

OsmoBTS - Bug #4215

osmo-bts-trx: DL burst towards osmo-trx dopped due to enqueued CMD NOHANDOVER

09/27/2019 10:45 AM - pespin

Status:	Resolved	Start date:	09/27/2019
Priority:	Normal	Due date:	
Assignee:	pespin	% Done:	100%
Category:	osmo-bts-trx		
Target version:			
Spec Reference:			

Description

Ass seen in BTS_Tests.TC_deact_sacch.pcap, when BSC sends over RSL a DEACTIVATE SACCH message to the BTS, the BTS enqueues a CMD NOHANDOVER. After that, we can see several of these messages in osmo-bts-trx log:

```
20386 09:02:08.628490 Sep 27, 2019 09:02:08.628490000 CEST 172.18.9.20 33148 172.18
.9.10 4729 GSMTAP 203 phy0.0: Enqueuing TRX control command 'CMD NOHANDOVER 2 0'
20387 09:02:08.628506 Sep 27, 2019 09:02:08.628506000 CEST 172.18.9.20 33148 172.18
.9.10 4729 GSMTAP 189 phy0.0: Sending control 'CMD NOHANDOVER 2 0'
...
20389 09:02:08.628780 Sep 27, 2019 09:02:08.628780000 CEST 172.18.9.20 33148 172.18
.9.10 4729 GSMTAP 193 phy0.0: Tx burst (hdr_ver=1): tn=0 fn=1401 pwr=0
20390 09:02:08.628794 Sep 27, 2019 09:02:08.628794000 CEST 172.18.9.20 33148 172.18
.9.10 4729 GSMTAP 191 phy0.0: Ignoring TX data, transceiver offline.
[repeated]
...
20406 09:02:08.629022 Sep 27, 2019 09:02:08.629022000 CEST 172.18.9.20 33148 172.18
.9.10 4729 GSMTAP 193 phy0.0: Response message: 'RSP NOHANDOVER 0 2 0'
```

I have also seen this kind of behavior before when running osmo-bts-trx+osmo-trx locally.

So the problem seems to be in osmo-bts-trx trx_if.c, in trx_if_send_burst():

```
/* we must be sure that we have clock, and we have sent all control
 * data */
if (transceiver_available && llist_empty(&llh->trx_ctrl_list)) {
    send(llh->trx_ofd_data.fd, buf, nbits + 6, 0);
} else
    LOGPPHI(llh->phy_inst, DTRX, LOGL_ERROR, "Ignoring TX data, transceiver offline.\n");
```

So IIUC, that check is there to make sure we don't send DL bursts while the TRX is stopped or still in progress of being configured, but I guess it should have its DL bursts dropped while already running and having a NOHANDOVER command.

History

#1 - 09/27/2019 03:24 PM - pespin

- Status changed from New to In Progress

- % Done changed from 0 to 20

I started doing some clean up in order to sort out real need for different states variables to be able to clearly indicate in code above when we should send or not data.

remote: <https://gerrit.osmocom.org/c/osmo-bts/+15613> struct gsm_bts: Add model_priv pointer handing bts_model specific data

remote: <https://gerrit.osmocom.org/c/osmo-bts/+15614> bts-trx: Allocate struct osmo_trx_clock_state as part of bts-trx private data

remote: <https://gerrit.osmocom.org/c/osmo-bts/+15615> bts-trx: Move transceiver_available as part of bts-trx private data

#2 - 09/30/2019 02:55 PM - pespin

- Status changed from In Progress to Feedback

- % Done changed from 20 to 90

Next bunch of refactor patches to fix the issue:

remote: <https://gerrit.osmocom.org/c/osmo-bts/+15627> bts-trx: vty: Print phy link state in cmd 'show transceiver'
remote: <https://gerrit.osmocom.org/c/osmo-bts/+15628> bts-trx: trx_set_bts(): Avoid double loop by checking current trx
remote: <https://gerrit.osmocom.org/c/osmo-bts/+15629> bts-trx: Rework code handling poweron state
remote: <https://gerrit.osmocom.org/c/osmo-bts/+15630> bts-trx: Don't reset transceiver_available in scheduler_trx.c
remote: <https://gerrit.osmocom.org/c/osmo-bts/+15615> bts-trx: Get rid of messy transceiver_available state handler
remote: <https://gerrit.osmocom.org/c/osmo-bts/+15631> bts-trx: Drop unused func check_transceiver_availability()

Once merged the ticket can be closed (issue is fixed as a side-effect of last patch).

#3 - 09/30/2019 04:29 PM - ipse

Just want to make sure - after all these patches, is `osmo-bts-trx` still monitoring that `osmo-trx` is "alive"? By monitoring CLK INDS or somehow else? I.e. will it notice if `osmo-trx` suddenly crash?

#4 - 10/08/2019 12:27 PM - pespin

During CMD POWERON command, the TRX is expected to create all required sockets and start sending clock indications against osmo-bts-trx, and once done, answer with RSP POWERON 0.

At that point, "powered" bool in BTS becomes true, until CMD POWEROFF is sent (and RSP POWEROFF 0 is received).

Once TRX is "powered", osmo-bts-trx starts sending bursts to TRX:

```
if (trx_if_powered(llh)) {  
    send(llh->trx_ofd_data.fd, buf, nbits + 6, 0);    <--- I just detected we don't check return code here,  
    I'll submit a patch.
```

If osmo-trx crashes, its sockets will become unavailable and `trx_data_read_cb()` in osmo-bts-trx will eventually fail, detecting thus that TRX is unavailable. I think thought that apart from logging the err it doesn't report it to upper layers. That's something we may want to improve (by calling for instance `bts_shutdown()`).

What really stops the BTS if TRX becomes unavailable is `bts_shutdown()` in `scheduler_trx.c`. First IND CLOCK received in `trx_sched_clock()` triggers `trx_setup_clock()`, which sets up a timerfd that triggers from time to time to push frames to upper layers. if IND CLOCK stopped being received, wall clock vs ind clock skews too much and `trx_fn_timer_cb()` exists the BTS with `bts_shutdown(bts, "No clock from osmo-trx");`.

You can easily see it by running osmo-bts-trx and osmo-trx, then at some point killing osmo-trx. osmo-bts-trx will stop with the "No clock from osmo-trx" message.

Now the question is: What happens if TRX answers with RSP POWERON 0 and sockets are available but no CLOCK IND is ever set? Then the timerfd is never set, so `trx_fn_timer_cb()` is never called and probably BTS never exits and thinks everything's fine, but the scheduler is really paused (so for instance no DL bursts are sent against the TRX). So it seems we need to fix this case by adding some kind of timing in osmo-bts-trx to timeout if first CLOCK IND is not send after X seconds, then exit. (I tried the scenario by commenting out `CLOCK ind write()` in osmo-trx).

But this issue didn't come from last patches merged, afaiu it was already there. I'll provide patches for that shortly.

#5 - 10/08/2019 12:55 PM - pespin

Improvement to log send/recv() errors:

<https://gerrit.osmocom.org/c/osmo-bts/+15702> bts-trx: Log TRXC and TRXD socket recv()/send() failures

I'll work on the timeout if no IND CLOCK is never received later.

#6 - 10/08/2019 04:45 PM - pespin

Timeout after POWERON and no CLOCK IND ever received is here:

<https://gerrit.osmocom.org/c/osmo-bts/+15706> bts-trx: Time out if no clock ind recvd after RSP POWERON

Once merged I think we can close the ticket if [ipse](#) has not other concerns.

#7 - 11/13/2019 08:55 AM - pespin

- Status changed from Feedback to Resolved

- % Done changed from 90 to 100