Reproducible builds

of openSUSE Factory

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Introduction

Where does our code come from
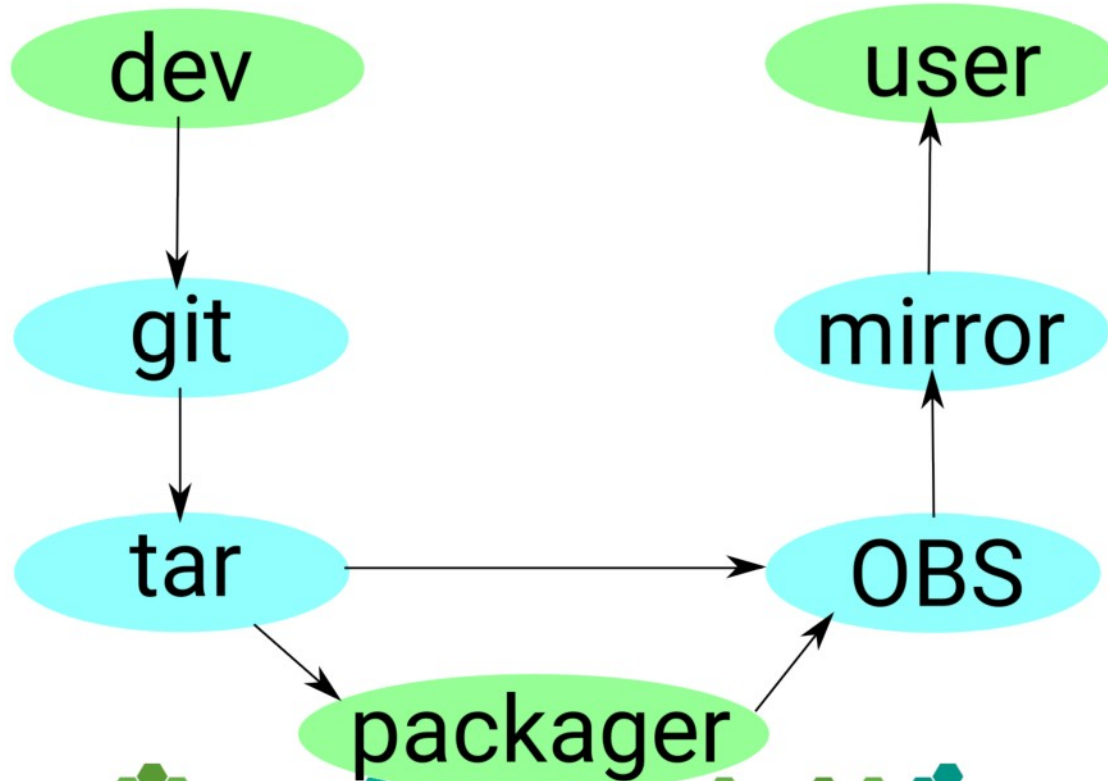
What are reproducible builds?

- Get the same results from building sources

- Two use-cases

    - ideally bit-by-bit identical (thus same hashes)

    - weaker: same content after applying some filters (via build-compare)

Why reproducible builds?

- Need less trust in the build hosts

- Reduced load on build-service from rebuilds

- Smaller delta-rpms in update repos

- Find other bugs that corrupt data during build time (e.g. boo#1021353, boo#1021335)

Typical problems

- embedded timestamps, hostname

- embedded rebuild counters

- random .o file link order changes optimization

- compile-time CPU detection

new sources of randomness discovered

- `%if 0%{?do_profiling}` in .spec files

- `%ghost` and `%dir` have (semi-random) sizes visible in rpm -qp --dump

- unsorted globs in make, python, bam, boost/jam

  - `$(wildcard *.c)` => `$(sort $(wildcard ...))`

  - `glob.glob("*.c")` => `sorted(...)`

  - jam see https://github.com/boostorg/container/pull/50

Current state

Work done

- 2016: 71 submit-requests

- 2017: +92 submit-requests

- 2016: 6 bugs filed

- 2017: +4 bugs filed: 1016848, 1017666, 1017667, 1020147

- 2016: 4 upstream fixes merged

- 2017: +51 upstream fixes submitted - ~34 merged

- 2017: patches for build-compare to disable filters

rebuild-test-scripts

- available from
  https://github.com/bmwiedemann/reproducibleopensuse

- including this presentation's source
  https://github.com/bmwiedemann/reproducibleopensuse/blob
  /master/presentation/reproducible.md
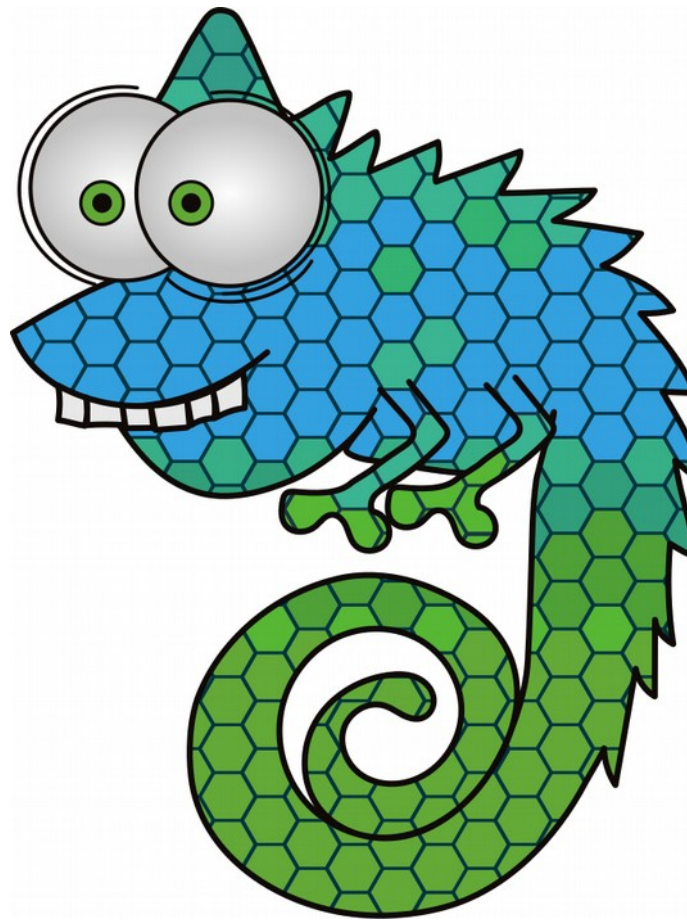
How reproducible can we get?

- bit-identical with factory rpm and `osc build --define='%_buildhost reproducible' --define='%clamp_mtime_to_source_date_epoch Y'`

Where do we want to go?

- fix all build-compare issues

- produce bit-identical rpms

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