

Git Unchained

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FOSSMeet/2013

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Outline

- 1 Part I: Introducing the object store
- 2 Part II: Advanced Git commands
- 3 Part III: A small fast-import detour
- 4 Part IV: Conclusion

Who am I?

Ramkumar Ramachandra

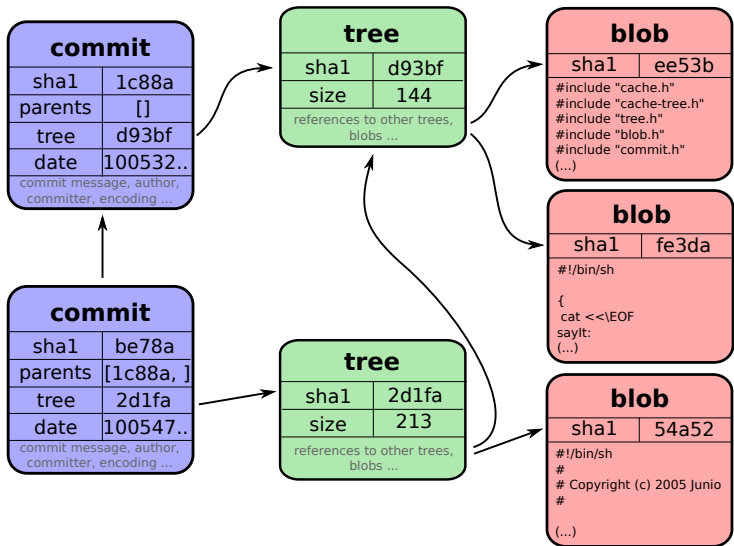
(Git contributor)

@artagnon

<https://github.com/artagnon>

<http://artagnon.com>

What does the object store look like?

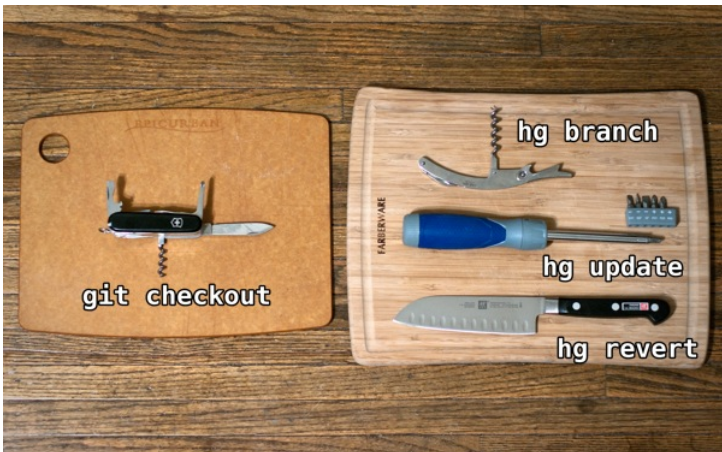


What is inside a tree?

```
$ git ls-tree HEAD^{tree}
```

```
100644 blob 5e98806c6cc246acef5f539ae191710a0c06ad3f .gitattributes
100644 blob 6669bf0c6c9a0b42f74e2ed189350a6a9f11f17d .gitignore
100644 blob c7e86183001a00ad2105765708b5b59852ef6640 .mailmap
100644 blob 536e55524db72bd2acf175208aef4f3dfc148d42 COPYING
040000 tree 53e11809b8bdfcd6486ba8aa2afd8839c4c73cfe Documentation
100755 blob e9f7abca91b96c2f9c99744c49adef04a4daf56 GIT-VERSION-GEN
120000 blob bdce3136ea5164d82f0d25d0a7a8b50181f572f7 RelNotes
100644 blob 59b394eea38494d5dfa525e28ca949e5a03efcf5 blob.h
040000 tree 5fb111c6a71bf720621724f54bec4679041f8ab6 block-sha1
100644 blob 2bef1e7e71b7cb3375b3d96fab5c4f20e0c3adff branch.c
040000 tree 41d60c10d7a21e786ec863bfc5f75a073dc7b8e5 builtin
[...]
```

