



Gerrit @ LibreOffice

- David Ostrovsky

Outline

- ▼ Motivation to introduce Gerrit
- ▼ Decentralized CI Infrastructure
- ▼ Add Gerrit to CI Infrastructure
- ▼ Gerrit plugin API
- ▼ Gerrit Buildbot plugin

Introduction of Gerrit for LibreOffice: Motivation

Patches Lost in Space: the old workflow

- ▼ A patch is intended to:
 - ▼ Be mailed to the dev-@mailinglist
 - ▼ Being picked up by a developer with commit rights and be
 - ▼ Checked for a valid license
 - ▼ Reviewed for Goodness
 - ▼ Applied, Build, Tested and Pushed
 - ▼ Reported back to the mailing list that this is in now

- ▼ Reality: fdo#40946



Does it hurt?

- ▼ Duplication of work
- ▼ Frustration
- ▼ Scaring away newcomers
- ▼ Makes some kinds of work very hard or painful for everyone

How does Gerrit help?

- ▼ Automatic Patch Uploads
- ▼ Integration in a wide range of communication channels
- ▼ Human Review
- ▼ Bot Verification

Thus:

- ▼ Find errors early and before they cause too much pain

Gerrit@LibreOffice

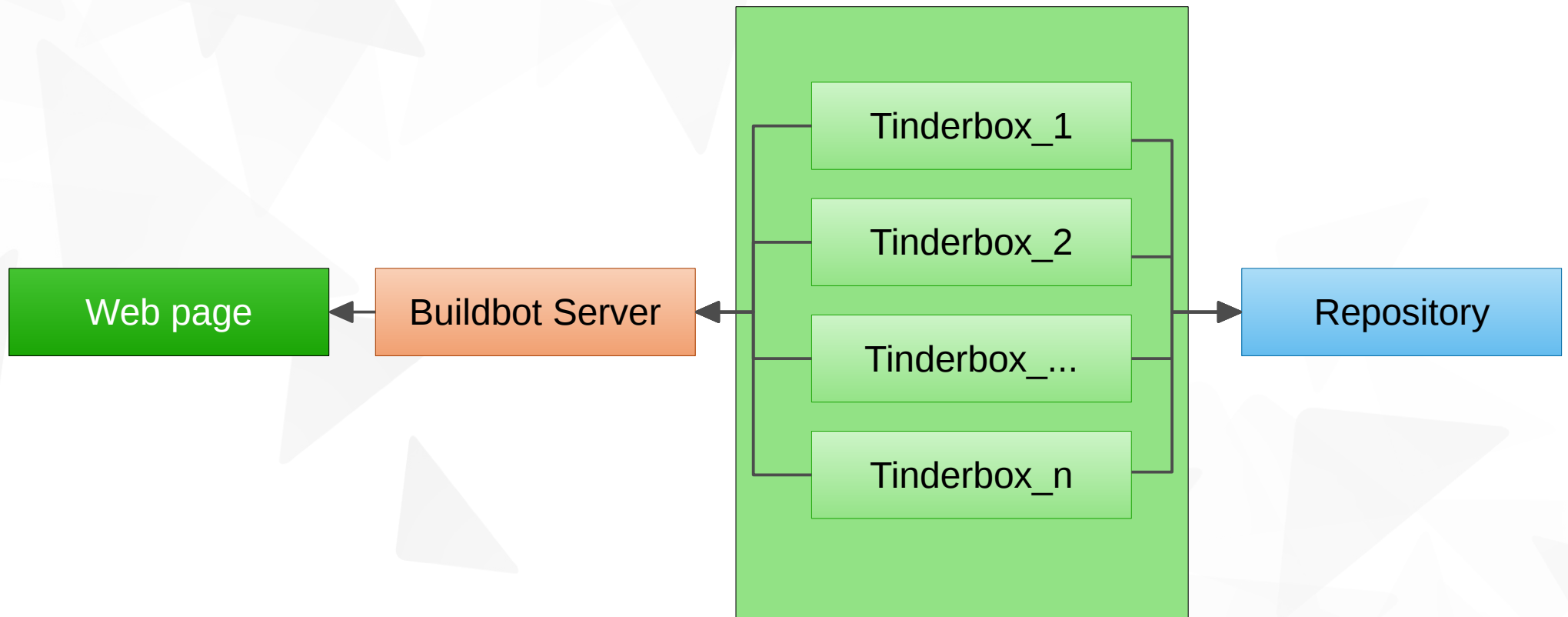
- ▼ Gerrit version: 2.8.3
- ▼ one core project
- ▼ many other projects (cpp unit, ...)
- ▼ 80 committers
- ▼ review workflow is optional on master
- ▼ review workflow is mandatory for release branches

