

DNF VS ZYPP: FIGHT!

A comparison of the two major RPM package managers

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WHO AM I?

- Open Source Advocate
- Contributor and package maintainer in Fedora, Mageia, and openSUSE
- Contributor to RPM, DNF, Zypper, KIWI, Open Build Service, Spacewalk/Uyuni, and various other similar projects
- DevOps Engineer at Datto, Inc.
- Developer and maintainer of package build and release pipeline using OBS
- Packager and Backporter

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THE TWO PACKAGE MANAGERS...



DNF

- Successor to YUM (Yellowdog Updater, Modified)
- Forked from YUM to rework the internals to leverage libsolv and offer a saner, more maintainable API
- Offers a defined plugin architecture for extending package manager functionality
- Used in Fedora, Mageia, OpenMandriva, Yocto, and RHEL/CentOS
- Available in openSUSE since Leap 15.0
- Available in Red Hat Enterprise Linux since RHEL 7.6
 - YUM is DNF in Red Hat Enterprise Linux 8

4

ZYPP / ZYPPER

- Package manager that pioneered large-scale usage of SAT solving for software management
- Replaced a motley of software management tools from Ximian and SuSE after the ZENworks and YaST teams merged
- Spawned the development of libsatsolver, which became libsolv
- Used in openSUSE and Tizen
- Available in Fedora since Fedora 26

THE SIMILARITIES...



TECHNOLOGY SIMILARITIES

- Usage of libsolv for dependency resolution
- Low level aspects of implementation in C/C++
- Plugins supported in base library
- Works with PackageKit
- Exclusively handle rpm-md repositories
- Library interfaces are flexible enough to build custom frontend interfaces
- Arbitrary subcommands can be implemented as extensions

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USER EXPERIENCE SIMILARITIES

- CLI uses subcommand-oriented command model (i.e. <tool> <action> <args>)
- Subcommands have standard abbreviated forms
- CLI supports colors for distinguishing information more easily
- Graphical frontends exist to offer more intuitive ways to manage packages



THE DIFFERENCES...



TECHNOLOGY DIFFERENCES



DNF

- Underlying implementation is split across multiple libraries
- Packages are installed as a transaction via librpm
- Supports comps group and module repository data
- Language bindings to APIs are a first-class citizen
- Has an API frontend that offers a D-Bus interface

ZYpp

- The entire underlying implementation is in a single library
- Packages are installed via subprocesses to rpm
- Supports patterns constructed from repository metadata of metapackages
- Language bindings to APIs are mostly broken and unsupported

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USER EXPERIENCE DIFFERENCES



DNF

- Allows user configurable aliases to commands
- Can locate and install a package containing any arbitrary file path (i.e. outside of regular binary paths)
- Multiple native graphical frontends exist

ZYpp

- Machine-readable (XML) output option in CLI
- Can split transactions up in low-disk scenarios
- YaST is the only native graphical frontend

THE ECOSYSTEM...



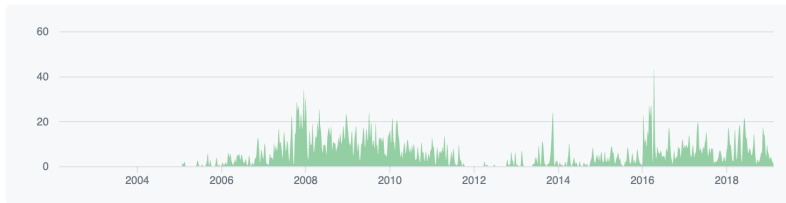
DEVELOPMENT ACTIVITY

DNF

Jun 2, 2002 – May 24, 2019

Contributions: Commits ▾

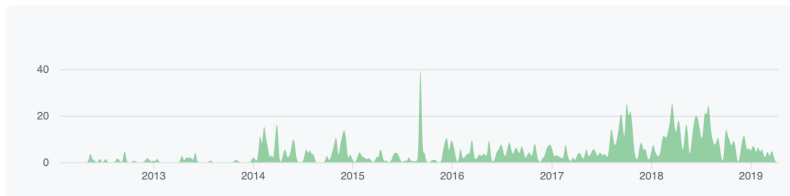
Contributions to master, excluding merge commits



