

Ubuntu Snap 技术介绍

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Ubuntu 簡介

Canonical



We are the company behind Ubuntu

Ubuntu is the #1 Choice for Innovators

ROS

Robotics Library



GAZEBO

ethereum



OpenCV

DRONEKIT

openHAB
empowering the smart home

eclipse

IOTA



GNURadio
THE FREE & OPEN SOFTWARE RADIO ECOSYSTEM

bitcoin



Open Source Routing



TensorFlow

cloud

to

edge



NETFLIX

Dropbox

amazon web services

IBM

rackspace
+ Joyent



Google Cloud Platform

ORACLE
PUBLIC CLOUD

Walmart

Cisco
webex

rackspace

eBay

verizon



WELLS FARGO



comcast

AT&T

NTT

NEC

sky

Deutsche Telekom

CISCO

peer1

SAMSUNG

SAMSUNG SDS

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YAHOO!

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DELL

ibm

bq

intel

meizu

dji

Parrot

Google

BROADCOM

TESLA

SAMSUNG

GE

QUALCOMM

Open Source

Robotics Foundation

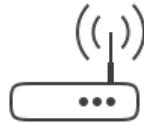
Ubuntu is powering smart IoT



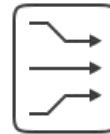
Smart drone
controllers



Advanced
robotics



Home gateways



Industrial
gateways



Digital Signage



Parrot[®]



BOSCH



QNAP

WD LABS™

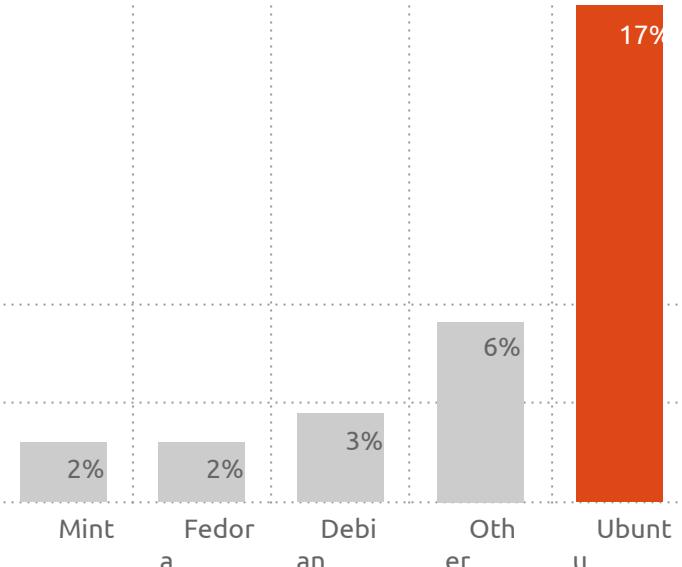
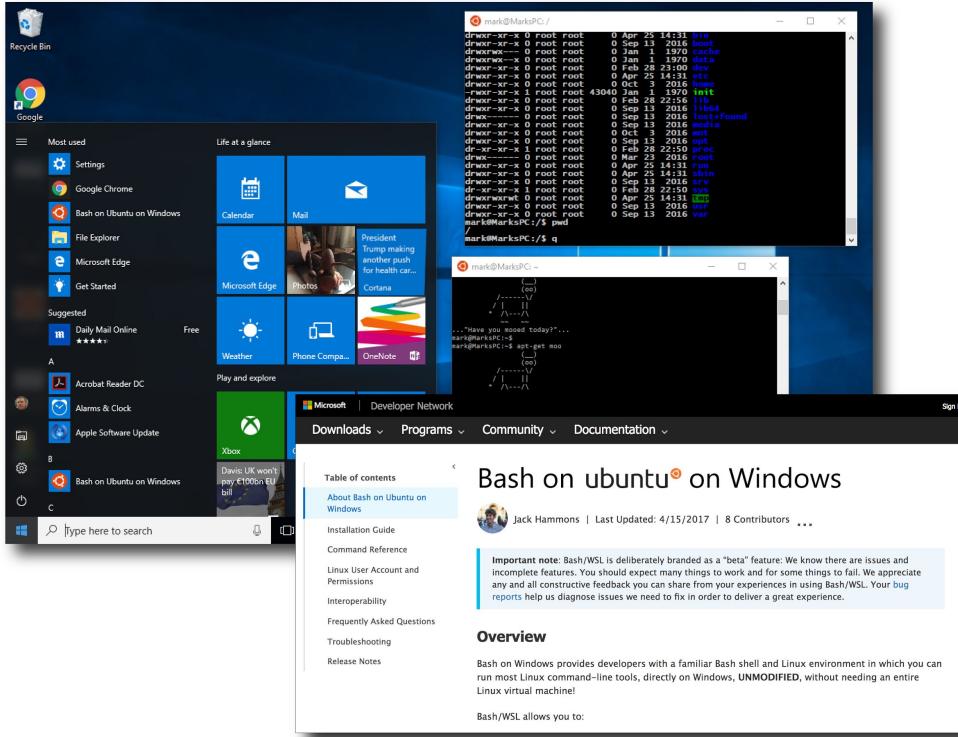
ADVANTECH



BroadSign

RISE VISION

Ubuntu is the #1 Choice for Innovators & developers



Source: Eclipse Foundation + StackOverflow survey

Ubuntu Snap 软件包

全新的软件包格式

特色软件



Jenkins



Rocket.Chat



Notes



Apache Cassandra



NATS



Shout



Stellarium



WebDM



ArangoDB



Krita



VLC



Blender

<https://uappexplorer.com/snaps>

<https://insights.ubuntu.com/tag/snaps>

六、七月特色软件



1. GIMP ↗

Daniel Llewellyn

GIMP is ... is there really a need to introduce GIMP? THE free, open source cross-platform image editor, for anything from advanced graphics design to quick image fixes!



2. Wormhole ↗

Snapcrafters

Wormhole is a command-line tool which makes it possible to get arbitrary-sized files and directories (or short pieces of text) from one computer to another quickly and securely, using password-authenticated key exchange. The two endpoints are identified by using identical “wormhole codes”: in general, the sending machine generates and displays the code, which must then be typed into the receiving machine.

- Install Wormhole [from the Software Center](#).
- or from the command-line:

```
sudo snap install wormhole
```



1. Wekan ↗

Lauri Ojansivu

Wekan is a self-hosted collaborative Kanban board. Whether you're maintaining a personal todo list, planning your holidays with some friends, or working in a team on your next revolutionary idea, Kanban boards are an unbeatable tool to keep things organised. After installing Wekan, open a web browser at <http://localhost:8080> to create your admin account.



2. Brackets ↗

Snapcrafters

Brackets is an open-source editor for web design and development built on top of web technologies such as HTML, CSS and JavaScript. The project was created and is maintained by Adobe, and is released under an MIT License.

- Install Brackets [from the Software Center](#).
- or from the command-line: `sudo snap install brackets`

特色软件 - 微信客户端

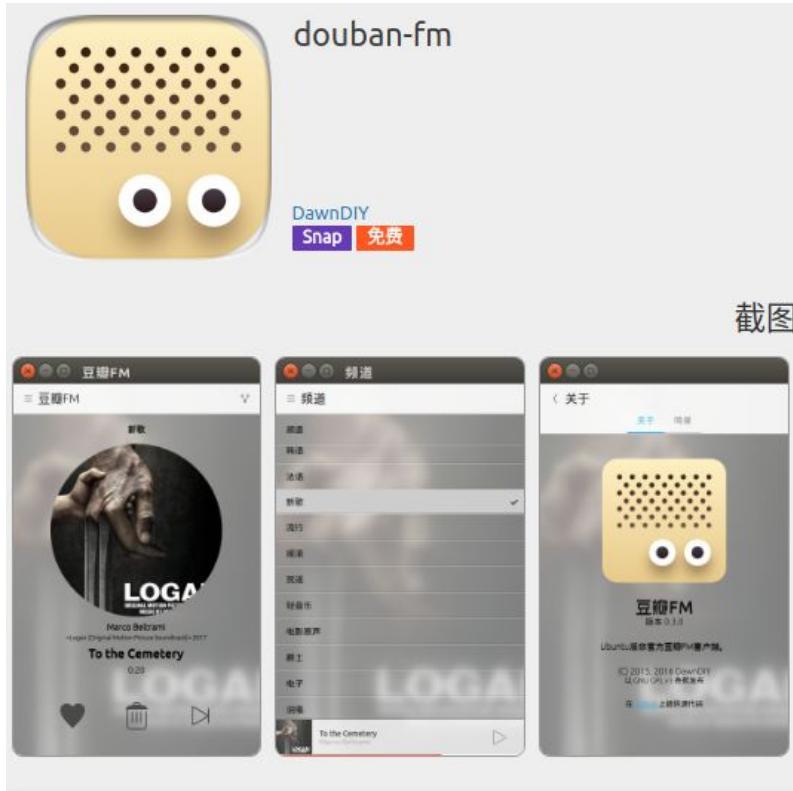


Electronic WeChat is a
unofficial WeChat client. A
better WeChat on Linux. Built
with Electron.

