

From Jenkins to BuildBot: just our experience

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Product to build & test



Security



Routing



Caching



Streaming

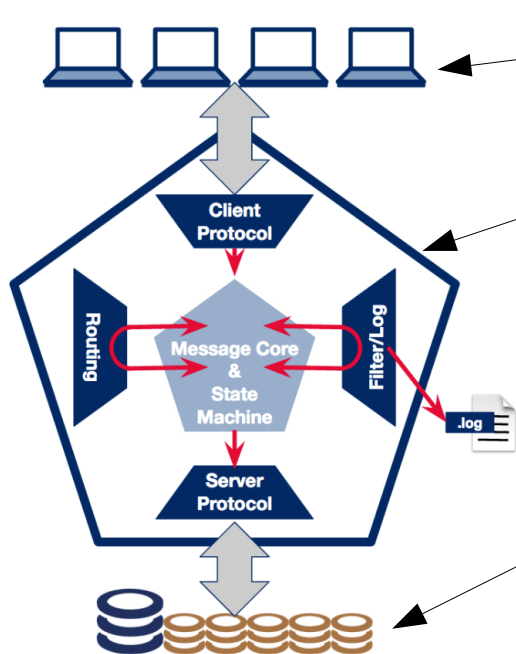


Sharding



Failover

Product to build & test



- incredible load and weird broken queries

- any combination of router/filters/core settings
- several Maxscales (HA setup)

- different Linux distributions
- different HW/Virtual Machines
- different products (MariaDB/MySQL/Percona server)
- different versions
- different topologies
- different failures simulation

Jenkins and Everything as code

Long long time ago...

- Jenkins Job Builder from OpenStack? YAML, easy to load...
 - no parametrized !include
 - only jobs can be loaded (plugins, views, configs – Jenkins CLI from own scripts?)
 - YAML is not really human-writable
- Pipelines? even less can be code! => JJB again!

Angry Jenkins

- Still no full "Everything is code solution"
- Mess of plugins
- how to implement complex triggering logic? Even more plugins!
 - Matrix jobs, nested jobs, parametrized triggers, ...
 - even more plugins
- all – triggers, builders, parameters definitions are **in the one place**
- bugs and resources consumption
 - one test goes mad – huge log – Jenkins down! (or whole host!)



← → ↻ 127.0.0.1:8089/view/All/

Jenkins

Jenkins > All >

- New Item
- People
- Build History
- Delete View
- Project Relationship
- Check File Fingerprint
- Manage Jenkins
- My Views
- Credentials
- New View

Build Queue -

No builds in the queue.

Build Executor Status -

master

- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle
- Idle

All	axilary	build	push_tests	regular_test	snapshot	test
S	W	Name ↓				
☉	☀	build				
☉	☀	build_all				
☉	☀	build_and_performance_test				
☉	☁	build_and_simple_test_pipeline				
🌐	☀	build_and_test				
☉	☀	build_and_test_alone				
🔴	☁	build_and_test_pipeline				
🔴	☁	build_and_test_simple				
🌐	☁	build_for_release				
☉	☀	build_regular				
☉	☀	cleanup				
🌐	☁	clone_configuration				
🌐	☁	collect_coredumps_for_build				
🌐	☁	create_snapshot				
☉	☁	daily_build_all				
☉	☁	daily_performance				
☉	☀	daily_tests_launcher				
☉	☀	destroy				
🌐	☀	parametrized_triggered_subjobs_killer				
🔴	☁	performance_test				
🌐	☀	print_branch_list				
🌐	☀	print_branches_which_matches_regex_in_file				
🌐	☀	print_branches_with_regex				

same job, but different triggers

not a jobs, but step

not jobs, but schedulers

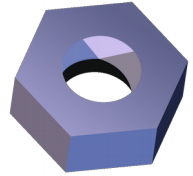
Job DSL? Other CI? BuildBot...

The agony of choice

- Everything is code
- Complex triggers:
 - any schedule for any test configuration
 - any host selection algorithm
- Can survive very long runs, huge logs
- Can process huge number of parameters
 - one test goes mad – huge log – Jenkins down! (or whole host!)



