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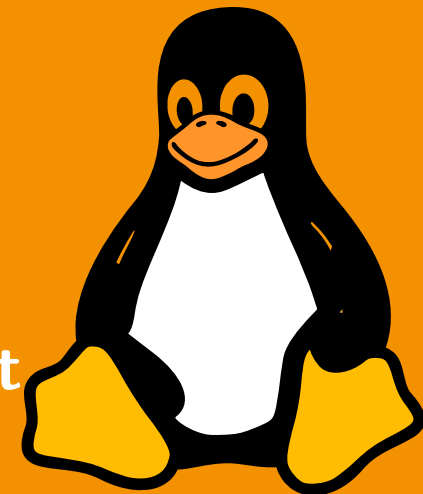Technical University of Applied Sciences

Prof. Dr. Florian Künzner

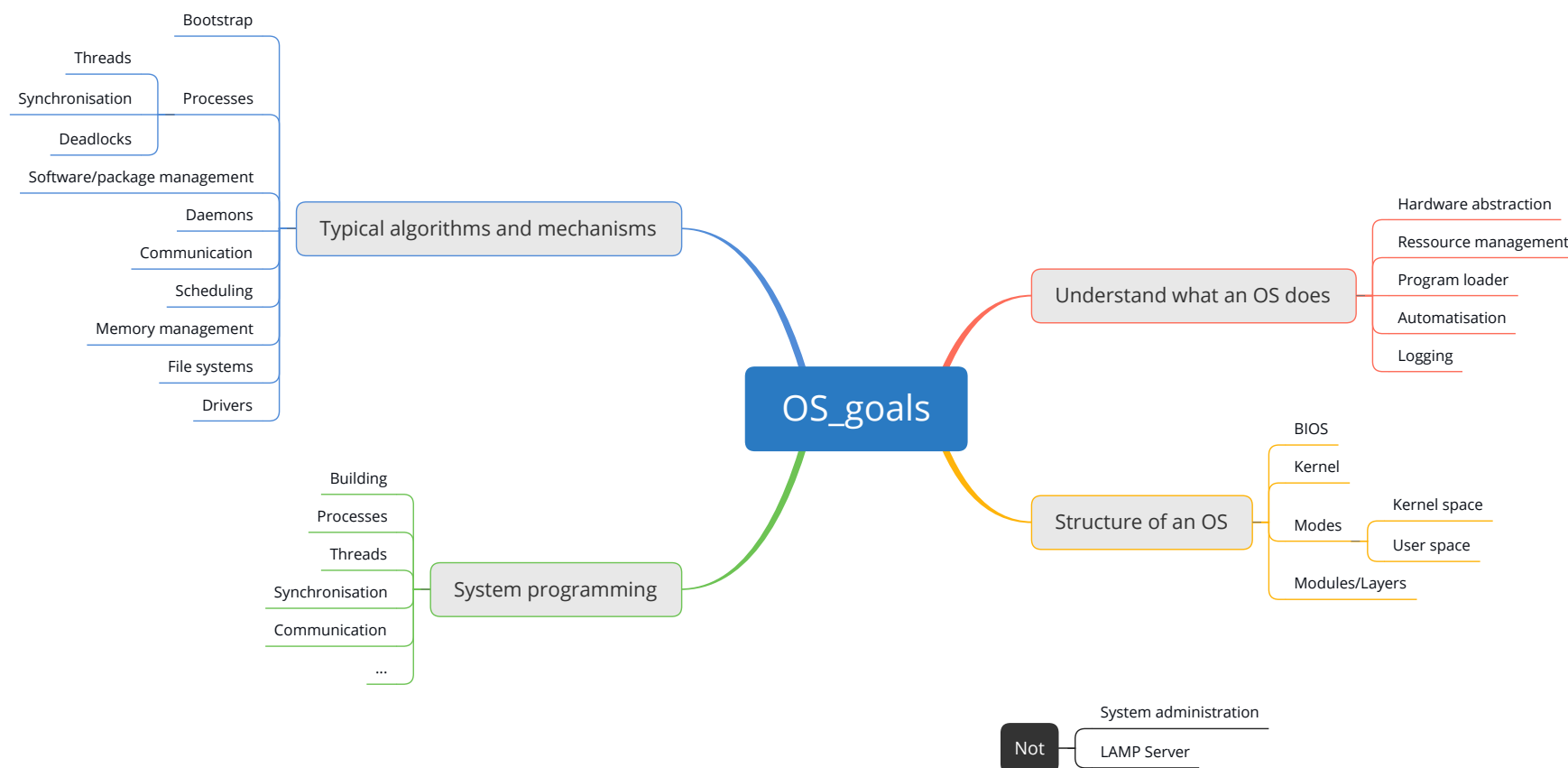Technical University of Applied Sciences Rosenheim, Computer Science

