

Yocto 3.1 Build Procedure and validation for rdk-generic-camera-image

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Introduction

This page is dedicated to bring up yocto 3.1 upgradation for RDK generic camera image.

Host Setup

The OpenEmbedded build system should be able to run on Ubuntu 18.04 distribution/other compatible linux distribution with the following versions for Git, tar, and Python.

- Git 1.8.3.1 or greater
- tar 1.27 or greater
- Python 3.4.0 or greater
- Coreutils(E.g realpath)

Note: You should also have about 50 Gbytes of free disk space for building images.

The essential packages you need for a supported Ubuntu or Debian distribution are shown in the following command:

```
$ sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib \
build-essential chrpath socat cpio python python3 python3-pip python3-pexpect \
xz-utils debianutils iputils-ping python3-git python3-jinja2 libegl1-mesa libsdl1.2-dev \
pylint3 xterm bmap-tools
```

Repo Setup

In order to use Yocto build system, the repo tool must be properly installed on the machine.

To install Repo make sure you have a /bin directory in your home directory and that it is included in your path

Repo Setup Steps

```
$ mkdir ~/bin
$ PATH=~/.bin:$PATH
Download the repo tool and ensure that it is executable
$ curl http://commondatastorage.googleapis.com/git-repo-downloads/repo > ~/bin/repo
$ chmod a+x ~/bin/repo
```

Note: it is also recommended to put credentials in ~/.netrc when interacting with repo.

A sample ~/.netrc file is illustrated below

.netrc
<pre> machine code.rdkcentral.com login YOUR_USERNAME password YOUR_PASSWORD </pre>

Build Procedure

Build step
<pre> \$ repo init -u "https://code.rdkcentral.com/r/manifests" -m rdkc-nosrc.xml -b yocto-dunfell-upgrade \$ repo sync \$ source meta-cmf-raspberrypi/setup-environment (Choose 11 `meta-cmf-raspberrypi/conf/machine/raspberrypi0-rdk-camera.conf`) \$ bitbake rdk-generic-camera-image </pre>

Image Flash Procedure

Flash step
<pre> \$ bzcat ImageName.wic.bz2 sudo dd of=/dev/sdc bs=4M iflag=fullblock oflag=direct conv=fsync </pre> Ex: <pre> bzcat rdk-generic-camera-image-raspberrypi0-rdk-camera.wic.bz2 sudo dd of=/dev/sdc bs=4M iflag=fullblock oflag=direct conv=fsync </pre>

Errors and Challenges

S. NO	Errors/challenges	Receipes/Repos	Updates	Change sets	Status
1.	Add camera manifest files	manifests	Added rdkc-nosrc and rdkc-extsrc manifest file in yocto-dunfell-upgrade branch	https://code.rdkcentral.com/r/c/manifests/+41610	Merged
2	Create dunfell branch for camera component	configmgr, httpclients-utility ledmgr-camera, plugins, rms cvr, mediastreamer, thumbnail	Created yocto dunfel upgrade branch for camera specific component	Branch Created	
3	ERROR: ExpansionError during parsing ems_git.bb fatal: remote error: rdkc/components/opensource/ems unavailable	meta-rdk-camera/recipes-extended/ems/ems_git.bb	Moved meta-rdk-camera and meta-cmf-camera latest update upto 23Jul20 from "rdk-next" into "yocto-dunfell-upgrade" branch	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-camera/+42088 https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-camera/+42090	Merged
4	ERROR: ExpansionError during parsing webpacamera_git.bb	meta-rdk-camera/recipes-common/webpacamera/webpacamera_git.bb	FetchError: Fetcher failure: Unable to resolve 'yocto-dunfell-upgrade' in upstream git repository in git	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk/+42095	Merged
5	ERROR: ExpansionError during parsing audioserver-sample-apps.bb	meta-rdk-video/recipes-extended/audioserver/audioserver-sample-apps.bb	Specific component source codes are not available in rdkcentral. so,masked this component in rdkc.inc file.		
6	ERROR: ExpansionError during parsing ctrlm-testapp.bb	meta-rdk-video/recipes-extended/ctrlm/ctrlm-testapp.bb			

