**OAI 5G NR搭建gNB和nrUE**  
ubuntu 18.04  
USRP N310

**安装UHD驱动[1]**

我们将在GitHub上git clone UHD源码库，切换到源码库的特定版本，然后从源代码构建和安装。

第一，在home目录下新建一个文件夹名字为git-repositories

cd $HOME

mkdir git-repositories

cd git-repositories

第二, clone 源码库, 然后进入uhd文件夹.

git clone https://github.com/EttusResearch/uhd

cd uhd

第三, 切换 UHD 版本 3.15.1.1.

git checkout v3.15.1.1

第四，新建文件夹

cd host

mkdir build

cd build

第五, 创建make文件.

cmake ../

第六, 运行 make去编译 UHD.-j8表示用8个CPU核心编译，加快速度，如果是四核的CPU可以用-j4或者不用

make -j8

第七，运行基本测试，以验证构建过程是否正确完成。

make test

第八, 安装 UHD, using the default install prefix, which will install UHD under the /usr/local/lib folder. You need to run this as root due to the permissions on that folder.

sudo make install

* 1

Next, update the system’s shared library cache.

sudo ldconfig

Finally, make sure that the LD\_LIBRARY\_PATH environment variable is defined, and includes the folder in which UHD was installed. Usually you can add the line below to the end of your $HOME/.bashrc file:

export LD\_LIBRARY\_PATH=/usr/local/lib

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If the LD\_LIBRARY\_PATH environment variable is already defined with other folders in your $HOME/.bashrc file, then add the line below to the end of your $HOME/.bashrc file to preserve your current settings.

export LD\_LIBRARY\_PATH=$LD\_LIBRARY\_PATH:/usr/local/lib

For this change to take effect, you will need to close the current terminal window, and open a new terminal window.

At this point, UHD should be installed and ready to use. Verify this by running uhd\_find\_devices. You should see something similar to the following.

[INFO] [UHD] linux; GNU C++ version 7.5.0; Boost\_106501; UHD\_3.15.0.0-0-unknown

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-- UHD Device 0

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Device Address:

serial: 31BAF1F

addr: 192.168.10.2

claimed: False

mgmt\_addr: 192.168.10.2

mgmt\_addr: 192.168.20.2

product: n310

type: n3xx

Now that UHD has been installed, we need to download the USRP FPGA images from the Ettus Research website. To do this, run the command listed below. The FPGA image files will be stored in the /usr/local/share/uhd/images folder.

sudo uhd\_images\_downloader

Next, we need to write the “HG” FPGA image to the USRP N310.

uhd\_image\_loader --args "type=n3xx,addr=192.168.10.2,fpga=HG"

Do not interrupt the writing program. If there is an interruption, an incomplete FPGA image will be written to flash memory, and the USRP 2974 will be bricked. To unbrick the device, you will need to write the FPGA via JTAG, and then re-write it with the uhd\_image\_loader utility.

Once the writing program successfully completes, **reboot the USRP N310.**

Verify that the FPGA image has been correctly written by running the uhd\_usrp\_probe utility.

UHD requires larger read and write socket buffer sizes than the default values to avoid potential overflows and underruns at high sample rates. A size of 32 MB should be sufficient. To do this, run the command listed below.

sudo sysctl -w net.core.rmem\_max=33554432

sudo sysctl -w net.core.wmem\_max=33554432

These settings will not persist across a reboot of the system. In order to make these settings permanent, add the following lines into the /etc/sysctl.conf file, as shown below.

net.core.rmem\_max=33554432

net.core.wmem\_max=33554432

Next, increase the system stack size limit, with the command below.

sudo ulimit -s 8192

When UHD spawns a new thread, it may try to boost the thread’s scheduling priority. If setting the new priority fails, then the UHD software prints a warning to the console, as shown below. This warning is harmless; it simply means that the thread will retain a normal or default scheduling priority.

UHD Warning:  
Unable to set the thread priority. Performance may be negatively affected.  
Please see the general application notes in the manual for instructions.

EnvironmentError: OSError: error in pthread\_setschedparam

To address this issue, non-privileged (non-root) users need to be given special permission to change the scheduling priority. This can be enabled by creating a group usrp, adding your username to it, and then appending the line @usrp - rtprio 99 to the file /etc/security/limits.conf.

sudo groupadd usrp

sudo usermod -aG usrp $USER

Then add the line below to end of the file /etc/security/limits.conf:

@usrp - rtprio 99

You must log out and log back into the account for this settings to take effect.

Additional information about this is posted in the UHD User Manual [here](https://blog.csdn.net/weixin_43313890/article/details/files.ettus.com/manual/page_general.html#general_threading_prio).

**gNB搭建**

基础文件下载

sudo apt-get update

sudo git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git

切换到develop分支

cd ~/openairinterface5g

sudo git checkout develop

source oaienv

cd cmake\_targets

第一、安装依赖：仅限于电脑之前从未安装过OAI，如果安装过就不需要了。可以采用build\_oai -h 查看相关参数的说明（这一步需要较长时间）

sudo ./build\_oai -I

第二、编译:使用USRP这里一定需要加-w USRP

sudo ./build\_oai -w USRP --gNB --nrUE

显示如下：

sdr@sdr-eNB1:~/openairinterface5g/cmake\_targets$ sudo ./build\_oai -x -w USRP --gNB

[sudo] sdr 的密码：

Will generate the software oscilloscope features

Setting hardware to: OAI\_USRP

Will compile gNB

CMAKE\_CMD=cmake ..

No transport protocol has been selected (TP set to None)

RF HW set to OAI\_USRP

Flags for Deadline scheduler: False

Flags for CPU Affinity: False

2. Setting the OAI PATHS ...

OPENAIR\_DIR = /home/sdr/openairinterface5g

FreeDiameter prefix not found, install freeDiameter if EPC, HSS

3. building the compilation directives ...

-- The C compiler identification is GNU 7.5.0

-- The CXX compiler identification is GNU 7.5.0

-- Check for working C compiler: /usr/bin/cc

-- Check for working C compiler: /usr/bin/cc -- works

-- Detecting C compiler ABI info

-- Detecting C compiler ABI info - done

-- Detecting C compile features

-- Detecting C compile features - done

-- Check for working CXX compiler: /usr/bin/c++

-- Check for working CXX compiler: /usr/bin/c++ -- works

-- Detecting CXX compiler ABI info

-- Detecting CXX compiler ABI info - done

-- Detecting CXX compile features

-- Detecting CXX compile features - done

CUDA\_TOOLKIT\_ROOT\_DIR not found or specified

-- Could NOT find CUDA (missing: CUDA\_TOOLKIT\_ROOT\_DIR CUDA\_NVCC\_EXECUTABLE CUDA\_INCLUDE\_DIRS CUDA\_CUDART\_LIBRARY)

No CUDA tool installed

CMAKE\_BUILD\_TYPE is RelWithDebInfo

Architecture is x86\_64

C\_FLAGS\_PROCESSOR is -mavx2 -msse4.1 -mssse3

-- Found Git: /usr/bin/git (found version "2.17.1")

git found: /usr/bin/git

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/RRC\_Rel15/Makefile.am.libasncodec

Generated LTE\_asn\_constant.h

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/RRC\_NR\_Rel15/Makefile.am.libasncodec