LibreOffice CI Infrastructure

Decentralized CI Infrastructure

- ▼ Independent tinderboxes that periodically check master and release branches
- ▼ Multiple checks for the same commits on the same platforms possible
- ▼ Build and configuration logic is located locally in tinbuild2 script
- ▼ Report results to tinderbox master per fire and forget
- ▼ Buildbot server presents results in a web page
- ▼ In failure case spam all committers from all changes since last successful build

Decentralized CI Infrastructure



Decentralized CI Infrastructure

Tinderbox Status Page tree: MASTER

Created at: Tue Oct 16 21:50

[Add to Notice Board](#)

[Regnerate HTML Pages](#)

[Administrate this tree \(MASTER\)](#)

[Tinderbox Index](#)

Build Time	Time (UTC)	Guilty	Android-ARM_24-Bytemark-Hosting	Android-MIPS_26-Bytemark-Hosting	Android-X86_25-Bytemark-Hosting	Linux-Fedora-x86_64_22-Incremental	Linux-Fedora17-x86_64_4-gcc.4.7-dbgutil	Linux-Gentoo-x86_64_2-no.moz_no-binfilter	Linux-Gentoo-x86_64_23-System-libs	Linux-RHEL6-x86_64_14-with.check	Linux-openSUSE-x86_18-Clang	Linux-openSUSE-x86_19-GCC	Linux-x86_64_8-SLED11
10/16 21:50	10/16 19:50												
21:09	19:09						details						
10/16 20:50	10/16 18:50												
10/16 19:33	10/16 17:33												
19:27	17:27												
19:24	17:24												
19:16	17:16												
19:13	17:13												
19:09	17:09												
10/16 18:58	10/16 16:58									details errs: 33			
18:53	16:53												
18:49	16:49		details errs: 33		details errs: 33		details errs: 27				details errs: 44		



Tinderboxes ...

- ▼ Tinderboxes have different speeds.
- ▼ Tinderboxes know nothing of each other.
- ▼ Tinderboxes cannot communicate or coordinate.
- ▼ The slowest and rarest tinderboxes (Windows) are the most valuable.