7	ERROR: ExpansionError during parsing audioserver-headers.bb	meta-rdk-video/recipes-extended/audioserver/audioserver-headers.bb			
8	ERROR: ExpansionError during parsing audioserver.bb	meta-rdk-video/recipes-extended/audioserver/audioserver.bb			
9	ERROR: ExpansionError during parsing ctrlm-main.bb	meta-rdk-video/recipes-extended/ctrlm/ctrlm-main.bb			
10	ERROR: ExpansionError during parsing ctrlm-headers.bb	meta-rdk-video/recipes-extended/ctrlm/ctrlm-headers.bb			
11	ERROR: ExpansionError during parsing base64_git.bb	meta-rdk-ext/recipes-support/base64/base64_git.bb			
12	ERROR: Nothing RPROVIDES 'ems'	meta-cmf-raspberrypi/recipes-core/packagegroups/packagegroup-rdk-oss-camera.bbappend	Changed ems into rms because we have recently modified this in rdk-next	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi/+42105	Merged
13	ERROR: Nothing PROVIDES 'ffmpeg' ffmpeg was skipped: because it has a restricted license 'commercial'. Which is not whitelisted in LICENSE_FLAGS_WHITELIST	openembedded-core/meta/recipes-multimedia/gstreamer/gstreamer1.0-libav_1.16.2.bb	Configured gstreamer1.0-libav preferred version as 1.14.1	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk/+42106	Merged
14	ERROR: rtmessage-git-r0 do_fetch: Fetcher failure for URL: 'git://code.rdkcentral.com/r/rdkc/components/opensource/rtmessage' Please set a valid SRCREV for url	meta-rdk-ext/recipes-common/rtmessage/rtmessage_git.bb	Added SRC_REV in rtmessage_git.bb	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-ext/+42108	Merged
15	ERROR: rtmessage-git-r0 do_fetch: Fetcher failure: Unable to find file file://rtouted.conf	meta-rdk-ext/recipes-common/rtmessage/rtmessage/	Added rtouted.conf file in rtmessage directory		
16	ERROR: gstreamer1.0-plugins-bad-1.16.2-r0 do_patch Applying patch gstreamer1.0-plugins-bad_1_patch Hunk #1 FAILED at 101.	meta-rdk-camera/recipes-multimedia/gstreamer/gstreamer1.0-plugins-bad_%.bbappend	Removed meta-rdk-camera/recipes-multimedia/gstreamer folder	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-camera/+42113	Merged
17	ERROR: QA Issue: rms: The LIC_FILES_CHKSUM does not match for file://LICENSE; md5=ae6150f078ea1c8196d0d595a46a293a	rdkc/components/opensource/rms	Moved rms source latest changes upto 24Jul20 from rdk-next into dunfell branch	https://code.rdkcentral.com/r/c/rdkc/components/opensource/rms/+42114	Merged
18	ERROR: bcm2835-bootfiles-20180619-r3 do_fetch: Fetcher failure for URL: 'https://github.com/raspberrypi/firmware/archive/748fb17992426bb29d99224b93cb962fefbdc833.tar.gz'. Checksum mismatch!	meta-cmf-raspberrypi/recipes-bsp/bootfiles/bcm2835-bootfiles.bbappend	Masked bcm2835-bootfiles.bbappend	https://code.rdkcentral.com/r/c/rdkc/components/generic/rdk-oe/meta-rdk/+42115	Merged
19	No rule to make target 'arch/arm/boot/dts/bcm2711-rpi-4-b.dtb' ERROR: Task linux-raspberrypi_4.14.bb:do_compile failed with exit code '1'	meta-rdk/conf/distro/include/rdkc.inc	Upgrade linux kernel version from 4.14 to 4.19	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk/+42223	Merged
20	ERROR: lighttpd-1.5-r0 do_compile: oe_runmake failed Makefile:1663: recipe for target 'lemon.o' failed	meta-cmf-raspberrypi/conf/machine/raspberrypi0-rdk-camera.conf	Changed lighttpd preferred version as 1.4.53	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi/+42116	Merged
21	configmgr : fatal error: PRO_file.h: No such file or directory	rdkc/components/opensource/configMgr	Moved configmgr source code changes upto 24Jul20 from rdk-next into dunfell branch	https://code.rdkcentral.com/r/c/rdkc/components/opensource/configMgr/+42149	Merged
22	plugins: error: 'RdkCVideoCapturer' does not name a type	rdkc/components/opensource/plugins	Moved plugins source code changes upto 27Jul20 from rdk-next into dunfell branch	https://code.rdkcentral.com/r/c/rdkc/components/opensource/plugins/+42151	Merged
23	ERROR: mediastreamer-git-r0 do_package_qa	meta-rdk-camera/recipes-multimedia/mediastreamer/mediastreamer_git.bb	Added RDEPENDS mediastreamer_git.bb file	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-camera/+42152	Merged
24	Thumbnail : CMake Error at CMakeLists.txt:40 (ADD_SUBDIRECTORY : normal_thumbnail)	rdkc/components/opensource/thumbnail	Moved thumbnail source code changes upto 27Jul20 from rdk-next into dunfell branch	https://code.rdkcentral.com/r/c/rdkc/components/opensource/thumbnail/+42167	Merged
25	smart_thumbnail.h:53:10: fatal error: RdkCVideoCapturer.h: No such file or directory	meta-rdk-camera/recipes-multimedia/thumbnail/thumbnail_git.bb	Added plugins dependency at thumbnail receipes.	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-camera/+42173	Merged
26	thumbnail : fatal error: opencv2/opencv.hpp: No such file or directory	meta-openembedded/meta-oe/recipes-support/opencv/opencv_4.1.0.bb	Avoid to store opencv header files under opencv4 in sysroot.	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-ext/+42201	Merged
27	thumbnail : fatal error: mongoose.h: No such file or directory	meta-rdk-camera/recipes-multimedia/thumbnail/thumbnail_git.bb	Added mongoose dependency at thumbnail receipes	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk-camera/+42204	Merged
28	thumbnail : error: 'CV_YUV2BGR_NV12' was not declared in this scope	rdkc/components/opensource/thumbnail	Included types_c.h at normal_thumbnail.h file.	https://code.rdkcentral.com/r/c/rdkc/components/opensource/thumbnail/+42205	Merged
29	ERROR: When reparsing /mnt/home/sanil534/Savidha/RDK-C/meta-rdk/recipes-core/images/rdk-generic-camera-image.bb:do_populate_lic_deploy, the basehash value changed from 1b3e827be261ee60d5bcea3827f4ede9ff99ebbd1c9e101686fe686e5ace3268 to 22d5dc96290d6fa6a5119e634d53e99bdc17d3dd4bf52361e874719822deb742. The metadata is not deterministic and this needs to be fixed.	meta-cmf-raspberrypi/recipes-core/images/rdk-generic-camera-image.bbappend	Added BB_HASH_IGNORE_MISMATCH = "1" in rdk-generic-camera-image.bbappend file	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi/+42206	Merged

