

2018 DEC OAI update 2018.12.01

未上機跑過，安裝上有任何問題在回報給我

版本資訊

Openair-cn : openair-cn-llmec (6cfc007bc05f7bc744d3e3b41727866ac4e31007)

eNB : master (ae0494b0bc431bf664e300b0b5a10f348d6b6757)

Linux Kernel : 4.10.0-28-generic

Install NUC

Ubuntu 16.04 64bit (多重開機碟)

```
user : labuser
hostname : labuser
password : 1234
```

labuser

確認hostname

```
$ cat /etc/hostname
labuser
```

修改hosts內容

```
$ cat /etc/hosts
127.0.0.1 localhost
127.0.1.1 labuser.openair4G.eur labuser
127.0.1.1 hss.openair4G.eur hss
```

請透過vim,nano,gedit修改成上面的內容

切換Kernel

確認Kernel版本

```
$ uname -r  
->  
kernel version
```

安裝 Kernel Linux 4.10.0-28-generic

```
sudo apt-get install linux-image-4.10.0-28-generic linux-headers-4.10.0-28-generic  
linux-image-extra-4.10.0-28-generic  
sudo reboot
```

檢查kernel是否切換過去

移除舊版Kernel

```
sudo apt-get remove 'linux-image-4.*'
```

任何非4.10.0-28-generic的kernel 含 linux-image-unsigned-*

Install EPC

安裝ssh,git,vim

```
$ sudo apt-get update;  
$ sudo apt-get install openssh-server -y;  
$ sudo apt-get install git -y;  
$ sudo apt-get install vim -y;
```

Clone EPC

```
git clone https://gitlab.eurecom.fr/oai/openair-cn.git;
```

請去OAI註冊一個帳號

```
Username for 'https://gitlab.eurecom.fr':  
Password for 'https://test@gitlab.eurecom.fr':
```

輸入帳號密碼開始clone

確認EPC版本

```
$ cd openair-cn;  
$ git log;
```

切換版本

```
git checkout openair-cn-llmec  
git checkout 6cfc007bc05f7bc744d3e3b41727866ac4e31007  
git fetch
```

複製設定檔到特定的資料夾

```
$ sudo mkdir /usr/local/etc/oai;  
$ sudo mkdir /usr/local/etc/oai/freeDiameter;  
  
$ sudo cp ~/openair-cn/etc/mme.conf /usr/local/etc/oai;  
$ sudo cp ~/openair-cn/etc/hss.conf /usr/local/etc/oai;  
$ sudo cp ~/openair-cn/etc/spgw.conf /usr/local/etc/oai;  
  
$ sudo cp ~/openair-cn/etc/acl.conf /usr/local/etc/oai/freeDiameter;  
$ sudo cp ~/openair-cn/etc/hss_fd.conf /usr/local/etc/oai/freeDiameter;  
$ sudo cp ~/openair-cn/etc/mme_fd.conf /usr/local/etc/oai/freeDiameter;
```

總共6個設定檔

build hss

```
$ cd  
$ sudo ~/openair-cn/scripts/build_hss -i  
$ sudo ~/openair-cn/scripts/build_hss;
```