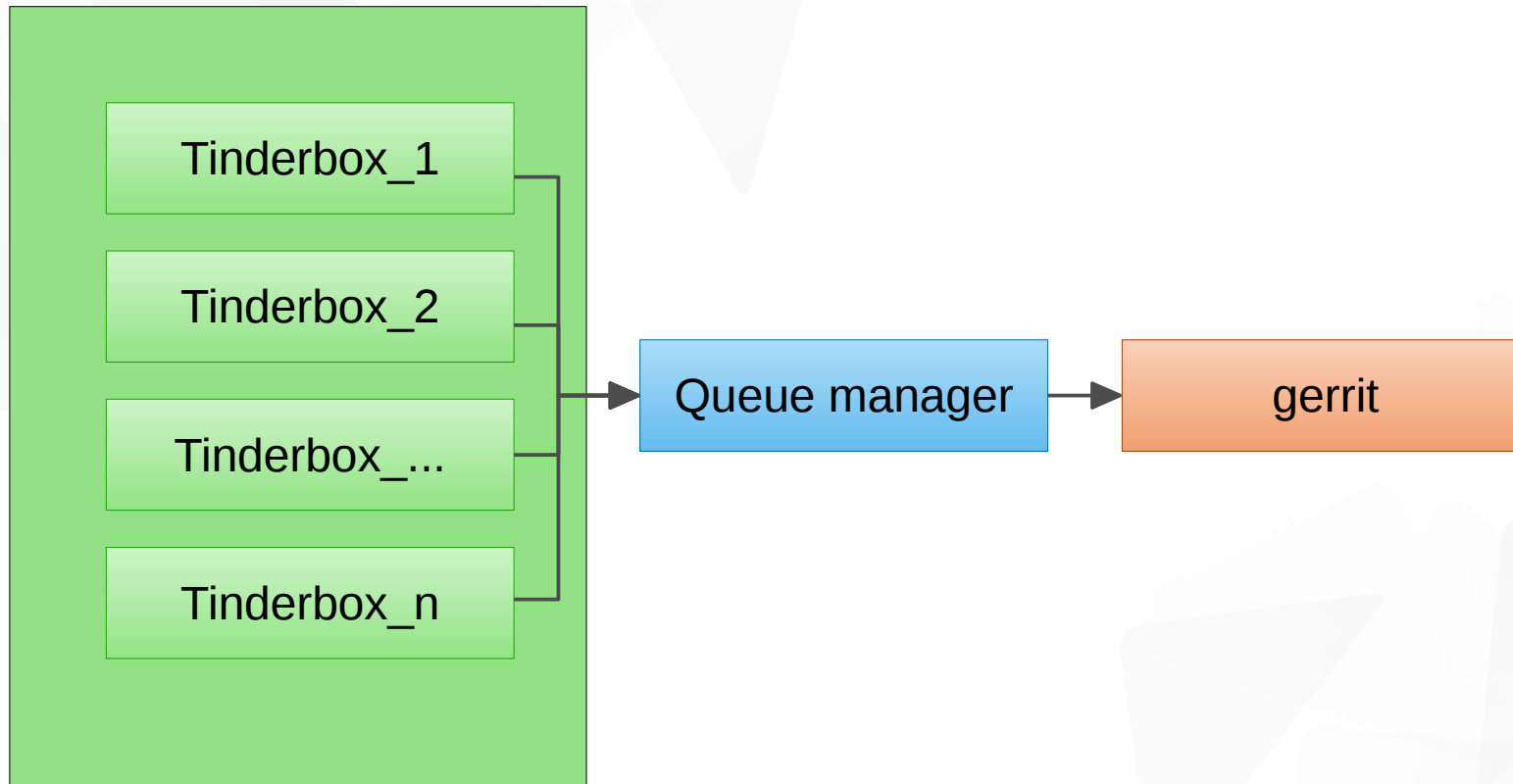


LibreOffice CI Infrastructure with Gerrit

Decentralized CI Infrastructure with gerrit 1/3

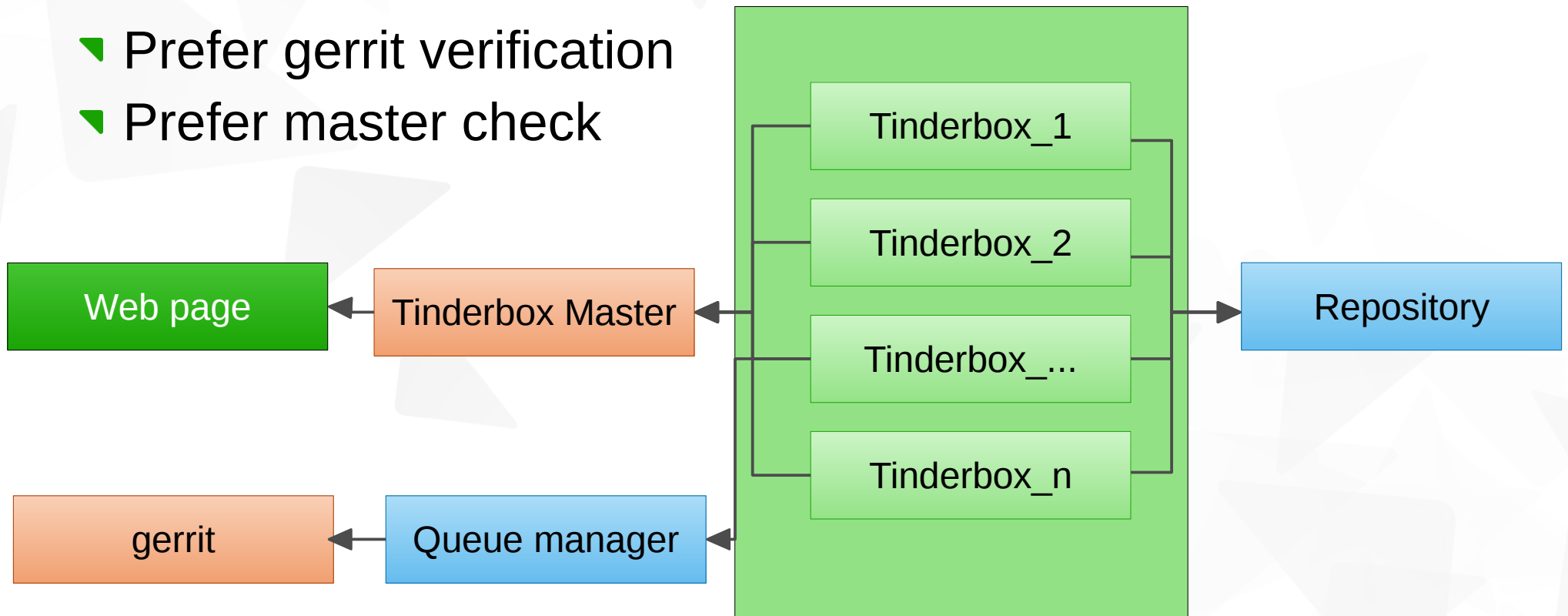
- ▼ Queue manager is needed to distribute build jobs between tinderboxes
- ▼ One patch set must be checked only once for each platform
- ▼ Tinbuild2 must be taught to talk to queue manager
- ▼ Results from all tinderboxes are gathered and combined result is reported back to gerrit
- ▼ A patch set is approved only when all check jobs were successful

Decentralized CI Infrastructure with gerrit 2/3



Decentralized CI Infrastructure with gerrit 3/3

- ▼ Reusing existing infrastructure
- ▼ Buildbot taught to talk to queue manager
- ▼ Different strategies for gerrit patch verification vs. master check
 - ▼ Prefer gerrit verification
 - ▼ Prefer master check



Queue manager's feature set

- ▼ Consumption gerrit-stream events
- ▼ Communication API/protocol for tinderboxes
- ▼ Job scheduler
- ▼ Build log publication and visualization
- ▼ Queue pipeline visualization
- ▼ Documentation
- ▼ Nice to have: Gerrit UI integration/extension
