

# Linux Snaps Lab

## By Michael Ambeguia

**Purpose:** The purpose of this lab is to gain hands-on experience working with Linux Snaps. Snaps are software packages that are controlled by Canonical, the company behind Ubuntu. Snaps are different from regular Linux packages that you get from a repository in that they are containerized applications that are distribution independent. Snaps are useful for Linux since they allow Linux users to have access to software that was previously unavailable on Linux devices. Snaps also allow users to have greater control over the security of software packages and versioning as well. In this lab I will explore what makes Snaps different from regular packages, the basics of working with Snaps, and finally how to do some advanced tasks with Snaps.

### Sections:

1. Introduction to Snaps
2. Installing and Managing Snaps
3. Advanced Snap features

### Section #1 Introduction to Snaps:

#### 1.1 What are Snaps?

Snaps are applications that are in a packaging format that are self-contained and sandboxed, come with all needed dependencies, are updated automatically, allow for versioning, and lastly they are cross-platform.

Self-Contained	They are sandboxed applications that only have access to system resources that are granted to them.
Comes with all dependencies	Snap packages are bundled with all the necessary software libraries and dependencies needed to run
Automatic updates	The Snapd daemon checks for updates daily in the background if the system is on and the Snap is not being used. The updates typically

	install the latest stable version of the Snap.
Versioning	You can move between different Snap versions. Snap packages are assigned a revision number and you can use that number to change the version of a Snap you are using. This is a great feature if a newer version has features you don't like or you need to use an older version for compatibility issues.
Cross-Platform	Snaps can be installed across Linux distributions. Due to the fact that they are packaged with all dependencies Snaps are the same on all distributions.

## 1.2 How are Snaps different from regular package managers like apt and yum?

Snaps	Traditional Package Managers
1. Automatic updates -The Snapd daemon automatically updates packages without user intervention.	1. Manual Updates - APT, YUM and other regular package managers are not related to any daemons/ services so updates require user intervention. Updates can only be automated via scripts.
2. Snaps contain all the dependencies	2. Traditional package managers require dependencies.
3. Snaps can work across various Linux distributions without changes. There is only one Snap store.	3. Traditional package managers are distribution specific. Packages have to be created for a specific distribution.
4. Snaps are restricted due to their sandboxed nature.	4. Traditional packages are less restricted.
5. Snaps are slower since they are containerized. When you start a Snap application it needs to be mounted to the system.	5. Traditional packages are considerably faster than Snaps since they can be started almost automatically once they are called.

6. Snaps have channels and versioning. Snaps can be easily converted to an older version or a different channel.

7. Changing a package version will be more difficult with regular packages.

## Section #2 Installing and Managing Snaps:

### 2.1 Search for Snaps:

To search for Snaps you can use the snap find command.

```
spy2@Laptop:~$ snap find video
Name                Version            Publisher          Notes    Summary
video               0.0.1             diginow            -        video
video-trimmer       0.8.2             soumyadghosh👉     -        Trim videos quickly
video-downloader    0.12.21           unrud              -        Download web videos
videobug-server     0.0.15            artpar             -        Time travel debugger for java
videos349           1.10.0            bankole7782        -        A simple video editor.
video-kiosk         0.1               ogra               -        A simple videoplayer kiosk snap using
XWayland
videocap            0.2               nsg                -        Listen RTSP cameras and analyze the v
ideo
vlc                 3.0.20-1-g2617de71b6 videolan✓          -        The ultimate media player
zoom-client         6.2.3.2056         ogra               -        ZOOM Cloud Meetings
spotify             1.2.52.442.g01893f92 spotify✓           -        Music for everyone
wekan               6.09              xet7               -        Open-Source kanban
plexmediaserver     1.41.3.9314-a0bfb8370 plexinc✓          -        Your media on all your devices.
rocketchat-server   7.0.0             rocketchat✓        -        Rocket.Chat server
```

You can search for Snaps by using a term. For instance I searched for snaps that are related to videos. On the Snapcraft website they provide a list of sections that can be used with snap find.

