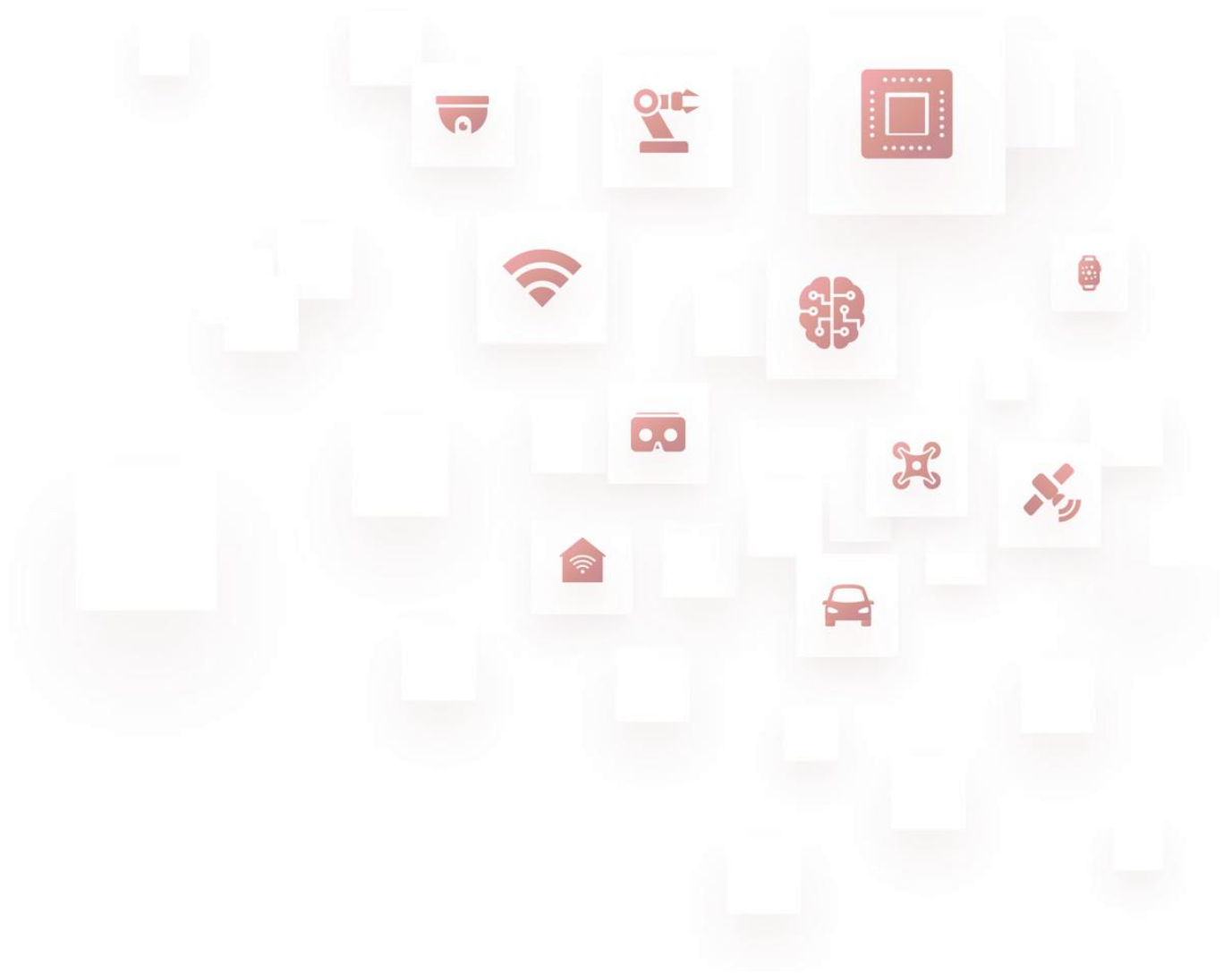


Thundercomm



Thundercomm EB5

# Multimedia SDK User Guide

Rev. V1.1

Jun 06, 2021

## Revision History

Revision	Date	Description
1.0	May 11, 2021	Initial release.
1.1	June 6, 2021	Add the table of contents

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## About This Document

This document introduce the MultiMedia SDK that can be used in EB5.

Gstreamer plugins support list

- gstreamer1.0-alsa
- gstreamer1.0-omx
- gstreamer1.0-plugins-bad
- gstreamer1.0-plugins-base
- gstreamer1.0-plugins-good
- gstreamer1.0-plugins-qt-oss-base
- gstreamer1.0-plugins-qt-oss-mle
- gstreamer1.0-plugins-qt-oss-overlay
- gstreamer1.0-plugins-qt-oss-vtransform
- gstreamer1.0-plugins-qtivdec
- gstreamer1.0-plugins-ugly
- gstreamer1.0-pulseaudio

Developer can start build their own pipeline base on this document.

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# Chapter 1. Gstreamer Command Line

We can use follow gstreamer plugin in EB5 to set up the multimedia pipeline for live streaming.

