

1-INSTALLATION D'OSMOCOM-NETWORK-IN-THE-BOX

(Splitted pour LimeSDR-Mini ou LimeSDR-USB)

```
mkdir /opt/GSM
cd /opt/GSM
git clone https://github.com/myriadrf/LimeSuite
cd /opt/GSM/LimeSuite
cd build && cmake .. && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libtalloc-dev libgnutls28-dev libmnl-dev
git clone https://github.com/osmocom/libosmocore
cd /opt/GSM/libosmocore
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libortp-dev
git clone https://github.com/osmocom/libosmo-abis
cd /opt/GSM/libosmo-abis
autoreconf -fi && ./configure -disable-dahdi && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/libosmo-netif
cd /opt/GSM/libosmo-netif
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-hlr
apt install -y libsqlite3-dev
cd /opt/GSM/osmo-hlr
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-mgw
cd /opt/GSM/osmo-mgw
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone git://git.osmocom.org/libgtpnl.git
cd /opt/GSM/libgtpnl
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/libosmo-sccp
cd /opt/GSM/libosmo-sccp
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-ggsn
cd /opt/GSM/osmo-ggsn
autoreconf -fi && ./configure -enable-gtp-linux && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libc-ares-dev
git clone https://github.com/osmocom/osmo-sgsn
cd /opt/GSM/osmo-sgsn
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-msc
```

```

apt install -y libdbi-dev
cd /opt/GSM/osmo-msc
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-bsc
cd /opt/GSM/osmo-bsc
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libsofia-sip-ua-glib-dev
git clone https://github.com/osmocom/osmo-sip-connector
cd /opt/GSM/osmo-sip-connector
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-trx
cd /opt/GSM/osmo-trx
git checkout 1.1.0
autoreconf -fi && ./configure -with-lms && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/osmo-bts
cd /opt/GSM/osmo-bts
git checkout 1.1.0
autoreconf -fi && ./configure -enable-trx && make -j4 && make install &&
ldconfig

cp -r /usr/local/bin/. /usr/bin

```

FICHIERS DE CONFIGURATION A METTRE DANS /etc/osmocom

osmo-all.sh

```

#!/bin/sh
cmd="${1:-status}"
set -ex
systemctl $cmd osmo-hlr osmo-msc osmo-stp osmo-ggsn osmo-sgsn osmo-mgw osmo-bsc
osmo-sip-connector

```

osmo-bsc.cfg

```

! osmo-bsc default configuration
! (assumes STP to run on 127.0.0.1 and uses default point codes)
!
e1_input
e1_line 0 driver ipa
network
network country code 208
mobile network code 92
encryption a5 0
neci 1
paging any use tch 0
handover 0
handover algorithm 1
handover1 window rxlev averaging 10
handover1 window rxqual averaging 1
handover1 window rxlev neighbor averaging 10
handover1 power budget interval 6
handover1 power budget hysteresis 3
handover1 maximum distance 9999

