OAI install (compression) (fhidriver_E)

- PHY patch from OAI (click right button on file can download)

  📄 phy_final.patch 13.4KB

- fhidriver_E tutorial (for reference only)

doc/ORAN_FHI7.2_Tutorial.md · fhidriver_E · oai / openairinterfac…
Openairinterface 5G Wireless Implementation

https://gitlab.eurecom.fr/oai/openairinterface5g/-/blob/fhidriver_E/doc/ORA…

doc/ORAN_FHI7.2_Tutorial.md · use_msgq_new_fhidriver_build_fi…
Openairinterface 5G Wireless Implementation

https://gitlab.eurecom.fr/oai/openairinterface5g/-/blob/use_msgq_new_fhid…

▼ cpu

```
[liteon@localhost ~]$ lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                32
On-line CPU(s) list: 0-31
Thread(s) per core:  1
Core(s) per socket:  16
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Silver 4216 CPU @ 2.10GHz
Stepping:              7
CPU MHz:               2100.000
CPU max MHz:           3200.0000
CPU min MHz:           800.0000
BogoMIPS:              4200.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              22528K
NUMA node0 CPU(s):   0-15
NUMA node1 CPU(s):   16-31
```

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_pkg_req pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

▼ os and kernel boot command

[liteon@localhost ~]$ cat /etc/redhat-release
Red Hat Enterprise Linux release 8.8 (Ootpa)
[liteon@localhost ~]$ uname -a
Linux localhost.localdomain 4.18.0-477.27.1.rt7.290.el8_8.x86_64 #1 SMP PREEMPT_RT Thu
Aug 31 10:40:44 EDT 2023 x86_64 x86_64 x86_64 GNU/Linux

[liteon@localhost build]$ cat /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-4.18.0-477.27.1.rt7.290.el8_8.x86_64
root=/dev/mapper/rhel-root ro crashkernel=auto resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap rhgb quiet igb.max_vfs=2 intel_iommu=on iommu=pt
mitigations=off cgroup_memory=1 cgroup_enable=memory mce=off idle=poll hugepagesz=1G
hugepages=40 hugepagesz=2M hugepages=0 default_hugepagesz=1G selinux=0 enforcing=0
nmi_watchdog=0 softlockup_panic=0 audit=0 skew_tick=1 rcu_nocb_poll
cgroup_disable=memory kthread_cpus=9-15,25-31 skew_tick=1
isolcpus=managed_irq,domain,0-8 nohz_full=0-8 rcu_nocbs=0-8 intel_pstate=disable
nosoftlockup tsc=nowatchdog

▼ nic

[liteon@localhost ~]$ ethtool -i ens1f0

driver: i40e

version: 4.18.0-477.27.1.rt7.290.el8_8.x

firmware-version: 9.00 0x8000d2ab 1.3256.0

expansion-rom-version:

bus-info: 0000:12:00.0

supports-statistics: yes

supports-test: yes

supports-eeprom-access: yes

supports-register-dump: yes

supports-priv-flags: yes

▼ Add sudoer

How to enable sudo on Red Hat Enterprise Linux | Red Hat Developer

```
su usermod -aG wheel your_user_id # logout
```

▼ register redhat

`subscription-manager register`

Reference : https://kknews.cc/code/nenqkq5.html

▼ install RT kernel

Installing RHEL 8 for Real Time Red Hat Enterprise Linux for Real Time 8 | Red Hat Customer Portal

`subscription-manager repos --enable rhel-8-for-x86_64-rt-rpms`

`dnf groupinstall RT`

▼ RT kernel version

4.18.0-477.27.1.rt7.290.el8_8.x86_64

▼ Add RT profile

`sudo tuned-adm profile realtime`

▼ install gcc11

`sudo yum remove --skip-broken gcc`

`sudo yum install gcc-toolset-11`

▼ install python3 and meson

`sudo dnf install python3-requests`

`sudo dnf install python3-pip`

`sudo pip3 install meson`

▼ install ninja

https://github.com/ninja-build/ninja/tree/v1.11.1

`git clone https://github.com/ninja-build/ninja.git`

`cd ninja`

`sudo dnf install cmake`

`cmake -Bbuild-cmake`

`cd build-cmake`

`sudo make install`

- Move ninja from /usr/local/bin to /usr/bin allow

    ○ `sudo cp /usr/local/bin/ninja /usr/bin/`

▶ configs - config_o_du_3450_E.dat

▶ configs - mwc_20899_newfhi_E_3450.conf

▶ configs - usecase_du_3450.cfg

▶ configs - default.cfg

gcc 11

```
sudo scl enable gcc-toolset-11 bash
```

PTP(C1)

```
git clone http://git.code.sf.net/p/linuxptp/code linuxptp cd linuxptp git
checkout v2.0 make sudo ./ptp4l -i ens1f2 -m -H -2 -s -f configs/default.cfg
sudo ./phc2sys -w -m -s ens1f2 -R 8 -f configs/default.cfg sudo ./ptp4l -i
ens1f0 -m -H -2 -f configs/default.cfg
```