### Section categories

Typing `snap find` without any arguments will return a list of suggested snaps and those suggestions can also be limited to a category with an additional `--section=` argument. The following section names are valid:

art-and-design	books-and-reference	development	devices-and-iot
education	entertainment	featured	finance
games	health-and-fitness	music-and-audio	news-and-weather
personalisation	photo-and-video	productivity	science
security	server-and-cloud	social	utilities

So now I will search for Snaps related to the server-and-cloud section.

```

spy2@Laptop:~$ snap find --section=server-and-cloud

```

Name	Version	Publisher	Notes	Summary
microk8s	v1.31.3	canonical✓	classic	Kubernetes for workstations and appl
nextcloud	30.0.4snap1	nextcloud✓	-	Nextcloud Server - A safe home for a
docker	27.2.0	canonical✓	-	Docker container runtime
google-cloud-sdk	506.0.0	google-cloud-sdk✓	classic	Google Cloud SDK
canonical-livepatch	10.9.0	canonical✓	-	Canonical Livepatch Client
rocketchat-server	7.0.0	rocketchat✓	-	Rocket.Chat server
lxd	5.21.2-084c8c8	canonical✓	-	LXD - container and VM manager
mosquitto	2.0.20	mosquitto✓	-	Eclipse Mosquitto MQTT broker
sabnzbd	4.5.0-develop	safihre	-	SABnzbd
doctl	v1.120.2	digitalocean✓	-	The official DigitalOcean command li

Now I will look for Snaps related to security.

```

spy2@Laptop:~$ snap find --section=security

```

Name	Version	Publisher	Notes	Summary
canonical-livepatch	10.9.0	canonical✓	-	Canonical Livepatch Client
keepassxc	2.7.8	keepassxreboot	-	Community-driven port of the
Windows application "KeePass Password Safe"				
bitwarden	2024.12.1	bitwarden✓	-	Bitwarden
nmap	7.95	maxiberta👉	-	A free and open source utili
ty for network discovery and security auditing				
ufw	0.36.2	canonical✓	-	ufw - Uncomplicated Firewall
john-the-ripper	roll+f9fedd2	claudioandre-br	-	Password security auditing a
nd recovery tool				
zapproxy	2.15.0	psiinon	classic	ZAP, a tool for finding vuln
erabilities in web applications				
ngrok	3.18.4	ngrok-publisher	-	ngrok is the programmable ne
etwork edge that adds connectivity, security, and observability				
vault	1.17.6	canonical✓	-	Vault is a tool for securely
accessing secrets.				
1password	8.10.56	1password✓	-	1Password - Password Manager
and Secure Wallet				

## 2.2 Install a Snap:

Now I will install a Snap. I want to install Nmap which is an open source network port and vulnerability scanner. To install a snap you have to use the `snap install [snap name]`.

```

spy2@Laptop:~$ sudo snap install "nmap"
[sudo] password for spy2:
Sorry, try again.
[sudo] password for spy2:
nmap 7.95 from Maximiliano Bertacchini (maxiberta👉) installed
spy2@Laptop:~$

```

Nmap should be installed now!

## 2.3 List all Snaps installed on your system:

You might be curious to see what Snaps are installed on your system. In order to view installed Snaps you can use the following command: `snap list`.

Snap list with no options or flags only shows Snaps that are actually installed and enabled.

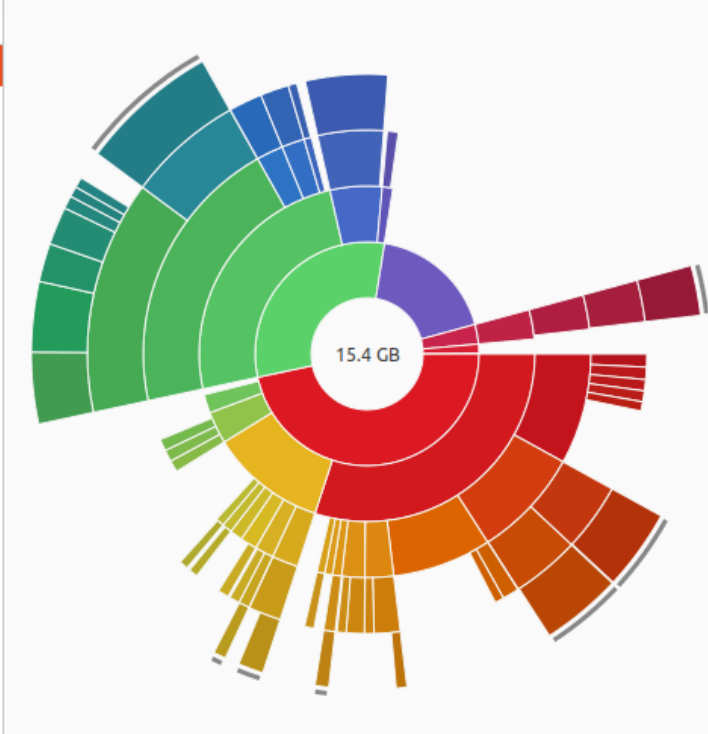
```
spy2@Laptop:~$ snap list
Name                Version      Rev    Tracking      Publisher    Notes
bare                1.0         5      latest/stable canonical✓    base
canonical-livepatch 10.9.0      286    latest/stable canonical✓    -
core22              20241119    1722   latest/stable canonical✓    base
core24              20240920    609    latest/stable canonical✓    base
firefox             131.0-1     5014   latest/stable mozilla✓      -
gnome-42-2204       0+git.510a601 176    latest/stable canonical✓    -
gtk-common-themes   0.1-81-g442e511 1535   latest/stable canonical✓    -
nmap                7.95        3582   latest/stable maxiberta👉  -
snap-store          41.3-72-g80e7130 1216   latest/stable canonical✓    -
snapd               2.67        23545  latest/stable canonical✓    snapd
snapd-desktop-integration 0.9         253    latest/stable canonical✓    -
spy2@Laptop:~$
```

