TSG-RAN Working Group 3 meeting #6
Sophia Antipolis, France, Aug 23-27, 1999

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Agenda Item: **Sync Ad-Hoc 4.2**

Source: **Ericsson**

Title: **Relationship between Cell SFN and super-frame cycle**

Document for: **Descision**

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1. Introduction

The super-frame cycle is today defined as 0..71 and an integral part of the Cell System Frame Number (Cell SFN), e.g. in TS25.211 [1] ch 7. This definition collides with the current WG2 assumption that Cell SFN has a 2^X cycle. The paging scheduling algorithms are, e.g., based on this WG2 assumption.

2. Discussion

The problem, with having a super-frame with a non power of 2 cycle (0..71 today) and at the same time have an paging algorithm working on a power of 2 cycle, is that the paging algorithm will get forbidden areas – which cannot be scheduled (since they does not exist as Cell SFN). This will then lead to increased delay for some UEs (whose IMSI maps to the forbidden areas).

The super-frame cycle of length 72 is not used for any specific purpose in an isolated WCDMA system. Furthermore there is no benefit of having a common frame base cycle towards other existing G2 systems (e.g. for scheduling of inter-system HO measurements).

This means that there exist no reason to keep the super-frame cycle as defined today (0..71).

Since doubts have been expressed earlier within 3GPP whether a super-frame cycle of 72 is enough (from transport delay variation perspective), the alternative to use a super-frame cycle of 64 is not considered feasible.

3. Proposal

Since the super-frame cycle is an integral part of the Cell SFN, the super-frame cycle should also be a power of 2. This would make the paging algorithm work optimally.

The proposal is to define the super-frame length as 0..127 (i.e., filling up the already “allocated” 7 bits). This would imply the following definition.

Start of super-frame cycle Cell SFN MOD 128 == 0
End of super-frame cycle Cell SFN MOD 128 == 127

It is proposed to update TS25.401 [2], chapter 9.5 and 9.6 accordingly.

Additionally a liaison to WG1 and WG2 regarding this matter is proposed.

4. References

[1] TS25.211 V2.1.1 “Physical channels and mapping of transport channels onto physical channels”

[2] TS25.401 V1.2.1 “UTRAN Overall Description”