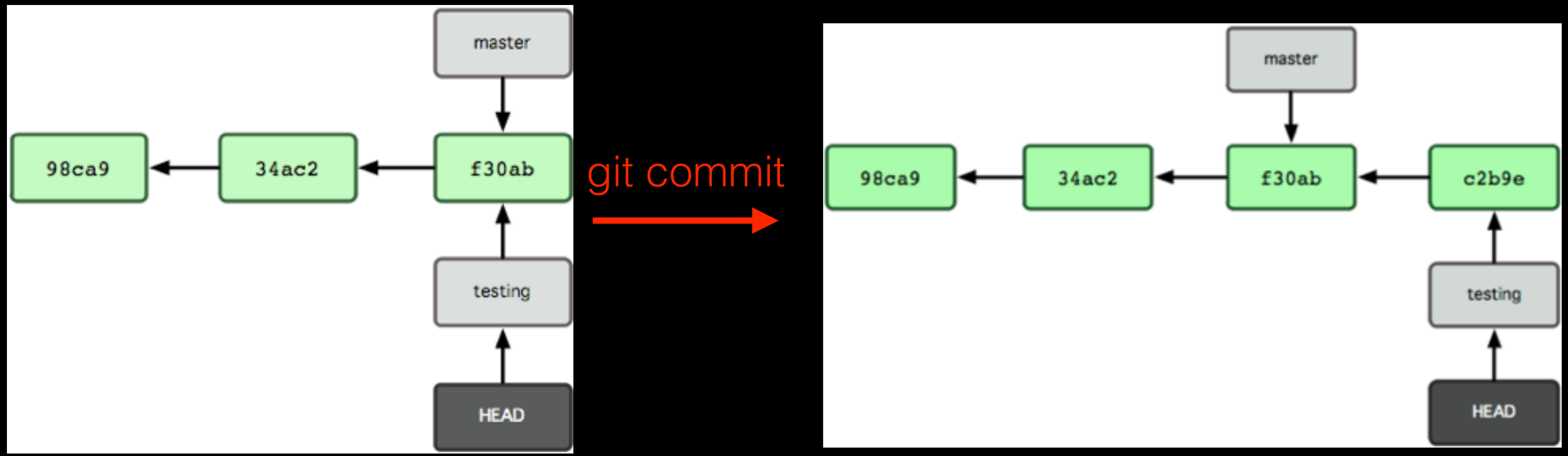


Branches, continued

- Git history is a graph: nodes can have multiple children / parents
- A branch is simply a pointer into the DAG

