

Core network ::UBUNTU 18.04

eNB::ubuntu 16

gNB::ubuntu 16 [high configuration recommended]

In core network:.....

Master / v .1.2.0

https://github.com/OPENAIRINTERFACE/openair-epc-fed/blob/v1.2.0/docs/DEPLOY_PRE_REQUISITES_MAGMA.md

----->\$ dpkg --get-selections | grep docker

.....if docker not found

Install docker and docker containers

\$ sudo apt install docker.io

\$ sudo apt install docker-compose-1.27.4

\$ sudo adduser idrbt

\$ sudo usermod -a -G docker myusername

Add user is must

Docker login

\$ docker pull ubuntu:bionic

\$ docker pull cassandra:2.1

\$ docker pull redis:6.0.5

docker logout

\$ sudo sysctl net.ipv4.conf.all.forwarding=1

\$ sudo iptables -P FORWARD ACCEPT

Note:::::

After restart core network should be apply 2 commands every time

```
$ sudo nano /etc/docker/daemon.json
{
  "bip": "192.168.17.1/24"
}
```

```
$ sudo service docker restart
```

```
$ docker info
```

```
$ docker network inspect bridge
```

```
{
  "Name": "bridge",
  ....
  "Scope": "local",
  "Driver": "bridge",
  "EnableIPv6": false,
  "IPAM": {
    "Driver": "default",
    "Options": null,
    "Config": [
      {
        "Subnet": "192.168.17.1/24",
        "Gateway": "192.168.17.1"
      }
    ]
  },
}
```

Subnet and gateway should be match

https://github.com/OPENAIRINTERFACE/openair-epc-fed/blob/master/docs/BUILD_IMAGES_MAGMA_MME.md

```
$ git clone --branch v1.2.0
```

<https://github.com/OPENAIRINTERFACE/openair-epc-fed.git>

```
$ cd openair-epc-fed
$ git checkout -f v1.2.0
$ git fetch --prune
$ git checkout master
$ git rebase origin/master
$ ./scripts/syncComponents.sh --hss-branch develop --spgwc-branch develop
--spgwu-tiny-branch develop
```

First file:

```
$ cd open-epc-fed/components/oai-hss/build/tools/
$ sudo nano build_helper.hss_rel14
```

```
build_c_ares()
{
    pushd $OPENAIRCN_DIR/build/git_submodules/c-ares
    git checkout -f cc6cd17df854530ec90f5d305c6ceb1278900736
    ./buildconf
    res=$?
```

second file

```
$ cd open-epc-fed/components/oai-hss/docker
```

```
$ sudo nano dockerfile.ubuntu18.04
```

ENV TZ=Europe/Paris

After this line add proxy

```
$ ENV https_proxy http://172.27.10.69:3128/
```

```
$ ENV http_proxy http://172.27.10.69:3128/
```

```
$ ENV no_proxy
```

```
localhost,192.168.61.194,192.168.61.195,192.168.61.196,192.168.61.  
.197,172.27.20.170,192.168.61.130,192.168.61.148,192.168.61.149,  
192.168.61.132,192.168.61.133
```

In no proxy line add oai-hss,spgwc & u ip values it will be found from below path

```
$ sudo nano open-epc-fed/docker compose/magma-mme-demo
```

```
$ sudo nano open-epc-fed/docker compose/inria-oai-mme-legacy
```

Oai_hss:

```
    ipv4_address: 192.168.61.130
```

Redis:

```
    ipv4_address: 192.168.61.148
```

Magma_mme:

```
    ipv4_address: 192.168.61.149
```

Oai_spgwc:

```
    ipv4_address: 192.168.61.132
```

Oai_spgwu:

```
    ipv4_address: 192.168.61.133
```

Like that add env settings in / oai-spgwc/aoi-spgwu-tiny/dockerfile.ubuntu18

```
$ docker build --target oai-hss --tag oai-hss:production --file
component/oai-hss/docker/Dockerfile.ubuntu18.04 --build-arg
EURECOM_PROXY="http://172.27.10.69:3128" component/oai-hss
$ docker image prune --force
$ docker image ls
```

```
$ docker build --target oai-spgwu-tiny --tag oai-spgwu-tiny:production --file
component/oai-spgwu-tiny/docker/Dockerfile.ubuntu18.04 --build-arg
EURECOM_PROXY="http://172.27.10.69:3128" component/oai-spgwu-tiny
$ docker image prune --force
$ docker image ls
```

```
$ cd ~  
$ git clone https://github.com/magma/magma.git  
$ cd magma  
$ git log | grep -i NSA  
$ rm .dockerignore  
$ git diff lte/gateway/c/core/oai/tasks/nas/emm/Attach.c
```

```
//emm_proc_emm_informtion(ue_mm_context);
```

Comment the about line in that file(attach.c)

```
$ docker build --target magma-mme --tag magma-mme:master --file
lte/gateway/docker/mme/Dockerfile.ubuntu18.04 --build-arg
GIT_PROXY="http://172.27.10.69:3128" .
```

```
$ docker image ls
```

[illegible]

Attach ue details like OP_KEY,LTE_K AND IMSI IN

```
$ cd /open-epc-fed/docker compose /docker-compose .yaml
```

OP_KEY: 63bfa50ee6523365ff14c1f45f88737d

LTE_K: 0c0a34601d4f07677303652c0462535b

FIRST_IMSI: 505010000000032

Oai_spgwc:

MCC: '505'

TAC: 1

Oai_spgwu:

MCC: '505'

