GIT

An Introduction

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Git Object Hashmap

- internal storage git (./.git/objects/)
- all content that represents history is stored here, ALL!
- stored in a hashmap of sha1 keys to content of objects
- different types of objects

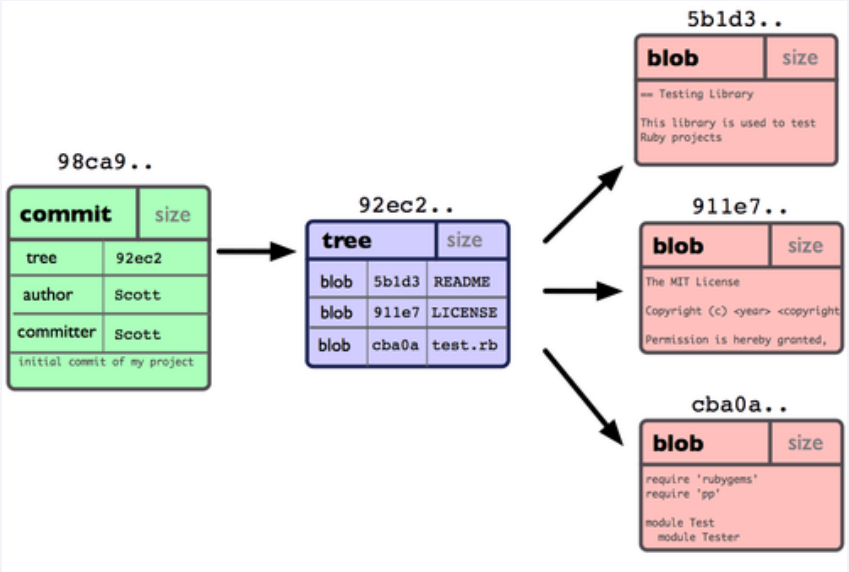
```
$ git cat-file -p <hash>
```

```
$ tree .git/objects
.git/objects/
| 9d/
|     `-- aeafb9864cf43055ae93beb0afd6c7d144bfa
`-- info/
`-- pack/

3 directories, 1 file
```

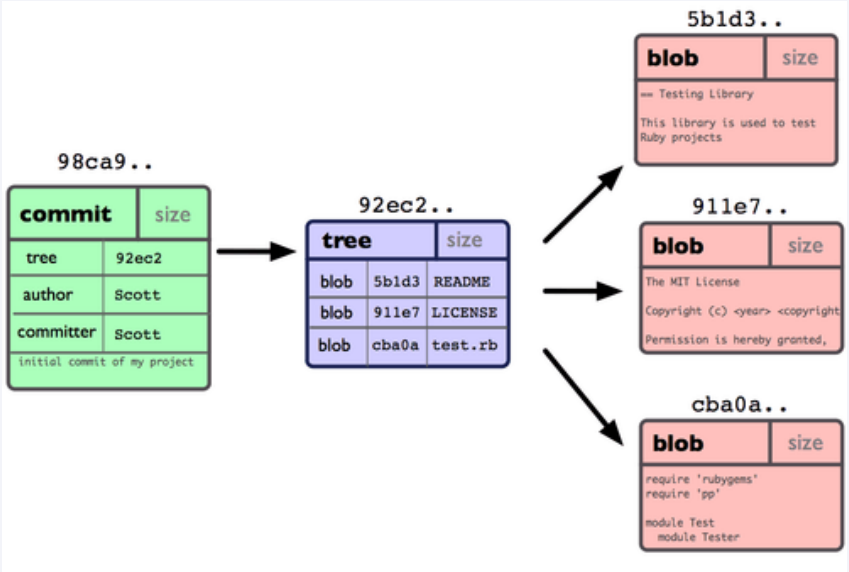
Git Object Hashmap

- blob
- tree
- commit
- tag (or are they?)



