5 FAQ

5.1 How to check if the O-RU is booted up and running normally?

RU's console log shows the following.

```
Latch later 1pps time=1427f8f7 swi4010=1427f8f7 xran_sec=1427f8f4 acc_diff[1]=0 hps_sec=1602777637 cur_sec=0 PA_ON
TDD
curr dBFS of ORx = 0 0 912 11910
mean dBFS of ORx = 0 0 65535 65535 count=1 1 0 0
10R: sec=1 hps=1602777638 64b=0 65to128=1 total=1 uni=0 uni>1158=0 multi=1 crc_err=0
10T: sec=1 hps=1602777638 64b=0 65to128=0 total=0 uni=0 uni>1158=0 multi=0 crc_err=0 state=1 start=0 adj=0 rstcnt=0
```

i. When "Latch xxx 1pps" strings are shown, the O-RU has got synchronization with a GM/BC and finished the initialization.

ii. Value definition:

- 10R…means number of packets received from BBU.
- 10T…means number of packets transmitted to BBU.
- 64b: number of packets with size 64 bytes.
- 65to128: number of packets with size between 65 bytes to 128 bytes.
- uni>1158: number of packets with size greater than 1158.
- total: total number of packets.
- uni: number of uni-casting packets.
- multi: number of multi-casting packets.
- crc_err: number of packets with CRC error.
- state = 1 : RU is waiting for the 1st c-plane message.
- state = 2 : RU had received the 1st c-plane and started working.

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5.2 Log “xran 10GbE is not ready... d6fff000” is normal or abnormal?

No. Please check 10GbE connectivity and make sure 10GbE is linkup at DU server.

5.3 Why does RU's log seem not aligned?

Usually, it indicates PTP signal quality is not good. Please check the GM's quality with GPS satellites.

5.4 Can I add Switch between O-RU and GM?

Yes. But, please make sure Switch supports IEEE 1588 PTPv2.

5.5 Can I add a Switch to connect O-RU and O-DU?

Yes. Please make sure following items:

iii. The L2 switch should support VLAN with tag.
iv. Those ports (connected to BBU and RU) should be in trunk mode
v. Both VLAN 1 and VLAN 2 should be in those trunk ports
vi. Should keep VLAN tag in those ports (DO NOT set untag)
vii. Enable jumbo frames. Set frame size more than 9000 Bytes.

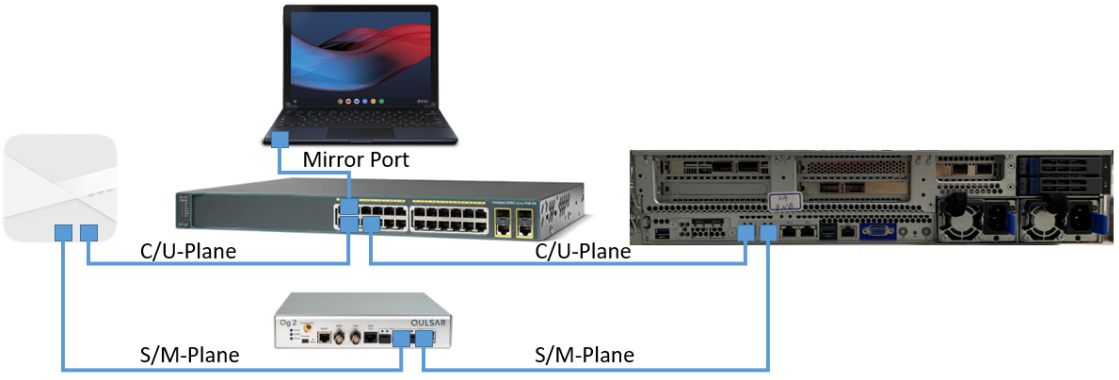

Figure 36 O-RU O-DU connectivity with Switch and GM

5.6 How to enable Auto boot up.?

If you want to make RU running when reboot without re-execute *4.1.2 RPQN O-RU setting* Step.6 and Step.7, please add below lines into **/home/root/test/test.sh** to configure IP and launch CU plane:

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```
if [ $(tty) = "/dev/ttyS0" ]; then
   ./set_port.sh 100 # 100 depends on your subnet setting
   ./init_rrh_config_enable_cuplane
fi
```

viii. How to change configuration after enabling auto boot up?
- If you **can** remote SSH to O-RU with account/passwd : root/root
  a. Make changes in ***RRHconfig_xran.xml***.
  b. Running ***/home/root/test/reboot.sh***
- If you **can not** remote SSH to RRH, you can
  a. Connect to O-RU via the USB Serial Port.
  b. Unplug Power cord and plug again.
  c. Once the prompt shown, press "**Ctrl+C**" to stop the running process.
  d. Make changes in ***RRHconfig_xran.xml***.
  e. Running ***/home/root/test/reboot.sh***

ix. How to disable auto boot up?
- Just remove or mark the above command in **/home/root/test/test.sh**.

5.7 What is the power-on sequence to bring up the Radio?

- Bring up from power off
  i. stop O-DU
  ii. power on O-RU
  iii. ./init_rrh_config_enable_cuplane
  iv. wait PTP lock at O-RU
  v. start O-DU
- restart O-RU
  i. stop O-DU
  ii. power down O-RU
  iii. power up O-RU
  iv. ./init_rrh_config_enable_cuplane
  v. wait PTP lock at O-RU
  vi. start O-DU

5.8 How to separate PTP log from console log?

- (console) boot up RPQN
- (console) set S/M-plane IP address
  ./set_port.sh 17
- (BBU or PC/NB) SSH connect to S/M-plane IP address
  ssh -oCiphers=aes128-ctr root@O-RU IP (disable OAM)
  ssh -p 830 root@O-RU IP (ever enabled OAM)
  After v1.4.12q.524, it needs the password "123456" for non-OAM and "cj/6c93zj4g4d;" for OAM.
- (ssh terminal) initial C/U-plane
  ./init_rrh_config_enable_cuplane

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- (ssh terminal) kill ptp4l process
  pkill ptp4l
- (ssh terminal) start ptp4l
  /usr/linuxptp/ptp4l -i eth0 -smf /usr/linuxptp/configs/user_gen.cfg -l 6
- (ssh terminal) After the C/U-plane is initialized, we can check the ptp4l log from SSH terminal.

5.9 Which firmware version matches the FlexRAN version?

- **Support FlexRAN version**

RPQN firmware version	FlexRAN version
v1.4.14q.524	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.4.13q.524	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.4.12q.524	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.3.10q.521	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.3.8q.52	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.2.7q.52	20.11(enable FCN_ADAPT and patch from Intel), 21.03(enable FCN_ADAPT)
v1.2.6q.432	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
v1.1.5q.432	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
v1.1.4q.432	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
v1.0.3q.432	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
v1.0.3q.431	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
v1.0.2q.431	20.11(enable FCN_ADAPT), 21.03(enable FCN_ADAPT and FCN_1_2_6_EARLIER)
Note: For RU firmware v1.2.7q.52 and later, the PRACH interface is changed. If you use FlexRAN 20.11, you should add patch from Intel for the PRACH interface. If you don't add the correct patch to 20.11, the FlexRAN will not receive PRACH from RU.	

5.10 Which prach format does RU support?

RU only supports short prach format B4.

5.11 How to calculate Tx power?

RRH_TX_ATTENUATION = 30.0, 30.0, 30.0, 30.0 -> output power is 0dBm per port

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RRH_TX_ATTENUATION = 20.0, 20.0, 20.0, 20.0 -> output power is 10dBm per port
Antenna gain is 5dBi

5.12 How to disable/enable DPD?

Disable DPD: RRH_RF_GENERAL_CTRL = 0x0, 0x0, 0x0, 0x0
Enable DPD: RRH_RF_GENERAL_CTRL = 0x3, 0x0, 0x0, 0x0
Note: the setting is affected for all 4 ports.

6 Troubleshooting

6.1 Why DU can not receive any data from RU?

Please check following items:

a. Check PTP is synced and GM's quality. You may need to check GM's status with satellites, O-RU's log and O-DU's log.
b. Check the 10GbE interface in the DU server is linked up.
c. Check the 10GbE interface in the DU server is running at 10Gb speed
d. Check connectivity, make sure SFP+ module is actually inserted into the cage of the connector in the DU server.
e. Check O-RU's log for xRAN packet:
    i. If log does not contains "xRan: log……", it means O-RU does not receive any C-Plane packet from O-DU.
    ii. Sometimes, it was caused by PTP sync issue.

