

RDK-V IP Client based STB on Raspberrypi 3

- [Introduction](#)
- [Host Setup](#)
- [Yocto Build Setup](#)
 - [Initializing the Build Environment](#)
 - [Image build](#)
 - [Flashing Procedure](#)
- [System View](#)
- [JIRA Tracker](#)
- [Compilation Errors\(Now all are resolved\)](#)
- [Testing Procedure](#)
- [UI Navigation](#)
- [Cobalt lifecycle using terminal:](#)
- [Trouble Shooting](#)

Introduction

RDK-V IP Client is a IP based Client Set-Top-Box (STB) with RDK 4.0 features which connects directly with Network Gateways. Targets on Accelerator platforms and utilizes only open-sourced RDK components.

Host Setup

Refer to the below link for Host Machine Setup

[How to Build#SettinguptheHostEnvironment](#)

Yocto Build Setup

All RPi based RDK images with the latest features are from the rdk-next branch

Initializing the Build Environment

To build RDK images from ipstb_bringup branch, follow the below build procedure

dunfell image

```
mkdir workspace
```

```
cd workspace
```

```
# initialize the manifest with repo tool
```

```
repo init -u https://code.rdkcentral.com/r/rdkcmf/manifests -b dunfell -m rdkv-extsrc.xml
```

```
repo sync -j `nproc` --no-clone-bundle --no-tags
```

Morty image

```
mkdir workspace
```

```
cd workspace
```

```
# initialize the manifest with repo tool
```

```
repo init -u https://code.rdkcentral.com/r/rdkcmf/manifests -b rdk-next -m rdkv-extsrc.xml
```

```
repo sync -j `nproc` --no-clone-bundle --no-tags
```

generic image

```
MACHINE=raspberrypi-rdk-ipmc source meta-cmf-raspberrypi/setup-environment  
  
bitbake rdk-generic-ipclient-image
```

Image build

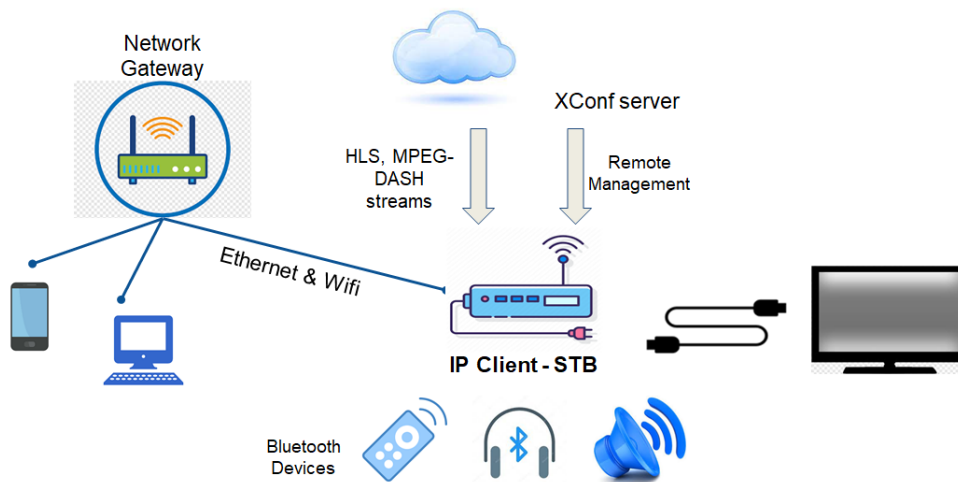
- Note. The kernel Image and root filesystem will be created under the `./tmp/deploy/images/raspberrypi-rdk-ipmc` folder

Flashing Procedure

The micro SD card should not have any partition while flashing the image. The complete memory of the card should be free.

```
# Insert the micro SD card to the host system and mention the card's device file name  
# of - output file (the device file for the inserted micro SD card  
bzcac <image name> | sudo dd of=/dev/<sd file> bs=4M iflag=fullblock oflag=direct conv=fsync
```

System View



JIRA Tracker

key summary type created updated due assignee reporter priority status resolution

 Jira project doesn't exist or you don't have permission to view it.

