3GPP TSG RAN WG1#10 **TDoc R1-(00)-0191**
Beijing, China
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Agenda Item: **Outgoing Liaisons**
Source: **3GPP TSG RAN WG1**
Destination: **3GPP TSG RAN WG2 and RAN WG3**
Cc: **3GPP TSG RAN WG4**
Title:

Liaison Statement on Out-of-Synch and DTX

1 Introduction

During their meeting #10, WG1 continued their work on the procedures required at the physical layer for detection and reporting of 'Out of Synchronisation'. From discussions it became clear that there are still questions on the requirements higher layers have. Thus, after outlining some proposed L1 procedures in section 2, this liaison brings these questions to your attention in section 3.

For TDD mode, additional provisions have to be made regarding DTX and Out-of-Synch detection. In this context, some clarifications with respect to DTX are requested in section 4.

Looking at the schedule for work items of release 99, WG1 felt the need to create the 'Ad Hoc Group 18' for dealing with Out-of-Synch procedures. Other working groups are invited to contribute to the expected e-mail discussions, which shall be held on WG1 mail-reflector. Contributions to this topic shall be marked with –AH18– in the subject line.

2 Proposed L1 Procedures for Out-of-Synch detection

Currently, there are different proposals dealing with different aspects of Out-of-Synch available within WG1. It should be understood, that the schemes depicted below are provisional and do not represent working assumptions or agreements in WG1.

It has been expressed in WG1, that different schemes shall be applied for Up- or Downlink direction:

- For uplink transmission, WG1 wants to create a quick, L1 based transmission shutdown procedure in the case that downlink out-of-synch is detected. The number of Out-of-Synch events in DL after which UL-TX shutdown shall apply is configurable by higher layers.

- For downlink transmission, it is proposed to report UL out-of-synch events to RRC and to let RRC decide on DL-TX shutdown.

The criterion for detection of Out-of-Synch is also under discussion in WG1. For instance, CRC decoding, TPC bit detection, frame timing accuracy or common pilot detection are considered here. The criterion may also depend on UE state. It was also stressed in WG1, that the criterion for decision may be manufacturer dependent as long as testing conditions are met.

3 Questions on Out-of-Synch Procedure

Q 3-1: Is Out-of-Synch detection applied for dedicated channels only?

From the liaison R1-00-0007 (Source: WG2) it could be understood that higher layers are expecting L1 to monitor dedicated physical channels only. In WG1 it is proposed that detection of Out-of-Synch can rely on common channels, too (cf. R1-99j59 and R1-00-0075). Moreover, in some UE states (and during DTX in TDD) continuous monitoring of dedicated channels is not feasible. TDoc R1-00-0130 contains specific monitoring requirements for different UE states and outlines their impact on testability. WG1 would appreciate the view of other WGs on monitoring of common channels for detection of synch-status.

Q 3-2: What periodicity is required for Out-of-Synch-Messages?

From the LS in R1-00-0007 (Source: WG2) it can be read that Synch Status has to be reported 'periodically'. WG1 would like to ask whether there is any preference in other WGs whether this should imply 'per frame', 'per TTI' or some other periodicity.
As an alternative from WG1 point of view, it might be possible to include appropriate timers in L1, which would then report the synch status as a result instead of a periodical update. This might reduce the load on Iub interface when applied at least at the Node B side.

Q 3-3: Do higher layers require that the Out-of-Synch-Message contains the SFN of the Frame at which this status was detected?

Inclusion of SFN would provide this information despite any possible delay on interfaces like Iub.
Moreover, due to the fact transmission is interrupted due to Out-of-Synch status, it may be requested by higher layers to know the exact SFN when this has happened.

4 Questions regarding DTX

In TDD mode, transmission on dedicated channels is omitted if no data is to be sent. For DL the assumption in WG1 is to monitor P-CCPCH during such DTX periods. For UL it is required to define a particular transmission to enable the receiver to distinguish between DTX and Out-of-Synch. It is understood by WG1, that the case 'no data is to be sent' is met under the condition all Transport Channels have zero Transport Blocks, whilst Transport blocks of zero length would initiate transmission due to CRC attachment (cf. R1-00-0184).

Q 4-1: Is L1 allowed to replace the data by L1 messaging, when all Transport Channels have zero Transport Blocks?

For TDD, there is a proposal in WG1 to introduce L1 messaging in the case where no data has to be transmitted. This message would then replace the corresponding Transport Format, thus normal multiplexing chain would be bypassed in this case. For instance L1-internal power control commands are candidate for such L1 messaging. Is such scheme acceptable for other WGs?