Porting of WanManager in RDKB RPI

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
```

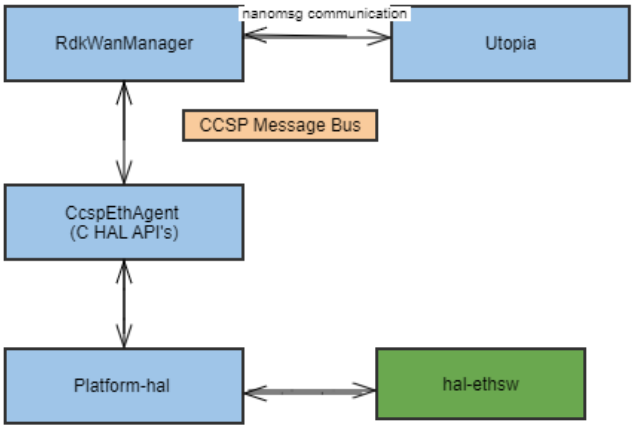
Image Generation Steps

Build Steps

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

Control Flow

Following diagram depicts the flow of control among the components,



- platform-hal (i.e. hal-ethsw) will send the callbacks(pGWP_act_EthWanLinkUP /pGWP_act_EthWanLinkDOWN) whenever physical link event change to EthAgent.
- 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"/>
```

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)} "
```

ethsw(platform-hal)

- Developed C HAL API's to support the ETH Agent for WanManager Feature .

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.SKBPort" 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.PPPIPCPEnable" type="astr">TRUE</Record>
  <Record name="dmsb.wanmanager.if.1.PPPIPV6CPEnable" type="astr">TRUE</Record>
  <Record name="dmsb.wanmanager.if.1.PPPIPCPEnable" type="astr">TRUE</Record>
```

Major Errors and Challenges

S. No	Recipe / Component Names	Layer	Error/Warning/challenges	Root Cause	Action
1	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 .	CR is waiting to get the MTA 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-raspberrypi	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-raspberrypi	Below gaps needs to be filled in rpi, • Below initialization activities were done by GWP 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	• 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/util/utopia.bbappend
4	system_defaults (utopia recipe)	meta-cmf-raspberrypi	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/util/utopia/system_defaults
5	ccsp-p-and-m.bbappend	meta-cmf-raspberrypi	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!	PandM DM was not loading after the WanManager Integration Device.DHCPv6.Client.{i} and Device.DHCPv4.Client.{i}. was moved to the WanManager . But the DMs was not removed from PAM XML file.	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 folloiwing 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:%d\n,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:%d\n,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-raspberrypi	ccsp-gwprov-app starts initialization scripts utopia_init.sh	Added utopia.service to call utopia_init.sh utopia_init.sh needs to be started before starting of the RdkWanManager executable	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 .	• Need platform-hal api's development (i.e. hal-ethsw)	https://code.rdkcentral.com/r/c/rdkb/devices/raspberrypi/hal/+/60021/1/source/hal-ethsw/ccsp_hal_ethsw.c