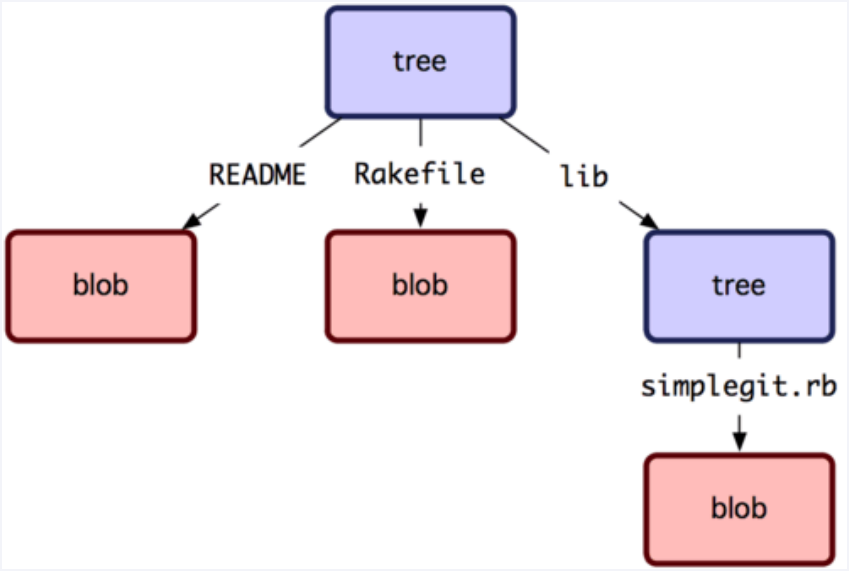
blob

- flat files
- the actual source code
- full copy
- has no further references to other objects