Generated NR\_asn\_constant.h

WARNING: Parameterized type BeamFailureRecoveryConfig expected for BeamFailureRecoveryConfig at line 1460 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type CG-UCI-OnPUSCH expected for CG-UCI-OnPUSCH at line 1700 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type ConfiguredGrantConfig expected for ConfiguredGrantConfig at line 1458 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type CSI-AperiodicTriggerStateList expected for CSI-AperiodicTriggerStateList at line 1896 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type CSI-MeasConfig expected for CSI-MeasConfig at line 4469 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type CSI-RS-ResourceConfigMobility expected for CSI-RS-ResourceConfigMobility at line 2631 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type CSI-SemiPersistentOnPUSCH-TriggerStateList expected for CSI-SemiPersistentOnPUSCH-TriggerStateList at line 1897 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type DataInactivityTimer expected for DataInactivityTimer at line 2474 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type DMRS-DownlinkConfig expected for DMRS-DownlinkConfig at line 3082 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type DMRS-UplinkConfig expected for DMRS-UplinkConfig at line 3460 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type DownlinkPreemption expected for DownlinkPreemption at line 2957 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type DRX-Config expected for DRX-Config at line 2465 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type GapConfig expected for GapConfig at line 2510 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type LocationMeasurementInfo expected for LocationMeasurementInfo at line 260 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type MeasGapSharingScheme expected for MeasGapSharingScheme at line 2535 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type MRDC-SecondaryCellGroupConfig expected for MRDC-SecondaryCellGroupConfig at line 430 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type OverheatingAssistanceConfig expected for OverheatingAssistanceConfig at line 6576 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDCCH-BlindDetection expected for PDCCH-BlindDetection at line 3212 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDCCH-ConfigCommon expected for PDCCH-ConfigCommon at line 1410 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDCCH-Config expected for PDCCH-Config at line 1419 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDCCH-ServingCellConfig expected for PDCCH-ServingCellConfig at line 4467 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDSCH-CodeBlockGroupTransmission expected for PDSCH-CodeBlockGroupTransmission at line 3142 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDSCH-ConfigCommon expected for PDSCH-ConfigCommon at line 1411 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDSCH-Config expected for PDSCH-Config at line 1420 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDSCH-ServingCellConfig expected for PDSCH-ServingCellConfig at line 4468 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PDSCH-TimeDomainResourceAllocationList expected for PDSCH-TimeDomainResourceAllocationList at line 3089 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PHR-Config expected for PHR-Config at line 2469 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PTRS-DownlinkConfig expected for PTRS-DownlinkConfig at line 2192 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PTRS-UplinkConfig expected for PTRS-UplinkConfig at line 2202 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUCCH-ConfigCommon expected for PUCCH-ConfigCommon at line 1448 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUCCH-Config expected for PUCCH-Config at line 1456 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUCCH-FormatConfig expected for PUCCH-FormatConfig at line 3288 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUCCH-TPC-CommandConfig expected for PUCCH-TPC-CommandConfig at line 2959 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-CodeBlockGroupTransmission expected for PUSCH-CodeBlockGroupTransmission at line 3563 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-ConfigCommon expected for PUSCH-ConfigCommon at line 1447 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-Config expected for PUSCH-Config at line 1457 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-ServingCellConfig expected for PUSCH-ServingCellConfig at line 4492 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-TimeDomainResourceAllocationList expected for PUSCH-TimeDomainResourceAllocationList at line 3468 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type PUSCH-TPC-CommandConfig expected for PUSCH-TPC-CommandConfig at line 2958 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type RACH-ConfigCommon expected for RACH-ConfigCommon at line 1446 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type RadioLinkMonitoringConfig expected for RadioLinkMonitoringConfig at line 1422 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type RateMatchPatternLTE-CRS expected for RateMatchPatternLTE-CRS at line 4480 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type RLF-TimersAndConstants expected for RLF-TimersAndConstants at line 1533 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type RNTI-Value expected for RNTI-Value at line 3202 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SlotFormatIndicator expected for SlotFormatIndicator at line 3003 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SPS-Config expected for SPS-Config at line 1421 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SRS-CarrierSwitching expected for SRS-CarrierSwitching at line 4493 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SRS-Config expected for SRS-Config at line 1459 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SRS-TPC-CommandConfig expected for SRS-TPC-CommandConfig at line 2960 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type SSB-ToMeasure expected for SSB-ToMeasure at line 2636 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type UCI-OnPUSCH expected for UCI-OnPUSCH at line 3477 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

WARNING: Parameterized type ZP-CSI-RS-ResourceSet expected for ZP-CSI-RS-ResourceSet at line 3121 in /home/sdr/openairinterface5g/openair2/RRC/NR/MESSAGES/asn1c/ASN1\_files/nr-rrc-15.6.0.asn1

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/S1AP\_R15/Makefile.am.libasncodec

Generated S1AP\_asn\_constant.h

WARNING: Parameterized type maxnoofE-RABs expected for maxnoofE-RABs at line 1197 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type maxPrivateIEs expected for maxPrivateIEs at line 7342 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type maxProtocolExtensions expected for maxProtocolExtensions at line 7326 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type maxProtocolIEs expected for maxProtocolIEs at line 7275 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PRIVATE-IES expected for S1AP-PRIVATE-IES at line 7346 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PRIVATE-IES expected for S1AP-PRIVATE-IES at line 7347 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PRIVATE-IES expected for S1AP-PRIVATE-IES at line 7348 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-EXTENSION expected for S1AP-PROTOCOL-EXTENSION at line 7330 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-EXTENSION expected for S1AP-PROTOCOL-EXTENSION at line 7331 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-EXTENSION expected for S1AP-PROTOCOL-EXTENSION at line 7332 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-IES expected for S1AP-PROTOCOL-IES at line 7282 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-IES expected for S1AP-PROTOCOL-IES at line 7283 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

WARNING: Parameterized type S1AP-PROTOCOL-IES expected for S1AP-PROTOCOL-IES at line 7284 in /home/sdr/openairinterface5g/openair3/S1AP/MESSAGES/ASN1/R15/s1ap-15.6.0.asn1

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/M2AP\_R14/Makefile.am.libasncodec

Generated M2AP\_asn\_constant.h

WARNING: Parameterized type M2AP-PRIVATE-IES expected for M2AP-PRIVATE-IES at line 1890 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PRIVATE-IES expected for M2AP-PRIVATE-IES at line 1891 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PRIVATE-IES expected for M2AP-PRIVATE-IES at line 1892 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-EXTENSION expected for M2AP-PROTOCOL-EXTENSION at line 1874 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-EXTENSION expected for M2AP-PROTOCOL-EXTENSION at line 1875 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-EXTENSION expected for M2AP-PROTOCOL-EXTENSION at line 1876 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-IES expected for M2AP-PROTOCOL-IES at line 1826 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-IES expected for M2AP-PROTOCOL-IES at line 1827 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type M2AP-PROTOCOL-IES expected for M2AP-PROTOCOL-IES at line 1828 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type maxPrivateIEs expected for maxPrivateIEs at line 1886 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type maxProtocolExtensions expected for maxProtocolExtensions at line 1870 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

WARNING: Parameterized type maxProtocolIEs expected for maxProtocolIEs at line 1819 in /home/sdr/openairinterface5g/openair2/M2AP/MESSAGES/ASN1/R14/m2ap-14.0.0.asn1

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/M3AP\_R14/Makefile.am.libasncodec

Generated M3AP\_asn\_constant.h

WARNING: Parameterized type M3AP-PRIVATE-IES expected for M3AP-PRIVATE-IES at line 1060 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PRIVATE-IES expected for M3AP-PRIVATE-IES at line 1061 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PRIVATE-IES expected for M3AP-PRIVATE-IES at line 1062 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-EXTENSION expected for M3AP-PROTOCOL-EXTENSION at line 1047 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-EXTENSION expected for M3AP-PROTOCOL-EXTENSION at line 1048 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-EXTENSION expected for M3AP-PROTOCOL-EXTENSION at line 1049 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-IES expected for M3AP-PROTOCOL-IES at line 1008 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-IES expected for M3AP-PROTOCOL-IES at line 1009 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type M3AP-PROTOCOL-IES expected for M3AP-PROTOCOL-IES at line 1010 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type maxPrivateIEs expected for maxPrivateIEs at line 1057 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type maxProtocolExtensions expected for maxProtocolExtensions at line 1044 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

WARNING: Parameterized type maxProtocolIEs expected for maxProtocolIEs at line 1003 in /home/sdr/openairinterface5g/openair3/M3AP/MESSAGES/ASN1/R14/m3ap-14.0.0.asn1

Generated /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/X2AP\_R15/Makefile.am.libasncodec

Generated X2AP\_asn\_constant.h

WARNING: Parameterized type maxPrivateIEs expected for maxPrivateIEs at line 8436 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type maxProtocolExtensions expected for maxProtocolExtensions at line 8420 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type maxProtocolIEs expected for maxProtocolIEs at line 8369 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PRIVATE-IES expected for X2AP-PRIVATE-IES at line 8440 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PRIVATE-IES expected for X2AP-PRIVATE-IES at line 8441 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PRIVATE-IES expected for X2AP-PRIVATE-IES at line 8442 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-EXTENSION expected for X2AP-PROTOCOL-EXTENSION at line 8424 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-EXTENSION expected for X2AP-PROTOCOL-EXTENSION at line 8425 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-EXTENSION expected for X2AP-PROTOCOL-EXTENSION at line 8426 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-IES expected for X2AP-PROTOCOL-IES at line 8376 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-IES expected for X2AP-PROTOCOL-IES at line 8377 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

WARNING: Parameterized type X2AP-PROTOCOL-IES expected for X2AP-PROTOCOL-IES at line 8378 in /home/sdr/openairinterface5g/openair2/X2AP/MESSAGES/ASN1/R15/x2ap-15.6.0.asn1

calling ASN1C\_PREFIX=F1AP\_ asn1c -gen-PER -no-gen-OER -fcompound-names -no-gen-example -findirect-choice -fno-include-deps -D /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/F1AP\_R15.2.1 /home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-CommonDataTypes.asn;/home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-Constants.asn;/home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-PDU-Descriptions.asn;/home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-PDU-Contents.asn;/home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-IEs.asn;/home/sdr/openairinterface5g/openair2/F1AP/MESSAGES/ASN1/R15.2.1/F1AP-Containers.asn