To view snaps that are disabled you can use `snap list --all`. Knowing what Snaps are disabled is a vital system management task since disabled snaps take up disk space on your Linux device.

```
spy2@Laptop:~$ snap list --all
Name                Version      Rev    Tracking      Publisher    Notes
bare                1.0         5      latest/stable canonical✓    base
canonical-livepatch 10.9.0      286    latest/stable canonical✓    -
core22              20240904    1621   latest/stable canonical✓    base,disabled
core22              20241119    1722   latest/stable canonical✓    base
core24              20240920    609    latest/stable canonical✓    base
firefox             129.0-2     4698   latest/stable mozilla✓      disabled
firefox             131.0-1     5014   latest/stable mozilla✓      -
gnome-42-2204       0+git.ff35a85 141    latest/stable canonical✓    disabled
gnome-42-2204       0+git.510a601 176    latest/stable canonical✓    -
gtk-common-themes   0.1-81-g442e511 1535   latest/stable canonical✓    -
nmap                7.95        3582   latest/stable maxiberta👉  -
snap-store          41.3-77-g7dc86c8 1113   latest/stable canonical✓    disabled
snap-store          41.3-72-g80e7130 1216   latest/stable canonical✓    -
snapd               2.66.1      23258  latest/stable canonical✓    snapd,disabled
snapd               2.67        23545  latest/stable canonical✓    snapd
snapd-desktop-integration 0.9         178    latest/stable canonical✓    disabled
snapd-desktop-integration 0.9         253    latest/stable canonical✓    -
spy2@Laptop:~$
```

See how I have many disabled Snaps. These disabled snaps can take up a significant amount of disk space.

<b>Laptop</b>	15.4 GB	274723 items	Today
> <b>usr</b>	7.2 GB	249562 items	18 days
✓ <b>var</b>	4.8 GB	13834 items	Today
✓ <b>lib</b>	3.8 GB	12940 items	Today
✓ <b>snaped</b>	3.1 GB	324 items	Today
> <b>snaps</b>	2.1 GB	19 items	Today
> <b>seed</b>	1.0 GB	23 items	10 months
> <b>apparmor</b>	1.6 MB	34 items	Today
> <b>seccomp</b>	557.1 kB	57 items	Today
> <b>assertions</b>	442.4 kB	108 items	Today
> <b>state.json</b>	127.0 kB	0 items	Today
> <b>desktop</b>	77.8 kB	11 items	30 days
> <b>mount</b>	69.6 kB	8 items	Today
> <b>sequence</b>	53.2 kB	12 items	Today
> <b>cgroup</b>	49.2 kB	12 items	Today
> <b>lib</b>	20.5 kB	5 items	10 months
> <b>device</b>	12.3 kB	3 items	10 months
> <b>dbus-1</b>	12.3 kB	3 items	10 months



Snaps take up around 2.1 GBs of disk space on my Ubuntu Desktop VM. Not all of these Snaps are even enabled and being used!