[View these issues in Jira](#)

Compilation Errors(Now all are resolved)

S. No	Component	Recipe	Dependent on	Remarks
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1	sysint	No bb file	It is not yet opensourced	If added in meta-rdk it is fixed
2	sysint-conf	No bb file	Removing from package oss file	Build is proceeding further
3	virtual/mfrlib		Opensourcing	
4	tenablehdcv-dev	meta-rdk-video/recipes-extended/tenablehdcv/tenablehdcv_git.bb	iarmmgrs	virtual/mfrlib
5	ledmgr-dev	meta-rdk-video/recipes-extended/ledmgr/ledmgr_git.bb	iarmmgrs	
6	iarm-query-powerstate-dev	meta-rdk-video/recipes-extended/sys_mon_tools/iarm-query-powerstate_git.bb	iarmmgrs	virtual/mfrlib
7	tr69hostif-dev	meta-rdk-video/recipes-thirdparty/tr69hostif/tr69hostif_git.bb	Bluetooth-mgr -> audiocapture -> iarmargs	
8	Netsrvmgr-pni-controller, netsrvmgr-pni-settings-loader, netsrvmgr-dev	meta-rdk-video/recipes-extended/networkmgr/netsrvmgr_git.bb	iarmmgrs	
9	iarm-set-powerstate-dev	meta-rdk-video/recipes-extended/sys_mon_tools/iarm-set-powerstate_git.bb	iarmmgrs	
10	rdkservices-dev	meta-rdk-video/recipes-extended/rdkservices/rdkservices_git.bb	iarmmgrs	
11	Key-simulator-dev	meta-rdk-video/recipes-extended/sys_mon_tools/key-simulator_git.bb	iarmmgrs	
12	iarmmgrs-dev	meta-rdk-video/recipes-extended/iarmmgrs/iarmmgrs_git.bb	virtual/mfrlib	
13	ledmgr-extended-noop-dev	meta-rdk-video/recipes-extended/ledmgr/ledmgr-extended-noop_git.bb	iarmmgrs	
14	bluetooth-mgr-dev	meta-rdk/recipes-connectivity/bluetooth/bluetooth-mgr_git.bb	Audiocapturemgr -> iarmargs	
15	aamp	meta-rdk-video/recipes-extended/aamp/gst-plugins-rdk-aamp_git.bb, meta-rdk-ext/recipes-extended/webkitbrowser-plugin/webkitbrowser-plugin_git.bb, meta-rdk-video/recipes-extended/injectedbundle/injectedbundle.bb	iarmmgrs	
16	mfrlib-rpi			
17	Wpe-webkit-dev, wpe-webkit-web-inspector-plugin, wpe-webkit	meta-rdk-ext/recipes-extended/wpe-webkit/wpe-webkit_2.22.2.bb		
18	audiocapturemgr, audiocapturemgr-dev	virtual/media-utils iarmbus iarmmgrs	iarmmgrs	virtual/mfrlib
19	tts	meta-cmf-video/recipes-graphics/tts/tts.bbappend	wpeframework-clientlibraries	security agent library is added to LD flag to fix the issue
20	mediautils			removed mediautils

Testing Procedure

- Controller UI** : For connecting Controller UI, use URL: `http://<machineip>:9998`

The screenshot displays the Controller UI web interface in a browser window. The address bar shows the URL `http://192.168.16.8:9998/Service/Controller/Ui?ip=192.168.16.8&port=9998`. The interface is divided into a left sidebar with navigation options and a main content area.