 - ▼ dedicated channel for patch set verifications
 - ▼ during review process specific configuration can be selected to be checked, i. e. with-java

Gerrit Plugin Architecture

Gerrit Plugin Architecture

- ▼ Extension points for gerrit plugin:

- ▼ SSH commands under plugin's own namespace

```
ssh gerrit plugin-name some-really-cool-command --foo bar baz
```

- ▼ Servlets under plugin's own namespace

```
https://review.gerrit.net/plugins/plugin-name/page.html
```

- ▼ UiAction (since 2.8)

Cherry Pick

Rebase

Abandon

Schedule...

- ▼ JS API / Html fragments (since 2.9)

Code-Review +2 David Ostrovsky (Admin)

Custom-Label

Verified +1 David Ostrovsky (Admin)

Bonjour France

Hallo Germany

Hello USA

Gerrit Buildbot Plugin

Build Trigger strategies

- ▼ Patch set created event
- ▼ Positive review from member of specific group
- ▼ Manually
 - ▼ The one actually used in LO set up

Buildbot plugin in a nutshell

- ▼ Schedule a build per SSH command or UI:

```
ssh gerrit buildbot schedule --project core <sha1>
```

- ▼ Poll the queue per SSH command:

```
ssh gerrit buildbot get --project core --platform linux
```