Mar 4, 2012 – May 24, 2019

Contributions: Commits ▾

Contributions to master, excluding merge commits



ZYpp

Oct 22, 2006 – May 24, 2019

Contributions: Commits ▾

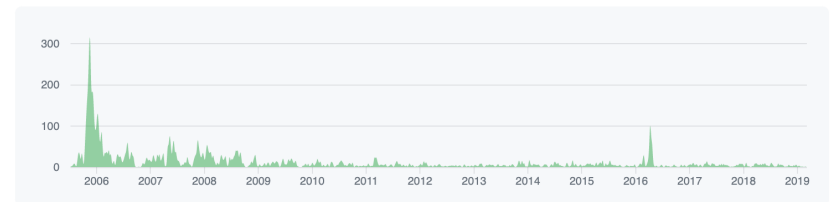
Contributions to master, excluding merge commits



Sep 25, 2005 – May 24, 2019

Contributions: Commits ▾

Contributions to master, excluding merge commits



.3

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PLUGINS AND EXTENSIONS

A major focus in DNF was to stabilize the way DNF itself could be extended to better support an ecosystem of plugins and extensions to the package manager.

Today, over 25 plugins are officially supported by the main DNF team in dnf-plugins-core and dnf-plugins-extras packages. Many more plugins are in development by the larger community for various purposes.

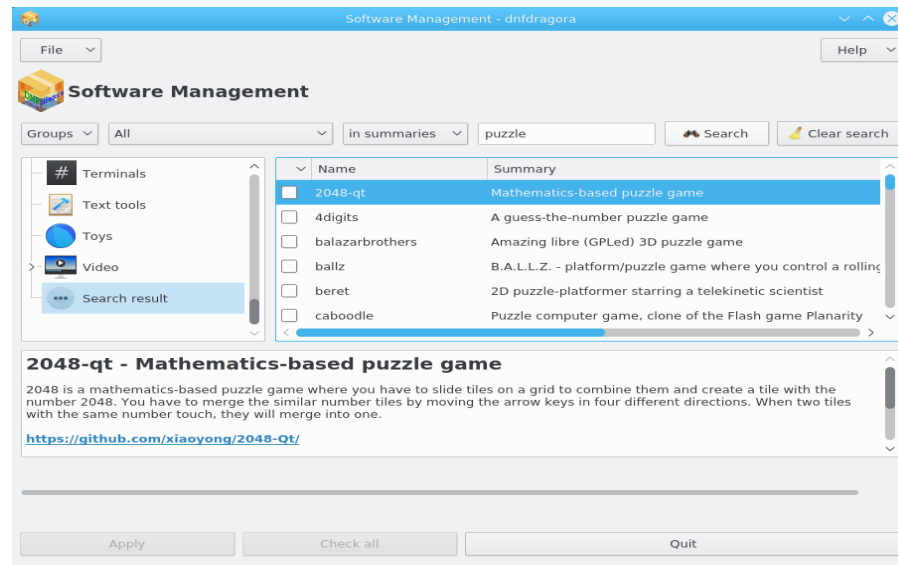
For Zypp, the only major plugins are the spacewalk plugin and the SCC package search plugin. The method to support plugins/extensions does not appear to be well-documented?

DNF AND GUI FRONTENDS

Because CLI is scary...

Aside from PackageKit frontends like GNOME Software and Plasma Discover, a few native frontends exist for DNF:

- Yumex-DNF (defunct)
- dnfdragora
- Simple-dnf



dnfdragora on Plasma 5 on Mageia 6

DEMONSTRATION



CONCLUSIONS AND LESSONS



DNF

- Architecture is more complex than it probably needs to be...
- Community is rather strong and diverse
- Language binding support beyond Python is still missing
- DNF makes YUM not suck!

ZYpp

- Zypp internal behaviors should be revisited...
- Someone needs to care about developing a community...
- Supporting plugins/extensions is too hard
- Zypp is still awesome!

QUESTIONS?