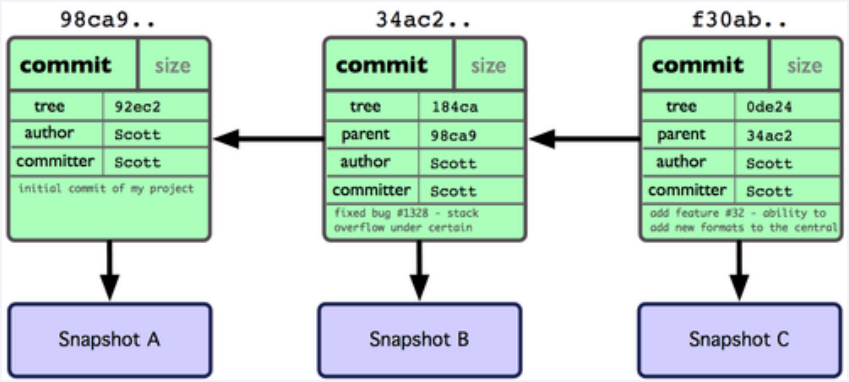
tree

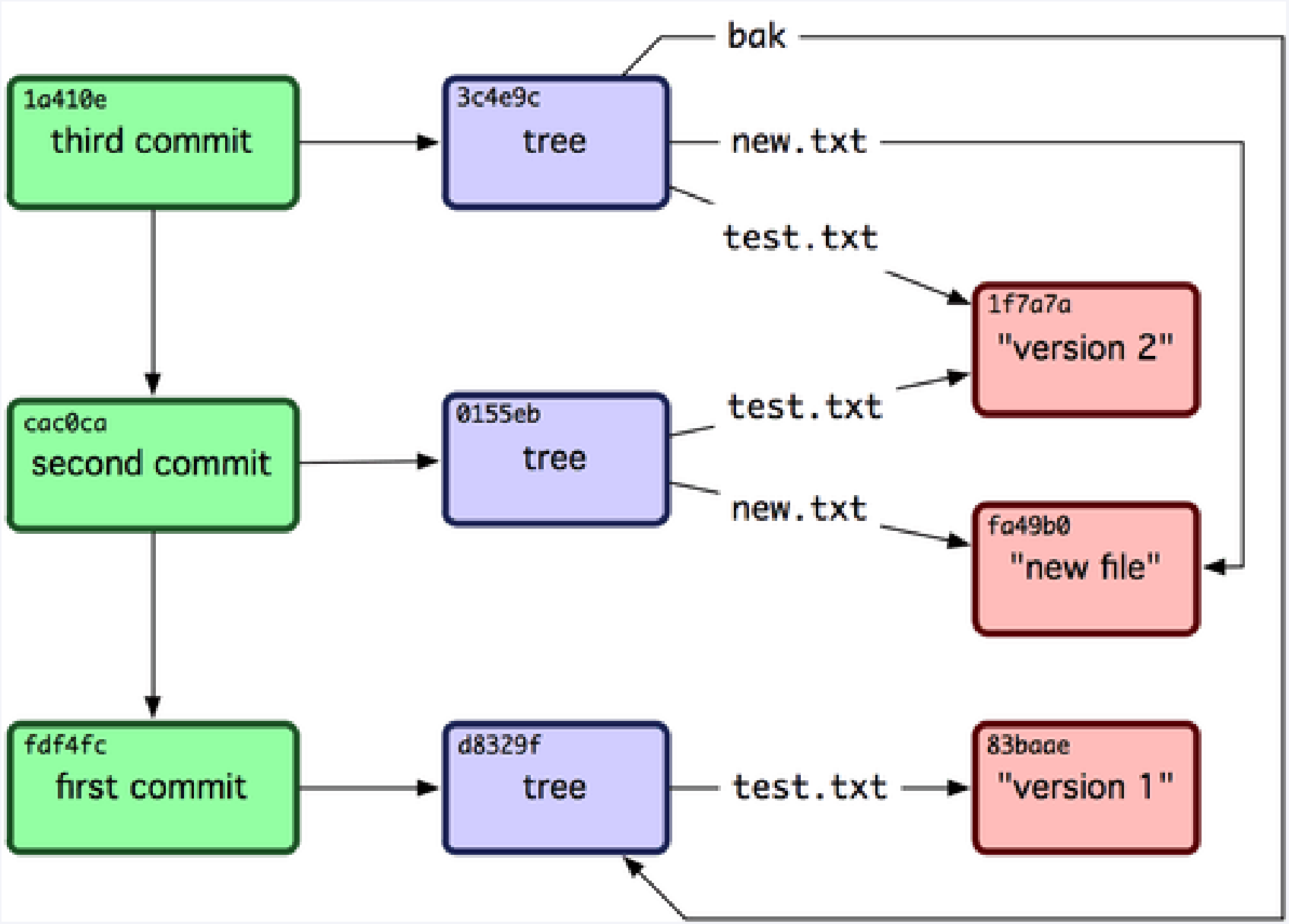
- represents a directory on disk
- retains file permissions (in unix notation)
- points to other trees and blobs



