

## OsmoBTS - Bug #1795

### osmo-bts-trx: fails to assign second lchan on TCH/H TS

08/09/2016 07:29 PM - neels

<b>Status:</b>	Closed	<b>Start date:</b>	08/09/2016
<b>Priority:</b>	High	<b>Due date:</b>	
<b>Assignee:</b>	fixeria	<b>% Done:</b>	100%
<b>Category:</b>			
<b>Target version:</b>	osmo-bts-trx refresh		
<b>Spec Reference:</b>	<a href="http://www.qtc.jp/3GPP/Specs/GSM_GE_RAN/0502-8b0.pdf">http://www.qtc.jp/3GPP/Specs/GSM_GE_RAN/0502-8b0.pdf</a>		

#### Description

With osmo-bts-trx and a TS configuration featuring TCH/H timeslots, a call between two phones on the same TRX BTS does never succeed to use the second lchan of a TCH/H timeslot.

(I do have general unreliability of osmo-trx in my setup but this error appears consistently)

- First available TCH/H is ts=5, lchan=0 [0]
- Second available TCH/H is ts=5, lchan=1 [1]  
But this apparently times out and then [2]
- Third available TCH/H on ts=6, lchan=0 is actually used

```
[0]
20160809212237806 DRLL <0000> chan_alloc.c:342 (bts=0,trx=0,ts=5,pchan=TCH/H) Allocating lchan=0 a
s TCH_H
20160809212237806 DRSL <0004> abis_rsl.c:1705 (bts=0,trx=0,ts=5,ss=0) Activating ARFCN(868) SS(0)
lctype TCH_H r=CALL ra=0x40 ta=1
20160809212237806 DRSL <0004> abis_rsl.c:539 (bts=0,trx=0,ts=5,pchan=TCH/H) Tx RSL Channel Activat
e with act_type=INITIAL
20160809212237806 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=5,ss=0) state NONE -> ACTIVATION REQ
UESTED
20160809212237806 DRSL <0004> abis_rsl.c:1434 (bts=0,trx=0,ts=5,ss=0) CHANNEL ACTIVATE ACK
20160809212237806 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=5,ss=0) state ACTIVATION REQUESTED -
> ACTIVE
20160809212238175 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 ESTABLISH INDICATION
20160809212238175 DRLL <0000> gsm_04_08.c:3667 Dispatching 04.08 message, pdisc=5
20160809212238175 DMM <0002> gsm_04_08.c:987 <- CM SERVICE REQUEST serv_type=0x01 MI(TMSI)=2191222
410
20160809212238183 DMM <0002> gsm_04_08_utils.c:681 -> CM SERVICE ACK
20160809212238500 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 DATA INDICATION
20160809212239700 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 DATA INDICATION
20160809212239700 DRR <0003> bsc_api.c:647 BSC: Passing unknown 04.08 RR message type 0x60 to MSC
20160809212239700 DRLL <0000> gsm_04_08.c:3667 Dispatching 04.08 message, pdisc=6
20160809212239700 DRR <0003> gsm_04_08.c:1281 MSC: Unimplemented GSM 04.08 RR msg type 0x60
20160809212239972 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 DATA INDICATION
20160809212240213 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 DATA INDICATION
20160809212240213 DRLL <0000> gsm_04_08.c:3667 Dispatching 04.08 message, pdisc=3
20160809212240214 DMSC <000a> bsc_api.c:402 Sending ChanModify for speech: SPEECH_V1 on channel TC
H_H
20160809212240215 DMM <0002> gsm_subscriber.c:176 Subscriber 901990000000038 not paged yet.
20160809212240938 DRLL <0000> abis_rsl.c:1893 (bts=0,trx=0,ts=5,ss=0) SAPI=0 DATA INDICATION
20160809212240938 DRSL <0004> abis_rsl.c:2110 (bts=0,trx=0,ts=5,ss=0) IPAC_BIND speech_mode=0x13 R
TP_PAYLOAD=96
20160809212240938 DRSL <0004> abis_rsl.c:1453 (bts=0,trx=0,ts=5,ss=0) CHANNEL MODE MODIFY ACK
20160809212240977 DRSL <0004> abis_rsl.c:2290 (bts=0,trx=0,ts=5,ss=0) IPAC_CRCX_ACK LOCAL_IP=127.0
.0.1 LOCAL_PORT=23536 CON_ID=0
[1]
20160809212241451 DRLL <0000> chan_alloc.c:342 (bts=0,trx=0,ts=5,pchan=TCH/H) Allocating lchan=1 a
s TCH_H
20160809212241451 DRSL <0004> abis_rsl.c:1705 (bts=0,trx=0,ts=5,ss=1) Activating ARFCN(868) SS(1)
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lctype TCH_H r=PAGING ra=0x27 ta=2
20160809212241451 DRSL <0004> abis_rsl.c:539 (bts=0,trx=0,ts=5,pchan=TCH/H) Tx RSL Channel Activat
e with act_type=INITIAL
20160809212241451 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=5,ss=1) state NONE -> ACTIVATION REQ
UESTED
20160809212241451 DRSL <0004> abis_rsl.c:1434 (bts=0,trx=0,ts=5,ss=1) CHANNEL ACTIVATE ACK
20160809212241451 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=5,ss=1) state ACTIVATION REQUESTED -
> ACTIVE
[2]
20160809212243806 DRLL <0000> chan_alloc.c:342 (bts=0,trx=0,ts=6,pchan=TCH/H) Allocating lchan=0 a
s TCH_H
20160809212243806 DRSL <0004> abis_rsl.c:1705 (bts=0,trx=0,ts=6,ss=0) Activating ARFCN(868) SS(0)
lctype TCH_H r=PAGING ra=0x27 ta=2
20160809212243806 DRSL <0004> abis_rsl.c:539 (bts=0,trx=0,ts=6,pchan=TCH/H) Tx RSL Channel Activat
e with act_type=INITIAL
20160809212243806 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=6,ss=0) state NONE -> ACTIVATION REQ
UESTED
20160809212243806 DRSL <0004> abis_rsl.c:1434 (bts=0,trx=0,ts=6,ss=0) CHANNEL ACTIVATE ACK
20160809212243806 DRSL <0004> abis_rsl.c:1105 (bts=0,trx=0,ts=6,ss=0) state ACTIVATION REQUESTED -
> ACTIVE

```

So it seems TRX is not capable of using two lchans on one TCH/H timeslot.

