



How to progress on Module identification

Linux Media Summit 2026, Nice

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The Problem

- The tuning data for a camera pipeline is dependent on the physical properties of the actual camera module like lens, and mounting positions.
- The properties are often not deducible from the hardware but still need to be specified somewhere
- Wide variety of use cases



- **Camera module with eeprom or some hardware identification method**
 - Add information in device tree on how to access that data
 - Querying that data happens in userspace as we won't be able to push the parsers into kernel space
- **Camera module with a lens but impossible to identify automatically**
 - We could add information in the device tree.
 - We like to overwrite it in userspace
- **Camera module with screw on lens**
 - Impossible to automatically detect the lens
 - Adding to dts would be useful for user who know their lens
 - Overwrite in userspace otherwise

Use cases 1/2



- **Laptop camera**
 - Sometime lens shading parameters in some eeprom?
 - Data could possibly be deduced from dmi/hwdb
- **Custom plug-and-play cameras**
 - Not officially supported in the kernel (for Mipi) but seen in the wild

Use cases 2/2



Previous work

- <https://lore.kernel.org/all/20250507081338.53614-1-sakari.ailus@linux.intel.com/>

By Sakari Ailus:

- `camera-module-canonical="vendor,model[,version]"`
 - `camera-module-casual=<id in camera module database>`
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- <https://lore.kernel.org/linux-media/20251021124121.93907-1-isaac.scott@ideasonboard.com/#r>

By Isaac Scott

- `V4L2_CID_CAMERA_MODULE_IDENTIFIER` that carries the SKU of a module



Concerns

- It will be difficult to setup and maintain the camera-module-database
- We might not know all the possible use-cases
- For single identifier might be too inflexible to handle all cases (think of the same moduls with a random screw-on lens)



Proposal

- Add string control V4L2_CID_CAMERA_MODULE_INFO
- Space separated list of tags of the form <category>:<info>
- <info> must be limited to a suitable list of characters
- Add dts entry camera-module-canonical="<list of tags>"
- This allows us to extend the scheme without breaking the kernel interface while reducing the likelihood of collisions
- Userspace can add additional tags if it knows more details



Ideas for tags

Tag	Example	Notes
m:<ModuleName>	m:vc-mipi-imx296	
v:<Vendor>	v:RaspberryPi	
l:<Lens>	l:generic-8mm-ircut	
s:<Sku>	s:B030801	
e:<how-to-query>	e:v4l2-eprom-spec-v1	Retrieve data from eeprom linked in media graph
u:<user defined>	u:stefans-selfmade-module	



Proposal

module-info: "v:RaspberryPi m:camera-module-3



module-info: "v:RaspberryPi m:camera-module-hq l:generic-8mm-wide-angle"



Q&A

- **Q:** Why isn't a single identifier sufficient?

A: The combinatory space is too big. We won't be able to create a linear list

- **Q:** How can we prevent arbitrary chaos?

A: We are free to create a list of curated entries per category but I think it will be difficult. Maybe possible for some tags like "vendors".

A2: Categories could be validated at parse time.



Discussion...

