

KWorkflow: Mix & Match Kernel Recipes End-to_end

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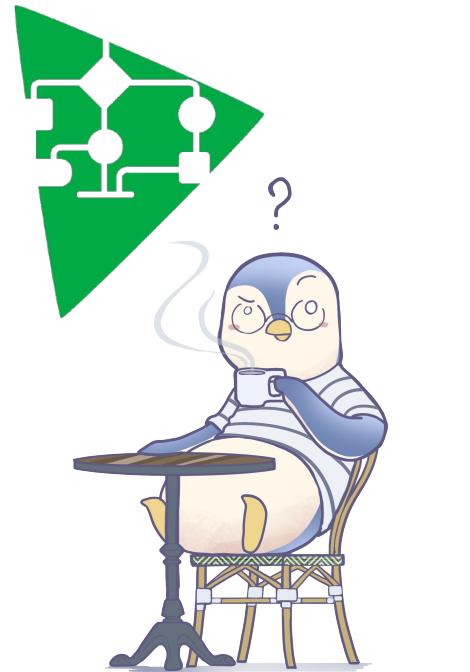
Let me introduce myself



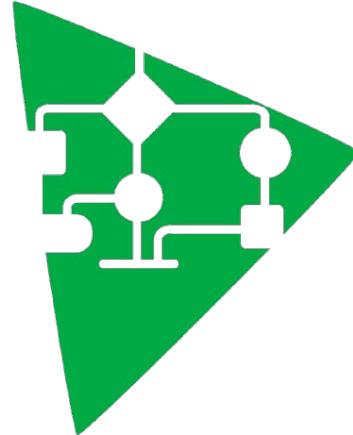
- Work for Igalia on GPU drivers in the DRM subsystem:
 - Co-maintained vkms and v3d drivers
 - Now on AMD display driver like the one in the Steam Deck
- Mentoring in Outreachy, Google Summer of Code and Igalia Coding Experience
- Improving documentation and tools



**...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**

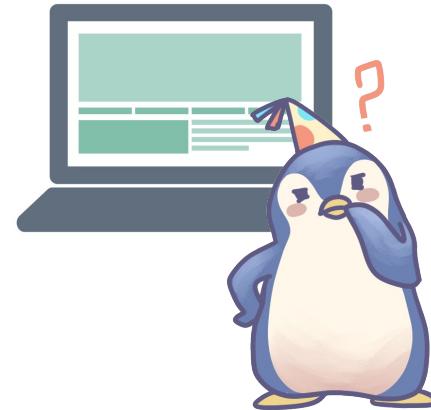


x86 remote



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 config

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

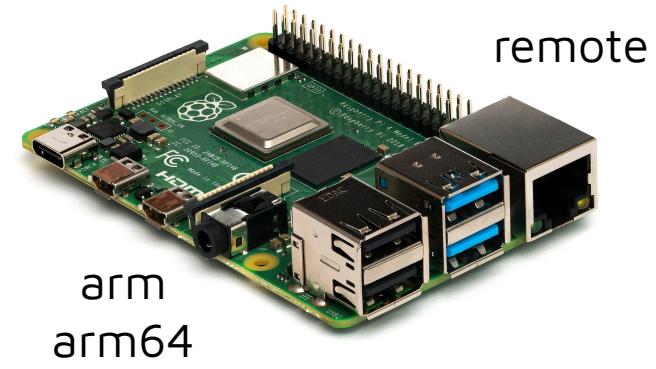
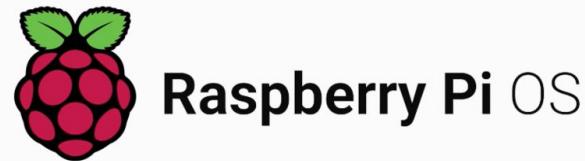
If your custom kernel doesn't taste good,
you can search the internet to make it
taste better with **`kw patch-hub`**



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

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

Second Recipe: Raspberry Pi 4 with Upstream Kernel



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/L2hvbwUvbWVsaxNzYXdlbi9saW51eC1kZXYva2VybmrVsLW1haW5saW5lL2xpbnV4/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:

x86

The Mainline Kernel Ringing on my Steamdeck



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

kworkflow.org



We are hiring!