By DawnDIY

<https://uappexplorer.com/snap/ubuntu/electronic-wechat>

特色软件 - 豆瓣FM



An unofficial client of Douban FM. You can select the channels you like to play songs and share it to Sina Weibo.

By DawnDIY

<https://uappexplorer.com/snap/ubuntu/douban-fm>

Snap 技术架构

What is a Snap?

- A squashFS filesystem containing your app runtime and a snap.yaml file with specific metadata. It has a **read-only** file-system and, once installed, a writable area
- **Self-contained.** It bundles most of the libraries and runtimes it needs and can be updated and reverted without affecting the rest of the system
- **Confined** from the OS and other apps through security mechanisms, but can exchange content and functions with other snaps according to fine-grained policies controlled by the user and the OS defaults

Service

Service

CLI

GUI

snap code & assets

(squashfs, RO bind-mounted in /snap/<snap_name>/<version>)

\$SNAP

Snap Package Architecture

- As squashFS filesystem based architecture, the snap is capable of providing:
 - Transactional updates
 - Integrity of the content
 - Compression ($\frac{1}{3}$ of unpacked size)
 - Read Only

Service

Service

CLI

GUI

snap code & assets

(squashfs, RO bind-mounted in /snap/<snap_name>/<version>)

\$SNAP

Snap Package Architecture

- A snap package ships:
 - One or more services
 - CLI apps
 - GUI apps
 - They are not limited to one process.

Service

Service

CLI

GUI

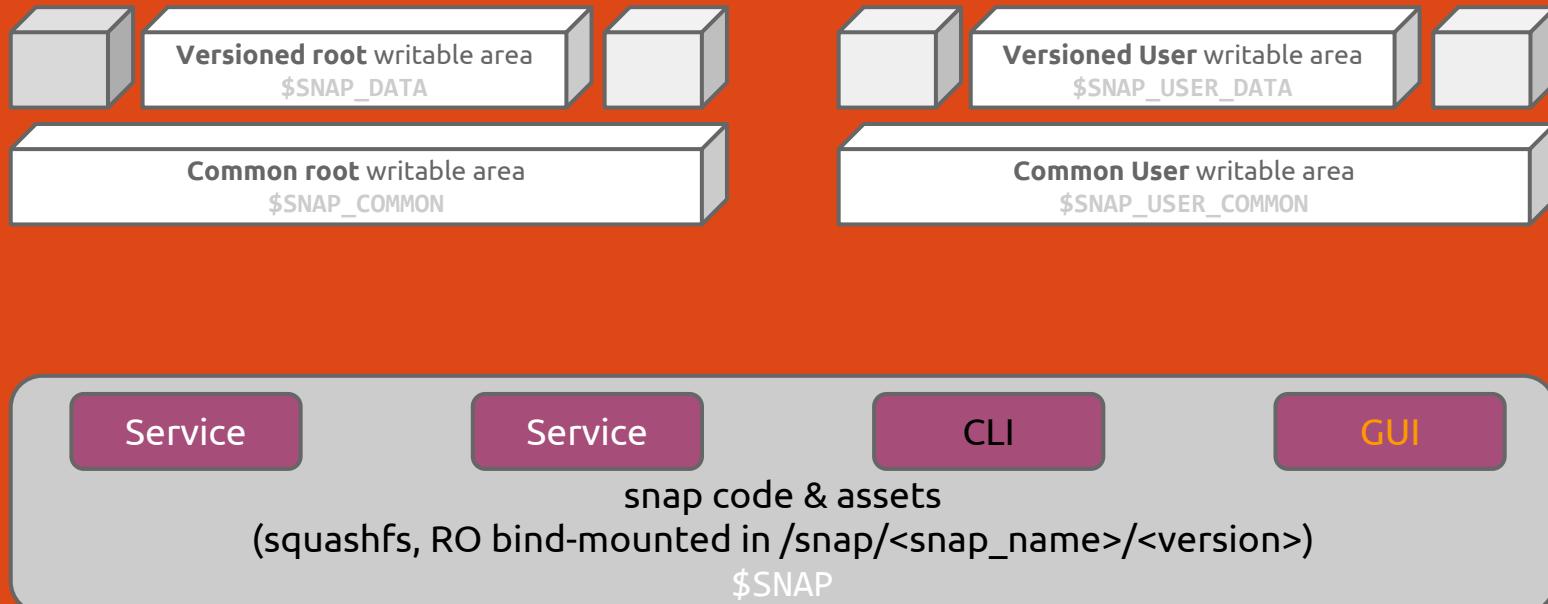
snap code & assets

(squashfs, RO bind-mounted in /snap/<snap_name>/<version>)

\$SNAP

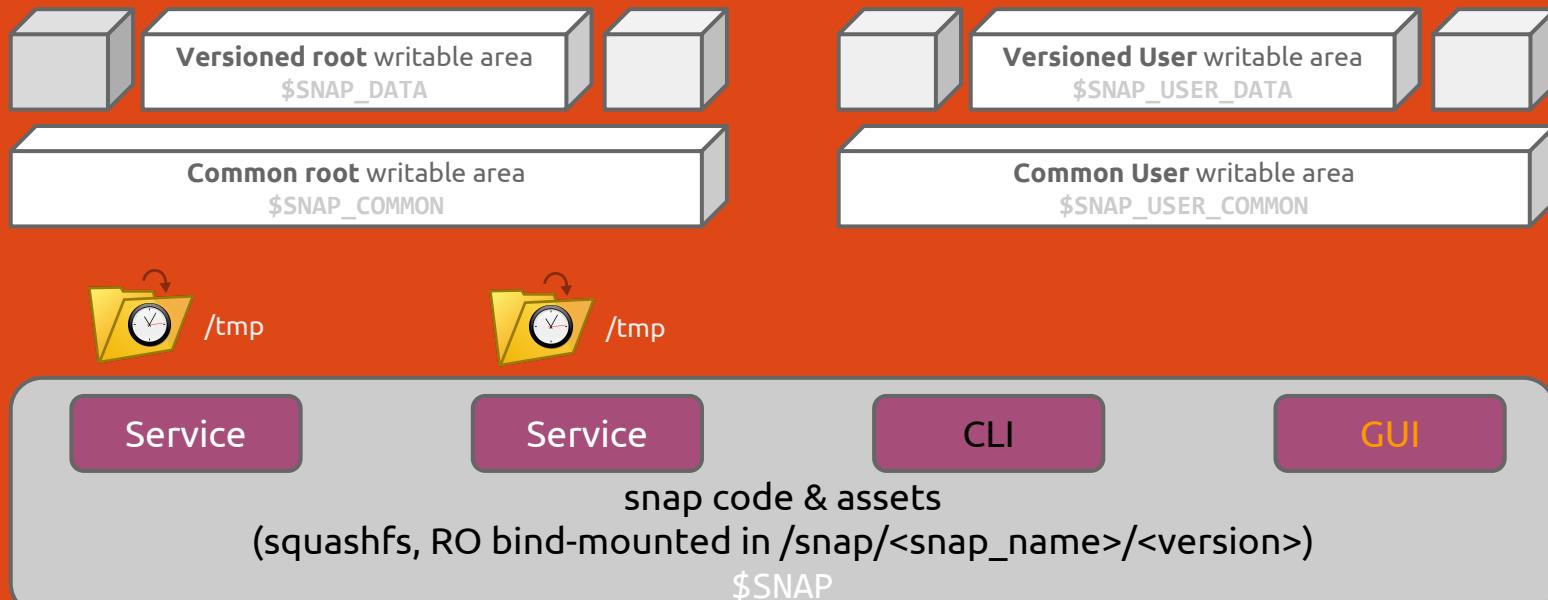
Snap Package Architecture

- It has its own writable space (services and users) & (versioned and unversioned)