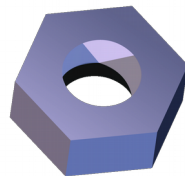
Travis CI




BuildBot



Job DSL



BuildBot

-  python™
- MariaDB server uses BuildBot
- Initially no UI, only code
- Continuing with Jenkins means moving to Job DSL
- very easy to implement any triggering logic: Python code can generate triggers

The Devil in the details

Nested tasks: parameters transfer

```
COMMON_PROPERTIES = [  
    "name",  
    "repository",  
    "branch",  
    "target",  
    ...
```

```
factory.addStep(steps.Trigger(  
    name="Call the 'build' scheduler",  
    schedulerNames=['build'],  
    copy_properties=COMMON_PROPERTIES,  
    ...
```

```
factory.addStep(steps.Trigger(  
    name="Call the 'run_test' scheduler",  
    schedulerNames=['run_test'],  
    copy_properties=COMMON_PROPERTIES,  
    ...
```

Scheduler:

```
from . import properties  
  
BUILD_AND_TEST_PROPERTIES = [  
    properties.build_name(),  
    properties.build_target(),  
    ...  
MANUAL_SCHEDULER = schedulers.ForceScheduler(  
    name="build_and_test",  
    label="Build and test",  
    builderNames=["build_and_test"],  
    codebases=properties.codebaseParameter(),  
    properties=BUILD_AND_TEST_PROPERTIES  
)
```

Schedulers debugging

- not possible to see “next scheduled build”
- only way now: dry runs with debug output

```
BUILD_INTERVAL = 1
launchTime = 18
for branch in constants.NIGHTLY_SCHEDS:
    ...
    nightlyScheduler = schedulers.Nightly(
        name="build_and_performance_test_{}_nightly".format(branch),
        builderNames=["build_and_performance_test"],
        hour=launchTime % 24, minute=0,
        codebases={"": {
            "branch": branch,
            "repository": constants.MAXSCALE_REPOSITORY
        }},
        properties=nightlyProperties
    )
    SCHEDULERS.append(nightlyScheduler)
```

✓	build_and_performance_test	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
✓	build_and_performance_test_2.2_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
✓	build_and_performance_test_2.3_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
✓	build_and_performance_test_2.4_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master

Task creation steps

- write scheduler
- write builder (collect all steps to builder – build, publish, report, cleanup)
- if needed, describe new parameters
- do not forget to add new scheduler, builder into `__init__.py`



- scheduler and builder are in one YAML
- builders, publishers, wrappers – can be in some YAML template, hard to forget anything

UI :(

- not possible to change parameters for rebuild
- schedulers view: only names, deleted items still in the list
- not the best log viewer



NAVIGATION

Home



Grid View



Waterfall View



Console View



> Builds



Builders

Pending Buildrequests

Last Changes

Build Masters

Schedulers

Workers

About



Settings



All schedulers

[All schedulers by master](#)

Enabled	Scheduler Name	Master
<input checked="" type="checkbox"/>	2.2	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	2.3	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	2.4	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_all	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_all_triggerable	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test_2.2_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test_2.3_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test_2.4_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test_develop_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_performance_test_on_push	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_2.2_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_2.3_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_2.4.0_nightly	
<input checked="" type="checkbox"/>	build_and_test_2.4_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_develop_nightly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_distros_2.3_suse_15_libvirt_weekly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_distros_2.3_ubuntu_bionic_libvirt_weekly	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master
<input checked="" type="checkbox"/>	build_and_test_snapshot_force	maxscale-ci.mariadb.com:/home/vagrant/maxscale-buildbot/master

