Git UP!

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@airbornpl

Young Digital Planet

Why to use VCS at all?

- backup
- multiple people working together
- history of changes
- multiple parallel lines of development
- differences between two versions
- review code changes

Basic concepts

- repository
- commit
- revision/changeset
- branch
- merge
- conflict

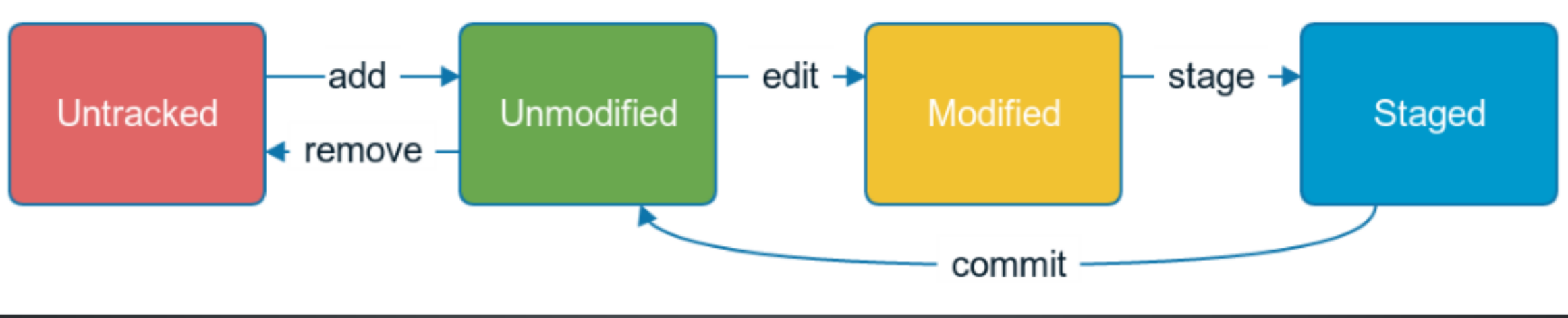
Why it was born?

- BitKeeper
- CVS
- distributed
- fast
- error proof
- easy branching

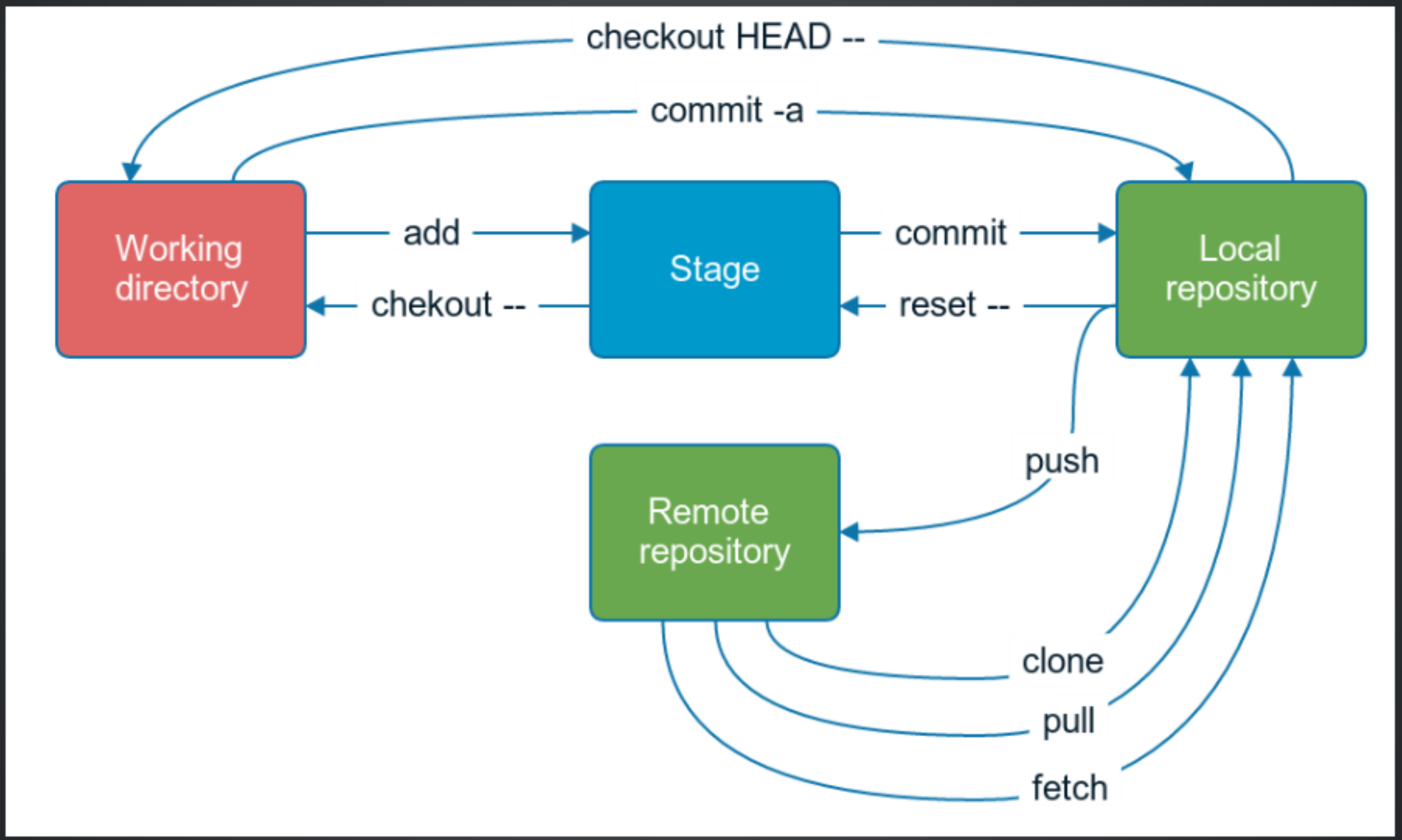
How does it work?

- file system snapshots
- everything (almost) is local
- SHA-1
- blob, tree, commit, tag
- cheap local branching
- committer != author

Filesystem


Untracked
add
remove
Unmodified
edit
Modified
stage
Staged
commit

Overview


checkout HEAD --
commit -a
Working directory
add
chekout --
Stage
commit
reset --
Local repository
push
Remote repository
clone
pull
fetch

Most important commands

help

- init
- status
- diff (difftool)
- merge
- add
- commit
- checkout
- reset
- stash
- rebase
- config
- fetch
- clone
- push
- pull
- revert
- cherry-pick
- remote
- log
- bisect

Before you begin

```
git config --global user.name "Jan Nowak"
git config --global user.email "jan.nowak@example.com"

//Also, for Linux and Mac users:
git config --global core.autocrlf input
git config --global core.safecrlf true

//And for Windows users:
git config --global core.autocrlf true
git config --global core.safecrlf true
```