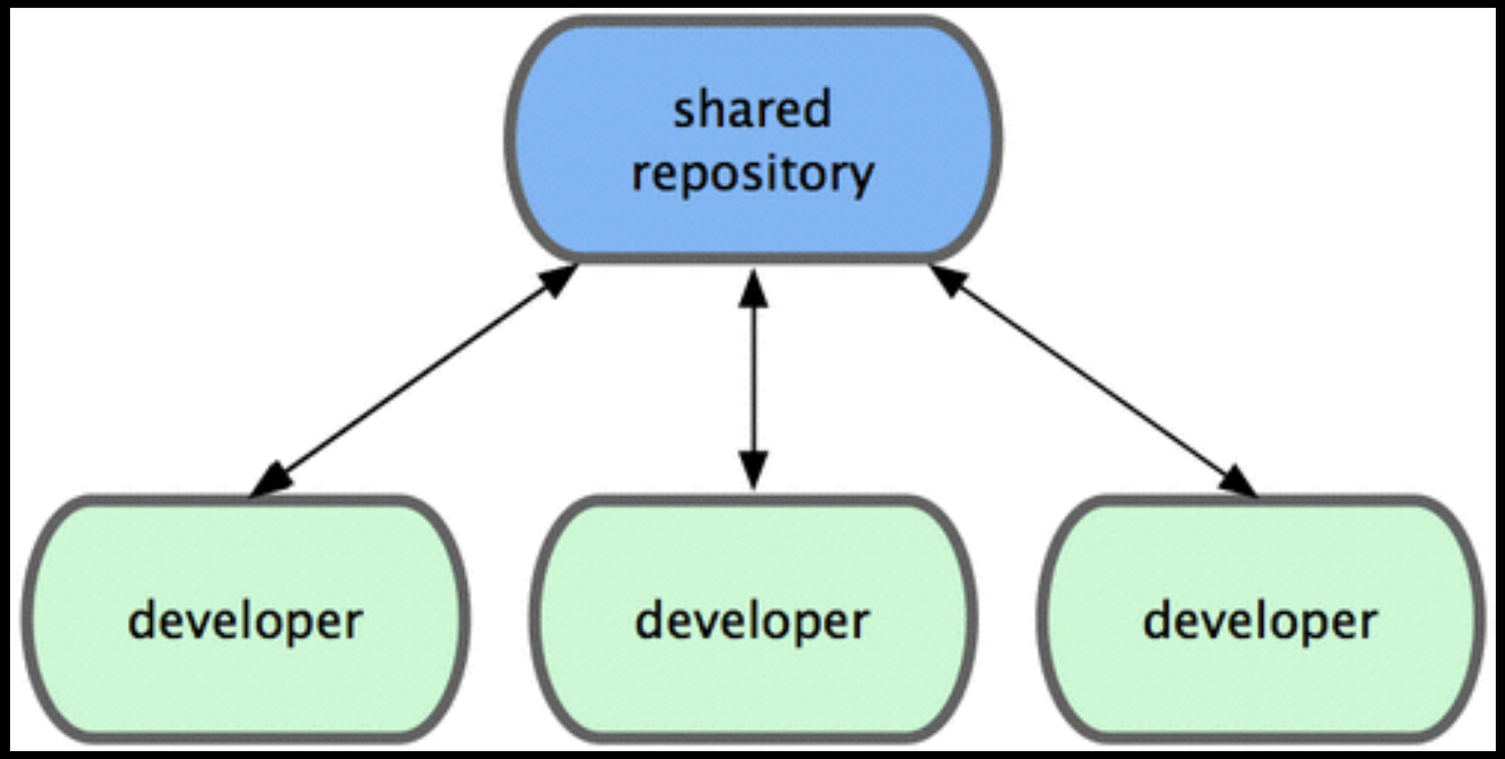


Commit Behavior



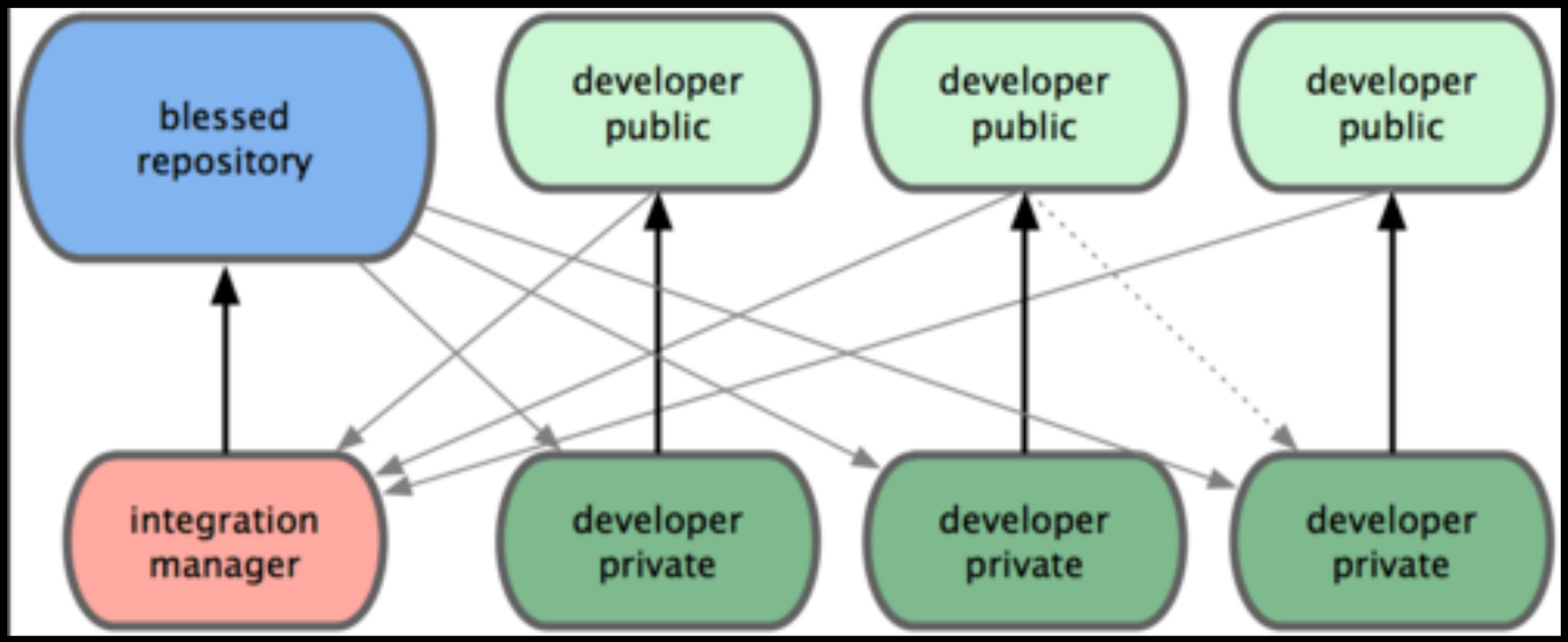
- HEAD is a special “you are here” pointer.
- On a commit, the HEAD branch advances, but no others.

git Distributed Workflow #1



Centralized Workflow

Distributed Workflow #2



Integration Manger

git Remotes

- A remote is a repository on a remote machine:
  - git@github.com:7andrew7/FantasyBaseball.git
- Tracking branch: A local branch that has a direct relationship with a remote branch.
  - git push: push local commits to the remote branch.
  - git pull: fetch and merge changes from remote branch.
- Prefer fetch + merge to pull; for details: http://longair.net/blog/2009/04/16/git-fetch-and-merge/

Command Quick Reference

- git status: information dump of local files; super-useful.
- git log: list recent changes.
- git add: stage a file for commit.
- git commit: commit a file to the local repo.
- git push: push changes to the default remote repo/branch.
- git pull: fetch and merge changes from default remote repo/branch. Equivalent to: git fetch followed by git merge.

Best Practices

- Use git for managing everything.
- Make lots of small self-contained commits.
- Don’t commit broken stuff.
  - See: git stash
- Write a good commit message.
- Use feature branches to group multiple commits.