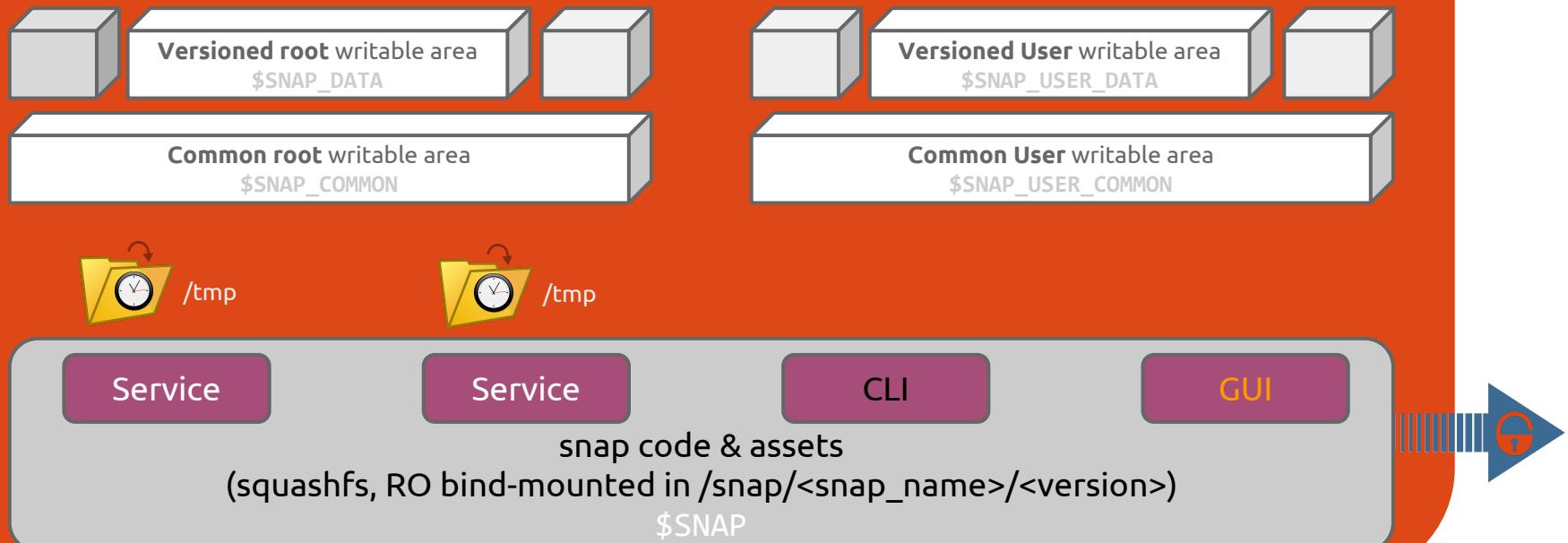
Snap Package Architecture

- **Process Isolation** (/tmp per process and app process)

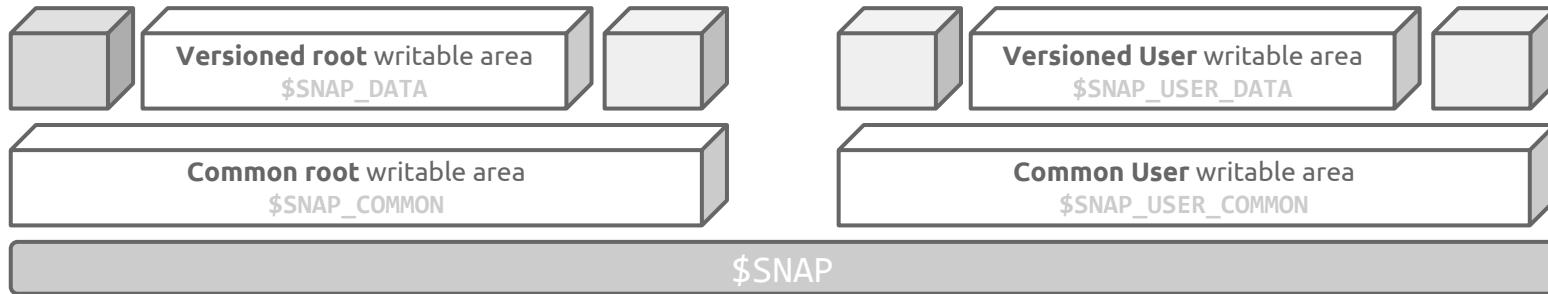


Snap Package Architecture

- MAC to other resources (Paths (/home), Devices /dev, etc) mediated with interfaces



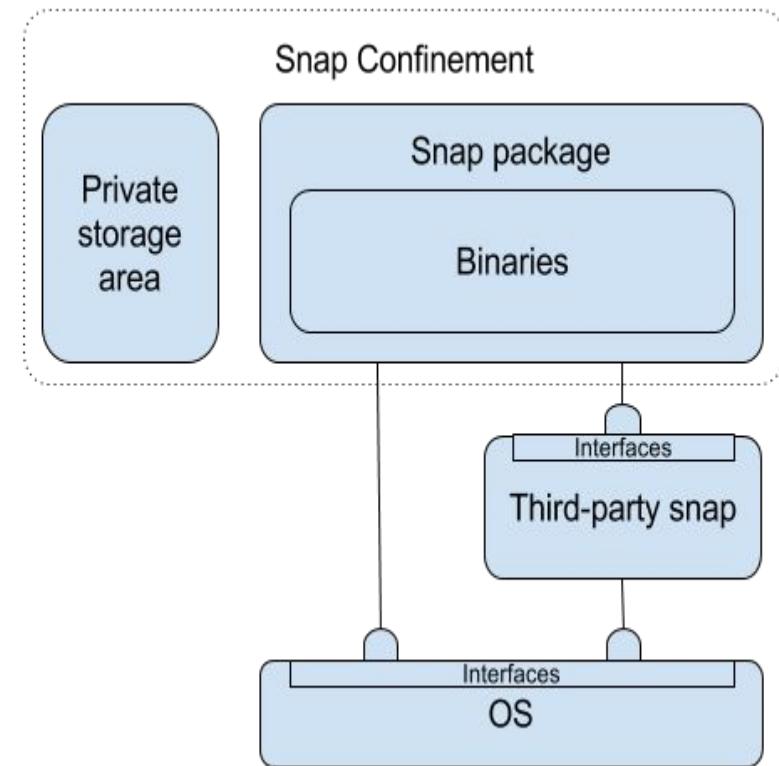
Snap Package Architecture: Snappy FHS



- **SNAP:** installation directory (read-only)
- **SNAP_DATA:** per-revision application data directory (writable)
- **SNAP_COMMON:** application data directory common to all revisions (writable)
- **SNAP_USER_DATA:** per-revision, per-user application data directory (writable)
- **SNAP_USER_COMMON:** per-user application data directory common to all revisions (writable)
- **SNAP_ARCH:** architecture of the system (eg, amd64, arm64, armhf, i386, etc)
- **SNAP_LIBRARY_PATH:** library paths added to LD_LIBRARY_PATH
- **SNAP_NAME:** package name
- **SNAP_REVISION:** store revision for this snap
- **SNAP_VERSION:** package version
- **TMPDIR:** temporary directory (writable)
- **XDG_RUNTIME_DIR:** set to /run/user//snap.\$SNAP_NAME (writable)

The snapd system

- **snapd**, a management environment that handles installing and updating snaps using the transactional system, as well as **garbage collection** of old versions of snaps
- **snapd-confine**, an execution environment for the applications and services delivered in snap packages
- **Interface**, snaps interact with each other using interface



跨越操作系统的封装格式



Package any app for every Linux desktop, server, cloud or device, and deliver updates directly.

