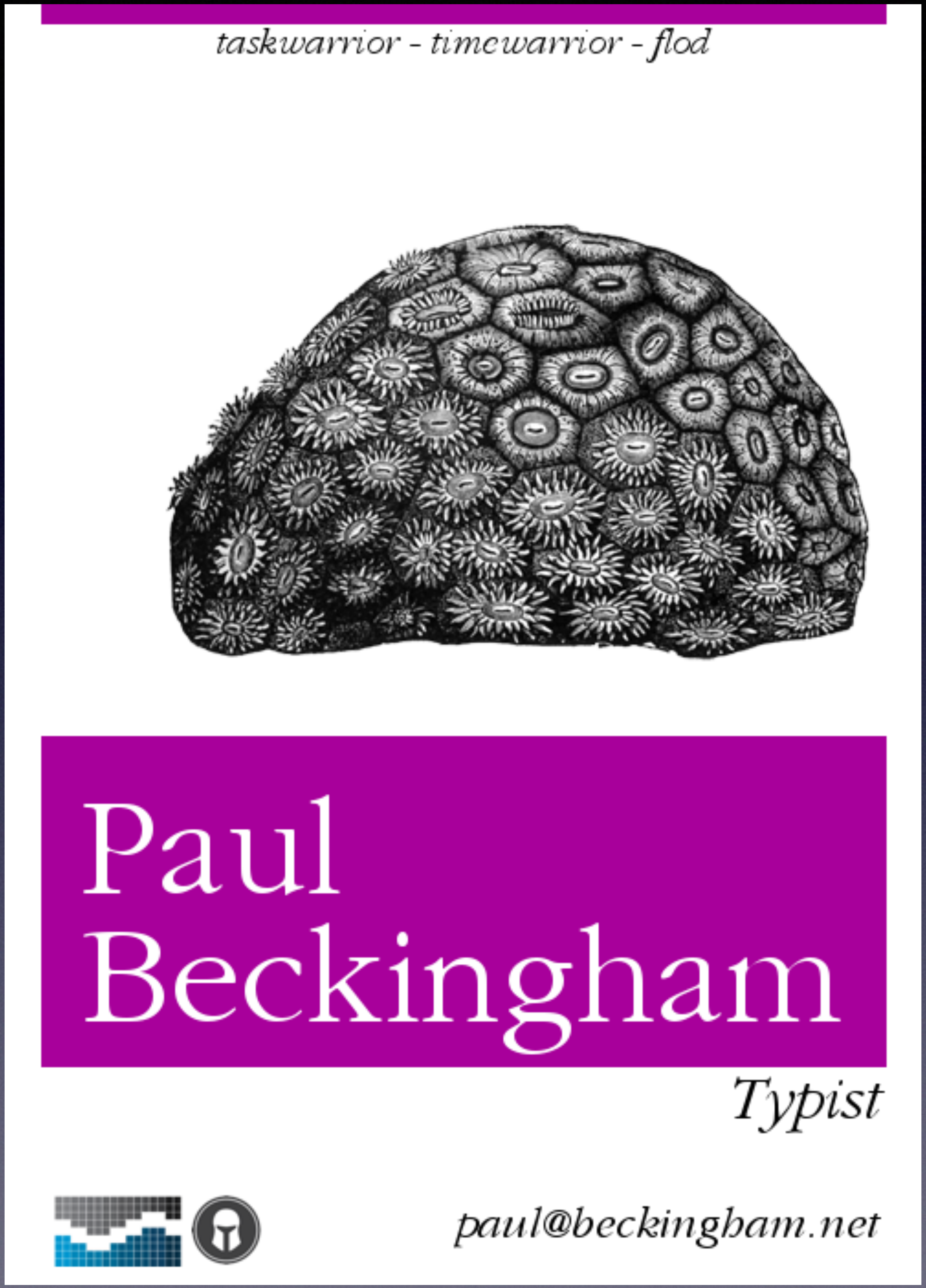
FLOD

agentless CI for the terminal

Poll

taskwarrior
timewarrior

Demo
30 second tutorial

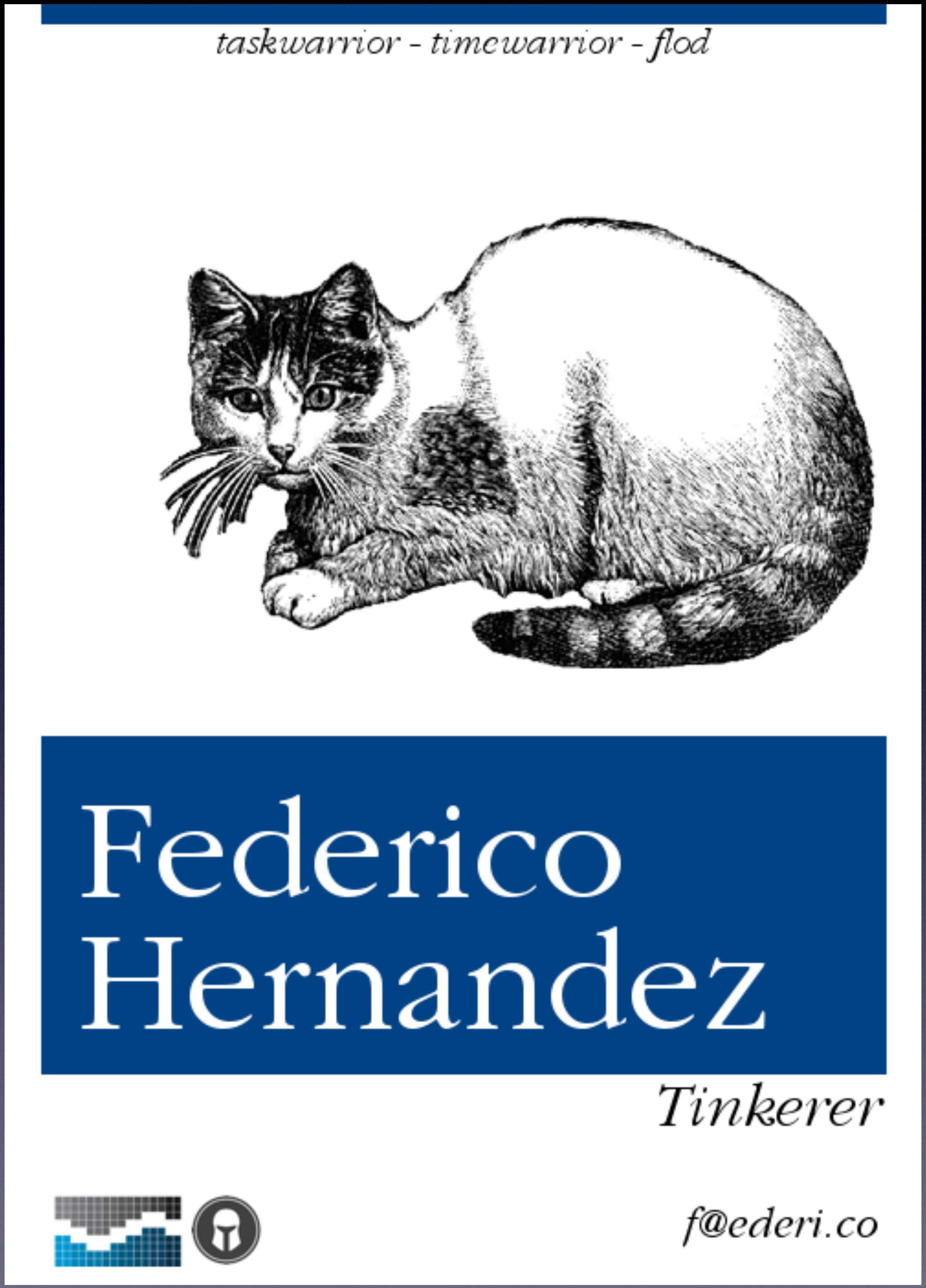


taskwarrior - timewarrior - flod

Paul Beckingham

Typist

paul@beckingham.net



taskwarrior - timewarrior - flod

Federico Hernandez

Tinkerer

f@ederi.co

omine 1492 a Christopho
bo nomine Regis Castel
detecta, et ab Ameri
nomen sortita 1497
SEPTEN
NALIS
NOVA FRANCIA
Oceanus
Ducale
domius
MARE
ATLAN
TICUM
MAR
DEL
NORT
DEL
AMERICA
OCEANUS
AETHIOPI
CUS
R
FICUM
MARE

```
commit 0ae76d3bf29faf2ae7a521f05f91ce2974e555b3
Author: Federico Hernandez <f@ederi.co>
Date:   Thu Jun 18 09:11:59 2009 +0200

    Fixed include statement for Linux
