Packaging ROOT for Fedora and EPEL

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Fedora and EPEL

- Fedora is a Linux distribution
  - Software distributed in Fedora must have an open source license and be packaged according to the Fedora Packaging Guidelines

- EPEL (Extra packages for Enterprise Linux) is an add-on repository for RedHat Enterprise Linux and its derivatives (CentOS, SL, …)
  - EPEL is maintained by the Fedora project

Building ROOT for Fedora

- The ROOT build that is packaged should be as complete as possible

- But installation should be modular – the build is split up in 90+ separate packages

- When building the Fedora version of ROOT, some rarely used modules get compiled, often using different versions of dependencies than was used before

- This results in bug reports and patches which sometimes surprise the ROOT developers

No bundled libraries

- In Fedora there should be one shared copy of each library

  – Packages are not allowed to bundle their own versions of their dependencies

- For most of the external dependencies, ROOT has configure flags to not use bundled code

  – --disable-builtin-afterimage, --disable-builtin-zlib, ...

- For a few, such flags are missing – patching required

  – unuran, gl2ps

No bundled fonts

- The no bundling rule is not only for libraries but for other system resources as well, such as fonts

- Patch ROOT to call font-config to find system provided fonts instead of using the bundled fonts

Architecture support

- ROOT works well on ix86 and x86_64

- The support for some other architectures used by Fedora and EPEL like ppc, ppc64 and arm is either missing or has some glitches

  - This is mostly due to missing or broken support in CINT

  - ROOT 6 could possibly help

configure vs. cmake

- Why are there two different ways to configure a root build? And why don't they do things the same way?

- configure is more complete
  - It finds dependencies for more modules

- cmake has test suite integration

Documentation generation

- As part of the building of the ROOT package the ROOT user guide is generated using the freshly compiled root

- This requires running the root binary inside the build tree even though it was configured to be installed elsewhere using --prefix

  – This is not really supported and requires quite a lot of tweaks

Running the test suite

- The test suite is currently not run as part of the package build – but I would really like it to be

- This has the same problem as the documentation generation that running a root binary intended to be installed from inside the build tree is not supported

- Requires using cmake

What about ROOT 6?

- The ROOT package in Fedora and EPEL is currently based on the latest ROOT 5 release

- ROOT 6 requires gcc 4.7 or later – so not for EPEL 5 and 6

- ROOT 6 bundles a private and substantially patched version of llvm and clang, using the system version does not work

- The documentation generation is very memory intensive in ROOT 6 – the migration to doxygen will help

Conclusions

- Packaging ROOT for Fedora and EPEL, complying to the Fedora Packaging Guidelines has been challenging

- The bug reports and feature requests resulting from this effort don't always make sense to the ROOT developers

Things that would make things easier

- Make it possible to run the root binary compiled for installation in the build tree to make it easy to generate documentation and run the test suite

- Avoid having to choose between being able to build a complete set of modules (using configure) and being able to easily run the test suite (using cmake) – make at least one of them feature complete

- Add missing --disable-builtin-xxx flags

References

- ROOT in the Fedora Package Database
  - https://admin.fedoraproject.org/pkgdb/package/root/
- The Fedora Packaging Guidelines
  - https://fedoraproject.org/wiki/Packaging:Guidelines