

RDK-B (Raspberry Pi 3 B+) Build and Setup Manual - Router Profile

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Introduction

The Raspberry Pi 3 Model B+ featuring a 64-bit quad core **processor** running at 1.4 Ghz. R-Pi3 B+ supports the dual band 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN which provides an high edge for the broadband developer community to test the RDK-B stack with Router, WIFI functionalities.

Build Instructions

Repo setup

In order 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 rdk-next -m rdkb-extsrc.xml
$ repo sync -j4 --no-clone-bundle
$ source meta-cmf-raspberrypi/setup-environment (Select option raspberrypi-rdk-broadband.conf)
$ bitbake rdk-generic-broadband-image
```

Hardware and Setup Information

- [RDKB RPI Setup Information](#)

Note : RPI-3 B and B+ have same Build instructions and testing procedure

Flashing Procedure

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

Flash command

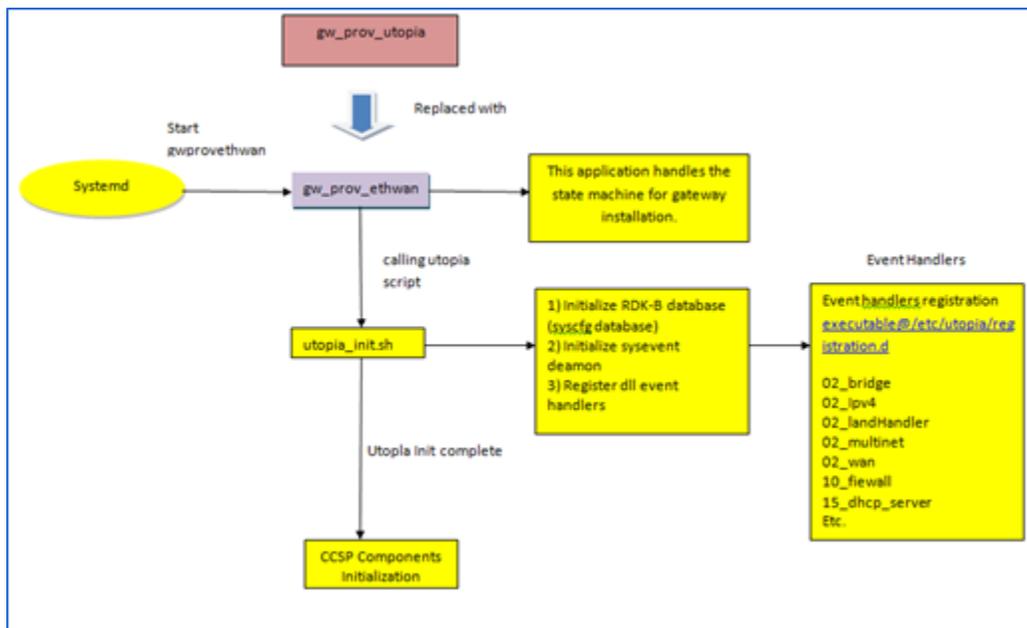
```
sudo dd if=<path to ImageName.rpi-sdimg> of=<path to SD card space> bs=4M
```

Example:

```
$ sudo dd if=rdk-generic-broadband-image-raspberrypi-rdk-broadband.rpi-sdimg of=/dev/sdb bs=4M
```

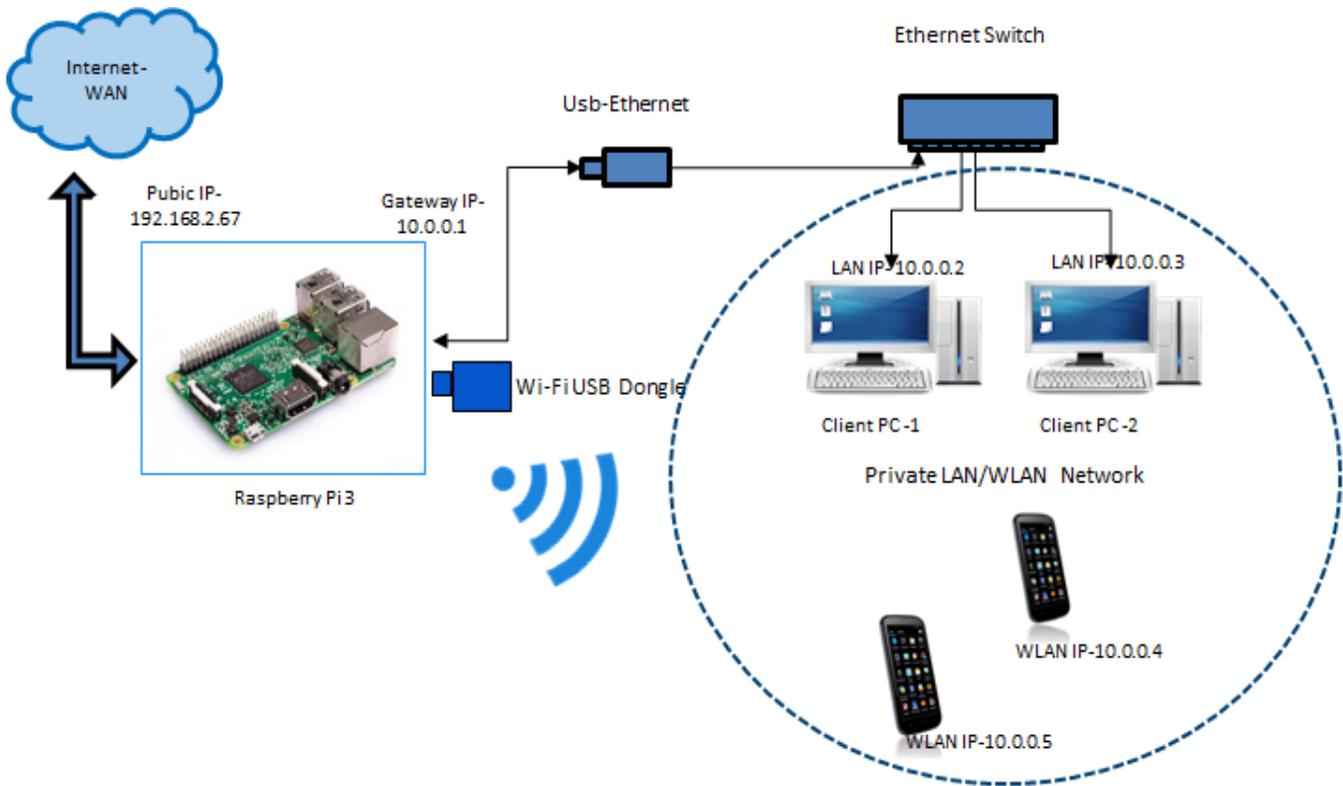
<https://www.balena.io/etcher/> can be used to flash RPI image in sd card using windows

RDk-B Bootup Sequence



- GwProvApp-Ethwan is the entry point for RDk-B stack middleware. It does all gateway initialization as above
- Responsible to initiate the registration of all services on boot -up. Responsible for all provisioning of LAN, FIREWALL(iptables), BRIDGE, etc
- GwProvApp-EthWan is specifically designed for Ethernet only Input feed for WAN Network Connection(i,e erouter0)

Router Profile Test Bed using RPI



Router Functionality Use Case - Internet connectivity for Wired and Wireless Client(s)

1. Ethernet Port of RPI should be connected to WAN Network
2. Connect WiFi Dongle to RPI (Please refer to supported dongle here [RDKB RPI Setup Information#DonglesInformationLinks](#))
3. Client PC(s) should be connected to RPI through Usb2Ethernet Adaptor which should be supported by RPI (Please refer to https://elinux.org/RPi_USB_Ethernet_adapters for supported usb to ethernet adapter by RPI). Ethernet switch is an optional in between usb2ethernet adapter and Client PC
4. Once powered on, RPI should be able to list interfaces erouter0,brlan0 and wlan0 after boot up
5. Logs can be verified under /rdklogs/logs folder
6. Now, client pc should be able to get private ip in the rage 10.0.0.x range
7. Two radios are supported by RPI (2.4 and 5 GHz) respectively. By default following SSID's are broadcasted by RPI under respective radio
 - a. 2.4GHz (Private WiFi)
 - i. SSID name - "RPI3_RDKB-AP0"
 - ii. Password - "rdk@1234"
 - b. 5 GHz (Xfinity WiFi)
 - i. SSID name - "RPI3_RDKB-AP1"
 - ii. Password - "rdk@1234"
8. Connect mobile with above default SSID name and password for respective radio. Any one radio should be used for establishing connection in mobile
9. Now, mobile should be able to get private ip in the rage 10.0.0.x range
10. To get Internet for both mobile and wired client pc , user should configure captive portal by accessing any url or 10.0.0.1 from mobile browser or PC browser. When RPI image is flashed for the first time captive portal will be enabled which will auto redirect to captive portal page and asks user to re-configure the default SSID name and password of radio(s) . Please refer to [Captive Portal in R-Pi User Manual](#) for more information.
11. Client PC should be able to connect to internet now. Ping test can also be done by connecting gateway ip 10.0.0.1
