

WanManager Integration for RDKB RPI

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Introduction

This page describes the bring-up of RdkWanManager on Raspberry-pi platform using rdk-next branch. Also, we captured list of the issues that are faced during bring up and resolution for the same.

Components

The following components are newly introduced for Porting of RdkWanManager in RPI Target Platform ,

- [RdkWanManager](#)
- [JSON RPC](#)

The following are the dependent components & meta-layers which are modified,

- [Utopia](#)
- [PandM](#)
- [LogAgent](#)
- [CcspCommonLibrary](#)
- [meta-rdk-broadband](#)
- [meta-cmf-broadband](#)
- [CcspEthAgent](#)
- [JSON ETHSW](#)
- [rdk_logger](#)
- [meta-cmf-raspberrypi](#)

RPI Build Steps

Please refer the below link for host environment set-up & flashing procedure for yocto build ,

Dunfell :

[RPI 3B/3B+ Model Reference Platform](#)

Morty:

[RDK-B Raspberrypi - Host SetUp and Build Instructions#BRaspberrypi-HostSetUpandBuildInstructions-YoctoBuildSteps](#)

Repo Steps

To build, follow below instructions

Dunfell Build

Dunfell Build - Repo 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
```

Morty Build

Morty Build - Repo 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 -j`nproc` --no-clone-bundle
```

WanManager Bug Fixes

WanManager Fixes

```
$ cd ~/rdkb/components/opensource/ccsp/CcspEthAgent
$ git fetch https://code.rdkcentral.com/r/rdkb/components/opensource/ccsp/CcspEthAgent refs/changes/98/58898/2
&& git cherry-pick FETCH_HEAD

$ cd ~/rdkb/components/generic/json-rpc
$ git fetch https://code.rdkcentral.com/r/rdkb/components/generic/json-rpc refs/changes/91/58891/1 && git
cherry-pick FETCH_HEAD

$ cd ~/rdk/components/generic/rdk_logger
$ git fetch https://code.rdkcentral.com/r/rdk/components/generic/rdk_logger refs/changes/85/58885/1 && git
cherry-pick FETCH_HEAD

$ cd ~/rdkb/components/opensource/ccsp/CcspPandM
$ git fetch https://code.rdkcentral.com/r/rdkb/components/opensource/ccsp/CcspPandM refs/changes/51/58951/1 &&
git cherry-pick FETCH_HEAD

$ cd ~/meta-cmf-broadband
$ git fetch https://code.rdkcentral.com/r/rdk/components/generic/rdk-oe/meta-cmf-broadband refs/changes/65/58865
/2 && git cherry-pick FETCH_HEAD

$ cd ~/meta-cmf-raspberrypi
$ git fetch https://code.rdkcentral.com/r/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi refs/changes/26
/59026/2 && git cherry-pick FETCH_HEAD
```

Note : The above bug fixes changes are temporary given as instructions. This is not required once the change is gets merged into the appropriate repo.

Build steps

Build Steps

```
$ MACHINE=raspberrypi-rdk-broadband source meta-cmf-raspberrypi/setup-environment
$ bitbake rdk-generic-broadband-image
```

We will get the following rdk-wanmanager compilation errors While bitbaking the target image,

rdk-wanmanager Compilation Errors

```
../../../../git/source/WanManager/wanmgr_interface_sm.c:720:62: error: macro "LOG_CONSOLE" passed 3 arguments, but
takes just 0
    LOG_CONSOLE("%s Wan_init_complete:%d\n",buffer,uptime);
                                   ^
../../../../git/source/WanManager/wanmgr_interface_sm.c:720:9: error: 'LOG_CONSOLE' undeclared (first use in this
function)
    LOG_CONSOLE("%s Wan_init_complete:%d\n",buffer,uptime);
    ^~~~~~
```

rdk-wanmanager compilation Fix

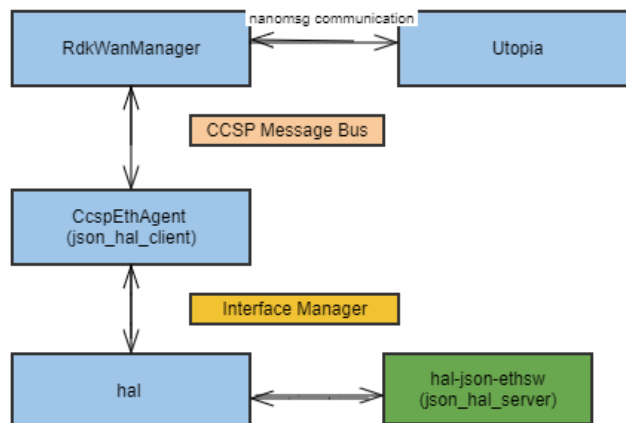
```
$ cd ~/build-raspberrypi-rdk-broadband/tmp/work/cortexa7t2hf-neon-vfpv4-rdk-linux-gnueabi/rdk-wanmanager/1.
99+gitAUTOINC+b6db33d891-r0/git/source
$ git fetch https://code.rdkcentral.com/r/rdkb/components/opensource/ccsp/RdkWanManager refs/changes/00/58500/2
&& git cherry-pick FETCH_HEAD

$ bitbake rdk-wanmanager -c compile -f
$ bitbake rdk-generic-broadband-image
```

Note: The above bug fixes changes are temporary given as instructions. This is not required once the change is gets merged into the appropriate repo.