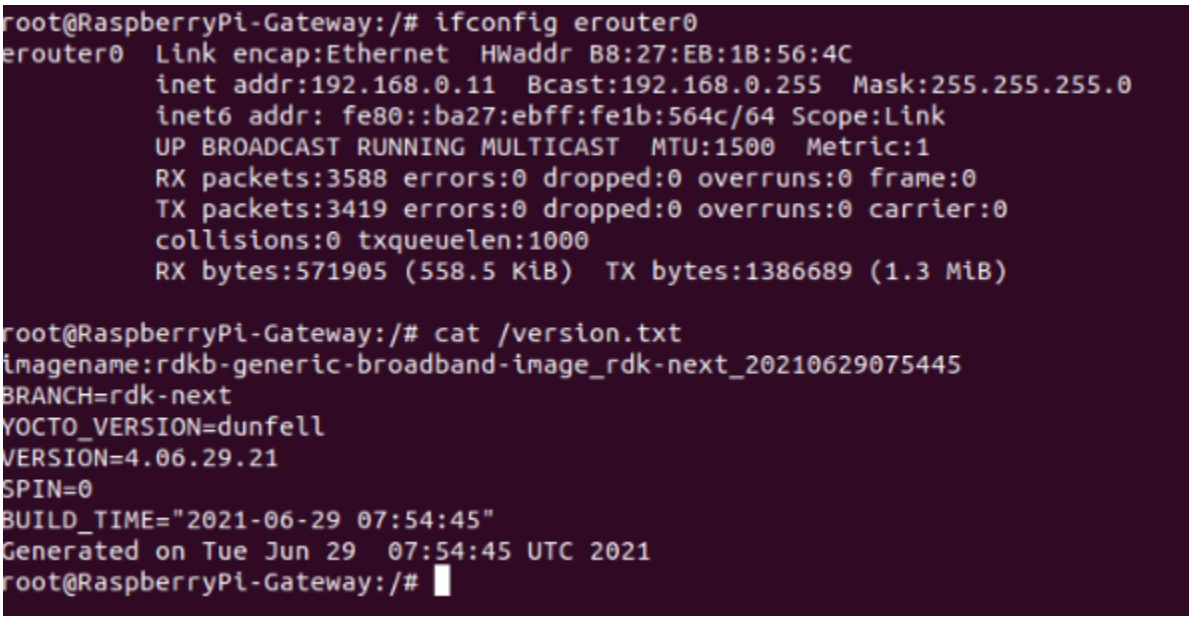
9	hal	hal	../../../../../../../../../rdkb/components/opensource/ccsp/CcspEthAgent/source/TR-181 /board_sbapi/cosa_ethernet_apis.c:651: error: undefined reference to 'GWP_GetEthWanLinkStatus' collect2: error: ld returned 1 exit status Makefile:423: recipe for target 'CcspEthAgent' failed	GWP_GetEthWanLinkStatus() 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	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
12	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/+/58951

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
imagename: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
imagename: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:ouwwjhdOMYqFrC9pXc08PZnFVT6cnMU12fvvWHVt77g.
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
imagename: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

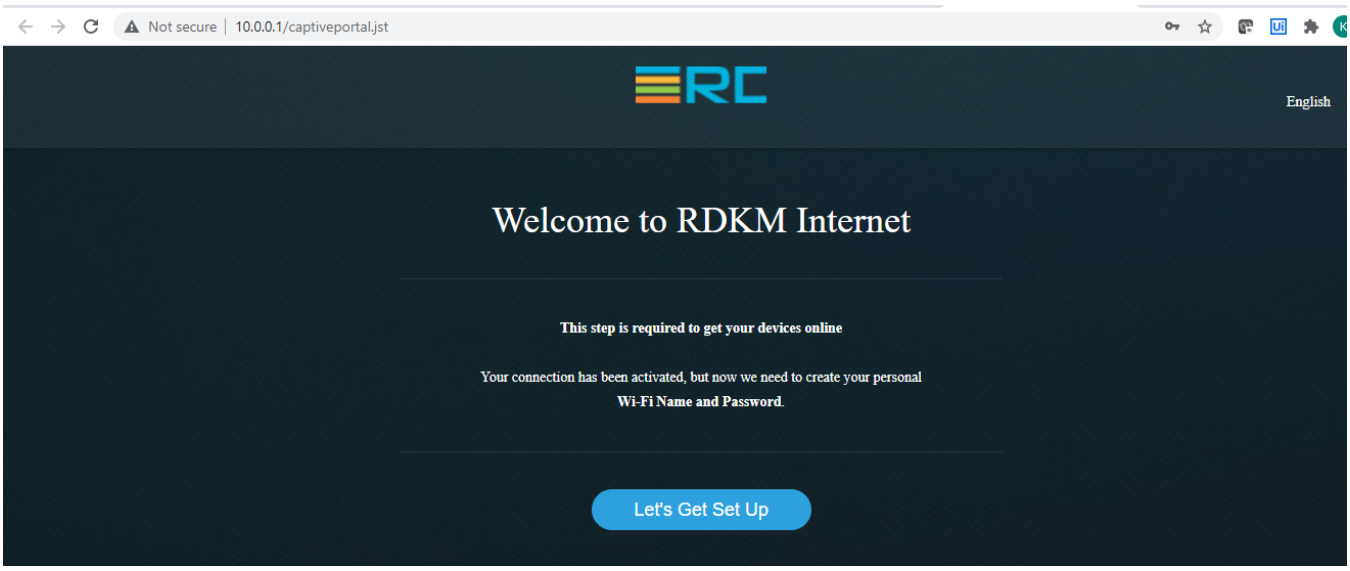
- erouter0 Interface should have Ipv4 Address
- verify the ping www.google.com on RPI
- RPI shouldn't lose the Internet

```
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/CcspTandDSsp -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.ccsp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsp.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      RXTX100Log.txt       WANMANAGERLog.txt.0  eth_telemetry.txt    xconf_curl_httpcode
ETHAGENTLog.txt.0    OnBoardingLog.txt.0  SNMP.txt.0           WANMANAGERLog.txt.1  ocsp-support.log
ETHAGENTLog.txt.1    PAMlog.txt.0         SNMP.txt.1           WEBPAlog.txt.0       response.txt
FirewallDebug.txt    PAMlog.txt.1         SelfHeal.txt.0       WEBPAlog.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 verfiy,

1. utopia
2. CcspEthAgent
3. CcspPandMSsp

