OAI Build platform guide (for eNB)

tags: OAI

Install low-latency kernel version (3.19) for eNodeB

- Download linux-image and linux-header from following web.
- I used linux-headers-3.19.0-61-lowlatency and linux-image-3.19.0-61-lowlatency
- Download from this web

Environment Setting

(a) Disable C-states and P-states in Linux

```
$ sudo vim /etc/default/grub
```

- Add “intel_pstate=disable intel_idle.max_cstate=0 processor.max_cstate=0 idle=poll” in line GRUB_CMDLINE_LINUX_DEFAULT

```
GRUB_DEFAULT=0
GRUB_HIDDEN_TIMEOUT=0
GRUB_HIDDEN_TIMEOUT_QUIET=true
GRUB_TIMEOUT=10
GRUB_DISTRIBUTOR=`lsb_release -i -s 2> /dev/null || echo Debian`
GRUB_CMDLINE_LINUX_DEFAULT="intel_pstate=disable intel_idle.max_cstate=0"
GRUB_CMDLINE_LINUX=""
```

- Second , perform update-grub

```
$ sudo update-grub
$ reboot
```

(b) Remove all power management and CPU frequency scaling

1. Append “blacklist intel_powerclamp” to the end of /etc/modprobe.d/blacklist.conf
2. Disable “hyperthreading”, “CPU frequency control”, “C-states”, “P-states” features in BIOS.
3. Install i7z to check the cpu

```
$ sudo apt-get isntall i7z
$ sudo i7z
```

4. The CPU should not change its frequency by more than 1-2 hertz and should not be any C-state other than C0

```
Cpu speed from cpuinfo 3599.00Mhz
cpuinfo might be wrong if cpufreq is enabled. To guess correctly try estimating via tsc
Linux's inbuilt cpu_khz code emulated now
True Frequency (without accounting Turbo) 3600 MHz
  CPU Multiplier 36x || Bus clock frequency (BCLK) 100.00 MHz

Socket [0] - [physical cores=4, logical cores=4, max online cores ever=4]
  TURBO DISABLED on 4 Cores, Hyper Threading OFF
  Max Frequency without considering Turbo 3600.00 MHz (100.00 x [36])
  Max TURBO Multiplier (if Enabled) with 1/2/3/4 Cores is  41x/40x/40x/39x
  Real Current Frequency 3590.63 MHz [100.00 x 35.91] (Max of below)
        Core [core-id]  :Actual Freq (Mult.)      C0%   Halt(C1)%  C3 %   C6 %  Temp
        Core 1 [0]:       3590.63 (35.91x)       100       1       0       0    50
        Core 2 [1]:       3590.63 (35.91x)       100       1       0       0    51
        Core 3 [2]:       3590.63 (35.91x)       100       1       0       0    49
        Core 4 [3]:       3590.63 (35.91x)       100       1       0       0    49



C0 = Processor running without halting
C1 = Processor running with halts (States >C0 are power saver)
C3 = Cores running with PLL turned off and core cache turned off
```

5. Disable CPU frequency scaling

   (1) Get cpufrequtils

   ```
   $ sudo apt-get install cpufrequtils
   ```

   (2) Edit the following file (If it doesn't exist, create it)

   ```
   $ sudo vim /etc/default/cpufrequtils
   ```

   (3) Then, add the following line into it and save it.

   ```
   GOVERNOR="performance"
   ```

   (4) Disable ondemand daemon

   ```
   $ sudo update-rc.d ondemand disable
   ```

After reboot, type the following command to check the result whether the verion is what we want (kernel 3.19 low-latency)

```
$ uname -a
```

- If the default kernel is not what we wish for, modify line "GRUB_DEFAULT = <kernel menuoption>"

```
$ sudo vim /etc/default/grub
$ sudo update-grub
```

Build eNodeB

- If your antenna is USRP

```
$ git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git
$ cd openairinterface5g
$ git checkout 67df8e0e7
$ source oaienv
$ cd cmake_targets
$ ./build_oai -I -w USRP
$ ./build_oai --eNB -c -w USRP
```

- Modify configuration files

```
$ cd openairinterface5g/targets/PROJECTS/GENERIC-LTE-EPC/CONF
$ vim enb.band7.tm1.100PRB.usrpb210.conf (or your usrp)
```

Go to line 139 & 141 ~ 152 and change interface/ip for your MME and SPGW

Run eNB

```
$ cd openairinterface5g/cmake_targets/lte_build_oai/build
$ sudo -E ./lte-softmodem -O ../../../targets/PROJECTS/GENERIC-LTE-
EPC/CONF/enb.band7.tm1.100PRB.usrpb210.conf -d
```