

# OsmoMSC - Bug #3859

## SGs FSM doesn't consider disconnected HLR

03/25/2019 04:30 PM - laforge

<b>Status:</b>	Resolved	<b>Start date:</b>	03/25/2019
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	dexter	<b>% Done:</b>	100%
<b>Category:</b>	SGs Interface		
<b>Target version:</b>			
<b>Resolution:</b>			

### Description

When having incoming SGs LU REQ from the MMS while no HLR is connected, we get:

```
<0011> sgs_server.c:185 SGs socket bound to r=NULL<->l=0.0.0.0:29118
Mon Mar 25 17:20:23 2019 DLSS7 <001e> osmo_ss7.c:1283 0: ASP Restart for server not implemented ye
t!
Mon Mar 25 17:20:23 2019 DMNCC <0004> msc_main.c:604 Using internal MNCC handler.
Mon Mar 25 17:20:23 2019 DLGLOBAL <0012> telnet_interface.c:104 Available via telnet 0.0.0.0 4254
Mon Mar 25 17:20:23 2019 DSMPP <000c> smpp_smsc.c:1012 SMPP at 0.0.0.0 2775
Mon Mar 25 17:20:23 2019 DLCTRL <0019> control_if.c:911 CTRL at 0.0.0.0 4255
Mon Mar 25 17:20:23 2019 DLSMS <0018> sms_queue.c:250 Attempting to send 20 SMS
Mon Mar 25 17:20:23 2019 DLSMS <0018> sms_queue.c:234 SMS queue: no SMS to be sent
Mon Mar 25 17:20:23 2019 DLSMS <0018> sms_queue.c:261 Sending SMS done (0 attempted)
Mon Mar 25 17:20:23 2019 DLSMS <0018> sms_queue.c:317 SMSqueue added 0 messages in 0 rounds
Mon Mar 25 17:20:23 2019 DLMGCP <0022> mgcp_client.c:716 MGCP client: using endpoint domain '@mgw'
Mon Mar 25 17:20:23 2019 DLMGCP <0022> mgcp_client.c:791 MGCP GW connection: r=127.0.0.1:2427<->l=
127.0.0.1:2727
Mon Mar 25 17:20:23 2019 DMSC <0006> msc_main.c:372 CS7 Instance identifiers: A = Iu = 0
Mon Mar 25 17:20:23 2019 DLSCCP <001f> sccp_user.c:397 OsmoMSC-A-Iu: Using SS7 instance 0, pc:0.23
.1
Mon Mar 25 17:20:23 2019 DLSCCP <001f> sccp_user.c:415 OsmoMSC-A-Iu: Using AS instance as-clnt-Osm
oMSC-A
Mon Mar 25 17:20:23 2019 DLSCCP <001f> sccp_user.c:420 OsmoMSC-A-Iu: Creating default route
Mon Mar 25 17:20:23 2019 DLSCCP <001f> sccp_user.c:476 OsmoMSC-A-Iu: Using ASP instance asp-clnt-O
smoMSC-A
Mon Mar 25 17:20:23 2019 DLSS7 <001e> osmo_ss7.c:471 0: Creating SCCP instance
Mon Mar 25 17:20:23 2019 DBSSAP <0010> a_iface.c:674 Initalizing SCCP connection to stp...
Mon Mar 25 17:20:27 2019 DSGS <0011> sgs_server.c:123 r=192.168.122.186:37270<->l=192.168.122.1:29
118: Accepted new SGs connection
Mon Mar 25 17:24:41 2019 DSGS <0011> fsm.c:320 SGs-VLR-RESET(262-42-8001-01)[0x55fda7c789d0]{unkno
wn 0}: Allocated
Mon Mar 25 17:24:41 2019 DSGS <0011> fsm.c:320 SGs-UE(num:0)[0x55fda7c760f0]{SGs-NULL}: Allocated
Mon Mar 25 17:24:41 2019 DSGS <0011> vlr_sgs_fsm.c:359 SGs-UE(num:0)[0x55fda7c760f0]{SGs-NULL}: st
ate_chg to SGs-NULL
Mon Mar 25 17:24:41 2019 DVLR <000e> vlr.c:438 set IMSI on subscriber; IMSI=262423203001508 id=262
423203001508
Mon Mar 25 17:24:41 2019 DVLR <000e> vlr.c:391 New subscr, IMSI: 262423203001508
Mon Mar 25 17:24:41 2019 DVLR <000e> vlr.c:438 set IMSI on subscriber; IMSI=262423203001508 id=262
423203001508
Mon Mar 25 17:24:41 2019 DSGS <0011> vlr_sgs.c:96 SGs-UE(num:0)[0x55fda7c760f0]{SGs-NULL}: Receive
d Event RX_LU_FROM_MME
Mon Mar 25 17:24:41 2019 DSGS <0011> vlr_sgs_fsm.c:55 SGs-UE(num:0)[0x55fda7c760f0]{SGs-NULL}: sta
te_chg to SGs-LA-UPDATE-PRESENT
Mon Mar 25 17:24:41 2019 DVLR <000e> gsm_04_08.c:1767 SUBSCR(IMSI=262423203001508:TMSInew-0x8611AE
A5) VLR: update for IMSI=262423203001508 (MSISDN=, used=1)
Mon Mar 25 17:24:41 2019 DVLR <000e> vlr.c:192 GSUP tx: 04010862423202031005f8280102
Mon Mar 25 17:24:41 2019 DLGSUP <001c> gsup_client.c:353 GSUP not connected, unable to send 04 01
08 62 42 32 02 03 10 05 f8 28 01 02
Mon Mar 25 17:24:41 2019 DSGS <0011> vlr_sgs_fsm.c:65 SGs-UE(num:0)[0x55fda7c760f0]{SGs-LA-UPDATE-
PRESENT}: (sub IMSI=262423203001508:TMSInew-0x8611AEA5) HLR LU request failed
Mon Mar 25 17:24:55 2019 DVLR <000e> vlr.c:438 set IMSI on subscriber; IMSI=262423203001508 id=262
```