```
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
```

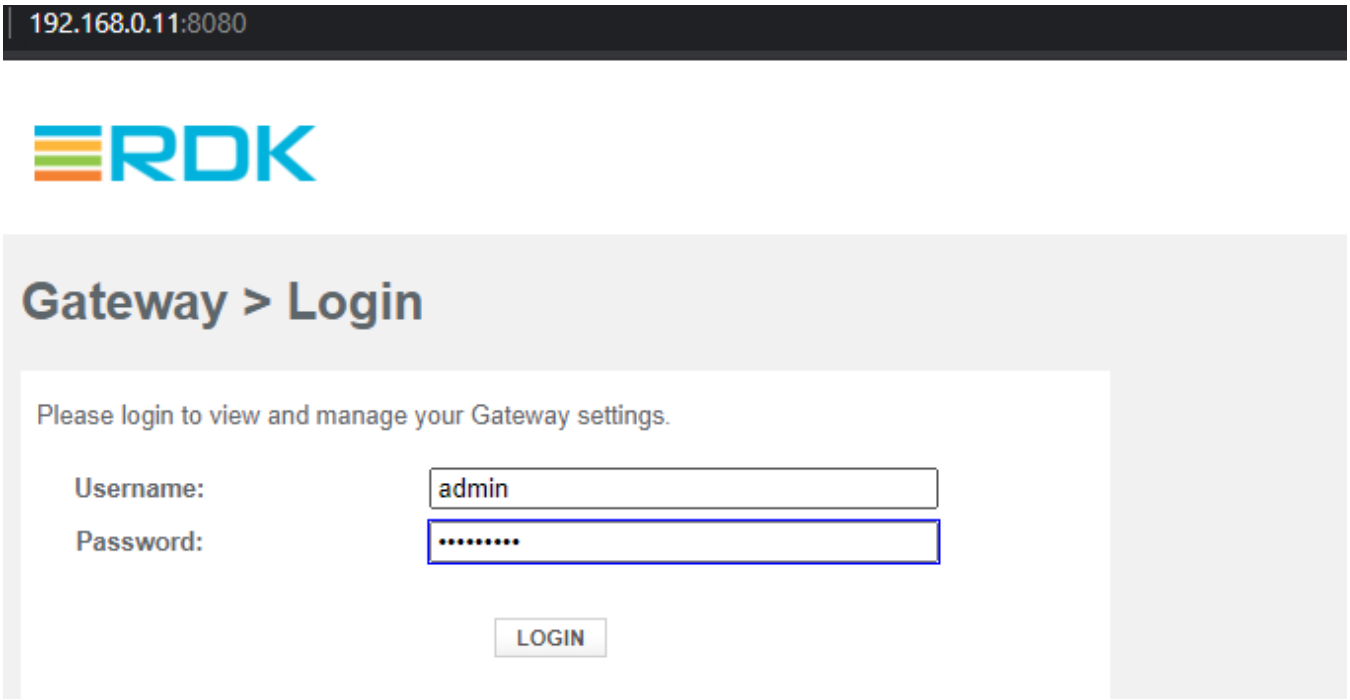
Using dmcli commands to verify the LinkStatus(CcspEthAgent will pass the LinkStatus to WanManager)

