

Steps to validate lightning refapp on RDK 4.0

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Overview

To validate lightning refapp on rdk 4.0 (rdk-generic-hybrid-image-raspberrypi) along with video playback, need to do some necessary code customizations /modifications in lightning refapp side for video player implementation provided by lightning-sdk framework and rdk library side for variable setting and url configurations.

Please follow the below instructions to validate lightning refapp on rdk-generic-hybrid-image.

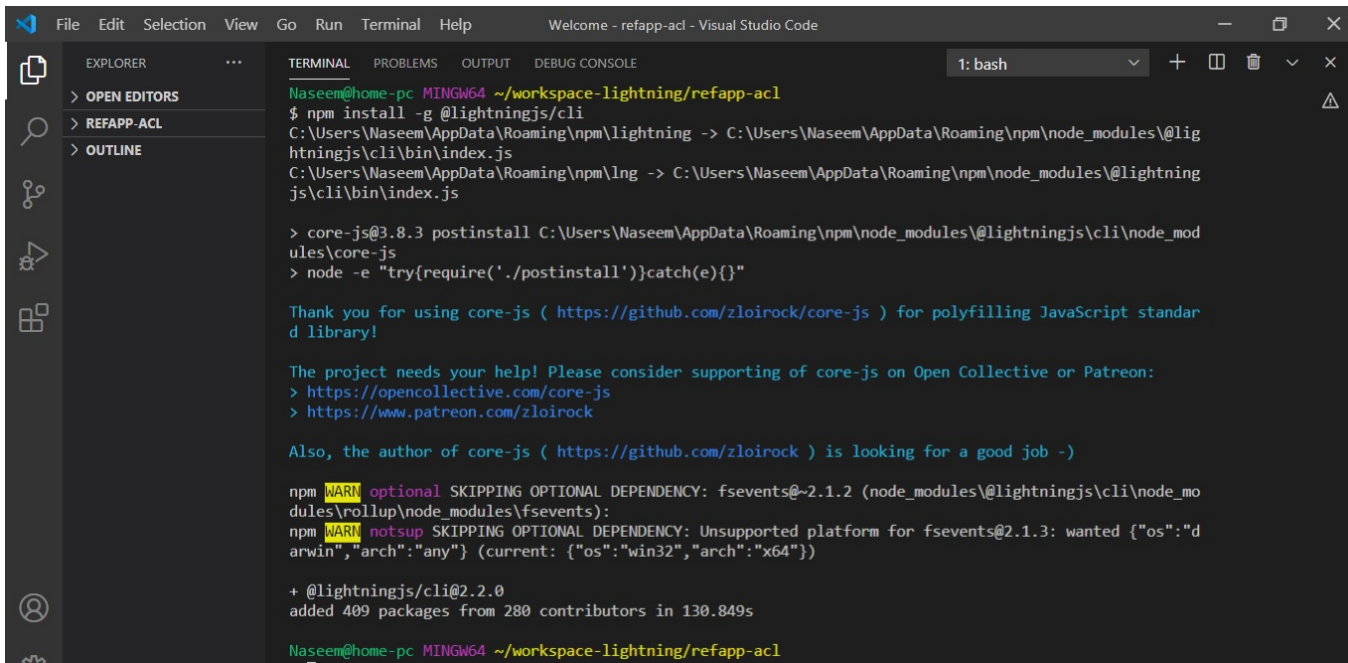
Prerequisites

Before you follow the steps below, make sure you have installed all the required prerequisites in your dev PC - [Node.js](#) , [npm](#), [Lightning-CLI](#)

- Download and install VSCode IDE (code editor) - <https://code.visualstudio.com/download>
- Download and install Node.js and npm - <https://nodejs.org/en/download/>
- Install Lightning-CLI globally in your dev PC

```
$ npm install -g @lightningjs/cli
```

