DNF

New Package Manager

Presented by

Parag Nemade

Fedora Project Contributor

DNF

- Introduction
- Goals
- Design
- Advantages of DNF
- Features
- Plugins
- Differences over yum
- Bugs
- Contribution

fedora

Introduction

- Dandified YUM
- New package manager for Fedora
- Approved for inclusion in Fedora 18
- Developed by Aleš Kozumplík

fedora

Goals

- API access to languages in addition to Python
- Migrating the package manager to libsolv
- Cleaned up API for external applications and plugins

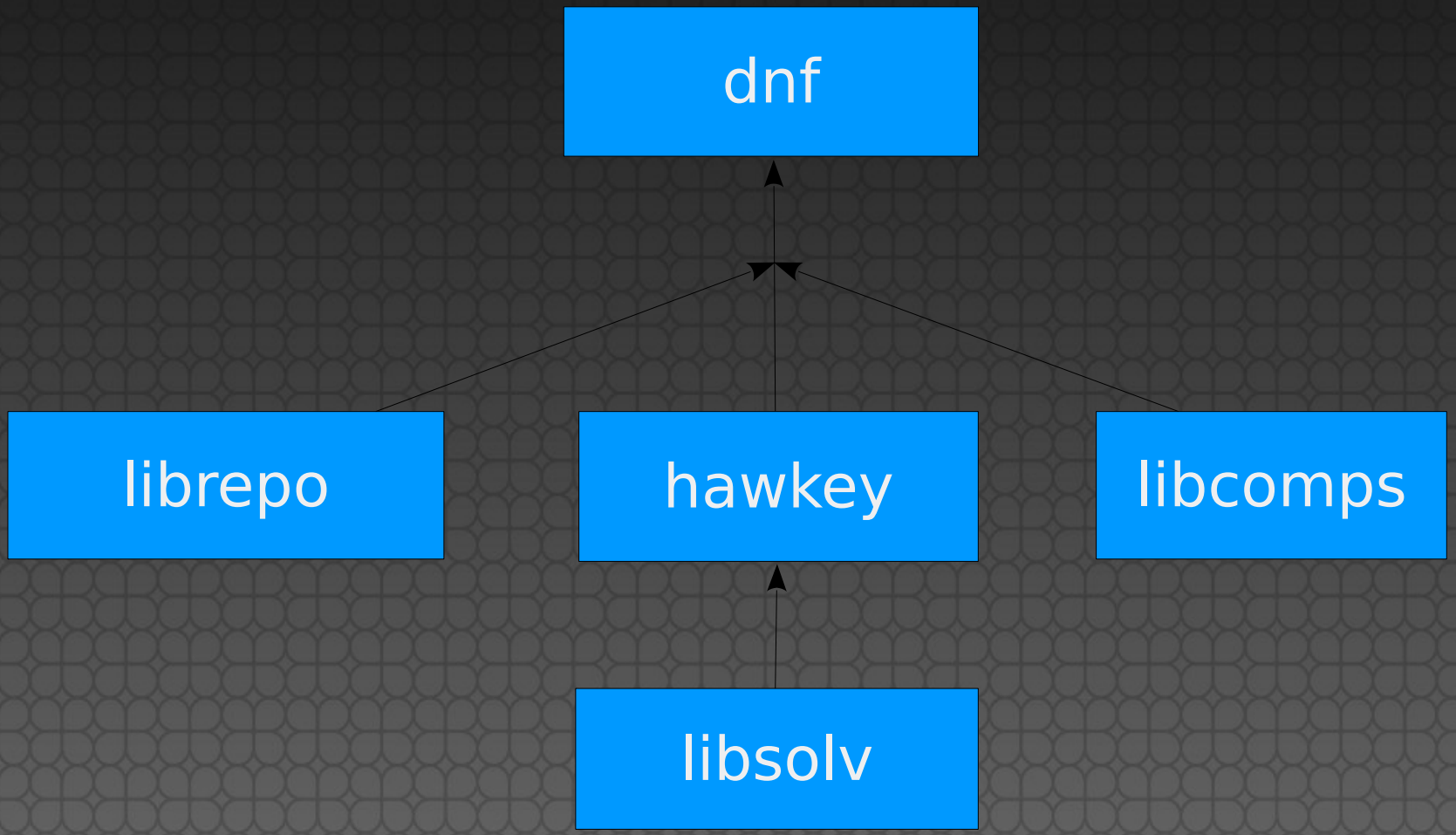
Existing options

- Fedora preferred to fork Yum instead of adopt zif (a package manager for Fedora written in C that was designed to replace yum.) because:
  - dnf looks for a middle ground between a sane API and some backwards compatibility.
  - dnf and hawkey are first steps toward using the same resolver across the entire stack.
  - Libsolv is a well tested and proven code base, currently the most sophisticated and optimized dependency solving implementation.

Design

- Fork of Yum 3.4 version, uses hawkey library to resolve package dependencies
- Hawkey itself is a wrapper around the libsolv library
- Libsolv is a free package dependency solver using a satisfiability algorithm.
- For metadata handling and package downloads it utilizes librepo
- To process and effectively handle the comps data it uses libcomps

Design



fedora

libsolv

- Using a modern satisfiability-solving algorithm (or "SAT solver") rather than the ad-hoc dependency checking methods.
- Libsolv uses a reimplementation of the open source Minisat solver.
- has been adopted by openSUSE's Zypper package manager.

librepo

- The repodata and package download backend.
- By default librepo downloads different metadata files per repo in parallel.
- Since its 1.0.0 release, supports parallel downloads out-of-box.
- provides C and Python API for downloading linux repository metadata and packages.

Advantages of DNF

- A CLI package manager tool built on modern depsolving technology allowing for faster and less memory-intensive operation
- Documented Python API
- C bindings for lower level libraries:
  - Hawkey, PackageKit is already making use of hawkey
  - Librepo, PackageKit is already making use of librepo
  - libcomps for comps operations
- Unlike Yum, DNF runs in both Python 2 and Python 3

Features

- Basic yum commands like clean, downgrade, erase, info, install, list, reinstall, search
- available/installed (environment) groups
- history feature (undo)
- no real update command (only alias)
- delta rpm (still no prior delta size calculated before downloading packages)
  - following line in /etc/dnf/dnf.conf [main] section
    - deltarpm=1

Features

- automatic
- Plugins
- bash-completion for commands and options
- The dnf-yum compatibility package
- Yum to dnf history migration

Plugins

- plugins (builddep, copr, debuginfo-install, download, kickstart, playground, noroot, bash-completion)
- dnf-plugins-core
  - We need this for noroot plugin to check if root access is needed for the given DNF command and abort with a message if the command is not running under the root UID.
- dnf-plugins-extras
  - These are some recent developed plugins which cannot be part of dnf-plugins-core project. Mostly user contributed plugins are available in this project

Differences over yum

- Changes in DNF CLI compared to Yum
- Changes in DNF plugins compared to Yum plugins
- Changes in DNF plugins compared to Yum utilities
- All installed plugins are enabled by default

Bugs

- File new bug at
  https://bugzilla.redhat.com/enter_bug.cgi?product=Fedora&component=dnf
- Existing bugs
  https://bugzilla.redhat.com/buglist.cgi?component=dnf&list_id=2600554&product=Fedora
- While filing bugs provide the solver debug output

  http://dnf.baseurl.org/2013/11/25/reporting-depsolving-bugs

Contribution

- https://github.com/rpm-software-management/dnf/wiki

Questions?

Contact:
pnemade@fedoraproject.org