RDK-C : RMS & CVR Validation with PipeWire

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Introduction

This page dedicated to bringing up and validation of RMS and CVR use case with PipeWire.

RMS: The RDKC Media Server is much more than a multi-format, multi-protocol server that delivers your media rich content across multiple screens and platforms. The RDK camera software runs on RPi-0/RPI-3 device. we can able to play live streaming content in VLC player or browser page or Mobile Application.

CVR: It using PipeWire callback to receive frames from v4l2 and also it's using AWS Kinesis Video Stream(KVS) to perform 24/7 video recording with AWS IOT credential.

Build and Flash Procedure

Refer below link to build camera image

RDK-C rdk-next Yocto 3.1 dunfell build for Raspberrypi

Fresh Bootup Setup

STEP 1:

Can validate this use case with Ethernet network or WiFi network.

Below networking process is only applicable for WiFi network, For Ethernet network only need to connect Ethernet cable to RPI target.

Please add your WiFi network username and password to this SSID and PSK in /etc/wpa_supplicant.conf file like below format

network={

ssid="username"

psk="password"

}

Console output

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=0
update_config=1

network={
ssid="XXXX"
psk="YYYYYYYYY"
}
```

STEP 2:

AWS Account and IOT credential creation steps

1.AWS account is needed for to validate CVR use case. so, Refer below link to create AWS account.

Procedure To Create AWS Account

After the AWS account creation, Refer same link to create Access key ID ,Secret Access Key and Region Name of your AWS account.

2. After the AWS account creation, Need to create IOT credential with AWS CLI interface to validate CVR use case.

Refer below link to install AWS CLI interface package for to create AWS IOT credential.

Please install this AWS CLI package in your local linux pc. we can interact AWS account through our local linux pc with this AWS CLI interface.

https://docs.aws.amazon.com/cli/latest/userguide/install-cliv2-linux.html#cliv2-linux-install

Follow the below command to create config and credentials file in your local PC to interact AWS account

AWS Configure

```
$ aws configure

AWS Access Key ID [None]: XXXXXXXXX        ( Give your AWS account Access Key ID )
AWS Secret Access Key [None]: YYYYYYYYYYYYY ( Give your AWS Secret Key )
Default region name [None]: ZZZZZZZZZZ ( Give your Region Name )
Default output format [None]: json
```

Once you done this **aws configure** in your local PC, then automatically below files will be create with below content. so, please cross check whether that is created or not.

AWS Configure

```
vi ~/.aws/config

[default]
region = ZZZZZZZZZZ
output = json
```

AWS Configure

```
vi ~/.aws/credentials

[default]
aws_access_key_id = XXXXXXXXX
aws_secret_access_key = YYYYYYYYYYYYY
```

Refer below link to create AWS IOT credential

https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/how-iot.html

After creation of IOT credential, we can get below list of details

Stream Name, Default Region, IOT Credential Endpoint, Certificate key, Private Kay, Role Alias and certificate key

STEP 3:

Have to copy certificate.pem,private.pem.key and cacert.pem keys into your RPI /etc/ssl/certs/ directory

Update your AWS STREAM_NAME, AWS_DEFAULT_REGION, IOT_GET_CREDENTIAL_ENDPOINT and ROLE_ALIAS values in RPI /usr/local/cvr/cvr.conf file

STEP 4:

Reboot the Target

After Reboot no need to follow steps 1 to 4.

Note : Step 1 to 4 is only applicable for fresh target boot-up with new image.

RMS & CVR Validation

STEP 1:

Ethernet or WiFi ip's are must needed for this use case validation, So please confirm Ethernet/WiFi network ip's availability in RPI target with "ifconfig" command.

ifconfig

Console output

```
root@raspberrypi3-rdk-camera:~# ifconfig
eth0      Link encap:Ethernet  HWaddr B8:27:EB:87:67:91
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:89842 errors:0 dropped:0 overruns:0 frame:0
          TX packets:89842 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:25639748 (24.4 MiB)  TX bytes:25639748 (24.4 MiB)

wlan0     Link encap:Ethernet  HWaddr B8:27:EB:D2:32:C4
          inet addr:192.168.43.146  Bcast:192.168.43.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:44 errors:0 dropped:0 overruns:0 frame:0
          TX packets:103 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4484 (4.3 KiB)  TX bytes:10216 (9.9 KiB)
```

Possible errors:

1. If there is no Ip in etho or in wlan0, Then please confirm ethernet cable connectivity in RPI for etho IP or else follow up fresh bootup setup steps again and check wlan0 IP.
2. Again if ip not generated, then check running status of wpa_supplicant service with below command
    a. systemctl status wpa_supplicant

STEP 2:

Please ensure loaded camera module bcm2835-v4l2 with "lsmod"

lsmod

Console output