DEADLINE\_SCHEDULER flag is False

CPU\_Affinity flag is False

-- Found Yaml: /usr/lib/x86\_64-linux-gnu/libyaml.so

calling protoc\_call=/home/sdr/openairinterface5g/cmake\_targets/tools/generate\_protobuf FSPT\_C\_DIR=/home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/FSPT\_V2 FSPT\_MSG\_DIR=/home/sdr/openairinterface5g/targets/COMMON/MESSAGES/V2 FSPT\_MSG\_FILES=/home/sdr/openairinterface5g/targets/COMMON/MESSAGES/V2/flexsplit.proto

[libprotobuf WARNING google/protobuf/compiler/parser.cc:546] No syntax specified for the proto file: flexsplit.proto. Please use 'syntax = "proto2";' or 'syntax = "proto3";' to specify a syntax version. (Defaulted to proto2 syntax.)

fspt c dir is : /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build/CMakeFiles/FSPT\_V2

-- Found PkgConfig: /usr/bin/pkg-config (found version "0.29.1")

-- Checking for one of the modules 'libxml-2.0'

-- Checking for one of the modules 'libxslt'

-- Checking for one of the modules 'openssl'

-- Checking for one of the modules 'libconfig'

-- Checking for one of the modules 'libcrypto'

-- Boost version: 1.65.1

-- Checking for one of the modules 'openpgm-5.1;openpgm-5.2'

-- Checking for one of the modules 'nettle'

NETTLE VERSION\_INSTALLED = 3.4

NETTLE\_VERSION\_MAJOR = 3

NETTLE\_VERSION\_MINOR = 4

-- Checking for one of the modules 'xpm'

Add enb specific telnet functions in libtelnetsrv\_enb.so

No specific telnet functions for gnb

No specific telnet functions for 4gUE

No specific telnet functions for 5gUE

-- Configuring done

-- Generating done

-- Build files have been written to: /home/sdr/openairinterface5g/cmake\_targets/ran\_build/build

Compiling nr-softmodem...

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/nr-softmodem.Rel15.txt

nr-softmodem compiled

WARNING: 1 warnings. See /home/sdr/openairinterface5g/cmake\_targets/log/nr-softmodem.Rel15.txt

Building shared libraries common to UE and gNB

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/params\_libconfig.Rel15.txt

params\_libconfig compiled

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/coding.Rel15.txt

coding compiled

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/nasmesh.Rel15.txt

nasmesh compiled

WARNING: 1 warnings. See /home/sdr/openairinterface5g/cmake\_targets/log/nasmesh.Rel15.txt

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/rb\_tool.Rel15.txt

rb\_tool compiled

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/oai\_usrpdevif.Rel15.txt

oai\_usrpdevif compiled

liboai\_device.so is linked to USRP device library

Compiling rfsimulator

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/rfsimulator.Rel15.txt

rfsimulator compiled

WARNING: 1 warnings. See /home/sdr/openairinterface5g/cmake\_targets/log/rfsimulator.Rel15.txt

Compiling tcp\_bridge\_oai

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/tcp\_bridge\_oai.Rel15.txt

tcp\_bridge\_oai compiled

Building transport protocol libraries

Log file for compilation is being written to: /home/sdr/openairinterface5g/cmake\_targets/log/oai\_eth\_transpro.Rel15.txt

oai\_eth\_transpro compiled

liboai\_transpro.so is linked to ETHERNET transport

10. Bypassing the Tests ...

BUILD SHOULD BE SUCCESSFUL

* 4修改配置文件：修改 ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/ 下n310配置文件gnb.band78.tm1.106PRB.usrpn300.conf的内容。电脑通过网线连接了网络，IP地址为192.168.0.9

sudo vim ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf

* 1

// MME parameters:

mme\_ip\_address = ( { ipv4 = "192.168.12.26";

ipv6 = "192:168:30::17";

active = "yes";

preference = "ipv4";

}

);

NETWORK\_INTERFACES :

{

GNB\_INTERFACE\_NAME\_FOR\_S1\_MME = "eth0";

GNB\_IPV4\_ADDRESS\_FOR\_S1\_MME = "192.168.0.9/24";

GNB\_INTERFACE\_NAME\_FOR\_S1U = "eth0";

GNB\_IPV4\_ADDRESS\_FOR\_S1U = "192.168.0.9/24";

GNB\_PORT\_FOR\_S1U = 2152; # Spec 2152

...

...

RUs = (

{

local\_rf = "yes"

nb\_tx = 1

nb\_rx = 1

att\_tx = 0

att\_rx = 0;

bands = [7];

max\_pdschReferenceSignalPower = -27;

max\_rxgain = 114;

eNB\_instances = [0];

sdr\_addrs = "addr=192.168.20.2,mgmt\_addr=192.168.10.2,second\_addr=192.168.20.2";

clock\_src = "external";

}

);

运行

sudo -E ./nr-softmodem --noS1 -O ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf -d

* 1

sdr@sdr-eNB1:~/openairinterface5g/cmake\_targets/ran\_build/build$ sudo ./nr-softmodem -O ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf

[CONFIG] get parameters from libconfig /home/sdr/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf , debug flags: 0x00000000

[CONFIG] function config\_libconfig\_init returned 0

[CONFIG] config module libconfig loaded

[LIBCONFIG] config: 1/1 parameters successfully set, (1 to default value)

Send signal 35 to display resource usage...

[LIBCONFIG] log\_config: 3/3 parameters successfully set, (1 to default value)

[LIBCONFIG] log\_config: 52/52 parameters successfully set, (46 to default value)

[LIBCONFIG] log\_config: 52/52 parameters successfully set, (52 to default value)

[LIBCONFIG] log\_config: 15/15 parameters successfully set, (15 to default value)

[LIBCONFIG] log\_config: 15/15 parameters successfully set, (15 to default value)

log init done

[HW] # /dev/cpu\_dma\_latency set to 10 us

Reading in command-line options

[GNB\_APP] Getting GNBSParams

[LIBCONFIG] (root): 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] THREAD\_STRUCT.[0]: 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] THREAD\_STRUCT.[0]: 2/2 parameters successfully set, (0 to default value)

[CONFIG] parallel\_conf is set to 2

[CONFIG] worker\_conf is set to 1

Configuration: nb\_rrc\_inst 1, nb\_nr\_L1\_inst 1, nb\_ru 1

[LIBCONFIG] (root): 23/23 parameters successfully set, (19 to default value)

[LIBCONFIG] (root): 5/5 parameters successfully set, (4 to default value)

[LIBCONFIG] TTracer: 4/4 parameters successfully set, (4 to default value)

configuring for RAU/RRU

CPU Freq is 3.600326

[TMR] Starting itti queue: TASK\_UNKNOWN as task 0

[TMR] Starting itti queue: TASK\_TIMER as task 1

[TMR] Starting itti queue: TASK\_L2L1 as task 2

[TMR] Starting itti queue: TASK\_BM as task 3

[TMR] Starting itti queue: TASK\_PHY\_ENB as task 4

[TMR] Starting itti queue: TASK\_MAC\_ENB as task 5

[TMR] Starting itti queue: TASK\_RLC\_ENB as task 6

[TMR] Starting itti queue: TASK\_RRC\_ENB\_NB\_IoT as task 7

[TMR] Starting itti queue: TASK\_PDCP\_ENB as task 8

[TMR] Starting itti queue: TASK\_DATA\_FORWARDING as task 9

[TMR] Starting itti queue: TASK\_END\_MARKER as task 10

[TMR] Starting itti queue: TASK\_RRC\_ENB as task 11

[TMR] Starting itti queue: TASK\_RRC\_GNB as task 12

[TMR] Starting itti queue: TASK\_RAL\_ENB as task 13

[TMR] Starting itti queue: TASK\_S1AP as task 14

[TMR] Starting itti queue: TASK\_X2AP as task 15

[TMR] Starting itti queue: TASK\_M2AP\_ENB as task 16

[TMR] Starting itti queue: TASK\_M2AP\_MCE as task 17

[TMR] Starting itti queue: TASK\_M3AP as task 18

[TMR] Starting itti queue: TASK\_M3AP\_MME as task 19

[TMR] Starting itti queue: TASK\_M3AP\_MCE as task 20

[TMR] Starting itti queue: TASK\_SCTP as task 21

[TMR] Starting itti queue: TASK\_ENB\_APP as task 22

[TMR] Starting itti queue: TASK\_GNB\_APP as task 23

[TMR] Starting itti queue: TASK\_MCE\_APP as task 24

[TMR] Starting itti queue: TASK\_MME\_APP as task 25

[TMR] Starting itti queue: TASK\_FLEXRAN\_AGENT as task 26

[TMR] Starting itti queue: TASK\_PHY\_UE as task 27

[TMR] Starting itti queue: TASK\_MAC\_UE as task 28

[TMR] Starting itti queue: TASK\_RLC\_UE as task 29

[TMR] Starting itti queue: TASK\_PDCP\_UE as task 30

[TMR] Starting itti queue: TASK\_RRC\_UE as task 31

[TMR] Starting itti queue: TASK\_NAS\_UE as task 32

[TMR] Starting itti queue: TASK\_RAL\_UE as task 33

[TMR] Starting itti queue: TASK\_MSC as task 34

[TMR] Starting itti queue: TASK\_GTPV1\_U as task 35

[TMR] Starting itti queue: TASK\_UDP as task 36

[TMR] Starting itti queue: TASK\_CU\_F1 as task 37

[TMR] Starting itti queue: TASK\_DU\_F1 as task 38

[LIBCONFIG] opt: 3/3 parameters successfully set, (3 to default value)