```

```
$ git log | fgrep include | wc -l
     239
```

```
fredde@ack:~$ gcc --version
gcc (Ubuntu 5.4.0-6ubuntu1~16.04.4) 5.4.0 20160609

fredde@sputnik1:~$ gcc --version
gcc (Ubuntu 6.2.0-5ubuntu12) 6.2.0 20161005

[fredde@sputnik2 ~]$ gcc --version
gcc (GCC) 6.3.1 20161221 (Red Hat 6.3.1-1)

[fredde@sputnik3 ~]$ gcc --version
gcc (GCC) 6.2.1 20160830

[fredde@sputnik4 ~]$ gcc --version
gcc (GCC) 4.8.5 20150623 (Red Hat 4.8.5-11)

[fredde@havasu ~]$ gcc --version
Apple LLVM version 8.1.0 (clang-802.0.42)
```

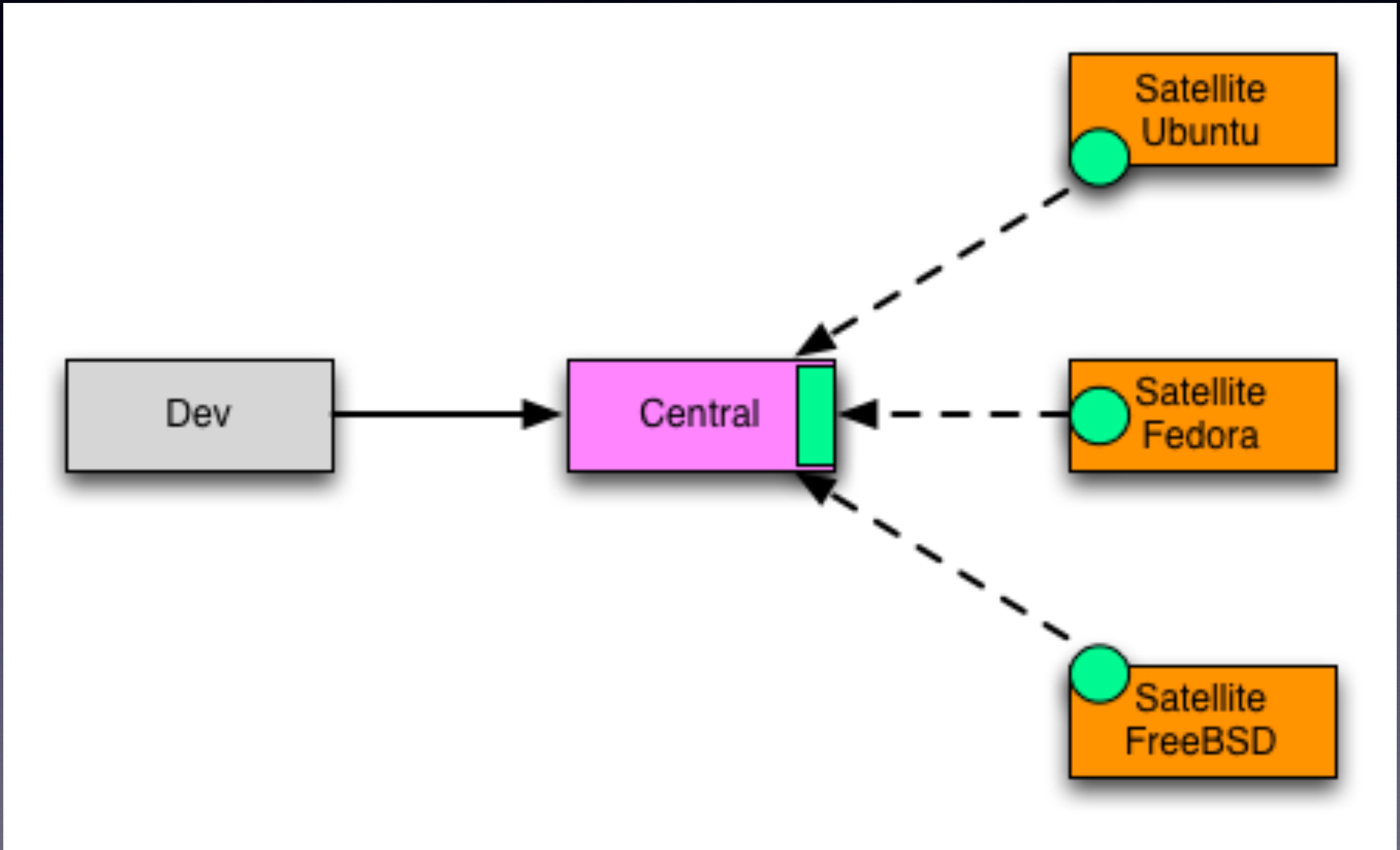
gnutls

3.3, 3.4.10, 3.5.8, 3.5.11

flod

linode

flod



Reuse donated “server capacity” like seti@home

flod

Still no access to shell for debugging.