Control Flow

Following diagram depicts the flow of control among the components,



- Eth Hal will configure interface and monitor the link. CcspEthAgent will subscribe for 'EthInterfaceStatus' event so that it can receive the notification form Vendor Software (i.e. Eth Hal) whenever physical link event change.
- CcspEthAgent will pass the link change event to Wan Manager, It will set the value for Wan Manger DM 'Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus'

Approach

Integration Approach

Manifest Changes

Manifest File

```
<project name="rdkb/components/opensource/ccsp/RdkWanManager" revision="rdk-next"/>
<project name="rdkb/components/generic/json-rpc" revision="rdk-next"/>
```

Note : RdkWanManager Project will be added in RPI Manifest , Once the RdkWanManager Compilation error changes are merged in rdk-next([58500](#))

Global CFLAGS

- **FEATURE_RDKB_WANMANAGER** is the global CFLAG used in other components to use with WANMANAGER feature.
- All the changes are enclosed inside **FEATURE_RDKB_WAN_MANAGER** compilation flag, this CFLAG can be used to control whether or not to compile the WanManager code changes.

We enabled WanManager CFLAGS in below file in rpi([meta-cmf-raspberrypi](#)) layer,

ccsp_common_rpi.inc

```
CFLAGS_append += "${@bb.utils.contains('DISTRO_FEATURES', 'rdkb_wan_manager', ' -DFEATURE_RDKB_WAN_MANAGER ',  
'', d)}"
```

Distro Features

We are using the following distro features to enable rdkb wanmanager in RPI machine configuration file,

- **rdkb_wan_manager** : Used to enable RDK WanManager and json hal

raspberrypi-rdk-broadband.conf

```
DISTRO_FEATURES_append = " rdkb_wan_manager"
```

Also , we need to disable the GwProvapp-EthWan component in ccsp packagegroup .

packagegroup-ccsp-rdk-broadband.bbappend

```
GWPROVAPP = ""
```

Package Group

To enable the RDKB Wanmanager components, added those components into the final build target. So, We have added those components into the ccsp packagegroup([58865](#)),

packagegroup-rdk-ccsp-broadband.bbappend

```
RDEPENDS_packagegroup-rdk-ccsp-broadband_append = " ${@bb.utils.contains('DISTRO_FEATURES', 'rdkb_wan_manager',  
' rdk-wanmanager json-hal-lib hal-json-ethsw', '', d)} "
```

hal-json-ethsw(Eth Hal)

- Eth Hal will configure interface and monitor the link. CcspEthAgent will subscribe for 'EthInterfaceStatus' event so that it can receive the notification from Vendor Software (i.e. Eth Hal) whenever physical link event change.
- JSON HAL server library can be used by the vendor application to receive actions from RDK WanManager application and do necessary action. The vendor application that has HAL server library integrated will receive the JSON rpc request from the RDK WanManager, process the request and sends the JSON based response back to the RDK WanManager. The HAL server also helps to dispatch asynchronous events to the RDK WanManager based on the event subscription.
- Recipe-path for JSON HAL server(58865)

```
$ ~/meta-cmf-broadband/recipes-ccsp/hal/hal-json-ethsw.bb
```

Utopia CFLAG

- To disable the utopia service_wan execution , we need to enable the utopia _WAN_MANAGER_ENABLED_ flag would mean that the RdkWanManager controls the Wan Management.

```
utopia.bbappend

CFLAGS_append += "${@bb.utils.contains('DISTRO_FEATURES', 'rdkb_wan_manager', ' -
D_WAN_MANAGER_ENABLED_', '', d)}"
```

Persistent (PSM) configuration changes

For wanmanager, the default configurations are stored in PSM. As of now, we have 1 interfaces defined for WAN in wanmanager modules (i,e) wanoe. For WANOE, by default we are using `eth0` port for WAN connection.

```
<Record name="dmsb.wanmanager.if.2.Name" type="astr">eth0</Record>
```

Example PSM Configurations

```
<!-- rdk-wanmanager records -->

<Record name="dmsb.wanmanager.wanenable" type="astr">1</Record>
<Record name="dmsb.wanmanager.wanifcount" type="astr">1</Record>
<Record name="dmsb.wanmanager.wanpolicy" type="astr">2</Record>
<Record name="dmsb.wanmanager.wanidletimeout" type="astr">0</Record>

<!-- X_RDK_WanManager.CPEInterface.1. -wanmanager -->
<Record name="dmsb.selfheal.rebootstatus" type="astr">0</Record>
<Record name="dmsb.wanmanager.if.1.Name" type="astr">eth0</Record>
<Record name="dmsb.wanmanager.if.1.DisplayName" type="astr">WanOE</Record>
<Record name="dmsb.wanmanager.if.1.Enable" type="astr">TRUE</Record>
<Record name="dmsb.wanmanager.if.1.Type" type="astr">2</Record>
<Record name="dmsb.wanmanager.if.1.Priority" type="astr">0</Record>
<Record name="dmsb.wanmanager.if.1.SelectionTimeout" type="astr">0</Record>
<Record name="dmsb.wanmanager.if.1.DynTriggerEnable" type="astr">FALSE</Record>
<Record name="dmsb.wanmanager.if.1.DynTriggerDelay" type="astr">0</Record>
<Record name="dmsb.wanmanager.if.1.Marking.List" type="astr">DATA</Record>
<Record name="dmsb.wanmanager.if.1.Marking.DATA.Alias" type="astr">DATA</Record>
<Record name="dmsb.wanmanager.if.1.Marking.DATA.SKBPport" type="astr">1</Record>
<Record name="dmsb.wanmanager.if.1.Marking.DATA.SKBMark" type="astr"> </Record>
<Record name="dmsb.wanmanager.if.1.Marking.DATA.EthernetPriorityMark" type="astr"></Record>
<Record name="dmsb.wanmanager.if.1.PPPEnable" type="astr">FALSE</Record>
<Record name="dmsb.wanmanager.if.1.PPPLinkType" type="astr">PPPoE</Record>
<Record name="dmsb.wanmanager.if.1.PPPIPCEnable" type="astr">TRUE</Record>
<Record name="dmsb.wanmanager.if.1.PPPIPv6CPEnable" type="astr">TRUE</Record>
<Record name="dmsb.wanmanager.if.1.PPPIPCEnable" type="astr">TRUE</Record>
```