```

```
periodic location update 30
bts 0
  type nanobts
  band DCS1800
  no system-information unused-send-empty

  cell_identity 6969
  location_area_code 1
  base_station_id_code 63
  ms max power 15
  cell reselection hysteresis 4
  rxlev access min 0
  radio-link-timeout 32
  channel allocator ascending
  rach tx integer 9
  rach max transmission 7
  channel-description attach 1
  channel-description bs-pa-mfrms 5
  channel-description bs-ag-blks-res 1
  early-classmark-sending forbidden

  ipa unit-id 1801 0
  oml ipa stream-id 255 line 0
  codec-support fr
  gprs mode gprs
  trx 0
    rf_locked 0
    arfcn 871
    nominal power 23
    ! to use full TRX power, set max_power_red 0
    max_power_red 20
    rsl e1 tei 0
    timeslot 0
      phys_chan_config CCCH+SDCCH4
      hopping enabled 0
    timeslot 1
      phys_chan_config SDCCH8
      hopping enabled 0
    timeslot 2
      phys_chan_config PDCH
      hopping enabled 0
    timeslot 3
      phys_chan_config TCH/F
      hopping enabled 0
    timeslot 4
      phys_chan_config TCH/F
      hopping enabled 0
    timeslot 5
      phys_chan_config TCH/F
      hopping enabled 0
    timeslot 6
      phys_chan_config TCH/F
      hopping enabled 0
    timeslot 7
```

```

!
! OsmoBTS () configuration saved from vty
!!
!
log stderr
  logging filter all 1
  logging level all info
  logging level trx debug
  logging color 1
  logging print category 1
  logging timestamp 1
  logging print extended-timestamp 1

!
line vty
  bind 127.0.0.1
ctrl
  bind 127.0.0.1
!
phy 0
  instance 0
    osmotrx rx-gain 25
    osmotrx tx-attenuation oml
  osmotrx ip local 127.0.0.1
  osmotrx ip remote 127.0.0.1

bts 0
  band GSM900
  ipa unit-id 1801 0
  pcu-socket /tmp/pcu_bts
  oml remote-ip 127.0.0.1
  gsmtap-sapi bcch
  gsmtap-sapi ccch
  gsmtap-sapi rach
  gsmtap-sapi agch
  gsmtap-sapi pch
  gsmtap-sapi sdcch
  gsmtap-sapi tch/f
  gsmtap-sapi tch/h
  gsmtap-sapi pacch
  gsmtap-sapi pdtch
  gsmtap-sapi ptcch
  gsmtap-sapi cbch
  gsmtap-sapi sacch
  trx 0
    phy 0 instance 0

```

osmo-ggsn.cfg

```

!
! OpenGGSN (0.94.1-adac) configuration saved from vty
!!
!
log stderr
  logging filter all 1
  logging color 1
  logging print category 0
  logging timestamp 0
  logging level ip info
  logging level tun info

```

```
logging level ggsn info
logging level sgsn notice
logging level icmp6 notice
logging level lglobal notice
logging level llapd notice
logging level linp notice
logging level lmux notice
logging level lmi notice
logging level lmib notice
logging level lsms notice
logging level lctrl notice
logging level lgtp info
logging level lstats notice
logging level lgsup notice
logging level loap notice
logging level lss7 notice
logging level lsccp notice
logging level lsua notice
logging level lm3ua notice
logging level lmgcp notice
!
stats interval 5
!
line vty
  no login
!
ggsn ggsn0
  gtp state-dir /tmp
  gtp bind-ip 127.0.0.2
  apn internet
    gtpu-mode tun
    tun-device tun4
    type-support v4
    ip prefix dynamic 172.16.222.0/24
    ip dns 0 8.8.8.8
    ip dns 1 8.8.4.4
    ip ifconfig 172.16.222.0/24
    no shutdown
  apn inet6
    gtpu-mode tun
    tun-device tun6
    type-support v6
    ipv6 prefix dynamic 2001:780:44:2000:0:0:0:0/56
    ipv6 dns 0 2001:4860:4860::8888
    ipv6 dns 1 2001:4860:4860::8844
    ipv6 ifconfig 2001:780:44:2000:0:0:0:0/56
    no shutdown
  apn inet46
    gtpu-mode tun
    tun-device tun46
    type-support v4v6
    ip prefix dynamic 172.16.46.0/24
    ip dns 0 8.8.8.8
    ip dns 1 8.8.4.4
    ip ifconfig 172.16.46.0/24
    ipv6 prefix dynamic 2001:780:44:2100:0:0:0:0/56
    ipv6 dns 0 2001:4860:4860::8888
    ipv6 dns 1 2001:4860:4860::8844
    ipv6 ifconfig 2001:780:44:2100:0:0:0:0/56
    no shutdown
default-apn internet
```

osmo-hlr.cfg

```
!  
! OsmoHLR example configuration  
!  
log stderr  
  logging filter all 1  
  logging color 1  
  logging print category 1  
  logging print category-hex 0  
  logging print level 1  
  logging print file basename last  
  logging print extended-timestamp 1  
  logging level main notice  
  logging level db notice  
  logging level auc notice  
  logging level ss notice  
  logging level lnp error  
!  
line vty  
  bind 127.0.0.1  
ctrl  
  bind 127.0.0.1  
hlr  
  gsup  
    bind ip 127.0.0.1  
  ussd route prefix *#100# internal own-msisdn  
  ussd route prefix *#101# internal own-imsi  
  subscriber-create-on-demand 5 cs+ps
```