## Gstreamer Plugin Example

### rtspsrc

```
gst-launch-1.0 rtspsrc location=rtsp://admin:ZKCD1234@192.168.1.102:554 ! rtph264depay ! h264parse ! queue !  
qtivdec skip-frames=yes turbo=yes ! waylandsink sync=false x=0 y=0 width=320 height=270
```

### qtivdec

```
gst-launch-1.0 rtspsrc location=rtsp://admin:ZKCD1234@192.168.1.102:554 ! rtph264depay ! h264parse ! queue !  
qtivdec skip-frames=yes turbo=yes ! waylandsink sync=false x=0 y=0 width=320 height=270
```

### qtivtransform

```
gst-launch-1.0 rtspsrc location=rtsp://admin:ZKCD1234@192.168.1.102:554 ! rtph264depay ! h264parse ! queue !  
qtivdec skip-frames=yes turbo=yes ! qtivtransform ! video/x-raw,width=320,height=270,format=NV12 ! queue !  
waylandsink sync=false x=0 y=0 width=320 height=270
```

### rtmpsink

```
gst-launch-1.0 rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 latency=500 ! rtph264depay ! h264parse !  
flvmux name=mux streamable=true ! rtmpsink sync=true async=true location='rtmp://10.0.20.182:1935/live/rtmp_test'
```

### omxh264enc

```
gst-launch-1.0 -e filesrc location=/data/test.yuv ! videoparse width=1920 height=1088 format=nv12 framerate=20 !  
omxh264enc target-bitrate=40000000 quant-p-frames=50 quant-b-frames=0 control-rate=variable ! h264parse ! filesink  
location=/data/test.h264
```

### omxh265enc

```
gst-launch-1.0 -e filesrc location=/data/test.yuv ! videoparse width=1920 height=1088 format=nv12 framerate=20 !  
omxh265enc target-bitrate=40000000 ! h265parse ! filesink location=/data/test.h265
```

## qtivcomposer

```
gst-launch-1.0 qtivcomposer name=mix \
sink_0::position="<0, 0>" \
sink_1::position="<320, 0>" \
sink_2::position="<640, 0>" \
sink_3::position="<960, 0>" \
sink_4::position="<1280, 0>" \
sink_5::position="<1600, 0>" \
sink_6::position="<0, 270>" \
sink_7::position="<320, 270>" \
sink_8::position="<640, 270>" \
sink_9::position="<960, 270>" \
sink_10::position="<1280, 270>" \
sink_11::position="<1600, 270>" \
! waylandsink x=0 y=0 width=1920 height=540 sync=false \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_0 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_1 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_2 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_3 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_4 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.166:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_5 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_6 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_7 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_8 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_9 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_10 \
rtspsrc location=rtsp://admin:ZKCD1234@10.0.20.167:554 ! rtph264depay ! h264parse ! queue ! qtivdec turbo=yes !
qtivtransform ! video/x-raw, format=NV12, width=320, height=270 ! mix.sink_11 &
```

## rtsp-> decode-> encode-> rtmp

```
gst-launch-1.0 -v rtspsrc location="rtsp://admin:ThunderSoft@192.168.83.120:554/h264/ch1/main/av_stream"
latency=500 ! queue ! rtph264depay ! h264parse ! queue ! omxh264dec ! videoparse width=1920 height=1088 !
video/x-raw ! queue ! omxh264enc target-bitrate=1000000 quant-p-frames=30 quant-b-frames=0 control-rate=variable !
queue ! h264parse ! 'video/x-h264,stream-format=(string)avc' ! queue ! flvmux ! queue ! rtmpsink sync=false
async=false location='rtmp://10.0.20.182:1935/live/rtmp_test'
```

## Chapter 2. Gstreamer MLE Plugin

We can references to the sample code command and use the plugin in the gstreamer application, here is the command:

### TFLite

```
gst-launch-1.0 rtspsrc location=rtsp://xxxx:xxxx@10.0.20.158:554 latency=500 ! rtph264depay ! h264parse ! queue !
qtiivdec ! qtimletflite config=/data/misc/camera/mle_tflite.config model=/data/misc/camera/detect.tflite
labels=/data/misc/camera/labelmap.txt postprocessing=detection ! queue ! qtioverlay ! waylandsink sync=false
```

### SNPE

```
gst-launch-1.0 rtspsrc location=rtsp://xxxx:xxxx@10.0.20.158:554 latency=500 ! rtph264depay ! h264parse ! queue !
qtiivdec ! qtimlesnpe config=/data/misc/camera/mle_snpe.config postprocessing=detection ! queue ! qtioverlay !
waylandsink sync=false
```

## Config

We can use the config to initial the plugin, the default config of the plugin is as follows.

### TFLite config

```
# mle_tflite.config
org.codeaurora.mle.tflite
input_format = 0
BlueMean = 0.0
GreenMean = 0.0
RedMean = 0.0
BlueSigma = 0.0
GreenSigma = 0.0
RedSigma = 0.0
UseNorm = false
preprocess_type = 1
confidence_threshold = 0.6
model = "/data/misc/camera/detect.tflite"
labels = "/data/misc/camera/labelmap.txt"
delegate = "dsp" # (cpu, gpu, dsp)
```

where the default models `detect.tflite` and default label file `labelmap.txt`.

## SNPE config

```
# mle_snpe.config
org.codeaurora.mle.snpe
input_format = 3
BlueMean = 128.0
GreenMean = 128.0
RedMean = 128.0
BlueSigma = 128.0
GreenSigma = 128.0
RedSigma = 128.0
UseNorm = true
preprocess_type = 1
confidence_threshold = 0.6
output_layers = < "add_6", "Postprocessor/BatchMultiClassNonMaxSuppression" >
runtime = 1 # (0: cpu, 1:dsp, 2:gpu)
model = "/data/misc/camera/mobilenet-SSD.dlc"
labels = "/data/misc/camera/coco_labels.txt"
```

where the default models `mobilenet-SSD.dlc` and default label file `coco_labels.txt`.



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