Major Errors and Challenges

S. No	Recipe / Component Names	Layer	Error/Warning/challenges	Root Cause	Action
1				CR is waiting to get the MTA	

	ccsp-cr.bbappend	meta-cmf-raspberry pi	CcspEthAgent will start once it gets the signal status from CR but CR is taking long time to send the Signal status .	System_Ready Signal but MTA is not supported for RPI.	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58559/1/recipes-ccsp/ccsp/ccsp-cr.bbappend
2	ccsp-psm.bbappend	meta-cmf-raspberry pi	WanManager DM parameters are not getting the default values from PSM DB	Need to add wanmanager default DM values in PSM database	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58559/1/recipes-ccsp/ccsp/ccsp-psm.bbappend
3	utopia.bbappend	meta-cmf-raspberry pi	Below gaps needs to be filled in rpi, <ul style="list-style-type: none"> Below initialization activities were done by GWP <ol style="list-style-type: none"> 1. /var/run/firewall directory creation. 2. copying files that are needed by CCSP modules -ccsp_msg.cfg and cp_subsys_ert. 3. crontab related changes(soft link) 4.ipv6/conf/all/forwarding proc entry LAN_start() in ccsp-gwprovapp-ethwan will set sysevents viz. "lan-start", "bridge_mode" and "dhcp_server-resync". Multiple sysevents were set in ccsp-gwprovappethwan: lan-status, wan-status, ethwan-initialized,eth_wan_enabled, wan_service-status, eth_wan_mac,current_ipv4_link_state, current_wan_state,wan_start_time, bridge_mode 	<ul style="list-style-type: none"> LAN_start() in ccsp-gwprovapp-ethwan will set sysevents viz. "lan-start", "bridge_mode" and "dhcp_server-resync". Multiple sysevents were set in ccsp-gwprovappethwan: lan-status, wan-status, ethwan-initialized, eth_wan_enabled, wan_service-status, eth_wan_mac, current_ipv4_link_state, current_wan_state, wan_start_time, bridge_mode. In service_wan, execute_dir /etc/utopia/post.d/ restart is being done once the address is set to the WAN interface. 	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58554/1/recipes-ccsp/utl/utopia.bbappend
4	system_defaults (utopia recipe)	meta-cmf-raspberry pi	Added WanManager default values to syscfg.db	These default values are used by PAM	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58567/1/recipes-ccsp/utl/utopia/system_defaults
5	ccsp-p-and-m.bbappend	meta-cmf-raspberry pi	210629-12:11:47.500509 [mod=PAM, lvl=WARN] [tid=8164] Found an unresolved api: Client_GetEntryCount 210629-12:11:47.500664 [mod=PAM, lvl=WARN] [tid=8164] Found an unresolved api: SentOption_GetEntryCount 210629-12:11:47.500810 [mod=PAM, lvl=WARN] [tid=8164] Found an unresolved api: Client3_GetEntryCount 210629-12:11:47.500950 [mod=PAM, lvl=WARN] [tid=8164] Found an unresolved api: Server2_GetEntryCount 210629-12:11:47.501602 [mod=PAM, lvl=WARN] [tid=8164] resolving APIs in xml file failed! 210629-12:11:47.501708 [mod=PAM, lvl=WARN] [tid=8164] DslhDmagntLoadDataModelXML -- failed, error = -1!	<p>PandM DM was not loading after the WanManager Integration</p> <p>Device.DHCPv6.Client.(i) and Device.DHCPv4.Client.(i). was moved to the WanManager . But the DMs was not removed from PAM XML file.</p>	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58681/2/recipes-ccsp/ccsp/ccsp-p-and-m.bbappend
6	RdkWanManager	RdkWanManager	RdkWanManager fails to build with the following errors: .././git/source/WanManager/wanmgr_interface_sm.c:720:62: error: macro LOG_CONSOLE passed 3 arguments, but takes just 0 720 LOG_CONSOLE(%s Wan_init_complete:%dn,buffer,uptime); ^ In file included from .././git/source/WanManager/wanmgr_interface_sm.c:31: .././git/source/WanManager/wanmgr_platform_events.h:48: note: macro LOG_CONSOLE defined here 48 #define LOG_CONSOLE() .././git/source/WanManager/wanmgr_interface_sm.c:720:9: error: LOG_CONSOLE undeclared (first use in this function) 720 LOG_CONSOLE(%s Wan_init_complete:%dn,buffer,uptime);	LOG_CONSOLE () api is not defined	https://code.rdkcentral.com/r/c/rdkb/components/opensource/ccsp/RdkWanManager/+58500
7	ccsp-common-library.bbappend	meta-cmf-raspberry pi	ccsp-gwprov-app starts initialization scripts utopia_init.sh	<p>Added utopia.service to call utopia_init.sh</p> <p>utopia_init.sh needs to be started before starting of the RdkWanManager executable</p>	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58899 https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-raspberrypi/+58899/5/recipes-