osmo-mgw.cfg

```
!  
! MGCP configuration example  
!  
mgcp  
  bind ip 127.0.0.1  
  rtp port-range 4002 16001  
  rtp bind-ip 127.0.0.1  
  rtp ip-probing  
  rtp ip-tos 184  
  bind port 2427  
  sdp audio payload number 98  
  sdp audio payload name GSM  
  number endpoints 512  
  loop 0  
  force-realloc 1  
  rtcp-omit  
  rtp-patch ssrc  
  rtp-patch timestamp  
mgcp  
  bind ip 127.0.0.1  
line vty  
  bind 127.0.0.1  
  
!! For another osmo-mgw instance on the same machine:  
!  
!mgcp  
! bind ip 127.0.0.1  
! # default port is 2427, choosing another one:  
! bind port 12427
```

```
!line vty
! # Bind to another address:
! bind 127.0.0.2
```

osmo-msc.cfg

```
!
! OsmoMSC configuration saved from vty
!
line vty
no login
!
network
network country code 208
mobile network code 92
short name OsmoMSC
long name OsmoMSC
encryption a5 0
rrlp mode none
mm info 1
msc
mgw remote-ip 127.0.0.1
mgw remote-port 2427
mgw local-port 2728
assign-tmsi
```

osmo-sgsn.cfg

```
!
! Osmocom SGSN configuration
!
!
line vty
no login
!
sgsn
gtp local-ip 127.0.0.1
ggsn 0 remote-ip 127.0.0.2
ggsn 0 gtp-version 1
ggsn 0 echo-interval 60
authentication required
auth-policy remote
gsup remote-ip 127.0.0.1
gsup remote-port 4222
!
ns
timer tns-block 3
timer tns-block-retries 3
timer tns-reset 3
timer tns-reset-retries 3
timer tns-test 30
timer tns-alive 3
timer tns-alive-retries 10
bind udp local
listen 127.0.0.1 23000
accept-ipaccess
!
```

```
bssgp
!
```

osmo-sip-connector.cfg

```
!
! OsmoSIPcon (1.5.0) configuration saved from vty
!!
!
log stderr
  logging filter all 1
  logging color 1
  logging print category-hex 1
  logging print category 0
  logging print thread-id 0
  logging timestamp 0
  logging print file 1
  logging level sip notice
  logging level mncc notice
  logging level app notice
  logging level call notice
  logging level lglobal notice
  logging level llapd notice
  logging level linp notice
  logging level lmux notice
  logging level lmi notice
  logging level lmib notice
  logging level lsms notice
  logging level lctrl notice
  logging level lgtp notice
  logging level lstats notice
  logging level lgsup notice
  logging level loap notice
  logging level lss7 notice
  logging level lscdp notice
  logging level lsua notice
  logging level lm3ua notice
  logging level lmgcp notice
  logging level ljibuf notice
  logging level lrspro notice
  logging level lns notice
  logging level lbssgp notice
!
stats interval 5
!
line vty
  no login
!
sip
  local 127.0.0.1 5069
  remote 127.0.0.1 5060
  sofia-sip log-level 2
mncc
  socket-path /tmp/msc_mncc
app
app
mncc
  socket-path /tmp/msc_mncc
sip
  local 127.0.0.1 5069
  remote 127.0.0.1 5060
```



```
!  
! osmo-stp (0.0.6.3.179-b248) configuration saved from vty  
!!  
!  
log stderr  
  logging filter all 1  
  logging color 1  
  logging print category 1  
  logging timestamp 0  
  logging level set-all notice
```

osmo-stp.cfg

```
!  
line vty  
  no login  
!  
trx  
  bind-ip 127.0.0.1  
  remote-ip 127.0.0.1  
  base-port 5700  
  egprs disable  
  multi-arfcn disable  
  clock-ref internal  
  swap-channels disable  
  tx-sps 4  
  rx-sps 4  
  chan 0  
    tx-path BAND1  
    rx-path LNAW
```