#### Related issues:

Related to OsmoPCU - Bug #1524: PACCH on the wrong timeslot

Stalled

02/22/2016

#### History

##### #1 - 08/09/2016 07:36 PM - neels

- Description updated

##### #2 - 10/28/2016 01:40 PM - laforge

- Assignee set to msuraev

##### #3 - 11/18/2016 09:44 PM - laforge

- Target version set to osmo-bts-trx refresh

##### #4 - 11/18/2016 09:45 PM - laforge

##### #5 - 01/09/2017 02:30 PM - msuraev

- Related to Bug #1524: PACCH on the wrong timeslot added

##### #6 - 01/09/2017 02:30 PM - msuraev

Could be related to [#1524](#) where changing TS order makes a difference.

##### #7 - 02/08/2017 09:34 AM - msuraev

- Status changed from New to In Progress

##### #8 - 02/08/2017 04:04 PM - msuraev

- % Done changed from 0 to 10

Reproduced locally, the problem seems to be that despite repetitive paging (Rx RSL PAGING\_CMD) osmo-bts-trx never receive back established indication (Fwd RLL msg EST\_IND from LAPDm to A-bis) from phone if assignment was on the same TS. Why this happens is unclear yet.

At the bts side there are multitude of errors like:

```

<0006> gsm0503_coding.c:1848 tch_fr_decode(): error checking CRC8 for an HR frame
<0006> scheduler_trx.c:1278 Received bad TCH frame ending at fn=641452 for TCH/H(0)
<0006> gsm0503_coding.c:1848 tch_fr_decode(): error checking CRC8 for an HR frame
<0006> scheduler_trx.c:1278 Received bad TCH frame ending at fn=641530 for TCH/H(0)
<0006> gsm0503_coding.c:1826 tch_hr_decode(): error decoding FACCH frame (158/456 bits)
<0006> scheduler_trx.c:1278 Received bad TCH frame ending at fn=641534 for TCH/H(0)
<0006> gsm0503_coding.c:1848 tch_fr_decode(): error checking CRC8 for an HR frame
<0006> scheduler_trx.c:1278 Received bad TCH frame ending at fn=641539 for TCH/H(0)

```

<0006> gsm0503\_coding.c:1826 tch\_hr\_decode(): error decoding FACCH frame (342/456 bits)

Also, sometimes, call just fails instead of being established on different TS - can't reproduce this reliably yet though.

**#9 - 02/27/2017 11:55 AM - msuraev**

- Status changed from In Progress to Stalled

**#10 - 03/12/2017 03:23 AM - fixeria**

Hi Max,

I just tested the configuration with only one TCH/H channel on both UmTRX SDR (through OsmoTRX) and CalypsoBTS (two OsmocomBB phones acting as BTS). In short, both lchans of TCH/H work fine on CalypsoBTS, and I was able to make a call between two connected subscribers and hear the voice ;)

On OsmoTRX I am getting similar problem as you mentioned above. The only difference is that I have configured only one TCH/H and disabled others.

