Future of the DNF package management stack

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Agenda

- What is DNF
- DNF stack overview & stats
- Achievements over the last year
- Roadmap
- Future plans
- Q & A
What is DNF?

- Package manager you may know from Fedora
- YUM v3 successor
- **Red Hat Enterprise Linux** 8 Beta distributes DNF as YUM v4 (continuity, compatibility)
- Also available in other distros such as:
  - Mageia
  - OpenSUSE
  - Yocto Project
# DNF stack overview

## DNF stack

- dnf
- dnf-plugins-core *(includes dnf-utils)*
- dnf-plugins-extras
- libdnf *(includes hawkey)*
- librepo
- libcomps
- librhsm
- microdnf
- createrepo_c

## Related projects

- rpm
- libsolve
- PackageKit
- dnfdaemon
- mock
- ... and many others
## DNF stack overview - stats

<table>
<thead>
<tr>
<th>Module</th>
<th>Forked/Started</th>
<th>Commits</th>
<th>Contributors</th>
<th>Active last year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DNF</strong></td>
<td>January 2012</td>
<td>3975</td>
<td>127</td>
<td>33</td>
</tr>
<tr>
<td><strong>DNF-plugins-core</strong></td>
<td>November 2013</td>
<td>765</td>
<td>56</td>
<td>16</td>
</tr>
<tr>
<td><strong>LIBDNF</strong></td>
<td>March 2012</td>
<td>2448</td>
<td>63</td>
<td>24</td>
</tr>
</tbody>
</table>
Achievements over the last year (1)

Modularity
- Preview in Fedora 28
- Fully featured in Fedora 29 and Red Hat Enterprise Linux 8 Beta

Improvements
- Fixed memory leaks and corruptions in libdnf
- Performance improvement
Performance improvement

<table>
<thead>
<tr>
<th>Command</th>
<th>dnf-2.5.1</th>
<th>dnf-2.7.5</th>
<th>dnf-4.0.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>dnf upgrade</td>
<td>3.3</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>dnf upgrade-minimal</td>
<td>77.0</td>
<td>77.2</td>
<td></td>
</tr>
<tr>
<td>dnf upgrade --security</td>
<td>2.5</td>
<td>10.0</td>
<td>10.3</td>
</tr>
<tr>
<td>dnf upgrade--bugfix</td>
<td>41.0</td>
<td>40.3</td>
<td></td>
</tr>
<tr>
<td>dnf reinstall $(rpm -qa)</td>
<td>42.2</td>
<td>6.5</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Achievements over the last year (2)

New history database
- Finally done right with a proper relational schema
- Unfortunately the main source of libdnf problems in Fedora 29 pre-releases

Coding
- C++ & SWIG are the new standard in libdnf (objects, typed containers, bindings)

C plugin API
- We are planning changes in the LIBDNF C API
- It is not guaranteed that C plugins will keep working for a long time
Existing DNF stack architecture

libdnf
- plugin API
- C API (libhif)
- python-libdnf
- hawkey

dnf
- python-dnf
- Py plugin API

microdnf

PackageKit
Unified DNF stack architecture

libdnf

C++ API
- C API
- Python API
- plugin API

microdnf

PackageKit

dnf
- python-dnf
- Py plugin API
Roadmap (1)

**Fedora 30**
- Zchunk support
  - New compression format designed to allow deltas
- Drop of Python 2 support in Fedora 30+

**Fedora 31**
- Modularity improvements
  - Looking for feedback
- Redesigned /var/cache/dnf layout
  - Preparation for shared cache with microdnf and PackageKit
- New CI stack
  - Faster, multiple tiers, complex test matrix
Integration Testing

Do you own a project based on DNF stack?
Do you have automated tests or willing to write some?
Reach out to us.
We are interested running your tests on our new commits.
Fedora 32

- Shared metadata and downloaded RPMs
  - PackageKit
  - DNF
  - Microdnf
- Unified code base
- Stable API (in progress)
- SWIG bindings (in progress)
- Drop hawkey subpackages (Python2/3)
  - Replaced with new stable API
Future Vision (F33+)

**DNF**
- All business logic in libdnf

**MicroDNF**
- Functional parity with DNF, almost identical look & feel to DNF
- It won't replace DNF which will keep providing existing APIs

**DNF Daemon**
- Possibly replace existing `dnfdaemon` with a new, tiny wrapper on top of libdnf
- Integration with Anaconda Installer
- It won't replace DNF or MicroDNF; an additional service
Thanks

Red Hat's DNF Team

- Daniel Mach
- Jaroslav Mráček
- Aleš Matěj
- Jaroslav Rohel
- Lukáš Hrázký
- Marek Blaha
- Michal Domonkos
- Pavla Kratochvílová

Community and Contributors

Special thanks to Neal Gompa (for spreading DNF to other distros)
THANK YOU

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