osmo-trx.cfg

```
!  
line vty  
  no login  
!  
trx  
  bind-ip 127.0.0.1  
  remote-ip 127.0.0.1  
  base-port 5700  
  egprs disable  
  multi-arfcn disable  
  clock-ref internal  
  swap-channels disable  
  tx-sps 4  
  rx-sps 4  
  chan 0  
    tx-path BAND1  
    rx-path LNAW
```

```
apt install libdbd-sqlite3  
mkdir /var/lib/osmocom
```

```
nano osmo-msc.service
```

osmo-msc.service

```
[Unit]
Description=Osmocom Mobile Switching Center (MSC)
Wants=osmo-hlr.service
Wants=osmo-mgw.service
After=osmo-hlr.service
After=osmo-hnbgw.service

[Service]
Type=simple
Restart=always
ExecStart=/usr/bin/osmo-msc -c /etc/osmocom/osmo-msc.cfg -M /tmp/msc_mncc
RestartSec=2

[Install]
WantedBy=multi-user.target
```

```
cp osmo-msc.service /lib/systemd/system/osmo-msc.service
systemctl daemon-reload
```

```
cd /etc/osmocom
./osmo-all enable
```

```
cd /opt/GSM
update-alternatives --set gcc /usr/bin/gcc-10
```

```
cd /opt/GSM
wget http://downloads.asterisk.org/pub/telephony/asterisk/releases/asterisk-11.25.3.tar.gz
tar zxvf asterisk-11.25.3.tar.gz
cd /opt/GSM/asterisk-11.25.3
apt install libncurses-dev libxml2-dev
./configure
make
make install
make config
ldconfig
```

```
cd /etc/asterisk
rm extensions.conf && nano extensions.conf
```

extension.conf

```
[default]
exten => _1.,1,Monitor(wav,myfilename2)
exten => _1.,n,Dial(SIP/${EXTEN:1}@trunk)
exten => _1.,n,Congestion
exten => _111.,1,Dial(LCR/ast/${EXTEN:3},60)
exten => 600,1,Playback(demo-echotest) ; Let them know what's going on
exten => 600,n,Echo ; Do the echo test
exten => 600,n,Playback(demo-echodone) ; Let them know it's over
exten => 600,n,Goto(s,6)
```

```
rm sip.conf && nano sip.conf
```

sip.conf

```
[general]
bindport=5060
bindaddr=0.0.0.0
context=default
srvlookup=yes
defaultexpiry=1800
dtmfmode=auto
qualify=yes
register => user:pass@trunk.com
nat=force_rport,comedia

; Add to your sip.conf
;
; Trunk.com termination
[trunk]
type=peer
username=user
fromuser=user
secret=pass
host=trunk.com
disallow=all
allow=alaw,ulaw
fromdomain=trunk.com
transport=udp
dtmfmode=rfc2833
insecure=invite,port
canreinvite=yes
nat=force_rport,comedia
```

RUNNING

```
cd /etc/osmocom
sudo ./osmo-all
sudo osmo-trx-lms
sudo osmo-bts-trx
```

2-INSTALLATION D'OSMO-NITB (Legacy pour LimeSDR-Mini ou LimeSDR-USB)

```
mkdir /opt/GSM
cd /opt/GSM
git clone https://github.com/myriadrf/LimeSuite
cd /opt/GSM/LimeSuite
cd build && cmake .. && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libtalloc-dev libgnutls28-dev libmnl-dev
git clone https://github.com/osmocom/libosmocore
cd /opt/GSM/libosmocore
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
apt install -y libortp-dev
git clone https://github.com/osmocom/libosmo-abis
cd /opt/GSM/libosmo-abis
autoreconf -fi && ./configure --disable-dahdi && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/libosmo-netif
cd /opt/GSM/libosmo-netif
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/openbsc
cd /opt/GSM/openbsc
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

cd /opt/GSM
git clone https://github.com/osmocom/openbsc
cd openbsc/openbsc
autoreconf -fi && ./configure && make -j4 && make install && ldconfig

nano /etc/osmocom/openbsc.cfg
```