## 2.4 Remove a Snap

I will remove some of these disabled Snaps to regain some disk space. To remove snaps you can use the `snap remove`. There is just one thing to note. Snaps will save some data upon removal just in case if you want to reinstall the Snap later on. If you don't want a snapshot of the data you can use the `-purge` option.

```
spy2@Laptop:~$ snap list --all
Name                Version      Rev   Tracking      Publisher    Notes
bare                1.0         5     latest/stable canonical✓    base
canonical-livepatch 10.9.0      286   latest/stable canonical✓    -
core22              20240904    1621  latest/stable canonical✓    base,disabled
core22              20241119    1722  latest/stable canonical✓    base
core24              20240920    609   latest/stable canonical✓    base
firefox             131.0-1     5014  latest/stable mozilla✓      -
firefox             129.0-2     4698  latest/stable mozilla✓      disabled
gnome-42-2204       0+git.510a601 176   latest/stable canonical✓    -
gnome-42-2204       0+git.ff35a85 141   latest/stable canonical✓    disabled
gtk-common-themes   0.1-81-g442e511 1535 latest/stable canonical✓    -
nmap                7.95        3582  latest/stable maxiberta✶   -
snap-store          41.3-77-g7dc86c8 1113 latest/stable canonical✓    disabled
snap-store          41.3-72-g80e7130 1216 latest/stable canonical✓    -
snapd               2.66.1      23258 latest/stable canonical✓    snapd,disabled
snapd               2.67        23545 latest/stable canonical✓    snapd
snapd-desktop-integration 0.9        178   latest/stable canonical✓    disabled
snapd-desktop-integration 0.9        253   latest/stable canonical✓    -
spy2@Laptop:~$
```

I will remove core22 revision 1621. I will also remove snap-store revision 1113 and firefox revision 4698.

```
spy2@Laptop:~$ sudo snap remove firefox --revision 4698
[sudo] password for spy2:
firefox (revision 4698) removed
spy2@Laptop:~$ sudo snap remove snap-store --revision 1113 --purge
snap-store (revision 1113) removed
spy2@Laptop:~$ sudo snap remove core22 --revision 1621,609 --purge
error: cannot decode request body into snap instruction: invalid snap revision: "\"1621,609\""
spy2@Laptop:~$ sudo snap remove core22 --revision 1621 --purge
core22 (revision 1621) removed
```

Now it is time to verify.

```
spy2@Laptop:~$ snap list --all
Name                Version      Rev   Tracking      Publisher      Notes
bare                1.0          5     latest/stable canonical✓      base
canonical-livepatch 10.9.0       286   latest/stable canonical✓      -
core22              20241119     1722  latest/stable canonical✓      base
core24              20240920     609   latest/stable canonical✓      base
firefox             131.0-1      5014  latest/stable/... mozilla✓       -
gnome-42-2204       0+git.510a601 176   latest/stable/... canonical✓     -
gnome-42-2204       0+git.ff35a85 141   latest/stable/... canonical✓     disabled
gtk-common-themes   0.1-81-g442e511 1535  latest/stable/... canonical✓     -
nmap                7.95         3582  latest/stable maxiberta🌟    -
snap-store          41.3-72-g80e7130 1216  latest/stable/... canonical✓     -
snapd               2.66.1       23258 latest/stable canonical✓      snapd,disabled
snapd               2.67         23545 latest/stable canonical✓      snapd
snapd-desktop-integration 0.9          253   latest/stable/... canonical✓     -
snapd-desktop-integration 0.9          178   latest/stable/... canonical✓     disabled
spy2@Laptop:~$
```

They are gone! Removing disabled snaps can be tedious so using a bash script would be helpful.

```
GNU nano 6.2                                snap_cleanup.sh
#!/bin/bash

#Script to remove disabled snaps.
#Must be ran as sudo or root! Also must be ran in the directory where the script is located so script can read
# .txt file created.

#Part #1 Display all the snaps that are disabled and send the output to disabled_snaps.txt

snap list --all | awk '/disabled/ {print $1,$3}' > disabled_snaps.txt

#Part #2 Use a while loop to read the contents of disabled_snaps.txt. The first column will be assign to the variable
# snap_name and the second column will be assigned to the variable revision_number. Then these variables will be used
# as parameters for snap remove [snap_name] --revision [revision_number]

cat "disabled_snaps.txt" | while read snapname revisionnumber;
do
    snap remove "$snapname" --revision="$revisionnumber"
done
```

^G Help	^O Write Out	^W Where Is	^K Cut	^T Execute	^C Location	M-U Undo	M-A Set Mark
^X Exit	^R Read File	^_ Replace	^U Paste	^J Justify	^_ Go To Line	M-E Redo	M-6 Copy

