

## OsmoPCU - Bug #2406

### CS-PAGING not implemented

07/29/2017 09:06 AM - laforge

<b>Status:</b> Resolved	<b>Start date:</b> 07/29/2017
<b>Priority:</b> Low	<b>Due date:</b>
<b>Assignee:</b> laforge	<b>% Done:</b> 100%
<b>Category:</b>	
<b>Target version:</b>	
<b>Spec Reference:</b>	
<b>Description</b> BSSGP PAGING CS is used to deliver a circuit-switched paging request to a MS while it is engaged in transferring GPRS data. The related paging request is not sent via Broadcast/PCH, but via PACCH to that MS.	
<b>Related issues:</b>	
Related to OsmoPCU - Bug #3927: Missing PCU_Tests.ttcn Paging tests	<b>Resolved</b> 04/15/2019
Related to OsmoPCU - Bug #2403: PS-PAGING and CS-PAGING not implemented on PT...	<b>Resolved</b> 07/29/2017
Related to OsmoBSC - Feature #4485: osmo-bsc: We should be announcing NMO I i...	<b>Rejected</b> 04/06/2020

#### History

**#1 - 10/29/2017 06:51 PM - laforge**

- Priority changed from Normal to Low

**#2 - 10/02/2018 03:43 PM - laforge**

**#3 - 10/17/2018 10:24 AM - laforge**

- Assignee changed from laforge to msuraev

**#4 - 04/15/2019 07:52 AM - laforge**

- Assignee changed from msuraev to lynxis

**#5 - 09/10/2019 11:55 AM - laforge**

- Assignee changed from lynxis to osmith

Please note this is mostly relevant with other core networks than osmocom. In osmocom, the MSC pages the BSC and the BSC pages the BTS, which then passes it to the PCU for transmission. This works.

However, when using a non-osmocom core with Gs interface between MSC and SGSN for paging coordination, the SGSN will likely send us CS-PAGING and we have to implement it in the PCU for interoperability.

**#6 - 09/24/2019 12:22 PM - osmith**

- Status changed from New to In Progress

**#7 - 12/09/2019 07:26 PM - pespin**

- Related to Bug #3927: Missing PCU\_Tests.ttcn Paging tests added

**#8 - 12/09/2019 07:46 PM - pespin**

While developing some TTCN3 PCU tests ([#3927](#)) I also tried to understand better this scenario. Some references I could find:

TS 23.060 sec 6.3.3 CS Paging (A/Gb mode)

TS 48-008 sec 3.1.10 Paging

TS 24.008 sec 4.7.9 Paging procedure

TS 44.018 sec 3.2.2.2 paging

TS 48.018 sec 5.2.4, 7.1

PAGING-PS: TS 48.018 10.3.1

PAGING-CS: TS 48.018 10.3.2

Specially important are the last 2, where the SGSN->PCU PDUs requesting the paging are described.

As far as I understand, we already implement paging (not sure if correctly) in the SGSN: it uses libosmocore's `bssgp_tx_paging()`. In libosmocore, we also have a symbol which afaui we should use in osmo-pcu and which I think is not yet use by anybody:

```
gprs_bssgp_bss.c:
/* Parse a single GMM-PAGING.req to a given NSEI/NS-BVCI */
int bssgp_rx_paging(struct bssgp_paging_info *pinfo,
                   struct msgb *msgb)
```

It seems PS-PAGING is already supported by osmo-pcu, while CS-PAGING is not:

```
    case BSSGP_PDUT_PAGING_PS:
        gprs_bssgp_pcu_rx_paging_ps(msg, tp);
    ...
    case BSSGP_PDUT_PAGING_CS:
    case BSSGP_PDUT_FLUSH_LL:
    case BSSGP_PDUT_SGSN_INVOKE_TRACE:
        LOGP(DBSSGP, LOGL_INFO, "Rx BSSGP BVCI=%d (SIGN) PDU type %s not implemented\n",
             bvci, bssgp_pdu_str(pdu_type));
        break;
```