PTP(C3)

```
git clone http://git.code.sf.net/p/linuxptp/code linuxptp cd linuxptp git
checkout v2.0 make sudo ./ptp4l -i ens1f0 -m -H -2 -s -f configs/default.cfg
sudo ./phc2sys -w -m -s ens1f0 -R 8 -f configs/default.cfg
```

DPDK install

```
wget http://fast.dpdk.org/rel/dpdk-20.11.7.tar.xz tar xvf dpdk-20.11.7.tar.xz &&
cd dpdk-stable-20.11.7 # use gcc 11 environment sudo scl enable gcc-toolset-11
bash /usr/local/bin/meson build ninja -C build sudo ninja install -C build
```

On Fedora-based OS, you may not have the `/usr/local/lib` or `/usr/local/lib64` paths in the LD_LIBRARY_PATH:

```
sudo echo "/usr/local/lib" > /etc/ld.so.conf.d/local-lib.conf sudo echo
"/usr/local/lib64" >> /etc/ld.so.conf.d/local-lib.conf sudo ldconfig -v | grep
rte_
```

Check if the PDK-CONFIG tool discovers the libraries:

```
# command pkg-config --libs libdpdk --static # result -lrte_node -lrte_graph -
lrte_bpf -lrte_flow_classify -lrte_pipeline -lrte_table -lrte_port -lrte_fib -
lrte_ipsec -lrte_vhost -lrte_stack -lrte_security -lrte_sched -lrte_reorder -
lrte_rib -lrte_rawdev -lrte_pdump -lrte_power -lrte_member -lrte_lpm -
lrte_latencystats -lrte_kni -lrte_jobstats -lrte_ip_frag -lrte_gso -lrte_gro -
lrte_eventdev -lrte_efd -lrte_distributor -lrte_cryptodev -lrte_compressdev -
lrte_cfgfile -lrte_bitratestats -lrte_bbdev -lrte_acl -lrte_timer -lrte_hash -
lrte_metrics -lrte_cmdline -lrte_pci -lrte_ethdev -lrte_meter -lrte_net -
lrte_mbuf -lrte_mempool -lrte_rcu -lrte_ring -lrte_eal -lrte_telemetry -
lrte_kvargs -Wl,--whole-archive -lrte_common_cpt -lrte_common_dpaax -
lrte_common_iavf -lrte_common_octeontx -lrte_common_octeontx2 -lrte_bus_dpaa -
lrte_bus_fslmc -lrte_bus_ifpga -lrte_bus_pci -lrte_bus_vdev -lrte_bus_vmbus -
lrte_mempool_bucket -lrte_mempool_dpaa -lrte_mempool_dpaa2 -
lrte_mempool_octeontx -lrte_mempool_octeontx2 -lrte_mempool_ring -
lrte_mempool_stack -lrte_pmd_af_packet -lrte_pmd_ark -lrte_pmd_atlantic -
lrte_pmd_avp -lrte_pmd_axgbe -lrte_pmd_bond -lrte_pmd_bnxt -lrte_pmd_cxgbe -
lrte_pmd_dpaa -lrte_pmd_dpaa2 -lrte_pmd_e1000 -lrte_pmd_ena -lrte_pmd_enetc -
lrte_pmd_enic -lrte_pmd_failsafe -lrte_pmd_fm10k -lrte_pmd_i40e -lrte_pmd_hinic
-lrte_pmd_hns3 -lrte_pmd_iavf -lrte_pmd_ice -lrte_pmd_igc -lrte_pmd_ixgbe -
lrte_pmd_kni -lrte_pmd_liquidio -lrte_pmd_memif -lrte_pmd_netvsc -lrte_pmd_nfp -
lrte_pmd_null -lrte_pmd_octeontx -lrte_pmd_octeontx2 -lrte_pmd_pfe -
lrte_pmd_qede -lrte_pmd_ring -lrte_pmd_sfc -lrte_pmd_softnic -lrte_pmd_tap -
lrte_pmd_thunderx -lrte_pmd_vdev_netvsc -lrte_pmd_vhost -lrte_pmd_virtio -
lrte_pmd_vmxnet3 -lrte_rawdev_dpaa2_cmdif -lrte_rawdev_dpaa2_qdma -
lrte_rawdev_ioat -lrte_rawdev_ntb -lrte_rawdev_octeontx2_dma -
lrte_rawdev_octeontx2_ep -lrte_rawdev_skeleton -lrte_pmd_caam_jr -
lrte_pmd_dpaa_sec -lrte_pmd_dpaa2_sec -lrte_pmd_nitrox -lrte_pmd_null_crypto -
lrte_pmd_octeontx_crypto -lrte_pmd_octeontx2_crypto -lrte_pmd_crypto_scheduler -
lrte_pmd_virtio_crypto -lrte_pmd_octeontx_compress -lrte_pmd_qat -lrte_pmd_ifc -
```

```
lrte_pmd_dpaa_event -lrte_pmd_dpaa2_event -lrte_pmd_octeontx2_event -
lrte_pmd_opdl_event -lrte_pmd_skeleton_event -lrte_pmd_sw_event -
lrte_pmd_dsw_event -lrte_pmd_octeontx_event -lrte_pmd_bbdev_null -
lrte_pmd_bbdev_turbo_sw -lrte_pmd_bbdev_fpga_lte_fec -
lrte_pmd_bbdev_fpga_5gnr_fec -Wl,--no-whole-archive -lrte_node -lrte_graph -
lrte_bpf -lrte_flow_classify -lrte_pipeline -lrte_table -lrte_port -lrte_fib -
lrte_ipsec -lrte_vhost -lrte_stack -lrte_security -lrte_sched -lrte_reorder -
lrte_rib -lrte_rawdev -lrte_pdump -lrte_power -lrte_member -lrte_lpm -
lrte_latencystats -lrte_kni -lrte_jobstats -lrte_ip_frag -lrte_gso -lrte_gro -
lrte_eventdev -lrte_efd -lrte_distributor -lrte_cryptodev -lrte_compressdev -
lrte_cfgfile -lrte_bitratestats -lrte_bbdev -lrte_acl -lrte_timer -lrte_hash -
lrte_metrics -lrte_cmdline -lrte_pci -lrte_ethdev -lrte_meter -lrte_net -
lrte_mbuf -lrte_mempool -lrte_rcu -lrte_ring -lrte_eal -lrte_telemetry -
lrte_kvargs -Wl,-Bdynamic -pthread -lm -ldl
```