As always, bash scripts need execute permissions to work.

```
spy2@Laptop:~$ chmod +x snap_cleanup.sh
spy2@Laptop:~$
```

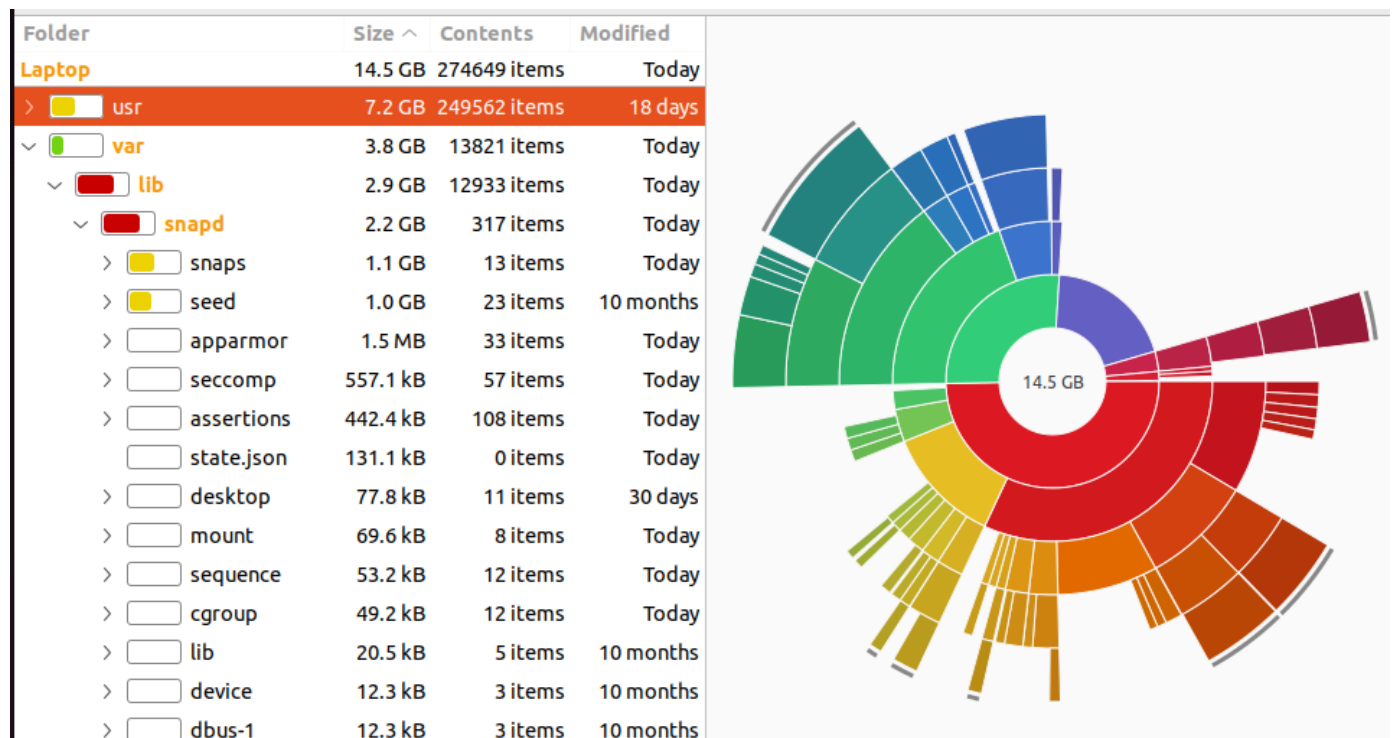
Now I will test it!

```
spy2@Laptop:~$ sudo ./snap_cleanup.sh
gnome-42-2204 (revision 141) removed

snapd (revision 23258) removed
snapd-desktop-integration (revision 178) removed
spy2@Laptop:~$
```

The bash script worked! What a convenient way to clean up disabled Snaps! I was able to get about 1 GB of data back!





Now only enabled snaps are present.