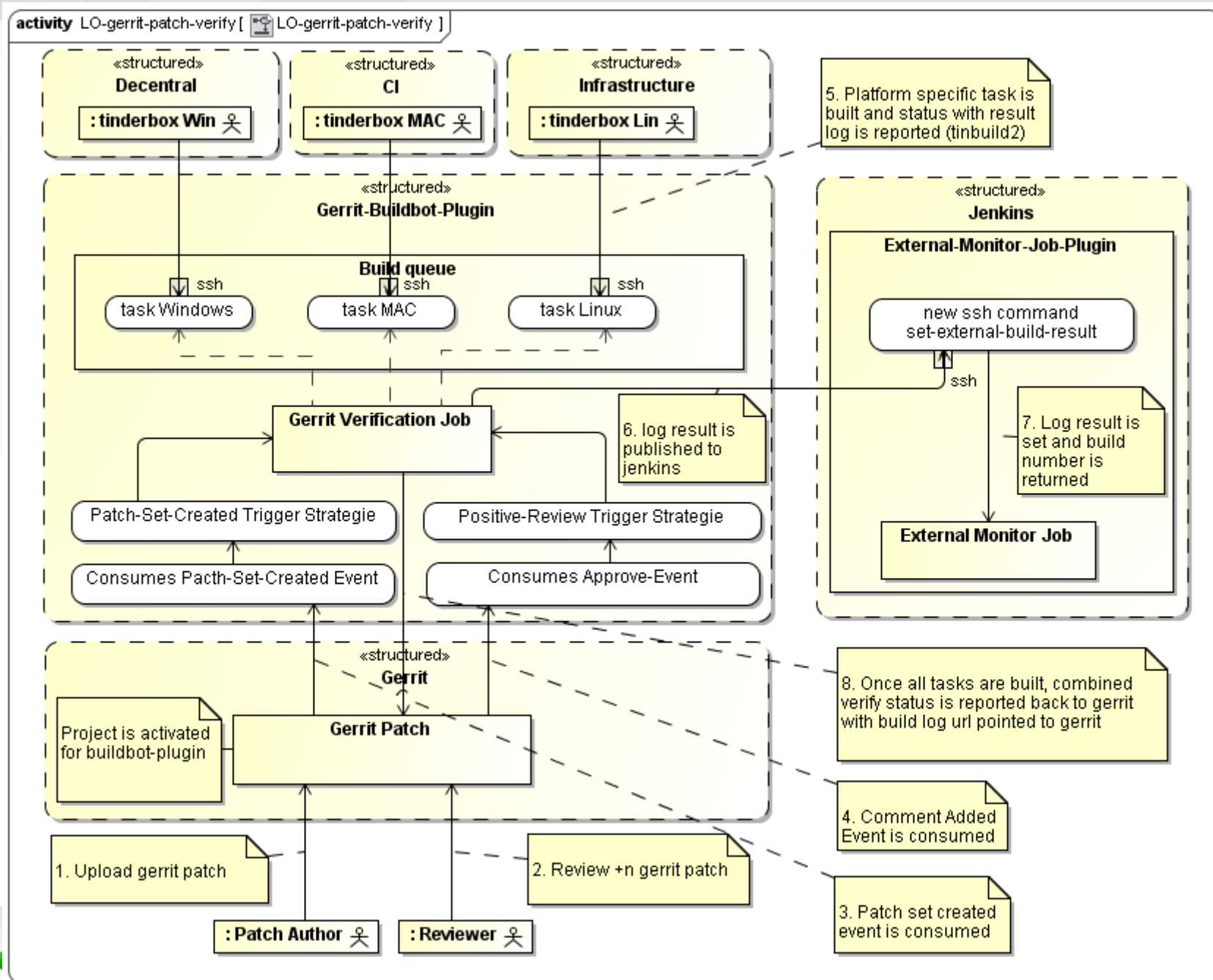
- ▼ Report result and publish log per SSH command:

```
cat result.log.gz | ssh gerrit buildbot put --ticket 4711 --failed
```

- ▼ Show queue content per SSH command or UI:

```
ssh gerrit buildbot show --project core
```

Gerrit Buildbot Plugin



Documentation: per SSH

▼ Documentation: per SSH

```
ssh logerrit buildbot put --help
buildbot put [--] [--failed (-f)] [--help (-h)] [--log (-l) -|LOG] [--
succeed (-s)] --ticket (-t) TICKET

--                : end of options
--failed (-f)     : specify this option if job failed
--help (-h)       : display this help text
--log (-l) -|LOG  : url of the job log page or - for standard input
--succeed (-s)    : specify this option if job was successfull
--ticket (-t) TICKET : ticket of the job
```

Documentation per web UI

▼ Documentation: web page

get-task - Get a task from platform specific queue

NAME

get-task - Get a task from platform specific queue.