```
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
```

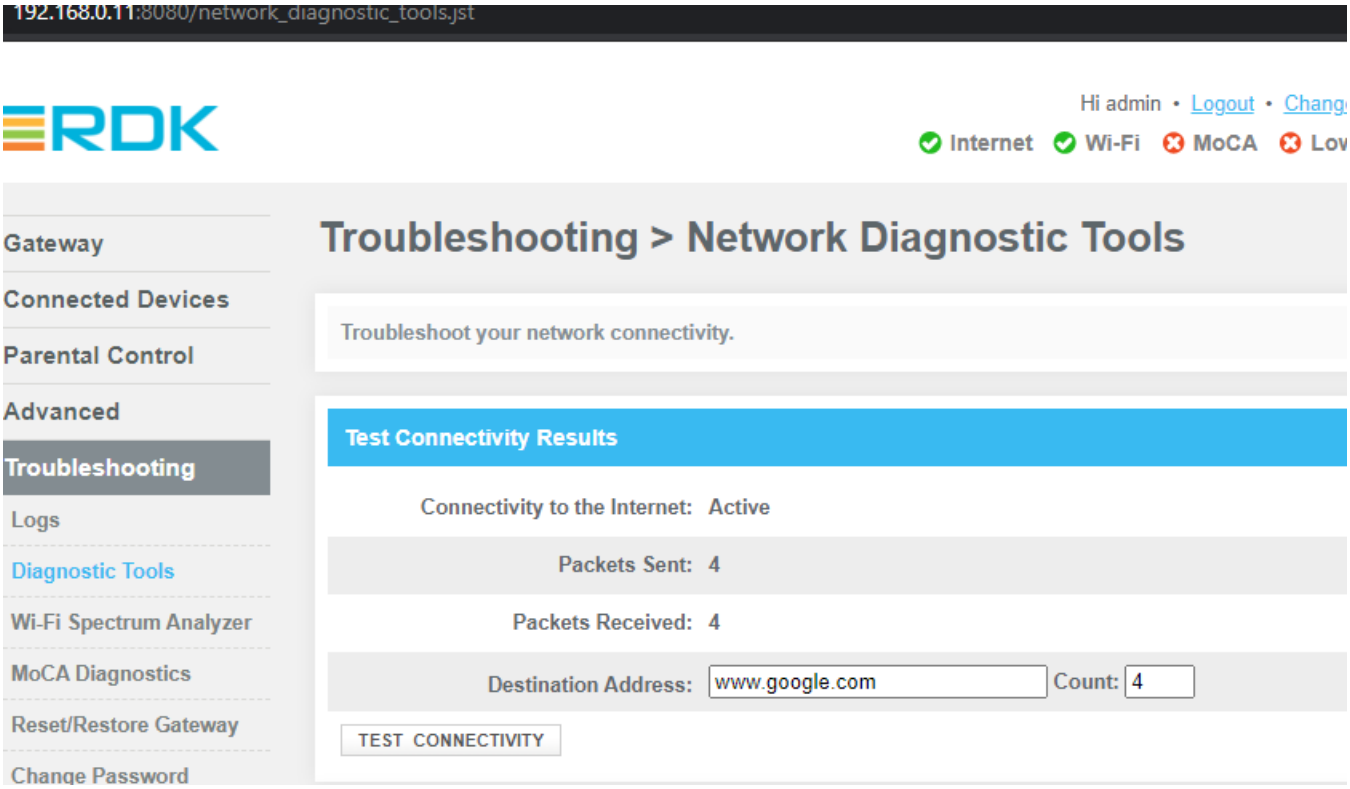
```
root@RaspberryPi-Gateway:~# dmcli eRT getv Device.Ethernet.X_RDK_Interface.1.
CR component name is: eRT.com.cisco.spvtg.ccsp.CR
subsystem_prefix eRT.
getv from/to component(eRT.com.cisco.spvtg.ccsp.ethagent): Device.Ethernet.X_RDK_Interface.1.
Execution succeed.
Parameter    1 name: Device.Ethernet.X_RDK_Interface.1.Upstream
               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



Internet check should be successful,



Known Issues

Sometimes , erouter0 interface is not getting the WAN IP .