Before you begin

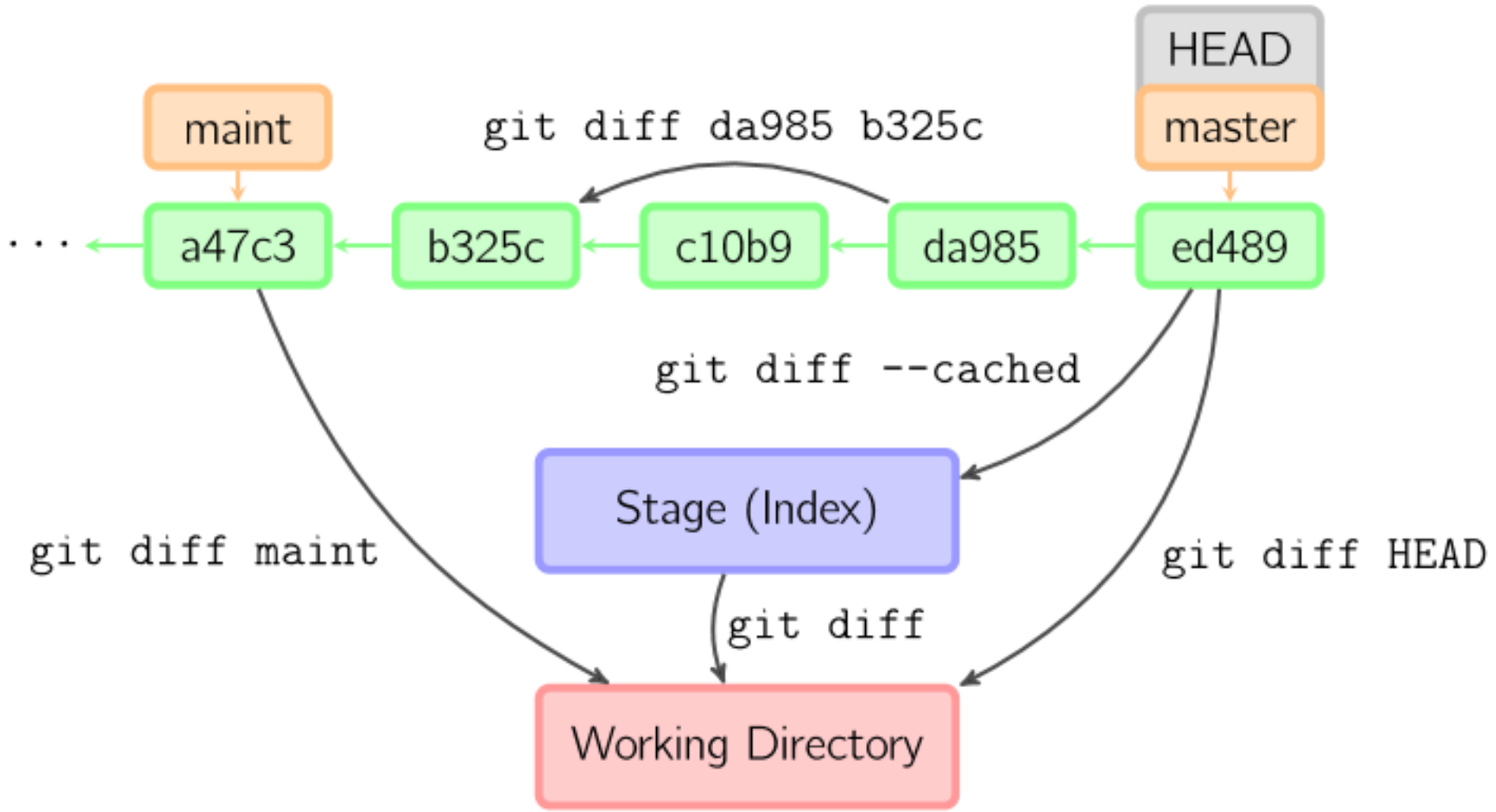
```
[user]
        name = Jacek Jackowiak
        email = jacek1986@gmail.com
[color]
        ui = auto
[core]
        autocrlf = input
        savecrlf = true
        editor = subl -n -w
[diff]
        tool = meld
[merge]
        tool = meld
[alias]
        lol = log --oneline --graph --decorate --all
[push]
        default = simple
```

```
*   39d8994 (HEAD, origin/master, origin/HEAD, master) Merge pull request #542 from ryankennedy/master <Nick Telford> (4 weeks ago)
|\
| * bc369f7 Removing AsyncAppender in favor of using Logback's AsyncAppender, which doesn't have a dependency on pre-Jetty 9.1's Concurr
* | 82779cd Quote applicationName in SyslogAppenderFactory <Nick Telford> (4 weeks ago)
* | e3af383 (origin/release/0.7.x) Fix dependency convergence issue: metrics/slf4j <Nick Telford> (4 weeks ago)
|/
*   4758ac6 Merge pull request #407 from mveitas/docs_guardfile <Nick Telford> (5 weeks ago)
|\
| * 7951e92 Adding a 'livehtml' target to the docs Makefile that will use livereload and a Guardfile to watch for changes to the docs <M
* |   eb25175 Merge pull request #510 from nickbabcock/blacklist <Nick Telford> (5 weeks ago)
|\ \
| * | 0f7bf9a Add ability to black list cipher suites <Nick Babcock> (7 weeks ago)
* | |   997fbc8 Merge pull request #518 from mveitas/multiple_assetbundle <Nick Telford> (5 weeks ago)
|\ \ \
| * | | 8c6791e Removing superfluous check for adding to the set <Matt Veitas> (5 weeks ago)
| * | | 17bd536 Moving the logic to check for duplicate registrations into a private method <Matt Veitas> (6 weeks ago)
| * | | 951676d Log a warning message if a servlet or filter is added with the same name <Matt Veitas> (6 weeks ago)
* | | |   84dc8a9 Merge pull request #473 from mveitas/task-metrics <Nick Telford> (5 weeks ago)
|\ \ \ \
| * | | | b67a33a Delegate to an underlying TaskExecutor to handle multiple metrics annotations on the method <Matt Veitas> (3 months ag
| * | | | bbe8499 Modify docs to reflect using Metrics annotations for Tasks <Matt Veitas> (3 months ago)
| * | | | 9bbad6f Modify TaskServlet to use the metrics annotations on a Task's execute method instead of using an implicit Timer <Matt
| * | | | 1c4a091 Instrument the execution of tasks with a Timer <Matt Veitas> (3 months ago)
* | | | |   e417d2a Merge pull request #516 from d2fn/patch-1 <Nick Telford> (5 weeks ago)
|\ \ \ \ \
| * | | | | 45e76fe add http patch annotation <Dietrich Featherston> (6 weeks ago)
| | |/ / /
| |/| | |
* | | | |   2183525 Merge pull request #527 from jplock/jp-testing-docs <Nick Telford> (5 weeks ago)
|\ \ \ \ \
| * | | | | 5545d1e Fixed health check documentation <Justin Plock> (5 weeks ago)
| * | | | | b74008c Missed a period <Justin Plock> (5 weeks ago)
| * | | | | 69c8208 Updated some of the documentation related to testing <Justin Plock> (5 weeks ago)
* | | | | |   f0f1bc4 Merge pull request #530 from pims/patch-1 <Nick Telford> (5 weeks ago)
|\ \ \ \ \ \
| |/ / / / /
|/| | | | |
| * | | | | 7ff25da Renaming 0.7.0-SNAPSHOT to 0.7.0 <Tim Bart> (5 weeks ago)
|/ / / / /
* | | | | 511005e [maven-release-plugin] prepare for next development iteration <carlo-rtr> (5 weeks ago)
* | | | | ecfa4a5 (tag: v0.7.0) [maven-release-plugin] prepare release v0.7.0 <carlo-rtr> (5 weeks ago)
```

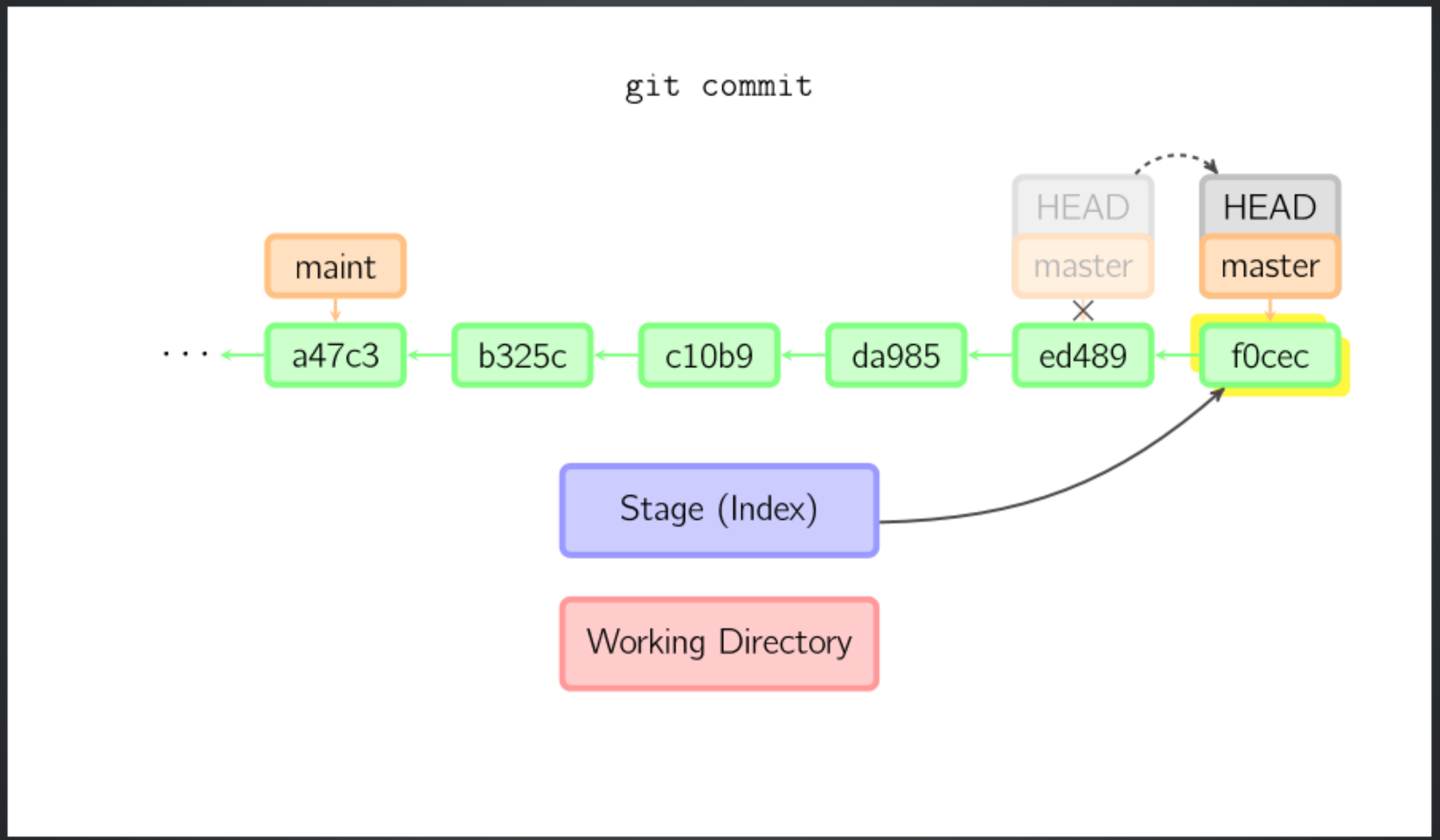
Where am I?!

- SHA-1
- partial SHA-1 (min. 4, typ. 7, Linux 12)
- branch name
- tag
- HEAD / @
- master~3
- master^2
- HEAD@{5} - reflog
- master@{yesterday} - reflog
- master..branch
- master...branch

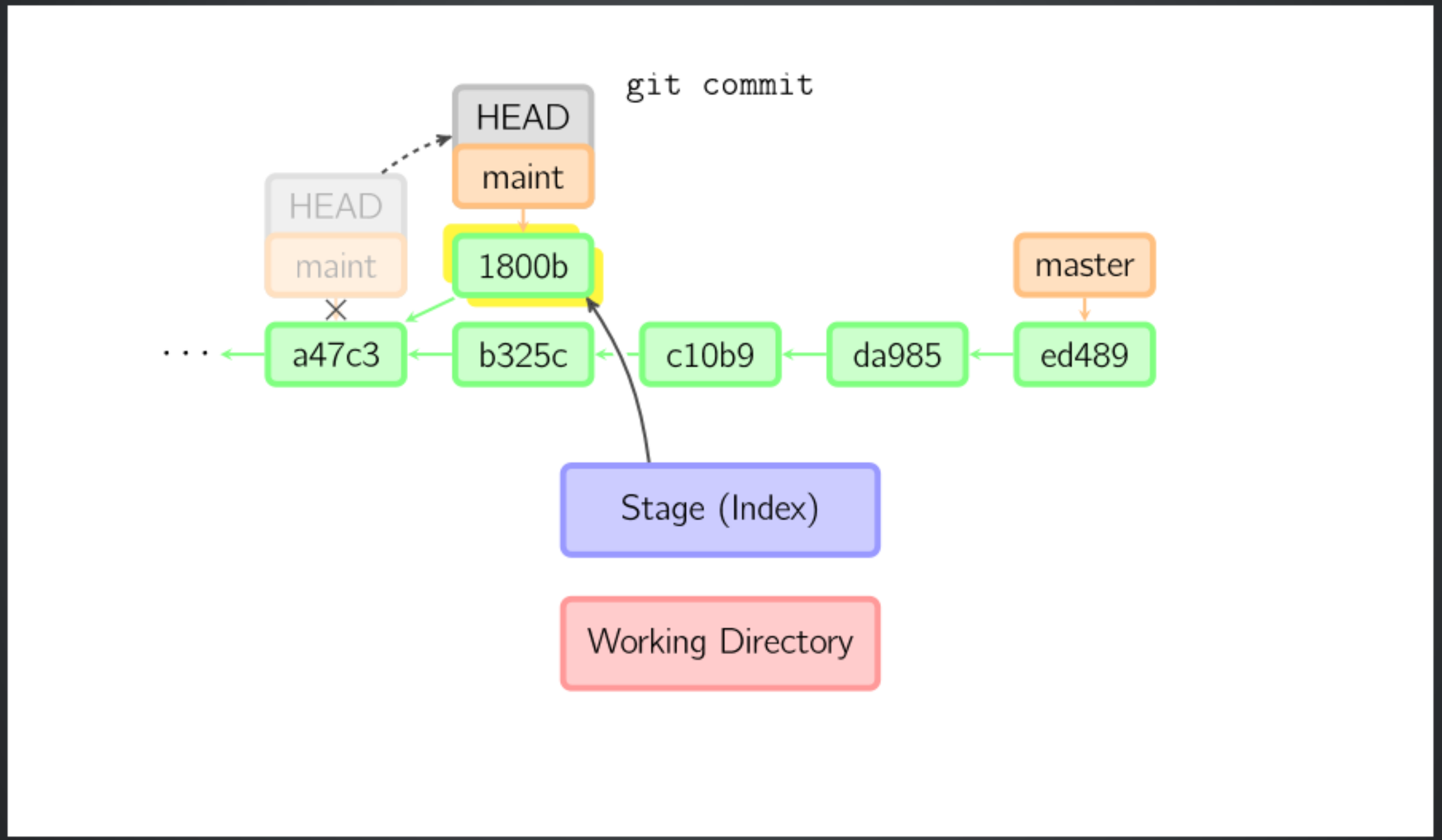
Howto: diff


HEAD
master
maint
git diff da985 b325c
...
a47c3
b325c
c10b9
da985
ed489
git diff --cached
Stage (Index)
git diff maint
git diff HEAD
git diff
Working Directory