SYNOPSIS

```
ssh -p <port> <host> buildbot get-task  
[--project <NAME> | -p <NAME>]  
--platform <NAME> | -a <NAME>]
```

DESCRIPTION

To get a task for building buildbot connect to buildbot plugin and poll a task from a platform specific. Once the task is spooled, it is removed from the build queue. If the task is successful, failed, or canceled, the status is reported with the report command. If the result is not reported and the timeout defined in buildbot.config is expired, the task status is timed out.

Once the task is executed, buildbot returns its status and log with the report command.

Note: Platform can be one from {windows | linux | mac}.

ACCESS

Caller must be a member of the privileged 'Administrators' group, or have been granted [the 'View Queue' global capability](#).

SEE ALSO

- [report](#)

Buildbot

Part of [Gerrit Buildbot Plugin](#)

Using reviewer channel for patch set verification firehose

- Results are presented in gerrit's comment table
- Nice to have: Show CI verification status table on gerrit's change screen: don't mix human reviews and bot verifications

Search for status:open

ID	Subject	Owner	Project	Branch	Updated	CR	V
▶ I012a479c	Documentation fdo#51793 another one	David Ostrovsky	foo	master	Aug 16	+1	+1

David Ostrovsky Uploaded patch set 6.	Aug 16 8:59 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on LINUX started at 21:01:41.386	Aug 16 9:01 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on WINDOWS started at 21:02:42.531	Aug 16 9:02 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on MAC started at 21:02:46.442	Aug 16 9:02 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on WINDOWS complete at 21:08:23.616, status ...	Aug 16 9:08 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on LINUX complete at 21:08:38.749, status ...	Aug 16 9:08 PM
David Ostrovsky Patch Set 6: Build 423fb1f4 on MAC complete at 21:08:51.499, status true ...	Aug 16 9:08 PM
David Ostrovsky	Aug 16 9:08 PM
Patch Set 6: Looks good to me, approved	
Build 423fb1f4 on WINDOWS complete, status true log: https://review.idaia.de/plugins/buildbot-1.0/log?file=423fb1f4_WINDOWS.log	
Build 423fb1f4 on LINUX complete, status true log: https://review.idaia.de/plugins/buildbot-1.0/log?file=423fb1f4_LINUX.log	
Build 423fb1f4 on MAC complete, status true log: https://review.idaia.de/plugins/buildbot-1.0/log?file=423fb1f4_MAC.log	

