A deep dive into the Git internals

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Object Database

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Quick Topic Clarification

We **are** going to talk about:

- Git Plumbing
- .git/objects/ (the object database)
- .git/refs/

We **are NOT** going to talk about:

- Basics
- Merge strategies
- git:// Protokoll

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Merge made by octopus

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Plumbing vs. Porcelaine

hash-object
cat-file
ls-tree
mktree
commit-tree
fsck
gc
index-pack
ls-files
mktag
pack-objects
repack
verify-pack

Source: Unsplash
Author: Dan Watson
Public Domain

commit
push
pull
merge
branch
checkout
clone
bisect
tag
diff
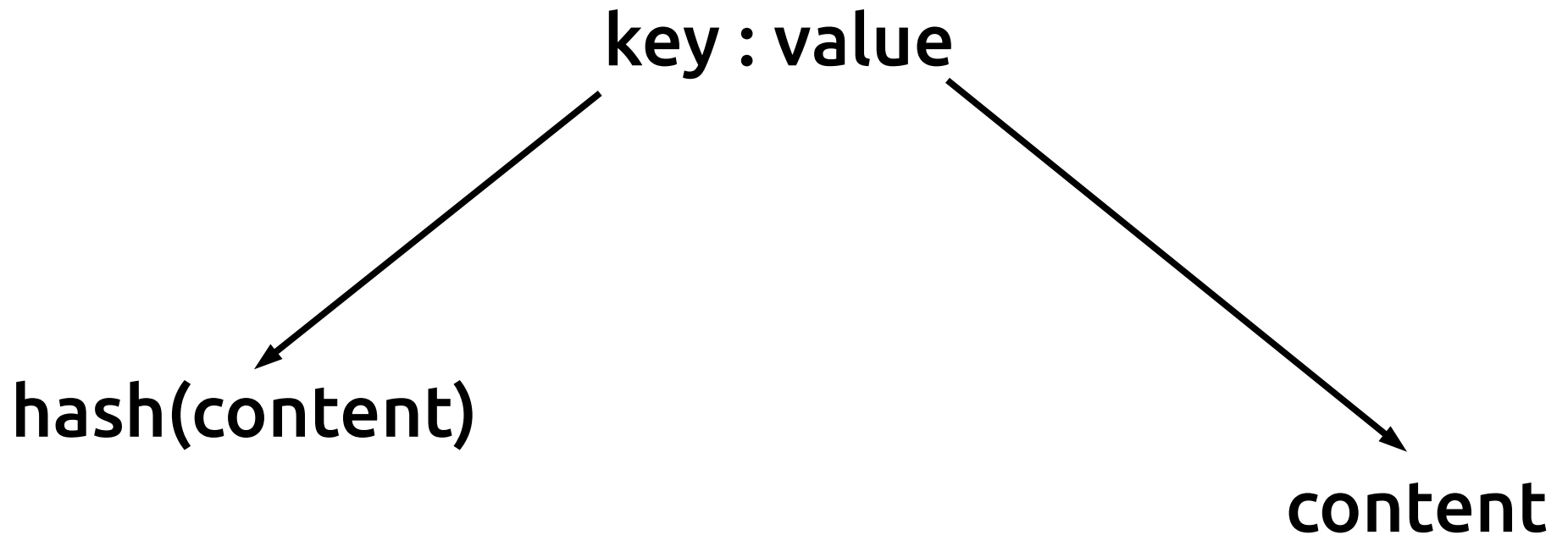
Source: xkcd, Author: Randall Munroe
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Core Principle

key : value

hash(content)

content

aka. Content-adressable storage

Git Object

key : value

sha1(object)

zlib(object)
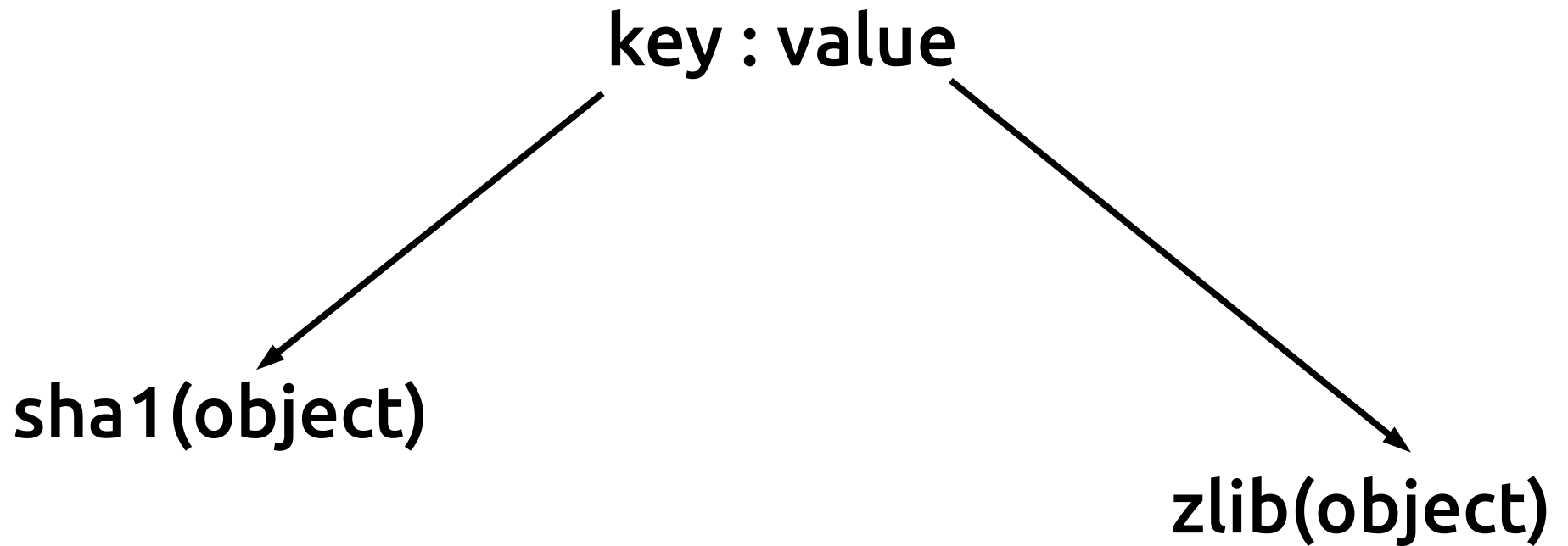
Format:

<type>␣<size>\0<value>

Four Types of Git Objects

blob
filecontent

tree
<mode>␣<filename>\0bin(<sha1>)

commit
tree␣<sha1>\n
parent␣<sha1>\n*
author␣<name>␣<timestamp+zeitzone>\n
committer␣<name>␣<timestamp+zeitzone>\n\n
<commit message>

tag
object␣<sha1>\n
type␣<type>\n
tag␣<name>\n
tagger␣<name>␣<timestamp+zeitzone>\n\n
<tag message>

But whait, where does Git save the Diffs?!?!

Sources

https://www.youtube.com/watch?v=4FUAaPyhOm0

https://git-scm.com/book/en/v2/Git-Internals-Plumbing-and-Porcelain

https://www.npmjs.com/package/gitviz

The end

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