Agent running, pulling jobs.

Unsecure communication (FW).

Unavailable build machines.

flod2

rackspace DigitalOcean

flod2

Access to *free* servers.

Reverse (push) the communication and use ***ssh*** *(Ansible).*

Model the steps in the CI process as queues.

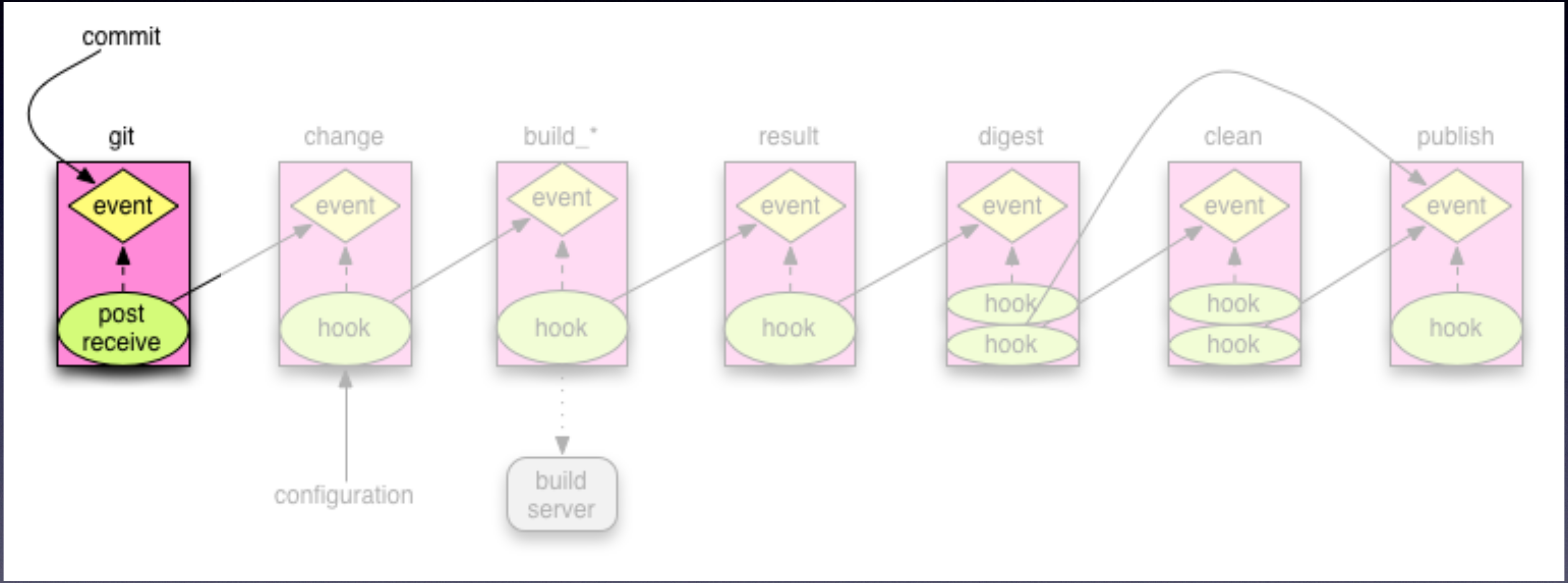
Use the filesystem/directories to store the state.

Attach hooks *(scripts)* that react to events in the directories *(git)*.

flod2

Text based configuration.

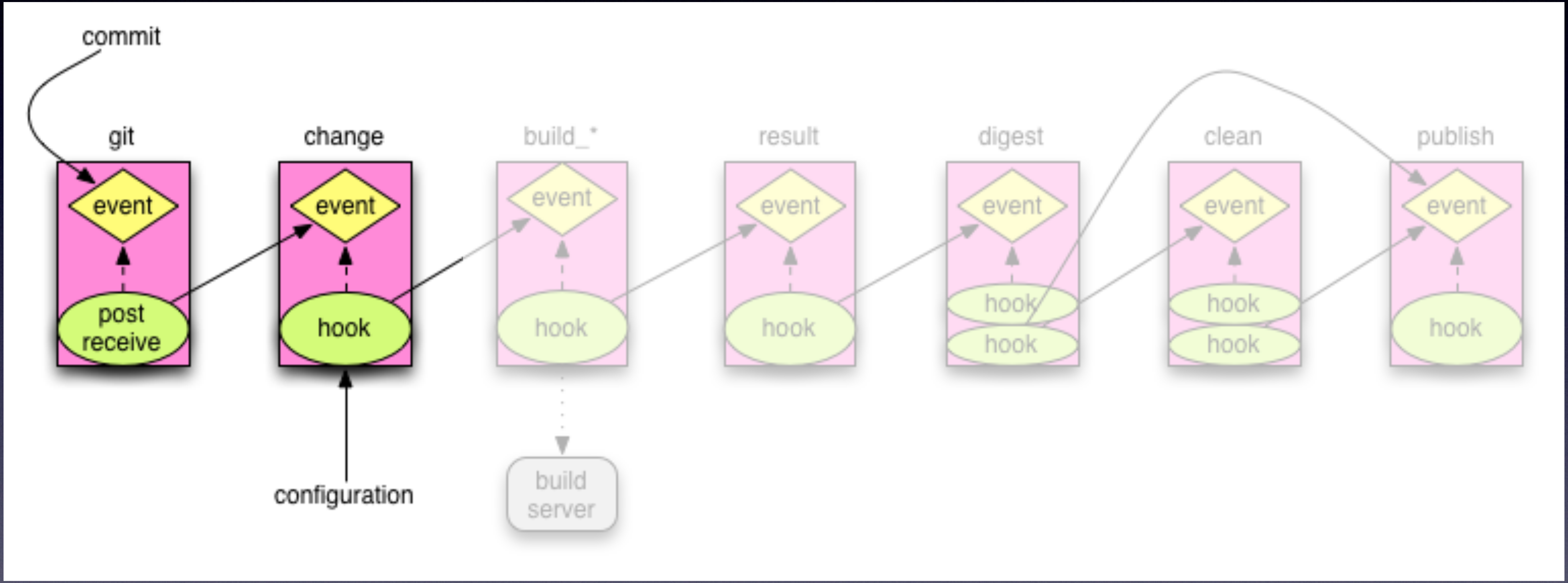
One small (1MB/5.5MB) binary to monitor the queues and trigger the registered hooks.