```
root@raspberrypi3-rdk-camera:~# lsmod
Module                  Size  Used by
bcm2835_v4l2           40563  0
v4l2_common             4809  1 bcm2835_v4l2
videobuf2_vmalloc       6264  1 bcm2835_v4l2
videobuf2_memops        1528  1 videobuf2_vmalloc
videobuf2_v4l2         12640  1 bcm2835_v4l2
videobuf2_core         27389  2 bcm2835_v4l2,videobuf2_v4l2
videodev              154457  4 v4l2_common,videobuf2_core,bcm2835_v4l2,videobuf2_v4l2
media                  23307  1 videodev
brcmfmac              258239  0
brcmutil                7590  1 brcmfmac
snd_bcm2835            21405  0
cfg80211              492836  1 brcmfmac
snd_pcm                79872  1 snd_bcm2835
rfkill                 19936  3 cfg80211
snd_timer              20294  1 snd_pcm
snd                    52949  3 snd_timer,snd_bcm2835,snd_pcm
lirc_rpi                6840  0
lirc_dev                7533  1 lirc_rpi
uio_pdrv_genirq         3469  0
uio                     8703  1 uio_pdrv_genirq
fixed                   2876  0
sch_fq_codel            9662  2
ipv6                  384101  18
```

Possible errors:

1. If bcm2834-v4l2 camera module not loaded in RPI, then try to load this module with modprobe and then check "lsmod" status
    a. modprobe bcm2835-v4l2

STEP 3:

Please confirm camera device availability within /dev directory

ls /dev/video0

Console output

