TSG-RAN Working Group 3 meeting #6
France, Sofia Antipolis, 24th-27th August

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Agenda Item: **14.2**

Source: **Ericsson**

Title: **FACH/PCH Frame Protocol data frame structure**

Document for: **Decision**

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1. INTRODUCTION

Based on inputs from several companies, a frame structure for the FACH/PCH common channel data frame for the Iub Frame Protocol (FP) was agreed during R3 #5 in Helsinki. This agreement is described ref [1].

In this contribution several changes are proposed to the layout and usage of this data frame structure. The proposed changes reflect recent WG2 decisions and want to enable a simplification of the delay handling in the node-B.

2. RECENT WG2 DECISIONS

In week 27 WG 2 had a meeting in which they decided to allow the multiplexing of different FACH's on one physical channel. These FACH's may have different Transport Block sizes and different Transmission Time Intervals.

The Iub FP data frame handling will have to be updated to reflect these changes. The following changes are proposed:

1. Different transport channels (one or more FACH's and/or one PCH) shall be transported over one transport bearer and multiplexed in one FP frame over Iub if these transport channels are multiplexed on one physical channel on the Uu. FACH and/or PCH transport channels mapped to different physical channels on Uu shall be transported by different transport bearers on Iub.

2. If transport channels with different TTI's are multiplexed in one Iub FP frame, the indicated transmission power level is only valid starting from the Uu frame with the indicated FNcell, up to the Uu frame for which a next Iub FP frame is received.

3. SIMPLIFICATION OF DELAY HANDLING IN NODE-B

The current solution, which combines the paging indicator information and the corresponding paging message in one FP frame over Iub, has the drawback that it complicates the delay handling in the Node-B.

Previously, the general approach was that everything received in one frame over Iub, should be transmitted on the Uu at the FNcell indicated in this Iub frame. Now however, information transported in one Iub FP frame will have to transmitted in different Uu frames => different delays have to be inserted by the Node-B.

It is proposed to change the usage of the Iub data frame in a way that the previous general rule can again be applied. So:

3. All payload information (PCH TBS, FACH TBS or paging indicator information) shall be included in the Iub FP data frame which is labeled with the FNcell corresponding to the Uu frame at which this data has to be transmitted.

According to ref [2], the start of the paging indicator information on the PICH and the corresponding paging message on the s-CCPCH will have an 18 slot offset. As a result, if a paging message is send in an Iub FP frame labeled with FNcell X, the corresponding paging indication information will be transmitted in Iub FP frame with FNcell X-1.

Furthermore it is proposed to state explicitly:

4. The node-B has no responsibility concerning ensuring the consistency between the paging indication information and the corresponding paging messages. E.g. if the paging indication information is lost over the Iub, the paging messages might be sent over the Uu while no UE is actually listening.

And in line with the assumptions on dedicate transport bearers:

5. The number of transport channels multiplexed on one transport bearer will be indicated in the control plane when the transport bearer is established and will be constant during the life-time of the transport bearer.

4. DATA FRAME CHANGES

The resulting data frame structure is shown below (changes w.r.t. [1] are indicated with revision marks):

	Information element	**Description**
Header	Frame Type	Data Frame
	FN_{CELL}	Indicates the Cell Frame Number on which this DL FACH/PCH TBSs need to be transmitted
	FACH Transport Format Indicators	These TFIs ~~to~~ denote the format of the Transport Block sets carrying the FACH payload.
	PCH Transport Format Indicator	This TFI to denote the format of the Transport Block set carrying the PCH payload.
	Transmission power level	Indicator of the transmission power level
Payload	FACH Transport Block Set 1	The TBS includes the FACH payload data to be transmitted by the physical layer over the air-interface for FACH 1.
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	FACH Transport Block Set N	The TBS includes the FACH payload data to be transmitted by the physical layer over the air-interface for FACH N.
	Paging Indication Information	Its content and coding is FFS.
	PCH Transport Block Set	The TBS includes the PCH payload data to be transmitted by the physical layer over the air-interface.
Tail	Data frame checksum.	Checksum of the header and payload

5. PROPOSAL

It is proposed to include the 5 listed points from chapters 2 and 3 as well as the updated FACH/PCH data frame structure as provided in chapter 4, in chapter 5.1.2. of [1].

6. REFERENCES

[1] TS 25.435 V0.3.1. 3GPP TSG RAN: “UTRAN Iub user plane protocols for common transport channel data streams”

[2] TS 25.211 v2.2.1. 3GPP TSG RAN: “Physical channels and mapping of transport channels onto physical channels (FDD)”