mysql設定

```
user : root  
passwor : linux
```

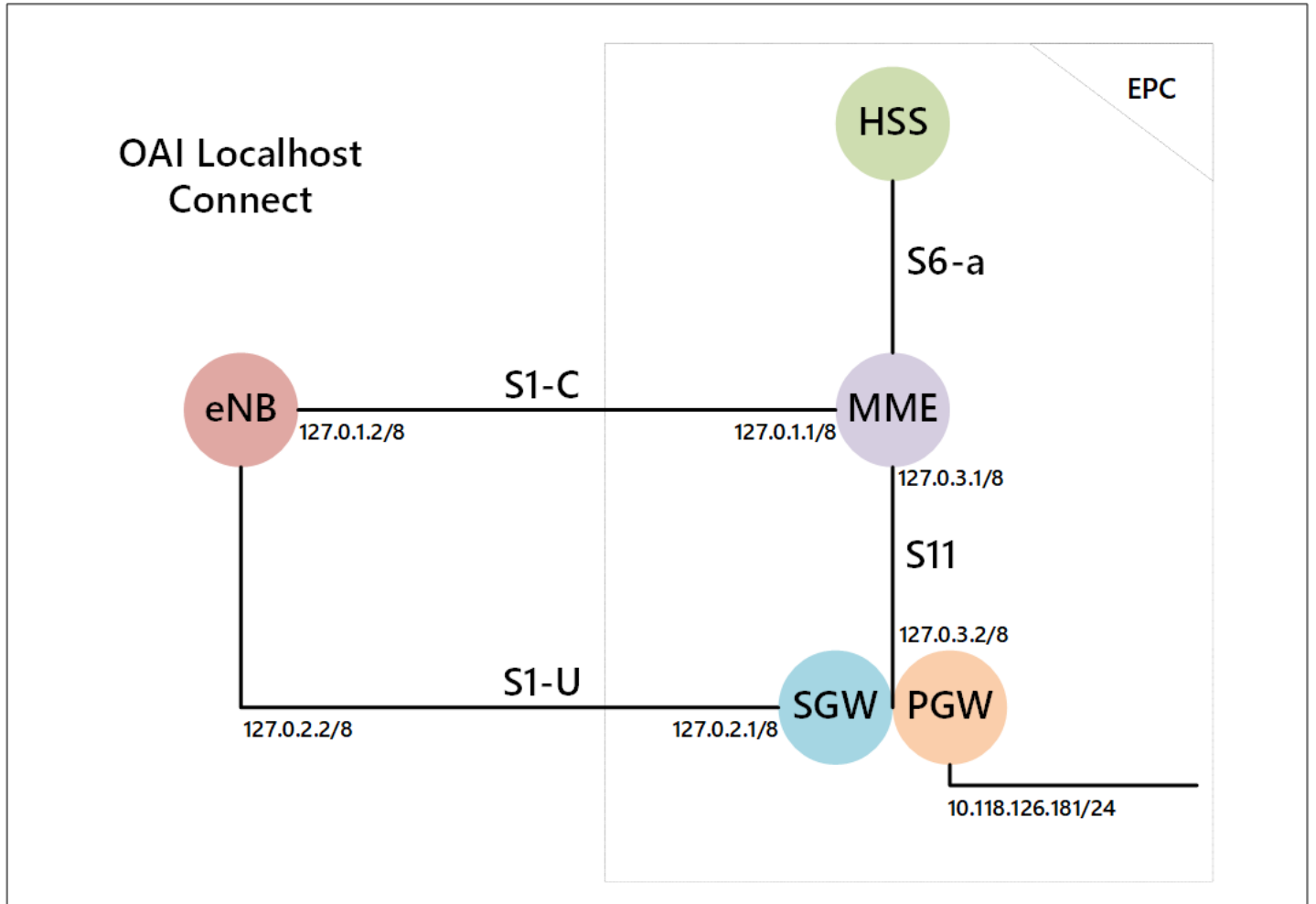
build mme

```
$ cd  
$ sudo ~/openair-cn/scripts/build_mme -i;  
$ sudo ~/openair-cn/scripts/build_mme;
```

build spgw

```
$ cd
$ sudo ~/openair-cn/scripts/build_spgw -i;
$ sudo ~/openair-cn/scripts/build_spgw;
```

修改設定檔參數



hss.conf

```
$ sudo vim /usr/local/etc/oai/hss.conf
```

```

24 MYSQL_server = "127.0.0.1";
25 MYSQL_user    = "@MYSQL_user@";
26 MYSQL_pass    = "@MYSQL_pass@";

```

改成

```

24 MYSQL_server = "127.0.0.1";
25 MYSQL_user    = "root";
26 MYSQL_pass    = "linux";

```

```

30 #OPERATOR_key = "1006020f0a478bf6b699f15c062e42b3"; # OP key for oai_db.sql
+31 OPERATOR_key = "11111111111111111111111111111111";

