Welcome and thank you for joining
The panel

- David Plowman, Raspberry Pi Ltd
- Naushir Patuk, Raspberry Pi Ltd
- Dorota Czaplejewicz, Purism Inc
- Martin Kepplinger, Purism Inc
- Kate Hsuan, Red Hat Inc
- Hans de Goede, Red Hat Inc
- Daniel Scally, Linux Surface
- Benjamin Schaaf, Pinephone camera developer
- Laurent Pinchart, Ideas on Board Oy
- Kieran Bingham, Ideas on Board Oy
The format

- 5 discussion points
- .. in 50 minutes
- final Q&A session (10 minutes)

- if any interesting questions comes up during the discussion...
- ... we’ll be happy to take it, but please help me out :)
Let’s resume the discussion

Does this apply to FOSS mobile devices too?
The picture most commonly found in the smartphone of a Linux power-user
Camera and Linux mobile devices

Lot of devices: the development effort scales
Camera and Linux mobile devices

Not that many devices?
No new devices at all?
Camera and Linux mobile devices

- What is the expected set of features?
  - "just" take pictures
  - video call/video recording
  - professional photography (high end smartphone)

- is the effort of using a camera stack justified?
- entry barriers?
The librem5 and pinephone camera camera stacks

- "legacy" designs: no ISP on the SoC
- RAW and YUV sensors

- current state & future plans
- challenges
  - Debayering (GPU?)
  - 3A (statistics and algorithms)
  - formats used for preview/still capture
libcamera: the simple pipeline handler

- the (not anymore so) simple pipeline handler

- implementing a pipeline handlers is not an easy task
  - is the entry barrier too high?
pinephone pro: plans for camera support?
libcamera natively supports RK3399!
Camera applications: other use cases

- desktop (UVC) and embedded (media-controller) diverged
- what are the requirements of camera applications in other context?
The RaspberriPi camera stack

- libcamera-apps
- picamera2
Camera applications

Linux-surface: regular Linux app on complex cameras

- the camera stack
- v4l2-loopback
Camera applications

Portals, pipewire and the long term plan

Figure:
https://blogs.gnome.org/uraeus/2021/10/01/pipewire-and-fixing-the-linux-video-capture-stack/
Reusable 3A algorithms

- Implementation of an auto-focus algorithm
- Reusable 3A components
  - opportunities
  - obstacles
The pain and joy just pain of sensor drivers development

(Most) sensor drivers are based on binary blobs
- difficulties in accessing datasheet?
- difficulties in getting support from vendors?
- are all vendors equal?
The pain and joy just pain of sensor drivers development

- How did we get there?
- MIPI CCS: Camera Command Set
- Standardization of the kernel interface
- Compliance tools