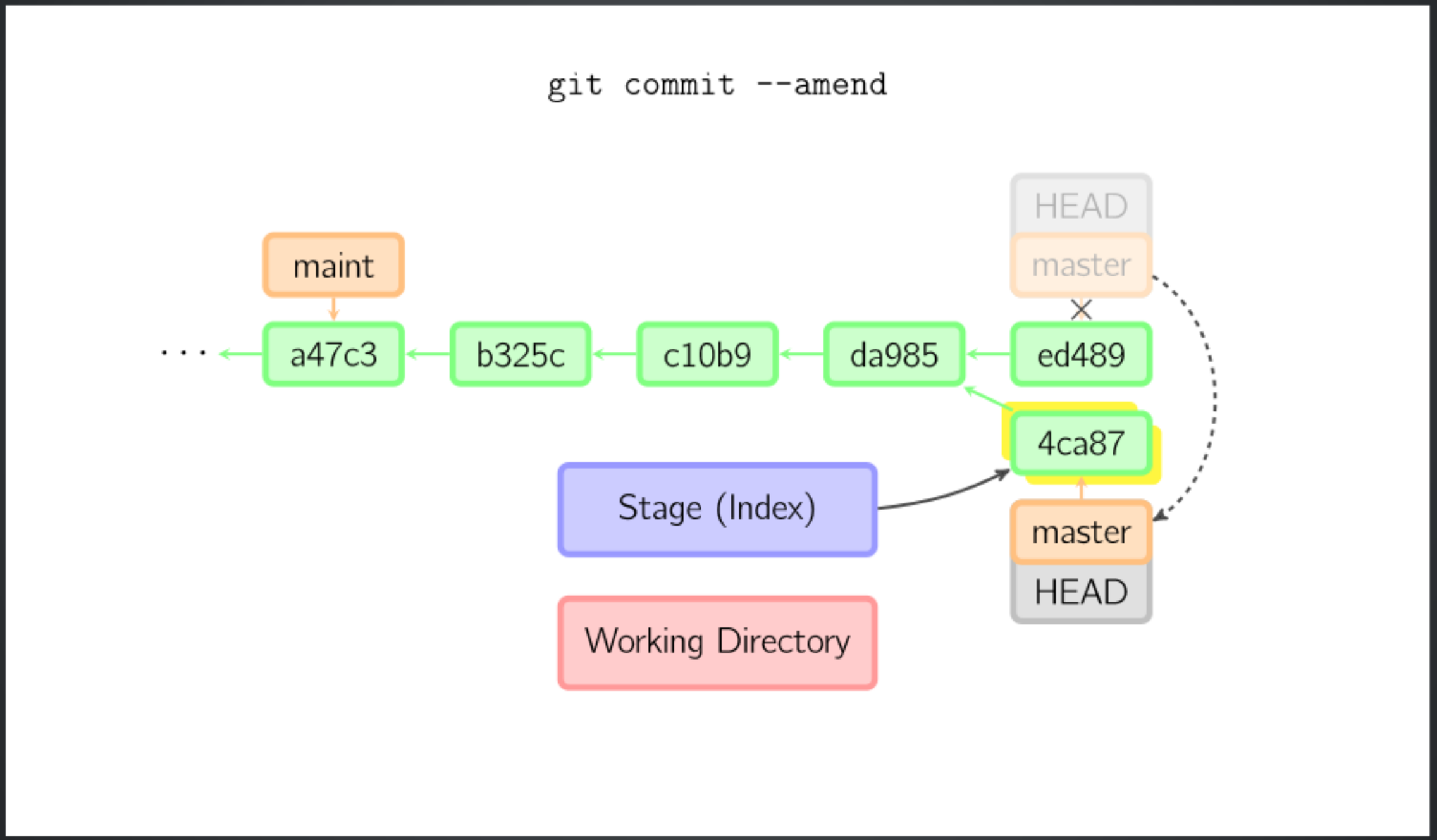
Howto: commit



Howto: commit (2)