```

line 25~26 : 設定DB 帳號密碼

line 31 : 修改OP key

mme.conf

```

150     NETWORK_INTERFACES :
151     {
152         # MME binded interface for S1-C or S1-MME communication (S1AP), can be
e ethernet interface, virtual ethernet interface, we don't advise wireless int
erfaces
153         MME_INTERFACE_NAME_FOR_S1_MME          = "lo";
# YOUR NETWORK CONFIG HERE
154         MME_IPV4_ADDRESS_FOR_S1_MME             = "127.0.1.1/8";           # Y
OUR NETWORK CONFIG HERE
155
156         # MME binded interface for S11 communication (GTPV2-C)
157         MME_INTERFACE_NAME_FOR_S11_MME          = "lo";
# YOUR NETWORK CONFIG HERE
158         MME_IPV4_ADDRESS_FOR_S11_MME            = "127.0.3.1/8";
# YOUR NETWORK CONFIG HERE
159         MME_PORT_FOR_S11_MME                    = 2123;
# YOUR NETWORK CONFIG HERE

204 S-GW :
205 {
206     # S-GW binded interface for S11 communication (GTPV2-C), if none selected
the ITTI message interface is used
207     SGW_IPV4_ADDRESS_FOR_S11                    = "127.0.3.2/8";
# YOUR NETWORK CONFIG HERE
208
209 };
~

```

line 153 ~ 158, 207 : 設定 S1C, S11 interface

MME對外 修改S1C interface 對外網卡

對外IP記得/24

spgw.conf

```
23     NETWORK_INTERFACES :
24     {
25         # S-GW binded interface for S11 communication (GTPV2-C), if none selected the ITTI message interface is used
26         SGW_INTERFACE_NAME_FOR_S11           = "lo";
27         # STRING, interface name, YOUR NETWORK CONFIG HERE
28         SGW_IPV4_ADDRESS_FOR_S11             = "127.0.3.2/8";
29         # STRING, CIDR, YOUR NETWORK CONFIG HERE
30
31         # S-GW binded interface for S1-U communication (GTPV1-U) can be ethernet interface, virtual ethernet interface, we don't advise wireless interfaces
32         SGW_INTERFACE_NAME_FOR_S1U_S12_S4_UP = "lo";
33         # STRING, interface name, YOUR NETWORK CONFIG HERE, USE "lo" if S-GW run on eNB host
34         SGW_IPV4_ADDRESS_FOR_S1U_S12_S4_UP   = "127.0.2.1/8";           # STRING, CIDR, YOUR NETWORK CONFIG HERE
35         SGW_IPV4_PORT_FOR_S1U_S12_S4_UP      = 2152;
36         # INTEGER, port number, PREFER NOT CHANGE UNLESS YOU KNOW WHAT YOU ARE DOING
37
38         # S-GW binded interface for S5 or S8 communication, not implemented, so leave it to none
39         SGW_INTERFACE_NAME_FOR_S5_S8_UP      = "none";
40         # STRING, interface name, DO NOT CHANGE (NOT IMPLEMENTED YET)
41         SGW_IPV4_ADDRESS_FOR_S5_S8_UP        = "0.0.0.0/24";
42         # STRING, CIDR, DO NOT CHANGE (NOT IMPLEMENTED YET)
43     };
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71 P-GW =
72 {
73     NETWORK_INTERFACES :
74     {
75         # P-GW binded interface for S5 or S8 communication, not implemented, so leave it to none
76         PGW_INTERFACE_NAME_FOR_S5_S8        = "none";
77         # STRING, interface name, DO NOT CHANGE (NOT IMPLEMENTED YET)
78
79         # P-GW binded interface for SGI (egress/ingress internet traffic)
80         PGW_INTERFACE_NAME_FOR_SGI          = "wlp58s0";
81         # STRING, YOUR NETWORK CONFIG HERE
82         PGW_MASQUERADE_SGI                  = "yes";
```

```

    # STRING, {"yes", "no"}. YOUR NETWORK CONFIG HERE, will do NAT for you if you p
ut "yes".
81     UE_TCP_MSS_CLAMPING                = "no";
    # STRING, {"yes", "no"}.
82 };

88     IP_ADDRESS_POOL :
89     {
90         IPV4_LIST = (
91             "10.118.127.0/24"
92         # STRING, CIDR, YOUR NETWORK CONFIG HERE.
93         );
94     };
95     # DNS address communicated to UEs
96     DEFAULT_DNS_IPV4_ADDRESS            = "8.8.8.8";
97     # YOUR NETWORK CONFIG HERE
98     DEFAULT_DNS_SEC_IPV4_ADDRESS = "8.8.4.4";
99     # YOUR NETWORK CONFIG HERE
100