commit

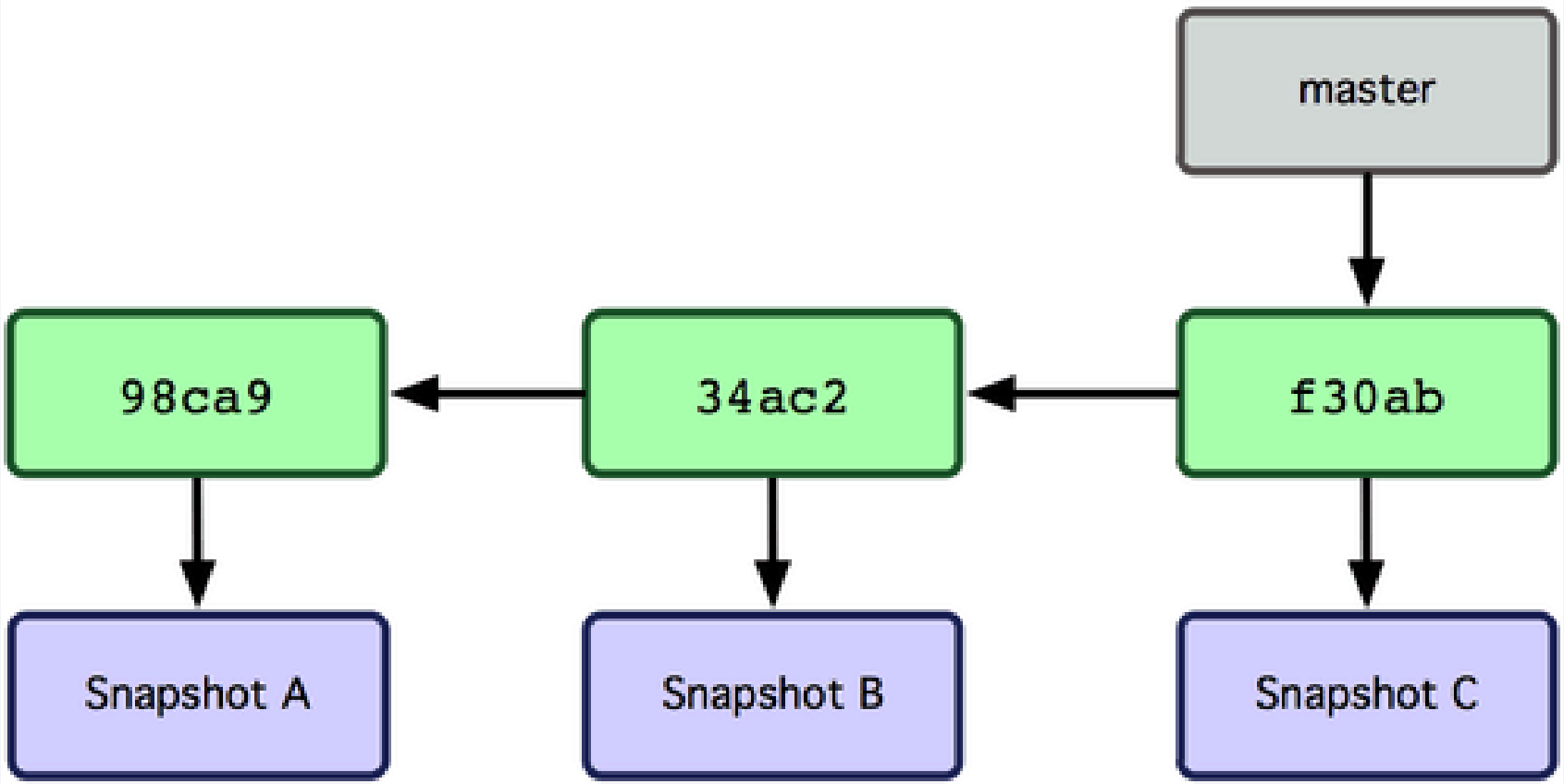
- stores author, timestamp, message, ...
- points to a tree
- points to 1 or more commits (parent commits)




bak
1a410e
third commit
3c4e9c
tree
new.txt
test.txt
1f7a7a
"version 2"
cac0ca
second commit
0155eb
tree
test.txt
new.txt
fa49b0
"new file"
fdf4fc
first commit
d8329f
tree
test.txt
83baae
"version 1"