					ccsp/ccsp/ccsp-common-library/utopia.service
8	hal	hal	Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus is getting Incorrect value .	Eth Hal will configure interface and monitor the link. CcspEthAgent will subscribe for 'EthInterfaceStatus' event so that it can receive the notification form Vendor Software (i.e. Eth Hal) whenever physical link event change.	https://code.rdkcentral.com/r/c/rdkb/devices/raspberrypi/hal/+58846/1/source/json-ethsw/hal-json-ethsw.c https://code.rdkcentral.com/r/c/rdk/components/generic/rdk-oe/meta-cmf-broadband/+58865/2/recipes-ccsp/hal/hal-json-ethsw.bb
9	hal	hal	../../../../../../../../rdkb/components/opensource/ccsp/CcspEthAgent/source/TR-181/board_sbapi/cosa_ethernet_apis.c:651: error: undefined reference to 'GWP_GetEthWanLinkStatus' collect2: error: ld returned 1 exit status Makefile:423: recipe for target 'CcspEthAgent' failed	GWP_GetEthWanLinkStatus() is not defined in eth hal. Earlier, it was defined in GWP-EthWan	https://code.rdkcentral.com/r/c/rdkb/devices/raspberrypi/hal/+58785/1/source/hal-ethsw/ccsp_hal_ethsw.c
10	rdk-logger	rdk_logger	WANMANAGERLog.txt is not created in /rdklogs/logs folder	rdkb_debug.ini and rdkb_log4crc files needs to be updated	https://code.rdkcentral.com/r/c/rdk/components/generic/rdk_logger/+58885
11	json-rpc	Json-rpc	../git/source/json-ethsw/hal-json-ethsw.c:31:10: fatal error: json_rpc_common.h: No such file or directory 31 #include "json_rpc_common.h" compilation terminated.	json_rpc_common.h required for hal-json-ethsw recipe compilation	https://code.rdkcentral.com/r/c/rdkb/components/generic/json-rpc/+58891
12	CcspEthAgent	CcspEthAgent	Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus , Device.X_RDK_WanManager.CPEInterface.1.Phy.Path & Device.X_RDK_WanManager.CPEInterface.1.Phy.Status is getting Incorrect values .	1.Fix for erouter0 interface bring up 2.Notifying EthAgent for the link event based on wan_physical_ifname 3.Fix to avoid CR ready check which is causing 1min delay in the ip-assignment flow for ETH. 4.Parameter instance correction for subscribeEvent	https://code.rdkcentral.com/r/c/rdkb/components/opensource/ccsp/CcspEthAgent/+58898
13	CcspPandM	CcspPandM	../../../../../../../../rdkb/components/opensource/ccsp/CcspPandM/source-arm/TR-181/board_sbapi/cosa_dhcpv6_apis.c:8411:56: error: 'hub4_preferred_lft' undeclared (first use in this function) 8411 dhcpv6_data.prefixPltime = hub4_preferred_lft; ^~~~~~ ../../../../../../../../rdkb/components/opensource/ccsp/CcspPandM/source-arm/TR-181/board_sbapi/cosa_dhcpv6_apis.c:8411:56: note: each undeclared identifier is reported only once for each function it appears in ../../../../../../../../rdkb/components/opensource/ccsp/CcspPandM/source-arm/TR-181/board_sbapi/cosa_dhcpv6_apis.c:8412:56: error: 'hub4_valid_lft' undeclared (first use in this function) 8412 dhcpv6_data.prefixVltime = hub4_valid_lft; ^~~~~~	hub4_preferred_lft , hub4_valid_lft are not declared properly in pam	https://code.rdkcentral.com/r/c/rdkb/components/opensource/ccsp/CcspPandM/+58891

Validation Test Results

- Flash the latest generated build
- Goto RG console

erouter0 IPv4 address

erouter0 should have valid IP based on the wan configuration (Eg 192.168.0.11/24)

```

root@RaspberryPi-Gateway:/# ifconfig erouter0
erouter0  Link encap:Ethernet  HWaddr B8:27:EB:1B:56:4C
          inet addr:192.168.0.11  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::ba27:ebff:fe1b:564c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3588 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3419 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:571905 (558.5 KiB)  TX bytes:1386689 (1.3 MiB)

root@RaspberryPi-Gateway:/# cat /version.txt
imagenam:rdkb-generic-broadband-image_rdk-next_20210629075445
BRANCH=rdk-next
YOCTO_VERSION=dunfell
VERSION=4.06.29.21
SPIN=0
BUILD_TIME="2021-06-29 07:54:45"
Generated on Tue Jun 29 07:54:45 UTC 2021
root@RaspberryPi-Gateway:/# █

```

brlan0 IPv4 Address

brlan0 IPv4 should be 10.0.0.1 (i,e Default IP Address)

```

root@RaspberryPi-Gateway:/# ifconfig brlan0
brlan0    Link encap:Ethernet  HWaddr B8:27:EB:4E:03:19
          inet addr:10.0.0.1  Bcast:10.0.0.255  Mask:255.255.255.0
          inet6 addr: fe80::ba27:ebff:fe4e:319/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:29 errors:0 dropped:0 overruns:0 frame:0
          TX packets:58 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4903 (4.7 KiB)  TX bytes:3960 (3.8 KiB)

root@RaspberryPi-Gateway:/# cat /version.txt
imagenam:rdkb-generic-broadband-image_rdk-next_20210629075445
BRANCH=rdk-next
YOCTO_VERSION=dunfell
VERSION=4.06.29.21
SPIN=0
BUILD_TIME="2021-06-29 07:54:45"
Generated on Tue Jun 29 07:54:45 UTC 2021
root@RaspberryPi-Gateway:/# █

```

Able to take SSH from WAN IP

ssh from WAN to eRouter IP should be successful


```

keerthana@keerthana-INVALID:~/keerthana/files$ ssh root@192.168.0.11
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!    @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the ECDSA key sent by the remote host is
SHA256:ouwwjhd0MYqFrc9pXc08PZnFVT6cnMU12fvvWHVt77g.
Please contact your system administrator.
Add correct host key in /home/keerthana/.ssh/known_hosts to get rid of this message.
Offending ECDSA key in /home/keerthana/.ssh/known_hosts:61
  remove with:
    ssh-keygen -f "/home/keerthana/.ssh/known_hosts" -R "192.168.0.11"
ECDSA host key for 192.168.0.11 has changed and you have requested strict checking.
Host key verification failed.
keerthana@keerthana-INVALID:~/keerthana/files$ ssh-keygen -f "/home/keerthana/.ssh/known_hosts" -R "192.168.0.11"