CalypsoBTS call log output:

```
<0000> chan_alloc.c:352 (bts=0,trx=0,ts=1,pchan=TCH/H) Allocating lchan=0 as TCH_H
<0004> abis_rsl.c:1822 (bts=0,trx=0,ts=1,ss=0) Activating ARFCN(103) SS(0) lctype TCH_H r=CALL ra=0x4d ta=1
<0004> abis_rsl.c:578 (bts=0,trx=0,ts=1,pchan=TCH/H) Tx RSL Channel Activate with act_type=INITIAL
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=0) state NONE -> ACTIVATION REQUESTED
<0004> abis_rsl.c:1545 (bts=0,trx=0,ts=1,ss=0) CHANNEL ACTIVATE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=0) state ACTIVATION REQUESTED -> ACTIVE
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 ESTABLISH INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=5
<0002> gsm_04_08.c:998 <- CM SERVICE REQUEST serv_type=0x01 MI (TMSI)=3752106384
<0002> gsm_04_08_utils.c:650 -> CM SERVICE ACK
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0003> bsc_api.c:593 GPRS SUSPENSION REQUEST
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 8 sub 41700) Received 'SETUP' from MS in state 0 (NULL)
<0001> gsm_04_08.c:3882 Unknown transaction ID 8, creating new trans.
<0001> transaction.c:71 subscr=0xe07990, net=0xcc3cd0
<0001> gsm_04_08.c:1605 new state NULL -> INITIATED
<0001> gsm_04_08.c:2285 Subscriber XXXXXXXXXXXXXXXX (41700) sends SETUP to 900
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 8 sub 41700) Sending 'MNCC_SETUP_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 08 sub 41700) Received 'MNCC_LCHAN_MODIFY' from MNCC in state 1 (
INITIATED)
<000a> bsc_api.c:404 Sending (bts=0,trx=0,ts=1,ss=0) ChanModify for speech: SPEECH_AMR on channel TCH_H
<0003> gsm_04_08_utils.c:500 -> CHANNEL MODE MODIFY mode=0x41
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 08 sub 41700) Received 'MNCC_CALL_PROC_REQ' from MNCC in state 1 (
INITIATED)
<0001> gsm_04_08.c:1605 new state INITIATED -> MO_CALL_PROC
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 80) Sending 'CALL_PROC' to MS.
<0001> gsm_04_08.c:2049 queue tch_recv_mncc request (1)
<0001> transaction.c:71 subscr=0xe222a0, net=0xcc3cd0
<0002> gsm_subscriber.c:190 Subscriber YYYYYYYYYYYYYY not paged yet.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0003> gsm_04_08_utils.c:525 CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2229 (bts=0,trx=0,ts=1,ss=0) IPAC_BIND speech_mode=0x15 RTP_PAYLOAD=98
<0003> osmo_msc.c:76 MSC assign complete (do nothing).
<0004> abis_rsl.c:1566 (bts=0,trx=0,ts=1,ss=0) CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2410 (bts=0,trx=0,ts=1,ss=0) IPAC_CRCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=25704 CON_ID=0 <000
1> gsm_04_08.c:1880 pending tch_re
cv_mncc request
<0004> abis_rsl.c:2268 (bts=0,trx=0,ts=1,ss=0) IPAC_MDCX IP=127.0.0.1 PORT=30002 RTP_PAYLOAD=98 RTP_PAYLOAD2=0
CONN_ID=0 speech_mode=0x05
<0004> abis_rsl.c:2420 (bts=0,trx=0,ts=1,ss=0) IPAC_MDCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=25704 CON_ID=0

<0000> chan_alloc.c:352 (bts=0,trx=0,ts=1,pchan=TCH/H) Allocating lchan=1 as TCH_H
<0004> abis_rsl.c:1822 (bts=0,trx=0,ts=1,ss=1) Activating ARFCN(103) SS(1) lctype TCH_H r=PAGING ra=0x20 ta=1
<0004> abis_rsl.c:578 (bts=0,trx=0,ts=1,pchan=TCH/H) Tx RSL Channel Activate with act_type=INITIAL
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=1) state NONE -> ACTIVATION REQUESTED
<0004> abis_rsl.c:1545 (bts=0,trx=0,ts=1,ss=1) CHANNEL ACTIVATE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=1) state ACTIVATION REQUESTED -> ACTIVE
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<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 ESTABLISH INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=6
<0003> gsm_04_08.c:1444 PAGING RESPONSE: MI(TMSI)=872893893
<0003> gsm_04_08.c:1477 <- Channel was requested by YYYYYYYYYYYYYYYY
<0001> gsm_04_08.c:1737 Paging subscr 900 succeeded!
<0001> gsm_04_08.c:2208 starting timer T303 with 30 seconds
<0001> gsm_04_08.c:1605 new state NULL -> CALL_PRESENT
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 00) Sending 'SETUP' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 0 sub 900) Received 'CALL_CONF' from MS in state 6 (CALL_PRESENT)
<0001> gsm_04_08.c:1647 stopping pending timer T303
<0001> gsm_04_08.c:2208 starting timer T310 with 180 seconds
<0001> gsm_04_08.c:1605 new state CALL_PRESENT -> MO_TERM_CALL_CONF
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 0 sub 900) Sending 'MNCC_CALL_CONF_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 00 sub 900) Received 'MNCC_LCHAN_MODIFY' from MNCC in state 9 (MO_TERM_CALL_CONF)
<000a> bsc_api.c:404 Sending (bts=0,trx=0,ts=1,ss=1) ChanModify for speech: SPEECH_AMR on channel TCH_H
<0003> gsm_04_08_utils.c:500 -> CHANNEL MODE MODIFY mode=0x41
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 DATA INDICATION
<0003> gsm_04_08_utils.c:525 CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2229 (bts=0,trx=0,ts=1,ss=1) IPAC_BIND speech_mode=0x15 RTP_PAYLOAD=98
<0003> osmo_msc.c:76 MSC assign complete (do nothing).
<0004> abis_rsl.c:1566 (bts=0,trx=0,ts=1,ss=1) CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2410 (bts=0,trx=0,ts=1,ss=1) IPAC_CRCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=17656 CON_ID=0
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 0 sub 900) Received 'ALERTING' from MS in state 9 (MO_TERM_CALL_C
ONF)
<0001> gsm_04_08.c:1647 stopping pending timer T310
<0001> gsm_04_08.c:2208 starting timer T301 with 180 seconds
<0001> gsm_04_08.c:1605 new state MO_TERM_CALL_CONF -> CALL_RECEIVED
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 0 sub 900) Sending 'MNCC_ALERT_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 08 sub 41700) Received 'MNCC_ALERT_REQ' from MNCC in state 3 (MO_
CALL_PROC)
<0001> gsm_04_08.c:1605 new state MO_CALL_PROC -> CALL_DELIVERED
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 80) Sending 'ALERTING' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 0 sub 900) Received 'CONNECT' from MS in state 7 (CALL_RECEIVED)
<0001> gsm_04_08.c:1647 stopping pending timer T301
<0001> gsm_04_08.c:1605 new state CALL_RECEIVED -> CONNECT_REQUEST
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 0 sub 900) Sending 'MNCC_SETUP_CNF' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 00 sub 900) Received 'MNCC_SETUP_COMPL_REQ' from MNCC in state 8
(CONNECT_REQUEST)
<0001> gsm_04_08.c:1605 new state CONNECT_REQUEST -> ACTIVE
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 00) Sending 'CONNECT_ACK' to MS.
<0004> abis_rsl.c:2268 (bts=0,trx=0,ts=1,ss=1) IPAC_MDCX IP=127.0.0.1 PORT=30004 RTP_PAYLOAD=98 RTP_PAYLOAD2=0
CONN_ID=0 speech_mode=0x05
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 08 sub 41700) Received 'MNCC_SETUP_RSP' from MNCC in state 4 (CAL
L_DELIVERED)
<0001> gsm_04_08.c:2208 starting timer T313 with 30 seconds
<0001> gsm_04_08.c:1605 new state CALL_DELIVERED -> CONNECT_IND
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 80) Sending 'CONNECT' to MS.
<0004> abis_rsl.c:2420 (bts=0,trx=0,ts=1,ss=1) IPAC_MDCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=17656 CON_ID=0
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 8 sub 41700) Received 'CONNECT_ACK' from MS in state 28 (CONNECT_
IND)
<0001> gsm_04_08.c:1647 stopping pending timer T313
<0001> gsm_04_08.c:1605 new state CONNECT_IND -> ACTIVE
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 8 sub 41700) Sending 'MNCC_SETUP_COMPL_IND' to MNCC.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 8 sub 41700) Received 'DISCONNECT' from MS in state 10 (ACTIVE)
<0001> gsm_04_08.c:1605 new state ACTIVE -> DISCONNECT_IND
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 8 sub 41700) Sending 'MNCC_DISC_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 08 sub 41700) Received 'MNCC_REL_REQ' from MNCC in state 12 (DISC
ONNECT_IND)
<0001> gsm_04_08.c:2208 starting timer T308 with 10 seconds
<0001> gsm_04_08.c:1605 new state DISCONNECT_IND -> RELEASE_REQ
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 80) Sending 'RELEASE' to MS.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 1 ti 00 sub 900) Received 'MNCC_DISC_REQ' from MNCC in state 10 (ACTIV
E)
<0001> gsm_04_08.c:2208 starting timer T306 with 30 seconds

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<0001> gsm_04_08.c:1605 new state ACTIVE -> DISCONNECT_IND
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 00) Sending 'DISCONNECT' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 8 sub 41700) Received 'RELEASE_COMPL' from MS in state 19 (RELEASE_REQ)
<0001> gsm_04_08.c:1647 stopping pending timer T308
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 8 sub 41700) Sending 'MNCC_REL_CNF' to MNCC.
<0001> gsm_04_08.c:1605 new state RELEASE_REQ -> NULL
<0000> chan_alloc.c:486 (bts=0,trx=0,ts=1,ss=0) starting release sequence
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=0) state ACTIVE -> RELEASE REQUESTED
<0003> gsm_04_08_utils.c:239 Sending Channel Release: Chan: Number: 0 Type: 3
<0004> abis_rsl.c:760 (bts=0,trx=0,ts=1,ss=0) DEACTivate SACCH CMD
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=0) SAPI=0 RELEASE INDICATION
<0004> abis_rsl.c:1673 (bts=0,trx=0,ts=1,ss=0) T3111 expired: releasing RF Channel
<0004> abis_rsl.c:852 (bts=0,trx=0,ts=1,ss=0) RF Channel Release
<0004> abis_rsl.c:2429 (bts=0,trx=0,ts=1,ss=0) IPAC_DLCX_IND
<0004> abis_rsl.c:923 (bts=0,trx=0,ts=1,ss=0) RF CHANNEL RELEASE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=0) state RELEASE REQUESTED -> NONE
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 1 ti 0 sub 900) Received 'RELEASE' from MS in state 12 (DISCONNECT_IND)
)
<0001> gsm_04_08.c:1647 stopping pending timer T306
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 1 ti 00) Sending 'RELEASE_COMPL' to MS.
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 1 ti 0 sub 900) Sending 'MNCC_REL_IND' to MNCC.
<0001> gsm_04_08.c:1605 new state DISCONNECT_IND -> NULL
<0000> chan_alloc.c:486 (bts=0,trx=0,ts=1,ss=1) starting release sequence
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=1) state ACTIVE -> RELEASE REQUESTED
<0003> gsm_04_08_utils.c:239 Sending Channel Release: Chan: Number: 1 Type: 3
<0004> abis_rsl.c:760 (bts=0,trx=0,ts=1,ss=1) DEACTivate SACCH CMD
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=1,ss=1) SAPI=0 RELEASE INDICATION
<0004> abis_rsl.c:1673 (bts=0,trx=0,ts=1,ss=1) T3111 expired: releasing RF Channel
<0004> abis_rsl.c:852 (bts=0,trx=0,ts=1,ss=1) RF Channel Release
<0004> abis_rsl.c:2429 (bts=0,trx=0,ts=1,ss=1) IPAC_DLCX_IND
<0004> abis_rsl.c:923 (bts=0,trx=0,ts=1,ss=1) RF CHANNEL RELEASE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=1,ss=1) state RELEASE REQUESTED -> NONE