12. Since reconfiguration is done for default SSID username and password in webUI, provide the reconfigured SSID and password in mobile for reconnection with RPI
13. Now, mobile and wired client pc should be able to browse the internet. Please refer to [Clients Connection and its set up Diagram in RPI - User Manual](#) for more information regarding the same for both wired and wireless connection information
14. Connected client(s) PC and mobile information can be verified through webui by executing URL 10.0.0.1 in Client PC Browser and login with following credentials
 - a. Username : **admin**
 - b. Password : **password**
15. Please refer to link [Webui Functions](#) for various features that can be controlled through webui

Lists of Supported Features

1. DHCP Gateway Configuration
2. Connected Devices (Wired/Wireless)
3. Private Wifi 2g/5g
4. Xfinity-wifi 2g/5g

5. Parental Control(Managed Devices,Managed Sites,Managed Services)
6. Port Forwarding
7. Remote Management (Available only with http support)
8. DMZ
9. Factory-Reset
10. Captive Portal
11. Password-Reset
12. Test and Diagnostics
13. Bridge Mode
14. Webpa
15. WPS
16. Bootchart
17. MAC Filtering
18. Firewall Settings
19. Log level control through CcspLogAgent
20. Firmware Upgrade using Dual bank
21. Log Rotation Support

Supported Features User manual

- [Clients Connection and its set up Diagram in RPI - User Manual](#)
 - [RDK Based WiFi Management](#)
- [Additional Routing features user manual](#) - Bridge Mode, Test and Diagnostics,DMZ,Xfinity hotspot (wifi connection) and Remote Management
 - [Demo Videos](#) - which covers mentioned features
- [Captive Portal in R-Pi User Manual](#) - Captive Portal
- [WebPA Client Support - User Manual](#) - Webpa
- [Wireless Protection Setup - User Manual](#) - WPS
- [RDK-B Boot time data automation - User Manual](#) - Bootchart
- [MAC Filtering in R-Pi - User Manual](#) - MAC Filtering
- [RDKB CcspLogAgent Component in RPI - User Manual](#) - Log level control through EthLogAgent
- [RDKB\(V\) Firmware Upgrade in RPI - User Manual](#) - Firmware Upgrade using Dual bank
- [Log Rotation Support in RPI User manual - Broadband - 2019 M8](#)

Additional Links

- [RDK-B Components](#) - covers components supported by RDKB
- [Utopia](#) covers basic routing features of RDKB

Yocto Modification for RDK B+ Support

1. Back port of Linux kernel from sumo branch(4.14.68) to morty branch in meta-raspberrypi layer
2. Modified linux-firmware bbappend in meta-raspberrypi layer to bring up wireless interface
3. Modified bcm2835-bootfiles bbappend and rdk-rpi.inc (added dtb files) in meta-cmf-raspberrypi layer to boot up RPI B+ Board