```
xRAN: log=0 toD(1) sec=656 tick=4009 smp_cnt=0f115740 pkt_en=0f115740 c_arr=00000000 1pps=cc6e5744 f2t_en=d3c134bc jesd_en=d3c156fc
diff: sec=656 tick=4009 c_arr_vs_1pps=1000000us f2t_vs_1pps=7040884us jesd_vs_1pps=7040884us
Cmsg1_p0: 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
c_kpi: total=26 early=26 on=26 late=26 dropTci=26 dropPort=26 dropSect=26
40R: idx=0 tick=4009 total=26 uni=1 64b=0 65to128=26 uni>1158=0 multi=25 fcs_err=0 cplane=00000100
```

f. Please run an Intel sample app to make sure O-RU is working properly.

6.2 Recover O-RU

When O-RU is going to a weird state like below phenomenon, please **POWER CYCLE** O-RU.

1. 10T state value is jumping 1&2

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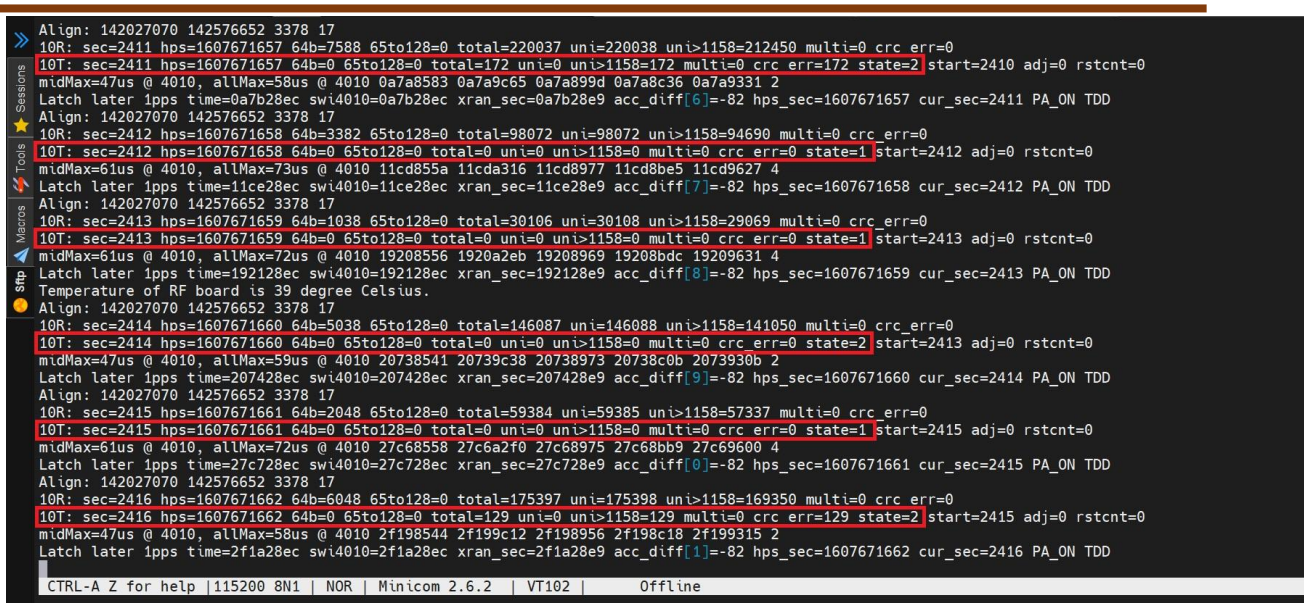
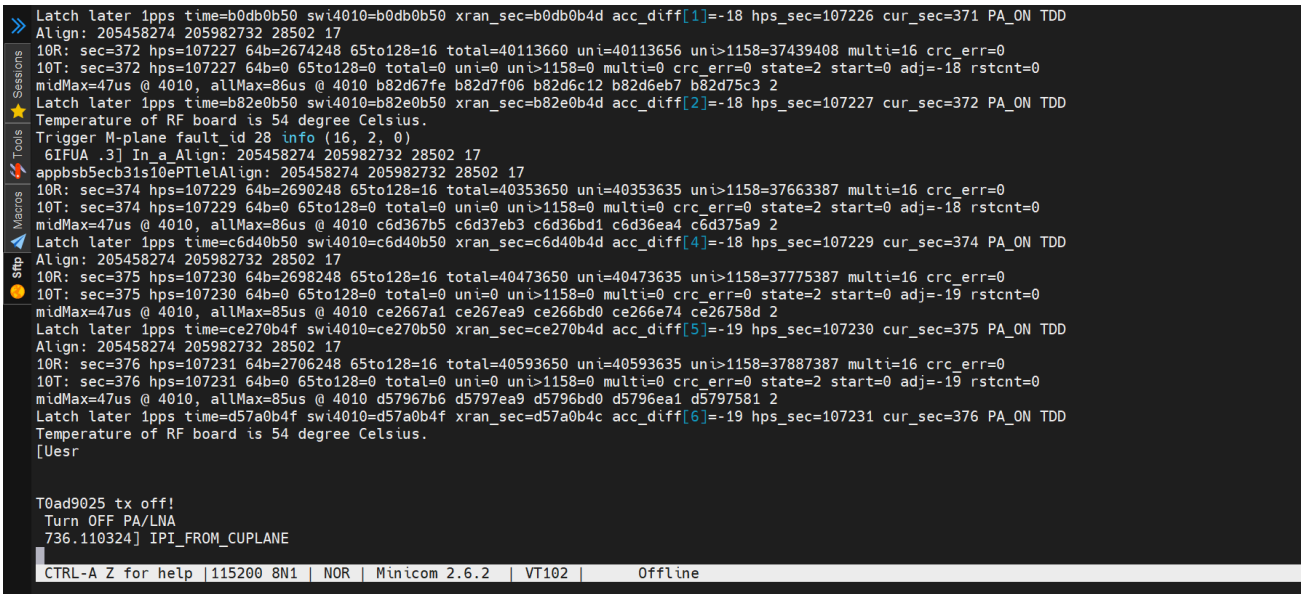


2. O-RU is unresponsive



3. There is no “**10R**” ,“**10T**” shows in console log after init_rrh_config_enable_cuplane

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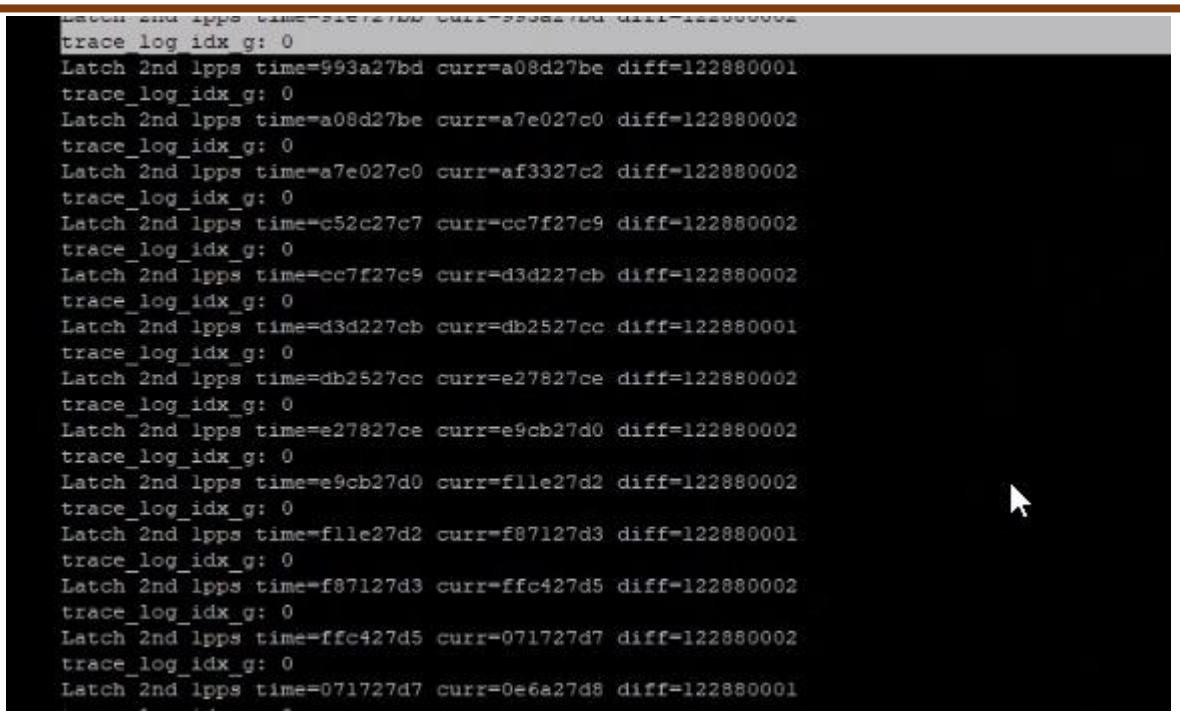

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