Dedicated communications channel for patch set verifications

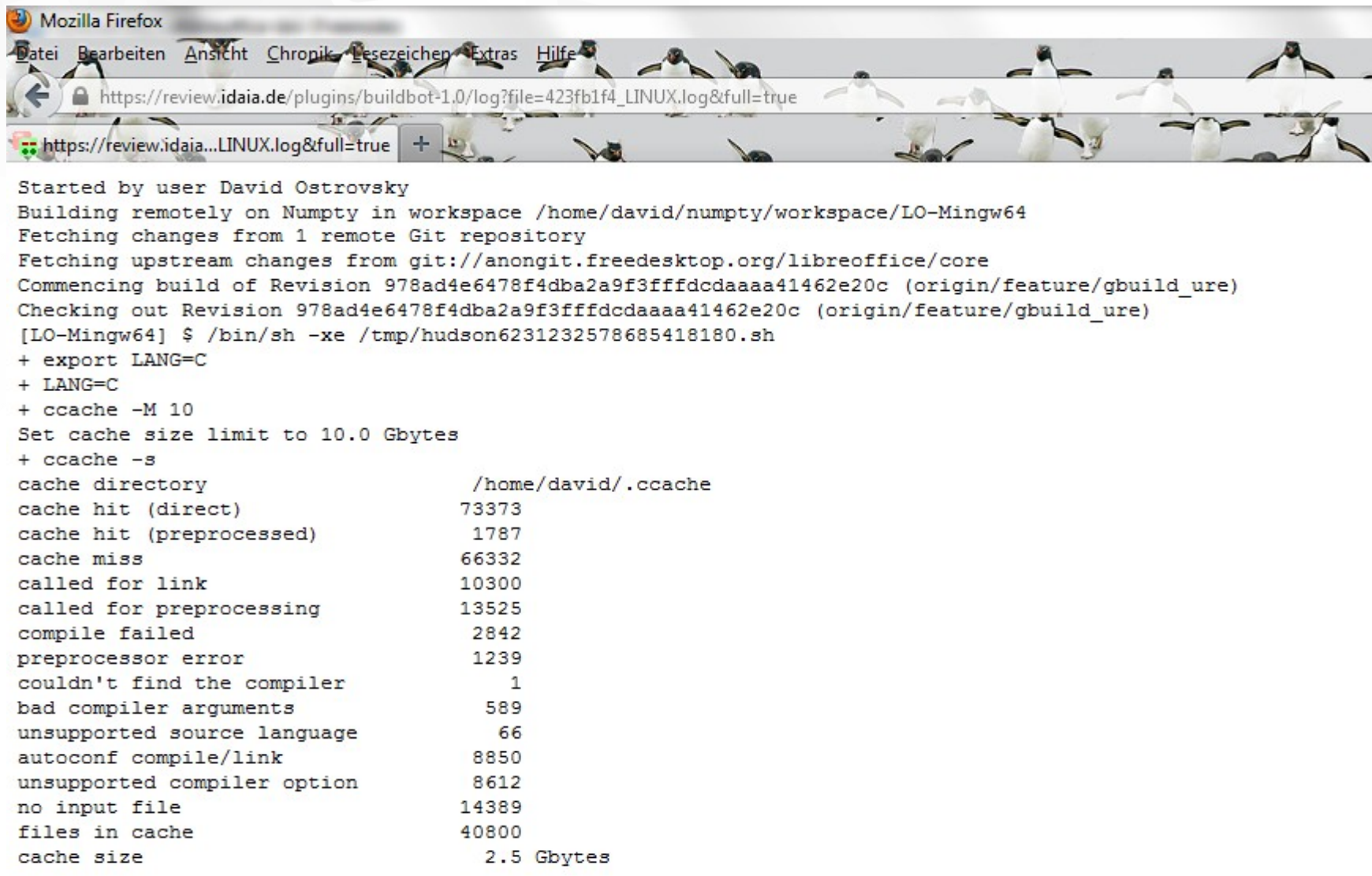
- ▼ Talk later today to implement this as a core feature or as a plugin

Log file publication modes

- ▼ Buildbot publish mode: local directory / servlet
 - ▼ Doesn't play nice with multi-master
- ▼ Jenkins publish mode: delegate publishing to Jenkins instance
 - ▼ external-monitor-job

Buildbot publish mode:

▼ Local directory and servlet



```
Started by user David Ostrovsky
Building remotely on Numpty in workspace /home/david/numpty/workspace/LO-Mingw64
Fetching changes from 1 remote Git repository
Fetching upstream changes from git://anongit.freedesktop.org/libreoffice/core
Commencing build of Revision 978ad4e6478f4dba2a9f3fffdcaaaaa41462e20c (origin/feature/gbuild_ure)
Checking out Revision 978ad4e6478f4dba2a9f3fffdcaaaaa41462e20c (origin/feature/gbuild_ure)
[LO-Mingw64] $ /bin/sh -xe /tmp/hudson6231232578685418180.sh
+ export LANG=C
+ LANG=C
+ ccache -M 10
Set cache size limit to 10.0 Gbytes
+ ccache -s
cache directory                /home/david/.ccache
cache hit (direct)             73373
cache hit (preprocessed)       1787
cache miss                     66332
called for link                10300
called for preprocessing       13525
compile failed                 2842
preprocessor error             1239
couldn't find the compiler     1
bad compiler arguments         589
unsupported source language     66
autoconf compile/link         8850
unsupported compiler option     8612
no input file                  14389
files in cache                 40800
cache size                     2.5 Gbytes
```


Jenkins publish mode 1/2

▼ Submit a job per RPC

Submit a run programatically

The above command submits the execution and its result by sending XML to HTTP. This means you can submit an execution record from any program.

