

# **KWorkflow:**

## **Mix & Match Kernel Recipes End-to\_end**

Melissa Wen

**Kernel Recipes - September 22, 2025 - Paris, France**



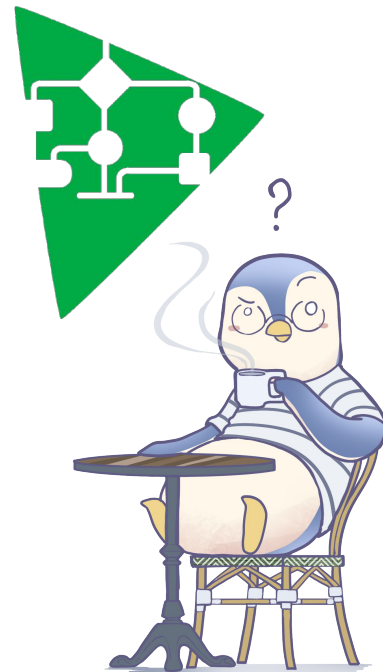
# Let me introduce myself



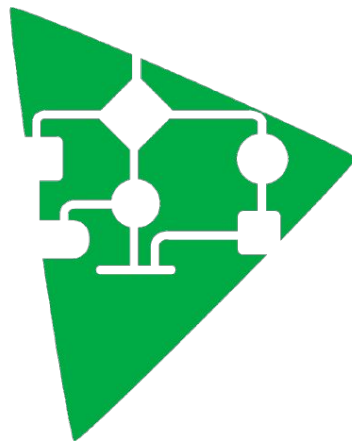
- Work for Igalia on GPU drivers in the DRM subsystem:
  - Co-maintained vkms and v3d drivers
  - Now on AMD display driver like the one in the Steam Deck
- Mentoring in Outreachy, Google Summer of Code and Igalia Coding Experience
- Improving documentation and tools



**...and what's  
this cookbook  
called  
KWorkflow?**



# Kworkflow (kw)



- ❑ Created by Rodrigo Siqueira
- ❑ Single platform combining software and tools to:
  - optimize your kernel development workflow;
  - reduce time spent on repetitive tasks;
  - standardize best practices;
  - ensure that deployment data flows smoothly between different kernel workflows.



# Kworkflow

## The Kernel Workflow Cookbook

# Mostly a voluntary work #

# Real-world recipes for kernel developer needs #



# Mix & Match

The daily life of a typical kernel developer  
+  
Kernel workflow recipes  
+  
Secret sauces



**Let's prepare our  
first recipe:**

# **A Good GPU Driver for my AMD laptop**

**AMD** 

x86 remote



# Ingredients and Tools

Check what you already have at home



# Ingredients and Tools

- **`kw device`**: get information about the target device
- **`kw remote`**: set the address of target machine



```
melissawen:linux(master) [AMD_LAPTOP]$
```

# Ingredients and Tools

- **`kw device`**: get information about the target device
- **`kw remote`**: set the address of target machine
- **`kw config`**: select the tools that kw will use



```
melissawen:linux(master)[AMD_LAPTOP]$ kw confi
```

# Ingredients and Tools

- ❑ **`kw device`**: get information about the target device
- ❑ **`kw remote`**: set the address of target machine
- ❑ **`kw config`**: select the tools that kw will use
- ❑ **`kw kernel-config-manager`**:  
get the shopping list (.config file)



```
melissawen:linux(master)[AMD_LAPTOP]$ kw kernel-config-manager --list
```

# List of .config files managed by kw

| Name            | Description                                     | Last updated        |
|-----------------|---|---------------------|
| amd_no_dcn      |   | 2023-06-06 12:26:34 |
| std_dcn_config  |   | 2023-06-06 12:26:34 |
| rpi5            |   | 2025-09-12 16:00:24 |
| steam_deck_oled | upstream kernels for steamOS on Deck OLED       | 2025-09-15 16:34:54 |
| rpi4            | upstream kernels for Raspbian on Raspberry Pi 4 | 2025-09-15 16:38:52 |
| i915_laptop     | kernel for Debian on my X1 laptop               | 2025-09-15 16:40:51 |

```
melissawen:linux(master)[AMD_LAPTOP]$
```

# Preparation



# Preparation

- **Step 1:** Mix the ingredients with `'kw build'`



```
melissawen:linux(master) [AMD_LAPTOP]$
```

# Preparation

- **Step 1:** Mix the ingredients with ``kw build``
- **Step 2:** Bake it with ``kw deploy``



```
melissawen:linux(master)[AMD_LAPTOP]$
```

# Preparation

- **Step 1:** Mix the ingredients with ``kw build``
- **Step 2:** Bake it with ``kw deploy``
- **Step 3:** Time to taste! Use ``kw debug``



```
melissawen:linux(master)[AMD_LAPTOP]$ kw debug --dmesg --history
```

# Cooking Problems

If your custom kernel doesn't taste good,  
you can search the internet to make it  
taste better with ``kw patch-hub``

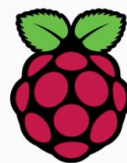


```
melissawen:linux(master) [AMD_LAPTOP]$
```