reference image for Lightning-CLI install



```
Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl
$ npm install -g @lightningjs/cli
C:\Users\Naseem\AppData\Roaming\npm\lightning -> C:\Users\Naseem\AppData\Roaming\npm\node_modules\@lightningjs\cli\bin\index.js
C:\Users\Naseem\AppData\Roaming\npm\lng -> C:\Users\Naseem\AppData\Roaming\npm\node_modules\@lightningjs\cli\bin\index.js

> core-js@3.8.3 postinstall C:\Users\Naseem\AppData\Roaming\npm\node_modules\@lightningjs\cli\node_modules\core-js
> node -e "try{require('./postinstall')}}catch(e){}"

Thank you for using core-js ( https://github.com/zloirock/core-js ) for polyfilling JavaScript standard library!

The project needs your help! Please consider supporting of core-js on Open Collective or Patreon:
> https://opencollective.com/core-js
> https://www.patreon.com/zloirock

Also, the author of core-js ( https://github.com/zloirock ) is looking for a good job -)

npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@~2.1.2 (node_modules\@lightningjs\cli\node_modules\rollup\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@2.1.3: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})

+ @lightningjs/cli@2.2.0
added 409 packages from 280 contributors in 130.849s

Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl
```

Build instructions

- **Create Lightning refapp dev build**

1. pull code from source repo using below command

```
$ git clone https://github.com/naseemshekh20/refapp.git
```

2. goto refapp directory

```
$ cd refapp
```

3. checkout to branch refapp-vid-playback-validation-on-rdk-4.0

```
$ git checkout refapp-vid-playback-validation-on-rdk-4.0
```

4. install the NPM dependencies by running below command

```
$ npm install
```

5. run copyAssets.sh command to create static folder and copy images, json files etc

```
$ ./copyAssets.sh
```

6. run below command for testing in browser

```
$ lng dev
```

refer below screenshots for reference

The screenshot shows the Visual Studio Code interface with the Explorer sidebar on the left. The Explorer sidebar shows the file structure: > OPEN EDITORS, > REFAPP-ACL, > OUTLINE, and > TIMELINE. The main area displays the TERMINAL output. The terminal shows the following commands and output:

```
Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl
$ git clone https://github.com/LibertyGlobal/refapp.git
Cloning into 'refapp'...
remote: Enumerating objects: 38, done.
remote: Counting objects: 100% (38/38), done.
remote: Compressing objects: 100% (32/32), done.
remote: Total 973 (delta 15), reused 12 (delta 5), pack-reused 935
Receiving objects: 100% (973/973), 723.54 KiB | 242.00 KiB/s, done.
Resolving deltas: 100% (401/401), done.

Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl
$ cd refapp/

Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl/refapp (master)
$ npm install
npm WARN deprecated request@2.88.2: request has been deprecated, see https://github.com/request/request/issues/3142
npm WARN deprecated request-promise@4.2.6: request-promise has been deprecated because it extends the now deprecated request package, see https://github.com/request/request/issues/3142
npm WARN deprecated har-validator@5.1.5: this library is no longer supported
npm WARN deprecated core-js@2.6.12: core-js@<3 is no longer maintained and not recommended for usage due to the number of issues. Please, upgrade your dependencies to the actual version of core-js@3.

> husky@3.1.0 install C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\node_modules\husky
> node husky install

husky > Setting up git hooks
husky > Done

> core-js@2.6.12 postinstall C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\node_modules\core-js
> node -e "try{require('./postinstall')}}catch(e){}"
```