## 2.5 Enable and disable Snaps

Sometimes you might not want to use a specific version of a Snap or you simply stopped using a specific Snap. In these cases you can disable the Snap so that it will not be used.

```

spy2@Laptop:~$ sudo snap disable "nmap"
[sudo] password for spy2:
nmap disabled
spy2@Laptop:~$ snap list -all
error: unknown flag 'a'
spy2@Laptop:~$ sudo snap list --all
Name                Version      Rev    Tracking      Publisher    Notes
bare                 1.0          5      latest/stable canonical✓    base
canonical-livepatch 10.9.0       286    latest/stable canonical✓    -
core22               20241119    1722   latest/stable canonical✓    base
core24               20240920    609    latest/stable canonical✓    base
firefox              131.0-1     5014   latest/stable mozilla✓      -
gnome-42-2204        0+git.510a601 176    latest/stable canonical✓    -
gtk-common-themes    0.1-81-g442e511 1535   latest/stable canonical✓    -
nmap                 7.95        3582   latest/stable maxiberta👹   disabled
snap-store           41.3-72-g80e7130 1216   latest/stable canonical✓    -
snapd                2.67        23545  latest/stable canonical✓    snapd
snapd-desktop-integration 0.9         253    latest/stable canonical✓    -
spy2@Laptop:~$

```

I disabled Nmap. Now I will enable it once again.

```

spy2@Laptop:~$ sudo snap enable "nmap"
nmap enabled
spy2@Laptop:~$ snap list --all

```

Name	Version	Rev	Tracking	Publisher	Notes
bare	1.0	5	latest/stable	canonical✓	base
canonical-livepatch	10.9.0	286	latest/stable	canonical✓	-
core22	20241119	1722	latest/stable	canonical✓	base
core24	20240920	609	latest/stable	canonical✓	base
firefox	131.0-1	5014	latest/stable/...	mozilla✓	-
gnome-42-2204	0+git.510a601	176	latest/stable/...	canonical✓	-
gtk-common-themes	0.1-81-g442e511	1535	latest/stable/...	canonical✓	-
nmap	7.95	3582	latest/stable	maxiberta🌟	-
snap-store	41.3-72-g80e7130	1216	latest/stable/...	canonical✓	-
snappd	2.67	23545	latest/stable	canonical✓	snappd
snappd-desktop-integration	0.9	253	latest/stable/...	canonical✓	-

## Section #3 Advanced Snap features:

### 3.1 Work with Snap channels:

Still working with Nmap, using the `snap info nmap` command I am able to see the different channels available for use with Nmap.

```

channels:
  latest/stable: 7.95 2024-09-16 (3582) 10MB -
  latest/candidate: 7.95 2024-09-13 (3582) 10MB -
  latest/beta: ↑
  latest/edge: 7.95-195-g3584adf32 2025-01-06 (3831) 12MB -
  installed: 7.95 (3582) 10MB -

```

I already have Nmap installed so in order to switch the channel I need to use the `snap refresh` command.

```

spy2@Laptop:~$ sudo snap refresh nmap --channel=latest/edge
Fetch and check assertions for snap "nmap" (3831)

```

The new channel is installed. An edge channel is too risky so I will switch it back to `latest/stable`.

```

refresh-date: today at 10:50 PST
channels:
  latest/stable:    7.95                2024-09-16 (3582) 10MB -
  latest/candidate: 7.95                2024-09-13 (3582) 10MB -
  latest/beta:      ↑
  latest/edge:      7.95-195-g3584adf32 2025-01-06 (3831) 12MB -
installed:         7.95-195-g3584adf32 (3831) 12MB -

```

```

spy2@Laptop:~$ snap list --all
Name                Version      Rev    Tracking      Publisher      Notes
bare                1.0          5       latest/stable  canonical✓     base
canonical-livepatch 10.9.0       286     latest/stable  canonical✓     -
core22              20241119     1722    latest/stable  canonical✓     base
core24              20241119     716     latest/stable  canonical✓     base
core24              20240920     609     latest/stable  canonical✓     base,disabled
firefox             131.0-1      5014    latest/stable/... mozilla✓       -
gnome-42-2204       0+git.510a601 176     latest/stable/... canonical✓     -
gtk-common-themes   0.1-81-g442e511 1535    latest/stable/... canonical✓     -
nmap                7.95         3582    latest/stable  maxiberta👉    -
nmap                7.95-195-g3584adf32 3831    latest/stable  maxiberta👉    disabled
snap-store          41.3-72-g80e7130 1216    latest/stable/... canonical✓     -
snapd               2.67         23545   latest/stable  canonical✓     snapd
snapd-desktop-integration 0.9          253     latest/stable/... canonical✓     -