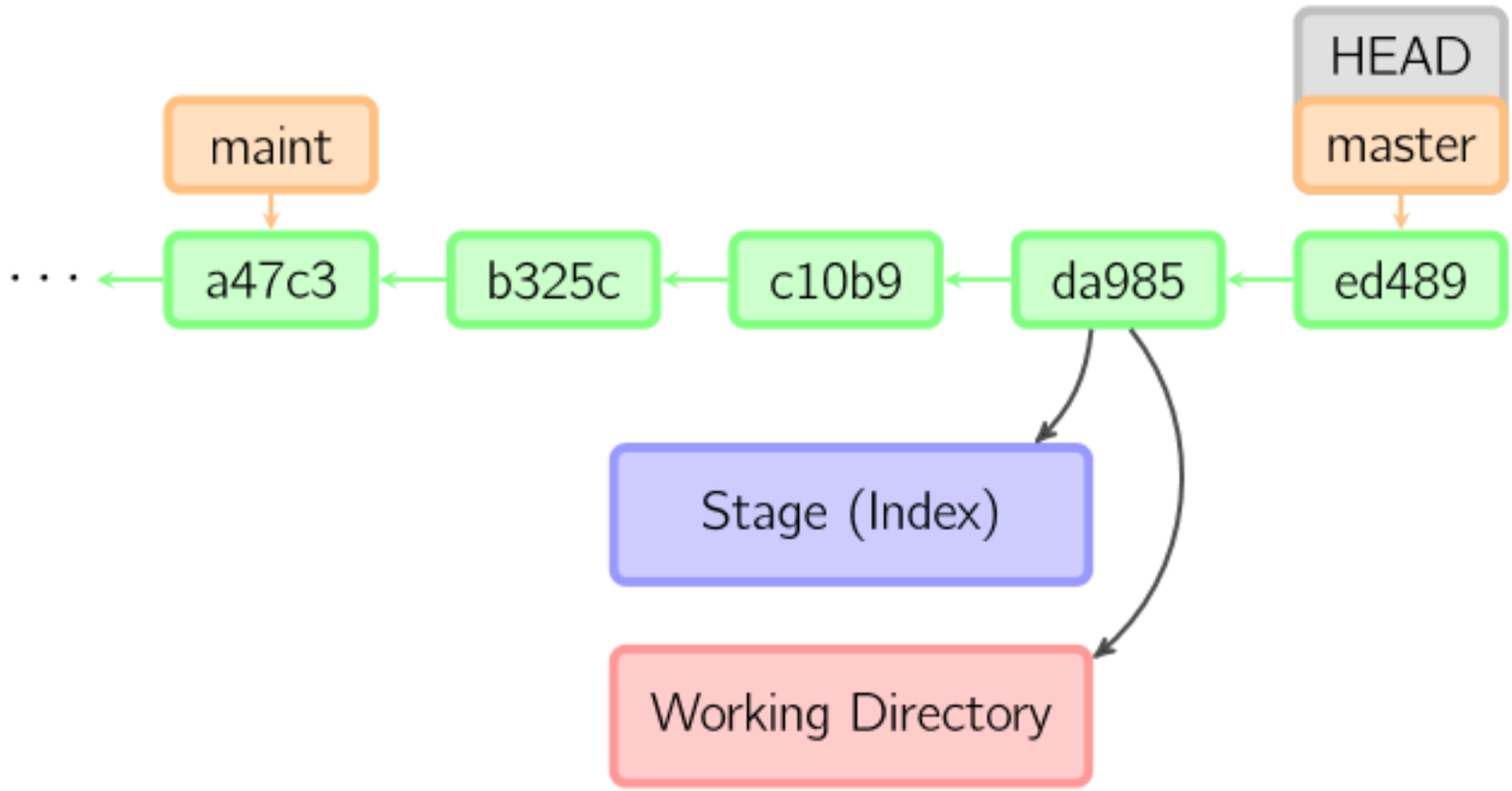


Howto: amend commit

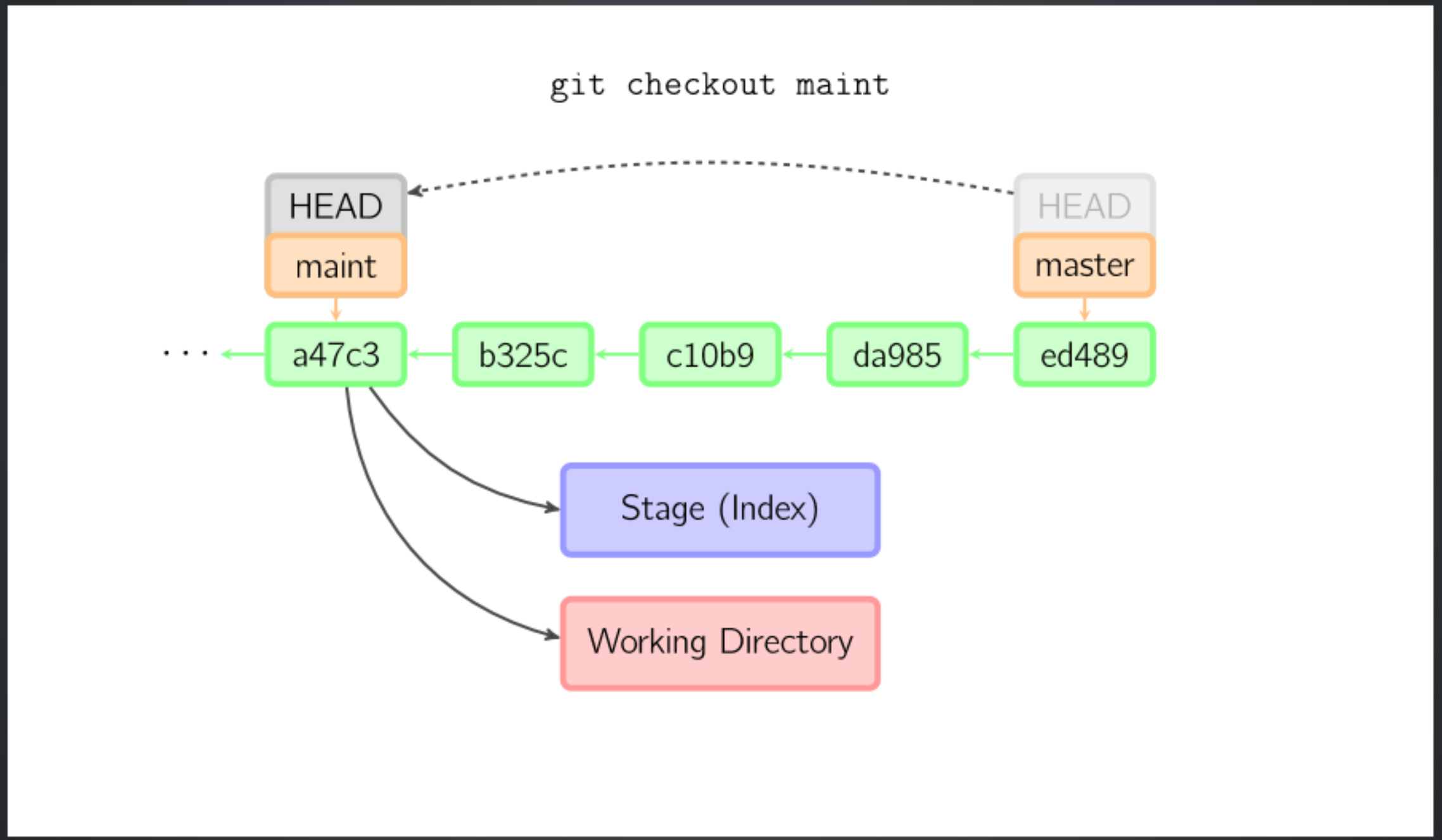


Howto: checkout files

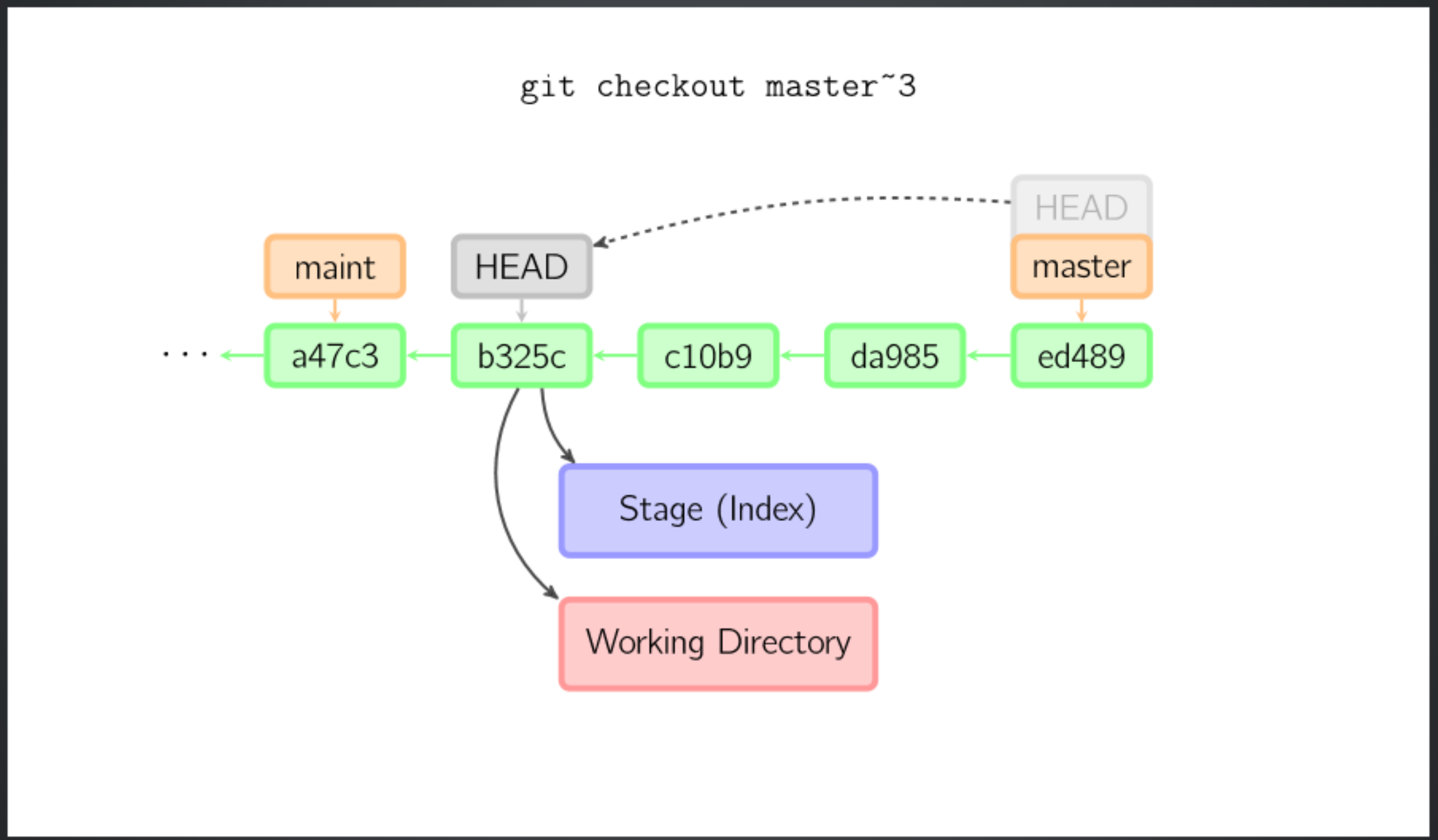
`git checkout HEAD~ files`



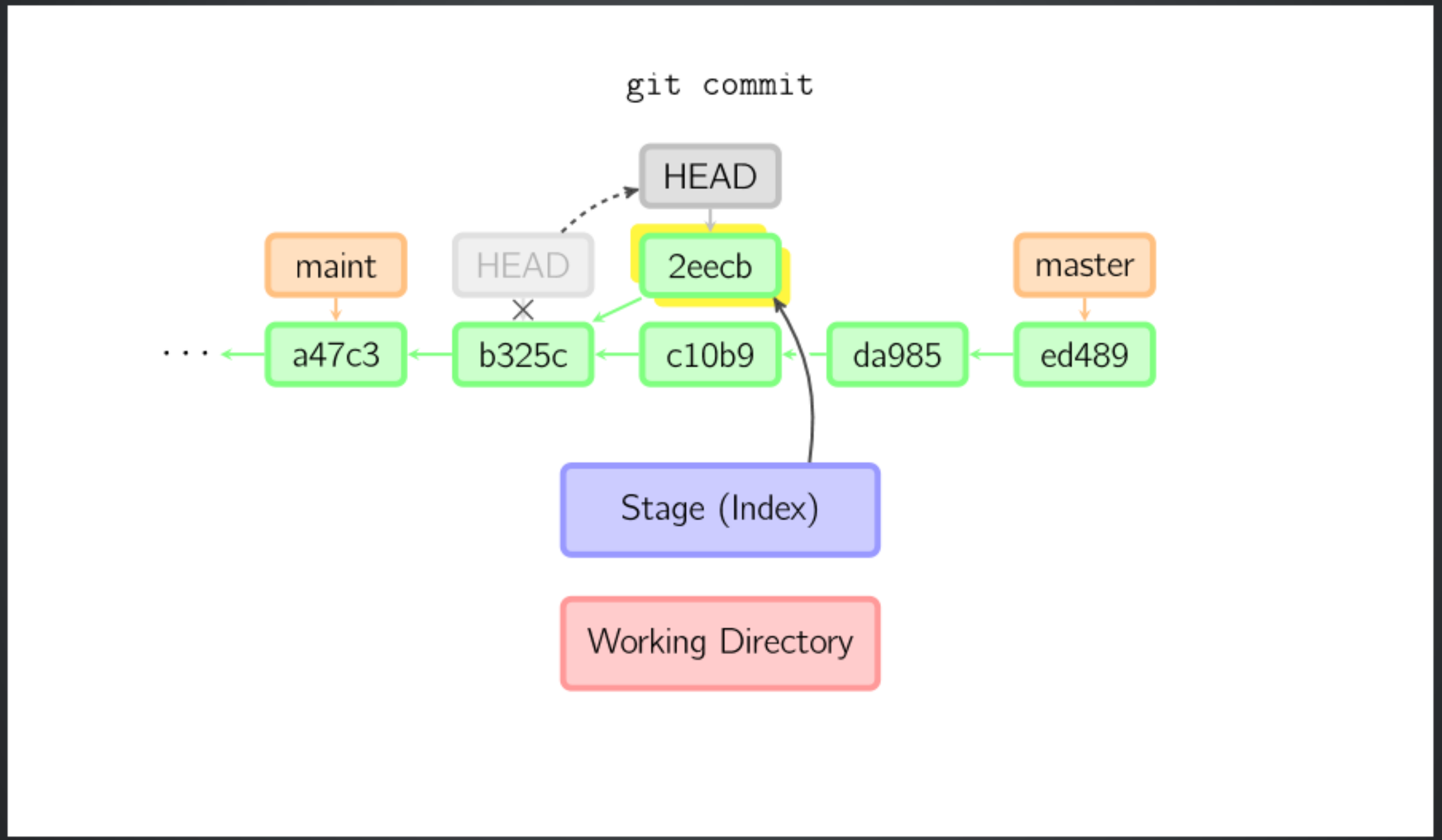
Howto: switch branch