```

```

keerthana@keerthana-INVALID:~/keerthana$ ssh root@192.168.0.11
root@RaspberryPi-Gateway:~#
root@RaspberryPi-Gateway:~# cat /version.txt
imagenam:rdkb-generic-broadband-image_rdk-next_20210629075445
BRANCH=rdk-next
YOCTO_VERSION=dunfell
VERSION=4.06.29.21
SPIN=0
BUILD_TIME="2021-06-29 07:54:45"
Generated on Tue Jun 29 07:54:45 UTC 2021
root@RaspberryPi-Gateway:~# █

```

Internet Testing on RPI

- erouter0 Interface should have Ipv4 Address
- verify the ping www.google.com on RPI
- RPI shouldn't lose the Internet

```

root@RaspberryPi-Gateway:~# ifconfig erouter0
erouter0  Link encap:Ethernet  HWaddr B8:27:EB:1B:56:4C
          inet addr:192.168.0.11  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::ba27:ebff:fe1b:564c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4456 errors:0 dropped:0 overruns:0 frame:0
          TX packets:4214 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:636995 (622.0 KiB)  TX bytes:1715564 (1.6 MiB)

root@RaspberryPi-Gateway:~# ping www.google.com
PING www.google.com (216.58.200.132): 56 data bytes
64 bytes from 216.58.200.132: seq=0 ttl=118 time=1.881 ms
64 bytes from 216.58.200.132: seq=1 ttl=118 time=1.870 ms
64 bytes from 216.58.200.132: seq=2 ttl=118 time=1.851 ms
64 bytes from 216.58.200.132: seq=3 ttl=118 time=2.035 ms
64 bytes from 216.58.200.132: seq=4 ttl=118 time=1.990 ms
64 bytes from 216.58.200.132: seq=5 ttl=118 time=16.568 ms
64 bytes from 216.58.200.132: seq=6 ttl=118 time=1.868 ms
64 bytes from 216.58.200.132: seq=7 ttl=118 time=1.861 ms
64 bytes from 216.58.200.132: seq=8 ttl=118 time=2.033 ms
64 bytes from 216.58.200.132: seq=9 ttl=118 time=1.839 ms
64 bytes from 216.58.200.132: seq=10 ttl=118 time=1.838 ms
64 bytes from 216.58.200.132: seq=11 ttl=118 time=1.859 ms
64 bytes from 216.58.200.132: seq=12 ttl=118 time=1.895 ms
64 bytes from 216.58.200.132: seq=13 ttl=118 time=2.081 ms
64 bytes from 216.58.200.132: seq=14 ttl=118 time=1.815 ms
64 bytes from 216.58.200.132: seq=15 ttl=118 time=1.874 ms
64 bytes from 216.58.200.132: seq=16 ttl=118 time=1.876 ms
64 bytes from 216.58.200.132: seq=17 ttl=118 time=1.833 ms
64 bytes from 216.58.200.132: seq=18 ttl=118 time=2.109 ms
64 bytes from 216.58.200.132: seq=19 ttl=118 time=1.895 ms

```

LAN client IPv4 and Internet

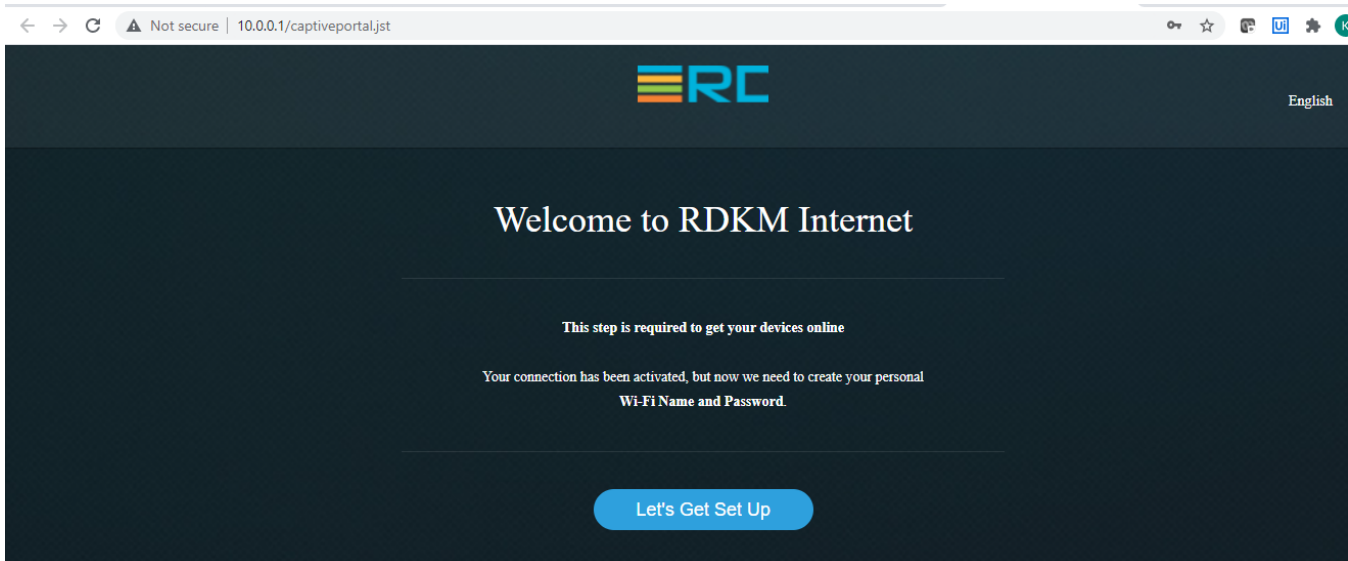
Lan clients should get IPv4 address in the range of 10 series(i,e default DHCP server pool range) and captive portal page should be loaded.

```
Ethernet adapter Ethernet:
```

```

Connection-specific DNS Suffix  . : utopia.net
Link-local IPv6 Address . . . . . : fe80::1896:967:110d:8ab4%17
IPv4 Address. . . . . : 10.0.0.207
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.0.0.1