Left Sidebar:

- Controller
- Device Info
- Location
- Messenger
- Monitor
- Player Info
- ResidentApp
- Tracing
- Bluetooth
- Display Settings
- Network
- Persistent Store
- RDK Shell
- System Services
- Wi-Fi

Main Content Area:

Device Information:

Device	Value
Name	raspberrypi-rdk-ipmc
Location	OEuChGyrt
Version	1.0 #a1d8bf0f95b13a8e55b6c334cb92f510067aefc
Network Interface	lo
MAC	00:00:00:00:00:00
IP	127.0.0.1
Uptime	116

RAM Statistics:

Category	Value
Total RAM	607.2 MB
Used RAM	415.9 MB
Free RAM	190.3 MB
Total GPU RAM	0.0 MB
Used GPU RAM	0.0 MB
Free GPU RAM	0.0 MB

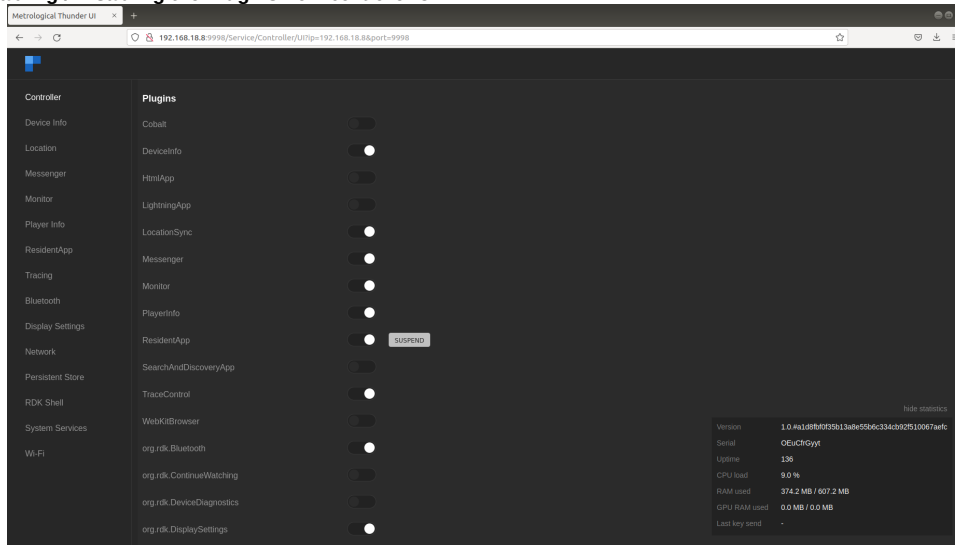
CPU Statistics:

Category	Value
CPU Load	17.0 %

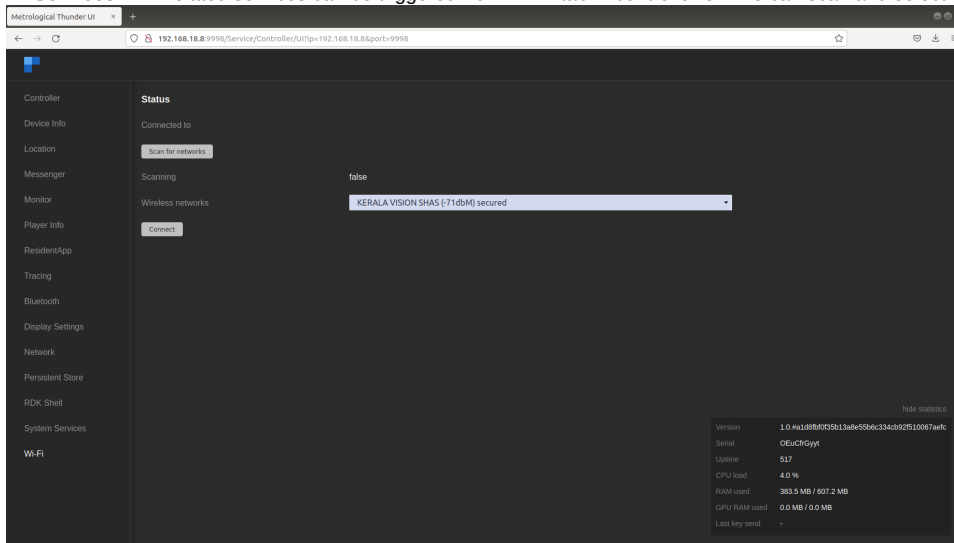
System Statistics (Bottom Right):

Category	Value
Version	1.0 #a1d8bf0f95b13a8e55b6c334cb92f510067aefc
Serial	OEuChGyrt
Uptime	296
CPU load	20.0 %
RAM used	415.3 MB / 607.2 MB
GPU RAM used	0.0 MB / 0.0 MB
Last key send	-

- **Enabling / Disabling the Plugins** from controller UI.