Once again on Fedora-based OS, you may not have the `/usr/local/lib` or `/usr/local/lib64` paths in the PKG_CONFIG_PATH:

```
export PKG_CONFIG_PATH=$PKG_CONFIG_PATH:/usr/local/lib64/pkgconfig/ # Check
before build phy and oai pkg-config --libs libdpdk --static
```

PHY

```
export XRAN_LIB_DIR=/home/liteon/phy/fhi_lib/lib/build export
XRAN_DIR=/home/liteon/phy/fhi_lib export RTE_SDK=/home/liteon/dpdk-stable-
20.11.7 export RTE_TARGET=x86_64-native-linuxapp-gcc export
RTE_INCLUDE=/usr/local/include
```

gerrit.o-ran-sc Code Review - o-du/phy.git/summary

```
git clone https://gerrit.o-ran-sc.org/r/o-du/phy.git cd phy git checkout oran_e_
maintenance_release_v1.0 git apply phy_final.patch # install gcc 11 sudo yum rem
ove --skip-broken gcc sudo yum install gcc-toolset-11
```

```
cd ~/phy/fhi_lib/lib make XRAN_LIB_SO=1
```

install openairinterface5g

```
git clone https://gitlab.eurecom.fr/oai/openairinterface5g.git git checkout
remotes/origin/fhidriver_E cd ~/openairinterface5g/cmake_targets ./build_oai --
gNB --ninja -t oran_fhlib_5g (Add, -I if you are building for the first time on
server for installing external dependencies) # if it occurs error message when
doing command "./build_oai --gNB --ninja -t oran_fhlib_5g" # and the error
message is about "No asn1c found!", doing the following commands. sudo dnf
install libtool sudo dnf install blas sudo dnf install lapack cd ~ git clone
https://github.com/vlm/asn1c.git cd asn1c test -f configure || autoreconf -iv
./configure make sudo make install cd ~/openairinterface5g/cmake_targets
./build_oai --gNB --ninja -t oran_fhlib_5g --cmake-opt -
DASN1C_EXEC=/opt/asn1c/bin/asn1c # install lack lib from build rpm...
https://rpmfind.net/linux/rpm2html/search.php?query=epel-release download epel-
release-8-19.el8.noarch.rpm or wget
https://rpmfind.net/linux/epel/8/Everything/x86_64/Packages/e/epel-release-8-
19.el8.noarch.rpm sudo yum localinstall epel-release-8-19.el8.noarch.rpm wget
https://vault.centos.org/centos/8/PowerTools/x86_64/os/Packages/libconfig-devel-
1.5-9.el8.x86_64.rpm sudo yum localinstall libconfig-devel-1.5-9.el8.x86_64.rpm
wget https://vault.centos.org/centos/8/PowerTools/x86_64/os/Packages/lapack-
devel-3.8.0-8.el8.x86_64.rpm sudo yum localinstall lapack-devel-3.8.0-
8.el8.x86_64.rpm wget
https://vault.centos.org/centos/8/PowerTools/x86_64/os/Packages/ninja-build-
1.8.2-1.el8.x86_64.rpm sudo yum localinstall ninja-build-1.8.2-1.el8.x86_64.rpm
wget https://vault.centos.org/centos/8/PowerTools/x86_64/os/Packages/guile-
devel-2.0.14-7.el8.x86_64.rpm sudo yum localinstall guile-devel-2.0.14-
7.el8.x86_64.rpm wget
https://vault.centos.org/centos/8/PowerTools/x86_64/os/Packages/blas-devel-
3.8.0-8.el8.x86_64.rpm sudo yum localinstall blas-devel-3.8.0-8.el8.x86_64.rpm #
change user to liteon cd ~ sudo chown -R liteon:liteon dpdk-stable-20.11.7 sudo
```