[OPT] OPT disabled

[NETLINK] Error opening socket -1 (93:Protocol not supported)

[NETLINK] Opened socket with fd -1

[NETLINK] Error fcntl (9:Bad file descriptor)

[HW] Version: Branch: develop Abrev. Hash: 2bf575841 Date: Fri Jul 10 16:49:26 2020 +0200

Wait for the ITTI initialize message

[TMR] Created Posix thread TASK\_L2L1

[SCTP] Starting SCTP layer

[TMR] Created Posix thread TASK\_SCTP

[LIBCONFIG] eNBs.[0]: 1/1 parameters successfully set, (1 to default value)

[LIBCONFIG] gNBs.[0]: 1/1 parameters successfully set, (1 to default value)

[X2AP] X2AP is disabled.

[UDP] Initializing UDP task interface

[UDP] Initializing UDP task interface: DONE

[TMR] Created Posix thread TASK\_UDP

[TMR] Created Posix thread TASK\_GTPV1\_U

[PHY] gNB\_app\_task() Task ready initialize structures

[TMR] Created Posix thread TASK\_GNB\_APP

[NR\_RRC] Creating NR RRC gNB Task

[GTPV1U] Initializing GTPU stack 0x562004f8f4b0

[NR\_PHY] RC.gNB = 0x7fef8c000b20

[LIBCONFIG] L1s.[0]: 24/24 parameters successfully set, (22 to default value)

[NR\_RRC] Entering main loop of NR\_RRC message task

[TMR] Created Posix thread TASK\_RRC\_GNB

[NR\_PHY] RC.gNB[0] = 0x7fef9ed5d010

Initializing northbound interface for L1

[PHY] l1\_north\_init\_gNB() RC.nb\_nr\_L1\_inst:1

[PHY] Installing callbacks for IF\_Module - UL\_indication

[MAC] Allocating shared L1/L2 interface structure for instance 0 @ 0x7fef8c001c40

[PHY] l1\_north\_init\_gNB() RC.gNB[0] installing callbacks

[LIBCONFIG] MACRLCs.[0]: 20/20 parameters successfully set, (17 to default value)

[MAC] [MAIN] Init function start:nb\_nr\_macrlc\_inst=1

NFAPI MODE:MONOLITHIC

START MAIN THREADS

RC.nb\_nr\_L1\_inst:1

Initializing gNB threads single\_thread\_flag:1 wait\_for\_sync:0

[PHY] gNB L1 structure RC.gNB allocated @ 0x7fef8c000b20

[PHY] [lte-softmodem.c] gNB structure RC.gNB[0] allocated @ 0x7fef9ed5d010

[PHY] Initializing gNB 0 single\_thread\_flag:1

[PHY] Initializing gNB 0

[PHY] Registering with MAC interface module (before 0x7fef8c001c40)

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] Registering with MAC interface module (after 0x7fef8c001c40)

[PHY] Setting indication lists

[PHY] [nr-softmodem.c] gNB structure allocated

wait\_gNBs()

Waiting for gNB L1 instances to all get configured ... sleeping 50ms (nb\_nr\_sL1\_inst 1)

[PDCP] PDCP layer has been initialized

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] gNB\_app\_task() RC.nb\_nr\_L1\_inst:1

[PHY] l1\_north\_init\_gNB() RC.nb\_nr\_L1\_inst:1

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] l1\_north\_init\_gNB() RC.gNB[0] installing callbacks

[GNB\_APP] Allocating gNB\_RRC\_INST for 1 instances

[PHY] gNB\_app\_task() RC.nb\_nr\_inst:1 RC.nrrrc:0x7fef8c002dd0

[PHY] gNB\_app\_task() Creating RRC instance RC.nrrrc[0]:0x7fef8c002df0 (1 of 1)

[LIBCONFIG] (root): 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] gNBs.[0]: 14/14 parameters successfully set, (8 to default value)

[LIBCONFIG] gNBs.[0].servingCellConfigCommon.[0]: 155/155 parameters successfully set, (83 to default value)

[RRC] Read in ServingCellConfigCommon (PhysCellId 0, ABSFREQSSB 641032, DLBand 78, ABSFREQPOINTA 640000, DLBW 106,RACH\_TargetReceivedPower -118

Checking element 15 : 4294967295

removing pdsch\_TimeDomainAllocationList element 15

List size now 15

Checking element 14 : 4294967295

removing pdsch\_TimeDomainAllocationList element 14

List size now 14

Checking element 13 : 4294967295

removing pdsch\_TimeDomainAllocationList element 13

List size now 13

Checking element 12 : 4294967295

removing pdsch\_TimeDomainAllocationList element 12

List size now 12

Checking element 11 : 4294967295

removing pdsch\_TimeDomainAllocationList element 11

List size now 11

Checking element 10 : 4294967295

removing pdsch\_TimeDomainAllocationList element 10

List size now 10

Checking element 9 : 4294967295

removing pdsch\_TimeDomainAllocationList element 9

List size now 9

Checking element 8 : 4294967295

removing pdsch\_TimeDomainAllocationList element 8

List size now 8

Checking element 7 : 4294967295

removing pdsch\_TimeDomainAllocationList element 7

List size now 7

Checking element 6 : 4294967295

removing pdsch\_TimeDomainAllocationList element 6

List size now 6

Checking element 5 : 4294967295

removing pdsch\_TimeDomainAllocationList element 5

List size now 5

Checking element 4 : 4294967295

removing pdsch\_TimeDomainAllocationList element 4

List size now 4

Checking element 3 : 0

Checking element 2 : 0

Checking element 1 : 0

Checking element 0 : 0

NRRRC 0: Southbound Transport local\_mac

[LIBCONFIG] gNBs.[0].plmn\_list.[0]: 3/3 parameters successfully set, (0 to default value)

SSB SCO 31

pdsch\_AntennaPorts 1

[GNB\_APP] Sending configuration message to NR\_RRC task

[GTPV1U] Configuring GTPu

[NR\_RRC] Received message NRRRC\_CONFIGURATION\_REQ

[LIBCONFIG] (root): 2/2 parameters successfully set, (0 to default value)

[NR\_RRC] [gNB 0] Received NRRRC\_CONFIGURATION\_REQ : 0x7fef8c0043a0

[LIBCONFIG] gNBs.[0].NETWORK\_INTERFACES: 3/3 parameters successfully set, (0 to default value)

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] Init...

[GTPV1U] Configuring GTPu address : 192.168.0.9 -> 900a8c0

[GNB\_APP] [gNB 0] gNB\_app\_register for instance 0

[GTPV1U] Tx UDP\_INIT IP addr 192.168.0.9 (868)

[UDP] Initializing UDP for local address 192.168.0.9 with port 2152

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] Checking release

[NR\_RRC] Done init\_NR\_SI

[MAC] Configuring common parameters from NR ServingCellConfig

[PHY] config\_common() dl\_BandwidthP:40

[PHY] Computing dl\_frequency (pointA 640000 => 3600000000 (dlmin 3300000, nr\_bandtable[27].N\_OFFs\_DL 620000))

[PHY] config\_common() dl\_BandwidthP:40

[PHY] Computing dl\_frequency (pointA 640000 => 3600000000 (dlmin 3300000, nr\_bandtable[27].N\_OFFs\_DL 620000))

[UDP] Inserting new descriptor for task 35, sd 85

[PHY] Scanning band 1, dl\_min 2110000, ul\_min 1920000

[PHY] Scanning band 2, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 3, dl\_min 1805000, ul\_min 1710000

[PHY] Scanning band 5, dl\_min 869000, ul\_min 824000

[PHY] Scanning band 7, dl\_min 2620000, ul\_min 2500000

[PHY] Scanning band 8, dl\_min 925000, ul\_min 880000

[PHY] Scanning band 12, dl\_min 728000, ul\_min 698000

[PHY] Scanning band 20, dl\_min 791000, ul\_min 832000

[PHY] Scanning band 25, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 28, dl\_min 758000, ul\_min 703000

