

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.

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.

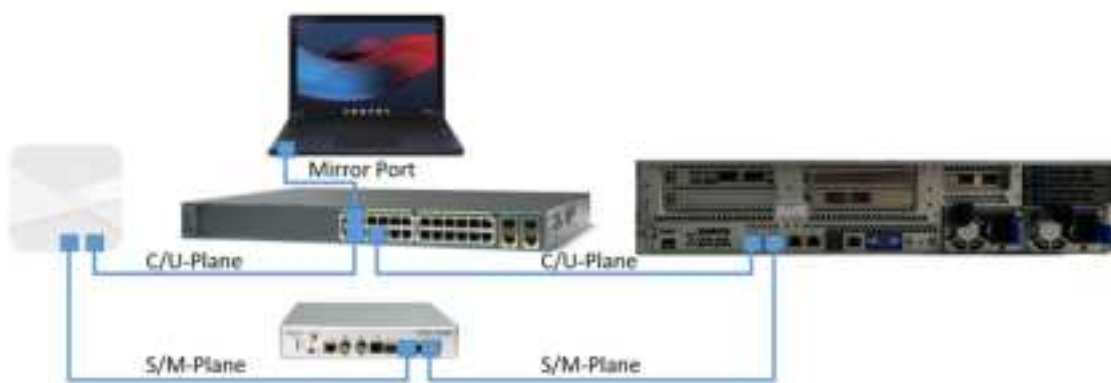


Figure 36 O-RU O-DU connectivity with Switch and GM

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:

```
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

- (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

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:

- 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.
- Check the 10GbE interface in the DU server is linked up.
- Check the 10GbE interface in the DU server is running at 10Gb speed
- Check connectivity, make sure SFP+ module is actually inserted into the cage of the connector in the DU server.
- Check O-RU's log for xRAN packet:
 - If log does not contains "xRan: log.....", it means O-RU does not receive any C-Plane packet from O-DU.
 - 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 lpps=cc6e3744 f2t_en=d3c134bc jead_en=d3c154fc  
diff: sec=656 tick=4009 c_err_vs_lpps=10000000us f2t_vs_lpps=7040884us jead_vs_lpps=7040884us  
cmsgl_p0: 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000  
c_epl: total=26 early=26 on=26 late=26 dropPci=26 dropPort=26 dropSect=26  
40R: idx=0 tick=4009 total=26 uni=1 44b=0 45to128=26 uni>1158=0 multi=25 fcs_err=0 cplane=00000100
```

- 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.

- 10T state value is jumping 1&2

```

Align: 142027070 142576652 3378 17
104: sec=2611 hss=1807671657 64m=9388 45tst12m=8 total=220937 uni=220138 uni=1358+212450 multi=0 crc_err=0
107: sec=2611 hss=1807671657 64m=8 45tst12m=8 total=172 uni=0 uni=1358+172 multi=0 crc_err=0 state=1 start=2438 adj=0 ratcnt=0
midMax=7us @ 4010, allMax=55us @ 4010 0a7d5583 0a7d5c65 0a7d599d 0a7d583d 0a7d5331 2
Catch later lpps time=0a7d38ac sw=4010=0a7d38ac xran_sec=0a7d28e9 acc_diff(1)= -82 tps_sec=1807671657 cur_sec=2411 PA_ON TDO
Align: 142027070 142576652 3378 17
106: sec=2612 hss=1807671658 64m=3382 45tst12m=8 total=36072 uni=98872 uni=1154+94890 multi=0 crc_err=0
107: sec=2612 hss=1807671658 64m=8 45tst12m=8 total=0 uni=0 uni=1154+0 multi=0 crc_err=0 state=1 start=2412 adj=0 ratcnt=0
midMax=5us @ 4010, allMax=7us @ 4010 11c8855e 11c8a316 11c88977 11c88eb8 11c89277 4
Catch later lpps time=11c82bac sw=4010=11c82bac xran_sec=11c82ba9 acc_diff(1)= -81 tps_sec=1807671658 cur_sec=2412 PA_ON TDO
Align: 142027070 142576652 3378 17
105: sec=2613 hss=1807671659 64m=1030 45tst12m=8 total=30106 uni=30106 uni=1158+29669 multi=0 crc_err=0
107: sec=2613 hss=1807671659 64m=8 45tst12m=8 total=0 uni=0 uni=1158+0 multi=0 crc_err=0 state=1 start=2413 adj=0 ratcnt=0
midMax=6us @ 4010, allMax=7us @ 4010 19208556 1920a2ab 19208963 19208bd6 19209011 4
Catch later lpps time=19212bac sw=4010=19212bac xran_sec=19212ba9 acc_diff(1)= -82 tps_sec=1807671659 cur_sec=2413 PA_ON TDO
Temperature of RF board is 35 degree Celsius
Align: 142027070 142576652 3378 17
104: sec=2614 hss=1807671660 64m=9338 45tst12m=8 total=146087 uni=146088 uni=1150+141950 multi=0 crc_err=0
107: sec=2614 hss=1807671660 64m=8 45tst12m=8 total=0 uni=0 uni=1150+0 multi=0 crc_err=0 state=1 start=2414 adj=0 ratcnt=0
midMax=7us @ 4010, allMax=7us @ 4010 20738541 20739c36 20738973 20738cd6 207390d0 2
Catch later lpps time=20742bac sw=4010=20742bac xran_sec=20742ba9 acc_diff(1)= -81 tps_sec=1807671660 cur_sec=2414 PA_ON TDO
Align: 142027070 142576652 3378 17
106: sec=2615 hss=1807671661 64m=2048 45tst12m=8 total=50334 uni=50334 uni=1158+57127 multi=0 crc_err=0
107: sec=2615 hss=1807671661 64m=8 45tst12m=8 total=0 uni=0 uni=1158+0 multi=0 crc_err=0 state=1 start=2415 adj=0 ratcnt=0
midMax=5us @ 4010, allMax=7us @ 4010 27c88554 27c8a2ab 27c88915 27c88eb8 27c890d0 4
Catch later lpps time=27c72bac sw=4010=27c72bac xran_sec=27c72ba9 acc_diff(1)= -82 tps_sec=1807671661 cur_sec=2415 PA_ON TDO
Align: 142027070 142576652 3378 17
105: sec=2616 hss=1807671662 64m=4048 45tst12m=8 total=170387 uni=170388 uni=1150+169350 multi=0 crc_err=0
107: sec=2616 hss=1807671662 64m=8 45tst12m=8 total=129 uni=0 uni=1150+129 multi=0 crc_err=129 state=1 start=2416 adj=0 ratcnt=0
midMax=7us @ 4010, allMax=5us @ 4010 2f198544 2f199c12 2f198956 2f198c18 2f199315 2
Catch later lpps time=2f1a2bac sw=4010=2f1a2bac xran_sec=2f1a2ba9 acc_diff(1)= -82 tps_sec=1807671662 cur_sec=2416 PA_ON TDO

