

OsmoBSC - Bug #3814

MS Power Control Problem with Osmo-BSC and nanoBTS

02/23/2019 02:39 AM - DrDeke

Status: New	Start date: 02/23/2019
Priority: Normal	Due date:
Assignee:	% Done: 0%
Category: ip.access BTS	
Target version:	
Spec Reference:	

Description

Greetings,

I seem to be having a problem with MS power control on an OsmoBSC/nanoBTS setup using the following software versions:

OsmoBSC: 1.4.0 (binary package: "Latest")
OsmoMSC: 1.3.1 (binary package: "Latest")
OsmoHLR: 1.0.0 (binary package: "Latest")
OsmoMGW: 1.5.0 (binary package: "Latest")
OsmoSTP: 1.0.0 (binary package: "Latest")
OsmoSIPConnector: 1.2.0.2-e911-dirty (compiled from source to add workaround for OsmoMSC issue [#3650](#) / OsmoSIPConnector issue [#3724](#))

This is a single-BTS system. The BTS in question is a nanoBTS 165BU.

This is a small test system with the BTS and all MSes contained within the same isolated room. In addition to other interference-avoidance measures, I want to configure the system to limit the MS transmit power to the lowest possible value.

The Osmo-BSC documentation suggests that this can be achieved by limiting the MS transmit power to 0 dBm with the following command (in BTS configuration mode on the BSC) :

```
ms max power 0
```

When I issue this command, start a test call, then issue the "show lchan" command on the OsmoBSC vty, I get the following output:

```
BTS 0, TRX 0, Timeslot 1, Lchan 0: Type TCH_F
Connection: 1, State: ESTABLISHED
BS Power: 3 dBm, MS Power: 0 dBm
Channel Mode / Codec: SPEECH_V1
No Subscriber
Bound IP: 10.x.x.x Port 4004 RTP_TYPE2=0 CONN_ID=2
Conn. IP: 10.x.x.x Port 4258 RTP_TYPE=3 SPEECH_MODE=0x00
Measurement Report:
  Flags:
  MS Timing Offset: 2
  L1 MS Power: 33 dBm, Timing Advance: 0
  RXL-FULL-dl: -48 dBm, RXL-SUB-dl: -48 dBm RXQ-FULL-dl: 0, RXQ-SUB-dl: 0
  RXL-FULL-ul: -54 dBm, RXL-SUB-ul: -54 dBm RXQ-FULL-ul: 0, RXQ-SUB-ul: 0
```

The following line looks normal; it seems to represent the configuration I gave OsmoBSC:

```
BS Power: 3 dBm, MS Power: 0 dBm
```

On the other hand, the following line confuses me. It seems to be the very opposite of the MS transmit power limit I requested (and also, I believe, is more power than the MS, a Nokia 5190, is capable of transmitting) :

```
L1 MS Power: 33 dBm, Timing Advance: 0
```

I have tried a number of variations of the "ms max power X" command, which have given the following results:

```
ms max power 1
BS Power: 3 dBm, MS Power: 2 dBm
```

L1 MS Power: 4294967274 dBm, Timing Advance: 8

ms max power 2

BS Power: 3 dBm, MS Power: 2 dBm

L1 MS Power: 4294967274 dBm, Timing Advance: 8

ms max power 3

BS Power: 3 dBm, MS Power: 4 dBm

L1 MS Power: 4294967274 dBm, Timing Advance: 8

ms max power 4

BS Power: 3 dBm, MS Power: 4 dBm

L1 MS Power: 4294967274 dBm, Timing Advance: 8

ms max power 10

BS Power: 3 dBm, MS Power: 10 dBm

L1 MS Power: 4294967274 dBm, Timing Advance: 8

ms max power 15

BS Power: 3 dBm, MS Power: 16 dBm

L1 MS Power: 2 dBm, Timing Advance: 8

ms max power 20

BS Power: 3 dBm, MS Power: 20 dBm

L1 MS Power: 10 dBm, Timing Advance: 8

I am puzzled by these results.

If I am interpreting this correctly, the "BS Power / MS Power" line represents the values that are being commanded by the BSC, and the "Measurement Report: L1 MS Power" line is the transmit power being reported to the BTS/BSC from the MS.

If this is the case, the "BS Power / MS Power" results seem to make sense, but the L1 MS Power results seem to be either incorrect or nonsensical, depending on the value given to the "ms max power" directive.

Also, I do not understand why the timing advance would be anything other than 0, since the MS for all of these tests was only about 3 meters away from the BTS.

There were no audio quality problems during these tests. Two-way audio was being passed between the MS and the SIP PBX and it sounded every bit as good as a GSM call on a production network would.

Please let me know if you have any ideas about this or if there is anything I should try or any additional information I can provide which may be of assistance.

History

#1 - 02/23/2019 08:40 PM - laforge

It would be useful to take a pcap file of the Abis communication including TCP ports 3002 and 3003 and showing:

- 1) the start-up of the BTS, i.e. the OML + RSL connections
- 2) a short period during which one of the MS is active and the erroneous readings in 'show lchan' appear

#2 - 02/24/2019 01:15 AM - DrDeke

- File *mymax0_ms_active_abis.pcap* added

- File *mymax0_startup_abis.pcap* added

- File *mymax1_ms_active_abis.pcap* added

- File *mymax1_startup_abis.pcap* added

I have attached two sets of the pcaps you requested; one with "ms max power" set to 0 and the other with "ms max power" set to 1.

While the MS was active with ms max power set to 0, show lchan on the BSC displayed the following relevant values:

BS Power: 3 dBm, MS Power: 0 dBm

Measurement Report:

Flags:

MS Timing Offset: 1

L1 MS Power: 33 dBm, Timing Advance: 0

While the MS was active with ms max power set to 1, show lchan on the BSC displayed the following relevant values:

BS Power: 3 dBm, MS Power: 2 dBm

Measurement Report:

Flags:

MS Timing Offset: 2

L1 MS Power: 4294967274 dBm, Timing Advance: 0

The Wireshark dissectors appear to do a very good job of explaining the contents of these packets. I will be reviewing them in detail as well to see if they can shed any light on what is going on.

Thanks,

Rusty

Files

mymax0_startup_abis.pcap	20.2 KB	02/24/2019	DrDeke
mymax0_ms_active_abis.pcap	28 KB	02/24/2019	DrDeke
mymax1_ms_active_abis.pcap	27.7 KB	02/24/2019	DrDeke
mymax1_startup_abis.pcap	20.2 KB	02/24/2019	DrDeke