openbsc.cfg

```
!
! OpenBSC configuration saved from vty
!
password foo
!
line vty
  no login
!
e1_input
  e1_line 0 driver ipa
network
  network country code 208
  mobile network code 15
  short name Free
  long name Free
  auth policy accept-all
  location updating reject cause 13
```

```

encryption a5 0
neci 1
rrlp mode none
mm info 1
handover 0
handover window rxlev averaging 10
handover window rxqual averaging 1
handover window rxlev neighbor averaging 10
handover power budget interval 6
handover power budget hysteresis 3
handover maximum distance 9999
timer t3101 10
timer t3109 4
timer t3113 60
bts 0
  type sysmobts
  band DCS1800
  cell_identity 0
  location_area_code 22532
  ms max power 33
  cell reselection hysteresis 14
  rxlev access min 0
  channel allocator ascending
  rach tx integer 9
  rach max transmission 7
  ip.access unit_id 1801 0
  oml ip.access stream_id 255 line 0
  gprs mode none
  trx 0
    rf_locked 0
    arfcn 514
    nominal power 23
    max_power_red 20
    rsl e1 tei 0
    timeslot 0
      phys_chan_config CCCH+SDCCH4
      hopping enabled 0
    timeslot 1
      phys_chan_config PDCH
      hopping enabled 0
    timeslot 2
      phys_chan_config TCH/F
    timeslot 3
      phys_chan_config TCH/F
    timeslot 4
      phys_chan_config TCH/F
    timeslot 5
      phys_chan_config TCH/F
    timeslot 6
      phys_chan_config TCH/F
    timeslot 7
      phys_chan_config TCH/F
mncc-int
  default-codec tch-h amr
  default-codec tch-f amr
nitb
  subscriber-create-on-demand
  assign-tmsi

```

```

cd /lib/modules/$(uname -r)/build/certs
openssl req -new -x509 -newkey rsa:2048 -keyout signing_key.pem -outform DER -
out signing_key.x509 -nodes -subj "/CN=Owner/"

```

```

apt install -y gcc-7 g++-7 gcc-10 g++-10
update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-7 70 --slave
/usr/bin/g++ g++ /usr/bin/g++-7
update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-10 100 --slave
/usr/bin/g++ g++ /usr/bin/g++-10
cd /opt/GSM/
git clone https://github.com/isdn4linux/mISDN
cd /opt/GSM/mISDN
rm -Rf /lib/modules/$(uname -r)/kernel/drivers/isdn/hardware/mISDN
rm -Rf /lib/modules/$(uname -r)/kernel/drivers/isdn/mISDN/

```

nano octvqe.patch

octvqe.patch

```

--- drivers/isdn/mISDN/octvqe/octvqe_linux.c      2021-04-24 19:52:33.18838065>
+++ drivers/isdn/mISDN/octvqe/octvqe_linux.c.new  2021-04-24 19:53:07.>
@@ -540,7 +540,7 @@
                                wake_up_interruptible(&pChan->ReadWaitQueue);

                                /* Retrieve CPU time before processing. */
-                               pChan->ulTimestampIn = (unsigned long)rdtsc();
+                               pChan->ulTimestampIn = (unsigned long)rdtsc();
+//                               pChan->ulTimestampIn = (unsigned long)rdtsc();
                                }

                                if (fWakeUpWrite == 1) /* wake_up_interruptible waiting on w>

```

```

cp /boot/System.map-$(uname -r) /usr/src/linux-headers-$(uname -r)/System.map
ln -s /lib/modules/$(uname -r)/build /lib/modules/$(uname -r)/source
aclocal && automake --add-missing
./configure
patch -p0 < octvqe.patch
make modules
cp /opt/GSM/mISDN/standalone/drivers/isdn/mISDN/modules.order /usr/src/linux-headers-$(uname -r)
cp -rn /usr/lib/modules/$(uname -r)/. /usr/src/linux-headers-$(uname -r)
make modules_install
depmod -a
update-alternatives --set gcc /usr/bin/gcc-7
cd /opt/GSM
apt install bison flex -y
git clone https://github.com/isdn4linux/mISDNuser
cd /opt/GSM/mISDNuser
make
./configure
make
make install
ldconfig
cd example
./configure
make
make install
ldconfig
update-alternatives --set gcc /usr/bin/gcc-10
cd /opt/GSM
wget http://downloads.asterisk.org/pub/telephony/asterisk/releases/asterisk-11.25.3.tar.gz
tar zxvf asterisk-11.25.3.tar.gz
cd /opt/GSM/asterisk-11.25.3

