# Normal Thumbnail in RPI - RDK Camera - User Manual - 2020 - M6



## 1.1. Introduction

Normal Thumbnail will get YUV data from RPI-0 camera device and it will convert YUV buffer into JPEG image based on openCV and then stored generated JPEG image in local /tmp directory . This page dedicated to bringing up and validation of Normal Thumbnail functionality in R-Pi Zero.

## 1.2. Environment Setup

Please refer below link for RPI-0 Environment setup

RDK-C Environment Setup

## 1.3. Build Procedure

Please refer below link to build camera image

RDK-C Build Instructions for R-Pi

## 1.4. Image Flash Procedure

**Image Flash step**

```
$ sudo dd if="Image Name" of="Device Name" bs=4M

Example:
sudo dd if=rdk-generic-camera-image_default_20200130060729.rootfs.rpi-sdimg of=/dev/sdb bs=4M
```

## 1.5. Normal Thumbnail Validation Procedure

**STEP 1:**

Add require SSID and PSK in /etc/wpa_supplicant.conf file in below format

network={

ssid="username"

psk="password"

}

**Console output**

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

network={
ssid="RDK"
psk="Comcast1"
}
```

**STEP 2:**

Reboot the Target

After Reboot don't do step 1 and 2.

Note : Step 1 & 2 is only applicable for fresh target boot-up with new image.

**STEP 3:**

WiFi connection is needed to copy captured JPEG Image from /tmp directory into your PC.

Check WiFi connection by using below command.

ifconfig

**Console output**

```
root@raspberrypi0-rdk-camera:~# ifconfig
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:87 errors:0 dropped:0 overruns:0 frame:0
          TX packets:87 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4552 (4.4 KiB)  TX bytes:4552 (4.4 KiB)

wlan0     Link encap:Ethernet  HWaddr B8:27:EB:2E:72:2B
          inet addr:192.168.43.246  Bcast:192.168.43.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23 errors:0 dropped:0 overruns:0 frame:0
          TX packets:44 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2893 (2.8 KiB)  TX bytes:5887 (5.7 KiB)
```

**STEP 4:**

check loaded module by using below command

**lsmod**

**Console output**

```
root@raspberrypi0-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
```

**STEP 5:**

check camera device there or not by using below command

ls /dev/video0

**Console output**

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

**STEP 6:**

check rdkcmediaserver( RMS ) binary is running or not.if it is running then we need to stop RMS binary running because we can't able to validate Normal Thumbnail while running RMS application.

**Console output : RMS application running status**

```
root@raspberrypi0-rdk-camera:~# ps -Af | grep rdkcmediaserver
root       659     1 22 10:24 ?        00:00:43 ./rdkcmediaserver ../config/config.lua
root      4911   381  0 10:28 ttyS0    00:00:00 grep rdkcmediaserver
```

if we get above status then need to do below step.

**Console output : Stop RMS application**

```
root@raspberrypi0-rdk-camera:~# systemctl stop rms-launcher
```

**STEP 7:**

Run normal_thumbnail binary by using below command

**Console output**

```
root@raspberrypi0-rdk-camera:~# normal_thumbnail
```

**STEP 8:**

Get JPEG image from local /tmp directory.

**Console output**

```
root@raspberrypi0-rdk-camera:~# cd /tmp/
root@raspberrypi0-rdk-camera:/tmp# ls thumbnail2020-06-28\:10\:33\:57..jpeg
thumbnail2020-06-28:10:33:57..jpeg
```

**STEP 9:**

Copy JPEG image from your RPI /tmp directory into your local PC.

**Console output**

```
xxxxxx@yyyyy-Lenovo-B480:~/THUMBNAIL$ scp root@RPI_DEVICE_WIFI_IP:/tmp/thumbnail* .

Example:
xxxxxx@yyyyy-Lenovo-B480:~/THUMBNAIL$ scp root@192.168.43.246:/tmp/thumbnail* .
thumbnail2020-06-28:10:33:57..jpeg
100%   16KB  16.4KB/s   00:00
xxxxxx@yyyyy-Lenovo-B480:~/THUMBNAIL$
```

## 1.6. **Limitations**

Can't able to validate RMS( RDK Media Streamer ) and CVR( Continuous Video Recoding ) features while validating Normal Thumbnail feature.