Swiss Army knives

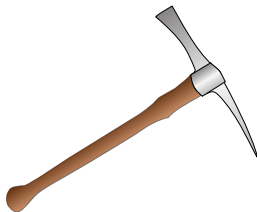


blame

```
$ git blame object.c
```

```
8f1d2e6f (Junio C Hamano      2006-01-07 01:33:54 -0800  1) #include "cache.h"
175785e5 (Daniel Barkalow    2005-04-18 11:39:48 -0700  2) #include "object.h"
e9eefa67 (Daniel Barkalow    2005-04-28 07:46:33 -0700  3) #include "blob.h"
e9eefa67 (Daniel Barkalow    2005-04-28 07:46:33 -0700  4) #include "tree.h"
e9eefa67 (Daniel Barkalow    2005-04-28 07:46:33 -0700  5) #include "commit.h"
e9eefa67 (Daniel Barkalow    2005-04-28 07:46:33 -0700  6) #include "tag.h"
175785e5 (Daniel Barkalow    2005-04-18 11:39:48 -0700  7)
0556a11a (Linus Torvalds     2006-06-30 11:20:33 -0700  8) static struct object **obj_hash;
0556a11a (Linus Torvalds     2006-06-30 11:20:33 -0700  9) static int nr_objs, obj_hash_size;
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 10)
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 11) unsigned int get_max_object_index(void)
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 12)
0556a11a (Linus Torvalds     2006-06-30 11:20:33 -0700 13)     return obj_hash_size;
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 14)
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 15)
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 16) struct object *get_indexed_object(unsigned int idx)
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 17)
0556a11a (Linus Torvalds     2006-06-30 11:20:33 -0700 18)     return obj_hash[idx];
fc046a75 (Linus Torvalds     2006-06-29 21:38:55 -0700 19)
175785e5 (Daniel Barkalow    2005-04-18 11:39:48 -0700 20)
[...]
```

pickaxe



```
$ git log --oneline -S 'static char *get_encoding(const char *message)'  
043a449 sequencer: factor code out of revert builtin  
d685654 revert: clarify label on conflict hunks  
81b50f3 Move 'builtin-*' into a 'builtin/' subdirectory  
52fae7d Missing statics.
```


filter-branch



```
--env-filter  
--tree-filter  
--index-filter  
--parent-filter  
--msg-filter  
--commit-filter  
--tag-name-filter  
--subdirectory-filter
```

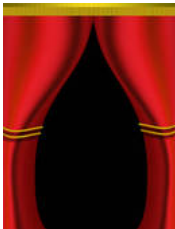
```
$ git filter-branch --tree-filter 'mv blog/_posts . || ;' HEAD
```

read-tree

```
$ git remote add -f Bproject /path/to/B
$ git merge -s ours --no-commit Bproject/master
$ git read-tree --prefix=dir-B/ -u Bproject/master
$ git commit -m "Merge B project as our subdirectory"
```

See also: [Documentation/howto/using-merge-subtree.txt](#)

rev-parse

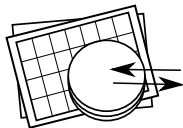


```
$ git rev-parse --short origin/master~13^2  
073678b
```

rev-list

```
$ git rev-list --abbrev-comit --topo-order -5 master~724
261ec7d
59f9b8a
8c5b1ae
f9bc573
c73f384
```

What does the protocol look like?



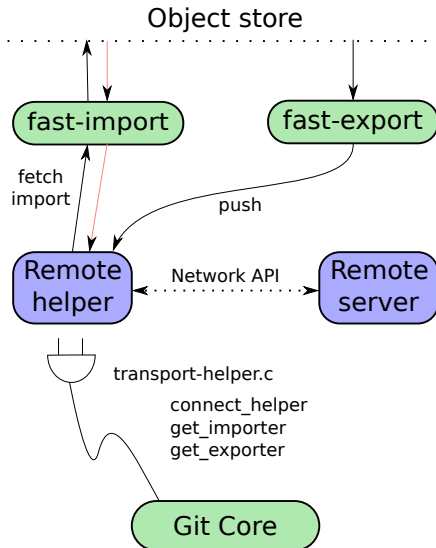
```

commit refs/heads/remote-helper
mark :30
author Ramkumar Ramachandra <artagnon@gmail.com> 1170314617 +0530
committer Junio C Hamano <gitster@pobox.com> 1170325891 +0100
data 111
vcs-svn: Fix delete operation in the treap

from :28
M 100644 :29 vcs-svn/trp.h

blob
mark :31
data 4941
/*
 * C macro implementation of treaps.
[...]
```

The concept of a remote helper



What you should hack on when you go home



scripting git

fast-import

env
improvement

explore libgit2

Can I have these slides?

```
http://github.com/artagnon/authoried  
http://artagnon.github.com/authoried
```