OS 3 – Software/package management

source: iconspng.com

The lecture is based on the work and the documents of Prof. Dr. Ludwig Frank

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Goal

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Goal

OS::Build

- Software management
- Create own deb packages
- Flatpak

Intro

How can you install software on your system?

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Intro

What are the challenges with software/package management?

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Intro

Centralised vs. local package management?
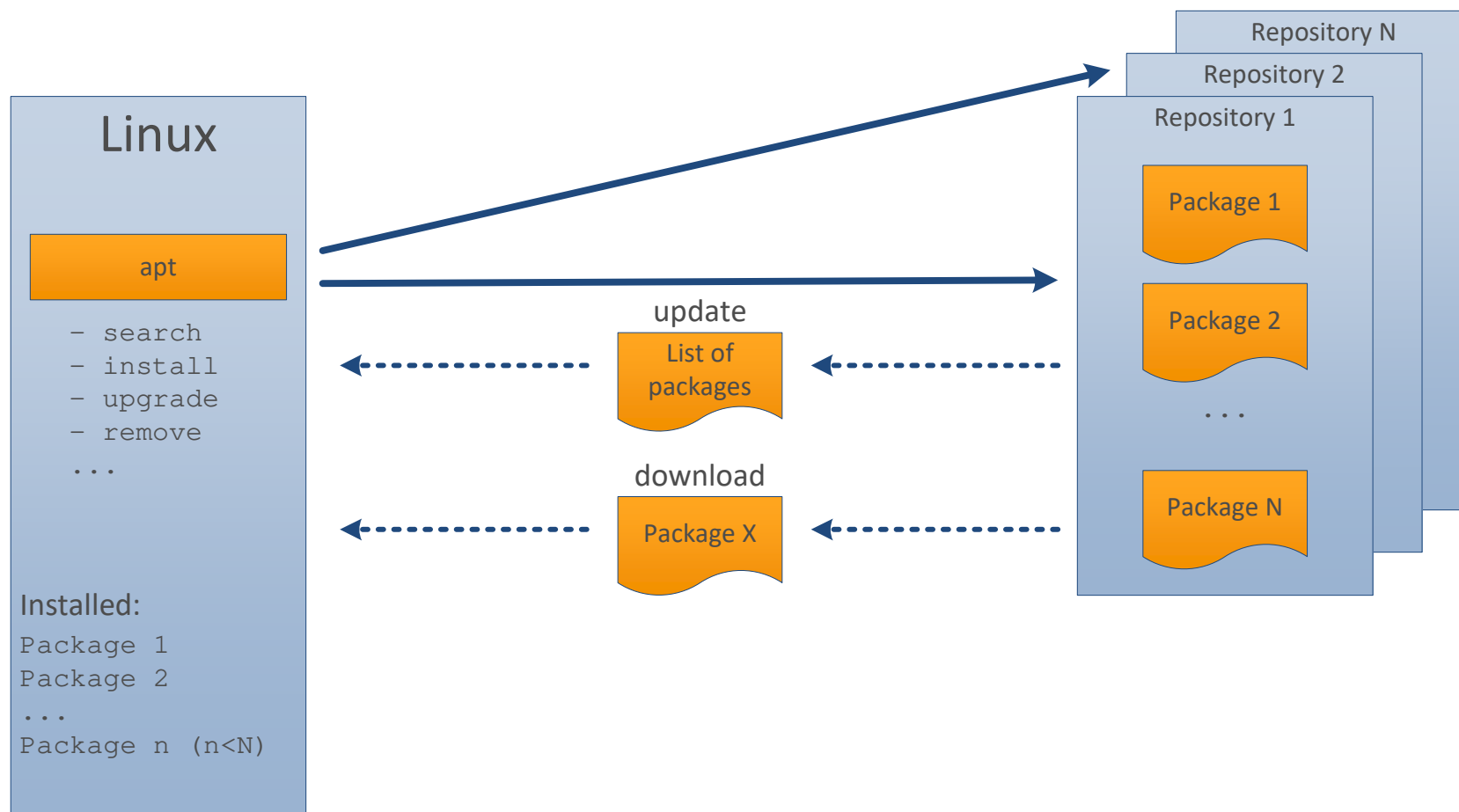
apt vs. dpkg