- **Wi-Fi Services:** Wifi related services can be triggered from Wi-Fi tab in controller UI. We can scan and select from available networks.



- **R-Pi Board Console Access :** Execute `ssh root@machineip` from your host PC
- **Image Details Verification:** For verifying the image details, we can use `cat /version.txt` command.

```
root@raspberrypi-rdk-ipmc:~# cat /version.txt

imagenam:rdk-generic-ip-stb-client_rdk-next_20210902101930

BRANCH=rdk-next

YOCTO_VERSION=dunfell

SPIN=0

BUILD_TIME="2021-09-02 10:19:30"

Generated on Thu Sep 02 10:19:30 UTC 2021

root@raspberrypi-rdk-ipmc:~#
```

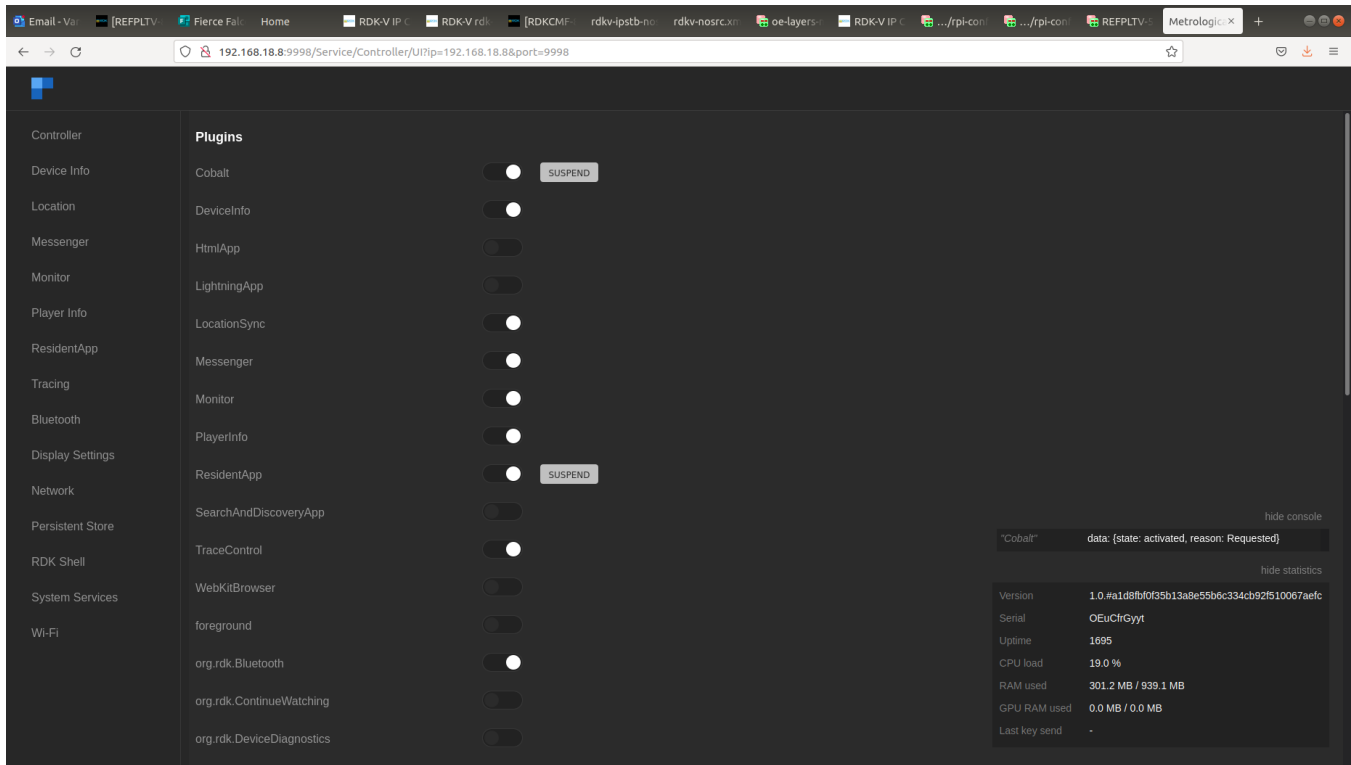
- **Playing a video using gstreamer, with aamp as gstreamer plugin element by using aamp:// in the uri:**

```
eg :- gst-launch-1.0 playbin uri=aamp://bitdash-a.akamaihd.net/content/Mi201109210084_1/m3u8s/f08e80da-bf1d-4e3d-8899-f0f6155f6efa.m3u8
video-sink=westerossink
```