```

#### #11 - 03/15/2017 12:44 PM - msuraev

fixeria wrote:

In short, both lchans of TCH/H work fine on CalypsoBTS, and I was able to make a call between two connected subscribers and hear the voice ;)

Curious, could you share more details on your calypsoBTS setup - configs, branches etc? If I understand this correctly, the only difference in this setup is replacement of osmo-trx with transceiver app from OsmocomBB. In this case the error is somewhere inside osmo-trx.

#### #12 - 03/21/2017 05:27 PM - fixeria

- File osmo-bts.cfg added
- File openbsc.cfg added
- File bad\_tch\_umtrx.pcap.gz added
- File bad\_tch\_calypso.pcap.gz added
- File bad\_tch\_ms\_side.pcap.gz added

Max wrote:

Curious, could you share more details on your calypsoBTS setup - configs, branches etc?

Of course, sorry for late answer.

## CONFIGURATION

Both OpenBSC and OsmoBTS configuration files are attached to this message. In case of CalypsoBTS there are the following changes:

## diff osmo-bts.cfg

```
timing-advance-loop
- settsc
+ setbsic
gsmtap-sapi ccch
```

## diff openbsc.cfg

```
timeslot 1
- phys_chan_config SDCC8
+ phys_chan_config TCH/H
hopping enabled 0
```

## GIT INFO

All software was compiled from master.

libosmocore: b14caa0ab9c6b8b8671171a238ab70eb66cf5bbe  
libosmo-abis: beb10ef02a10d73537a97f6f21aad36664c9b266  
libosmo-netif: 5fd93e02f818aecfc73db66e8064858442122959  
libosmo-dsp: e82886ad0e13bb012e4a244df2ce6d84cd277763  
openbsc: 6d804b1a7e375213cb4b3e437c2b9b8c68872164  
osmo-bts: a1b891aab4a250ef12ed6c1cd2a331a272b4d65c  
osmo-trx: 2dee3e996e777b67aa3185f7456c041765f0d71f

sofia-sip-1.12.11  
libortp-dev 3.6.1-2.1build2  
libortp9:amd64 3.6.1-2.1build2  
libopencore-amrnb0:amd64 0.1.3-2ubuntu1  
libopencore-amrwb0:amd64 0.1.3-2ubuntu1