[PHY] Scanning band 34, dl\_min 2010000, ul\_min 2010000

[PHY] Scanning band 38, dl\_min 2570000, ul\_min 2570000

[PHY] Scanning band 39, dl\_min 1880000, ul\_min 1880000

[PHY] Scanning band 40, dl\_min 2300000, ul\_min 2300000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 50, dl\_min 1432000, ul\_min 1432000

[PHY] Scanning band 51, dl\_min 1427000, ul\_min 1427000

[PHY] Scanning band 66, dl\_min 2110000, ul\_min 1710000

[PHY] Scanning band 70, dl\_min 1995000, ul\_min 1695000

[PHY] Scanning band 71, dl\_min 617000, ul\_min 663000

[PHY] Scanning band 74, dl\_min 1475000, ul\_min 1427000

[PHY] Scanning band 75, dl\_min 1432000, ul\_min 0

[PHY] Scanning band 76, dl\_min 1427000, ul\_min 0

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 80, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 81, dl\_min 0, ul\_min 860000

[PHY] Scanning band 82, dl\_min 0, ul\_min 832000

[PHY] Scanning band 83, dl\_min 0, ul\_min 703000

[PHY] Scanning band 84, dl\_min 0, ul\_min 1920000

[PHY] Scanning band 86, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] DL frequency 3600000000: band 78, frame\_type 1, UL frequency 3600000000

[UDP] Initializing UDP for local address 192.168.0.9 with port 2152: DONE

found\_sequences 16

[MAC] Set TX/RX antenna number to 1 (num ssb 1: 80000000,0)

[MAC] Setting TDD configuration period to 6

[PHY] TDD has been properly configurated

[MAC] rrc\_mac\_config\_req\_gNB() /home/sdr/openairinterface5g/openair2/LAYER2/NR\_MAC\_gNB/config.c:345 RC.nrmac[Mod\_idP]->if\_inst->NR\_PHY\_config\_req:0x562003def380

[PHY] Scanning band 1, dl\_min 2110000, ul\_min 1920000

[PHY] Scanning band 2, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 3, dl\_min 1805000, ul\_min 1710000

[PHY] Scanning band 5, dl\_min 869000, ul\_min 824000

[PHY] Scanning band 7, dl\_min 2620000, ul\_min 2500000

[PHY] Scanning band 8, dl\_min 925000, ul\_min 880000

[PHY] Scanning band 12, dl\_min 728000, ul\_min 698000

[PHY] Scanning band 20, dl\_min 791000, ul\_min 832000

[PHY] Scanning band 25, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 28, dl\_min 758000, ul\_min 703000

[PHY] Scanning band 34, dl\_min 2010000, ul\_min 2010000

[PHY] Scanning band 38, dl\_min 2570000, ul\_min 2570000

[PHY] Scanning band 39, dl\_min 1880000, ul\_min 1880000

[PHY] Scanning band 40, dl\_min 2300000, ul\_min 2300000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 50, dl\_min 1432000, ul\_min 1432000

[PHY] Scanning band 51, dl\_min 1427000, ul\_min 1427000

[PHY] Scanning band 66, dl\_min 2110000, ul\_min 1710000

[PHY] Scanning band 70, dl\_min 1995000, ul\_min 1695000

[PHY] Scanning band 71, dl\_min 617000, ul\_min 663000

[PHY] Scanning band 74, dl\_min 1475000, ul\_min 1427000

[PHY] Scanning band 75, dl\_min 1432000, ul\_min 0

[PHY] Scanning band 76, dl\_min 1427000, ul\_min 0

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 80, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 81, dl\_min 0, ul\_min 860000

[PHY] Scanning band 82, dl\_min 0, ul\_min 832000

[PHY] Scanning band 83, dl\_min 0, ul\_min 703000

[PHY] Scanning band 84, dl\_min 0, ul\_min 1920000

[PHY] Scanning band 86, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] DL frequency 3619080000: band 78, frame\_type 1, UL frequency 3619080000

[PHY] Configuring MIB for instance 0, : (Nid\_cell 0,DL freq 3619080000, UL freq 3619080000)

[PHY] Initializing frame parms for mu 1, N\_RB 106, Ncp 0

[PHY] gNB 0 configured

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] gNB:OPENAIR NR RRC IN....

gNB L1 are configured

About to Init RU threads RC.nb\_RU:1

Initializing RU threads

configuring RU from file

[LIBCONFIG] RUs.[0]: 27/27 parameters successfully set, (16 to default value)

Set RU mask to 1

Creating RC.ru[0]:0x562005a46490

Setting function for RU 0 to gNodeB\_3GPP

[PHY] number of L1 instances 1, number of RU 1, number of CPU cores 8

[PHY] DJP - delete code above this /home/sdr/openairinterface5g/executables/nr-ru.c:2254

[PHY] Copying frame parms from gNB in RC to gNB 0 in ru 0 and frame\_parms in ru

configuring ru\_id 0 (start\_rf 0x562003d98020)

[PHY] Starting ru\_thread 0

[PHY] Initializing RU proc 0 (,synch\_to\_ext\_device),

[PHY] Starting RU 0 (,synch\_to\_ext\_device),

[PHY] Initializing frame parms for mu 1, N\_RB 106, Ncp 0

[PHY] fp->scs=30000

[PHY] fp->ofdm\_symbol\_size=2048

[PHY] fp->nb\_prefix\_samples0=176

[PHY] fp->nb\_prefix\_samples=144

[PHY] fp->slots\_per\_subframe=2

[PHY] fp->samples\_per\_subframe\_wCP=57344

[PHY] fp->samples\_per\_frame\_wCP=573440

[PHY] fp->samples\_per\_subframe=61440

[PHY] fp->samples\_per\_frame=614400

[PHY] fp->dl\_CarrierFreq=3619080000

[PHY] fp->ul\_CarrierFreq=3619080000

channel 0, Setting tx\_gain offset 0.000000, rx\_gain offset 114.000000, tx\_freq 3619080000.000000, rx\_freq 3619080000.000000

[PHY] Initializing RU signal buffers (if\_south local RF) nb\_tx 1

[PHY] init\_RU\_proc() DJP - added creation of pthread\_prach

[PHY] [INIT] common.txdata[0] = 0x7fef980b7040 (2457600 bytes)

[PHY] nb\_tx 1

[PHY] init feptx thread 0

[PHY] rxdata\_7\_5kHz[0] 0x7fef9091a040 for RU 0

[PHY] init feptx thread 1

wait RUs

[PHY] Waiting for RUs to be configured ... RC.ru\_mask:01

[PHY] [INIT] common.txdata\_BF= 0x7fef7c000b00 (8 bytes)

[PHY] txdataF\_BF[0] 0x7fef9ece3040 for RU 0

[PHY] rxdataF[0] 0x7fef98046040 for RU 0

[PHY] [INIT] nr\_phy\_init\_RU() RC.nb\_nr\_L1\_inst:1

[LIBCONFIG] device.recplay: 7/7 parameters successfully set, (7 to default value)

[LIBCONFIG] device: 1/1 parameters successfully set, (1 to default value)

[LIBCONFIG] loader: 2/2 parameters successfully set, (2 to default value)

[LIBCONFIG] loader.oai\_device: 2/2 parameters successfully set, (1 to default value)

[LOADER] library liboai\_device.so successfully loaded

[HW] UHD version 3.14.1.1-release (3.14.1)

[HW] Checking for USRP with args addr=192.168.10.2,mgmt\_addr=192.168.10.2,second\_addr=192.168.20.2

[INFO] [UHD] linux; GNU C++ version 7.4.0; Boost\_106501; UHD\_3.14.1.1-release

[HW] Found USRP n3xx

Found USRP n300

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[INFO] [MPMD] Initializing 1 device(s) in parallel with args: mgmt\_addr=192.168.10.2,type=n3xx,product=n310,serial=31BAF1F,claimed=False,addr=192.168.10.2,second\_addr=192.168.20.2,master\_clock\_rate=122880000.000000

[INFO] [MPM.main] Launching USRP/MPM, version: 3.14.1.1-g0347a6d8

[INFO] [MPM.main] Spawning RPC process...

[INFO] [MPM.PeriphManager] Device serial number: 31BAF1F

[INFO] [MPM.PeriphManager] Initialized 2 daughterboard(s).

[INFO] [MPM.PeriphManager] init() called with device args `time\_source=internal,clock\_source=internal'.

[INFO] [MPM.RPCServer] RPC server ready!

[INFO] [MPM.RPCServer] Spawning watchdog task...

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[INFO] [MPM.PeriphManager] init() called with device args `time\_source=internal,second\_addr=192.168.20.2,clock\_source=internal,master\_clock\_rate=122880000.000000,product=n310,mgmt\_addr=192.168.10.2'.