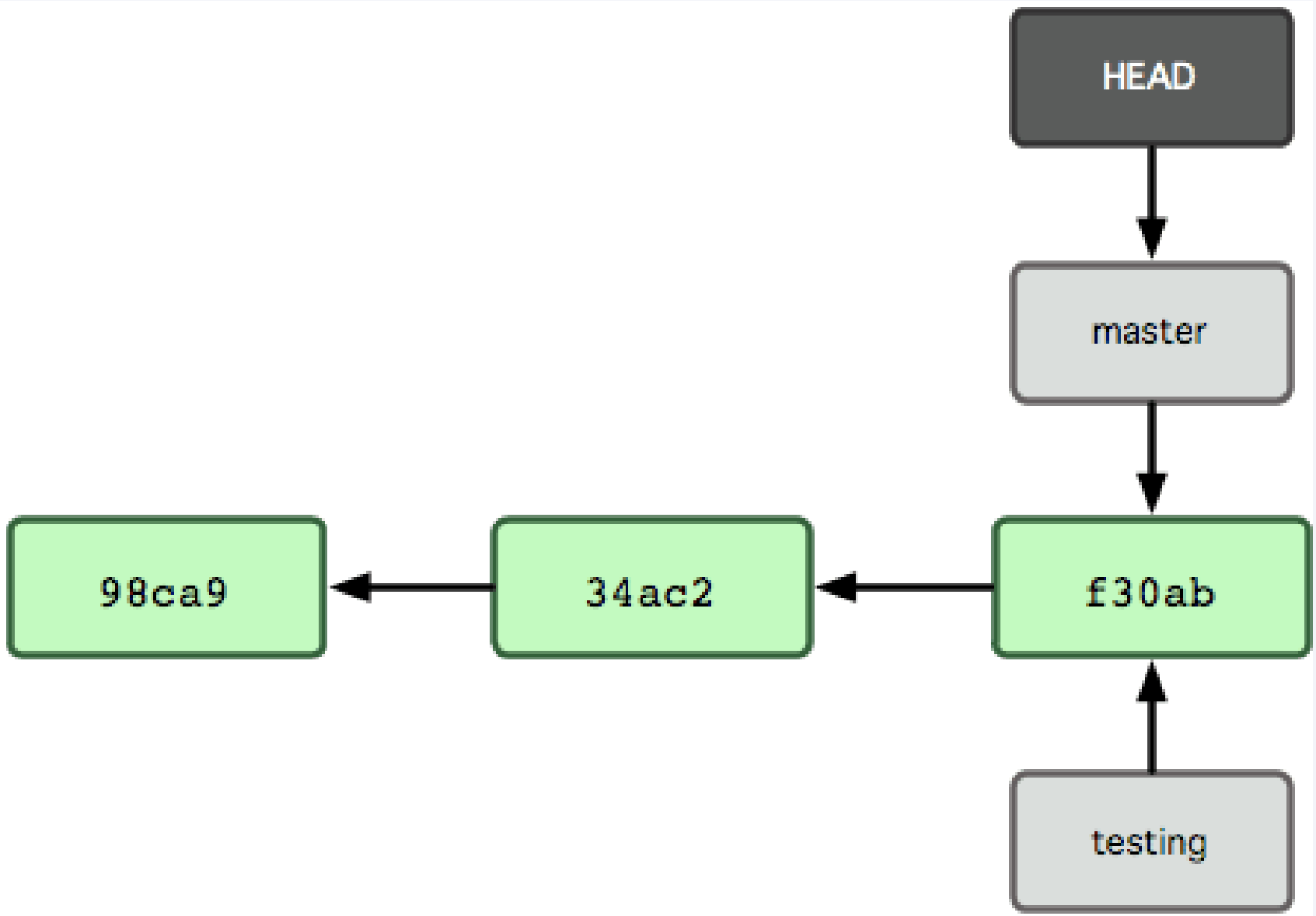
branches

- point to a commit (flat file with sha1 hash).
- moves pointer on commit, revert, rebase, reset, ...
- stored in .git/refs/


master
98ca9
34ac2
f30ab
Snapshot A
Snapshot B
Snapshot C

What is HEAD

- points to a branch
- flat file with relative path to branch
- or sha1 hash in detached head mode.
- moves on git checkout
- does NOT move on revert, rebase, reset, commit, ...


HEAD
master
98ca9
34ac2
f30ab
testing

Tags vs Anotated Tags

Tags

- comparable to branch, can not be commit on
- located in .git/refs/tags
- does not create git objects

