

libosmcore - Bug #4731

LAPDm does not implement SAPI priorities between data link layers

08/26/2020 07:34 PM - laforge

Status: Stalled	Start date: 08/26/2020
Priority: Normal	Due date:
Assignee: fixeria	% Done: 80%
Category: libosmogsm	
Target version:	
Spec Reference:	
Description	
AFAIR, The 3GPP specifications contain some very strict rules regarding priorities among different concurrent LAPDm data links for the same subscriber. For example, SAPI0 always has higher priority than SAPI3.	
We've just encountered a situation where in MT-SMS, the SAPI3 SABM from BTS to MS was sent before the BTS replied with the UA for SAPI0 (contetion resolution procedure, where we echo the PAGING RESPONSE back to the MS).	
A quick look at the LAPDm code in libosmcore reveals that it is doing a round-robin rather than implementing the rules.	
TS 44.005 Section 4.2.2 states the priorities for SDCCH and SACCH. I guess we can think of FACCH == SDCCH in this context.	
Related issues:	
Related to OsmoMSC - Bug #4714: SMS Message Lost Although Delivery Ack Sent	Resolved 08/16/2020
Related to OsmoBTS - Bug #1979: Priority of SAPI=0/SAPI=3 on SABM	Resolved 03/10/2017

History

#1 - 08/26/2020 07:36 PM - laforge

btw: We think this situation never happened so far due to the fact that we had NAGLE enabled on the TCP connections used for RSL. As we have started to disable NAGLE by enabling TCP_NODELAY, the latency of the BSC getting back to the BTS has significantly been reduced, changing the timing at which a RLL EST REQ for SAPI3 is received by the BTS.

#2 - 08/27/2020 07:52 AM - fixeria

- Status changed from New to In Progress

#3 - 08/27/2020 12:52 PM - fixeria

- Checklist item [x] implement test case set to Done

- % Done changed from 0 to 40

I have just submitted a unit test that reproduces the problem:

<https://gerrit.osmocom.org/c/libosmcore/+/19847> lapd_test: add a test checking SAPI0/SAPI3 prioritization

together with a bunch of misc/cosmetic changes:

<https://gerrit.osmocom.org/c/libosmcore/+/19843> lapdm_pad_msgb(): cosmetic: use GSM_MACBLOCK_PADDING

<https://gerrit.osmocom.org/c/libosmcore/+/19844> lapd_test: fix wrong comment in lapdm_establish()

<https://gerrit.osmocom.org/c/libosmcore/+/19845> lapd_test: rename func=UA (RR) CM Service Request: s/ua/ua_cm/

<https://gerrit.osmocom.org/c/libosmcore/+/19846> lapd_test: fix: print all messages to stdout, not stderr

#4 - 08/27/2020 12:55 PM - fixeria

- Related to Bug #4714: SMS Message Lost Although Delivery Ack Sent added

#5 - 08/27/2020 03:21 PM - fixeria

- Checklist item [x] fix priority in LAPDm code set to Done

- Status changed from In Progress to Feedback

- % Done changed from 40 to 80

TS 44.005 Section 4.2.2 states the priorities for SDCCH and SACCH. I guess we can think of FACCH == SDCCH in this context.

During a voice call, SMS/SAPI=3 always goes over SACCH. So don't need to worry about FACCH.

The fix for DCCH has been submitted to Gerrit:

<https://gerrit.osmocom.org/c/libosmocore/+19853> lapdm: fix SAPI-0/SAPI-3 frame prioritization on DCCH

We still need to add some testing coverage for SACCH. Unfortunately it's much more complicated.

#6 - 08/28/2020 11:21 AM - fixeria

- Status changed from *Feedback* to *Stalled*

- Priority changed from *High* to *Normal*

I'll continue to work on this as soon as I have more time.

#7 - 09/30/2020 08:01 PM - laforge

- Related to Bug #1979: Priority of SAPI=0/SAPI=3 on SABM added