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

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[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[ERROR] [MPMD] Failure during block enumeration: AssertionError: Failed to find a valid XML path for RFNoC blocks.

Try setting the enviroment variable UHD\_RFNOC\_DIR to the correct location

terminate called after throwing an instance of 'uhd::runtime\_error'

what(): RuntimeError: Failed to run enumerate\_rfnoc\_blocks()

Linux signal Aborted...

/home/sdr/openairinterface5g/executables/softmodem-common.c:187 signal\_handler() Exiting OAI softmodem: softmodem starting exit procedure

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

nr-softmodem: /usr/include/boost/thread/pthread/mutex.hpp:111: boost::mutex::~mutex(): Assertion `!res' failed.

Linux signal Aborted...

/home/sdr/openairinterface5g/executables/softmodem-common.c:187 signal\_handler() Exiting OAI softmodem: softmodem starting exit procedure

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

注意到上面出现了 GNU C++ version 7.4.0; Boost\_106501; UHD\_3.14.1.1-release,可能是编译的时候安装了这个版本，所以尝试把这个UHD\_3.14.1.1-release删除掉，然后更改build\_helper文件，注释掉相关部分。

check\_install\_usrp\_uhd\_driver(){

# if [[ "$OS\_DISTRO" == "ubuntu" ]]; then

# #first we remove old installation

# $SUDO apt-get remove -y uhd || true

# $SUDO apt-get remove libuhd-dev libuhd003 uhd-host -y || true

# v=$(lsb\_release -cs)

# # The new USRP repository

# # Raphael Defosseux: Adding a loop on adding PPA because in CI the gpg key retrieve may

# # timeout due to proxy / network latencies in Eurecom on VM

# echo\_info "\nAdding PPA repository ettusresearch/uhd\n"

# x=0

# while [ $x -le 5 ]

# do

# if $SUDO add-apt-repository ppa:ettusresearch/uhd -y

# then

# echo\_info "add-apt-repository successful\n"

# break

# else

# echo\_info "add-apt-repository failed, retrying...\n"

# sleep 30

# fi

# x=$((x + 1))

# done

$SUDO apt-get update

# $SUDO apt-get -y install python python-tk libboost-all-dev libusb-1.0-0-dev

# $SUDO apt-get -y install libuhd-dev libuhd003 uhd-host

# elif [[ "$OS\_BASEDISTRO" == "fedora" ]]; then

# $SUDO $INSTALLER -y install python boost libusb-devel libusbx-devel boost-devel python-mako python-docutils cmake

# $SUDO -H pip install requests

# if [[ "$OS\_DISTRO" == "rhel" ]] || [[ "$OS\_DISTRO" == "centos" ]]; then

# # until EPEL repo hasn't bumped UHD driver to >=3.10 in EPEL, build driver from source

# $SUDO $INSTALLER -y remove uhd uhd-devel uhd-firmware

# install\_usrp\_uhd\_driver\_from\_source

# else

# $SUDO $INSTALLER -y install uhd uhd-devel uhd-firmware

# fi

# fi

}

install\_usrp\_uhd\_driver() {

$SUDO apt-get update

# if [[ "$OS\_DISTRO" == "ubuntu" ]]; then

# We move uhd-host apart because it depends on linux kernel version

# On newer kernels, it fails to install

# $SUDO apt-get -y install uhd-host

# fi

# quick workaround for RHE7.6

# local distribution=$(get\_distribution\_release)

# if [ -z $1 ]; then

# if [[ "$OS\_DISTRO" == "rhel" ]]; then

# $SUDO /usr/local/bin/uhd\_images\_downloader

# else

# $SUDO uhd\_images\_downloader

# fi

# else

# if [[ "$OS\_DISTRO" == "rhel" ]]; then

# $SUDO /usr/local/bin/uhd\_images\_downloader -i $1

# else

# $SUDO uhd\_images\_downloader -i $1

# fi

# fi

}

重新编译

sdr@sdr-eNB1:~/openairinterface5g/cmake\_targets$./build\_oai -c -C -I -w USRP --gNB

* 1

运行

sdr@sdr-eNB1:~/openairinterface5g/cmake\_targets/ran\_build/build$ sudo ./nr-softmodem -O ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf --noS1

* 1

sdr@sdr-eNB1:~/openairinterface5g/cmake\_targets/ran\_build/build$ sudo ./nr-softmodem -O ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf --noS1

[CONFIG] get parameters from libconfig /home/sdr/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/gnb.band78.tm1.106PRB.usrpn300.conf , debug flags: 0x00000000

[CONFIG] function config\_libconfig\_init returned 0

[CONFIG] config module libconfig loaded

[LIBCONFIG] config: 1/1 parameters successfully set, (1 to default value)

Send signal 35 to display resource usage...

[LIBCONFIG] log\_config: 3/3 parameters successfully set, (1 to default value)

[LIBCONFIG] log\_config: 52/52 parameters successfully set, (46 to default value)

[LIBCONFIG] log\_config: 52/52 parameters successfully set, (52 to default value)

[LIBCONFIG] log\_config: 15/15 parameters successfully set, (15 to default value)

[LIBCONFIG] log\_config: 15/15 parameters successfully set, (15 to default value)

log init done

[HW] # /dev/cpu\_dma\_latency set to 10 us

Reading in command-line options

[GNB\_APP] Getting GNBSParams

[LIBCONFIG] (root): 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] THREAD\_STRUCT.[0]: 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] THREAD\_STRUCT.[0]: 2/2 parameters successfully set, (0 to default value)

[CONFIG] parallel\_conf is set to 2

[CONFIG] worker\_conf is set to 1

Configuration: nb\_rrc\_inst 1, nb\_nr\_L1\_inst 1, nb\_ru 1

[LIBCONFIG] (root): 23/23 parameters successfully set, (19 to default value)

[LIBCONFIG] (root): 5/5 parameters successfully set, (4 to default value)

[LIBCONFIG] TTracer: 4/4 parameters successfully set, (4 to default value)

configuring for RAU/RRU

CPU Freq is 3.600363

[TMR] Starting itti queue: TASK\_UNKNOWN as task 0

[TMR] Starting itti queue: TASK\_TIMER as task 1

[TMR] Starting itti queue: TASK\_L2L1 as task 2

[TMR] Starting itti queue: TASK\_BM as task 3

[TMR] Starting itti queue: TASK\_PHY\_ENB as task 4

[TMR] Starting itti queue: TASK\_MAC\_ENB as task 5

[TMR] Starting itti queue: TASK\_RLC\_ENB as task 6

[TMR] Starting itti queue: TASK\_RRC\_ENB\_NB\_IoT as task 7

[TMR] Starting itti queue: TASK\_PDCP\_ENB as task 8

[TMR] Starting itti queue: TASK\_DATA\_FORWARDING as task 9

[TMR] Starting itti queue: TASK\_END\_MARKER as task 10

[TMR] Starting itti queue: TASK\_RRC\_ENB as task 11

[TMR] Starting itti queue: TASK\_RRC\_GNB as task 12

[TMR] Starting itti queue: TASK\_RAL\_ENB as task 13

[TMR] Starting itti queue: TASK\_S1AP as task 14

[TMR] Starting itti queue: TASK\_X2AP as task 15

[TMR] Starting itti queue: TASK\_M2AP\_ENB as task 16

[TMR] Starting itti queue: TASK\_M2AP\_MCE as task 17

[TMR] Starting itti queue: TASK\_M3AP as task 18

[TMR] Starting itti queue: TASK\_M3AP\_MME as task 19

[TMR] Starting itti queue: TASK\_M3AP\_MCE as task 20

[TMR] Starting itti queue: TASK\_SCTP as task 21

[TMR] Starting itti queue: TASK\_ENB\_APP as task 22

[TMR] Starting itti queue: TASK\_GNB\_APP as task 23

[TMR] Starting itti queue: TASK\_MCE\_APP as task 24

[TMR] Starting itti queue: TASK\_MME\_APP as task 25

[TMR] Starting itti queue: TASK\_FLEXRAN\_AGENT as task 26

[TMR] Starting itti queue: TASK\_PHY\_UE as task 27

[TMR] Starting itti queue: TASK\_MAC\_UE as task 28

[TMR] Starting itti queue: TASK\_RLC\_UE as task 29

[TMR] Starting itti queue: TASK\_PDCP\_UE as task 30

[TMR] Starting itti queue: TASK\_RRC\_UE as task 31

[TMR] Starting itti queue: TASK\_NAS\_UE as task 32

[TMR] Starting itti queue: TASK\_RAL\_UE as task 33

[TMR] Starting itti queue: TASK\_MSC as task 34

[TMR] Starting itti queue: TASK\_GTPV1\_U as task 35

[TMR] Starting itti queue: TASK\_UDP as task 36

[TMR] Starting itti queue: TASK\_CU\_F1 as task 37

[TMR] Starting itti queue: TASK\_DU\_F1 as task 38

[LIBCONFIG] opt: 3/3 parameters successfully set, (3 to default value)