reference images for build instructions-1

The screenshot shows the Visual Studio Code interface with the Explorer sidebar on the left. The Explorer sidebar shows the file structure: > OPEN EDITORS, > REFAPP-ACL, > OUTLINE, and > TIMELINE. The main area displays the TERMINAL output. The terminal shows the following commands and output:

```
Thank you for using core-js ( https://github.com/zloirock/core-js ) for polyfilling JavaScript standard library!

The project needs your help! Please consider supporting of core-js on Open Collective or Patreon:
> https://opencollective.com/core-js
> https://www.patreon.com/zloirock

Also, the author of core-js ( https://github.com/zloirock ) is looking for a good job -)

> @lightningjs/sdk@3.2.1 postinstall C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\node_modules\@lightningjs\
sdk
> node ./scripts/postinstall.js

=====

The package name of the Lightning SDK has recently changed from "wpe-lightning-sdk"
to "@lightningjs/sdk"
Read more about it here: http://www.lightningjs.io/announcements/carbon-release

From now on you should import plugins from the Lightning SDK like this:

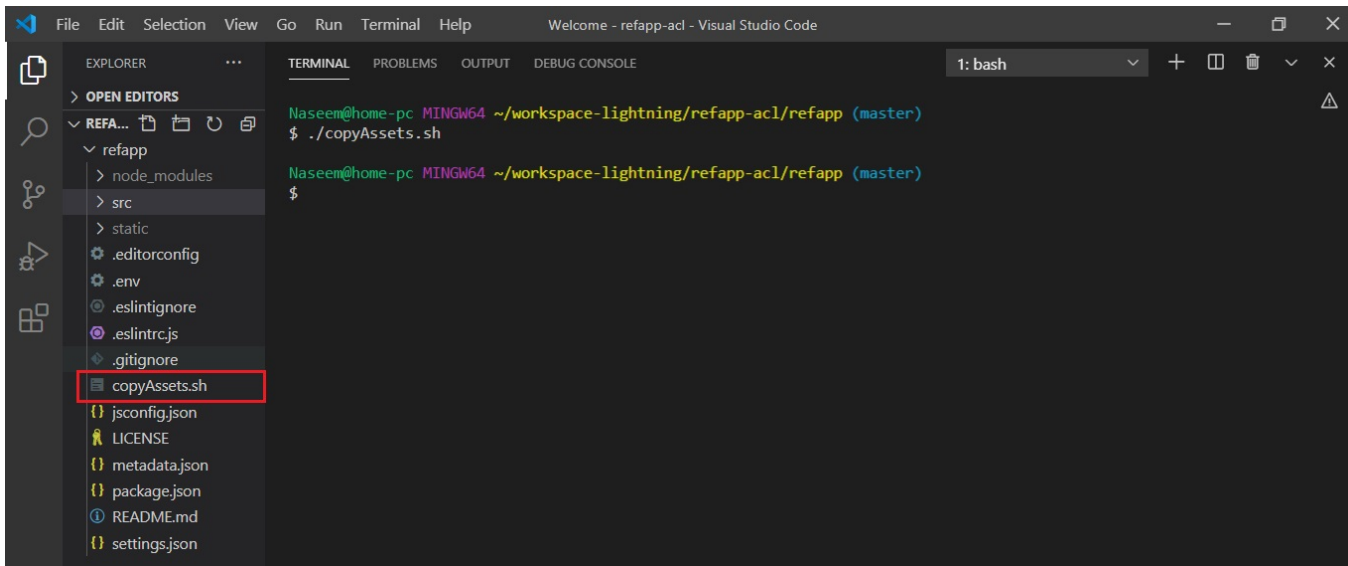
import { Utils } from '@lightningjs/sdk'

=====
```