## OpenBSC and OsmoBTS log output

### UmTRX through OsmoTRX transceiver:

```
// Subscriber #1 initiates an outgoing call on TS2/SS0
<0000> chan_alloc.c:352 (bts=0,trx=0,ts=2,pchan=TCH/H) Allocating lchan=0 as TCH_H
<0004> abis_rsl.c:1822 (bts=0,trx=0,ts=2,ss=0) Activating ARFCN(103) SS(0) lctype TCH_H r=CALL ra=0x40 ta=1
<0004> abis_rsl.c:578 (bts=0,trx=0,ts=2,pchan=TCH/H) Tx RSL Channel Activate with act_type=INITIAL
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=0) state NONE -> ACTIVATION REQUESTED
<0004> abis_rsl.c:1545 (bts=0,trx=0,ts=2,ss=0) CHANNEL ACTIVATE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=0) state ACTIVATION REQUESTED -> ACTIVE
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 ESTABLISH INDICATION

<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=5
<0002> gsm_04_08.c:998 <- CM SERVICE REQUEST serv_type=0x01 MI (TMSI)=3451168378
<0002> gsm_04_08_utils.c:650 -> CM SERVICE ACK
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0003> bsc_api.c:593 GPRS SUSPENSION REQUEST
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 2 ti 8 sub 41700) Received 'SETUP' from MS in state 0 (NULL)
<0001> gsm_04_08.c:3882 Unknown transaction ID 8, creating new trans.
<0001> transaction.c:71 subscr=0x1b79bc0, net=0x1a1abcd0
<0001> gsm_04_08.c:1605 new state NULL -> INITIATED
<0001> gsm_04_08.c:2285 Subscriber XXXXXXXXXXXXXXXX (41700) sends SETUP to 900
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 2 ti 8 sub 41700) Sending 'MNCC_SETUP_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 2 ti 08 sub 41700) Received 'MNCC_LCHAN_MODIFY' from MNCC in state 1 (
INITIATED)
<000a> bsc_api.c:404 Sending (bts=0,trx=0,ts=2,ss=0) ChanModify for speech: SPEECH_AMR on channel TCH_H
<0003> gsm_04_08_utils.c:500 -> CHANNEL MODE MODIFY mode=0x41
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 2 ti 08 sub 41700) Received 'MNCC_CALL_PROC_REQ' from MNCC in state 1
(INITIATED)
<0001> gsm_04_08.c:1605 new state INITIATED -> MO_CALL_PROC
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 2 ti 80) Sending 'CALL_PROC' to MS.
<0001> gsm_04_08.c:2049 queue tch_recv_mncc request (1)
<0001> transaction.c:71 subscr=0x1b5c370, net=0x1a1abcd0
<0002> gsm_subscriber.c:190 Subscriber YYYYYYYYYYYYYY not paged yet.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0003> gsm_04_08_utils.c:525 CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2229 (bts=0,trx=0,ts=2,ss=0) IPAC_BIND speech_mode=0x15 RTP_PAYLOAD=98
```

```

<0003> osmo_msc.c:76 MSC assign complete (do nothing).
<0004> abis_rsl.c:1566 (bts=0,trx=0,ts=2,ss=0) CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2410 (bts=0,trx=0,ts=2,ss=0) IPAC_CRCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=17674 CON_ID=0
<0001> gsm_04_08.c:1880 pending tch_recv_mncc request
<0004> abis_rsl.c:2268 (bts=0,trx=0,ts=2,ss=0) IPAC_MDCX IP=127.0.0.1 PORT=30000 RTP_PAYLOAD=98 RTP_PAYLOAD2=0
CONN_ID=0 speech_mode=0x05
<0004> abis_rsl.c:2420 (bts=0,trx=0,ts=2,ss=0) IPAC_MDCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=17674 CON_ID=0

// The network allocates TS2/SS1 for subscriber #2
// NOTE: there is no "ESTABLISH INDICATION"
<0000> chan_alloc.c:352 (bts=0,trx=0,ts=2,pchan=TCH/H) Allocating lchan=1 as TCH_H
<0004> abis_rsl.c:1822 (bts=0,trx=0,ts=2,ss=1) Activating ARFCN(103) SS(1) lctype TCH_H r=PAGING ra=0x2b ta=1
<0004> abis_rsl.c:578 (bts=0,trx=0,ts=2,pchan=TCH/H) Tx RSL Channel Activate with act_type=INITIAL
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=1) state NONE -> ACTIVATION REQUESTED
<0004> abis_rsl.c:1545 (bts=0,trx=0,ts=2,ss=1) CHANNEL ACTIVATE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=1) state ACTIVATION REQUESTED -> ACTIVE

// The network allocates TS3/SS0 for subscriber #2
<0000> chan_alloc.c:352 (bts=0,trx=0,ts=3,pchan=TCH/H) Allocating lchan=0 as TCH_H
<0004> abis_rsl.c:1822 (bts=0,trx=0,ts=3,ss=0) Activating ARFCN(103) SS(0) lctype TCH_H r=PAGING ra=0x24 ta=1
<0004> abis_rsl.c:578 (bts=0,trx=0,ts=3,pchan=TCH/H) Tx RSL Channel Activate with act_type=INITIAL
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=3,ss=0) state NONE -> ACTIVATION REQUESTED
<0004> abis_rsl.c:1545 (bts=0,trx=0,ts=3,ss=0) CHANNEL ACTIVATE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=3,ss=0) state ACTIVATION REQUESTED -> ACTIVE
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 ESTABLISH INDICATION

<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=6
<0003> gsm_04_08.c:1444 PAGING RESPONSE: MI(TMSI)=2229387159
<0003> gsm_04_08.c:1477 <- Channel was requested by YYYYYYYYYYYYYYYY
<0001> gsm_04_08.c:1737 Paging subscr 900 succeeded!
<0001> gsm_04_08.c:2208 starting timer T303 with 30 seconds
<0001> gsm_04_08.c:1605 new state NULL -> CALL_PRESENT
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 3 ti 00) Sending 'SETUP' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 3 ti 0 sub 900) Received 'CALL_CONF' from MS in state 6 (CALL_PRESENT)
<0001> gsm_04_08.c:1647 stopping pending timer T303
<0001> gsm_04_08.c:2208 starting timer T310 with 180 seconds
<0001> gsm_04_08.c:1605 new state CALL_PRESENT -> MO_TERM_CALL_CONF
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 3 ti 0 sub 900) Sending 'MNCC_CALL_CONF_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 3 ti 00 sub 900) Received 'MNCC_LCHAN_MODIFY' from MNCC in state 9 (MO_TERM_CALL_CONF)
<000a> bsc_api.c:404 Sending (bts=0,trx=0,ts=3,ss=0) ChanModify for speech: SPEECH_AMR on channel TCH_H
<0003> gsm_04_08_utils.c:500 -> CHANNEL MODE MODIFY mode=0x41
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 DATA INDICATION
<0003> gsm_04_08_utils.c:525 CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2229 (bts=0,trx=0,ts=3,ss=0) IPAC_BIND speech_mode=0x15 RTP_PAYLOAD=98
<0003> osmo_msc.c:76 MSC assign complete (do nothing).
<0004> abis_rsl.c:1566 (bts=0,trx=0,ts=3,ss=0) CHANNEL MODE MODIFY ACK
<0004> abis_rsl.c:2410 (bts=0,trx=0,ts=3,ss=0) IPAC_CRCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=48012 CON_ID=0
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 3 ti 0 sub 900) Received 'ALERTING' from MS in state 9 (MO_TERM_CALL_C
ONF)
<0001> gsm_04_08.c:1647 stopping pending timer T310
<0001> gsm_04_08.c:2208 starting timer T301 with 180 seconds
<0001> gsm_04_08.c:1605 new state MO_TERM_CALL_CONF -> CALL_RECEIVED
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 3 ti 0 sub 900) Sending 'MNCC_ALERT_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 2 ti 08 sub 41700) Received 'MNCC_ALERT_REQ' from MNCC in state 3 (MO_
CALL_PROC)
<0001> gsm_04_08.c:1605 new state MO_CALL_PROC -> CALL_DELIVERED
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 2 ti 80) Sending 'ALERTING' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 3 ti 0 sub 900) Received 'CONNECT' from MS in state 7 (CALL_RECEIVED)
<0001> gsm_04_08.c:1647 stopping pending timer T301
<0001> gsm_04_08.c:1605 new state CALL_RECEIVED -> CONNECT_REQUEST
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 3 ti 0 sub 900) Sending 'MNCC_SETUP_CNF' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 3 ti 00 sub 900) Received 'MNCC_SETUP_COMPL_REQ' from MNCC in state 8
(CONNECT_REQUEST)
<0001> gsm_04_08.c:1605 new state CONNECT_REQUEST -> ACTIVE
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 3 ti 00) Sending 'CONNECT_ACK' to MS.
<0004> abis_rsl.c:2268 (bts=0,trx=0,ts=3,ss=0) IPAC_MDCX IP=127.0.0.1 PORT=30002 RTP_PAYLOAD=98 RTP_PAYLOAD2=0
CONN_ID=0 speech_mode=0x05
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 2 ti 08 sub 41700) Received 'MNCC_SETUP_RSP' from MNCC in state 4 (CAL