[OPT] OPT disabled

[HW] Version: Branch: develop Abrev. Hash: 2bf575841 Date: Fri Jul 10 16:49:26 2020 +0200

[PDCP] PDCP layer has been initialized

IS\_SOFTMODEM\_NOS1 option enabled

[PDCP] pdcp init, usenetlink

[LIBCONFIG] nas.noS1: 3/3 parameters successfully set, (3 to default value)

[NETLINK]Opened socket oaitun\_enb1 with fd nas\_sock\_fd[0]=85

[OIP] Interface oaitun\_enb1 successfully configured, ip address 10.0.1.1, mask 255.255.255.0 broadcast address 10.0.1.255

[PDCP] ENB pdcp will use tun interface

Wait for the ITTI initialize message

[TMR] Created Posix thread TASK\_L2L1

[SCTP] Starting SCTP layer

[TMR] Created Posix thread TASK\_SCTP

[LIBCONFIG] eNBs.[0]: 1/1 parameters successfully set, (1 to default value)

[LIBCONFIG] gNBs.[0]: 1/1 parameters successfully set, (1 to default value)

[X2AP] X2AP is disabled.

[PHY] gNB\_app\_task() Task ready initialize structures

[NR\_PHY] RC.gNB = 0x7f8404000b20

[LIBCONFIG] L1s.[0]: 24/24 parameters successfully set, (22 to default value)

[NR\_PHY] RC.gNB[0] = 0x7f840d5ce010

Initializing northbound interface for L1

[PHY] l1\_north\_init\_gNB() RC.nb\_nr\_L1\_inst:1

[PHY] Installing callbacks for IF\_Module - UL\_indication

[MAC] Allocating shared L1/L2 interface structure for instance 0 @ 0x7f8404001c40

[PHY] l1\_north\_init\_gNB() RC.gNB[0] installing callbacks

[LIBCONFIG] MACRLCs.[0]: 20/20 parameters successfully set, (17 to default value)

[MAC] [MAIN] Init function start:nb\_nr\_macrlc\_inst=1

[PDCP] PDCP layer has been initialized

add new uid is 0 1234

[PDCP] [FRAME 00000][eNB][MOD 00][RNTI 1234][DRB 01] Action ADD LCID 4 (DRB id 1) configured with SN size 12 bits and RLC UM

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] gNB\_app\_task() RC.nb\_nr\_L1\_inst:1

[PHY] l1\_north\_init\_gNB() RC.nb\_nr\_L1\_inst:1

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] l1\_north\_init\_gNB() RC.gNB[0] installing callbacks

[GNB\_APP] Allocating gNB\_RRC\_INST for 1 instances

[PHY] gNB\_app\_task() RC.nb\_nr\_inst:1 RC.nrrrc:0x7f8404003570

[PHY] gNB\_app\_task() Creating RRC instance RC.nrrrc[0]:0x7f8404003590 (1 of 1)

[LIBCONFIG] (root): 2/2 parameters successfully set, (0 to default value)

[LIBCONFIG] gNBs.[0]: 14/14 parameters successfully set, (8 to default value)

[LIBCONFIG] gNBs.[0].servingCellConfigCommon.[0]: 155/155 parameters successfully set, (83 to default value)

[RRC] Read in ServingCellConfigCommon (PhysCellId 0, ABSFREQSSB 641032, DLBand 78, ABSFREQPOINTA 640000, DLBW 106,RACH\_TargetReceivedPower -118

Checking element 15 : 4294967295

removing pdsch\_TimeDomainAllocationList element 15

List size now 15

Checking element 14 : 4294967295

removing pdsch\_TimeDomainAllocationList element 14

List size now 14

Checking element 13 : 4294967295

removing pdsch\_TimeDomainAllocationList element 13

List size now 13

Checking element 12 : 4294967295

removing pdsch\_TimeDomainAllocationList element 12

List size now 12

Checking element 11 : 4294967295

removing pdsch\_TimeDomainAllocationList element 11

List size now 11

Checking element 10 : 4294967295

removing pdsch\_TimeDomainAllocationList element 10

List size now 10

Checking element 9 : 4294967295

removing pdsch\_TimeDomainAllocationList element 9

List size now 9

Checking element 8 : 4294967295

removing pdsch\_TimeDomainAllocationList element 8

List size now 8

Checking element 7 : 4294967295

removing pdsch\_TimeDomainAllocationList element 7

List size now 7

Checking element 6 : 4294967295

removing pdsch\_TimeDomainAllocationList element 6

List size now 6

Checking element 5 : 4294967295

removing pdsch\_TimeDomainAllocationList element 5

List size now 5

Checking element 4 : 4294967295

removing pdsch\_TimeDomainAllocationList element 4

List size now 4

Checking element 3 : 0

Checking element 2 : 0

Checking element 1 : 0

Checking element 0 : 0

NRRRC 0: Southbound Transport local\_mac

[LIBCONFIG] gNBs.[0].plmn\_list.[0]: 3/3 parameters successfully set, (0 to default value)

SSB SCO 31

pdsch\_AntennaPorts 1

[GNB\_APP] Sending configuration message to NR\_RRC task

[TMR] Created Posix thread TASK\_GNB\_APP

[NR\_RRC] Creating NR RRC gNB Task

[NR\_RRC] Entering main loop of NR\_RRC message task

[TMR] Created Posix thread TASK\_RRC\_GNB

[NR\_RRC] Received message NRRRC\_CONFIGURATION\_REQ

[NR\_RRC] [gNB 0] Received NRRRC\_CONFIGURATION\_REQ : 0x7f8404004b40

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] Init...

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] Checking release

[NR\_RRC] Done init\_NR\_SI

[MAC] Configuring common parameters from NR ServingCellConfig

[PHY] config\_common() dl\_BandwidthP:40

[PHY] Computing dl\_frequency (pointA 640000 => 3600000000 (dlmin 3300000, nr\_bandtable[27].N\_OFFs\_DL 620000))

[PHY] config\_common() dl\_BandwidthP:40

[PHY] Computing dl\_frequency (pointA 640000 => 3600000000 (dlmin 3300000, nr\_bandtable[27].N\_OFFs\_DL 620000))

[PHY] Scanning band 1, dl\_min 2110000, ul\_min 1920000

[PHY] Scanning band 2, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 3, dl\_min 1805000, ul\_min 1710000

[PHY] Scanning band 5, dl\_min 869000, ul\_min 824000

[PHY] Scanning band 7, dl\_min 2620000, ul\_min 2500000

[PHY] Scanning band 8, dl\_min 925000, ul\_min 880000

[PHY] Scanning band 12, dl\_min 728000, ul\_min 698000

[PHY] Scanning band 20, dl\_min 791000, ul\_min 832000

[PHY] Scanning band 25, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 28, dl\_min 758000, ul\_min 703000

[PHY] Scanning band 34, dl\_min 2010000, ul\_min 2010000

[PHY] Scanning band 38, dl\_min 2570000, ul\_min 2570000

[PHY] Scanning band 39, dl\_min 1880000, ul\_min 1880000

[PHY] Scanning band 40, dl\_min 2300000, ul\_min 2300000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 41, dl\_min 2496000, ul\_min 2496000

[PHY] Scanning band 50, dl\_min 1432000, ul\_min 1432000

[PHY] Scanning band 51, dl\_min 1427000, ul\_min 1427000

[PHY] Scanning band 66, dl\_min 2110000, ul\_min 1710000

[PHY] Scanning band 70, dl\_min 1995000, ul\_min 1695000

[PHY] Scanning band 71, dl\_min 617000, ul\_min 663000

[PHY] Scanning band 74, dl\_min 1475000, ul\_min 1427000

[PHY] Scanning band 75, dl\_min 1432000, ul\_min 0

[PHY] Scanning band 76, dl\_min 1427000, ul\_min 0

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 79, dl\_min 4400000, ul\_min 4400000

[PHY] Scanning band 80, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 81, dl\_min 0, ul\_min 860000

[PHY] Scanning band 82, dl\_min 0, ul\_min 832000

[PHY] Scanning band 83, dl\_min 0, ul\_min 703000

[PHY] Scanning band 84, dl\_min 0, ul\_min 1920000

[PHY] Scanning band 86, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] DL frequency 3600000000: band 78, frame\_type 1, UL frequency 3600000000

found\_sequences 16

[MAC] Set TX/RX antenna number to 1 (num ssb 1: 80000000,0)

[MAC] Setting TDD configuration period to 6

[PHY] TDD has been properly configurated

[MAC] rrc\_mac\_config\_req\_gNB() /home/sdr/openairinterface5g/openair2/LAYER2/NR\_MAC\_gNB/config.c:345 RC.nrmac[Mod\_idP]->if\_inst->NR\_PHY\_config\_req:0x55634a41d380