commit
git
event
post receive
change
event
hook
configuration
build_*
event
hook
build server
result
event
hook
digest
event
hook
hook
clean
event
hook
hook
publish
event
hook

```
git rev-list ${FROM}..${TO} | while read COMMIT
do
  AUTHOR=`git log -1 --format="%an" $COMMIT`
  TIMESTAMP=`git log -1 --format="%at" $COMMIT`

  EVENT=`mktemp`
  cat <<EOF >$EVENT
    change.repository: $REPOSITORY
    change.project: $PROJECT
    change.branch: $BRANCH
    change.commit: $COMMIT
    change.author: $AUTHOR
    change.timestamp: $TIMESTAMP
  EOF

  cd $FLD
  /usr/local/bin/central post change $EVENT
  cd $GWD
  rm $EVENT
done
```


commit
git
event
post receive
change
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configuration
build_*
event
hook
build server
result
event
hook
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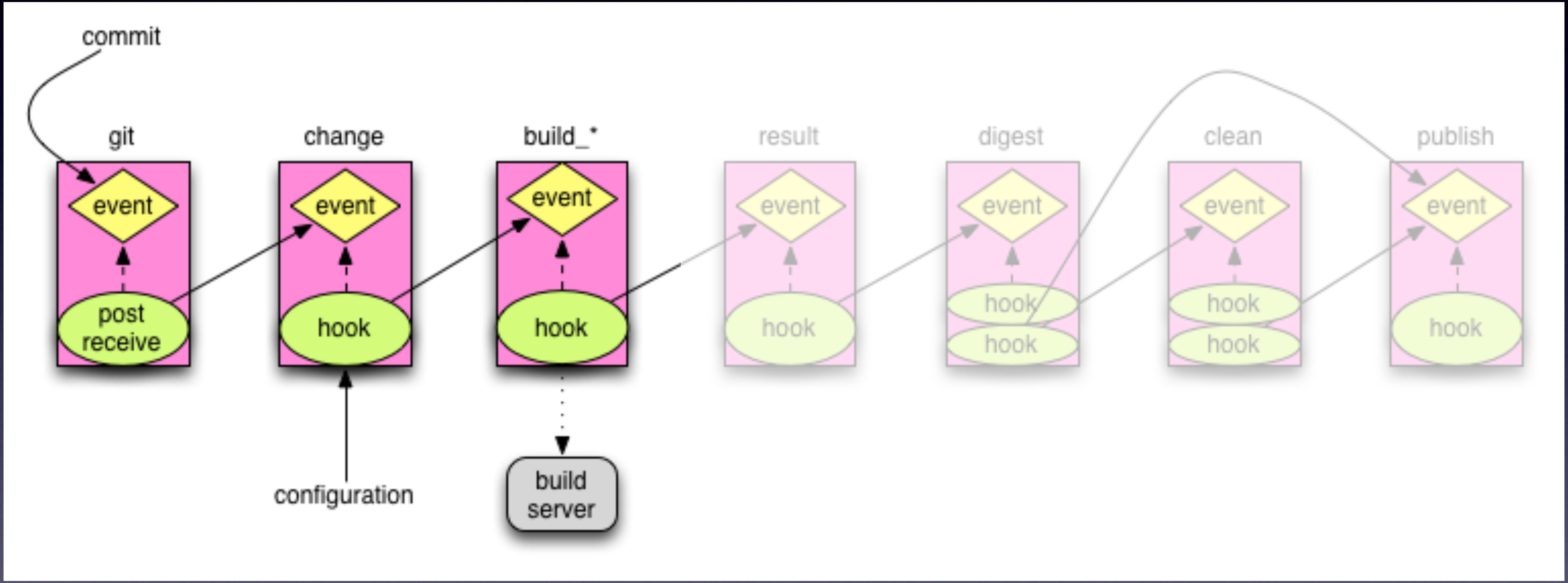
event
hook
hook
clean
event
hook
hook
publish
event
hook

```
project.task.description=Taskwarrior

project.task.ignore=README*,*.md

project.task.platforms=ubuntu1610,fedora25,arch2016,
centos73,macos10_12
project.task.dependencies=cmake,git,c++,
gnutls,uuid,python

project.task.repository=https://git.tasktools.org/
TM/task.git

project.task.job={bash}{nl}{nl}set -x{nl}git clone
--recursive -b {change.branch} {project.repository}
{change.project}.git{nl}cd {change.project}.git{nl}
git reset --hard {change.commit}{nl}cmake .{nl}
make{nl}make test{nl}

project.task.snapshot={bash}{nl}{nl}make package{nl}
```

```
platform.ubuntu1610.description=Ubuntu 16.10
platform.ubuntu1610.details=64-bit;GCC 6.2.0;CMake 3.5.2
platform.ubuntu1610.pkg.cmake=cmake
platform.ubuntu1610.pkg.git=git
platform.ubuntu1610.pkg.c++=build-essential
platform.ubuntu1610.pkg.gnutls=gnutls-dev
platform.ubuntu1610.pkg.uuid=uuid-dev
platform.ubuntu1610.pkg.python=python
platform.ubuntu1610.host=sputnik1.tasktools.org
platform.ubuntu1610.scratch=/tmp
```