```



CCSP Process Status

All ccsp process should be Up and corresponding DataModel parameters should be loaded properly.

```
root@RaspberryPi-Gateway:~# ps aux | grep Ccs
 387 root      0:16 /usr/bin/CcspCrSsp -subsys eRT.
 610 root      0:10 /usr/bin/CcspEthAgent -subsys eRT.
1677 root      0:16 /usr/bin/CcspTandOSSp -subsys eRT.
1680 root      1:13 /usr/bin/CcspLMLite -subsys eRT.
1721 root      2:01 /usr/bin/CcspWifiSsp -subsys eRT.
1740 root      0:41 /usr/bin/CcspTr069PaSsp -subsys eRT.
11763 root     1:26 /usr/bin/CcspPandMSsp -subsys eRT.
16207 root      0:00 grep Ccs
root@RaspberryPi-Gateway:~# ps aux | grep Psm
 681 root      0:21 /usr/bin/PsmSsp -subsys eRT.
16501 root      0:00 grep Psm
root@RaspberryPi-Gateway:~#
```

RdkWanManager systemd Status

- RdkWanManager process should be up . We can verify the status by using the below screenshot command,

```
root@RaspberryPi-Gateway:~# systemctl status RdkWanManager
● RdkWanManager.service - Rdk Wan Manager service
   Loaded: loaded (/lib/systemd/system/RdkWanManager.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-06-28 06:13:39 UTC; 1 day 8h ago
     Process: 818 ExecStartPre=/bin/sh /lib/rdk/run_rm_key.sh (code=exited, status=0/SUCCESS)
     Process: 821 ExecStartPre=/bin/touch /tmp/OS_WANMANAGER_ENABLED (code=exited, status=0/SUCCESS)
     Process: 823 ExecStart=/usr/rdk/wanmanager/wanmanager -subsys $Subsys (code=exited, status=0/SUCCESS)
    Main PID: 828 (wanmanager)
       Tasks: 10 (limit: 830)
      CGroup: /system.slice/RdkWanManager.service
              └─ 828 /usr/rdk/wanmanager/wanmanager -subsys eRT.
                 1162 udhcpc -f -i erouter0 -p /tmp/erouter_dhcp4c.pid -s //usr/bin/service_udhcpc
                 12206 trigger

Warning: Journal has been rotated since unit was started. Log output is incomplete or unavailable.
root@RaspberryPi-Gateway:~#
```

- RdkWanManager DataModel Parameters should be loaded properly, we can use the below command to verify the status,

```
root@RaspberryPi-Gateway:~# dmcli eRT getv Device.X_RDK_WanManager.
CR component name is: eRT.com.cisco.spvtg.ccsdp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsdp.wanmanager): Device.X_RDK_WanManager.
Execution succeed.
Parameter 1 name: Device.X_RDK_WanManager.Enable
           type:      bool,      value: true
Parameter 2 name: Device.X_RDK_WanManager.Policy
           type:      string,     value: FIXED_MODE
Parameter 3 name: Device.X_RDK_WanManager.IdleTimeout
           type:      uint,       value: 0
Parameter 4 name: Device.X_RDK_WanManager.CPEInterfaceNumberOfEntries
           type:      uint,       value: 1
Parameter 5 name: Device.X_RDK_WanManager.CPEInterface.1.Name
           type:      string,     value: eth0
Parameter 6 name: Device.X_RDK_WanManager.CPEInterface.1.DisplayName
           type:      string,     value: WanOE
Parameter 7 name: Device.X_RDK_WanManager.CPEInterface.1.MarkingNumberOfEntries
           type:      uint,       value: 1
Parameter 8 name: Device.X_RDK_WanManager.CPEInterface.1.Phy.Path
           type:      string,     value: Device.Ethernet.X_RDK_Interface.1
Parameter 9 name: Device.X_RDK_WanManager.CPEInterface.1.Phy.Status
           type:      string,     value: Up
Parameter 10 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.Enable
           type:      bool,       value: true
Parameter 11 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.Name
           type:      string,     value: erouter0
Parameter 12 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.SelectionTimeout
           type:      uint,       value: 0
Parameter 13 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.EnableMAPT
           type:      bool,       value: false
Parameter 14 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.EnabledSLite
```

WanManager Logs

WanManager logs will be generated in /rdklogs/logs folder in RPI

```
root@RaspberryPi-Gateway:/rdklogs/logs# ls
ArmConsoleLog.txt.0  LM.txt.0          PARODUSLog.txt.0    TDMLog.txt.0       WIFILog.txt.0      telemetry.log
BootTime.log         LM.txt.1          PARODUSLog.txt.1    TDMLog.txt.1       WIFILog.txt.1      telemetry2_0.txt.0
CRLog.txt.0          MnetDebug.txt     PSMLog.txt.0        TR69Log.txt.0      dcmProcessing.log   wificlientdrop.txt
CRLog.txt.1          NOTIFYLog.txt.0   PSMLog.txt.1        TR69Log.txt.1      dcmscript.log       wifihealth.txt
ConsoleLog.txt.0     NOTIFYLog.txt.1   RTX100Log.txt       WANMANAGERLog.txt.0 eth_telemetry.txt   xconf_curl_httpcode
ETHAGENTLog.txt.0    OnBoardingLog.txt.0 SNMP.txt.0           WANMANAGERLog.txt.1 ocsdp-support.log
ETHAGENTLog.txt.1    PAMLog.txt.0      SNMP.txt.1           WEBPAMLog.txt.0    response.txt
FirewallDebug.txt    PAMLog.txt.1      SelfHeal.txt.0       WEBPAMLog.txt.1    swupdate.log
root@RaspberryPi-Gateway:/rdklogs/logs#
root@RaspberryPi-Gateway:/rdklogs/logs# ls -lh WANMANAGERLog.txt.*
-rw-r--r-- 1 root root 113 Jun 29 14:28 WANMANAGERLog.txt.0
-rw-r--r-- 1 root root 0 Jun 29 14:05 WANMANAGERLog.txt.1
root@RaspberryPi-Gateway:/rdklogs/logs#
```