The format is explained below:

```
<run>
  <log encoding="hexBinary">...hex binary encoded console output...</log>
  <result>... integer indicating the error code. 0 is success and everything else is failure</result>
  <duration>... milliseconds it took to execute this run ...</duration>
  <displayName>... The name to be displayed rather than the build number ...</displayName>
  <description>... Description of the build ...</description>
</run>
```

▼ New SSH command contributed to Jenkins

Submit a run per CLI

The easiest option is for the execution can be submitted per CLI/ssh command. The gzipped log file can be transported through pipe:

```
$ cat result.log.gz | ssh jenkins set-external-build-result --display 7d552c4ba_Linux_tb21 --job buildbot --result 1
```

Sometimes build number is needed, as the calling program might need to put an URL to the submitted build. The CLI command above returns the new sample for it [here](#).

Jenkins publish mode 2/2

ci.libreoffice.org/job/buildbot/1677/consoleFull

Jenkins

Jenkins > buildbot > 826069ea2_MacOSX_tb21

- [Back to Job](#)
- [Console Output](#)
- [View Configuration](#)

Console Output

```
Started
gerrit_task_ticket:826069ea2_MacOSX
gerrit_task_branch:master
gerrit_task_ref:refs/changes/78/8478/5
```

Build: OK

```
Reading autogen.lastrun. Please rename it to autogen.input to avoid this message.
Running ./configure with '--with-external-tar=/lo/lo_external_tar' '--with-package-format=dmg'
```

```
*****
*
*   Running LibreOffice build configuration.
*
*****
```

```
checking build system type... x86_64-apple-darwin12.5.0
checking host system type... x86_64-apple-darwin12.5.0
checking for product name... LibreOfficeDev
checking for product version... 4.3
checking for grep that handles long lines and -e... /usr/bin/grep
checking for egrep... /usr/bin/grep -E
checking for grep... (cached) /usr/bin/grep
checking for sed... /usr/bin/sed
checking whether build target is Release Build... no
checking whether to sign windows build... no
checking for gawk... no
checking for mawk... no
checking for nawk... no
checking for awk... awk
checking for awk... /usr/bin/awk
checking for bash... /bin/sh
checking for GNU or BSD tar... gnutar
checking for tar's option to strip components... --strip-components
checking how to build and package galleries... internal src images for desktop
checking for ccache... /opt/lo/bin/ccache
checking whether version of ccache is suitable... yes, 3.1.9
checking gcc home... /usr
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for gcc option to accept ISO C89... none needed
checking for gcc... /usr/bin/gcc
```

Broken Buildbot/Jenkins bridge or why code review can be dangerous

LibreOffice gerrit bot

Patch Set 1:

MacOSX build started for 896d7bdef on tb21 at Feb-28 09:42

LibreOffice gerrit bot

Patch Set 1:

Windows build started for 896d7bdef on tb39 at Feb-28 09:46

LibreOffice gerrit bot

Patch Set 1:

MacOSX SUCCESS (896d7bdef)

Build on tb21 at Feb-28 10:42: <https://ci.libreoffice.org/job/buildbot/0>

LibreOffice gerrit bot

Patch Set 1:

Linux SUCCESS (896d7bdef)

Build on tb33 at Feb-28 11:00: <https://ci.libreoffice.org/job/buildbot/0>

LibreOffice gerrit bot

Patch Set 1:

Windows SUCCESS (896d7bdef)

Build on tb39 at Feb-28 11:11: <https://ci.libreoffice.org/job/buildbot/0>

LibreOffice gerrit bot

Patch Set 1: Verified+1

Build 896d7bdef:

- on Windows SUCCESS : <https://ci.libreoffice.org/job/buildbot/0>
- on Linux SUCCESS : <https://ci.libreoffice.org/job/buildbot/0>
- on MacOSX SUCCESS : <https://ci.libreoffice.org/job/buildbot/0>

Future development

- ▼ Persistence
- ▼ Presents results in own table on CS2
- ▼ Allow platforms to be configurable
- ▼ Idle timeout
- ▼ Engaged time out



Questions ?



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