

# TRX Toolkit and virtual Um-interface

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# TRX Interface

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## What is TRX Interface?

- Custom interface between L1 and transceiver:
  - e.g. between OsmoBTS and OsmoTRX,
  - e.g. between OpenBTS and Transceiver52M.
- First introduced in OpenBTS project
- Basically three UDP sockets are assumed:
  - TRX-CTRL - control messages (ASCII),
    - similar to HTTP: REQ / RSP,
    - e.g. TXTUNE, POWERON, etc.
  - TRX-CLCK - hardware clock indications
  - TRX-DATA - DL / UL bursts

# TRX Toolkit

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## What is TRX Toolkit?

- Set of tools written in Python
- Aimed to help with debugging of TRX Interface
- Usage areas:
  - TRX-CTRL commands injection (`ctrl_cmd.py`),
  - Burst capture (`trx_sniff.py`),
  - Burst injection (`burst_send.py`),
  - Random burst generation (`burst_gen.py`),
  - Virtual Um-interface (`fake_trx.py`).
- Merged into the master branch of OsmocomBB now:
  - [https://osmocom.org/projects/baseband/wiki/TRX\\_Interface](https://osmocom.org/projects/baseband/wiki/TRX_Interface)
  - <https://osmocom.org/projects/baseband/wiki/FakeTRX>
  - [https://git.osmocom.org/osmocom-bb/tree/src/target/trx\\_toolkit](https://git.osmocom.org/osmocom-bb/tree/src/target/trx_toolkit)

