AppStream & Listaller

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Who am I?

- PackageKit Developer
- Debian Developer
- Contributor to KDE, GNOME
- AppStream and Listaller maintainer

Outline of the Talk

What is wrong with application management?

- Content of distribution's software repositories is displayed in form of packages
    - Unclear for non-technical users: What is a package? Why are there so many of them?
- Existing software-centers are distribution specific and not well integrated with their desktop environments
- Applications are not presented well to the user
    - localization missing, bad or no screenshots, missing urls, inconsistencies between distributions, ...
- No interaction possible
    - We want user ratings, reviews, maybe an easy way to report bugs in the software-center, etc.

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What is wrong with application distribution?

- PPAs/Repositories are insecure: 3rd-party applications are installed with root permission, may override system components, break distribution upgrades, ...
- Handling of PPAs is not very simple for users
- PPAs are distribution-specific: Many 3rd-party apps are available for e.g. Ubuntu, while other distributions need their own repos
- PPAs have a complex structure and are an overkill if people just want to distribute an app on Linux
- Binary installers don't integrate well and are difficult to handle. If executed as root, they are a potential security risk

We need a simple and secure cross-desktop solution to install 3rd-party applications, which integrates well with the rest of the system

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Two independent projects

AppStream

- Cross-distro specifications for building software-center applications
- Metadata / database specs for distributors
- Some (optional) new metadata for upstream projects
- Interactive features (Ratings & Reviews, ...)

Listaller

- Generates cross-distro application packages
- Tools for app developers to make their app work on many distros
- Additional specs to enhance "component metadata" in distributions
- Optional component, requires PackageKit (and ideally AppStream) to work

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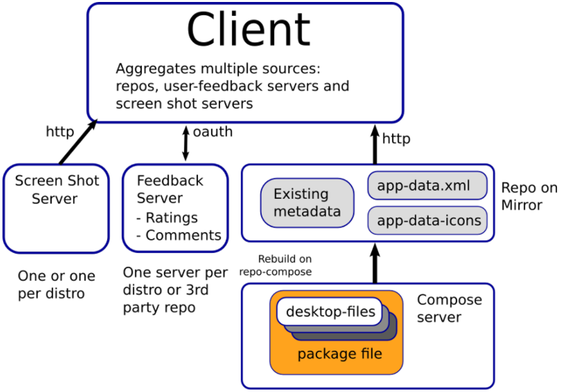
AppInstaller meeting 2011

Fedora, Debian, OpenSUSE, Mageia, Ubuntu, KDE, Freedesktop

AppStream Concept



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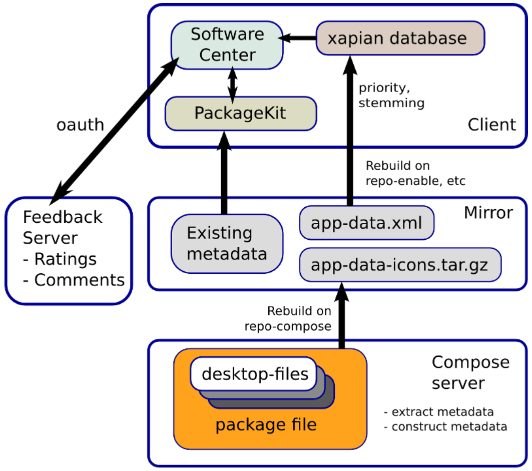

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AppStream XML contains meta-data for each application, such as name,

XML!?

Debian FTP-Masters prefer YAML, adding XML to the metadata set is discouraged. A more general solution is wanted too.

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Where do we get the data from if the distribution does not have it already in it's package metadata or it is missing from desktop-files? Where do we get good screenshots from?

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- Small XML file shipped with upstream project
- Subset of the AppStream XML specification
- Contains screenshot URLs to 3rd-party servers
- Is localized upstream
- **No requirement** to implement AppStream! It is just additional metadata to extend or improve existing data
- We would like to have upstreams ship the file to improve the quality of data which is used to present apps in a software center
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Some metadata statistics

Fedora ships AppStream since v20

Applications in Fedora with:

- Long descriptions: 170 (9%)
- Keywords: 95 (5%)
- Categories: 1744 (98%)
- Screenshots: 143 (8%)

- GNOME applications with AppData: 60 (50%)
- KDE applications with AppData: 1 (1%)
- XFCE applications with AppData: 0 (0%)

http://alt.fedoraproject.org/pub/alt/screenshots/f20/status.html

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One database to rule them all

- In order to make use of AppStream, you have to combine many data sources (and consider fallback solutions)
- Debian will provide AppStream data in YAML (describing not only applications, but providing extra archive metadata), Ubuntu uses an own desktop-file extension, others use XML
- The AppStream software and libappstream were created to avoid to require every software center to provide parsers to all formats
- A Xapian database is generated, containing all data for software centers to access
- libappstream allows acessing the database and various other data sources using a GObject-based API (you don't have to work with Xapian's C++ interface)