If I understand correctly, what's missing here is to do something similar to what we do when PCU receives a struct `gsm_pcu_if_pag_req` with type `PCU_IF_MSG_PAG_REQ` on `pcu_rx_pag_req()` from BTS. That path is already covered by `PCU_Tests_RAW.TC_paging_cs_from_bts`, where a `DL_PACKET_PAGING_REQUEST` is sent over PACCH. The only difference in this scenario is that the `PAGING_REQUEST` must be retrIGGERED on reception of the CS-PAGING message from SGSN in `gprs_bssgp_pcu.cpp`.

So mainly calling libosmocore's `bssgp_rx_paging()` and then calling similar to what `pcu_rx_pag_req()` does:

```
    return BTS::main_bts()->add_paging(pag_req->chan_needed,
                                       pag_req->identity_lv);
```

#### #9 - 12/10/2019 05:25 PM - pespin

- Related to Bug #2403: PS-PAGING and CS-PAGING not implemented on PTP-BVCI added

#### #10 - 12/10/2019 07:17 PM - pespin

- Status changed from In Progress to Feedback

- % Done changed from 0 to 90

Done so far:

remote: <https://gerrit.osmocom.org/c/osmo-pcu/+16536> Allow Gb PAGING-PS without P-TMSI

remote: <https://gerrit.osmocom.org/c/osmo-pcu/+16537> Support Gb PAGING-CS

Can be tested with TTCN3 PCU test `TC_paging_cs_from_sgsn`.

#### #11 - 12/23/2019 01:53 PM - pespin

- Assignee changed from osmith to pespin

Testing is done here:

<https://gerrit.osmocom.org/c/osmo-ttcn3-hacks/+16528> pcu: Introduce tests for CS and PS paging from SGSN/Gb

#### #12 - 01/21/2020 04:14 PM - pespin

- Status changed from Feedback to Resolved

- % Done changed from 90 to 100

#### #13 - 04/06/2020 12:17 PM - fixeria

- Status changed from Resolved to Feedback

BTW, there is `BSS_PAGING_COORDINATION` in SI13 / GPRS Cell Options IE (see 3GPP TS 44.060, table 12.24.2):

This field indicates the network support of CS paging co-ordination in packet transfer mode during network mode of operation II and III. [...] It is coded as follows:

```
0 The cell does not support Circuit-Switched paging coordination
```

1 The cell supports Circuit-Switched paging coordination

OsmoBSC currently hard-codes this option to 0. Should we make it configurable?

As per section 6.1.3 "Paging initiation using PACCH", "if such indication is received, a mobile station in packet transfer mode shall expect the paging messages to be received on the PACCH". So does it mean that otherwise (if BSS\_PAGING\_COORDINATION is set to 0) the MS would ignore our paging messages?

**#14 - 04/06/2020 07:39 PM - fixeria**

- Related to Feature #4485: osmo-bsc: We should be announcing NMO I instead of NMO II added

**#15 - 06/21/2020 01:42 PM - laforge**

- Status changed from Feedback to In Progress

- Assignee changed from pespin to laforge

fixeria wrote:

BTW, there is BSS\_PAGING\_COORDINATION in SI13 / GPRS Cell Options IE (see 3GPP TS 44.060, table 12.24.2):

nice catch. I'm adding related code in <https://gerrit.osmocom.org/c/libosmocore/+18934> and <https://gerrit.osmocom.org/c/osmo-bsc/+18936>

**#16 - 06/21/2020 05:46 PM - laforge**

- Status changed from In Progress to Resolved

laforge wrote:

fixeria wrote:

BTW, there is BSS\_PAGING\_COORDINATION in SI13 / GPRS Cell Options IE (see 3GPP TS 44.060, table 12.24.2):

nice catch. I'm adding related code in <https://gerrit.osmocom.org/c/libosmocore/+18934> and <https://gerrit.osmocom.org/c/osmo-bsc/+18936>

patch merged.