commit
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hook
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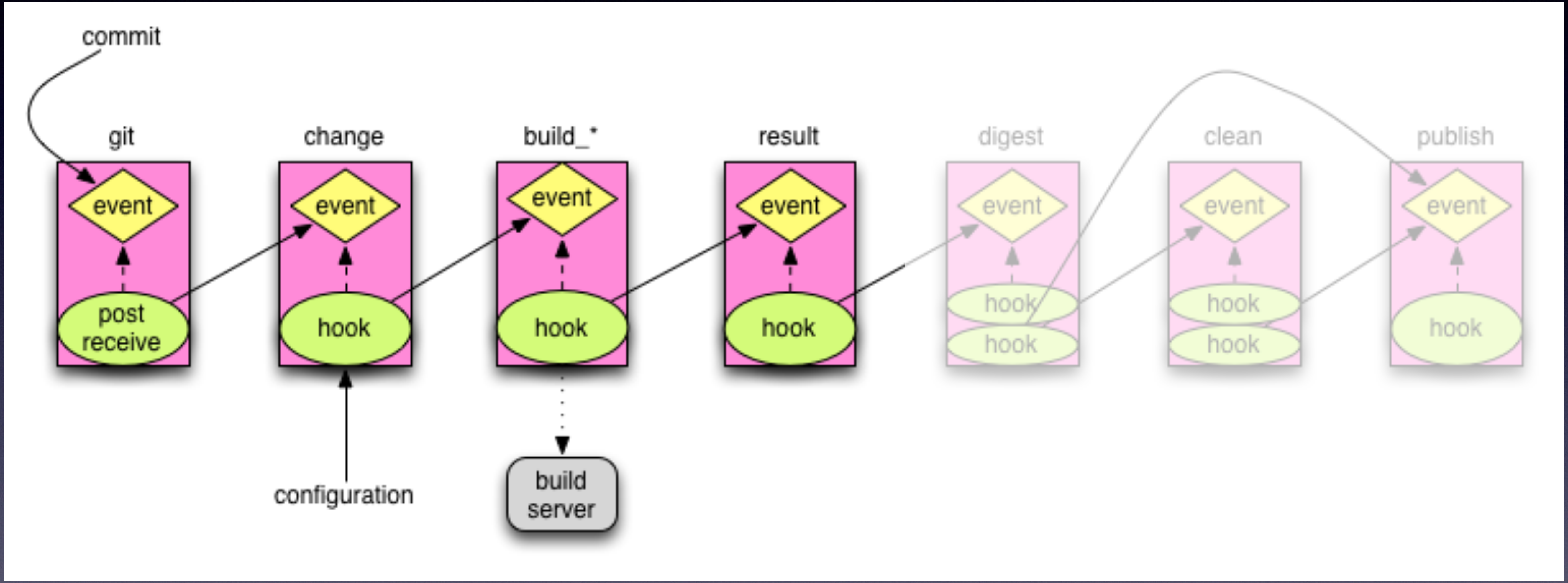
hook
digest
event
hook
hook
clean
event
hook
hook
publish
event
hook

```
def createJobScript(tempdir, contents):
  expanded = contents.replace('{sh}', '#!/bin/sh')
  expanded = expanded.replace('{bash}', '#!/bin/
bash')
  expanded = expanded.replace('{nl}', '\n')

  script = '{}/job'.format(tempdir)
  with open(script, 'w') as fh:
    fh.write(expanded)
  os.chmod(script, 0o700)
  return script
```

```
host = event.header('platform.host')
scratch = event.header('platform.scratch')
script = createJobScript(tempdir, event.header('project.job'))
id = ‘{0}.{1}'.format(event.header('change.project'),
  event.header('change.commit'))

log, err = subprocess.Popen(['ssh', host, 'mkdir {0}/
  {1}'.format(scratch, id)],
             stdout=subprocess.PIPE,
  stderr=subprocess.STDOUT).communicate()

out, err = subprocess.Popen(['scp', script, ‘{0}:{1}/{2}/
  {2}.job'.format(host, scratch, id)],
             stdout=subprocess.PIPE,
  stderr=subprocess.STDOUT).communicate()
log += out

out, err = subprocess.Popen(['ssh', host, 'cd {0}/{1} && ./
  {1}.job'.format(scratch, id)],
                  stdout=subprocess.PIPE,
  stderr=subprocess.STDOUT).communicate()
log += out
```


commit
git
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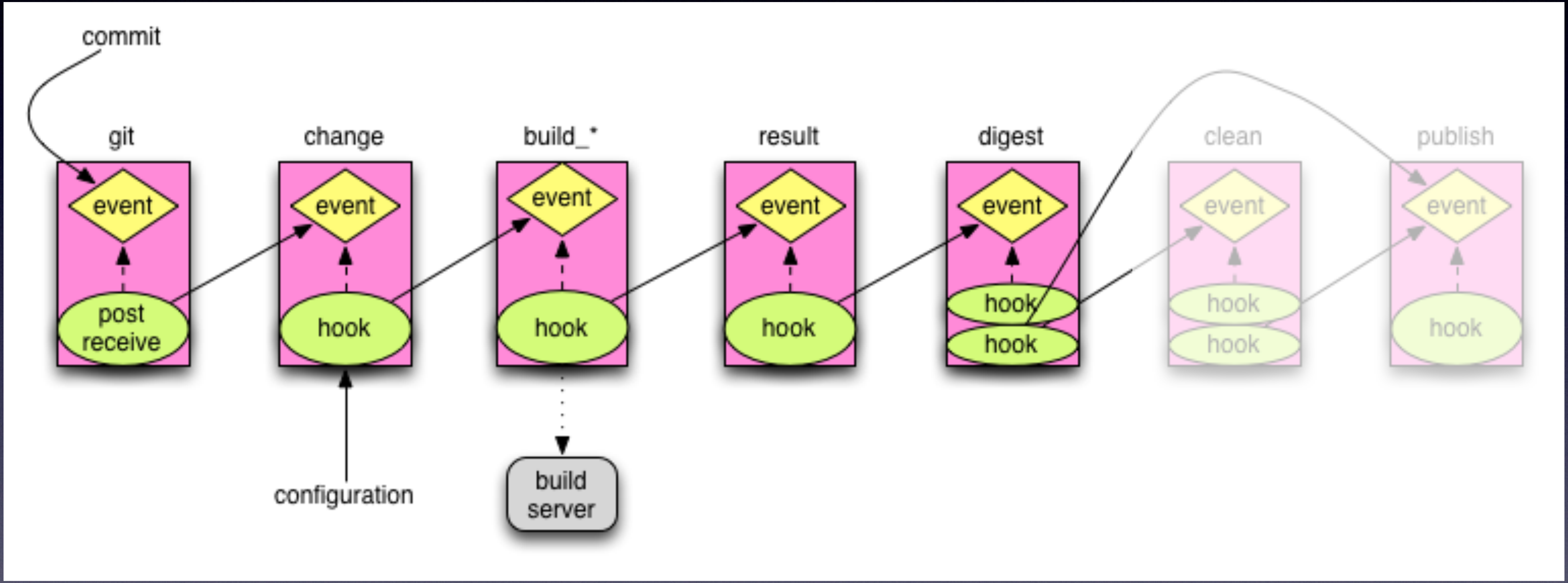
result
digest
clean
publish
event
event
event
event
event
event
event
post receive
hook
hook
hook
hook
hook
hook
hook
hook
configuration
build server