Learn to craft [snaps](#) or join the community



ubuntu



archlinux



debian



gentoo linux



fedora



openSUSE



openembedded



yocto
PROJECT



OpenWrt
Wireless Freedom



Solus

<https://snapcraft.io/docs/core/install>

Read the [installation instructions](#) or [build snapd from source](#)



操作方式

动手尝试

<https://tutorials.ubuntu.com/tutorial/basic-snap-usage>

Ubuntu Core

ubuntu®core

A minimal, secure, transactional Ubuntu designed for IoT

What is Ubuntu Core?



A minimal version with the same bits as today's Ubuntu



Ubuntu Core with **transactional updates**



Applications confined by technologies lead by Canonical



Safe, reliable, worry free **updates** with tests and rollback



Amazing developer experience with **snapcraft**



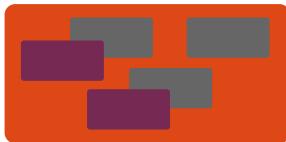
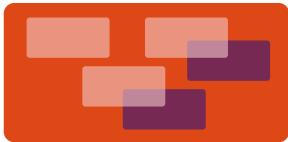
Easily extensible



Easily create **app stores** for all your devices

All Snap Architecture

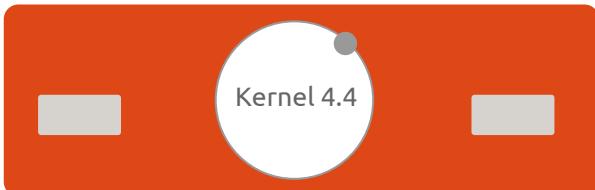
Ubuntu Core



Confined applications packages
as a snap with dependencies



Minimal OS packaged as snap



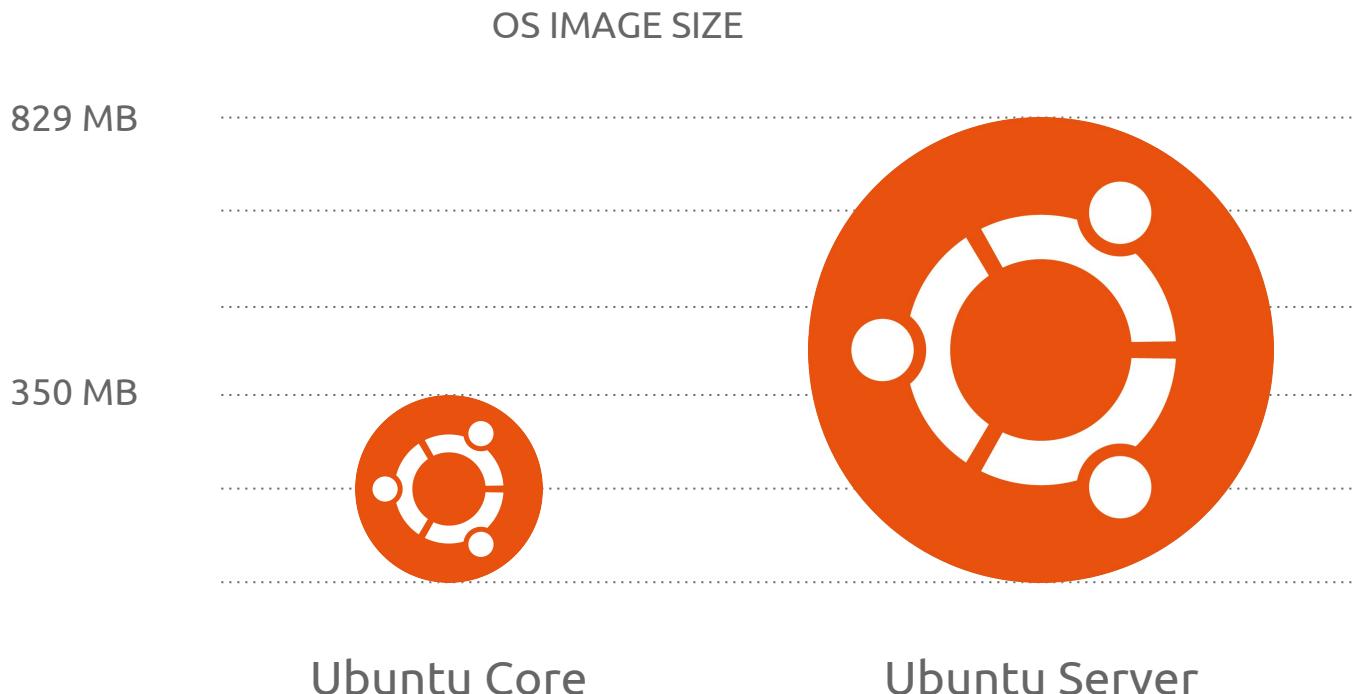
Clearly defined Kernel and device packaged as snap



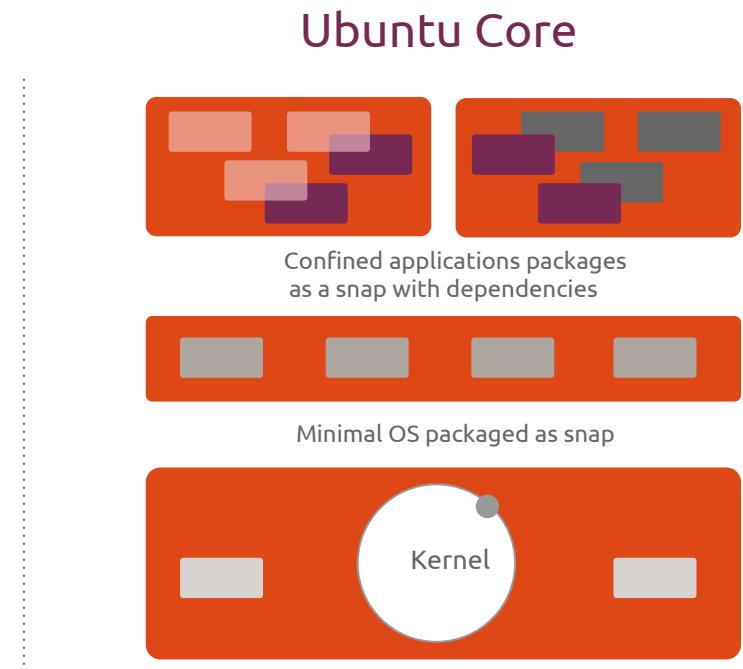
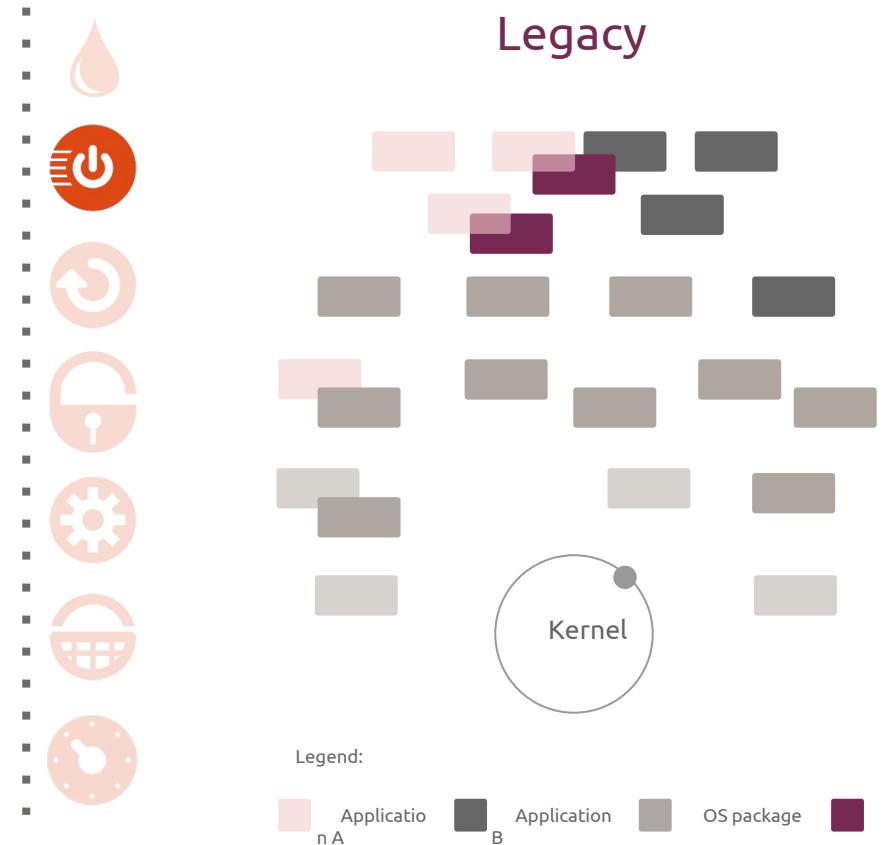
In a snappy system, all software beyond the bootloader is distributed as a snap in this same format.