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apt

Centralised package management with apt

Idea: **Work with centralised (remote) repositories and automatically download packages.**

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apt - advanced packaging tool

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apt - commands

cmd	Description
apt search	**Searches** for packages in the package repositories.
apt list	**Lists** packages with criteria (installed, upgradable).
apt show	**Shows information** about packages.
apt depends	**Shows dependencies** of packages.
apt install	**Installs** packages from the repository.
apt remove	**Removes** installed packages.
apt update	**Updates** the list of available packages.
apt upgrade	**Upgrades** installed packages to the newest version.
apt contains	**Find** out in which package a file is contained.

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dpkg

Local package management
with dpkg

Idea: Work with local packages on the system.

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Debian package

Installing .deb packages.

A .deb package contains:

- Control file: version, license, architecture, dependencies, maintainer, ...

- All files and folders that should be installed

- Install (copy) commands for installing

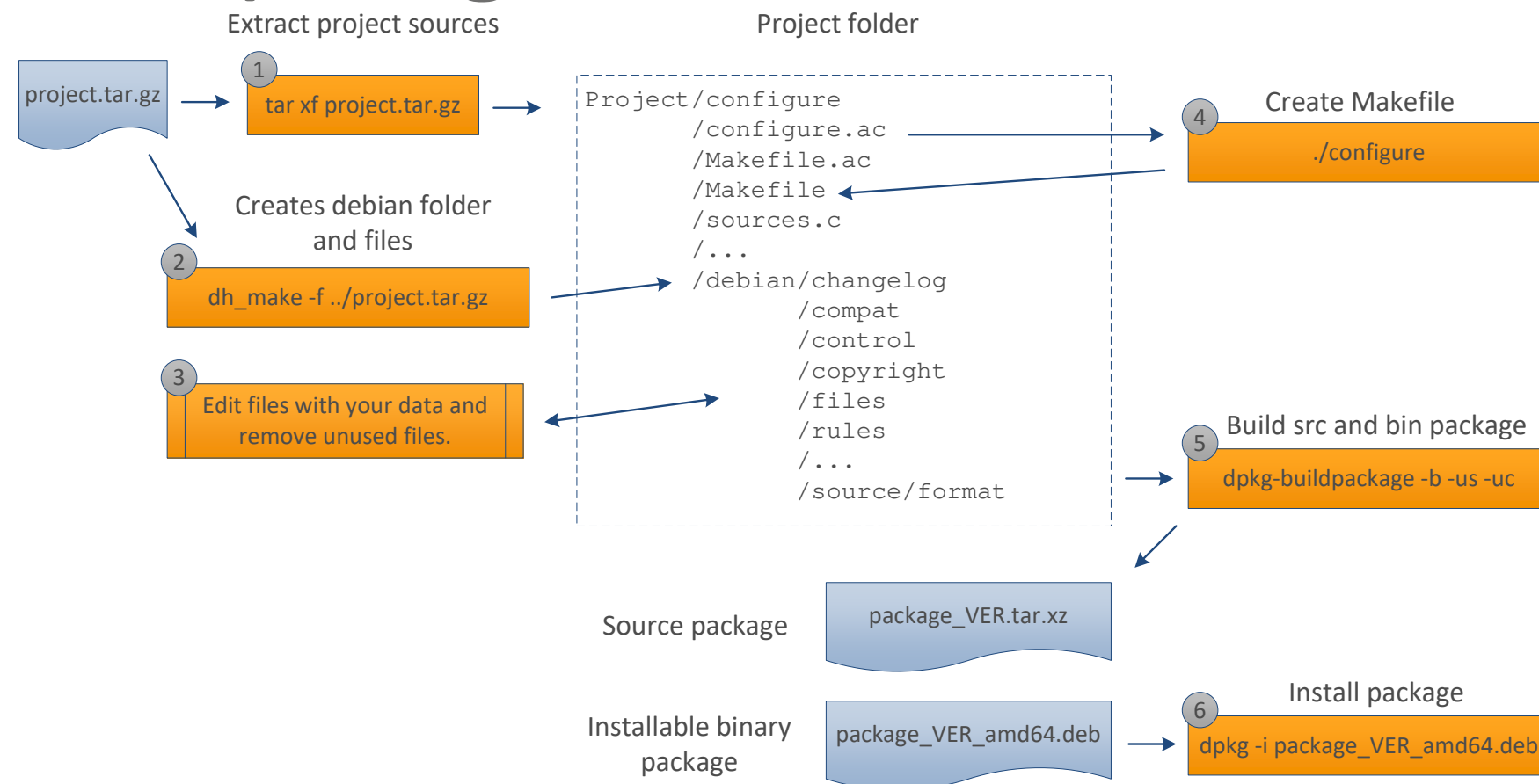- Remove commands for uninstalling

- ...

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dpkg - package manager for Debian