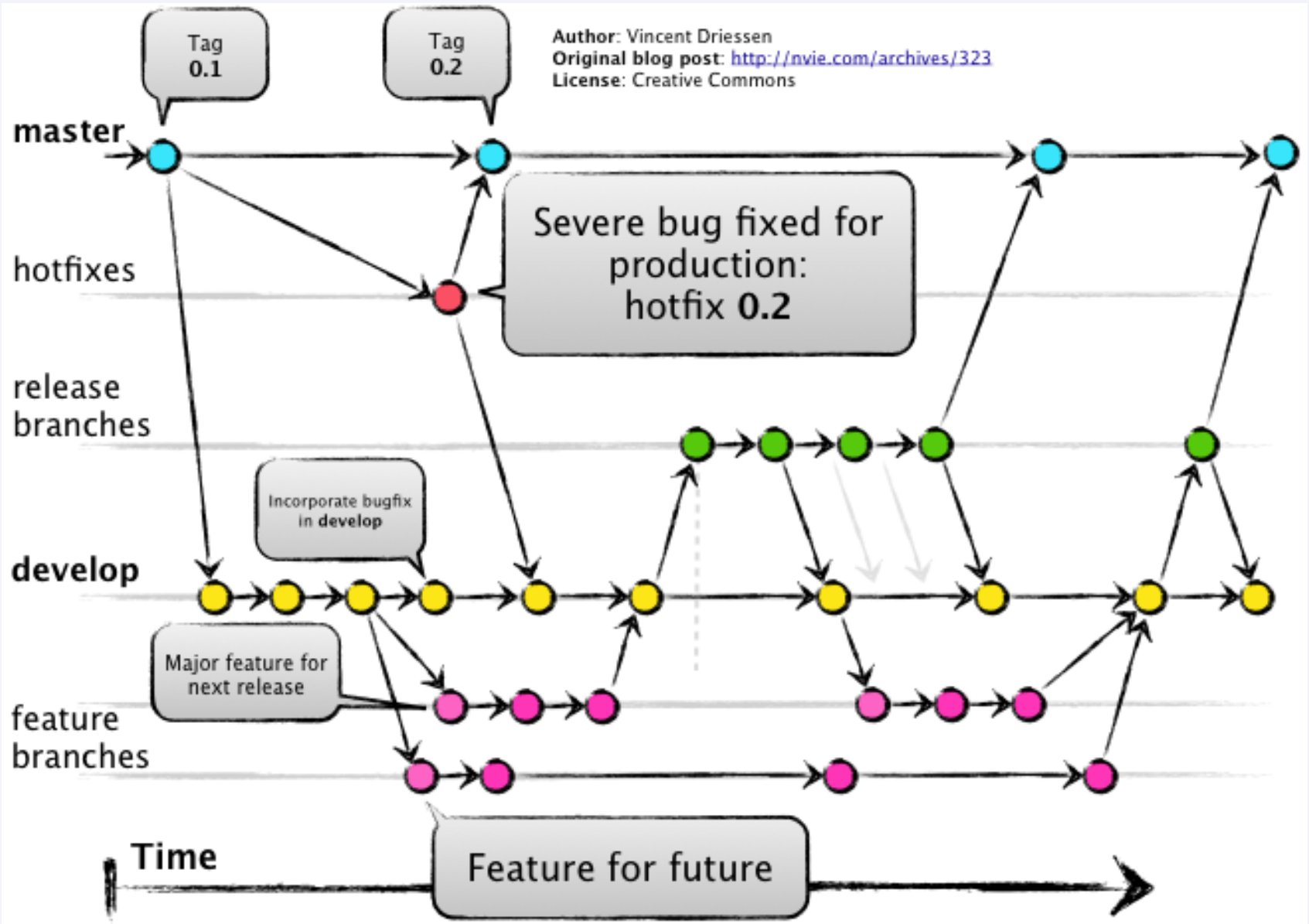
Anotated Tags

- comparable to branch, can not be commit on
- has tagger, time and message
- can be cryptographically signed! (REAL TAGS)
- does create git objects (‘git cat-file -p ¡tag-name¿‘)
- will be used for releases.

And now, a demo

All hail the demo gods.

gitflow


Tag
0.1
Tag
0.2
Author: Vincent Driessen
Original blog post: http://nvie.com/archives/323
License: Creative Commons
master
hotfixes
Severe bug fixed for production: hotfix 0.2
release branches
Incorporate bugfix in develop
develop
Major feature for next release
feature branches
Time
Feature for future

gitflow branches

- master, develop (ever present)
- feature branch (each jira ticket)
- hotfix branch (production issues)
- release branch (only showstopper)

gitflow rules

- feature branch:
  - from develop
  - to develop
- hotfix branch:
  - from master
  - to master and develop (develop will also need this fix)
- release branch:
  - from develop
  - to master and develop

You are implementing a feature.

- create branch ('feature/JIRA-547')
- commit, commit, commit, ..., revert, commit again
- keep running unit tests
- create pull request
- reviewer merges back into develop
- ci deploys develop to TST

feature pull request breaks CI build

- merge develop in feature/JIRA-547
- commit, commit, commit, ... (hopefully fixing stuff)
- reopen pull request
- rinse and repeat

Preparing for a new release

- branch from develop ('release/release-version')
- deploy release branch to ACC
- have customer test everything
- fix showstoppers on release branch
- merge into master and back into develop
- tag merge commit on master branch