- The **OS** snap contains the core operating system.
- The **kernel** snap contains the kernel and hardware-specific drivers.
- The **gadget** snap is device specific and is used to configure a particular model of device.

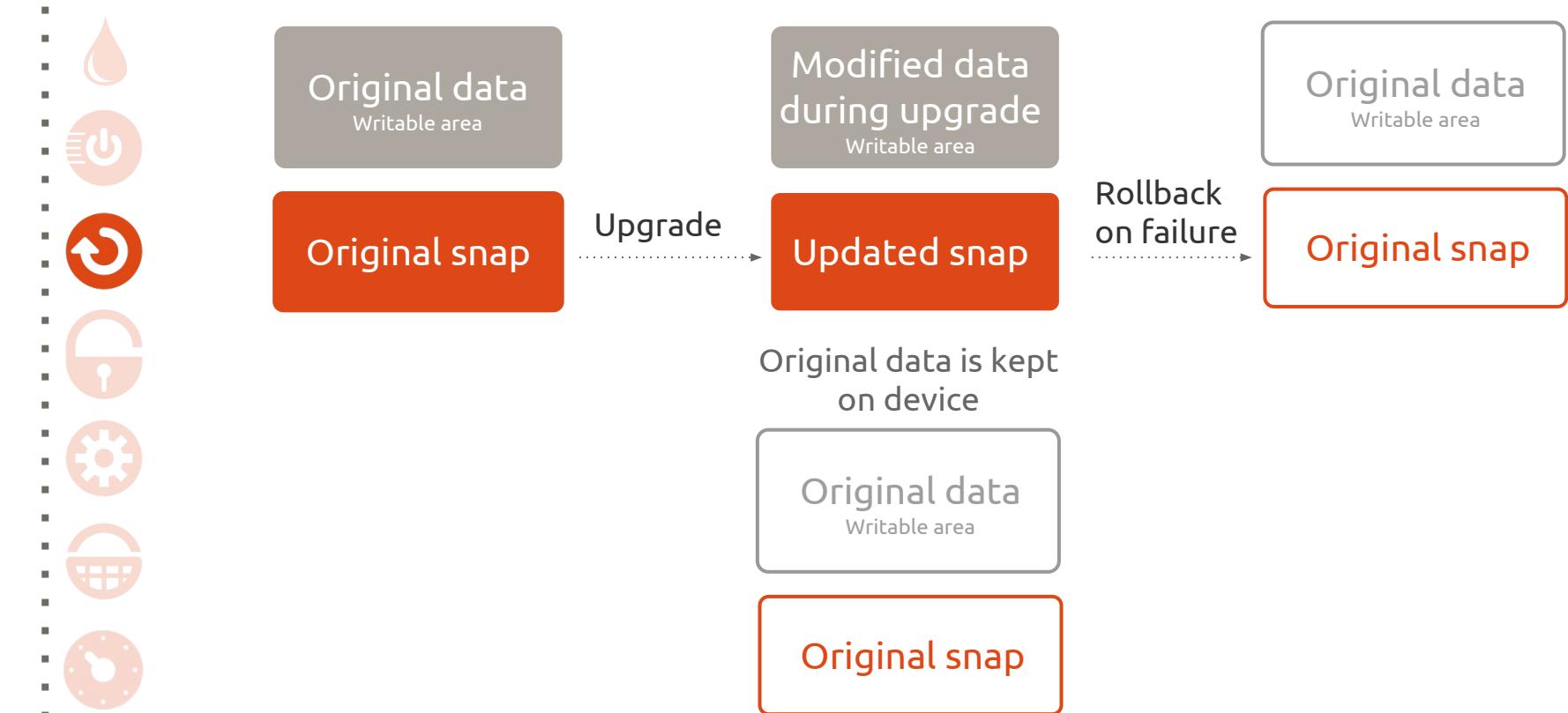
Minimal footprint



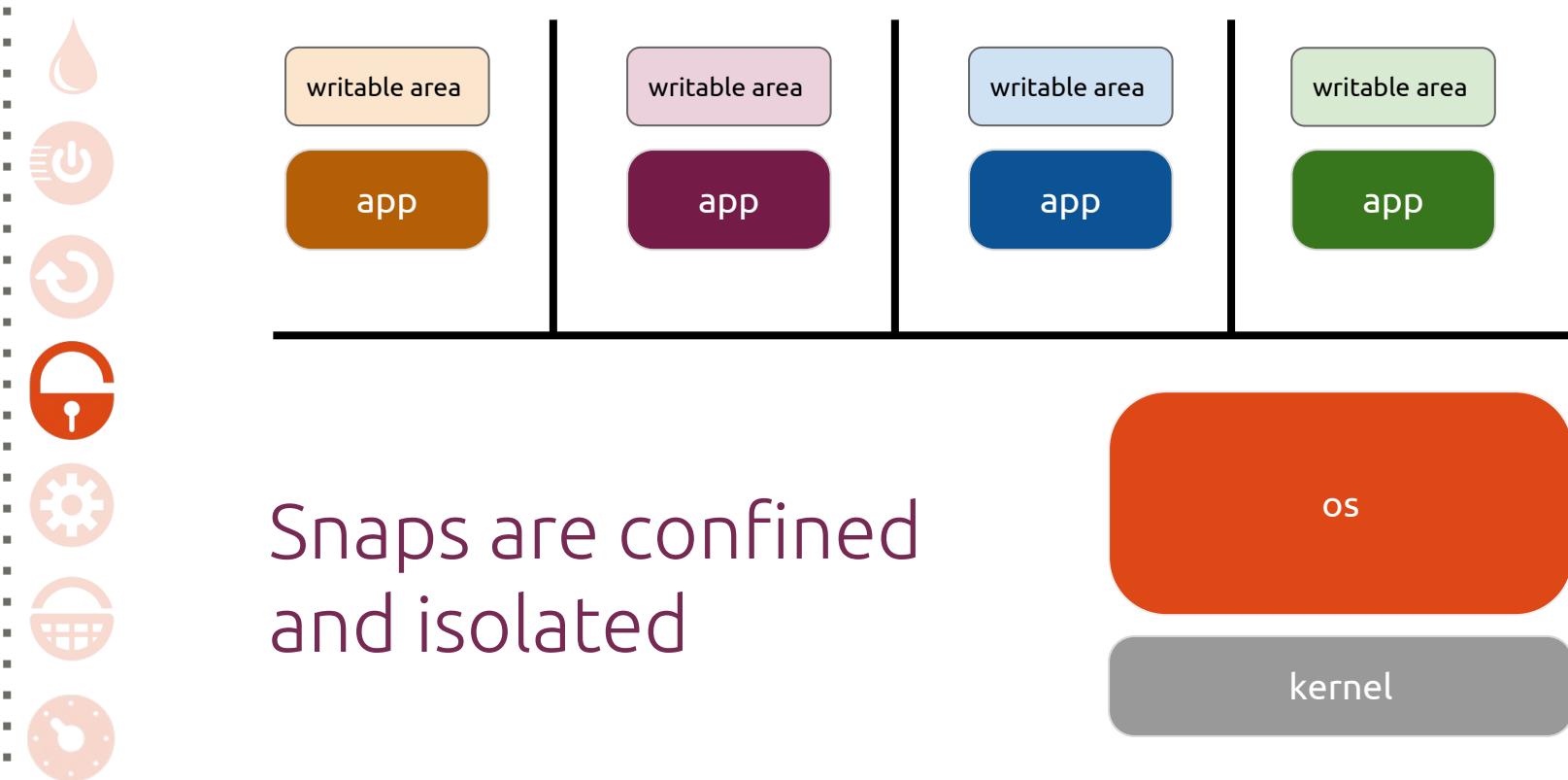
Modular and simple architecture



Transactional updates: Apps, OS and kernel



Automatically confines applications





Security and apps confinement

Apps confinement: Trust model

The trust model of snappy Ubuntu Core is different from traditional Ubuntu

Software is either:

- Part of the base system OS
- Pre-installed via OEM/gadget snaps (apps and frameworks installed during provisioning)
- **Snaps installed from a store**

Apps confinement: Trust model

By default the **application snaps** are untrusted by the OS and:

- cannot access other applications' data
- cannot access non-app-specific user data
- cannot access privileged portions of the OS

Trusted by the OS

vs

Untrusted by the OS

Apps confinement: Technologies

Several technologies are used by snappy Ubuntu Core to:

- Implement the security sandboxing
- Implement the application isolation

These technologies are mainly:

- **AppArmor**: A **Mandatory Access Control** system to confine programs and processes to a limited set of resources. (Application Isolation)
- **Seccomp**: A **secure computing mode** that provides an application sandboxing mechanism ([wiki](#))
- **Device cgroups**: are a kernel mechanism for grouping, tracking, and limiting the resource usage of tasks

example

<https://wiki.ubuntu.com/SecurityTeam/Specifications/SnappyConfinement>

Snap locations after installation

Mount point	Writable	Description
/apps/<app-name>/<version>	No	Read only location for application data, binaries and libraries that are immutable.
/var/lib/apps/<app-name>/<version>/	Yes	Writable location which is mounted through to the writable partition, this is where applications write out during their runtime.
/home/user/apps/<app-name>/<version>	Yes	User specific directory that contains all configuration and user-specific data pertaining to the application in question.

data from app with root can be written to **var/lib/apps/<app-name>/<version>/** However, if an app does not have root privs, the best place for dumping data is the user specific directory **/home/<user>/apps/<app-name>/<version>**

Snapcraft

snapcraft.io

Developers from multiple Linux distributions and companies collaborate on the “**“snap” universal Linux package** format, enabling a single binary package to work perfectly and securely on any Linux desktop, server, cloud or device.

Package any app for every Linux desktop, server, cloud or device, and deliver updates directly



Faster to install

Snaps are faster to install, easier to create, safer to run, and they update automatically and transactionally so your app is always fresh and never broken.

Work anywhere

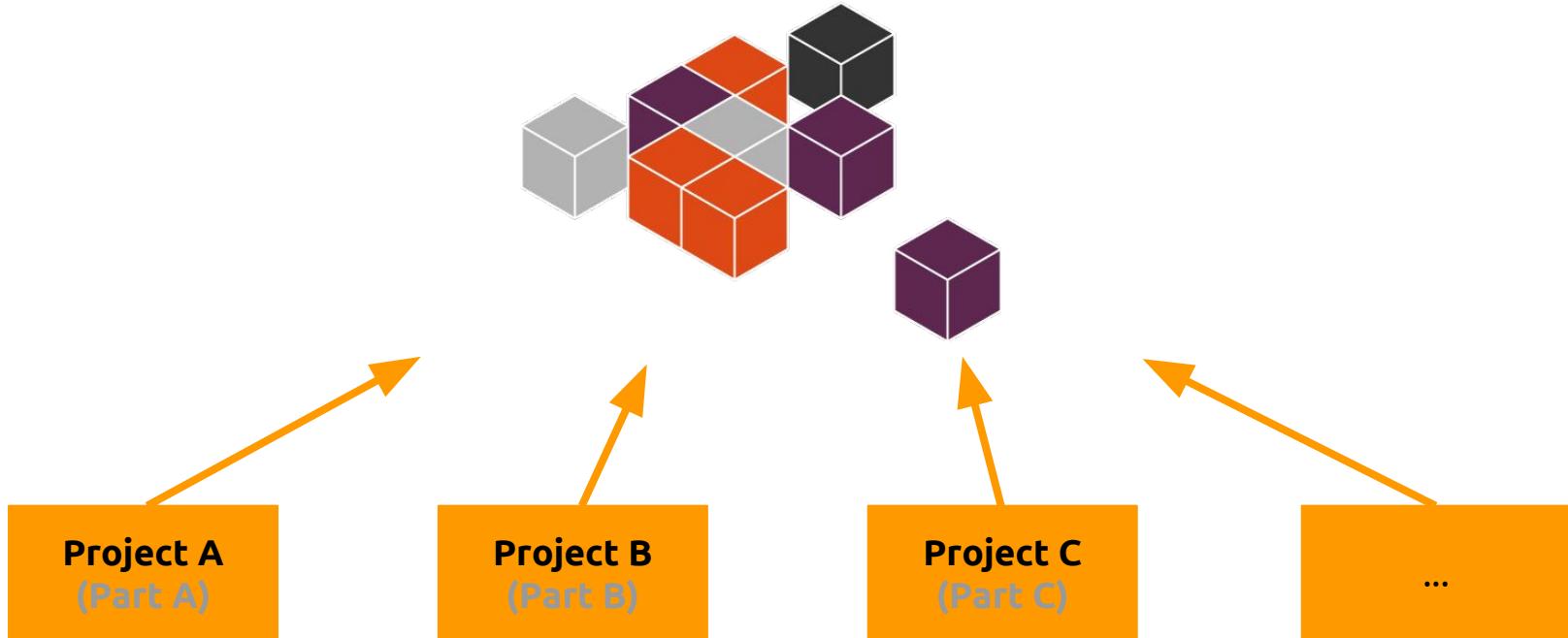
Snaps aim to work on any distribution or device, from IoT devices to servers, desktops to mobile devices.

Github and beyond

The public collection of snaps includes the best of GitHub and beyond, so you have the whole world of Linux at your fingertips.

snapcraft.io

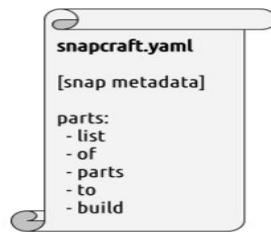
Snapcraft lets developers assemble their snap from existing projects, leveraging different technologies.



Snapcraft benefits

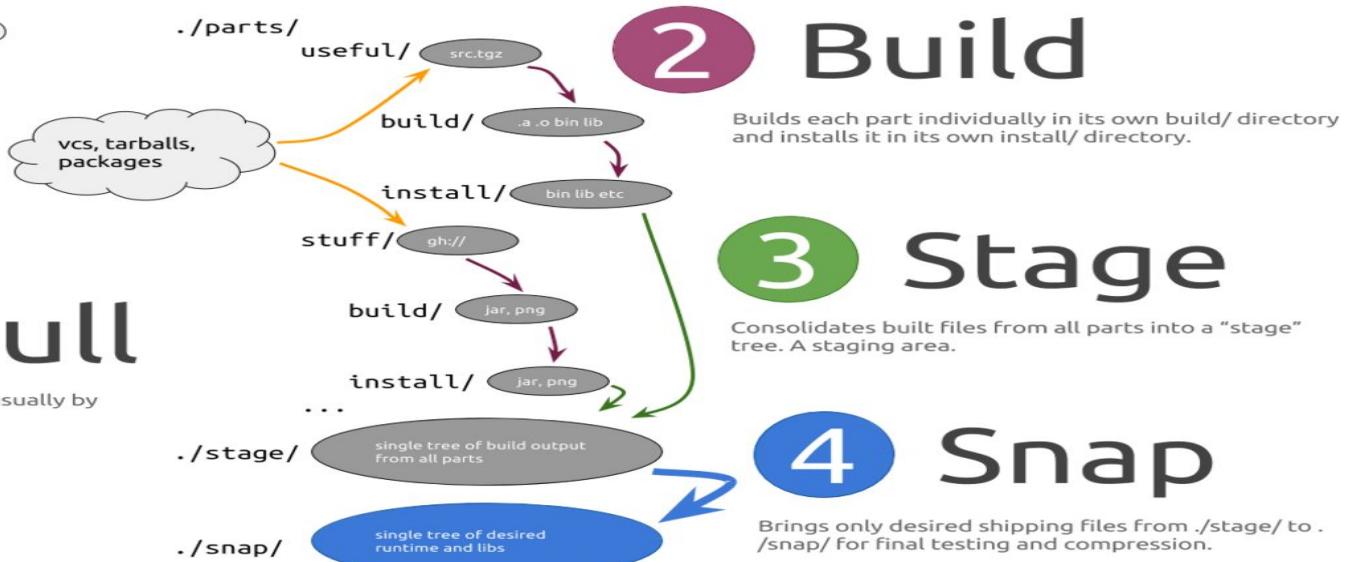
For developers:

- snap your app once and it will run on any snappy device
- can leverage existing part library ('stand on the shoulder of giants')
- complete control of their entire software stack



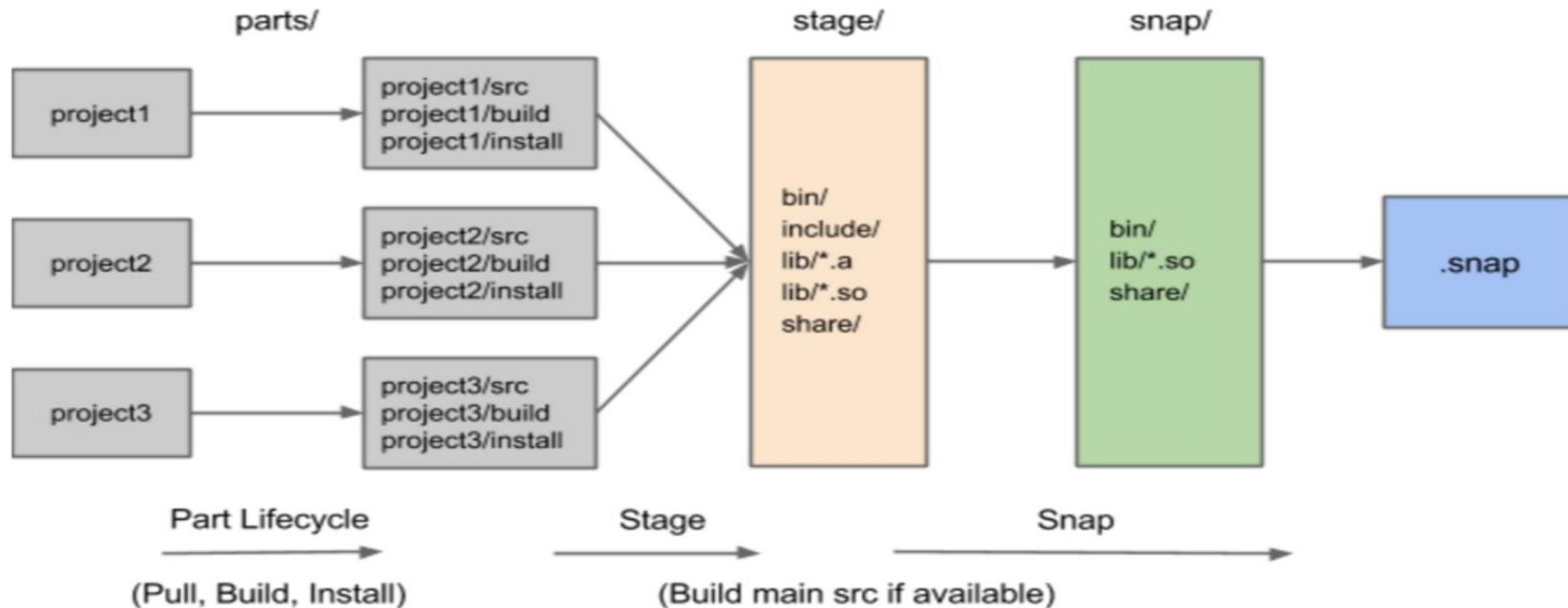
1 Pull

Populates the parts, usually by fetching source.



Snapcraft 组合机制

Snapcraft lets developers assemble their snap from existing projects.



snapcraft.io

- A central aspect of a snapcraft recipe is a "**part**". A part is a piece of software or data that the snap package requires to work or to build other parts.
- Each part is managed by a snapcraft **plugin** that encapsulates the logic of the underlying technology

```
parts:  
  cam:  
    plugin: go  
    source: git://github.com/mikix/golang-static-http  
  stage-packages:  
    - fswebcam  
  
glue:  
  plugin: copy  
  
files:  
  webcam-webui: bin/webcam-webui
```

Snapcraft plugins

```
$ snapcraft list-plugins
```

ant	cmake	gradle	kbuild	maven	plainbox-provider	qmake
autotools	copy	gulp	kernel	nil	python2	scons
catkin	go	jdk	make	nodejs	python3	tar-content

Write your own plugins:

- <https://developer.ubuntu.com/en/snappy/build-apps/plugins/>

Custom plugin examples:

- <https://github.com/ubuntu/snappy-playpen>



Snap usage

Live tour of snapcraft build commands (clean, stage, prime...)
Snapcraft upload/update/release commands

创建软件包

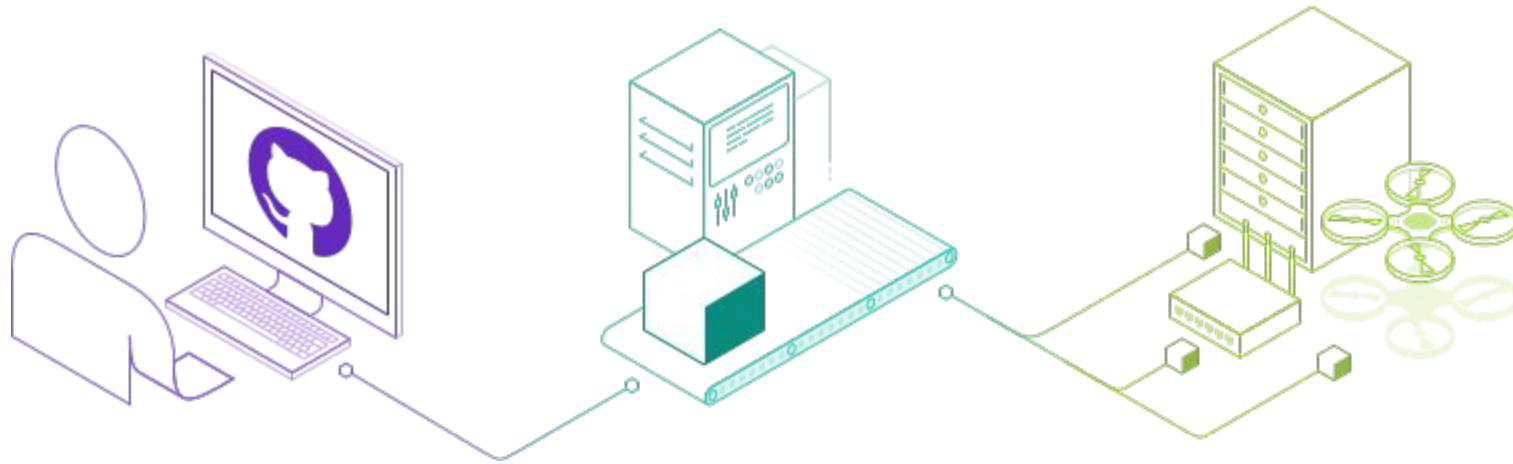
创见你的第一个 snap...