TAC: 1

```
$ cd /open-epc-fed/docker compose /mme.conf
```

```
GUMMEI_LIST = (
    { MCC="505".....
```

```
TAI_LIST = (
    {MCC="505".....
```

```
TAC_LIST = (
    {MCC="505".....
    CSFB :
    CSFB_MCC = "505";.....
```

<https://github.com/OPENAIRINTERFACE/openair-epc-fed/blob/master/docker-compose/magma-mme-demo/README.md>

```
$ cd docker-compose/magma-mme-demo
```

```
$ docker-compose up -d db_init
```

```
$ docker logs demo-db-init --follow
```

Output:

```
Connection error: ('Unable to connect to any servers', {'192.168.68.130': error(111, "Tried connecting to
[('192.168.68.130', 9042)]. Last error: Connection refused")}).....
```

OK

NOTE:

If you not get 'ok' in output try to re-run `init --follow` command upto you will get ok

```
$ docker rm -f demo-db-init
```

```
$ docker-compose up -d oai_spgwu
```

```
$ docker ps -a
```

All status of containers should be healthy

[illegible]

If you want to change anything in conf files in magma container

You have to run the command below and re-run commands from **

```
$ docker-compose down
```

For mme logs use below command:

```
$ docker exec -it demo-magma-mme /bin/bash -c "tail -f /var/log/mme.log"
```

To restart the mme setup we should use below commands:

```
$ docker-compose up -d db init
```

```
$ docker logs demo-db-init --follow
```

```
$ docker rm -f demo-db-init
$ docker-compose up -d oai_spgwu
$ docker ps -a
```

In enb side

```
$ git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git
$ cd openairinterface5g/
$ git checkout develop
$ source oaienv
$ cd cmake_targets/
$ ./build_oai -l -w USRP
$ ./build_oai --eNB -w USRP
```

```
$ uhd_usrp_probe
      UHD_3.15.0.0-release.....{check version }
```

Change system to low-latency ::

```
$ uname -r
      4.15.0-112-lowlatency {should be like this }
```

For that

```
$ sudo apt-get install linux-image-4.15.0-112-lowlatency
linux-headers-4.15.0-112-lowlatency
```

Change the version and install low latency

```
$ sudo reboot
```

```
$ uname -r
```

If not changing follow below commands

<https://adamstechblog.com/2017/08/21/deploying-a-low-latency-kernel-with-ubuntu-server-16-04-lts/>


```
$ sudo apt-get install linux-lowlatency
```

```
$ sudo apt update
```

```
$ uname -r
```

```
.....
```

```
.....
```

```
.....
```

In configuration:::::

```
$ sudo ip route add 192.168.61.128/26 via 172.27.20.170 dev eno1
```

```
$ sudo ./lte-softmodem -O ../../ci-scripts/conf_files/enb.band7.tm1.fr1.25PRB.usrbp210.conf
```

In gnb side

```
$ git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git
```

```
$ cd openairinterface5g/
```

```
$ git checkout develop
```

```
$ source oaienv
```

```
$ cd cmake_targets/
```

```
$ ./build_oai -l -w USRP
```

```
$ ./build_oai --gNB -w USRP
```

```
$ uhd_usrp_probe
```

```
$ Uname -r
```

```
$ sudo apt-get install linux-image-4.15.0-112-lowlatency
```

```
linux-headers-4.15.0-112-lowlatency
```

```
$ sudo reboot
```

```
$ sudo ip route add 192.168.61.128/26 via 172.27.20.170 dev eno1
```

```
$ sudo ./nr-softmodem -O ../../ci-scripts/conf_files/gnb.band78.tm1.fr1.106PRB.usrbp210.conf -E
```

sim configuration ::::::::::

https://gitlab.eurecom.fr/oai/openairinterface5g/-/blob/develop/doc/TESTING_GNB_W_COTS_UE.md

<https://docs.google.com/document/d/1pL8Szm0ocGxdl5ESVp12Ff71a4PbhCb9SpvbLZzwYbo/edit>

Commands to be follow :

```
$ sudo ./program_uicc --adm 0c004430 --imsi 505010100000001 --key  
0c0a34601d4f07677303652c0462535b --xx 63bfa50ee6523365ff14c1f45f88737d
```

```
$ sudo ./program_uicc --adm 0c004435 --key 0c0a34601d4f07677303652c0462535b --opc  
ba05688178e398bedc100674071002cb --authenticate
```

ADM:

Here adm is the number which is given on the sim card
Its a 8 digit number

IMSI:

505-country code (australia)

01-network (tetra network)

Remaining 10 digit -user choice

For reference country code and networks below link will be helpful

[https://www.mcc-mnc.com/#:~:text=In%20order%20to%20uniquely%20identify,i n%20an%20HNI%20of%2026201\).](https://www.mcc-mnc.com/#:~:text=In%20order%20to%20uniquely%20identify,i n%20an%20HNI%20of%2026201).)

Note:

Opt and lte keys are present in following doc

If we change that ,we have to update in configuration files

For sim writing/programming we have follow below steps:

<https://open-cells.com/index.php/uiccsim-programing/>

Step 1:

Download source code

Step 2:

Open the path

Cd Download/uicc-v2.4

Step 3 :

Set sim in sim writer and connect to the cpu

Step 4:

Run below command

```
./program_uicc
```

Output:

Existing values in USIM

ICCID: 89860061100000000102

WARNING: iccid luhn encoding of last digit not done

USIM IMSI: *****

USIM MSISDN: *****

USIM Service Provider Name:*****

Note:

We can the name of the sim using --spn

```
sudo ./program_uicc --adm 0c004430 --imsi 505010100000001 -spn IDRBT --key  
0c0a34601d4f07677303652c0462535b --xx 63bfa50ee6523365ff14c1f45f88737d
```