commit
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post receive
change
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hook
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build_*
event
hook
build server
result
event
hook
digest
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hook
hook
clean
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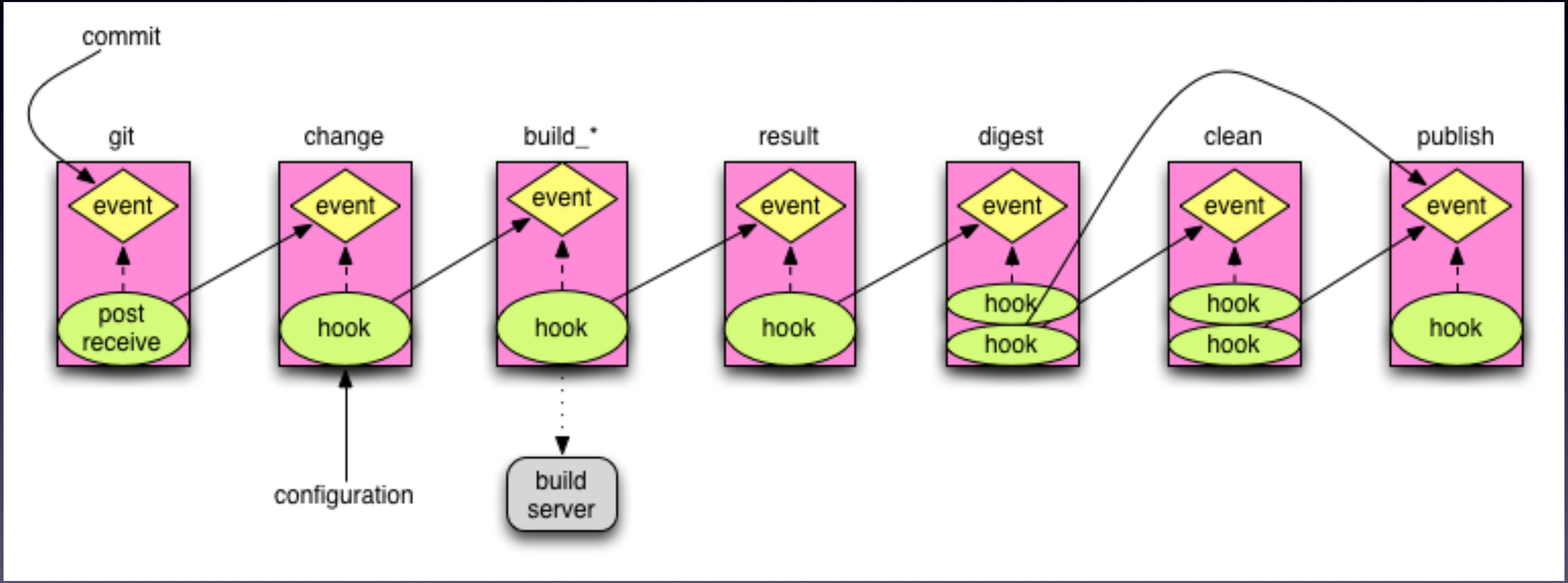
hook
publish
event
hook


commit
