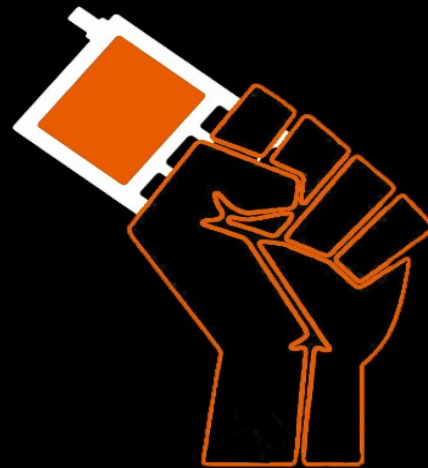


Rhizomatica

OpenBSC Software Components and Configuration



OsmoNITB

- OsmoNITB implements part of GSM network (BSC, SMSC, MSC, VLR, HLR, AUC) in one element
- OsmoNITB implements ETSI/3GPP A-bis interface
- A-bis as spec TS 08.56(LAPD) TS08.58 (RSL) TS12.21(OML)
- In addition the A-bis supports multiple vendor specific implementation to connect with different BTSs.

OsmoNITB - BSC

- BSC implements GSM Base Station Controller functionality
- Configuring and bringing up BTSs and their TRXs and TSs
- Implementing A-bis protocol and signalling for voice data
- Processing management results of MSs, performing handover decision
- Terminating Radio Resource from the MS

OsmoNITB - MSC

- Implements mobility management MM functions of the TS04.08
- Can handle call control, with an internal **MNCC** (Mobile Network Call Control) handler
- Or using an external MNCC agent

OsmoNITB - SMSC

- Minimal store-and-forward server for SMS
- Supports **MO** (Mobile Originating) and **MT** (Mobile Terminating) SMS
- Supports multi-part messages

OsmoNITB – HLR/AUC

- Implements subscriber database (HLR)
- Implements subscriber secret key storage for authentication (AUC)
- Contains IMSI and phone number of the subscribers
- Data stored in file-based SQLite3 database

OsmoBTS

- Implements the layer 2 (LADPm)
- Implements the A-bis interface including **RSL** (Radio Signalling Link) and **OML** (Operation and Maintenance Link) protocol
- Minimal configuration
- Most of the configuration for the BTS is loaded from the BSC

OsmoTRX

- Handles the low level interface Um protocol
- Derived from OpenBTS transceiver
- Supports UmTRX and USRP devices

Configuration Interface

- NiTB provides a file based or a VTY (Virtual Tele Type) interface for configuration and administration
- BTS VTY is accessible with telnet 127.0.0.1 4241
- BSC VTY is accessible with telnet 127.0.0.1 4242
- VTY has an “enable” mode to access to privileged configurations

OsmoBTS Configuration

- Basic configuration for the BTS includes:
 - GSM band type
 - OML address to connect to (BSC) and bind address for **RTP** (Realtime Transport Protocol)
 - Transceiver related configuration

OsmoBTS Configuration

- Create osmo-bts.cfg

```
bts 0
band GSM850
ipa unit-id ID 0
oml remote-ip IPBSC
rtp bind-ip LOCALIP
rtp jitter-buffer 0
paging lifetime 0
fn-advance 20
ms-power-loop -10
timing-advance-loop
trx 0
  rxgain 12
  power 10
```

OsmoBTS Configuration

- **band**: set the frequency band of this BTS
- **ipa unit-id**: Set the unit ID of this BTS. SiteID and UnitID
- **oml remote-ip**: OML IP address
- **rtp bind-ip**: RTP local bind address

OsmoBTS Configuration

- **trx**: Transceiver related configuration
- **rxgain**: Reception gain in db
- **power**: Transmission power in db

OsmoNITB Configuration

- Basic configuration for the BSC includes:
- Set the ARFCN
- Network name
- MCC/MNC
- Channel configuration
- Codec selection

OsmoNITB Configuration

- Edit `openbsc.cfg`

```
e1_input
```

```
e1_line 0 driver ipa
```

```
network
```

```
network country code 1
```

```
mobile network code 1
```

```
short name MyNetwork
```

```
long name MyNetwork
```

```
auth policy accept-all
```

```
location updating reject cause 13
```

```
encryption a5 0
```

```
neci 1
```

```
paging any use tch 0
```

```
rrlp mode none
```

```
mm info 1
```

OsmoNITB Configuration

```
bts 0
  type sysmobts
  band GSM850
  cell_identity 0
  location_area_code 2
  training_sequence_code 7
  base_station_id_code 63
  ip.access unit_id 1801 0
  oml ip.access stream_id 255 line 0
  neighbor-list mode automatic
  codec-support fr hr efr afs
```


OsmoNITB Configuration

```
trx 0
rf_locked 0
arfcn 235
nominal power 23
max_power_red 0
rs1 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 TCH/F
  hopping enabled 0
```

OsmoNITB Configuration

timeslot 2

phys_chan_config TCH/F
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/H
hopping enabled 0

timeslot 7

phys_chan_config TCH/H
hopping enabled 0

OsmoNITB Configuration

- **network country code**: Set the GSM network country code
- **mobile network code**: Set the GSM mobile network code
- **short name**: Set network name
- **auth policy**: Set authentication policy, accept-all / closed / token

OsmoNITB Configuration

- **encryption a5**: 1 Enable/ 0 Disable A5 encryption
- **paging any use tch**: 1 Enable / 0 Disable. Assign a TCH when a paging any request
- **handover**: Handover specific configurations
- **ip.access unit**: Under bts settings. The ID has to match with the BTS configuration
- **codec-support**: Codec support selection

OsmoNITB Configuration

- **arfcn**: Set the Absolute Radio Frequency Channel Number for the `trx`
- **timeslot**: Select the timeslot on the
- **phys_chan_config**: Configure the channel type for the specific timeslot

OsmoNITB Configuration

- **network country code**: Set the GSM network country code
- **mobile network code**: Set the GSM mobile network code
- **short name**: Set network name
- **auth policy**: Set authentication policy, accept-all / closed / token