```

```

L_DELIVERED)
<0001> gsm_04_08.c:2208 starting timer T313 with 30 seconds
<0001> gsm_04_08.c:1605 new state CALL_DELIVERED -> CONNECT_IND
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 2 ti 80) Sending 'CONNECT' to MS.
<0004> abis_rsl.c:2420 (bts=0,trx=0,ts=3,ss=0) IPAC_MDCX_ACK LOCAL_IP=127.0.0.1 LOCAL_PORT=48012 CON_ID=0
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 2 ti 8 sub 41700) Received 'CONNECT_ACK' from MS in state 28 (CONNECT_
IND)
<0001> gsm_04_08.c:1647 stopping pending timer T313
<0001> gsm_04_08.c:1605 new state CONNECT_IND -> ACTIVE
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 2 ti 8 sub 41700) Sending 'MNCC_SETUP_COMPL_IND' to MNCC.

// Paging Response wasn't received on TS2/SS1, so T3101 expired
<0004> abis_rsl.c:1663 (bts=0,trx=0,ts=2,ss=1) T3101 expired: no response to IMMEDIATE ASSIGN
<0004> abis_rsl.c:850 (bts=0,trx=0,ts=2,ss=1) RF Channel Release due to error: 1
<0004> abis_rsl.c:760 (bts=0,trx=0,ts=2,ss=1) DEACTivate SACCH CMD
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=1) state ACTIVE -> RELEASE DUE ERROR
<0004> abis_rsl.c:923 (bts=0,trx=0,ts=2,ss=1) RF CHANNEL RELEASE ACK
<0004> abis_rsl.c:809 (bts=0,trx=0,ts=2,ss=1) is back in operation.
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=1) state RELEASE DUE ERROR -> NONE

<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 2 ti 8 sub 41700) Received 'DISCONNECT' from MS in state 10 (ACTIVE)
<0001> gsm_04_08.c:1605 new state ACTIVE -> DISCONNECT_IND
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 2 ti 8 sub 41700) Sending 'MNCC_DISC_IND' to MNCC.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 2 ti 08 sub 41700) Received 'MNCC_REL_REQ' from MNCC in state 12 (DISC
ONNECT_IND)
<0001> gsm_04_08.c:2208 starting timer T308 with 10 seconds
<0001> gsm_04_08.c:1605 new state DISCONNECT_IND -> RELEASE_REQ
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 2 ti 80) Sending 'RELEASE' to MS.
<0001> gsm_04_08.c:3779 (bts 0 trx 0 ts 3 ti 00 sub 900) Received 'MNCC_DISC_REQ' from MNCC in state 10 (ACTIV
E)
<0001> gsm_04_08.c:2208 starting timer T306 with 30 seconds
<0001> gsm_04_08.c:1605 new state ACTIVE -> DISCONNECT_IND
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 3 ti 00) Sending 'DISCONNECT' to MS.
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 2 ti 8 sub 41700) Received 'RELEASE_COMPL' from MS in state 19 (RELEAS
E_REQ)
<0001> gsm_04_08.c:1647 stopping pending timer T308
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 2 ti 8 sub 41700) Sending 'MNCC_REL_CNF' to MNCC.
<0001> gsm_04_08.c:1605 new state RELEASE_REQ -> NULL
<0000> chan_alloc.c:486 (bts=0,trx=0,ts=2,ss=0) starting release sequence
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=0) state ACTIVE -> RELEASE REQUESTED
<0003> gsm_04_08_utils.c:239 Sending Channel Release: Chan: Number: 0 Type: 3
<0004> abis_rsl.c:760 (bts=0,trx=0,ts=2,ss=0) DEACTivate SACCH CMD
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=2,ss=0) SAPI=0 RELEASE INDICATION
<0004> abis_rsl.c:1673 (bts=0,trx=0,ts=2,ss=0) T3111 expired: releasing RF Channel
<0004> abis_rsl.c:852 (bts=0,trx=0,ts=2,ss=0) RF Channel Release
<0004> abis_rsl.c:2429 (bts=0,trx=0,ts=2,ss=0) IPAC_DLCX_IND
<0004> abis_rsl.c:923 (bts=0,trx=0,ts=2,ss=0) RF CHANNEL RELEASE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=2,ss=0) state RELEASE REQUESTED -> NONE
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 DATA INDICATION
<0000> gsm_04_08.c:3983 Dispatching 04.08 message, pdisc=3
<0001> gsm_04_08.c:3877 (bts 0 trx 0 ts 3 ti 0 sub 900) Received 'RELEASE' from MS in state 12 (DISCONNECT_IND
)
<0001> gsm_04_08.c:1647 stopping pending timer T306
<0001> gsm_04_08.c:143 (bts 0 trx 0 ts 3 ti 00) Sending 'RELEASE_COMPL' to MS.
<0001> gsm_04_08.c:1667 (bts 0 trx 0 ts 3 ti 0 sub 900) Sending 'MNCC_REL_IND' to MNCC.
<0001> gsm_04_08.c:1605 new state DISCONNECT_IND -> NULL
<0000> chan_alloc.c:486 (bts=0,trx=0,ts=3,ss=0) starting release sequence
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=3,ss=0) state ACTIVE -> RELEASE REQUESTED
<0003> gsm_04_08_utils.c:239 Sending Channel Release: Chan: Number: 0 Type: 3
<0004> abis_rsl.c:760 (bts=0,trx=0,ts=3,ss=0) DEACTivate SACCH CMD
<0004> abis_rsl.c:1389 (bts=0,trx=0,ts=3,ss=0): MEAS RES for inactive channel
<0006> gsm_04_08.c:3595 TCH frame for non-existing trans
<0000> abis_rsl.c:2012 (bts=0,trx=0,ts=3,ss=0) SAPI=0 RELEASE INDICATION
<0004> abis_rsl.c:1673 (bts=0,trx=0,ts=3,ss=0) T3111 expired: releasing RF Channel
<0004> abis_rsl.c:852 (bts=0,trx=0,ts=3,ss=0) RF Channel Release
<0004> abis_rsl.c:2429 (bts=0,trx=0,ts=3,ss=0) IPAC_DLCX_IND
<0004> abis_rsl.c:923 (bts=0,trx=0,ts=3,ss=0) RF CHANNEL RELEASE ACK
<0004> abis_rsl.c:1188 (bts=0,trx=0,ts=3,ss=0) state RELEASE REQUESTED -> NONE