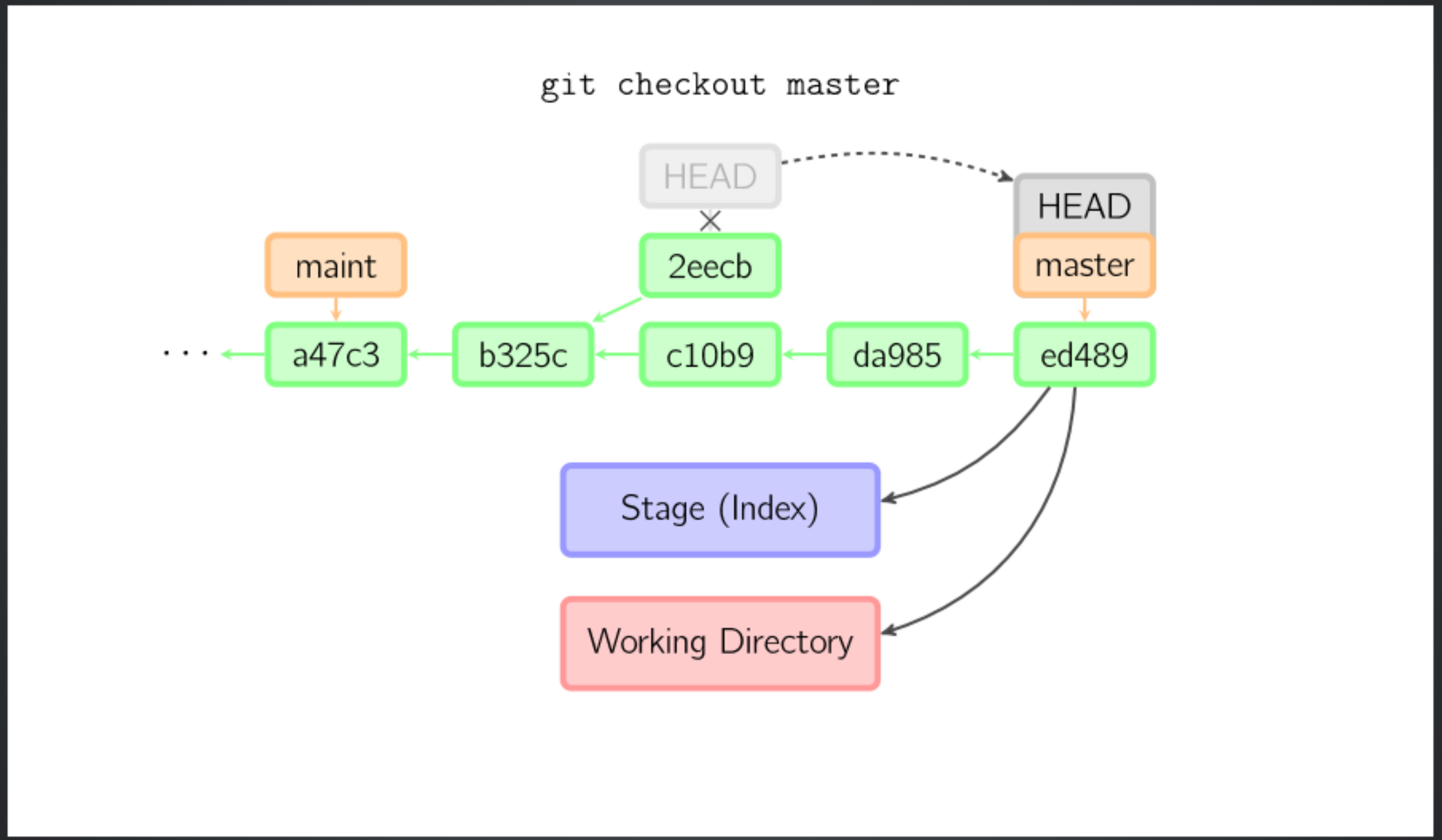
Howto: detach head



Howto: detached commit

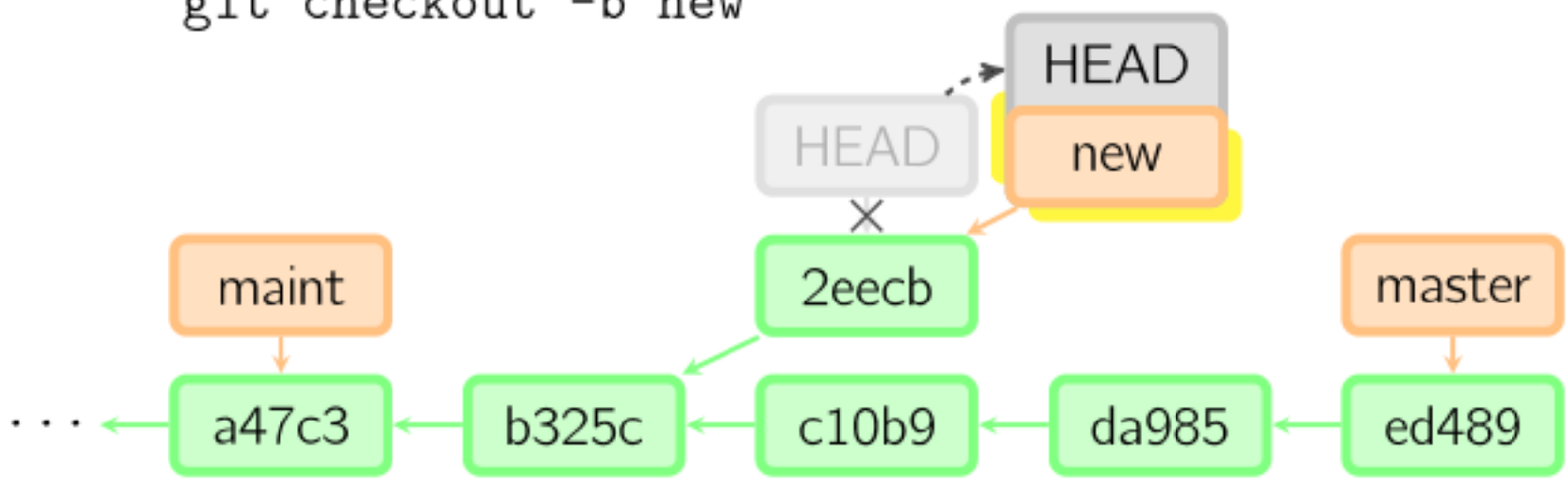


Howto: lose commit



Howto: NOT TO lose commit

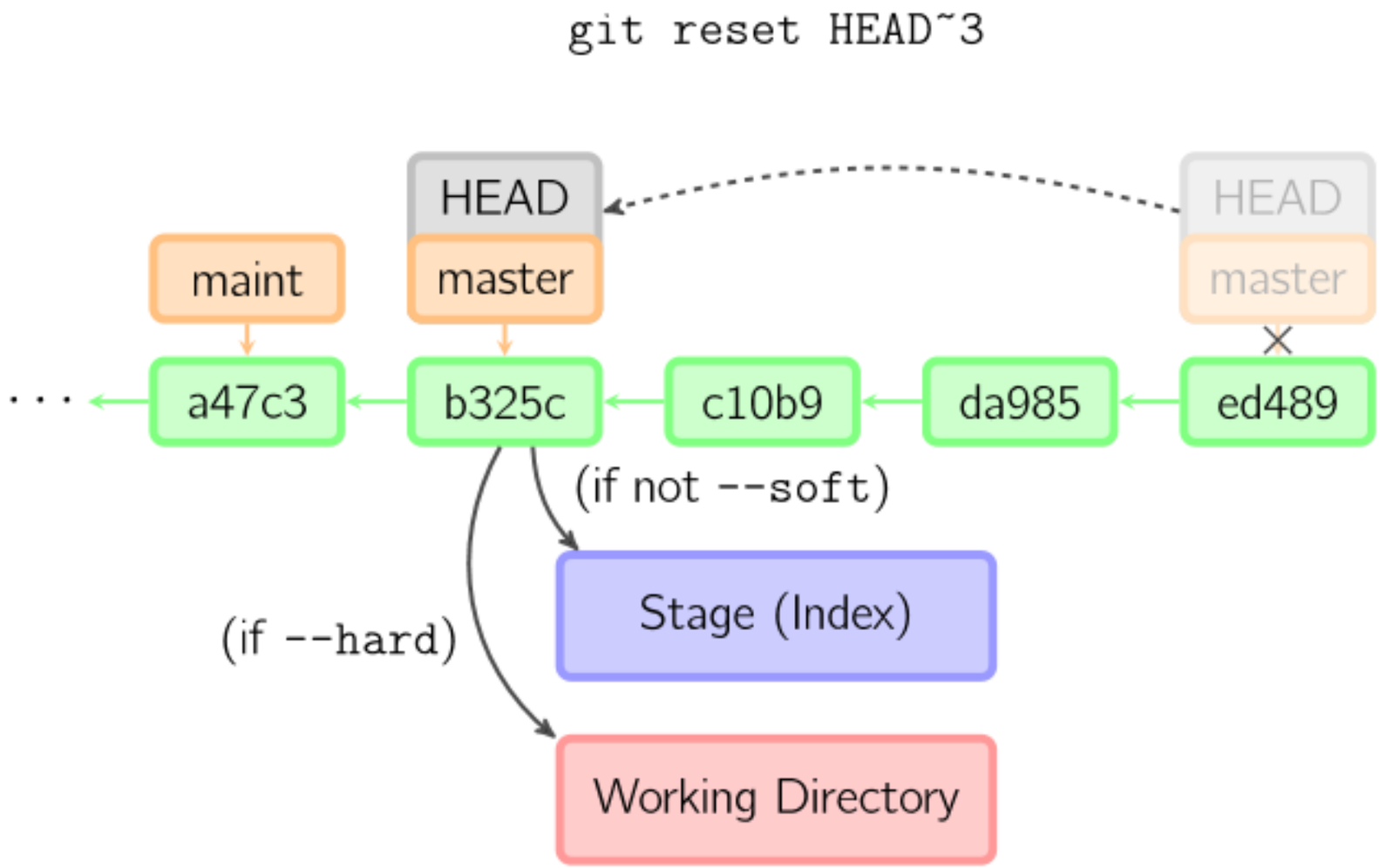
```
git checkout -b new
```