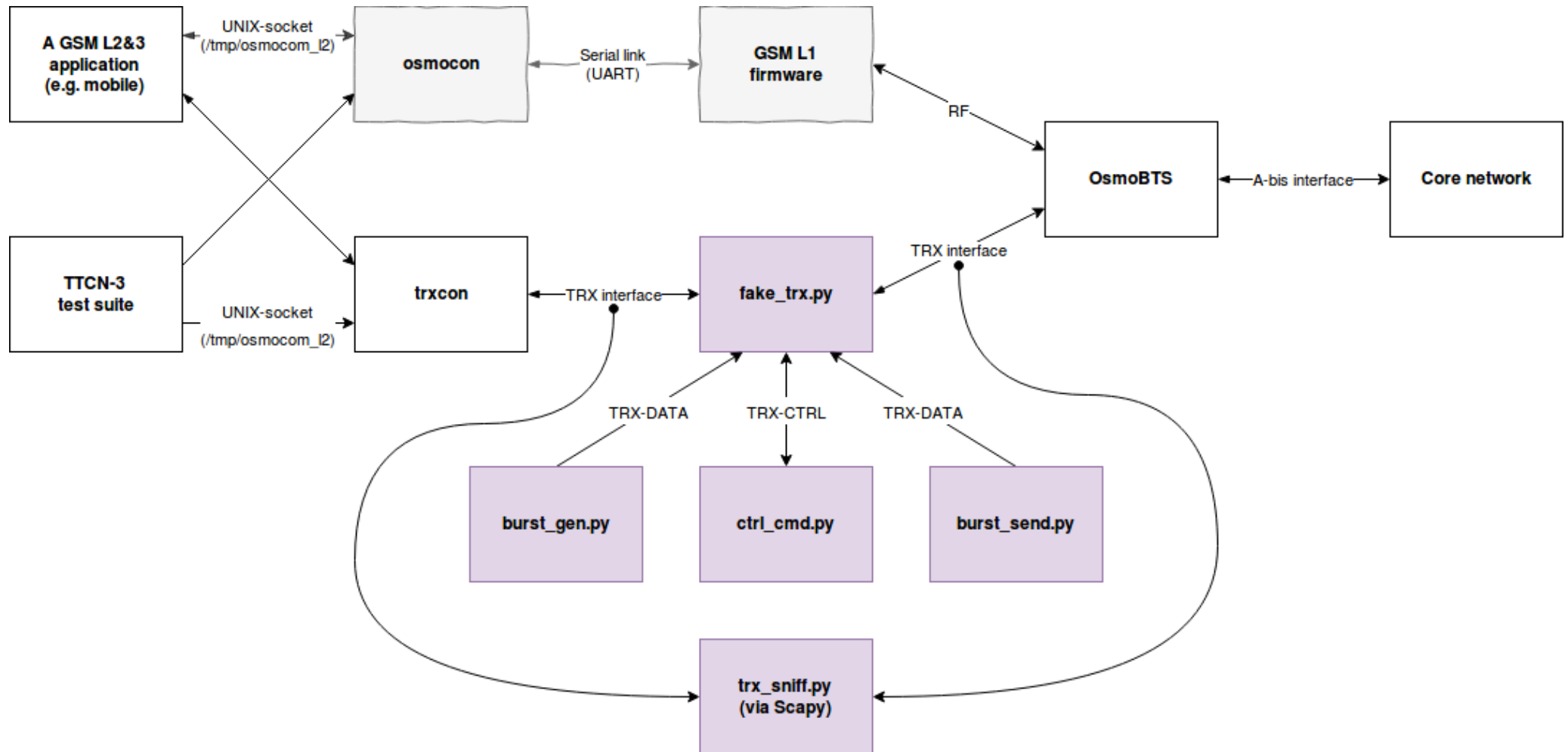
# TRX Toolkit

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## How can one use TRX Toolkit?

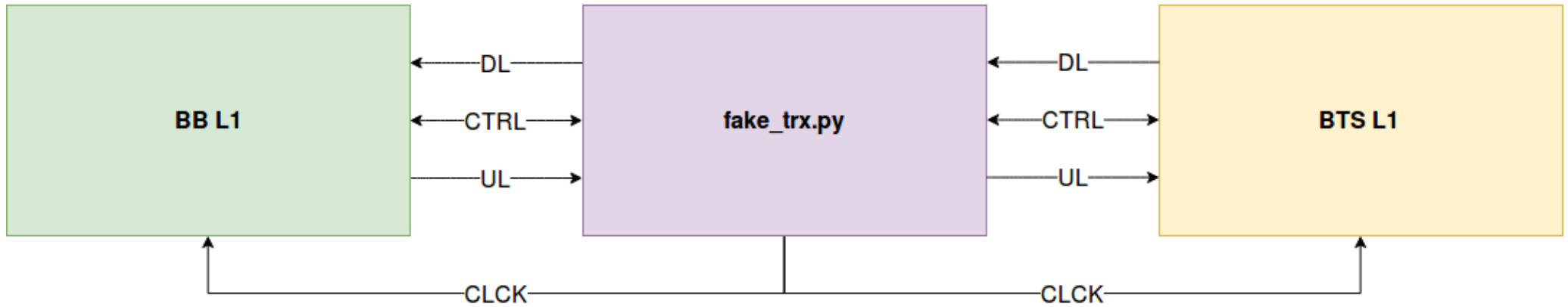
- Learn and research GSM without actual hardware
- Write and test new code without actual hardware
- RSSI / Time of Arrival / path loss simulation
- Fuzzing and testing without actual hardware:
  - Currently used by OsmoBTS TTCN3 test cases:
    - Timing Advance loop testing
    - WIP: Measurement Reporting testing
    - WIP: Path loss (bit corruption) testing

# FakeTRX - virtual Um-interface



# FakeTRX - virtual Um-interface

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# Current status

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## Supported:

- Simulation and randomization of both RSSI and ToA
- Burst capture to file (see [data\\_dump.py](#))
- Injection of bursts and commands

## Future plans:

- Make multiple BTS to work with multiple BB instances
- Distinguish debug messages (BTS / MS, ID)

# EOF

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```
Traceback (most recent call last)
  Russia, Novosibirsk:
    get_visa()
  Russia, Novosibirsk:
    goto_osmodevcon()
  OsmoDevCon, Berlin, Germany:
    day_first()
  OsmoDevCon, Berlin, Germany:
    day_second()
  OsmoDevCon, Berlin, Germany:
    day_third()
  OsmoDevCon, Berlin, Germany:
    start_talk("TRX Interface")
  OsmoDevCon, Berlin, Germany:
    raise EOFError
```

## Questions?

```
for q in questions:
    print self.find_answer(q)
```