Multiple Rectangle Cropping (v2)
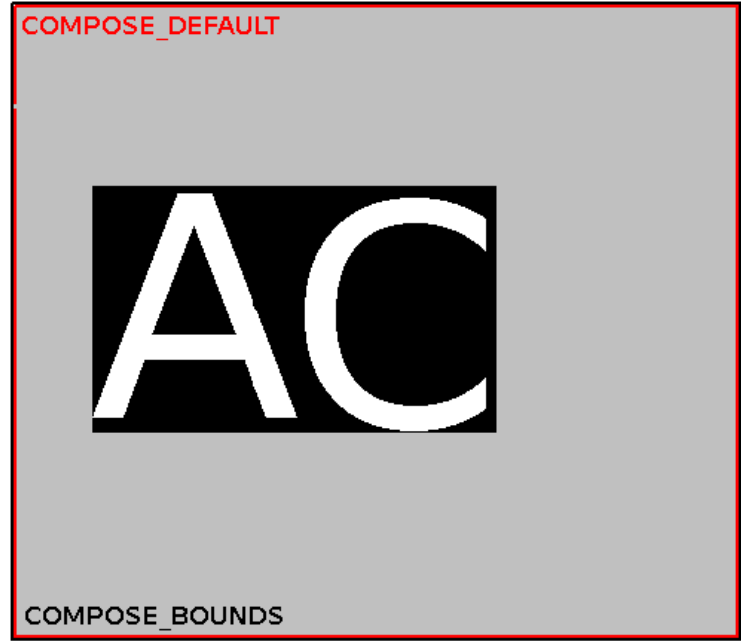
When the interesting data is not contiguous

Ricardo Ribalda
ricardo@qtec.com

technology

Proposed Capabilities
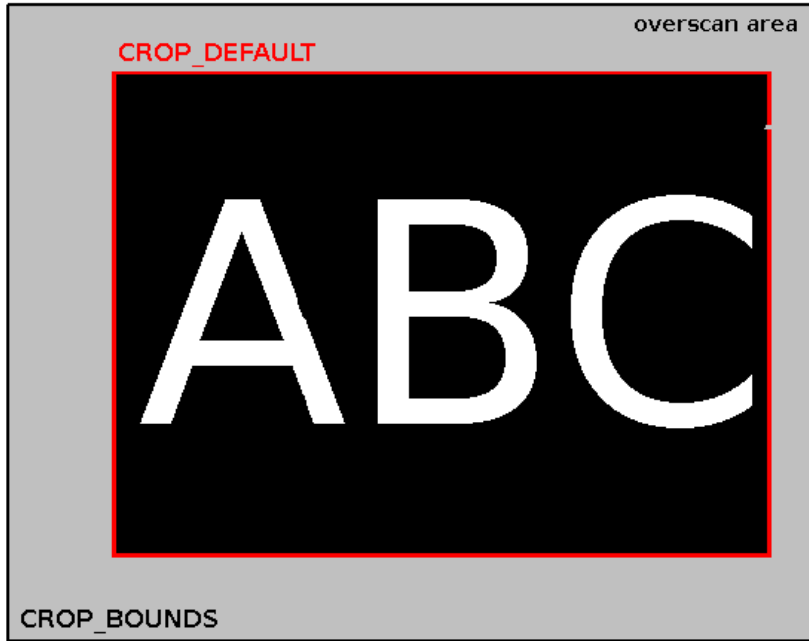
Last year RFC (not in upstream)

```
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?

Multiple timestamps

When not only time matter but also space

Ricardo Ribalda
ricardo@qtec.com

Q technology

Applications

QC90SV rejecting loose item and damaged pack.
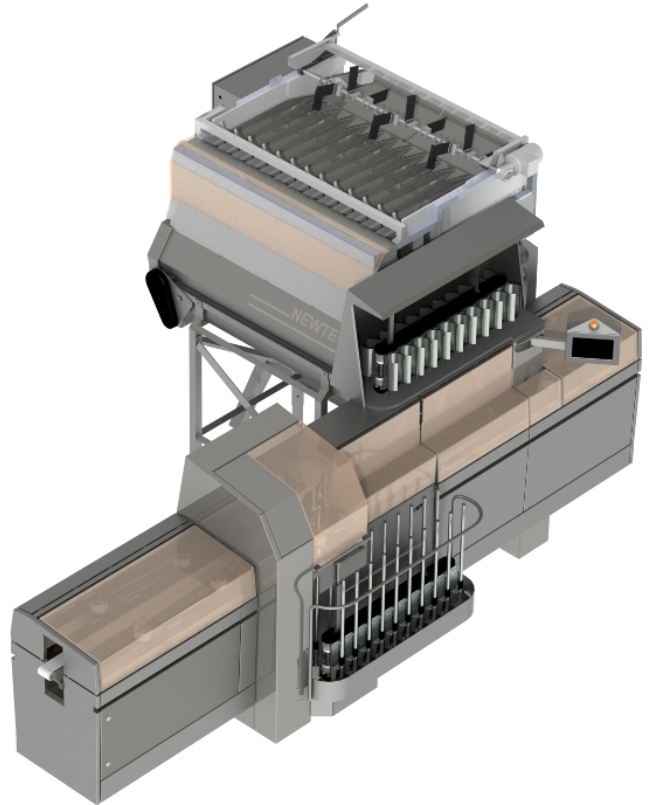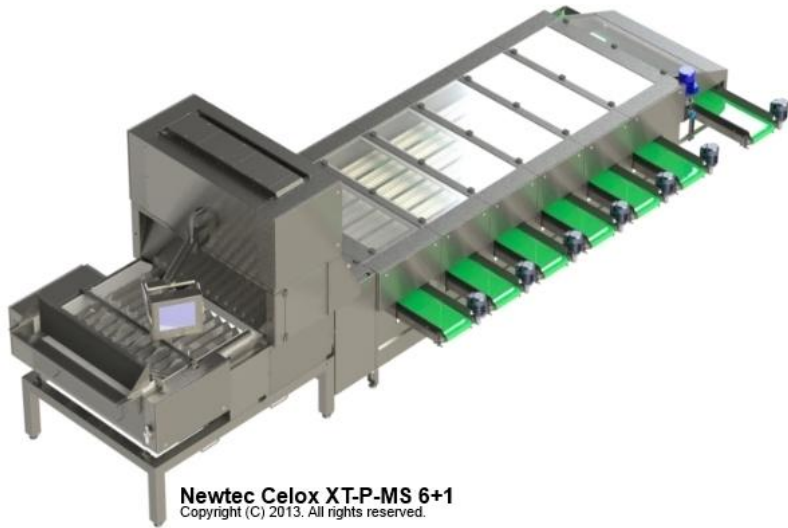
Today's solution

```
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...

Newtec Celox XT-P-MS 6+1
Copyright (C) 2013. All rights reserved.

Wait a bit….

We have multiple plans!!!!

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 dequeued

Dead Pixel API

When pixels cost 10 cents a piece

Ricardo Ribalda
ricardo@qtec.com

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
(t/#) 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 (Volt)	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		Responsivity 20/ 35 Noise (50 samples)	300K average NEDT of non defective pixels	< 100 mK	49,5	Y	
4,4	operability	30.09.07/UP/ DVMNT 07 025-1	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 : V/K

Big opportunity

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