Continuous Integration (CI) for TEX binaries

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based on Buildbot

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Binaries in TeX Live

- ~20 platforms
- effort by a number of volunteers
- built “once” per year –
  reasonable compromise between:
  - demand for new binaries
  - burden on volunteer builders and packagers
  - stability & amount of testing (LuaTeX)

W32TEX

- for 32-bit and 64-bit Windows
- 100% compatible with TEX Live
- updated on regular basis (~daily)
- done by a single developer (Akira Kakuto), non-trivial to build

ConTEXt Distribution (I)

- ~13 platforms (5 more dropped for lack of interest)
- 100% compatible with TEX Live
- Windows binaries from W32TEX
- other binaries built by volunteers
  with a single command (or by cronjobs)
- distribution checks for updates every 15 minuts,
  binaries for every MetaPost, LuaTEX, XETEX release
- (binaries found their way to TL users via TLContrib)

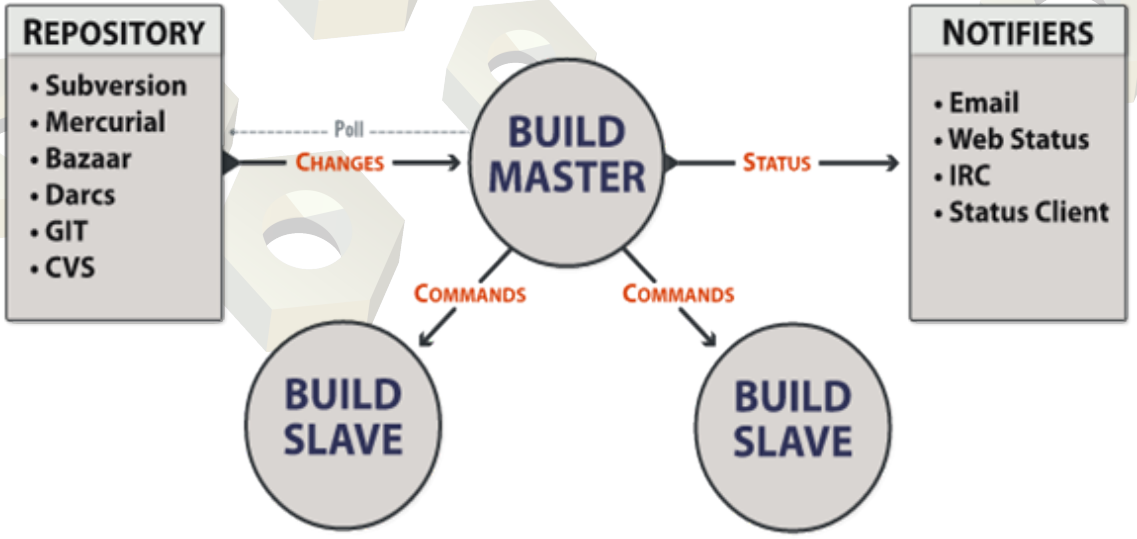
ConTEXt Distribution (II)

- many build problems discovered during the year (in particular on exotic platforms like Solaris), less debugging left for the TEX Live freeze period
- little work to do, but it would be even better if computers would do **all** the work for us
- number of builders decreased, Hans started setting up virtual machines for binary builds at Pragma
- it would be nice to have nightly LuaTEX builds for adventurous users

Buildbot

- a framework for automating builds
- written in Python
- highly customisable
- composed of:
  - **Build Master**
    central server: delegates work, collects results
  - **Build Slaves**
    multiple “stupid” computers to compile binaries

Buildbot


REPOSITORY
• Subversion
• Mercurial
• Bazaar
• Darcs
• GIT
• CVS
Poll
CHANGES
BUILD MASTER
STATUS
NOTIFIERS
• Email
• Web Status
• IRC
• Status Client
COMMANDS
COMMANDS
BUILD SLAVE
BUILD SLAVE

Build Slaves

- a number of computers on a variety of platforms
- may live behind a firewall on a private network
- very easy to set up
  - Debian: `sudo apt-get install buildbot-slave`
    PIP: `pip install buildbot-slave`
  - install just compiler and any build dependencies, no need to worry **what** to build / **how** to build it

Build Master

- a single server, publicly accessible
- slaves connect to it with username & password
- contains all the “brains” to delegate work:
  - checks for software updates, schedules builds
  - sends build commands to build slaves
  - sends emails on build failures
  - collects results, may distributes binaries

Demo

Advantages & Opportunities (I)

- build binaries for all platforms after each commit, on daily basis or manually triggered
- automatically send emails when something breaks, less problems left for TEX Live pretest period
- possibility to get newer binaries to (adventurous) TEX Live users or regular basis
- TL 2017 could potentially be built “automatically” no need to send “please rebuild” emails and wait

Advantages & Opportunities (II)

- also build wget, xz, asymptote, …
- one could build/test development versions of dependencies (icu, poppler, libpng, luajit, …), detect problems & get fixes before release
- testing for reproducibility of builds
- TEX Live-compatible repositories with up-to-date binaries

More work to do

- complete setups for different software & components
- set up a collection of servers or virtual machines to get full coverage or even duplication of different OSes and architectures
- write more test cases to detect problems
- set up proper private TEX Live repositories with updated binaries

Thanks

- Hans Hagen @ PRAGMA ADE
  - many build slaves (OS X, Raspberry, Linux, …)
- Dagobert Michelsen @ OpenCSW project
  - Solaris build farm, help with setup
- Johnny @ Jožef Stefan Institute
  - administration and bandwidth for the main server