```



## Another look from another side

Now let's have a look, what's happening on MS side.  
Both subscribers were registered in the test network:

- Subscriber #1 - regular phone (initiates call)
  - Subscriber #2 - OsmocomBB mobile application (accepts call)
1. Subscriber #1 requests a channel (sending RACH)
  2. Network allocates a new channel on TS2/SS0 as TCH/H and sends an IMM ASS
  3. Subscriber #1 switches to TS2/SS0 and requests the voice call service to #2
  4. Network periodically sends Paging Request to subscriber #2
  5. Subscriber #2 sees the Paging Request and requests a new channel (sending RACH)
  6. Network allocates a new channel on TS2/SS1 and sends an IMM ASS
  7. Subscriber #2 switches to TS2/SS1, and sends Paging Response
  8. BUT! Network doesn't response to the Paging Response, and still sends Paging Requests...
  9. Subscriber #2 switches back to CCCH TS0, because some timer getting expired
  10. Subscriber #2 still sees Paging Requests, and requests a new channel (sending RACH)
  11. Network allocates a new channel on TS3/SS0 and sends an IMM ASS
  12. Subscriber #2 switches to TS3/SS0, and sends Paging Response
  13. Now the network handles the Paging Response and the phone is rings
  14. Meanwhile, T3101 expires for TS2/SS1 because Paging Response wasn't reached the BSC
  15. Network deactivates TS2/SS1

So, the problem is that the OsmoTRX based network doesn't handle incoming data on the second lchan.  
Please also see some network captures attached.

### #13 - 03/22/2017 09:24 AM - fixeria

- Status changed from Stalled to In Progress
- Priority changed from Normal to High
- % Done changed from 10 to 90

Dear Max,

I just managed to make both lchans of a single TS work.  
The problem is that OsmoBTS sends the "SETSLOT N 2" instead of "SETSLOT N 3".  
Please see <http://git.osmocom.org/osmo-trx/tree/Transceiver52M/Transceiver.h#n125>

In case of ChannelCombination II, OsmoTRX ignores UL data on TSN/SS1, what we can clearly see in the MS side traffic dump. So, I did a simple hack in OsmoTRX source code, replacing 2 by 3, and the miracle happened ;)

Now we need to figure out, is it a bug of OsmoTRX or OsmoBTS.

### #14 - 03/22/2017 11:22 AM - neels

fixeria wrote:

Now we need to figure out, is it a bug of OsmoTRX or OsmoBTS.