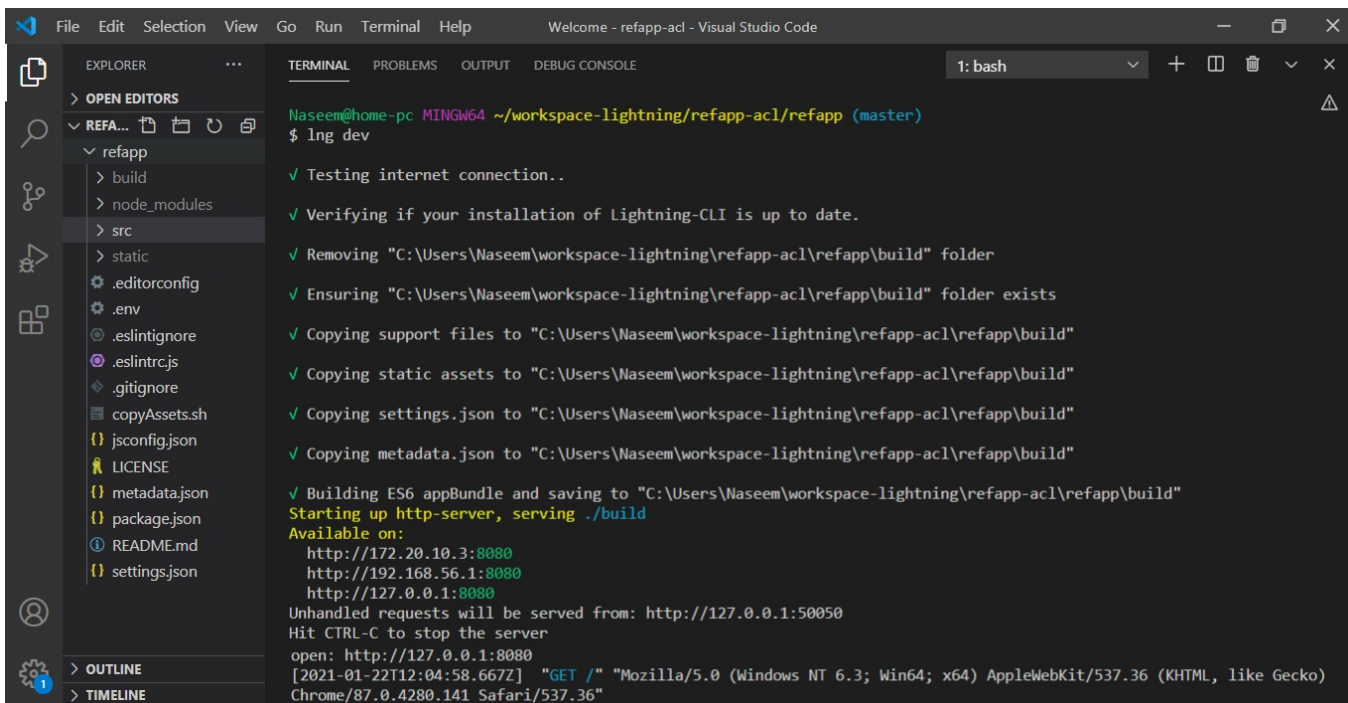
reference images for build instructions-2

once npm install complete, you will get message at the end "Do you want us to automatically check for old Lightning-SDK imports and update them in your project files? y/n

press n and hit enter button because on pressing y it gets hanged or stuck, in this case press ctrl+c



reference images for build instructions-3



reference images for build instructions-4

Running refapp

by default vscode launch generated url on chrome browser in dev pc.



reference image for running app on browser

- **Pre-build refapp code**

Download customized pre-build refapp code which has lightning sdk video player integrated: [build.zip](#)

(or)

- **Create dist (build)**

- run below command to make build.

```
$ lng dist
```

The screenshot shows the Visual Studio Code interface with the 'REFAPP-ACL' project open. The Explorer panel on the left shows the project structure, with the 'dist' folder highlighted. The Terminal panel on the right shows the output of the 'ng dist' command, which includes messages about ensuring folder existence, removing a static folder, copying assets, and building the ES6 app bundle. The terminal output is as follows:

```
[2021-01-22T12:29:18.882Z] "GET /static/img/movies/movie_06.png" "Mozilla/5.0 (Windows NT 6.3; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 Safari/537.36"
[2021-01-22T12:29:18.945Z] "GET /static/img/movies/movie_01.png" "Mozilla/5.0 (Windows NT 6.3; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 Safari/537.36"
[2021-01-22T12:29:19.030Z] "GET /static/img/movies/movie_03.png" "Mozilla/5.0 (Windows NT 6.3; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 Safari/537.36"
[2021-01-22T12:29:19.118Z] "GET /static/img/movies/movie_05.png" "Mozilla/5.0 (Windows NT 6.3; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 Safari/537.36"

Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl/refapp (master)
$ ng dist

✓ Ensuring "C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\dist\es6" folder exists
✓ Ensuring "C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\dist\es6\js" folder exists
✓ Removing "C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\dist\es6\static" folder
✓ Copying static assets to "C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\dist\es6"
✓ Building ES6 appBundle and saving to "C:\Users\Naseem\workspace-lightning\refapp-acl\refapp\dist\es6\js"

Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl/refapp (master)
$
Naseem@home-pc MINGW64 ~/workspace-lightning/refapp-acl/refapp (master)
$
```

reference image for dist creation

Hosting Lighting refapp

1. copy the lighting build app from dist folder.
2. host build folder into any http server.
3. test the hosted application on browser



Lighting refapp integration

- **Pre-build rdk-generic-hybrid-image-raspberrypi image**

Download pre-build rdk-generic-hybrid-image-raspberrypi image from here: [rdk-generic-hybrid-image-raspberrypi-rdk-hybrid.zip](#)