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```

0 /home/vagrant/buildbot-workers/max-tst-01-01/build/scripts/Build_MaxScale_using_MDBCI
1 in dir /home/vagrant/buildbot-workers/max-tst-01-01/build/build (timeout 1800 secs)
2 watching logfiles {}
3 argv: [b'/home/vagrant/buildbot-workers/max-tst-01-01/build/scripts/Build_MaxScale_using_MDBCI']
4 environment:
5   BUILD_ID=912
6   BUILD_NUMBER=912
7   HOME=/home/vagrant
8   JOB_NAME=build
9   LANG=en_GB.UTF-8
10  LOGNAME=vagrant
11  MAIL=/var/mail/vagrant
12  MDBCI_VM_PATH=/home/vagrant/vms
13  PATH=/home/vagrant/buildbot-virtual-env/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games
14  PWD=/home/vagrant/buildbot-workers/max-tst-01-01/build/build
15  SHELL=/bin/bash
16  SHLVL=1
17  SSH_CLIENT=94.23.196.190 46490 22
18  SSH_CONNECTION=94.23.196.190 46490 151.80.21.219 22
19  USER=vagrant
20  VIRTUAL_ENV=/home/vagrant/buildbot-virtual-env
21  XDG_RUNTIME_DIR=/run/user/1001
22  XDG_SESSION_ID=381840
23  _=/home/vagrant/buildbot-virtual-env/bin/run-worker.py
24  box=ubuntu_bionic_libvirt
25  cmake_flags=-DBUILD_TESTS=N -DBUILD_MMON=Y -DBUILD_CDC=Y
26  target=develop-buildbot-2019-Aug-19-21-00-00
27  try_already_running=yes
28  using PTY: False
29  +++ readlink -f BUILD/mdbci/build.sh
30  ++ dirname /home/vagrant/buildbot-workers/max-tst-01-01/build/build/BUILD/mdbci/build.sh
31  + export script_dir=/home/vagrant/buildbot-workers/max-tst-01-01/build/build/BUILD/mdbci
32  + script_dir=/home/vagrant/buildbot-workers/max-tst-01-01/build/build/BUILD/mdbci
33  + . /home/vagrant/buildbot-workers/max-tst-01-01/build/build/BUILD/mdbci/set_build_variables.sh
34  +++ pwd
35  ++ export dir=/home/vagrant/buildbot-workers/max-tst-01-01/build/build
36  ++ dir=/home/vagrant/buildbot-workers/max-tst-01-01/build/build
37  ++ export MDBCI_VM_PATH=/home/vagrant/vms
38  ++ MDBCI_VM_PATH=/home/vagrant/vms
39  ++ mkdir -p /home/vagrant/vms
40  ++ echo MDBCI_VM_PATH=/home/vagrant/vms
41  ++ export box=ubuntu_bionic_libvirt
42  ++ box=ubuntu_bionic_libvirt
43  ++ echo box=ubuntu_bionic_libvirt
44  MDBCI_VM_PATH=/home/vagrant/vms
45  box=ubuntu_bionic_libvirt
46  +++ git log
47  +++ head -1
48  +++ sed 's/commit //'
49  ++ commitID=c01925ee348aba3afd3e802df4eefe2235a65483
50  ++ echo 'commitID c01925ee348aba3afd3e802df4eefe2235a65483'
51  commitID c01925ee348aba3afd3e802df4eefe2235a65483
52  +++ git symbolic-ref --short HEAD
53  ++ export branch=develop
54  ++ branch=develop
55  +++ date +%Y-%m-%d_%H-%M
56  ++ export curr_date=2019-08-19_23-00

```

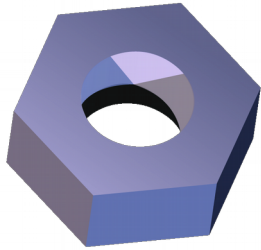

Time flies....

2018

04	May	10	31	June	July	August
Decision, initial commit	server up	Tasks transferred from Jenkins	14	Last commit to Jenkins config	All schedulers created	06 Jenkins down

September	October
Bug fixing, a couple of broken Maxscale releases	"scripts spaghetti" converted into Python code (logs parsing, results publishing)

Boring numbers



- 76 Python files (4.9 KLOC)
- 2 Bash files (36 LOC)
- 540 commits from Aug, 2018



- 207 YAML files (2.2 KLOC)
- 16 Bash files (520 LOC)
- 9 Ruby files (1.9 KLOC)
- 593 commits (Apr 2016 – Apr 2018) – only YAMLs

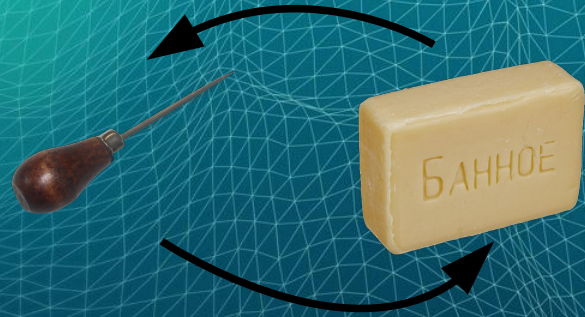
Win?

- Stability!!!
- everything in one language
- no pile of plugins
- less host resources consumption

Next?

- schedulers viewer (plugin?)
- automated parameters transfer for nested jobs

THANK YOU!



<https://github.com/mariadb-corporation/maxscale-buildbot>
<https://github.com/mariadb-corporation/maxscale-jenkins-jobs>
<https://github.com/OSLL/jjg> - JJB YAMLS loader
<https://github.com/mariadb-corporation/MaxScale>