```

```
apt install libncurses-dev libxml2-dev
./configure
make
make install
make config
ldconfig
```

```
cd /etc/asterisk/
```

```
rm sip.conf && nano sip.conf
```

sip.conf

```
[general]
bindport=5060
bindaddr=0.0.0.0
context=default
srvlookup=yes
defaultexpiry=1800
dtmfmode=auto
qualify=yes
register => user:pass@trunk.com
nat=force_rport,comedia

; Add to your sip.conf
;
; Trunk.com termination
[trunk]
type=peer
username=user
fromuser=user
secret=pass
host=trunk.com
disallow=all
allow=alaw,ulaw
fromdomain=trunk.com
transport=udp
dtmfmode=rfc2833
insecure=invite,port
canreinvite=yes
nat=force_rport,comedia
```

```
rm extensions.conf && nano extensions.conf
```

extensions.conf

```
[from-lcr]
include => default
exten => _X.,1,Monitor(wav,myfilename2)
exten => _X.,n,Dial(SIP/${EXTEN}@trunk)
exten => _X.,n,Congestion
exten => 700,1,Playback(demo-echotest) ; Let them know what's going on
exten => 700,n,Echo ; Do the echo test
exten => 700,n,Playback(demo-echodone) ; Let them know it's over
exten => 700,n,Goto(s,6)
```

```
cd /opt/GSM
git clone http://git.eversberg.eu/lcr.git
cd /opt/GSM/lcr
nano ast_lcr.patch
```

ast_lcr.patch

```
--- chan_lcr.c 2021-04-24 12:40:11.019018759 +0000
+++ chan_lcr.c 2021-04-24 12:40:49.878583419 +0000
@@ -105,7 +105,7 @@

    */

-
+#define ASTERISK_VERSION_NUM 110000
/* Choose if you want to have chan_lcr for Asterisk 1.4.x or CallWeaver 1.2.x
*/
#define LCR_FOR_ASTERISK
/* #define LCR_FOR_CALLWEAVER */
```

nano sip_gcc.patch

sip_gcc.patch

```
--- sip.cpp 2021-04-24 16:45:17.223599013 +0000
+++ sip.cpp 2021-04-24 16:52:04.312502995 +0000
@@ -18,14 +18,6 @@
#include <sofia-sip/stun_tag.h>
#include <sofia-sip/su_md5.h>

-#ifndef SOFIA_SIP_GCC_4_8_PATCH_APLLIED
-#warning *****
-#warning Please apply the sofia-sip-gcc-4.8.patch !
-#warning If this issue is already fixed, just remove this check.
-#warning *****
-#error
-#endif
-
-#undef NUTAG_AUT0100

unsigned char flip[256];
```

```
patch -p0 < ast_lcr.patch
patch -p0 < sip_gcc.patch
```

```
./autogen.sh
./configure --with-sip --with-gsm-bs --with-gsm-ms --with-asterisk --with-sip
make
make install
ldconfig
```

```
cp chan_lcr.so /etc/asterisk
```

```
cd /usr/local/etc/lcr
```

```
nano interface.conf
```

interface.conf

```
# interface.conf
#####
```



```
[GSM]
gsm-bs
#hr
#tones yes
#earlyb no
bridge ast

[ast]
remote asterisk
context from-lcr
earlyb no
tones yes
bridge GSM
```