Systemd Status

Following systemd service file's status needs to be verify,

1. hal-json-ethsw
2. utopia
3. CcspEthAgent
4. CcspPandMSSp


```

type: 0000, value: false
root@RaspberryPi-Gateway:~# systemctl status hal-json-ethsw
● hal-json-ethsw.service - Json server service
   Loaded: loaded (/lib/systemd/system/hal-json-ethsw.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-06-28 06:13:33 UTC; 1 day 8h ago
     Main PID: 234 (hal_json_ethsw)
        Tasks: 3 (limit: 830)
    CGroup: /system.slice/hal-json-ethsw.service
            └─234 /usr/bin/hal_json_ethsw

Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: "module":"ethhal",
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: "version":"0.0.1",
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: "reqId":"00000101",
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: "action":"result",
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: "Result":{
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]:   "Status":"Success"
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: }
Jun 28 06:13:41 RaspberryPi-Gateway hal_json_ethsw[234]: }
Jun 28 06:13:47 RaspberryPi-Gateway hal_json_ethsw[234]: NOTICE:[json_hal_server_publish_event.755]: Find registered client for event
Jun 28 06:13:47 RaspberryPi-Gateway hal_json_ethsw[234]: NOTICE:[ethsw_thread_main.105]: Link Up event sent to json-client

```

```

root@RaspberryPi-Gateway:~# netstat -ltnp | grep hal_js
tcp        0      0 127.0.0.1:40003      0.0.0.0:*            LISTEN     234/hal_json_ethsw
root@RaspberryPi-Gateway:~#
root@RaspberryPi-Gateway:~# netstat -ltnp | grep lighttpd
netstat: showing only processes with your user ID
tcp        0      0 :::21515            :::*                  LISTEN     1805/lighttpd
tcp        0      0 :::8080             :::*                  LISTEN     1805/lighttpd
tcp        0      0 :::80               :::*                  LISTEN     1805/lighttpd
tcp        0      0 :::8181             :::*                  LISTEN     1805/lighttpd
tcp        0      0 :::443              :::*                  LISTEN     1805/lighttpd
root@RaspberryPi-Gateway:~#

```

```

root@RaspberryPi-Gateway:~# systemctl status utopia
● utopia.service - Utopia service
   Loaded: loaded (/lib/systemd/system/utopia.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-06-28 06:13:38 UTC; 1 day 8h ago
     Process: 255 ExecStart=/bin/sh /etc/utopia/utopia_init.sh (code=exited, status=0/SUCCESS)
        Tasks: 25 (limit: 830)
    CGroup: /system.slice/utopia.service
            └─300 klogd -c 6
              └─303 syslogd -l 6
                └─326 syseventd
                  └─341 /fss/gw/usr/bin/syseventd_fork_helper 12
                    └─545 crond -l 9
                      └─920 dropbear -R -E -a -r /tmp/.dropbear/dropcfg1856 -r /tmp/.dropbear/dropcfg2856 -p []:22 -P /var/run/dropbear.pid -B
                        └─2988 dropbear -R -E -a -r /tmp/.dropbear/dropcfg1856 -r /tmp/.dropbear/dropcfg2856 -p []:22 -P /var/run/dropbear.pid -B
                          └─3005 -sh
                            └─3332 nfq_handler 6
                              └─3335 nfq_handler 4
                                └─3444 zebra -d -f /var/zebra.conf -u root -P 0
                                  └─3935 dnsmasq -u nobody -P 4096 -C /var/dnsmasq.conf
                                    └─15213 systemctl status utopia
                                      └─15214 /bin/cat

Jun 29 14:43:06 RaspberryPi-Gateway kernel[300]: [ 219.005484] audit: type=1325 audit(1624977786.679:125): table=raw family=10 entries=3
Jun 29 14:43:06 RaspberryPi-Gateway kernel[300]: [ 219.014344] audit: type=1325 audit(1624977786.689:126): table=mangle family=10 entries=16

```

```

root@RaspberryPi-Gateway:~# systemctl status CcspEthAgent
● CcspEthAgent.service - CcspEthAgent service
   Loaded: loaded (/lib/systemd/system/CcspEthAgent.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-06-28 06:13:38 UTC; 1 day 8h ago
     Process: 596 ExecStart=/usr/bin/CcspEthAgent -subsys $Subsys (code=exited, status=0/SUCCESS)
        Main PID: 606 (CcspEthAgent)
           Tasks: 11 (limit: 830)
      CGroup: /system.slice/CcspEthAgent.service
              └─606 /usr/bin/CcspEthAgent -subsys eRT.

Jun 28 06:13:41 RaspberryPi-Gateway CcspEthAgent[606]: "notificationType":"onChange"
Jun 28 06:13:41 RaspberryPi-Gateway CcspEthAgent[606]: }
Jun 28 06:13:41 RaspberryPi-Gateway CcspEthAgent[606]: }
Jun 28 06:13:41 RaspberryPi-Gateway CcspEthAgent[606]: }
Jun 28 06:13:41 RaspberryPi-Gateway CcspEthAgent[606]: NOTICE:[json_hal_client_subscribe_event.628]: Event Device.Ethernet.X_RDK_Interface.1.S
tatus subscribed
Jun 28 06:13:47 RaspberryPi-Gateway CcspEthAgent[606]: NOTICE:[response_parse_cb.354]: Event response found
Jun 28 06:13:47 RaspberryPi-Gateway CcspEthAgent[606]: NOTICE:[response_parse_cb.369]: Event name = Device.Ethernet.X_RDK_Interface.1.Status
Jun 28 06:13:47 RaspberryPi-Gateway CcspEthAgent[606]: NOTICE:[response_parse_cb.378]: Event callback invoked
Jun 29 14:42:44 RaspberryPi-Gateway CcspEthAgent[606]: ethernet umac is 0
Jun 29 14:45:44 RaspberryPi-Gateway CcspEthAgent[606]: ethernet umac is 0
root@RaspberryPi-Gateway:~#