- **Playing a video using gstreamer, with gst-launch-1.0.**

```
eg :- gst-launch-1.0 playbin uri=aamp://bitdash-a.akamaihd.net/content/Mi201109210084_1/m3u8s/f08e80da-bf1d-4e3d-8899-f0f6155f6efa.m3u8 v
ideo-sink=westerossink
```

- **Playback through Youtube Application** : For launching youtube from controller UI, enable cobalt plugin, youtube page will be loaded in TV UI.



UI Navigation

For details on UI page, visit [RDK Accelerator Home UI - Version 2.0#ControllerUI](#).

Cobalt lifecycle using terminal:

Launching cobalt using RDK Shell : execute below command from ssh terminal

```
curl --data-binary '{"jsonrpc":"2.0", "id":3, "method":"org.rdk.RDKShell.1.launch", "params":{"callsign": "Cobalt", "type":"","uri":""}}' -H 'content-type:text/plain;' http://127.0.0.1:9998/jsonrpc
```

Setting a video URL using deeplink method.

```
curl --data-binary '{"jsonrpc":"2.0", "id":3, "method":"Cobalt.1.deeplink", "params": "<videoURL>"}' -H 'content-type:text/plain;' http://127.0.0.1:9998/jsonrpc
```

Sending enter key to proceed video playback

```
curl --header "Content-Type: application/json" --request POST --data '{"jsonrpc":"2.0", "id":3, "method":"org.rdk.RDKShell.1.generateKey", "params":{"keys":[{"keyCode": 13, "modifiers": [], "delay": 1.0}]}}' http://127.0.0.1:9998/jsonrpc
```

Suspending the plugin using RDKShell

```
curl --data-binary '{"jsonrpc":"2.0", "id":3, "method":"org.rdk.RDKShell.1.suspend", "params":{"callsign": "Cobalt"}}' -H 'content-type:text/plain;' http://127.0.0.1:9998/jsonrpc
```

Resuming the plugin

```
curl --data-binary '{"jsonrpc":"2.0", "id":3, "method":"org.rdk.RDKShell.1.launch", "params":{"callsign": "Cobalt", "type":"","uri":""}}' -H 'content-type:text/plain;' http://127.0.0.1:9998/jsonrpc
```

Destroy

```
curl --data-binary '{"jsonrpc":"2.0", "id":3, "method":"org.rdk.RDKShell.1.destroy", "params":{"callsign": "Cobalt"}}' -H 'content-type:text/plain;' http://127.0.0.1:9998/jsonrpc
```

Trouble Shooting

- **Overcoming build time fetch errors:**
 - If fetch failure occurs for libinput, comment SRC_URI related changes from meta-cmf/recipes-graphics/libinput/libinput_git.bbappend.
 - If fetch failure occurs for gst-plugins-ugly, use mirror source, for that comment out SRC_URI related changes from meta-cmf/recipes-multimedia/gstreamer/gstreamer1.0-plugins-ugly_git.bbappend.
- If the wireless networks are not listed in controller wifi page, try after disabling and enabling wifi from Network page, networks will be listed.
- Disable cntlm-main.service if device reboot occasionally.