```

line 25 ~ 36 : 設定S1U,S11 interface

line 79 : 修改成對外網卡

line 91 : 設定分配給UE的IP網段

line 96 ~ 97 : DNS設定

SPGW對外 修改S1U interface 對外網卡

對外IP記得/24

mme_fd.conf

```

sudo vim /usr/local/etc/oai/freeDiameter/mme_fd.conf;
-4 Identity = "yang.openair4G.eur";
+4 Identity = "labuser.openair4G.eur";

```

line 4 : 修改憑證參數

產生憑證

```
$ cd
$ sudo ./openair-cn/scripts/check_hss_s6a_certificate /usr/local/etc/oai/freeDiameter hss.openair4G.eur
$ sudo ./openair-cn/scripts/check_mme_s6a_certificate /usr/local/etc/oai/freeDiameter labuser.openair4G.eur
```

設定Database

Databass帳號密碼

```
user : root
password : linux
```

安裝adminer

```
$ sudo wget https://www.adminer.org/latest-mysql-en.php -O /var/www/html/adminer.php
```

匯入資料庫

```
$ mysql -u root -p
// password : linux
//建立oad_db
>CREATE DATABASE oai_db;
//匯入資料庫
$ mysql -u root -p oai_db < ~/openair-cn/src/oai_hss/db/oai_db.sql
```

利用adminer修改資料

1. apn 中 新增 oai.ipv4 類型ipv4
2. mmeidentity 中 mmeidentity 1 mme host "mme1.openair4G.eur" 改 labuser.openair4G.eur
3. 根據pdn內的pgw_id 將pgw中 對應的ID的 ipv4欄位改成 這台EPC的對外IP

Run EPC

先開hss 再開 mme 最後開 spgw

```
$ cd
$ sudo ./openair-cn/scripts/run_hss
$ sudo ./openair-cn/scripts/run_mme
$ sudo ./openair-cn/scripts/run_spgw
```


Install eNB

Clone eNB

```
$ git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git
$ cd ~/openairinterface5g
$ git checkout ae0494b0bc431bf664e300b0b5a10f348d6b6757
$ git pull
```

Build eNB

```
$ cd ~/openairinterface5g/cmake_targets/
$ sudo ./build_oai -I -c -C
$ sudo ./build_oai -w USRP --eNB -c -C
or
$ ./build_oai -I --eNB -x --install-system-files -w USRP

###測試模式
$ ./build_oai --eNB -t ETHERNET
```

conf

```
$ vim ~/openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/enb.band7.tml.50P
RB.usrpb210.conf
```

```

 9      eNB_ID      = 0xe00;
10
11      cell_type = "CELL_MACRO_ENB";
12
13      eNB_name  = "eNB_Eurecom_LTEBox";
14
15      // Tracking area code, 0x0000 and 0xffff are reserved values
16      tracking_area_code = "1";
17
18      mobile_country_code = "208";
19
20      mobile_network_code = "93";


33      eutra_band                                = 3;
34      downlink_frequency                        = 1833000000L;
35      uplink_frequency_offset                  = -95000000;


138     //////////// MME parameters:
139     mme_ip_address      = ( { ipv4          = "127.0.1.1";
140                             ipv6          = "192:168:30::17";
141                             active       = "yes";
142                             preference   = "ipv4";
143                             }
144                             );
145
146     NETWORK_INTERFACES :
147     {
148         ENB_INTERFACE_NAME_FOR_S1_MME      = "lo";
149         ENB_IPV4_ADDRESS_FOR_S1_MME        = "127.0.1.2/8";
150
151         ENB_INTERFACE_NAME_FOR_S1U         = "lo";
152         ENB_IPV4_ADDRESS_FOR_S1U           = "127.0.2.2/8";
153         ENB_PORT_FOR_S1U                   = 2152; # Spec 2152
154     };
155

```

line 16 ~ 20 : TAC, MCC, MNC參數設定 , 要mapping MME

line 33 ~ 35 : 頻段設定

line 139 : 設定MME IP

line 148 ~ 151 : 設定S1C, S1U interface

Run eNB

```
$ cd
```

```
$ sudo -E ./openairinterface5g/cmake_targets/lte_build_oai/build/lte-softmodem -O  
./openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF/enb.band7.tm1.50PRB.usr  
pb210.conf
```

手機設定

需root

手機連到eNB後，需要使用MTU changer修改rmnet0的值為1458