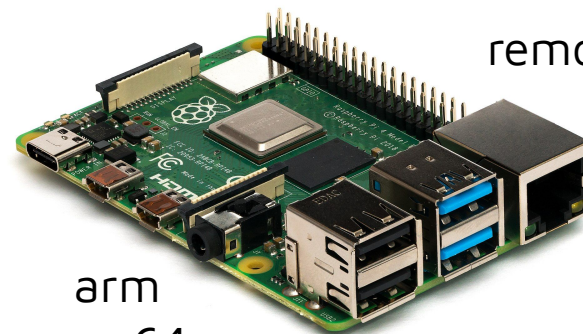
```
melissawen:linux(master) [AMD_LAPTOP]$
```

# Second Recipe:

## Raspberry Pi 4 with Upstream Kernel



Raspberry Pi OS



remote

arm  
arm64



# Ingredients and Tools



# ~~Ingredients and Tools~~

``kw env``: Change scenarios as in a TV show



```
melissawen:linux(master)[AMD_LAPTOP]$ kw device
```

Remote device

Chassis:

Type:

CPU:

Model: AMD Ryzen 7 5800U with Radeon Graphics

Architecture: x86\_64

Max frequency (MHz): 4508.0859

Min frequency (MHz): 407.3580

RAM:

Total RAM: 15G

Storage devices:

Root filesystem: /dev/mapper/debian-db--root

Size: 46G

Mounted on: /

Operating System:

Distribution: Debian GNU/Linux

Desktop environments: gnome

Kernel:

Name: Linux

Release: 6.17.0-rc6+

Version: #25 SMP PREEMPT\_DYNAMIC Fri Sep 19 17:38:14 -03 2025

Machine hardware name: x86\_64

Motherboard:

Vendor: HP

Name: 8929

GPU:

Model: Sandisk Corp WD Blue SN550 NVMe SSD

Provider: Sandisk Corp SanDisk Ultra 3D / WD PC SN530, IX SN530, Blue SN550 NVMe SSD

Model: Hewlett-Packard Company Device 8929

Provider: Advanced Micro Devices, Inc.

```
melissawen:linux(master)[AMD_LAPTOP]$ █
```

``kw init --template`:`  
**the mirepoix is ready!**



```
melissawen:linux(master) [AMD_LAPTOP]$
```

```
LD [M] net/dsa/dsa_core.ko
LD [M] net/dsa/tag_brcm.ko
LD [M] net/dsa/tag_none.ko
LD [M] net/dsa/tag_ocelot.ko
LD [M] net/dsa/tag_ocelot_8021q.ko
LD [M] net/8021q/8021q.ko
LD [M] net/wireless/cfg80211.ko
LD [M] net/llc/llc.ko
LD [M] net/bridge/bridge.ko
LD [M] net/bridge/br_netfilter.ko
LD [M] net/can/can.ko
LD [M] net/can/can-raw.ko
LD [M] net/can/can-bcm.ko
LD [M] net/can/can-gw.ko
LD [M] net/bluetooth/bluetooth.ko
LD [M] net/bluetooth/hidp/hidp.ko
LD [M] net/mac80211/mac80211.ko
LD [M] net/rfkill/rfkill.ko
LD [M] net/rfkill/rfkill-gpio.ko
LD [M] net/nfc/nfc.ko
LD [M] net/nfc/nci/nci.ko
LD [M] net/hsr/hsr.ko
LD [M] net/qrtr/qrtr.ko
LD [M] net/qrtr/qrtr-smd.ko
LD [M] net/qrtr/qrtr-tun.ko
LD [M] net/qrtr/qrtr-mhi.ko
make[1]: Leaving directory '/home/melissawen/.cache/kw/envs/L2hvbWUvbWVsaxNzYXdlbi9saW5leC1kZXlva2VybmVsLW1haW5saW5lL2xpbnV4/RPI_64_V2'
-> Execution time: 00:25:35
It looks like that 'strip_modules_debug_option' is set 'no' in the kworkflow.config, and you have the CONFIG_DEBUG_INFO=y in your .config file, which can lead to a large initramfs and consequently boot failure like "error: out of memory". Consider enabling the strip option on kworkflow.config.
* Preparing modules
[=====>] 100%
* Sending kernel package (6.17.0-rc6-mainline+.kw.tar) to the remote
32,768 0% 0.00kB/s 0:00:00
```

# Third Recipe:

## The Mainline Kernel Ringing on my Steamdeck

x86



remote



```
melissawen:linux(master)[RPI_64]$ kw s
```

```
Linux raspberrypi 6.17.0-rc6-mainline+ #8 SMP PREEMPT Fri Sep 19 20:05:08 -03 2025 aarch64
```

The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/\*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.

Last login: Sat Sep 20 01:44:16 2025 from 192.168.31.42

root@raspberrypi:~# exit

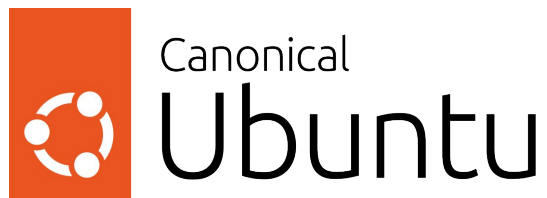
logout

Connection to 192.168.31.144 closed.

```
melissawen:linux(master)[RPI_64]$
```

# What else can kworkflow already mix & match?





**And you... do you have any  
secret recipes to share?**



# Thank You!

Know more about us:

[igalia.com](http://igalia.com)

[kworkflow.org](http://kworkflow.org)



**We are hiring!**