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clean
publish
event
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event
event
event
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event
post receive
hook
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hook
hook
hook
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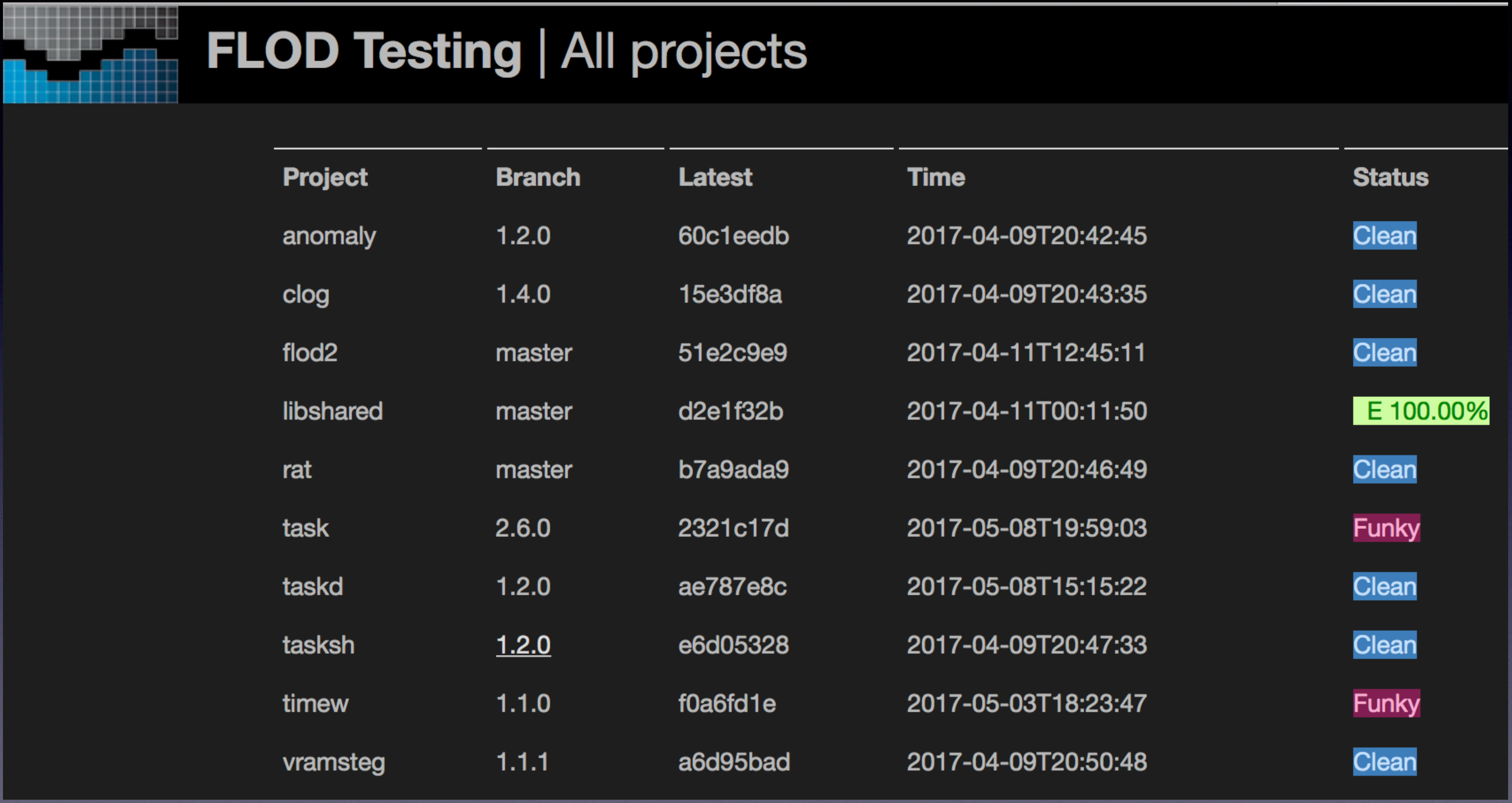
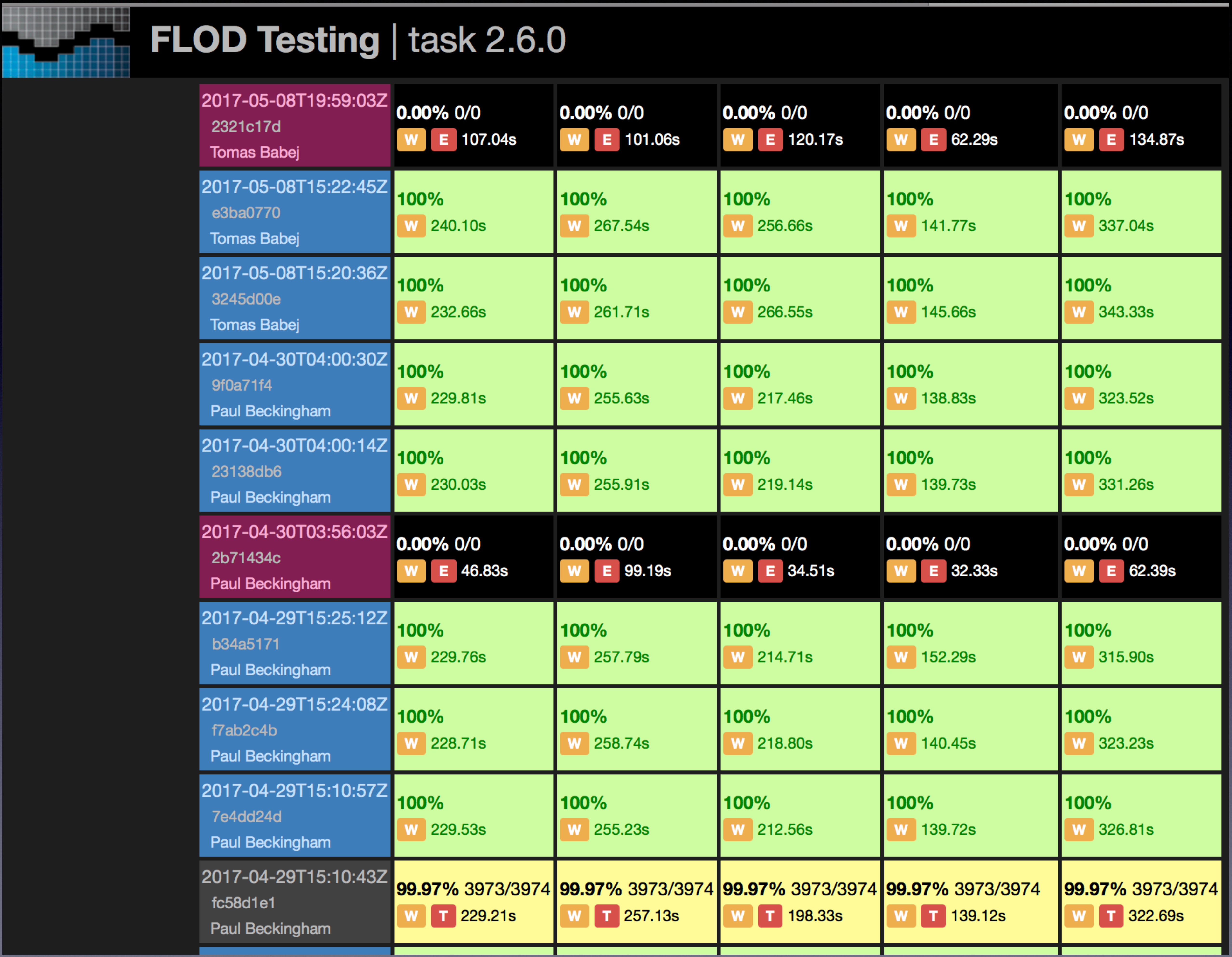
configuration
build server



