Multiple timestamps

When not only time matter but also space

Ricardo Ribalda
ricardo@qtec.com
Applications
Today's solution

```
struct v4l2_timecode {
    __u32    type;
    __u32    flags;
    __u8     frames;
    __u8     seconds;
    __u8     minutes;
    __u8     hours;
    __u8     userbits[4];
};
```

- Encoder position is coded in userbits [4]
Does not fit every machine...
Wait a bit....

We have multiple planes!!!!

But:
- Data does not arrive at the same time
  - And latency is very important
- Not supported by many apps
- It is not part of the image
Proposal 1

New timecode alike structure with bigger size

Cons:
- Waste of space on 99.9999% of the time
- Does not solve the multiple creation time
Proposal 2

- Add new metadata structure to v4l2_buffer
- Add new ioctl VIDIOC_GMETA
- Input: Address of buffer
- Output:
  - Final size
- Blocks
  - Until meta data is ready or
  - Returns ERR when buffer is enqueued
Dead Pixel API

When pixels cost 10 cents a piece
Problem

- Software correction
- Setup hardware to auto correction
- Ignore non valid pixels/clusters
Basic approach

- New compound type V4L2_CTRL_TYPE_POINT
  - Already sent 25 July
- New control for DEAD_PIXEL
  - User can read it
  - User can write it (OPTIONAL)
  - User can restore factory settings (OPTIONAL)
Proposed helpers

- MTD access
- Data types on flash
Can we go one step further?

- Sensor Metadata
Big opportunity

- Define a de-facto standard for sensor data
- No more pdf/excel from manufacturers!!
- Global database/Sensor fingerprinting
Multiple Rectangle Cropping (v2)

When the interesting data is not contiguous
Proposed Capabilities
Last year RFC (not in upstream)

```c
struct v4l2_subdev_selection {
    __u32 pad;
    __u32 target;
    __u32 flags;
    -   struct v4l2_rect r;
    -   __u32 reserved[8];
    +   union {
    +       struct v4l2_rect r;
    +       struct v4l2_ext_rect *pr;
    +   }
    +   __u32 rectangles;
    +   __u32 reserved[7];
};

struct v4l2_ext_rect {
    __s32   left;
    __s32   top;
    __u32   width;
    __u32   height;
    __u32   reserved[4];
};
```
Lessons Learned

1) The structure had a different size… bad idea

2) Helpers are needed:
   a) Sort sections
   b) Verify sizes
   c) Verify bayer mosaic is not affected
   d) Merge consecutive sections

3) Used in production in around 100 machines
Representatives' Patch:

[RFC PATCH 00/11] Add configuration store support

What is missing?

- Helper functions
- Support for vivi
- Support for other sensors (Anyone?)
- Split configuration store patchset?
- Automatic call of ctrl code if s_selection is not implemented?