```
root@raspberrypi0-rdk-camera:~# ls /dev/video0
/dev/video0
```

Possible errors:

1. If video0 device not there within /dev directory, Then please check camera connectivity in both RPI target end and RPI camera end.
2. Reboot the system once you modified the camera connection.

STEP 4:

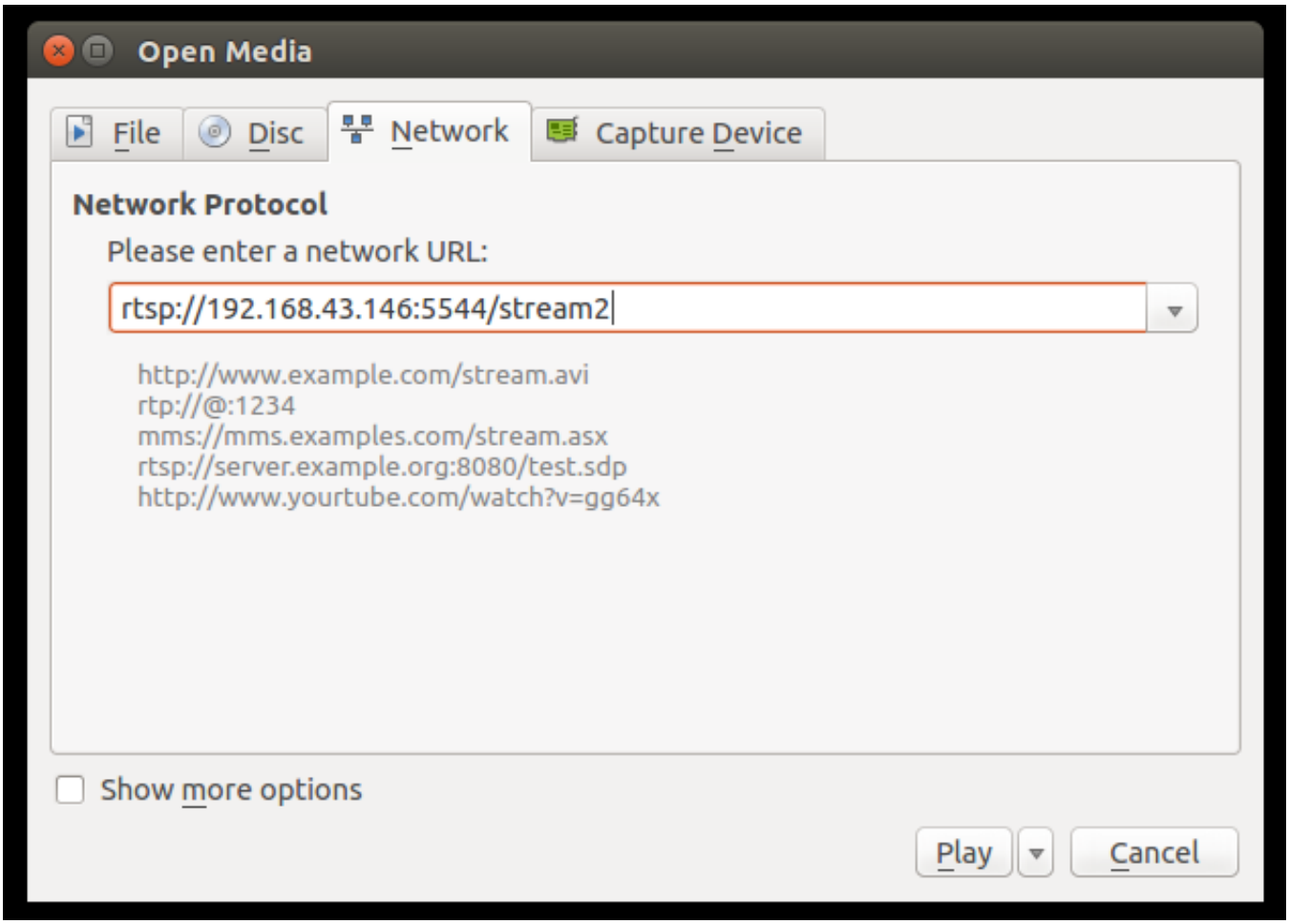
RMS Output

Can view RTSP live streaming in VLC player.

To view video in VLC player need to go to mediaOpen Network stream option in VLC and then need to give rtsp URL like below.

rtsp://camera_ip:5544/stream2

Example :rtsp://192.168.43.146:5544/stream2



We can able to see live stream content in VLC Player.

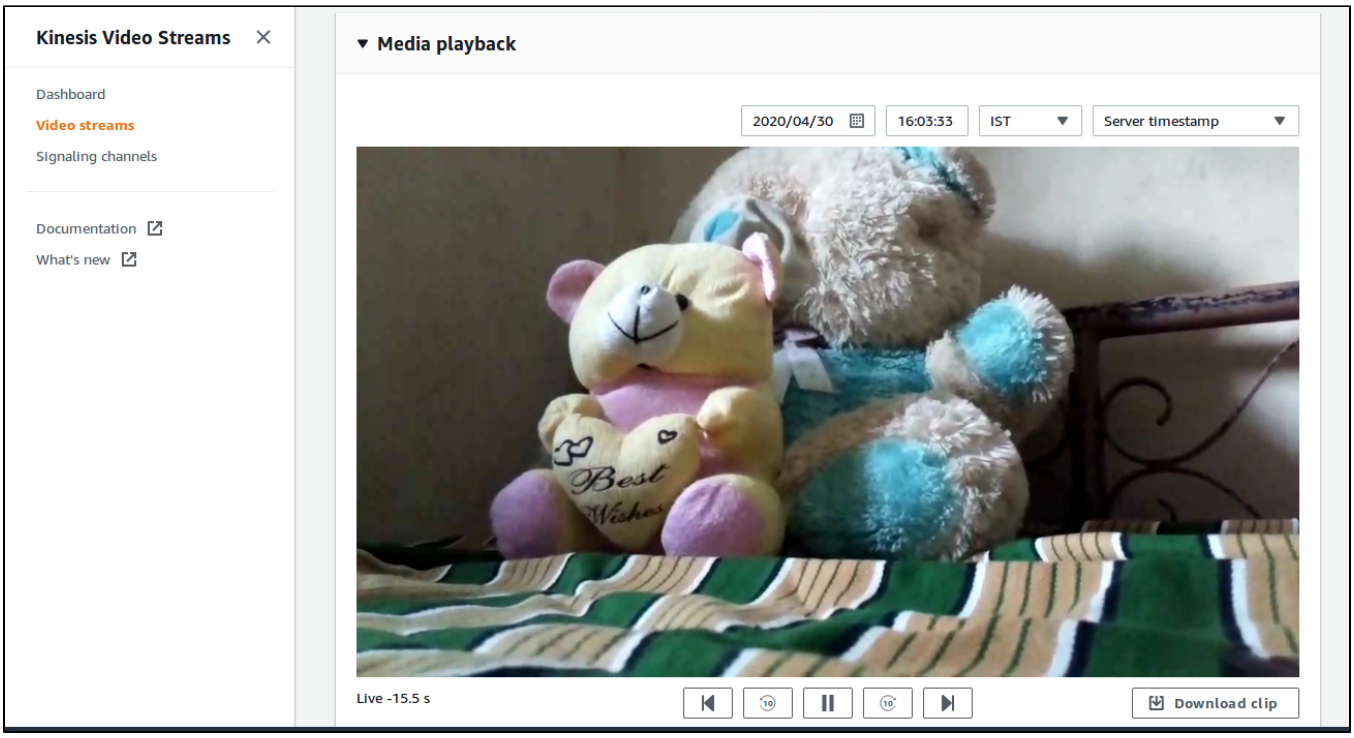
Note: VLC player running system and RPI target should be in same network.

STEP 5:

CVR Output

Please go to the AWS account and then select your video stream service and press "Media Playback" to view video frames.

Can view decoded video buffers in AWS


Kinesis Video Streams
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Documentation
What's new
Media playback
2020/04/30
16:03:33
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