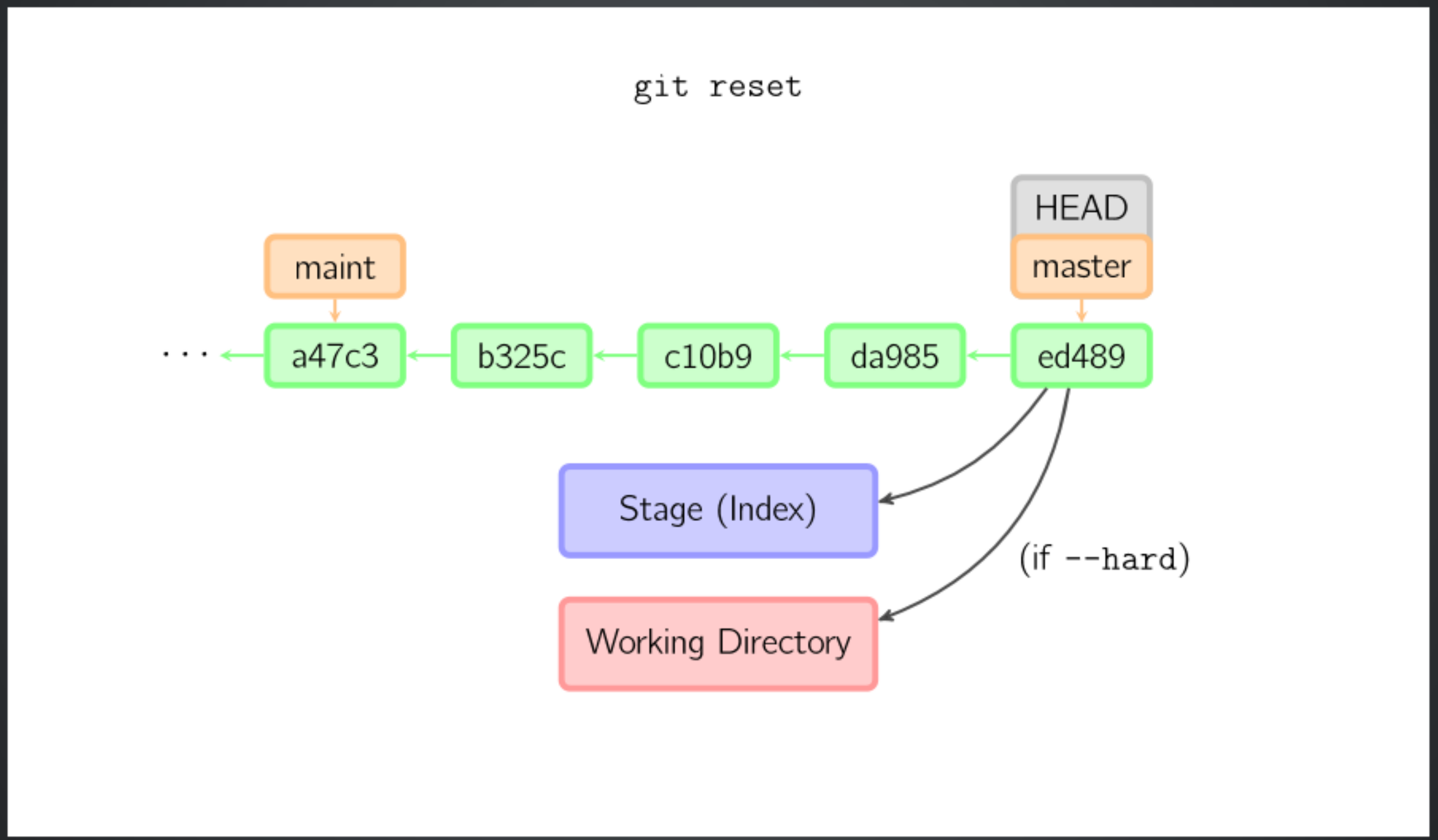
Stage (Index)

Working Directory

Howto: reset

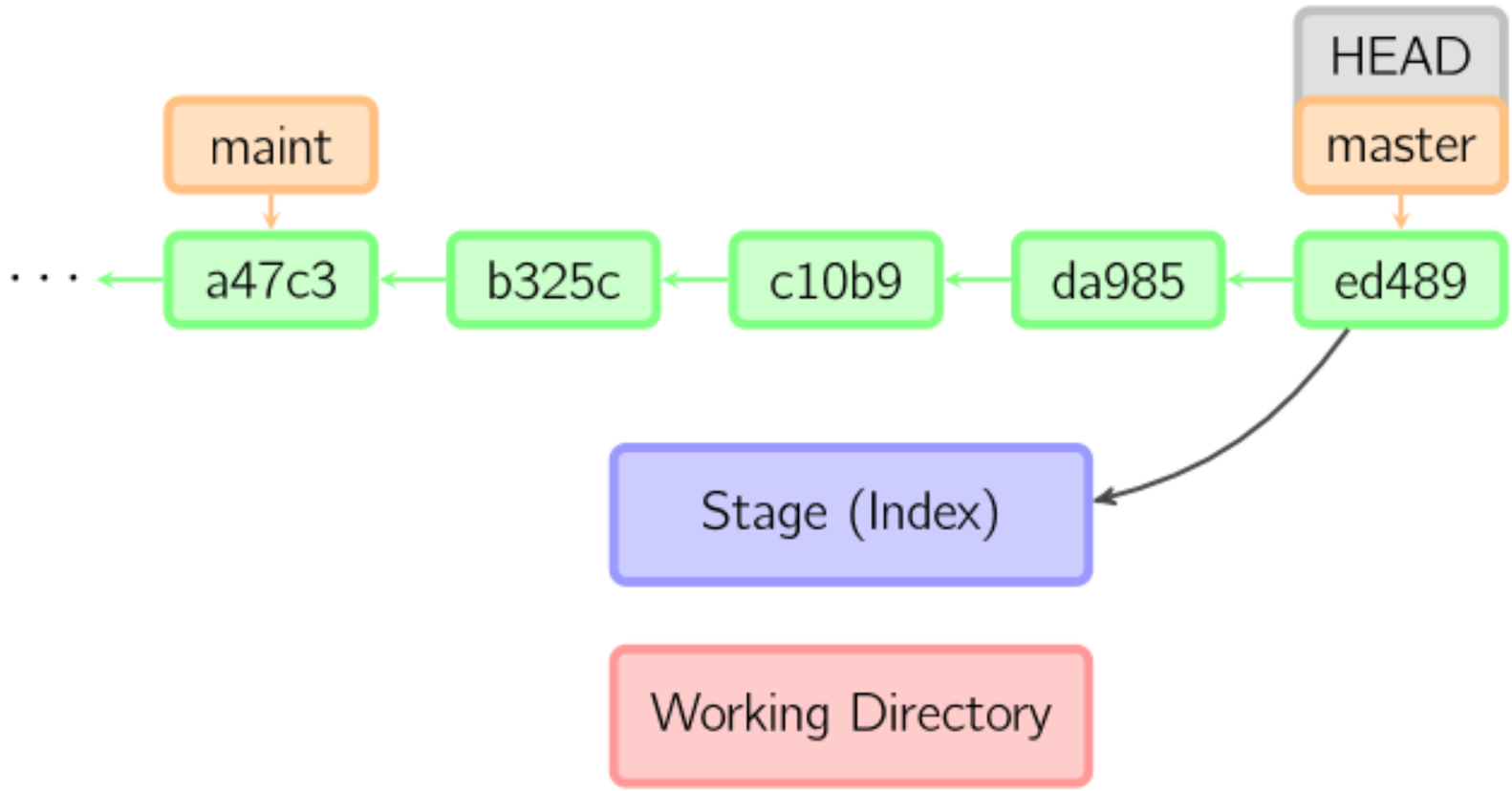

git reset HEAD~3
HEAD
HEAD
maint
master
master
...
a47c3
b325c
c10b9
da985
ed489
(if not --soft)
Stage (Index)
(if --hard)
Working Directory