- 手把手教学
 - <https://tutorials.ubuntu.com/tutorial/create-your-first-snap>
 - <https://tutorials.ubuntu.com/tutorial/snap-a-python-application>
- 动手做一个服务器
 - <https://tutorials.ubuntu.com/tutorial/build-a-nodejs-service>
- 看看别人的代码...
 - <https://github.com/search?utf8=%E2%9C%93&q=filename%3Asnapcraft.yaml&type=Code>

build.snapcraft.io

持续交付 快速迭代

build.snapcraft.io



Create an
update

Auto build
and publish

Auto update
and rollback

My repos ›

popey/offlineimap

Number	Architecture	Duration	Result	
#30097	armhf	6 minutes	Successfully built	11 minutes ago
#30096	amd64	3 minutes	Successfully built	8 minutes ago

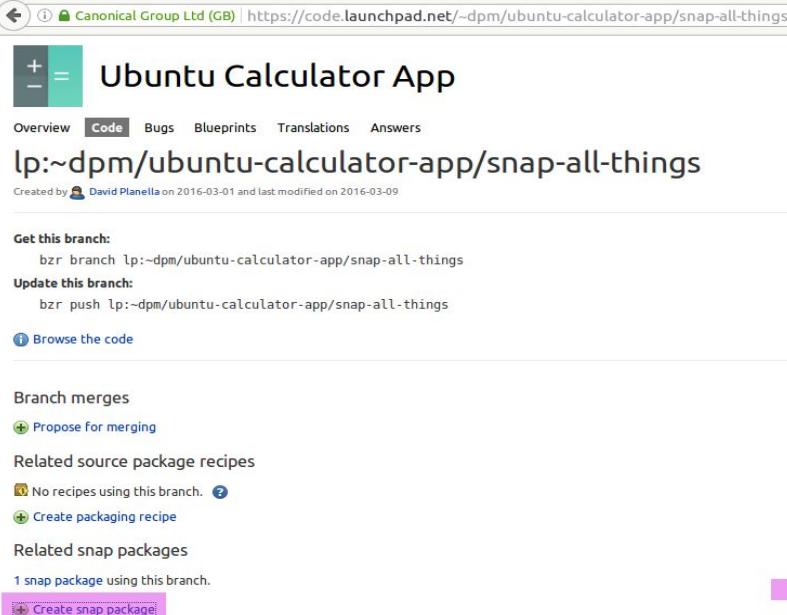
To test this snap on your PC or cloud instance:

```
sudo snap install --edge offlineimap-demo
```

Don't have snapd installed? [Install it now!](#)

How to build your app for all architectures?

- Develop your application for one architecture and test it successfully, let's say amd64
- Create a project on launchpad and make use of the services there
 - <https://kyrofa.com/posts/building-your-snap-on-device-there-s-a-better-way>
 - Click on the “Create snap package” button



Canonical Group Ltd (GB) | https://code.launchpad.net/~dpm/ubuntu-calculator-app/snap-all-things

Ubuntu Calculator App

Overview Code Bugs Blueprints Translations Answers

lp:~dpm/ubuntu-calculator-app/snap-all-things

Created by David Planella on 2016-03-01 and last modified on 2016-03-09

Get this branch:
bzr branch lp:~dpm/ubuntu-calculator-app/snap-all-things

Update this branch:
bzr push lp:~dpm/ubuntu-calculator-app/snap-all-things

[Browse the code](#)

Branch merges

[Propose for merging](#)

Related source package recipes

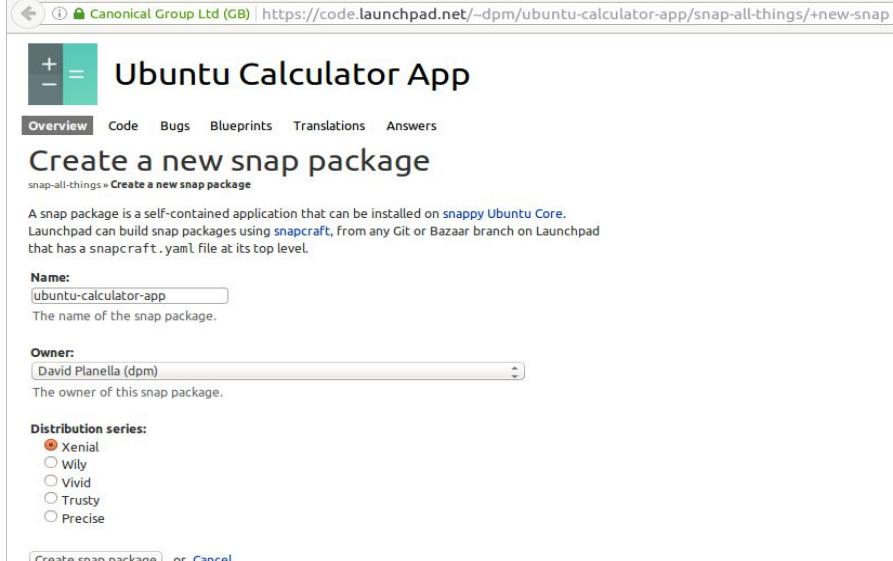
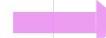
No recipes using this branch. [?](#)

[Create packaging recipe](#)

Related snap packages

1 snap package using this branch.

[Create snap package](#)



Canonical Group Ltd (GB) | https://code.launchpad.net/~dpm/ubuntu-calculator-app/snap-all-things/+new-snap

Ubuntu Calculator App

Overview Code Bugs Blueprints Translations Answers

Create a new snap package

lp:~dpm/ubuntu-calculator-app/snap-all-things » [Create a new snap package](#)

A snap package is a self-contained application that can be installed on [snappy Ubuntu Core](#). Launchpad can build snap packages using [snapcraft](#), from any Git or Bazaar branch on Launchpad that has a `snapcraft.yaml` file at its top level.

Name: The name of the snap package.

Owner: The owner of this snap package.

Distribution series:

Xenial
 Wily
 Vivid
 Trusty
 Precise

[Create snap package](#) or [Cancel](#)

近期活动



2017 年 9 月 1 日 14:00~17:00
深圳 · 南山 · 南京产学研 A 区 5 楼

Snap Your IoT Device on Ubuntu

从云端到智能硬件，看 OrangePi、CrazyPi、UCrobotics
如何玩转嵌入式开发？

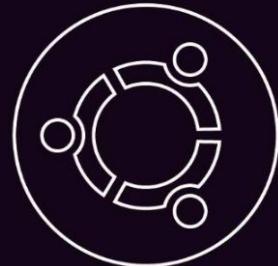
主办方：ubuntu®

协办 / 支持： shenzhenware | 深圳湾  ACT Lab 深智实验室



立即参与

<https://www.shenzhenware.com/events/1047030532>



ubuntu jam

黑客松大赛

2017年9月9日-10日 江苏如皋

Jamming with Ubuntu 2017
用开源技术打造物联网应用

主办方：如皋开源空间

承办方：Ubuntu

赞助商： 威控直博 趣之科技



<http://www.huodongxing.com/event/239810979480>

参加黑客松微信群



Ubuntu官方微博



Ubuntu官方微信



其他英文资源

- **Ask a question on Ask Ubuntu**
 - If you're stuck on a problem, someone else has probably encountered it too and they can help you. Take a look at the "ubuntu-core" tag on Ask Ubuntu or [ask a question](#).
- **Join our real time chat (#snappy on freenode.net)**
 - Share your projects and ask other developers for support. This high-bandwidth IRC channel is a good place when you are looking [for a quick answer](#) to a single question.
- **For app developers**
 - Reach out to other snap developers by using the "[snapcraft](#)" tag on Ask Ubuntu, join the [snapcraft mailing list](#) and make sure to join the [Ubuntu App Developers Google+](#) community.
- **Snapcraft.io forums**
 - This is the place where snap users, contributors and developers get together. We are a multi-distribution team of enthusiasts and professionals that want to improve the way software is distributed and used in Linux systems. <https://forum.snapcraft.io/>

Thank you



Rex Tsai

[http://weibo.com/chihchun/
rex.tsai@canonical.com](http://weibo.com/chihchun/rex.tsai@canonical.com)

ubuntu