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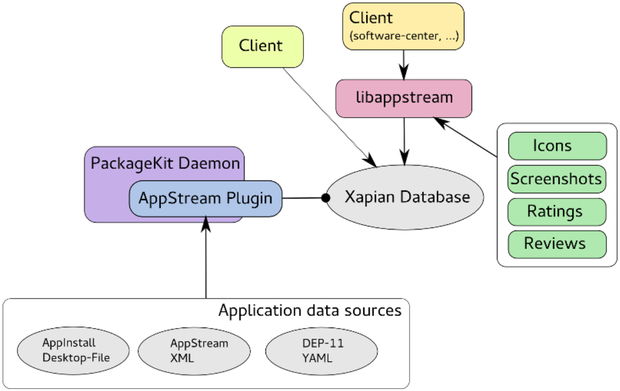

GNOME? - AppStream status in desktops and distros

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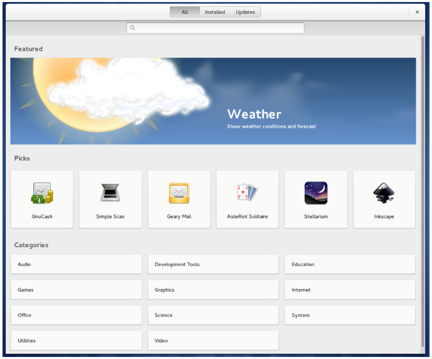
- Fully supported on Fedora, pending on other distributions, blocked on Debian by DEP-11 implementation



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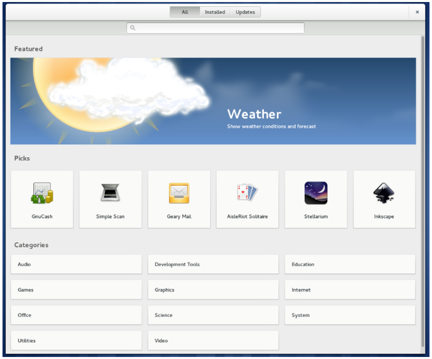

KDE? - AppStream status in desktops and distros

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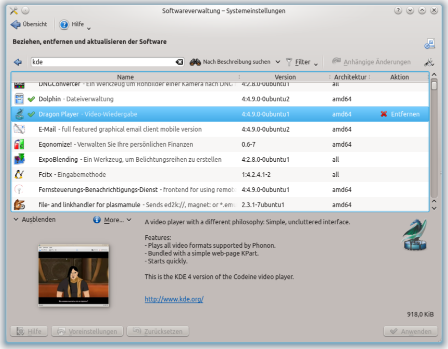

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DNGConverter - Ein Werkzeug um Rohbilder einer Kamera nach DNG	4:2.8.0-0ubuntu1	all	
Dolphin - Dateiverwaltung	4:4.9.0-0ubuntu2	amd64	
Dragon Player - Video-Wiedergabe	4:4.9.0-0ubuntu1	amd64	Entfernen
E-Mail - full featured graphical email client mobile version	4:4.9.0-0ubuntu2	amd64	
Eqonomize! - Verwalten Sie Ihre persönlichen Finanzen	0.6-7	amd64	
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Features:
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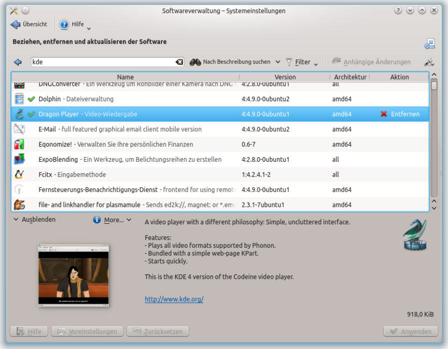

Beziehen, entfernen und aktualisieren der Software

kde

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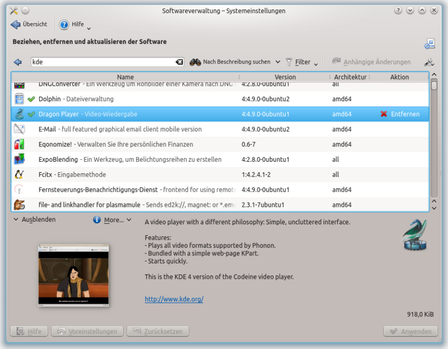

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- System integration
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  - Listaller apps should integrate seamlessly with the system
- Cross-distro and -desktop compatibility
- Simplification
  - No catch-all solution, Listaller should cover the most common use-cases. Native distribution packages should cover the remaining cases.
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  - Signatures, security hints database, sandboxing, ...
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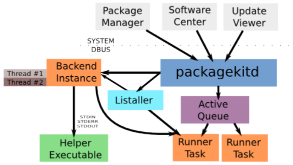
Basic concept

- Listaller contains a PackageKit plugin, mediating between Listaller and PackageKit
- The plugin acts as »meta-backend«, sending information about Listaller packages via PackageKit's DBus interface, and making queries to the native backend
    - Every PackageKit client can install, remove and update Listaller packages
- Listaller installs some XML for AppStream-compatible software centers, so they can display details about a 3rd-party application
- Uses a superset of the AppData specification as source for application metadata