(or)

- **Build rdk-generic-hybrid-image-raspberrypi follow below instructions**

```
$ repo init -u https://code.rdkcentral.com/r/manifests -b yocto-dunfell-upgrade -m rdkv-nosrc.xml
$ repo sync -j4 --no-clone-bundle
$ MACHINE=raspberrypi-rdk-hybrid source meta-cmf-raspberrypi/setup-environment
$ bitbake rdk-generic-hybrid-image
```

- **Flash image on the SD card**

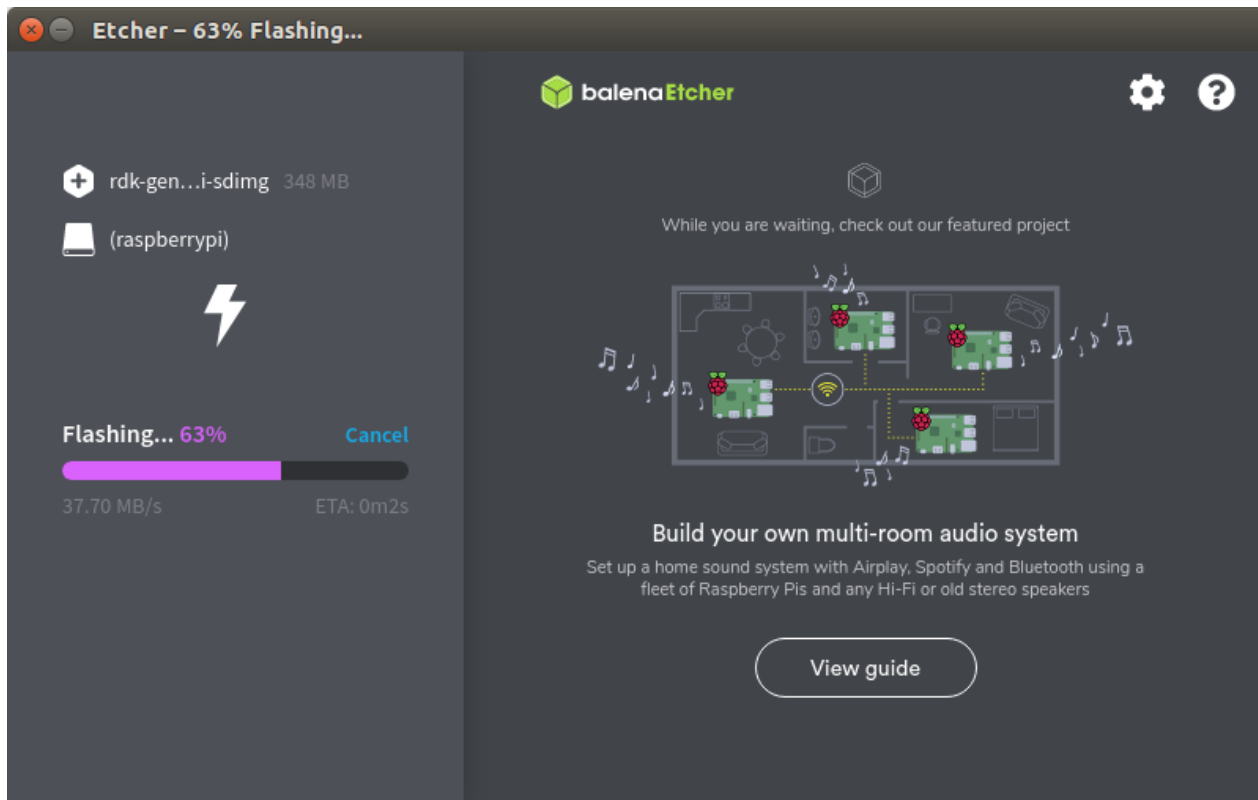
- Execute the following command to flash the image on the SD card

```
# sudo dd if=<r-pi sdimg> of=<SD card device> bs=1M
for ex: # sudo dd if=rdk-mc-rpi.sdimg of=/dev/sdb bs=1M
```

(or)

Windows user can download and install Balena Etcher to write the Raspberry Pi SD card: <https://www.balena.io/etcher/>

