



Reproducible builds

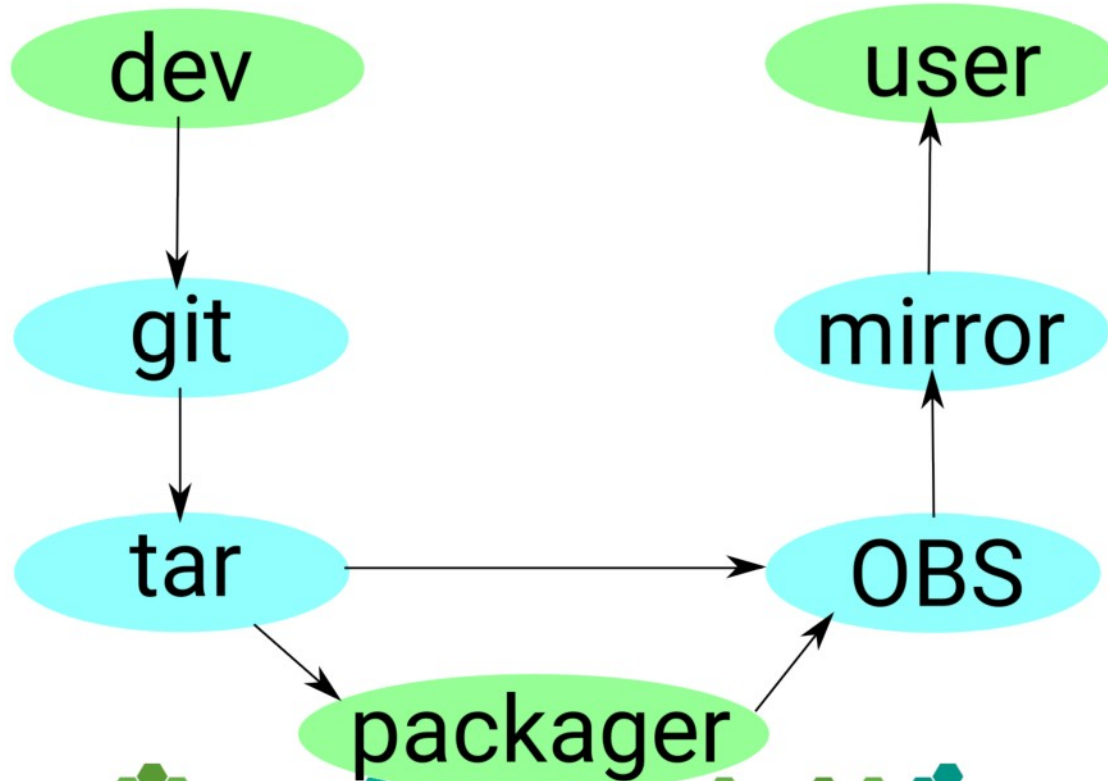
of openSUSE Factory

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Introduction

The background features a large teal shape on the left and a green shape on the right, separated by a white diagonal line. The teal shape is a large, irregular polygon with a pointed top and a pointed bottom. The green shape is a large, irregular polygon with a pointed top and a pointed bottom, mirroring the teal shape's form. The white diagonal line runs from the top right towards the bottom left, creating a clear division between the two colored areas.

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?

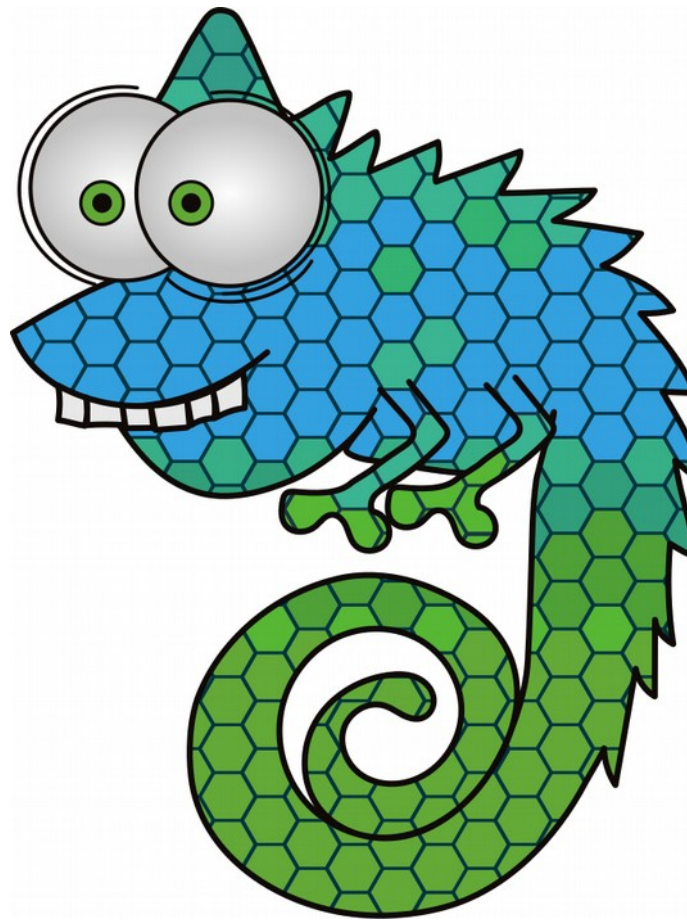
- bit-identical with factory rpm and osc build
--define='%_buildhost reproducible'
--define='%clamp_mtime_to_source_date_epoch
Y'



Where do we want to go?

- fix all build-compare issues
- produce bit-identical rpms





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Credits

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Design & Inspiration

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