```

### 3.2 Work with Snap interfaces/ connections ( Snap permissions):

Snaps are able to access system resources such as hardware and files through the use of interfaces, plugs, and slots. A Snap interface is basically a permission category. Snap plugs are the specific permission that you want a Snap to have. Snap slots are what you attach a plug to. It can be a bit confusing but the main thing to remember is that you connect plugs to slots. **You never work with the interfaces only with plugs!**

To see what interfaces, plugs, and slots are available for a snap package you can use the snap connect command.

```
spy2@Laptop:~$ sudo snap connections vlc
```

Interface	Plug	Slot	Notes
audio-playback	vlc:audio-playback	:audio-playback	-
audio-record	vlc:audio-record	-	-
avahi-control	vlc:avahi-control	-	-
camera	vlc:camera	-	-
desktop	vlc:desktop	:desktop	-
desktop-legacy	vlc:desktop-legacy	:desktop-legacy	-
dvb	vlc:dvb	-	-
home	vlc:home	:home	-
jack1	vlc:jack1	-	-
mount-observe	vlc:mount-observe	-	-
mpri	-	vlc:mpri	-
network	vlc:network	:network	-
network-bind	vlc:network-bind	:network-bind	-
opengl	vlc:opengl	:opengl	-
optical-drive	vlc:optical-drive	:optical-drive	-
pulseaudio	vlc:pulseaudio	:pulseaudio	-
removable-media	vlc:removable-media	:removable-media	-
screen-inhibit-control	vlc:screen-inhibit-control	:screen-inhibit-control	-
unity7	vlc:unity7	:unity7	-
x11	vlc:x11	:x11	-

```
spy2@Laptop:~$
```

I will configure the camera interface to work for VLC:

```
spy2@Laptop:~$ sudo snap connect vlc:camera
```

```
spy2@Laptop:~$ sudo snap connections vlc
```

Interface	Plug	Slot	Notes
audio-playback	vlc:audio-playback	:audio-playback	-
audio-record	vlc:audio-record	-	-
avahi-control	vlc:avahi-control	-	-
camera	vlc:camera	:camera	manual
desktop	vlc:desktop	:desktop	-
desktop-legacy	vlc:desktop-legacy	:desktop-legacy	-
dvb	vlc:dvb	-	-
home	vlc:home	:home	-
jack1	vlc:jack1	-	-
mount-observe	vlc:mount-observe	-	-
mpri	-	vlc:mpri	-
network	vlc:network	:network	-
network-bind	vlc:network-bind	:network-bind	-
opengl	vlc:opengl	:opengl	-
optical-drive	vlc:optical-drive	:optical-drive	-
pulseaudio	vlc:pulseaudio	:pulseaudio	-
removable-media	vlc:removable-media	:removable-media	-
screen-inhibit-control	vlc:screen-inhibit-control	:screen-inhibit-control	-
unity7	vlc:unity7	:unity7	-
x11	vlc:x11	:x11	-

```
spy2@Laptop:~$
```

Note that I used the name of the plug (vlc:camera) not the name of the interface. Also I did not have to specify a slot since the slot will be occupied by the vlc:camera plug once it is connected.

Now I will disconnect the camera interface:

```
spy2@Laptop:~$ sudo snap disconnect vlc:camera
```

```
spy2@Laptop:~$ sudo snap connections vlc
```

Interface	Plug	Slot	Notes
audio-playback	vlc:audio-playback	:audio-playback	-
audio-record	vlc:audio-record	-	-
avahi-control	vlc:avahi-control	-	-
camera	vlc:camera	-	-
desktop	vlc:desktop	:desktop	-
desktop-legacy	vlc:desktop-legacy	:desktop-legacy	-
dvb	vlc:dvb	-	-
home	vlc:home	:home	-
jack1	vlc:jack1	-	-
mount-observe	vlc:mount-observe	-	-
mpris	-	vlc:mpris	-
network	vlc:network	:network	-
network-bind	vlc:network-bind	:network-bind	-
opengl	vlc:opengl	:opengl	-
optical-drive	vlc:optical-drive	:optical-drive	-
pulseaudio	vlc:pulseaudio	:pulseaudio	-
removable-media	vlc:removable-media	:removable-media	-
screen-inhibit-control	vlc:screen-inhibit-control	:screen-inhibit-control	-
unity7	vlc:unity7	:unity7	-
x11	vlc:x11	:x11	-