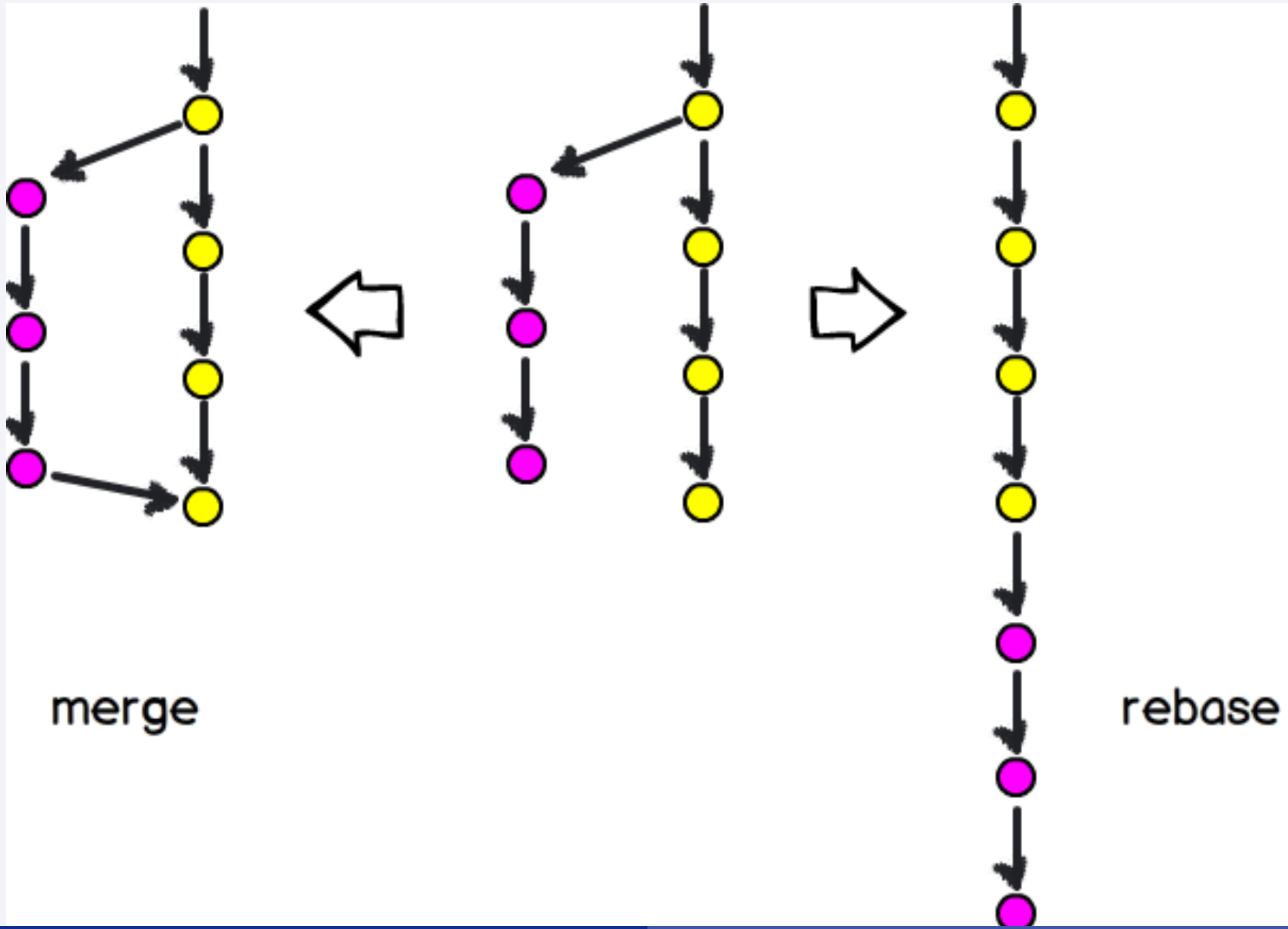
Production goes down

- branch from master ('hotfix/issue-description')
- commit, commit, commit, ...
- merge into master and develop
- tag merge commit on master branch
- deploy master to PRD

And now, a demo

All hail the demo gods.

merge vs rebase



interesting links

- Knowledge is Power: Getting out of trouble by understanding Git by Steve Smith
- `www.youtube.com/watch?v=sevc6668cQ0`