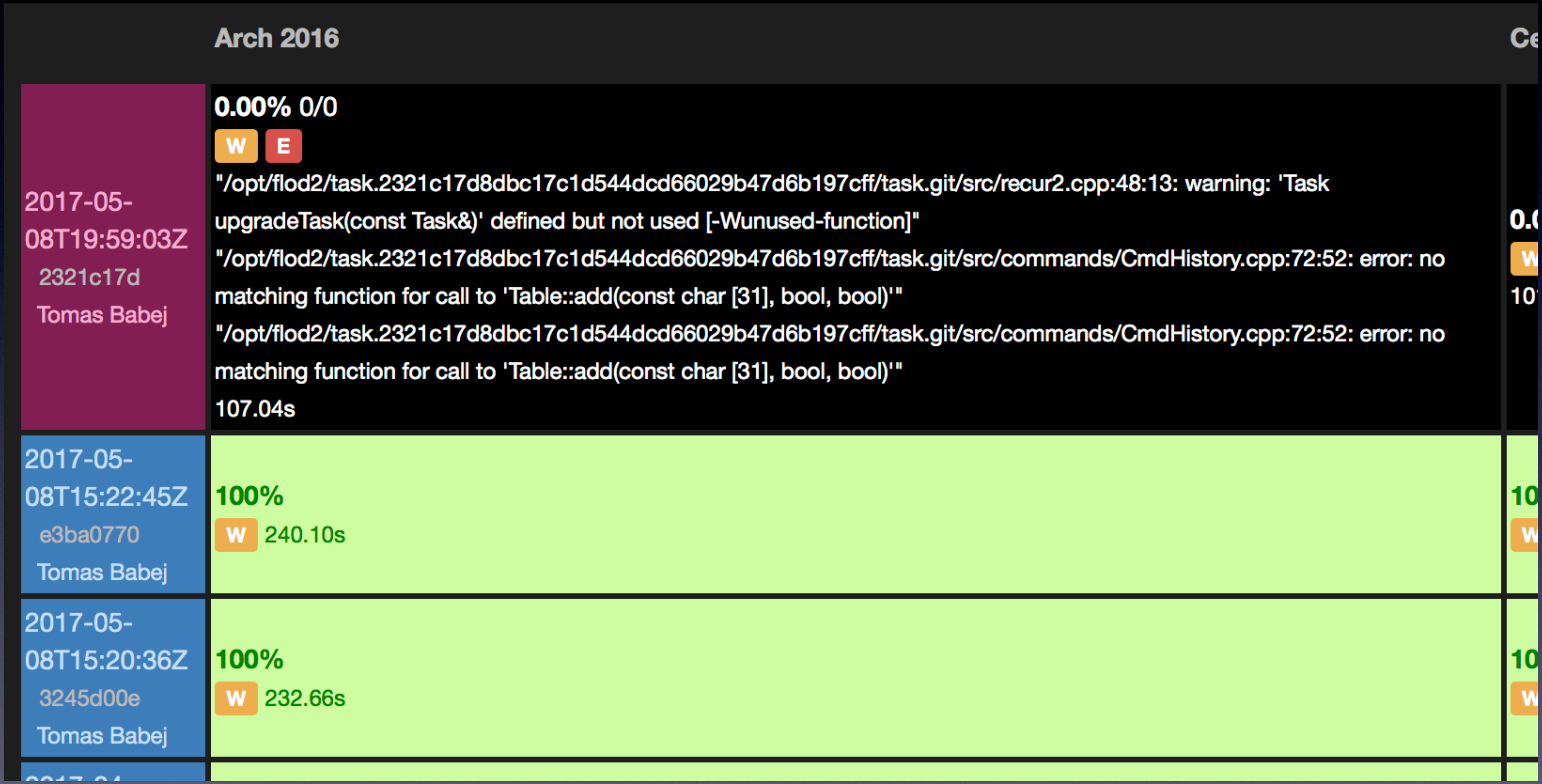
FLOD Testing | All projects

Project	Branch	Latest	Time	Status
anomaly	1.2.0	60c1eedb	2017-04-09T20:42:45	Clean
clog	1.4.0	15e3df8a	2017-04-09T20:43:35	Clean
flod2	master	51e2c9e9	2017-04-11T12:45:11	Clean
libshared	master	d2e1f32b	2017-04-11T00:11:50	E 100.00%
rat	master	b7a9ada9	2017-04-09T20:46:49	Clean
task	2.6.0	2321c17d	2017-05-08T19:59:03	Funky
taskd	1.2.0	ae787e8c	2017-05-08T15:15:22	Clean
tasksh	1.2.0	e6d05328	2017-04-09T20:47:33	Clean
timew	1.1.0	f0a6fd1e	2017-05-03T18:23:47	Funky
vramsteg	1.1.1	a6d95bad	2017-04-09T20:50:48	Clean



FLOD Testing | task 2.6.0

2017-05-08T19:59:03Z 2321c17d Tomas Babej	0.00% 0/0 W E 107.04s	0.00% 0/0 W E 101.06s	0.00% 0/0 W E 120.17s	0.00% 0/0 W E 62.29s	0.00% 0/0 W E 134.87s
2017-05-08T15:22:45Z e3ba0770 Tomas Babej	100% W 240.10s	100% W 267.54s	100% W 256.66s	100% W 141.77s	100% W 337.04s
2017-05-08T15:20:36Z 3245d00e Tomas Babej	100% W 232.66s	100% W 261.71s	100% W 266.55s	100% W 145.66s	100% W 343.33s
2017-04-30T04:00:30Z 9f0a71f4 Paul Beckingham	100% W 229.81s	100% W 255.63s	100% W 217.46s	100% W 138.83s	100% W 323.52s
2017-04-30T04:00:14Z 23138db6 Paul Beckingham	100% W 230.03s	100% W 255.91s	100% W 219.14s	100% W 139.73s	100% W 331.26s
2017-04-30T03:56:03Z 2b71434c Paul Beckingham	0.00% 0/0 W E 46.83s	0.00% 0/0 W E 99.19s	0.00% 0/0 W E 34.51s	0.00% 0/0 W E 32.33s	0.00% 0/0 W E 62.39s
2017-04-29T15:25:12Z b34a5171 Paul Beckingham	100% W 229.76s	100% W 257.79s	100% W 214.71s	100% W 152.29s	100% W 315.90s
2017-04-29T15:24:08Z f7ab2c4b Paul Beckingham	100% W 228.71s	100% W 258.74s	100% W 218.80s	100% W 140.45s	100% W 323.23s
2017-04-29T15:10:57Z 7e4dd24d Paul Beckingham	100% W 229.53s	100% W 255.23s	100% W 212.56s	100% W 139.72s	100% W 326.81s
2017-04-29T15:10:43Z fc58d1e1 Paul Beckingham	99.97% 3973/3974 W T 229.21s	99.97% 3973/3974 W T 257.13s	99.97% 3973/3974 W T 198.33s	99.97% 3973/3974 W T 139.12s	99.97% 3973/3974 W T 322.69s



	Arch 2016	Ce
2017-05-08T19:59:03Z 2321c17d Tomas Babej	**0.00%** 0/0 W E "/opt/flod2/task.2321c17d8dbc17c1d544dcd66029b47d6b197cff/task.git/src/recur2.cpp:48:13: warning: 'Task upgradeTask(const Task&)' defined but not used [-Wunused-function]" "/opt/flod2/task.2321c17d8dbc17c1d544dcd66029b47d6b197cff/task.git/src/commands/CmdHistory.cpp:72:52: error: no matching function for call to 'Table::add(const char [31], bool, bool)'" "/opt/flod2/task.2321c17d8dbc17c1d544dcd66029b47d6b197cff/task.git/src/commands/CmdHistory.cpp:72:52: error: no matching function for call to 'Table::add(const char [31], bool, bool)'" 107.04s	**0.0** W 10
2017-05-08T15:22:45Z e3ba0770 Tomas Babej	**100%** W 240.10s	**10** W
2017-05-08T15:20:36Z 3245d00e Tomas Babej	**100%** W 232.66s	**10** W

Demo

Likely Enhancements

- Bugfixes and improvements.
- Auto cleanup of main result page.
- auto tagging, auto run performance scripts, auto snapshot tar balls for stable commits.
- smarter configuration, e.g. * for platform requests.
- discovery (self registration) for build satellites.
- build and test-run metrics.
- better notification of results.
- start VMs for build on demand, docker (cost vs performance).

What we have learned

- A lot can be learned from when a build only fails on macOS, FreeBSD and Solaris. [BSD Potability]
- If a build/test cycle is too long, then by the time the CI results are in, you've moved on to the next thing.
- No matter how much detail you can cram into the platform-specific build/test log, you still need ssh access to properly investigate.
- A CI report is a great way to answer a whole class of "it won't build on xxxx" complaints.
- Having build/test machines in different time zones is a great way to identify brittle tests that are dependent on time of day.
- Having the report identify "funky" builds is a great way to highlight problems on specific platforms.
- More than just running tests, knowing that a project builds "clean" (no warnings) is an important extra piece of data.
- CI is so useful, we won't release without it now. It almost eliminates the need for x.y.1 releases.

Graph of dependencies

Graph/event/hook system is capable of implementing basically anything.

Join us at
FOSDEM 2018
in Brussels

https://git.tasktools.org/TS/flod2
https://taskwarrior.org
support@taskwarrior.org
@taskwarrior
IRC: #taskwarrior

Disclaimer

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