cmd	Description
dpkg -S	**Searches** for files in packages
dpkg -l	**Lists** installed packages.
dpkg -i	**Installs** packages from file.
dpkg -r	**Removes** installed packages.
dpkg -L	**Lists** files in installed packages.
dpkg --info	**Shows information** about packages.
dpkg --contents	**Lists** files contained in packages.
dpkg-reconfigure	**Reconfigures** (repairs) installed packages.
dpkg-buildpackage	**Builds** debian packages.

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Build package overview

Extract project sources

Project folder

project.tar.gz

1 tar xf project.tar.gz

```
Project/configure
       /configure.ac
       /Makefile.ac
       /Makefile
       /sources.c
       /...
       /debian/changelog
              /compat
              /control
              /copyright
              /files
              /rules
              /...
              /source/format
```

Creates debian folder
and files

2 dh_make -f ../project.tar.gz

3 Edit files with your data and
remove unused files.

Create Makefile

4 ./configure

Build src and bin package

5 dpkg-buildpackage -b -us -uc

Source package

package_VER.tar.xz

Installable binary
package

package_VER_amd64.deb

Install package

6 dpkg -i package_VER_amd64.deb

-> Example for an autotools project located compressed in `project.tar.gx`.
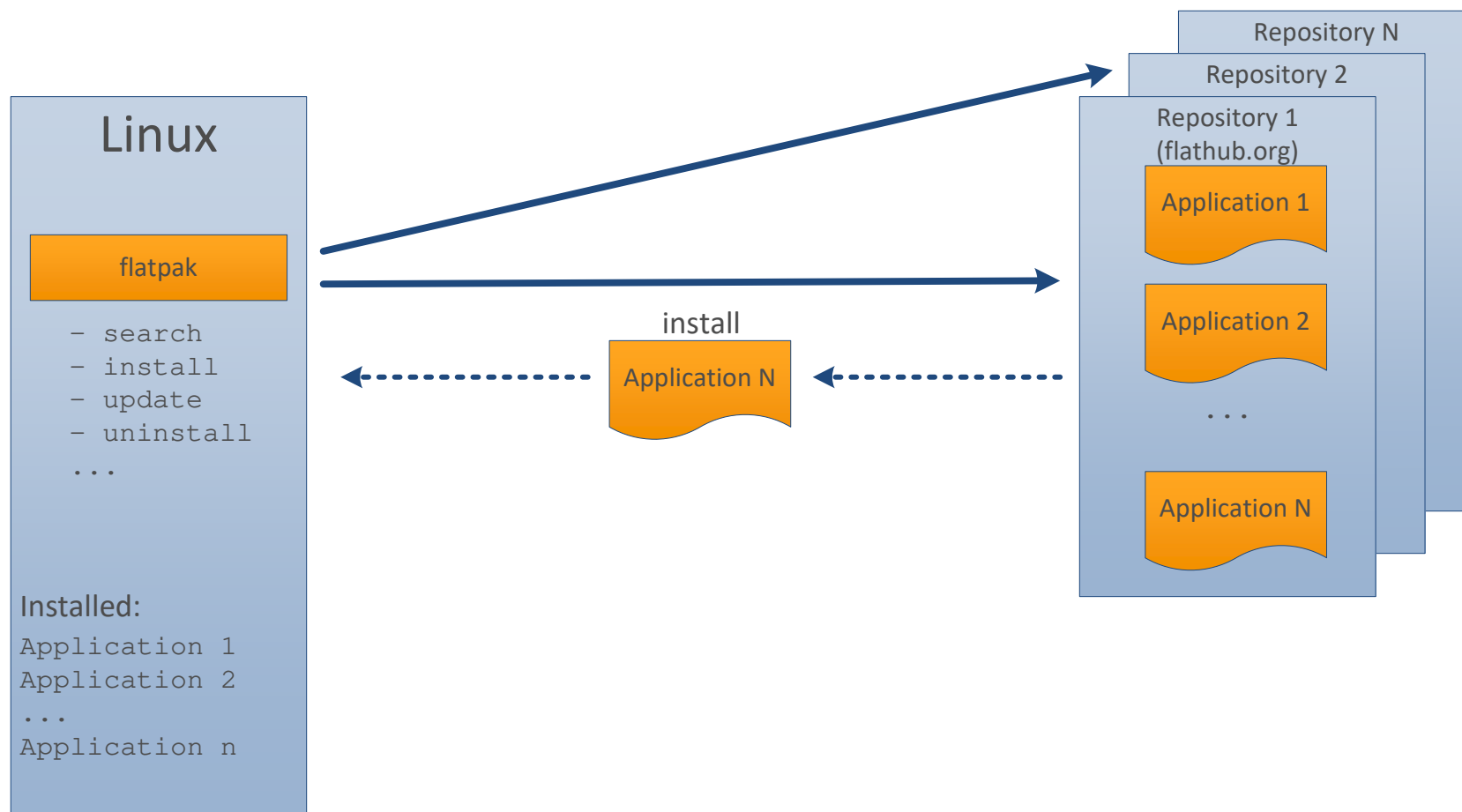
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Problem with .deb packages?