- Download the pre-build image file from [rdk-generic-hybrid-image-raspberrypi-rdk-hybrid.zip](#) link to your PC and extract
- Flash it to the Raspberry Pi's SD card using Etcher



- Lighting refapp integration into rdk-generic-hybrid-image-raspberrypi

- Method 1:

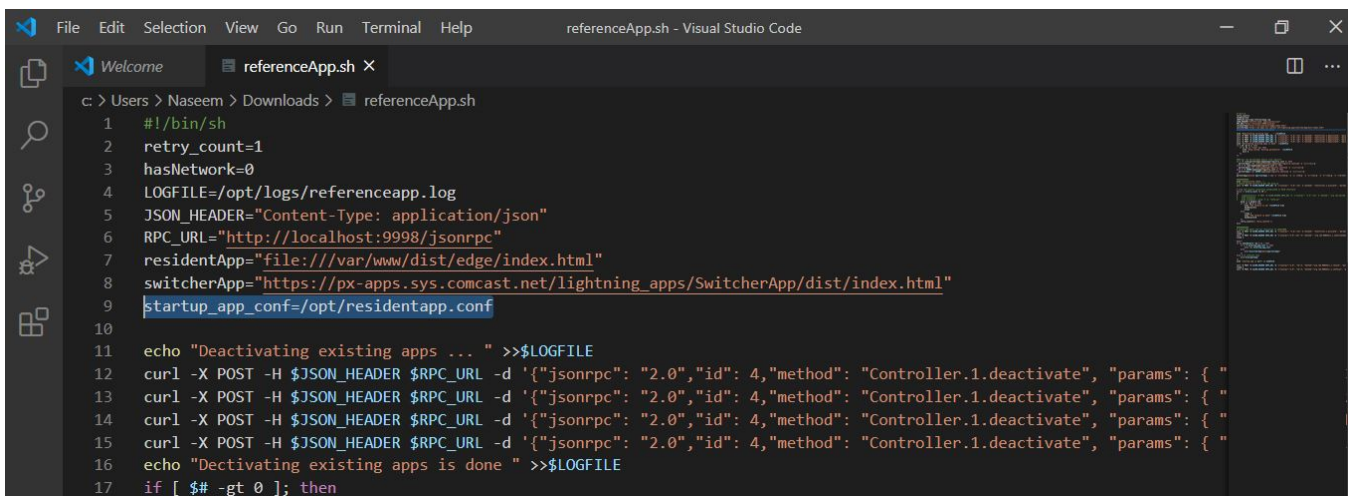
1. login into raspberrypi and change directory:

```
$ ssh root@<<IP address>>

# after login into box
$ cd /lib/rdk/
```

2. add startup_app_conf variable into referenceApp.sh config file, if referenceApp.sh file is not available in /lib/rdk then refer **method 2** below to validate refapp.