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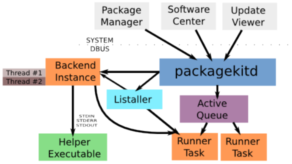

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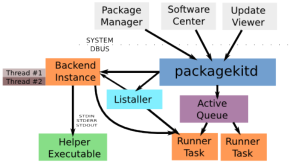

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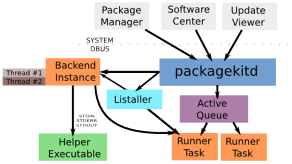

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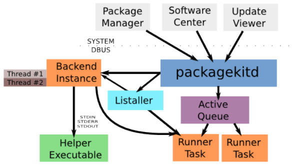
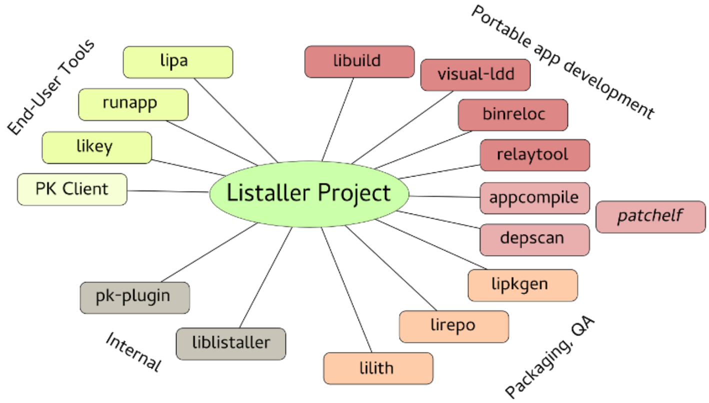


Listaller Tools



Utopia package creation

1. Write AppStream AppData describing the application
2. Write a small `pkoptions` file, defining few basic options for the package
3. Write a file/dir listing for the new package
4. Build the package!

- Listaller will use `appcompile` to determine the buildsystem and build the app, install it to a temporary location and then add it to the package
- The `depscan` tool is used to determine dependencies and map them to a component (e.g. libglib2 is part of the GLib2 component)
- Package is GPG-signed afterwards
- During installation, a few optimizations and adjustments are made automatically
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Utopia package creation

1. Write AppStream AppData describing the application
2. Write a small `pkoptions` file, defining few basic options for the package
3. Write a file/dir listing for the new package
4. Build the package!

- Listaller will use `appcompile` to determine the buildsystem and build the app, install it to a temporary location and then add it to the package
- The `depscan` tool is used to determine dependencies and map them to a component (e.g. libglib2 is part of the GLib2 component)
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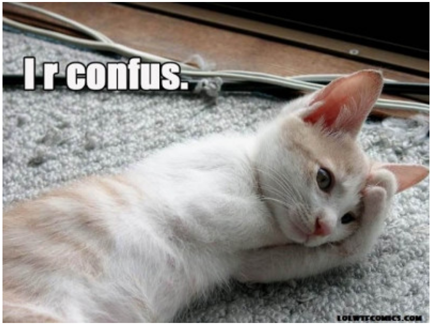
Dependency solving?



Dependency solving...

Problem #1

Satisfying dependencies is a complex task, searching for the right dependency is difficult and takes time. We want to avoid complex dependency-solving.

Problem #2

What if the distributor does not provide enough metadata to find a dependency?

Problem #3

What if the ABI of a dependency is not stable? What if we absolutely require an old library version?

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Components to the rescue!

- Most 3rd-party applications don't need complex dependency-solving, they are built against a certain development platform
  - Apps might require GTK+3 (>= 3.12), or Qt5 (>= 5.2) or PulseAudio (>= 2.4)
- A component is e.g. a toolkit, a basic building block the systems consists of. Public interfaces a component provides are described in a component-definition file.
- Listaller only needs to ensure that basic components are present for the application to run. Minor dependencies can be shipped with the application package
- Upstream should write component-definition files and ship them with their source
- Some dependencies can be satisfied by downloading a statically linked version provided by upstream or the distributor, or querying cpan/cran/pypi/gems/...

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- Think of it as an »non-developer pkg-config file«
- Describes the component version and all public interfaces this component provides
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Version: 2.36
VersionDynamic: shell$ glib-fake --version
Libraries: libgio-2.0.so.0
 libgobject-2.0.so.0
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- We need a solution to make it easy for 3rd-party developers to distribute their software on all distributions at once. We also need to increase visibility of existing applications in distributors repositories
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- Never do things leading to the impression that you develop the standard primarily for GNOME/KDE
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- Communicate and blog as much as possible while introducing a new thing, so people know about it and can give feedback
- Sometimes it needs someone to just go ahead with a project and have others follow
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Thank you for your attention!

(Further) Questions?

Useful links

PackageKit: http://www.packagekit.org/

Listaller: http://listaller.tenstral.net/

AppStream Documentation:
http://www.freedesktop.org/software/appstream/docs/

AppData Information & Validation:
http://people.freedesktop.org/~hughsient/appdata/