423203001508

```
Mon Mar 25 17:24:55 2019 DSGS <0011> vlr_sgs.c:96 SGs-UE(num:0) [0x55fda7c760f0] {SGs-LA-UPDATE-PRES  
ENT}: Received Event RX_LU_FROM_MME
```

```
Mon Mar 25 17:24:55 2019 DSGS <0011> vlr_sgs.c:96 SGs-UE(num:0) [0x55fda7c760f0] {SGs-LA-UPDATE-PRES  
ENT}: Event RX_LU_FROM_MME not permitted
```

Even after many minutes, there is no timeout or any other visible recovery. We have to consider such cases as the HLR might always be unreachable at least temporarily. What does the spec say? Shouldn't we return something at all to the MME in this case?

## History

### #1 - 03/25/2019 04:32 PM - laforge

What makes the problem ven worse: If the HLR is later recovered and the MME is sending another LU REQ, we get:

```
Mon Mar 25 17:31:03 2019 DSGS <0011> vlr_sgs.c:96 SGs-UE(num:0) [0x55fda7c760f0] {SGs-LA-UPDATE-PRESENT}: Receiv  
ed Event RX_LU_FROM_MME
```

```
Mon Mar 25 17:31:03 2019 DSGS <0011> vlr_sgs.c:96 SGs-UE(num:0) [0x55fda7c760f0] {SGs-LA-UPDATE-PRESENT}: Event  
RX_LU_FROM_MME not permitted
```

so a temporary HLR outage will break CSFB for an apparently indefinite time :/

### #2 - 04/03/2019 04:09 PM - dexter

- Status changed from New to In Progress

- % Done changed from 0 to 30

I found a way to reproduce the problem above using TTCN3. I also investigated the spec and found out that we are supposed to send an SGsAP-RESET-INDICATION to the MME in those cases. (see also: 3GPP TS 29.118 5.7 VLR failure procedure).

I have some code ready that triggers the sending of an SGsAP-RESET-INDICATION when the HLR (VLR) fails. This works so far. We now need a TTCN3 test that responds to the SGsAP-RESET-INDICATION properly.

### #3 - 04/09/2019 03:47 PM - dexter

- % Done changed from 30 to 90

There is now a TTCN3 test that provokes the problem. See the following patches:

<https://gerrit.osmocom.org/#/c/osmo-ttcn3-hacks/+13556> SGsAP\_Templates: Remove invalid template.

<https://gerrit.osmocom.org/#/c/osmo-ttcn3-hacks/+13557> MSC\_Tests: allow disabeling GSUP

<https://gerrit.osmocom.org/#/c/osmo-ttcn3-hacks/+13558> MSC\_Tests: Add testcase to simulate VLR/HLR failure (SGsAP)

There are several problems in the MSC. On the one side the code in the VLR did not report the failure back to the SGs related code in the msc. I have added a flag so that the actual msc code gets aware of the failure. When the flag is set, the reset procedure is carried out. This works well on the TTCN3 test so far.

<https://gerrit.osmocom.org/#/c/osmo-msc/+13559> sgs\_iface: detect and react to VLR/HLR failure

### #4 - 04/23/2019 11:51 AM - dexter

The patches that add the TTCN3 tests are all merged. The MSC part still needs some review:

<https://gerrit.osmocom.org/#/c/osmo-msc/+13559> sgs\_iface: detect and react to VLR/HLR failure

### #5 - 05/27/2019 01:27 PM - laforge

- Status changed from In Progress to Resolved

- % Done changed from 90 to 100

patch now reviewed/rebased/merged