

Multiple timestamps

When not only time matter but also space

Applications

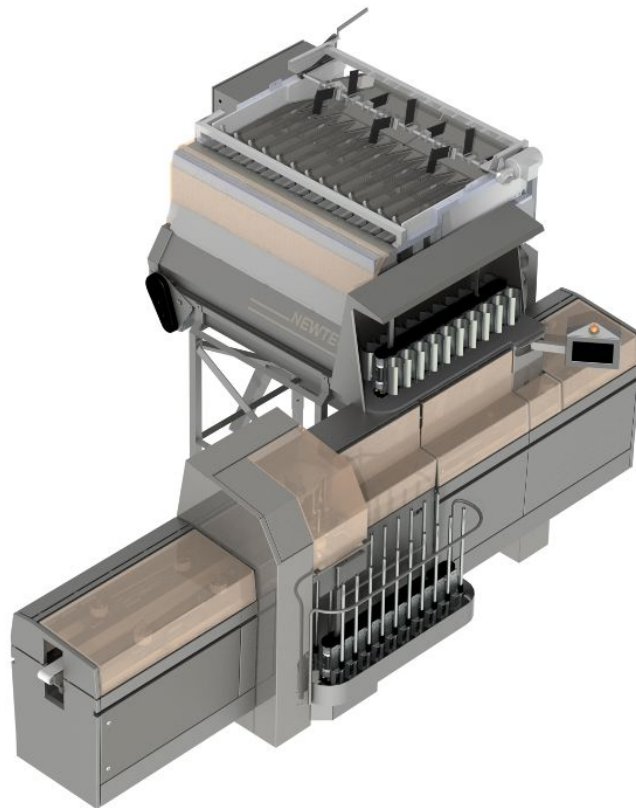
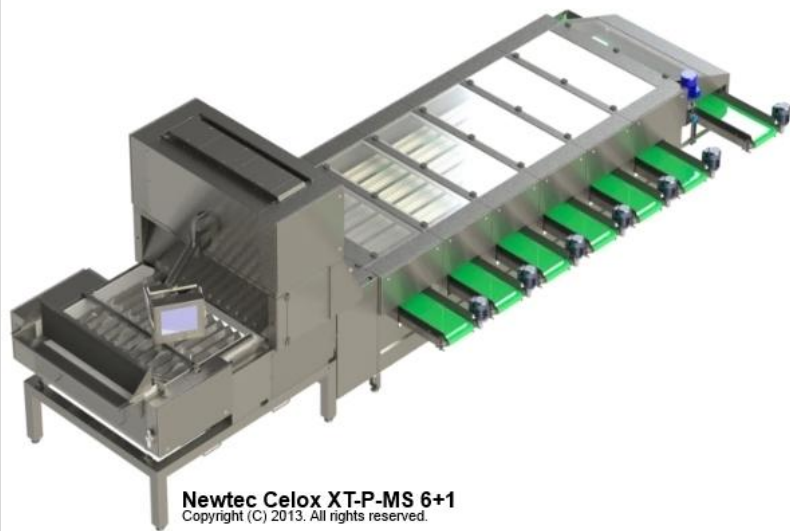