```

```

root@RaspberryPi-Gateway:~# systemctl status CcspPandMSSp
● CcspPandMSSp.service - CcspPandMSSp service
   Loaded: loaded (/lib/systemd/system/CcspPandMSSp.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-06-28 06:13:47 UTC; 1 day 8h ago
     Process: 854 ExecStartPre=/bin/sh -c (/usr/ccsp/utopiaInitCheck.sh) (code=exited, status=0/SUCCESS)
     Process: 859 ExecStartPre=/bin/sh -c rm -rf /tmp/pam_initialized (code=exited, status=0/SUCCESS)
     Process: 863 ExecStart=/usr/bin/CcspPandMSSp -subsys $Subsys (code=exited, status=0/SUCCESS)
     Process: 1550 ExecStartPost=/bin/sh -c (/usr/ccsp/ccspPAMCPCheck.sh) (code=exited, status=0/SUCCESS)
    Main PID: 868 (CcspPandMSSp)
       Tasks: 13 (limit: 830)
      CGroup: /system.slice/CcspPandMSSp.service
              └─868 /usr/bin/CcspPandMSSp -subsys eRT.

Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[868]: result = a020d3
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[868]: result = rdkb-generic-broadband-image_rdk-next_20210629075445
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[868]: result = 00000000a31b564c
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[868]: result = 00000000a31b564c
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[868]: result = rdkb-generic-broadband-image_rdk-next_20210629075445
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[5587]: Cannot find device "wan0"
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[5594]: fe80::/64 proto kernel metric 256 pref medium
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[5595]: fe80::/64 proto kernel metric 256 pref medium
Jun 29 14:40:20 RaspberryPi-Gateway CcspPandMSSp[5596]: ::1 proto kernel metric 256 pref medium

```

Using dmcli commands to verify the LinkStatus(CcspEthAgent will pass the LinkStatus to WanManager)

```

root@RaspberryPi-Gateway:~# dmcli eRT getv Device.X_RDK_WanManager.CPEInterface.1.Phy.
CR component name is: eRT.com.cisco.spvtg.ccsp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsp.wanmanager): Device.X_RDK_WanManager.CPEInterface.1.Phy.
Execution succeed.
Parameter 1 name: Device.X_RDK_WanManager.CPEInterface.1.Phy.Path
           type: string, value: Device.Ethernet.X_RDK_Interface.1
Parameter 2 name: Device.X_RDK_WanManager.CPEInterface.1.Phy.Status
           type: string, value: Up

root@RaspberryPi-Gateway:~# dmcli eRT getv Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus
CR component name is: eRT.com.cisco.spvtg.ccsp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsp.wanmanager): Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus
Execution succeed.
Parameter 1 name: Device.X_RDK_WanManager.CPEInterface.1.Wan.LinkStatus
           type: string, value: Up

```

```

root@RaspberryPi-Gateway:~# dmcli eRT getv Device.Ethernet.X_RDK_Interface.1.
CR component name is: eRT.com.cisco.spvtg.ccsp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsp.ethagent): Device.Ethernet.X_RDK_Interface.1.
Execution succeed.
Parameter 1 name: Device.Ethernet.X_RDK_Interface.1.Upstream
           type: bool, value: true
Parameter 2 name: Device.Ethernet.X_RDK_Interface.1.WanValidated
           type: bool, value: false
Parameter 3 name: Device.Ethernet.X_RDK_Interface.1.Name
           type: string, value: eth0
Parameter 4 name: Device.Ethernet.X_RDK_Interface.1.Status
           type: string, value: Up
Parameter 5 name: Device.Ethernet.X_RDK_Interface.1.WanStatus
           type: string, value: Up
Parameter 6 name: Device.Ethernet.X_RDK_Interface.1.Enable
           type: bool, value: false
Parameter 7 name: Device.Ethernet.X_RDK_Interface.1.LowerLayers
           type: string, value: Device.Ethernet.X_RDK_Interface.1

root@RaspberryPi-Gateway:~#

```

WebUI Test on RPI

WebUI should be loaded in Webbrowser by using erouter0 IPv4 Address(i,e erouter0ip:8080) and login should be successful

192.168.0.11:8080



Gateway > Login

Please login to view and manage your Gateway settings.

Username:

Password:

LOGIN

Internet check should be successful,

192.168.0.11:8080/network_diagnostic_tools.js



Hi admin • [Logout](#) • [Change](#)

✓ Internet ✓ Wi-Fi ✗ MoCA ✗ Lov

Gateway

Connected Devices

Parental Control

Advanced

Troubleshooting

Logs

[Diagnostic Tools](#)

Wi-Fi Spectrum Analyzer

MoCA Diagnostics

Reset/Restore Gateway

Change Password

Troubleshooting > Network Diagnostic Tools

Troubleshoot your network connectivity.

Test Connectivity Results

Connectivity to the Internet: Active

Packets Sent: 4

Packets Received: 4

Destination Address:

Count:

TEST CONNECTIVITY

Known Issues

Sometimes , erouter0 interface is not getting the WAN IP .

