Reproducible builds
of openSUSE Factory

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Introduction
Where does our code come from

device

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git

-->

.tar

-->

packager

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OBS

-->

mirror

-->

user
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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