Howto: reset changes

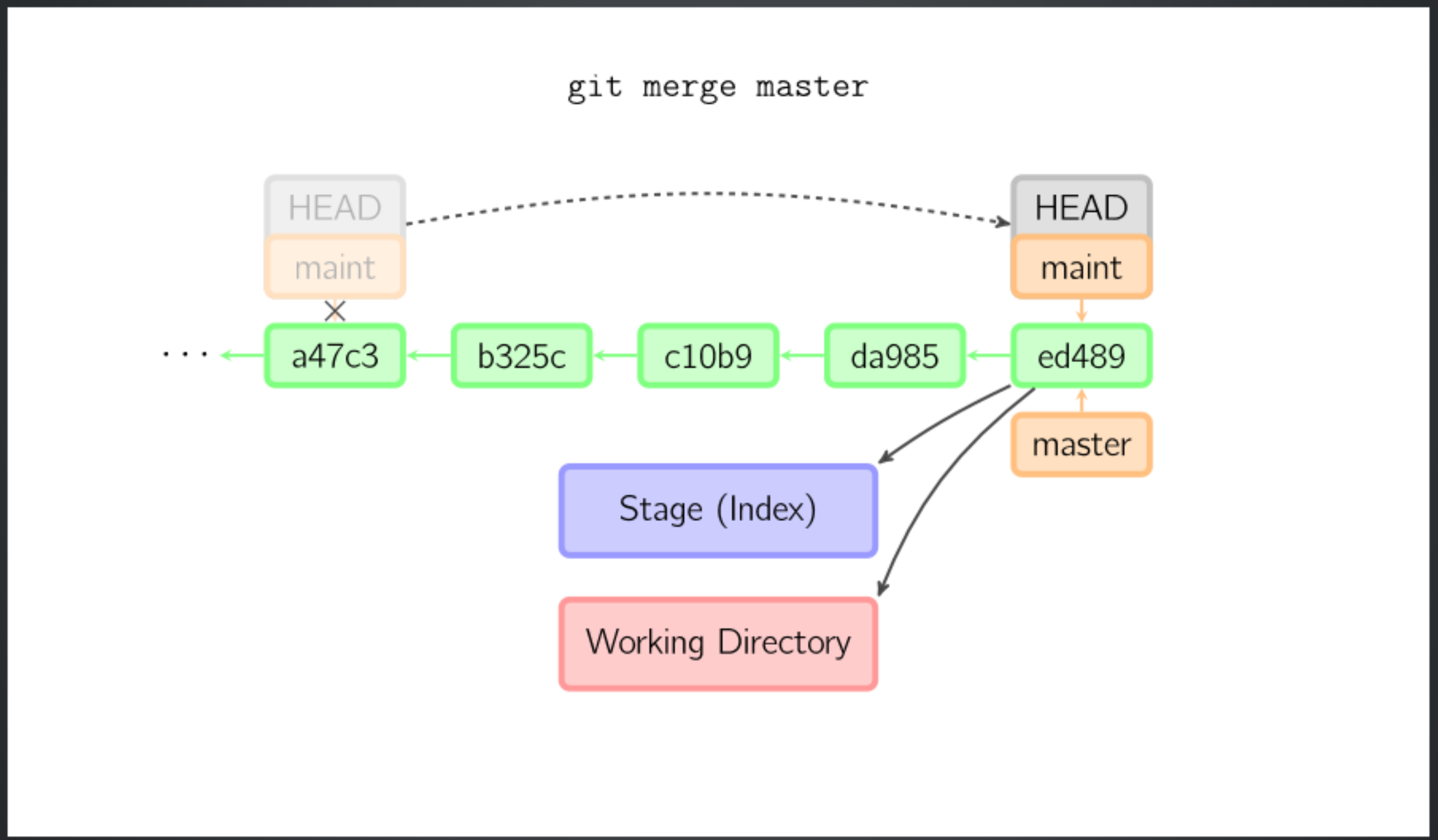


Howto: unstage

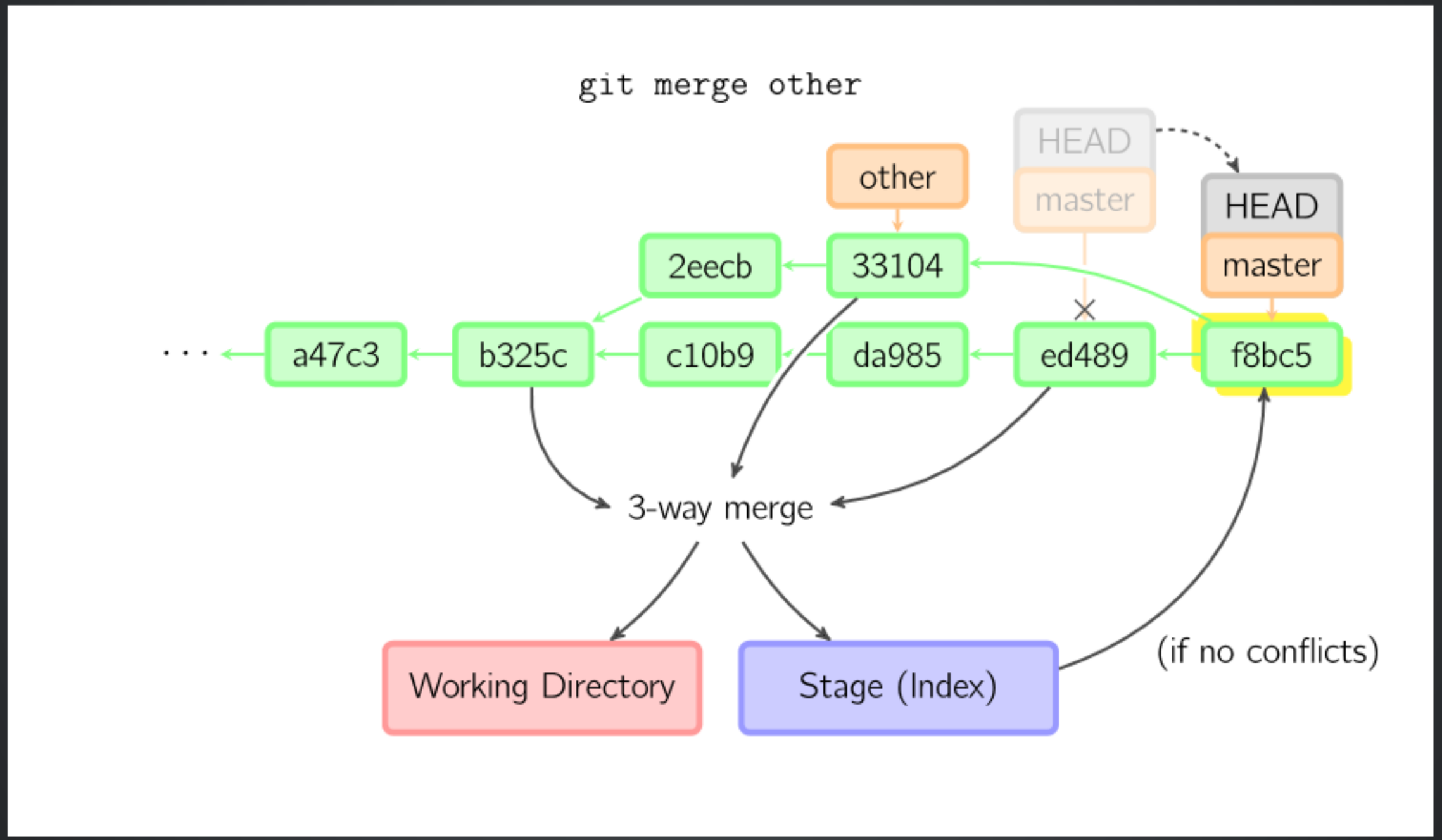
`git reset -- files`



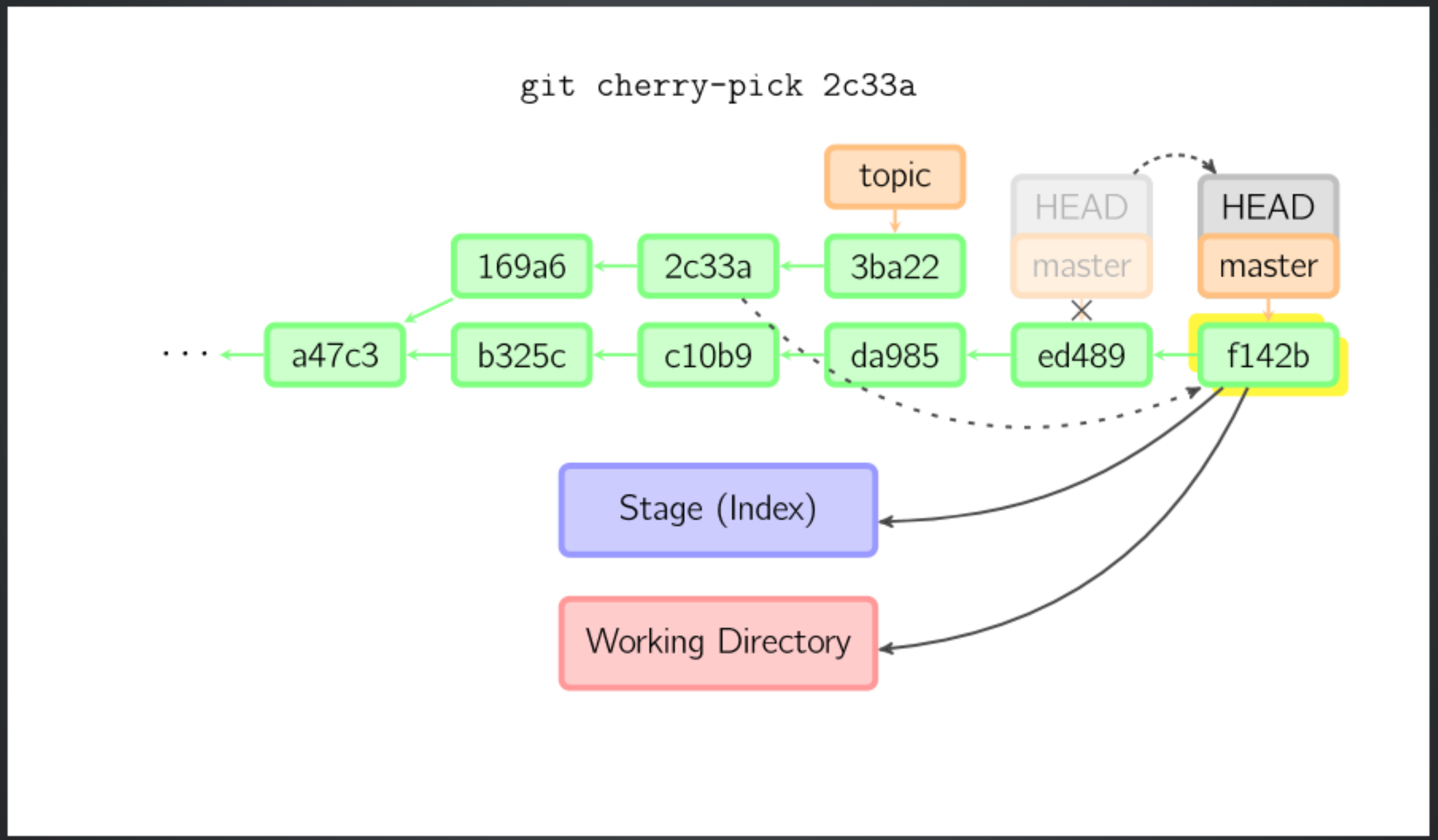
Howto: fast forward merge



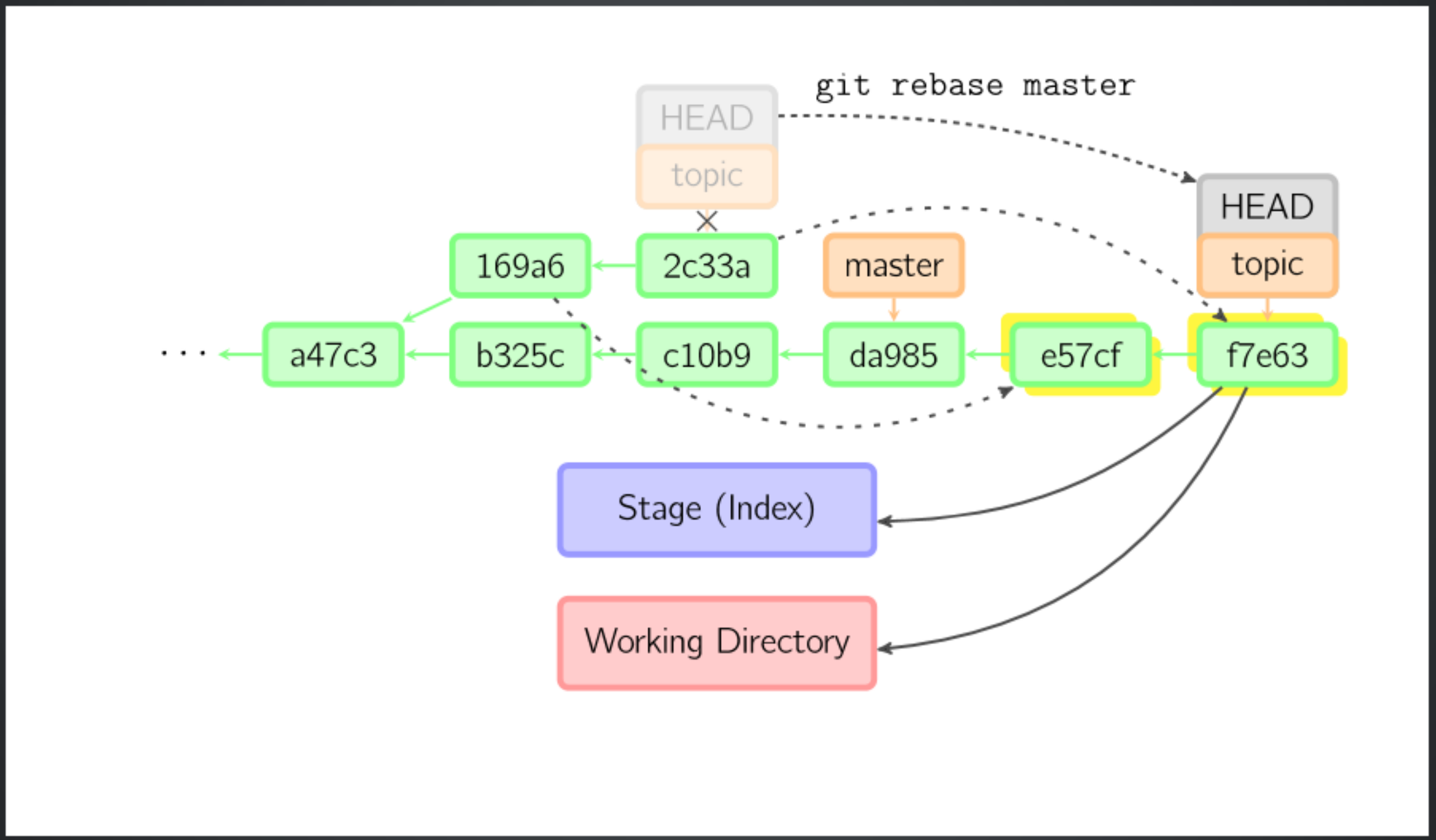
Howto: 3-way merge



Howto: cherry-pick

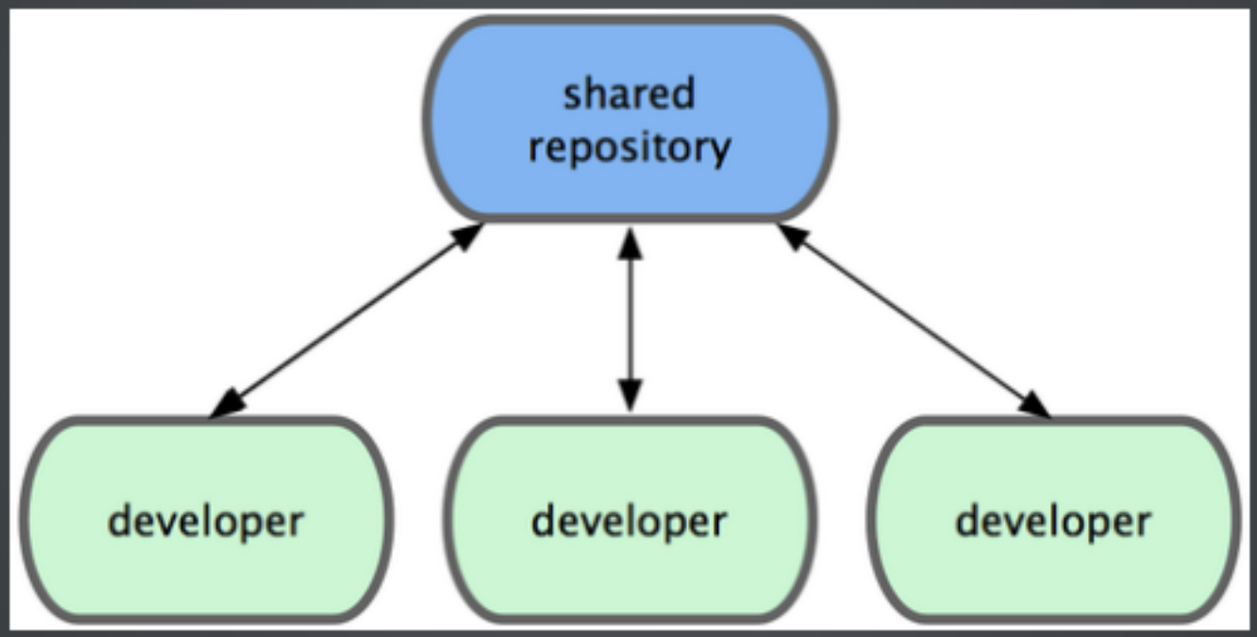


Howto: rebase

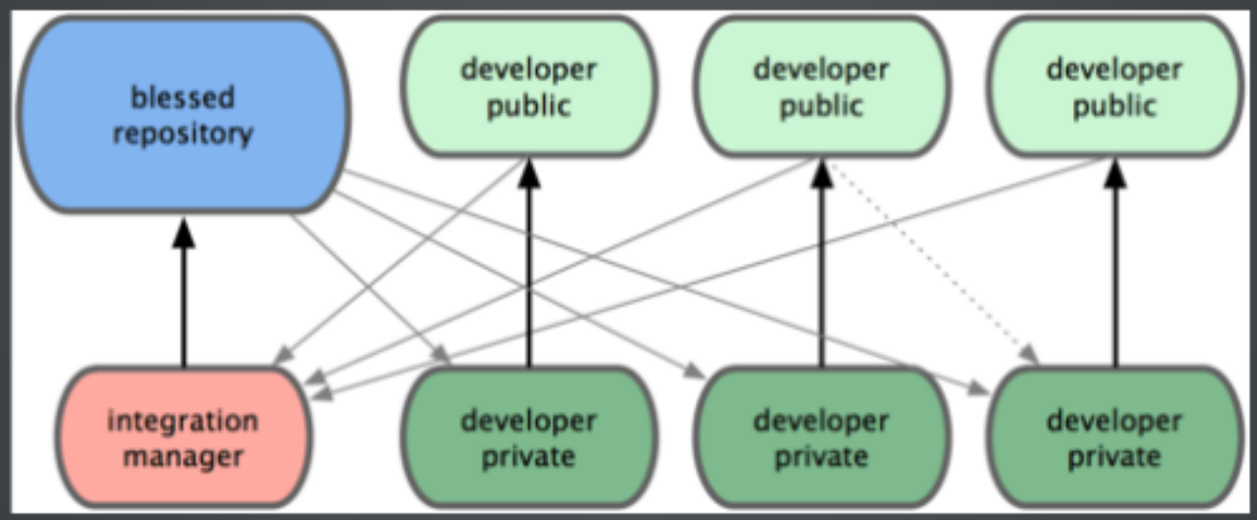


Workflows

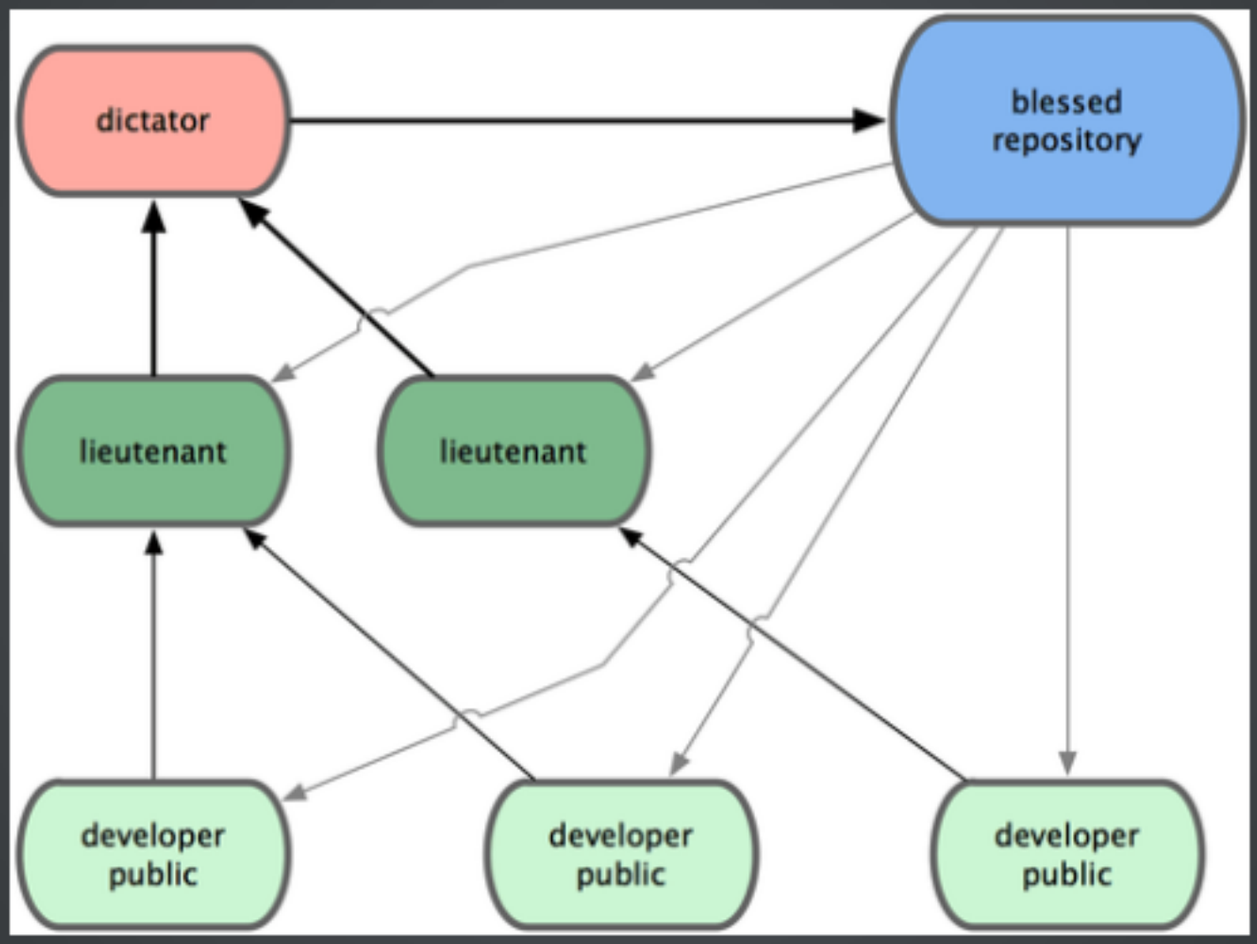
Shared repository



Blessed repository



Dictator


dictator
blessed repository
lieutenant
lieutenant
developer public
developer public
developer public

Gitflow

- A successful Git branching model
- tool (not so great)

Separate development

Feature branch

Release branch

Hotfix

Where to use it

- console
- Git Extensions
- IDE (but not eclipse)
- SourceTree
- SmartGit
- gitg
- gitk

Tips and tricks

- .gitignore
- Pull frequently
- Commit early, commit often
- Push when tested
- Branch freely
- Stash before switching branches
- Use Git as SVN client

Sources

- Pro Git
- A Visual Git Reference
- Atlassian's Git Tutorial

Questions?