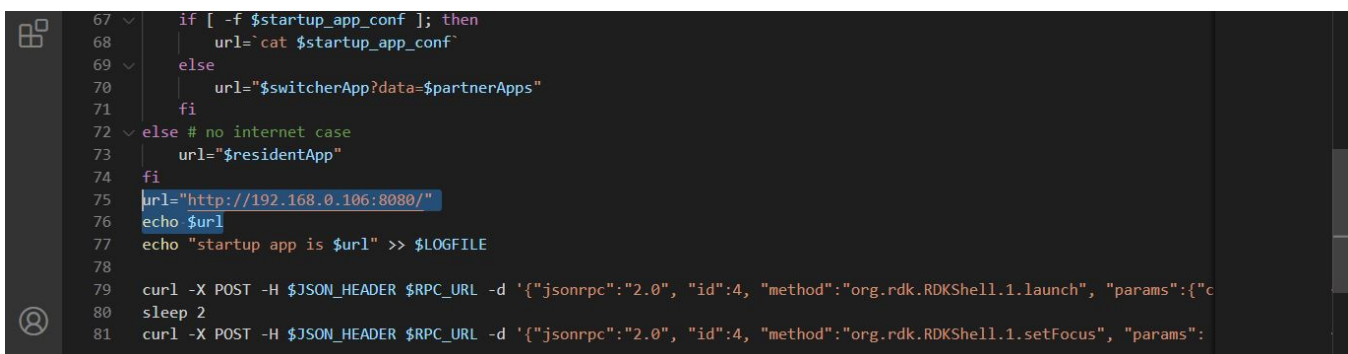
```
startup_app_conf=/opt/residentapp.conf
```



```
File Edit Selection View Go Run Terminal Help referenceApp.sh - Visual Studio Code
Welcome referenceApp.sh X
c: > Users > Naseem > Downloads > referenceApp.sh
1 #!/bin/sh
2 retry_count=1
3 hasNetwork=0
4 LOGFILE=/opt/logs/referenceapp.log
5 JSON_HEADER="Content-Type: application/json"
6 RPC_URL="http://localhost:9998/jsonrpc"
7 residentApp="file:///var/www/dist/edge/index.html"
8 switcherApp="https://px-apps.sys.comcast.net/lightning_apps/SwitcherApp/dist/index.html"
9 startup_app_conf=/opt/residentapp.conf
10
11 echo "Deactivating existing apps ... " >> $LOGFILE
12 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0","id": 4,"method": "Controller.1.deactivate", "params": { "
13 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0","id": 4,"method": "Controller.1.deactivate", "params": { "
14 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0","id": 4,"method": "Controller.1.deactivate", "params": { "
15 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0","id": 4,"method": "Controller.1.deactivate", "params": { "
16 echo "Deactivating existing apps is done " >> $LOGFILE
17 if [ $# -gt 0 ]; then
```

3. add below line to avoid loading default app

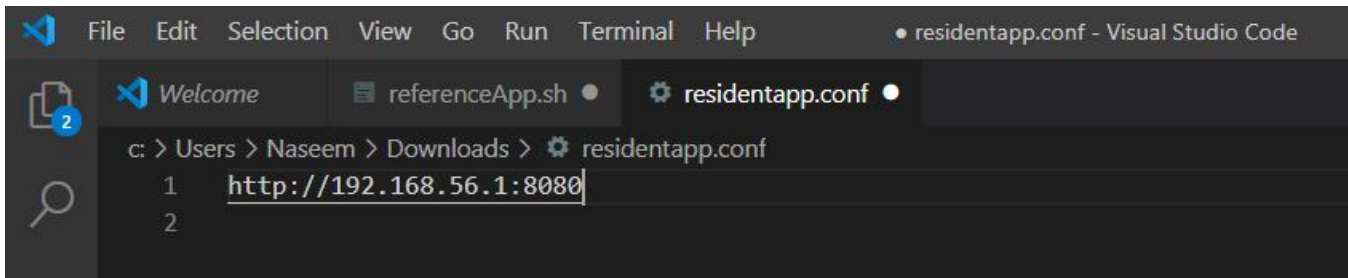
```
url="http://192.168.0.106:8080/"
echo $url
```



```
67 if [ -f $startup_app_conf ]; then
68     url='cat $startup_app_conf`
69 else
70     url="$switcherApp?data=$partnerApps"
71 fi
72 else # no internet case
73     url="$residentApp"
74 fi
75 url="http://192.168.0.106:8080/"
76 echo $url
77 echo "startup app is $url" >> $LOGFILE
78
79 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0", "id": 4, "method": "org.rdk.RDKShell.1.launch", "params": {"c
80 sleep 2
81 curl -X POST -H $JSON_HEADER $RPC_URL -d '{"jsonrpc": "2.0", "id": 4, "method": "org.rdk.RDKShell.1.setFocus", "params":
```


4. replace existing url https://px-apps.sys.comcast.net/lightning_apps/SwitcherApp/dist/index.html in /opt/residentapp.conf with lightning app url which is hosted on server

for example your server providing url <http://192.168.56.1:8080>



5. reboot the box

- **Method 2:**

Validated on rdk-generic-hybrid-wpe-image_rdk-next image, download image link: https://drive.google.com/file/d/1_VgFDk_IRWLoMww0JKQrZ4HUifN-F6Qa/view?usp=sharing

step 1: login to box \$ ssh root@<your box ip>

step 2: copy refapp build into /opt/www

step3: \$ cd /lib/rdk

step 4: \$ vi residentApp.sh

step 5: configure refapp url into residentApp.sh > find in residentApp.sh line "offlineApp="<http://127.0.0.1:50050/ixresui/index.html>" and replace with refapp url, Example: "offlineApp="<http://127.0.0.1:50050/refapp/index.html>"