30	ERROR: rdk-generic-camera-image-1.0-r0 do_rootfs: Taskhash mismatch 271be5777a813d0312a7a1fba331bf05f45a42cd7249ed412f5bbd966a452c21 versus 66a9d352e30c8c1bcca799a340b7051c2fd97feaf98d379678cae7da6d43afc3 for /mnt/home/sanil534 /Savidha/RDK-C/meta-rdk/recipes-core/images/rdk-generic-camera-image.bb:do_rootfs	meta-cmf-raspberrypi /recipes-core/images /rdk-generic-camera- image.bbappend	Added IMAGE_NAME [vardepsexclude] = "DATETIME" in rdk-generic-camera-image. bbappend file		
31	nothing provides gstreamer1.0-plugins-bad-opengl needed by packagegroup-rdk-gstreamer1-1.0-r0.all	meta-cmf-raspberrypi /recipes-core /packagegroups /packagegroup-rdk- gstreamer1.bbappend	Opengl license was whitelisted	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi+/42212	Merged
32	ERROR: userland-20190724-r0 do_patch: Command Error:Patch 0013-Implement-triple-buffering-for-wayland.patch is already applied	meta-raspberrypi /recipes-graphics /userland/userland_git. bb	Removed morty from machine overrides and distro.	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi+/42248	Merged
33	Bootup Issue	meta-rdk/conf/distro /include/rdkc.inc	Removed VC4graphics in camera build to avoid bootup issue	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-rdk+/42384	Merged
34	RDK Media Streamer validation (RMS) validation	meta-cmf-raspberrypi /recipes-extended/rms/	Moved automatic bootup process changes from rdk-next into yocto-dunfell-upgrade branch	https://code.rdkcentral.com/r/c/components/generic/rdk-oe/meta-cmf-raspberrypi+/42387	Merged
35	Normal Thumbnail validation	rdkc/devices/raspberrypi /mediastreamer	Moved needed normal thumbnail changes from rdk-next into yocto-dunfell-upgrade	https://code.rdkcentral.com/r/c/rdkc/devices/raspberrypi/mediastreamer+/42390	Merged

Supported Features

S.No	Features	Supported Status
1	Ethernet connection(USB Ethernet Adapter)	blocked URL
2	WiFi Connection	blocked URL
3	RMS (RDKC Media Server)	blocked URL
4	CVR (Continuous video recording) with kvssink	blocked URL
5	Normal Thumbnail	blocked URL
6	Firmware upgrade with tftp and xconf server	blocked URL
7	Webpa	blocked URL

User Manual for Supported Feature

S.No	Features	User Manual
1	RMS (RDKC Media Server)	RDK-C RDKC Media Server(RMS) - Community
2	CVR (Continuous video recording)	RDK-C : Continuos Video Recording (CVR)
3	Normal Thumbnail	RDK-C Normal Thumbnail
4	Firmware upgrade with tftp and xconf server	RDK-C Firmware Upgrade with HTTP and TFTP support
5	Webpa	RDK-C : WebPA Support

Known Issues and Limitations

- Ethernet connection (USB Ethernet Adapter):
 - Able to get 'Ethernet IP' but unable to ping any address like www.google.com due to this issue not able to validate RMS feature.
- WiFi connection:
 - After bootup unable to get the 'WiFi IP' address by default.
 - Once we restart the " wpa_supplicant.service" forcefully then we can able to get the 'WiFi IP'.
- RDKC Media Streamer(RMS)
 - After bootup, RMS services are not running.
 - Everytime manually we need to run this " rms-launcher.service" command to launch rms.