[PHY] Scanning band 1, dl\_min 2110000, ul\_min 1920000

[PHY] Scanning band 2, dl\_min 1930000, ul\_min 1850000

[PHY] Scanning band 3, dl\_min 1805000, ul\_min 1710000

[PHY] Scanning band 5, dl\_min 869000, ul\_min 824000

[PHY] Scanning band 7, dl\_min 2620000, ul\_min 2500000

[PHY] Scanning band 8, dl\_min 925000, ul\_min 880000

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[PHY] Scanning band 75, dl\_min 1432000, ul\_min 0

[PHY] Scanning band 76, dl\_min 1427000, ul\_min 0

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 77, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

[PHY] Scanning band 78, dl\_min 3300000, ul\_min 3300000

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[PHY] Scanning band 83, dl\_min 0, ul\_min 703000

[PHY] Scanning band 84, dl\_min 0, ul\_min 1920000

[PHY] Scanning band 86, dl\_min 0, ul\_min 1710000

[PHY] Scanning band 257, dl\_min 26500000, ul\_min 26500000

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[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 258, dl\_min 24250000, ul\_min 24250000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 260, dl\_min 37000000, ul\_min 37000000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] Scanning band 261, dl\_min 27500000, ul\_min 27500000

[PHY] DL frequency 3619080000: band 78, frame\_type 1, UL frequency 3619080000

[PHY] Configuring MIB for instance 0, : (Nid\_cell 0,DL freq 3619080000, UL freq 3619080000)

[PHY] Initializing frame parms for mu 1, N\_RB 106, Ncp 0

[PHY] gNB 0 configured

[NR\_RRC] [FRAME 00000][eNB][MOD 00][RNTI 0] gNB:OPENAIR NR RRC IN....

NFAPI MODE:MONOLITHIC

START MAIN THREADS

RC.nb\_nr\_L1\_inst:1

Initializing gNB threads single\_thread\_flag:1 wait\_for\_sync:0

[PHY] gNB L1 structure RC.gNB allocated @ 0x7f8404000b20

[PHY] [lte-softmodem.c] gNB structure RC.gNB[0] allocated @ 0x7f840d5ce010

[PHY] Initializing gNB 0 single\_thread\_flag:1

[PHY] Initializing gNB 0

[PHY] Registering with MAC interface module (before 0x7f8404001c40)

[PHY] Installing callbacks for IF\_Module - UL\_indication

[PHY] Registering with MAC interface module (after 0x7f8404001c40)

[PHY] Setting indication lists

[PHY] [nr-softmodem.c] gNB structure allocated

wait\_gNBs()

Waiting for gNB L1 instances to all get configured ... sleeping 50ms (nb\_nr\_sL1\_inst 1)

gNB L1 are configured

About to Init RU threads RC.nb\_RU:1

Initializing RU threads

configuring RU from file

[LIBCONFIG] RUs.[0]: 27/27 parameters successfully set, (16 to default value)

Set RU mask to 1

Creating RC.ru[0]:0x55634d019380

Setting function for RU 0 to gNodeB\_3GPP

[PHY] number of L1 instances 1, number of RU 1, number of CPU cores 8

[PHY] DJP - delete code above this /home/sdr/openairinterface5g/executables/nr-ru.c:2254

[PHY] Copying frame parms from gNB in RC to gNB 0 in ru 0 and frame\_parms in ru

configuring ru\_id 0 (start\_rf 0x55634a3c6020)

[PHY] Starting ru\_thread 0

[PHY] Initializing RU proc 0 (,synch\_to\_ext\_device),

[PHY] Starting RU 0 (,synch\_to\_ext\_device),

[PHY] Initializing frame parms for mu 1, N\_RB 106, Ncp 0

[PHY] fp->scs=30000

[PHY] fp->ofdm\_symbol\_size=2048

[PHY] fp->nb\_prefix\_samples0=176

[PHY] fp->nb\_prefix\_samples=144

[PHY] fp->slots\_per\_subframe=2

[PHY] fp->samples\_per\_subframe\_wCP=57344

[PHY] fp->samples\_per\_frame\_wCP=573440

[PHY] fp->samples\_per\_subframe=61440

[PHY] fp->samples\_per\_frame=614400

[PHY] fp->dl\_CarrierFreq=3619080000

[PHY] fp->ul\_CarrierFreq=3619080000

channel 0, Setting tx\_gain offset 0.000000, rx\_gain offset 114.000000, tx\_freq 3619080000.000000, rx\_freq 3619080000.000000

[PHY] Initializing RU signal buffers (if\_south local RF) nb\_tx 1

[PHY] [INIT] common.txdata[0] = 0x7f840812b040 (2457600 bytes)

[PHY] nb\_tx 1

[PHY] rxdata\_7\_5kHz[0] 0x7f840803a040 for RU 0

[PHY] [INIT] common.txdata\_BF= 0x7f83f4000b00 (8 bytes)

[PHY] txdataF\_BF[0] 0x7f840d554040 for RU 0

[PHY] rxdataF[0] 0x7f840276d040 for RU 0

[PHY] [INIT] nr\_phy\_init\_RU() RC.nb\_nr\_L1\_inst:1

[LIBCONFIG] device.recplay: 7/7 parameters successfully set, (7 to default value)

[LIBCONFIG] device: 1/1 parameters successfully set, (1 to default value)

[LIBCONFIG] loader: 2/2 parameters successfully set, (2 to default value)

[LIBCONFIG] loader.oai\_device: 2/2 parameters successfully set, (1 to default value)

[PHY] init\_RU\_proc() DJP - added creation of pthread\_prach

[PHY] init feptx thread 0

[PHY] init feptx thread 1

wait RUs

[PHY] Waiting for RUs to be configured ... RC.ru\_mask:01

[LOADER] library liboai\_device.so successfully loaded

[HW] UHD version 3.15.0.0-0-unknown (3.15.0)

[HW] Checking for USRP with args addr=192.168.10.2,mgmt\_addr=192.168.10.2,second\_addr=192.168.20.2

[INFO] [UHD] linux; GNU C++ version 7.5.0; Boost\_106501; UHD\_3.15.0.0-0-unknown

[HW] Found USRP n3xx

Found USRP n300

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[INFO] [MPMD] Initializing 1 device(s) in parallel with args: mgmt\_addr=192.168.10.2,type=n3xx,product=n310,serial=31CF3C1,claimed=False,addr=192.168.10.2,second\_addr=192.168.20.2,master\_clock\_rate=122880000.000000

[WARNING] [MPM.RPCServer] A timeout event occured!

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[INFO] [MPM.PeriphManager] init() called with device args `clock\_source=external,time\_source=internal,second\_addr=192.168.20.2,master\_clock\_rate=122880000.000000,product=n310,mgmt\_addr=192.168.10.2'.

[INFO] [0/Replay\_0] Initializing block control (NOC ID: 0x4E91A00000000004)

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured

[ERROR] [UHD] Exception caught in safe-call.

in ctrl\_iface\_impl<\_endianness>::~ctrl\_iface\_impl() [with uhd::endianness\_t \_endianness = (uhd::endianness\_t)0]

at /home/sdr/uhd-3.15.0.0/host/lib/rfnoc/ctrl\_iface.cpp:52

this->send\_cmd\_pkt(0, 0, true); -> EnvironmentError: IOError: Block ctrl (CE\_01\_Port\_40) no response packet - AssertionError: bool(buff)

in uint64\_t ctrl\_iface\_impl<\_endianness>::wait\_for\_ack(bool, double) [with uhd::endianness\_t \_endianness = (uhd::endianness\_t)0; uint64\_t = long unsigned int]

at /home/sdr/uhd-3.15.0.0/host/lib/rfnoc/ctrl\_iface.cpp:151

[ERROR] [MPMD] Failure during block enumeration: EnvironmentError: IOError: Block ctrl (CE\_01\_Port\_40) no response packet - AssertionError: bool(buff)

in uint64\_t ctrl\_iface\_impl<\_endianness>::wait\_for\_ack(bool, double) [with uhd::endianness\_t \_endianness = (uhd::endianness\_t)0; uint64\_t = long unsigned int]

at /home/sdr/uhd-3.15.0.0/host/lib/rfnoc/ctrl\_iface.cpp:151

terminate called after throwing an instance of 'uhd::runtime\_error'

what(): RuntimeError: Failed to run enumerate\_rfnoc\_blocks()

Linux signal Aborted...

/home/sdr/openairinterface5g/executables/softmodem-common.c:187 signal\_handler() Exiting OAI softmodem: softmodem starting exit procedure

[PHY] ru\_thread\_prach() RACH waiting for RU to be configured