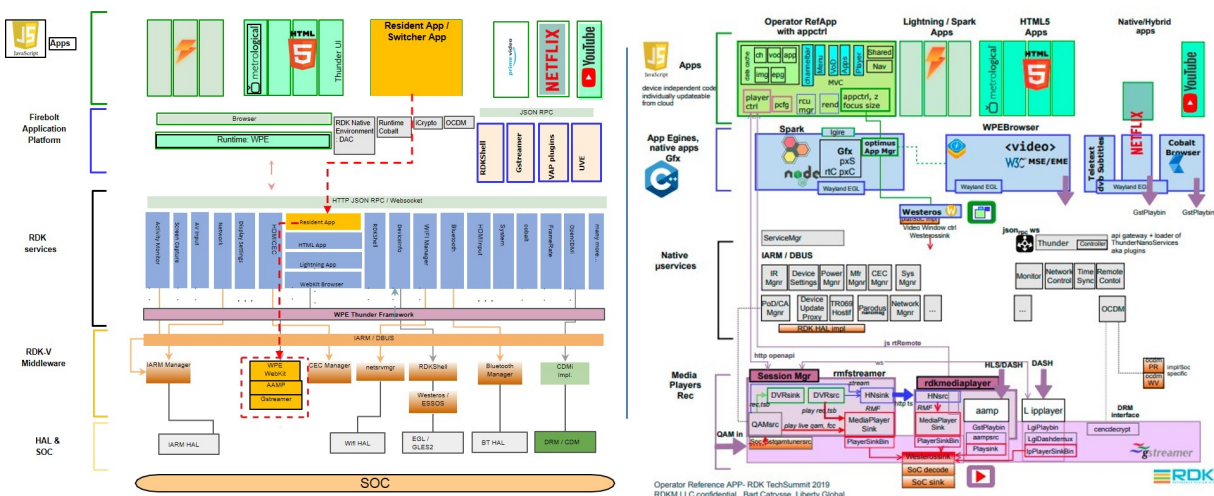
Note: if you are downloading prebuild refapp from download link: [build.zip](#) after extract you will see build/build/<files>, you can copy build folder as it is and in this case url will be "offlineApp="<http://127.0.0.1:50050/build/build/index.html>".

step 6: After reboot app come up with a splash screen. Lighting application will launch instead of switcher app. Main menu screen is displayed which allows users to launch apps, vod, and play video content.



RefApp Video Playback

- RDK 4.0 (rdk-generic-hybrid-image) Vs LGI RefApp (rdk-generic-hybrid-refapp-image)



Dependencies

- **Lightning RefApp on RDK 4.0**

- Uses lightning sdk media player to play video, verified video playback using mp4 and HLS streams.
- Tested mp4 source: [http://clips-media-aka.warnermediacdn.com/cnn/clips/2021-01/79895-97f21462b4db4236abcbd68a581\[...\].remarks-vpx-primary-58581-79895-1920x1080_8000k.mp4](http://clips-media-aka.warnermediacdn.com/cnn/clips/2021-01/79895-97f21462b4db4236abcbd68a581[...].remarks-vpx-primary-58581-79895-1920x1080_8000k.mp4)
- Tested hls source: <https://cdn.metrological.com/hls/greenland720.m3u8>
- Lightning (a javascript TV app development framework) refapp is a web based app, which runs on browser (supports WebGL). To run this wpe framework or rdkbrowser2 is required.
- [sessionmanager](#), [rmfstreamer](#), [spark](#) environment, [nodejs](#) and LGI based [IP player](#) not required.

- **Lightning RefApp on Operator reference image (rdk-generic-hybrid-refapp-image)**

- uses various native RDK components such as [spark](#), [rmfstreamer](#) with [sessionmanager](#), IP players ([aamp](#) and [Liberty IPplayer](#)) to play QAM source, IP video streams (hls/dash).

Reference Video

Your browser does not support the HTML5 video element