Today's solution

```
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

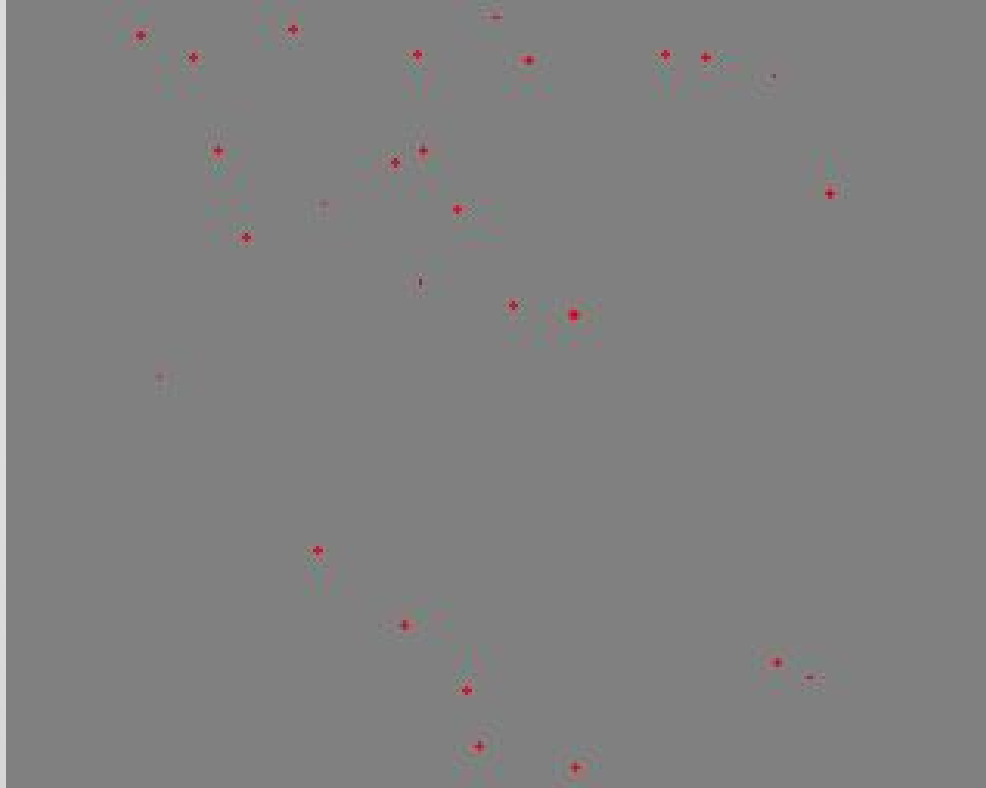
Proposal 2

- 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

TEST CONDITIONS								
PARAMETER			ACCEPTED VALUES		APPLIED VALUES	COMMENTS		
(IR) number			non applicable		1			
Integration time (µs)			39,76		39,76			
Cycle time (ms)			32,5		32,5			
Frame rate (Hz)			30		30			
FPA temperature stability (mK)			< 10 mK		< 10 mK	30°C (± 2)		
VTEMP (VGT)			non applicable		1,788			
TIA capacitance (pF)			2 to 6		4			
VFID BIAS* (V)			0,65 to 3,6 ± 0,005		3,000	tunable for each component		
VSKIMMING BIAS (V)			2 to 5,5 ± 0,005		4,617	tunable for each component		
other biases and clocks characteristics are given in the technical data package document								
TEST RESULTS								
APPLICABLE SPECIFICATION : REFER TO THE APPLICABLE CONTRACT / PURCHASE ORDER								
Paragraph	Title	Procedure	Test conditions	Parameters	Accepted value	Measured value	Conformity	Comments
4,2	temporal NEDT	30.09.07/UP/ DIVMMT 07 005-1	Responsivity 20/ 35 Noise (50 samples)	300K average NEDT of non defective pixels	< 100 mK	49,5	Y	
4,4	operability		On each pixel	NEDT <=> 50% of average value or responsivity <=> 20% of average value	< 0.5% of defective pixels (3932 pixels max)	655	Y	
4,1	responsivity		Responsivity 20/ 35	Average responsivity of non defective pixels		7,80E-03	Non applicable	for information only unit : VK

Big opportunity

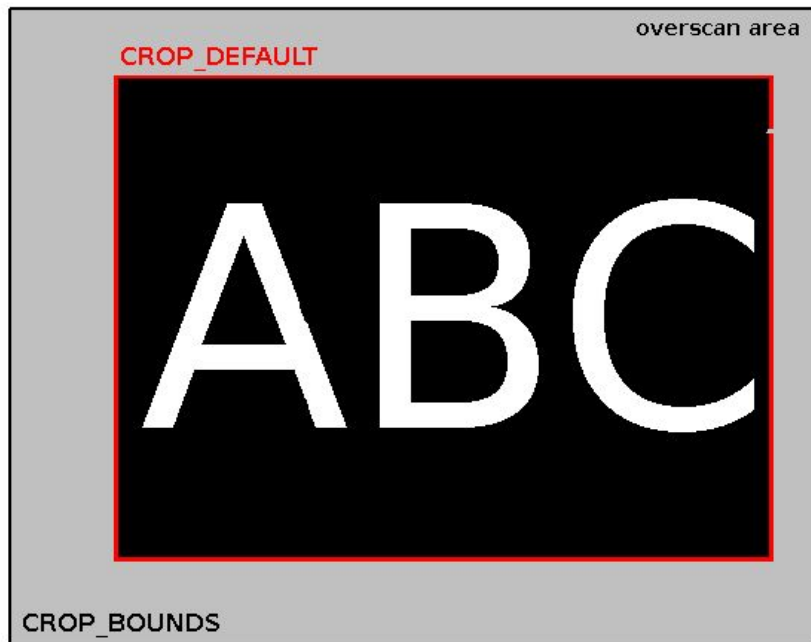
- Define a de-facto standard for sensor data
- No more pdf/excel from manufacturers!!
- Global database/Sensor fingerprinting

Multiple Rectangle Cropping (v2)

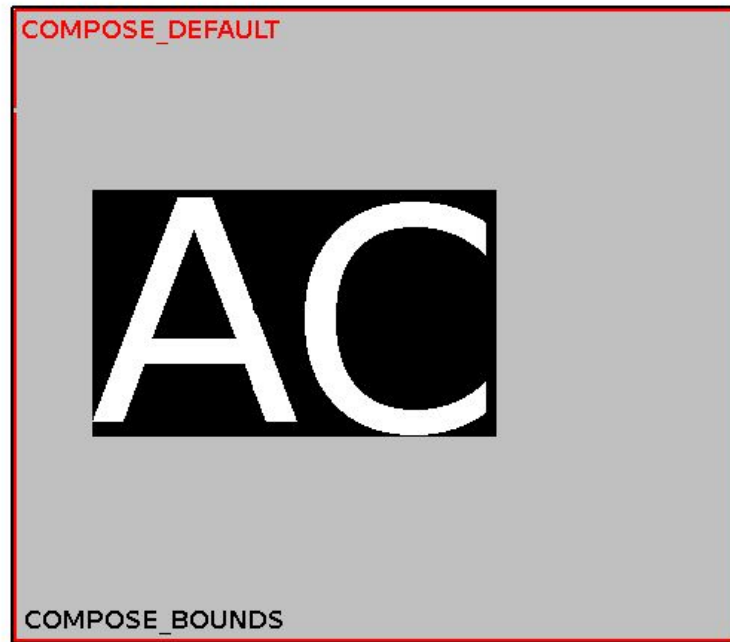
When the interesting data is not contiguous

Proposed Capabilities

DATA SOURCE



DATA SINK



Last year RFC (not in upstream)

```
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

Present

Hans' Patch:

[RFC PATCH 00/11] Add configuration store support

[RFC PATCH 09/11] videodev2.h: add v4l2_ctrl_selection compound control type.

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?