

# RPI 4B Model Reference Platform with 64bit Arch

- [Host Setup](#)
- [Repo Setup](#)
- [Yocto Build Steps](#)
- [Validated Functionalities](#)
- [OEM Side Changes Required](#)
- [For DBUS Enabling support](#)
- [System Testing](#)
  - [E2E Validation Test Results](#)
- [Performance comparison metrics between RPi4 64 bit Vs 32 bit](#)

## 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

$ sudo apt-get install git cmake autoconf texinfo openjdk-8-jdk openjdk-8-jre \
m4 libtool libtool-bin curl pkg-config lib32z1 doxygen
```

## 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

```
machine code.rdkcentral.com login YOUR_USERNAME password YOUR_PASSWORD
```

## Yocto Build Steps

To build, follow below instructions

### Build Steps

```
$ mkdir <workspace dir>
$ cd <workspace dir>
$ repo init -u https://code.rdkcentral.com/r/manifests -b dunfell -m rdkb-extsrc.xml
$ repo sync -j`nproc` --no-clone-bundle
$ MACHINE=raspberrypi4-64-rdk-broadband source meta-cmf-raspberrypi/setup-environment
$ bitbake rdk-generic-broadband-image
```

## Flashing Procedure

Following command can be used to flash the RPI image to sd card using linux machine . bmap tool should be available in linux

### Flash command

```
bzip2 -d <path to ImageName.wic.bz2>
sudo -E bmaptool copy --nobmap <path to ImageName.wic> <path to SD card space>
```

Example:

```
$ bzip2 -d rdk-generic-broadband-image-raspberrypi4-64-rdk-broadband.wic.bz2
$ sudo -E bmaptool copy --nobmap rdk-generic-broadband-image-raspberrypi4-64-rdk-broadband.wic /dev/sdb
```

## Validated Functionalities

| No | Feature                                  | Supported |
|----|------------------------------------------|-----------|
| 1  | LAN Connected Devices-Ethernet           | ✓         |
| 2  | WAN Connected Devices-Wi-Fi              | ✓         |
| 3  | Parental Control                         | ✓         |
| 4  | Firewall settings                        | ✓         |
| 5  | Advanced Config: Port Triggering         | ✗         |
| 6  | Advanced Config: Port Forwarding         | ✓         |
| 7  | Advanced Config: Remote Management       | ✓         |
| 8  | Advanced Config: DMZ                     | ✓         |
| 9  | Xfinity Wi-Fi 2.4/5 GHz – Public Hotspot | ✓         |
| 10 | Test and Diagnostics                     | ✓         |
| 11 | Local WebUI Configuration                | ✓         |
| 12 | Factory Reset                            | ✓         |
| 13 | DHCP /Reserved IP                        | ✓         |
| 14 | EthWan                                   | ✗         |
| 15 | Eth Agent                                | ✓         |
| 16 | 2.4 GHz Band Support                     | ✓         |
| 17 | 5 GHz Band Support                       | ✓         |
| 18 | Bridge Mode Support                      | ✓         |
| 19 | Persistent Storage Management            | ✓         |
| 20 | WebPA for Comcast,community              | ✓         |

|    |                                        |   |
|----|----------------------------------------|---|
| 21 | Lost and Found                         | ✗ |
| 22 | Bluetooth                              | ✗ |
| 22 | Harvester Support                      | ✗ |
| 23 | TR-69                                  | ✗ |
| 24 | SNMP                                   | ✓ |
| 27 | Boot time data measurement             | ✗ |
| 28 | Wireless Protection Setup(WPS)         | ✓ |
| 29 | Captive Portal                         | ✓ |
| 30 | Wi-Fi MAC Filtering                    | ✗ |
| 31 | Log Rotation Support                   | ✓ |
| 32 | Firmware Upgrade Support               | ✓ |
| 33 | Multiboot Support                      | ✗ |
| 34 | Telemetry Support                      | ✓ |
| 35 | IPV6                                   | ✗ |
| 36 | Log level control through CcspLogAgent | ✓ |
| 37 | Band Steering using RSSI               | ✓ |
| 38 | Backup and Restore                     | ✗ |
| 39 | SelfHeal                               | ✓ |
| 40 | Password-Reset                         | ✓ |
| 41 | WebUI JST                              | ✓ |
| 42 | Telemetry 2                            | ✓ |
| 43 | RdkWanManager                          | ✓ |
| 44 | RdkFwUpgradeManager                    | ✓ |

## OEM Side Changes Required

### Global CFLAGS

NOTE: This can be added in ccsp\_common inc files. So, will be available for all ccsp components.

```
CFLAGS_append_aarch64 = " -D_64BIT_ARCH_SUPPORT_ "
```

## For DBUS Enabling support

By default, rbus is enabled in rpi4 64b build. For dbus enabling in rpi4 64b build, please follow the below steps,

```
Delete the below lines from below file's,

File path : ~/meta-cmf-raspberrypi/meta-rdk-broadband/recipes-ccsp/util/utopia.bbappend
touch \nvrnm\rbus_support ' ${D}${sysconfdir}/utopia/utopia_init.sh

File path : ~/meta-cmf-raspberrypi/recipes-core/dbus/dbus_%.bbappend
do_install_append_aarch64_broadband ()
{
# Removing dbus service in 64bit arch alone
rm ${D}${systemd_system_unitdir}/dbus.service
}
```

## System Testing

## E2E Validation Test Results

[System Test Plan and Report - Broadband - 2021 - M10](#)

[System Test Plan and Report - RDK Broadband - 2022 - M1](#)

## Performance comparison metrics between RPi4 64 bit Vs 32 bit

- [Performance comparison metrics-RPi4-64 bit Vs 32 bit.ods](#)