GStreamer

GStreamer is a powerful tool which allows streaming complex video pipes over network. Simple pipelines to stream and receive video provided below.

Stream h.264@30fps over network

Show MJPEG stream on the LCD

```
gst-launch-1.0 -v v4l2src device=/dev/video0 ! image/jpeg, width=1920, height=1080,
framerate=30/1 ! jpegdec ! videoconvert ! queue ! autovideosink
```

Stream h.264 compressed video over UDP socket

```
gst-launch-1.0 -v v4l2src device=/dev/video2 do-timestamp=true ! video/x-h264, width=1920, \
height=1080, framerate=30/1 ! h264parse ! queue ! \
rtph264pay config-interval=10 pt=96 ! udpsink \
host=192.168.0.111 port=5600 sync=false
```

Receive stream and display on monitor

```
gst-launch-1.0 -e -v udpsrc port=5600 ! application/x-rtp, encoding-name=H264,payload=96 ! \
rtpjitterbuffer ! rtph264depay ! avdec_h264 ! autovideosink
```

Some other helpful pipelines

Receive, display and record video

```
gst-launch-1.0 -e -v udpsrc port=5600 ! tee name=STREAMOUT ! \
tee name=VIDEOWINDOW ! queue ! application/x-rtp, encoding-name=H264, payload=96 ! \
rtph264depay ! h264parse ! mp4mux ! filesink location=myvideo.mp4 STREAMOUT. ! \
queue ! udpsink port=5700 VIDEOWINDOW. ! queue ! application/x-rtp, \
payload=96 ! rtph264depay ! avdec_h264 ! autovideosink
```

Display h.264 stream (Windows)

```
gst-launch-1.0.exe ksvideosrc ! \
video/x-raw,format=H264,width=1920 ! \
```

```
capssetter caps=video/x-h264,format=byte-stream join=false ! \
queue ! \
h264parse ! \
avdec_h264 ! \
autovideosink
```

> Not all firmware modifications are supported by gstreamer. If you experiencing streaming issues, feel free to contact us. Update procedure is detailed here.

Inspect video device capabilities

Video device details can be inspected with video4linux command `v4l2-ctl --device /dev/video2 --all` Video device should support H.264 pixel format. Various firmware modifications can have different configuration parameters and

```
Driver Info:
        Driver name      : uvcvideo
        Card type        : KurokesuC1_536     : Kurokesu C
        Bus info         : usb-0000:01:00.0-1.3
        Driver version   : 5.10.11
        Capabilities     : 0x84a00001
                Video Capture
                Metadata Capture
                Streaming
                Extended Pix Format
                Device Capabilities
        Device Caps      : 0x04200001
                Video Capture
                Streaming
                Extended Pix Format
Media Driver Info:
        Driver name      : uvcvideo
        Model            : KurokesuC1_536     : Kurokesu C
        Serial           : SN000000
        Bus info         : usb-0000:01:00.0-1.3
        Media version    : 5.10.11
        Hardware revision: 0x00000100 (256)
        Driver version   : 5.10.11
Interface Info:
        ID               : 0x03000008
```

```
        Type            : V4L Video
Entity Info:
        ID              : 0x00000007 (7)
        Name            : KurokesuC1_536     : Kurokesu C
        Function        : V4L2 I/O
        Pad 0x01000011  : 0: Sink
          Link 0x0200001e: from remote pad 0x1000010 of entity 'Extension 4': Data, Enabled,
Immutable
Priority: 2
Video input : 0 (Camera 1: ok)
Format Video Capture:
        Width/Height     : 1920/1080
        Pixel Format     : 'H264' (H.264)
        Field            : None
        Bytes per Line   : 3840
        Size Image       : 2073600
        Colorspace       : sRGB
        Transfer Function : Rec. 709
        YCbCr/HSV Encoding: ITU-R 601
        Quantization     : Default (maps to Full Range)
        Flags            :
Crop Capability Video Capture:
        Bounds      : Left 0, Top 0, Width 1920, Height 1080
        Default     : Left 0, Top 0, Width 1920, Height 1080
        Pixel Aspect: 1/1
Selection: crop_default, Left 0, Top 0, Width 1920, Height 1080, Flags:
Selection: crop_bounds, Left 0, Top 0, Width 1920, Height 1080, Flags:
Streaming Parameters Video Capture:
        Capabilities     : timeperframe
        Frames per second: 30.000 (30/1)
        Read buffers     : 0
                     brightness 0x00980900 (int)    : min=-64 max=64 step=1 default=0
value=0
                       contrast 0x00980901 (int)    : min=0 max=64 step=1 default=32
value=32
                     saturation 0x00980902 (int)    : min=0 max=128 step=1 default=52
value=52
                            hue 0x00980903 (int)    : min=-40 max=40 step=1 default=0 value=0
 white_balance_temperature_auto 0x0098090c (bool)   : default=1
value=1
```

```
gamma 0x00980910 (int)    : min=72 max=500 step=1 default=100
value=100
                           gain 0x00980913 (int)    : min=0 max=100 step=1 default=0
value=0
           power_line_frequency 0x00980918 (menu)   : min=0 max=2 default=2 value=2
      white_balance_temperature 0x0098091a (int)    : min=2800 max=9300 step=1 default=4600
value=4600 flags=inactive
                      sharpness 0x0098091b (int)    : min=0 max=6 step=1 default=3
value=3
         backlight_compensation 0x0098091c (int)    : min=0 max=2 step=1 default=1
value=1
                  exposure_auto 0x009a0901 (menu)   : min=0 max=3 default=3
value=3
              exposure_absolute 0x009a0902 (int)    : min=1 max=5000 step=1 default=156
value=156 flags=inactive
         exposure_auto_priority 0x009a0903 (bool)   : default=0 value=0
```

Debugging

Useful commands:

- `gst-launch-1.0 --gst-version` - read gstreamer version (tested with **GStreamer Core Library version 1.14.4**)

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