Packages for other Linux distributions and with different release cycles of your distribution?

https://flatpak.org
https://flathub.org

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flatpak - repositories

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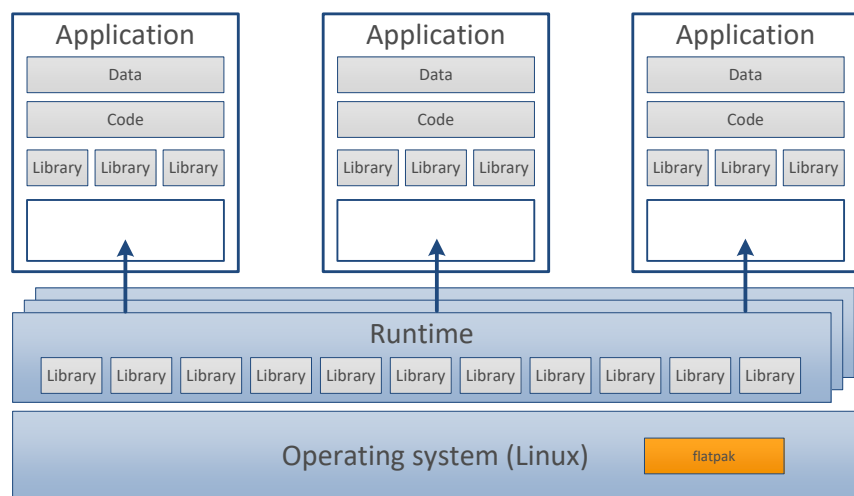
flatpak - applications

flatpak properties

- Build for **all Linux distributions**
- **Runtimes** (basic dependencies)
- **Bundled libraries** (different version, patched, not available on host)
- **Sandboxes** (isolated applications)
- **Portals** (interact with host through sandbox)
- **Repositories** (easy search/update)

More details: `http://docs.flatpak.org/en/latest/basic-concepts.html`

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flatpak - commands

cmd	Description
`flatpak search`	**Searches** for packages on flathub.
`flatpak list`	**Lists** installed packages.
`flatpak install`	**Installs** packages from file or flathub.
`flatpak uninstall`	**Removes** installed packages.
`flatpak update`	**Updates** installed packages.
`flatpak info`	**Shows information** about packages.
`flatpak run`	**Runs** a installed application.
`flatpak-builder`	Set of commands to **build** packages.

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Summary and outlook

Summary

- Software management
- Create own packages
- Flatpak

Outlook

- OS system boot
- OS architecture