```

2. O-RU is unresponsive

```

* Launch later lpps time=c6d8b05d sw4010=c6d8b05d arm_sec=c6d8b04d acc_diff/1=-18 hps_sec=107226 car_sec=371 PA_ON TDO
Align: 205458274 205982732 20582 17
106: sec=372 hps=107227 640=0 650a12b=0 total=0 uni=0 uni1158=0 multi=0 crc_err=0
107: sec=372 hps=107227 640=0 650a12b=0 total=0 uni=0 uni1158=0 multi=0 crc_err=0 state=2 start=0 adj=-18 rctcnt=0
widthMaxBus # 4010, allMaxBus # 4010 c6267fa c6267f06 c626dc12 c626de67 c62675c1 2
* Launch later lpps time=c626b058 sw4010=c626b058 arm_sec=c626b046 acc_diff/1=-18 hps_sec=107227 car_sec=372 PA_ON TDO
Temperature of RF board is 54 degree Celsius.
Trigger M-plane fault, id 28 info (16, 2, 0).
GTPA (3) To a Align: 205458274 205982732 20582 17
acsb05cbcb310ePfeAlign: 205458274 205982732 20582 17
108: sec=374 hps=107229 640=2698248 650a12b=0 total=40353658 uni=40353635 uni1158=37663387 multi=16 crc_err=0
109: sec=374 hps=107229 640=0 650a12b=0 total=0 uni=0 uni1158=0 multi=0 crc_err=0 state=2 start=0 adj=-18 rctcnt=0
widthMaxBus # 4010, allMaxBus # 4010 c6267fa c6267f06 c626dc12 c626de67 c62675c1 2
* Launch later lpps time=c6d40b58 sw4010=c6d40b58 arm_sec=c6d40b4d acc_diff/1=-18 hps_sec=107229 car_sec=374 PA_ON TDO
Align: 205458274 205982732 20582 17
110: sec=375 hps=107230 640=2038248 650a12b=0 total=40473658 uni=40473635 uni1158=37775187 multi=16 crc_err=0
111: sec=375 hps=107230 640=0 650a12b=0 total=0 uni=0 uni1158=0 multi=0 crc_err=0 state=2 start=0 adj=-18 rctcnt=0
widthMaxBus # 4010, allMaxBus # 4010 c6267fa c6267fa9 c626db00 c626de7a c62675c1 2
* Launch later lpps time=c6279b4f sw4010=c6279b50 arm_sec=c6279b46 acc_diff/1=-18 hps_sec=107230 car_sec=375 PA_ON TDO
Align: 205458274 205982732 20582 17
112: sec=376 hps=107231 640=2796248 650a12b=0 total=40533658 uni=40533635 uni1158=37867387 multi=16 crc_err=0
113: sec=376 hps=107231 640=0 650a12b=0 total=0 uni=0 uni1158=0 multi=0 crc_err=0 state=2 start=0 adj=-18 rctcnt=0
widthMaxBus # 4010, allMaxBus # 4010 d5796706 d5797a07 d5796b00 d5796a01 d5797581 2
* Launch later lpps time=d57a0b4f sw4010=d57a0b4f arm_sec=d57a0b3c acc_diff/1=-18 hps_sec=107231 car_sec=376 PA_ON TDO
Temperature of RF board is 54 degree Celsius.
* User
76cd9025 ya off!
Turn OFF PA/LNA
736_110264 IPI_PMON_CPU_LAME
CTRL=0 2 far help 115200 3M1 NOR Huxian 2.6.3 VT102 Offline

```

3. There is no “**10R**” ,“**10T**” shows in console log after init rrh config enable cuplane


```
Latch 2nd lpps time=993a27bd curr=a08d27be diff=122880001  
trace_log_idx_g: 0  
Latch 2nd lpps time=a08d27be curr=a7e027c0 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=a7e027c0 curr=af3327c2 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=c52c27c7 curr=cc7f27c9 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=cc7f27c9 curr=d3d227cb diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=d3d227cb curr=db2527cc diff=122880001  
trace_log_idx_g: 0  
Latch 2nd lpps time=db2527cc curr=e27827ce diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=e27827ce curr=e9cb27d0 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=e9cb27d0 curr=f11e27d2 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=f11e27d2 curr=f87127d3 diff=122880001  
trace_log_idx_g: 0  
Latch 2nd lpps time=f87127d3 curr=ffc427d5 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=ffc427d5 curr=071727d7 diff=122880002  
trace_log_idx_g: 0  
Latch 2nd lpps time=071727d7 curr=0e6a27d8 diff=122880001
```