Excellent! Nice catch.

Take a look at [http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1\\_if.c#n47](http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1_if.c#n47)  
which sets TCH\_H to 2,  
which is assigned to slottype at [http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1\\_if.c#n431](http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1_if.c#n431)

Is the issue fixed when using 3 instead of 2 in transceiver\_chan\_types[]?

Should it use two or three dynamically, depending on how many lchans are in use?

(Besides, there should not be magic numbers in that transceiver\_chan\_types array, we should probably use defined constants instead ... somehow.)

### #15 - 03/22/2017 12:46 PM - fixeria

Neels wrote:

Take a look at [http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1\\_if.c#n47](http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1_if.c#n47)

which sets TCH\_H to 2,  
which is assigned to slottype at [http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1\\_if.c#n431](http://git.osmocom.org/osmo-bts/tree/src/osmo-bts-trx/l1_if.c#n431)

Thanks, exactly what I was looking for.

Is the issue fixed when using 3 instead of 2 in `transceiver_chan_types[]`?

Yes, but I did the hack on the OsmoTRX side. So, let me some time to try with OsmoBTS.

Should it use two or three dynamically, depending on how many lchans are in use?

Good question. What kind of difference between TCH/F and TCH/H in II the mode?

Regarding to the way of resolving this issue: I suggest to change the hardcoded magic number to the III. What do you think?

#### #16 - 03/22/2017 05:39 PM - ipse

Ok, I'm glad that my suggestion about channel types on osmo-trx has worked out.

For the reference, a full list of channel combination types is in GSM 05.02 section "6.4.1 Permitted channel combinations onto a basic physical channel": [http://www.qtc.jp/3GPP/Specs/GSM\\_GERAN/0502-8b0.pdf](http://www.qtc.jp/3GPP/Specs/GSM_GERAN/0502-8b0.pdf)

It clearly states that channel combination II is only for one TCH/H channel and combination III is two TCH/H channels, osmo-trx behavior is correct and it's osmo-bts which should be fixed:

- ii) TCH/H(0,1) + FACCH/H(0,1) + SACCH/TH
- iii) TCH/H(0,0) + FACCH/H(0,1) + SACCH/TH + TCH/H(1,1)

That said, you should test with a Calypso based setup first to make sure Calypso will accept channel combination III just as it works with channel combination II right now. Otherwise we'll have to somehow distinguish between Calypso and a proper SDR based osmo-trx.

The reason for combination II is that it saves a bit of CPU by disabling Rx burst detection on SS1. Also when used on C1..n it *may* flag that transmission of downlink bursts on SS1 is turned off to reduce interference and save some power. That said, in the current implementation osmo-trx transmits only those bursts which are sent by osmo-bts, so the latter concern is not valid for osmo-trx - this should be handled by osmo-bts itself.

So ideally we should start with combination II when we have only one TCH/H call on a slot and dynamically switch to combination III when a second channel is allocated, or to channel combination XXIV when we want to use SS1 for PDTCH/H. But changing to channel combination III will solve the issue in short terms (if we don't want to use PDTCH/H) in exchange to a slight increase of CPU usage in under-loaded situations.

That said, we should introduce much more dynamic channel switching between osmo-bts and osmo-trx, because right now all channels are configured on start and thus Rx burst detection is always active on all timeslots, which is far from optimal from CPU utilization perspective. We should probably create a separate ticket for that.

We also should add all 24 channel combinations to osmo-trx, because right now it supports only the first 13. Then these channel combinations should be also added to osmo-bts-trx which I believe lack those and thus lacks support for SMSCB for example. A separate ticket as well I assume.

#### #17 - 03/22/2017 07:07 PM - fixeria

Hi,

That said, you should test with a Calypso based setup first to make sure Calypso will accept channel combination III just as it works with channel combination II right now. Otherwise we'll have to somehow distinguish between Calypso and a proper SDR based osmo-trx.

Yeah, just tested - works fine as with II. Both SS0 and SS1 are available.

The reason for combination II is that it saves a bit of CPU by disabling Rx burst detection on SS1. Also when used on C1..n it may flag that transmission of downlink bursts on SS1 is turned off to reduce interference and save some power. That said, in the current implementation osmo-trx transmits only those bursts which are sent by osmo-bts, so the latter concern is not valid for osmo-trx - this should be handled by osmo-bts itself.

Great explanation, thanks!

My suggestion is to change the II to III for now, until dynamic II <-> III switching

is implemented. The patch is very simple and ready to be sent to the Gerrit.

**#18 - 03/22/2017 07:38 PM - ipse**

fixeria wrote:

My suggestion is to change the II to III for now, until dynamic II <-> III switching is implemented. The patch is very simple and ready to be sent to the Gerrit.

I agree that this is an ok fix for now.

If you have time - could you look at implementing all 24 specified combinations while you're at this code? And check that all existing combinations are implemented correctly. :)

**#19 - 03/23/2017 06:23 AM - fixeria**

- Status changed from In Progress to Closed
- Assignee changed from msuraev to fixeria
- % Done changed from 90 to 100
- Spec Reference set to [http://www.3gpp.org/Specs/3GPP/Specs/GSM\\_GERAN/0502-8b0.pdf](http://www.3gpp.org/Specs/3GPP/Specs/GSM_GERAN/0502-8b0.pdf)

<https://gerrit.osmocom.org/#/c/2160/>

**#20 - 03/23/2017 06:38 AM - fixeria**

If you have time - could you look at implementing all 24 specified combinations while you're at this code? And check that all existing combinations are implemented correctly.

I am not so good in the OsmoTRX source code, but I'll try :)

**Files**

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osmo-bts.cfg	717 Bytes	03/21/2017	fixeria
openbsc.cfg	3.41 KB	03/21/2017	fixeria
bad_tch_calypso.pcap.gz	3.55 KB	03/21/2017	fixeria
bad_tch_umtrx.pcap.gz	24.2 KB	03/21/2017	fixeria
bad_tch_ms_side.pcap.gz	11.2 KB	03/21/2017	fixeria