nano options.conf

options.conf

```
# LCR options
#####

debug 0x100000
```

nano routing.conf

routing.conf

```
# Linux-Call-Router routing configuration "routing.conf"
#####

# Ruleset: MAIN
# Calls with different origins will be processed in different rulesets.

[main]
#interface=xyz                : goto ruleset=xyz
extern                        : goto ruleset=extern
intern                        : goto ruleset=intern
                             : disconnect cause=31

# Ruleset: EXTERN
# All calls from external lines are processed here.

[extern]
dialing=0,1234                : intern extension=200
dialing=200-299               : intern
dialing=81                    : partyline room=42
#timeout=6                   : intern extension=200
default                       : disconnect cause=1

# Ruleset: INTERN
# All calls from internal ports are processed here.

[intern]
dialing=0                     : extern
dialing=1                     : extern capability=digital-
unrestricted
dialing=200-299               : intern
dialing=3                     : pick
dialing=5 enblock             : reply
```

```

dialing=5 : reply select
dialing=6 enblock : redial
dialing=6 : redial select
dialing=7 : abbrev
dialing=80 : vbox-play
dialing=81 : partyline room=42
dialing=90 : powerdial
dialing=91 : callerid
dialing=92 : calleridnext
#dialing=93 : login
#dialing=94 : powerdial
#dialing=950 real : callback
#dialing=953 : forward diversion=cfu
#dialing=954 : forward diversion=cfb
#dialing=955 : forward diversion=cfnr delay=26
#dialing=956 : forward diversion=cfp
#dialing=957 : forward diversion=cfu dest=vbox
#dialing=958 : forward diversion=cfb dest=vbox
#dialing=959 : forward diversion=cfnr dest=vbox
delay=20
#dialing=96 : dtmf
#dialing=970 : calculator connect
dialing=99 : test
default : disconnect cause=1 display="Invalid
Code"

```

RUNNING

nano 2G_legacy_lms.sh

2G_legacy_lms.sh

```

#!/bin/bash
#A lancer en tant que root
#on supprime les sessions précédentes sinon la lime ne se lancera pas
#si il reste des process
killall -9 osmo-nitb osmo-bts-trx osmo-trx-lms asterisk lcr > kill.log 2>&1
#Pour quitter le script Ctrl22222-C
echo -e "Hello World stop w/ Ctrl-C\n"
#On lance ou relance asetisk pour etre sur qu'il tourne
asterisk > asterisk.log 2>&1
#On charge les drivers pour lcr
modprobe mISDN_core > mISDN.log 2>&1
modprobe mISDN_dsp >> mISDN.log 2>&1
modprobe snd-pcm > snd-pcm.log 2>&1
#On lance un fork de lcr et on attend dix secondes
exec lcr st12
art > lcr.log 2>&1 &
echo -e "I am going to wait for 10 seconds only ...\n"
./bar.sh
echo -e "\nLCR started !\n"2
#On lance un fork de Openbsc et on attends dix secondes pour qu'il
#soit apte à accueillir osmo-trx-lms
exec /usr/bin/osmo-nitb -c /etc/osmocom/nitb/openbsc.cfg -l hlr.sqlite3 -P -
m /tmp/bsc_mncc -C --debug=DRLL:DCC:DMM:DRSL:DMM --yes-i-really-want-to-
run-prehistoric>
echo -e "I am going to wait for 10 seconds only ...\n"
./bar.sh
echo -e "\nopenbsc started !\n"

```

```
#On lance un fork de Openbsc et on attends dix secondes pour qu'il
#soit apte à accueillir osmo-bts-trx
exec /usr/bin/osmo-trx-lms -C /etc/osmocom/nitb/osmo-trx.cfg 2>&1 osmo-trx.log
&
echo -e "\nI am going to wait for 10 seconds only ...\n"
./bar.sh
echo -e "\nosmo-trx started ! \n"
#Enfin on lance un process (non forké de osmo-bts-trx) pour pouvoir killer
exec /usr/bin/osmo-bts-trx -c /etc/osmocom/nitb/osmo-bts.cfg 2>&1 osmo-bts.log
./bar.sh
echo -e "\nosmo-bts started !\n"
exec killall -9 osmo-nitb osmo-bts-trx osmo-trx-lms
```

nano bar.sh

bar.sh

```
#!/bin/bash printf "[" for x in {1..150} ; do printf "#" sleep .05 # do some
work here done ; printf "]\n"
```