TSG-RAN Working Group 1 meeting No. 11 ***TSGR1-00-0198***
February 29 – March 3, Las Vegas, USA

TSG-RAN Working Group 3 Meeting #10 R3-000398
Gothenburg, Sweden, 24th – 28th January 2000

Agenda Item: **30 (Outgoing Liaisons)**
Source: **3GPP TSG RAN WG3**
Destination: **3GPP TSG RAN WG1**
Cc: **3GPP TSG RAN WG2 and RAN WG4**

Title:

Answer to Liaison Statement on Out-of-Synch and DTX

Contact in WG3: Achim V. Brandt, Siemens,
achim.brandt@icn.siemens.de, phone +49 89 722-41981, fax -24450

1 Introduction

WG3 thanks WG1 for the LS on Out-of-Synch and DTX [1] containing information about current WG1 proposals on this topic as well as questions on the requirements from higher layers.

WG3 treated the LS at meeting #10 and compiled this response to WG1 which includes information about the current provisions in WG3 specifications related to out-of-synch detection, and some answers to the questions from WG1 as far as WG3 is concerned. WG3 noted that WG1 has created the "Ad-hoc group 18" dealing with Out-of-Synch procedures, and WG3 members are ready to contribute to the related WG1 mail discussion.

2 Current provisions in WG3 specifications for Out-of-Synch detection

Out-of-synch detection of *uplink* channels is addressed under the heading "Radio Link Failure" in the NBAP protocol specification [2] (clauses 8.3.12, 9.1.57) as well as in the RNSAP protocol specification [3] (clauses 8.3.9, 9.1.18).

With the procedure in NBAP, the Node B informs the Controlling RNC (CRNC) about the loss of synchronization of the uplink part of a radio link between the UE and a cell of the NodeB. The CRNC uses the corresponding RNSAP message on Iur to inform the SRNC of that event, if applicable. The procedure also indicates the inability to get synchronization during radio link setup or addition. After having reported this Radio Link Failure event to the RNC, the Node B continuously tries to achieve synchronization again, which may lead to the Radio Link Restoration procedure – unless the Node B receives a Radio Link Deletion Request message from the RNC.

The Radio Link Failure and Restoration procedures, as specified in NBAP and RNSAP, are independent from the UTRA mode FDD or TDD. It is assumed that the required L1

processing in the NodeB for radio link failure detection and for radio link restoration are defined in L1 specifications, covering both modes.

Basically, the Radio Link Failure procedure indicates the "out-of-synch" state of one or more radio links, while the Radio Link Restoration procedure indicates restoration of the "synchronized" state. WG3 expects that the "synchronized" and "out-of-synch" states are defined at L1 in a suitable way for both FDD and TDD, and also including the case where DTX is applied in uplink.

The Radio Link Failure procedure is aiming at those radio links where *Dedicated Physical Channels* are involved, uplink and downlink. This is the case for FDD by definition of the "Radio Link", and in TDD in the Cell_DCH state of the RRC for a UE. Whether the Radio Link Failure procedure is also applicable for the case where no DPCH but a PUSCH is used in uplink (which is possible in TDD in Cell_FACH state), depends on the details of the "out-of-synch" state definition at Layer 1.

For the PRACH or other uplink common physical channels, an out-of-synch detection procedure has not been requested by WG3.

WG3 specifications do not address out-of-synch detection of *downlink* channels since this is performed by the UE and is out of scope of the WG3 specifications.

3 Comments to Proposed L1 Procedures for Out-of-Synch detection

Comments are given to those WG1 statements which address WG3 issues.

- ***WG1:*** *For downlink transmission, it is proposed to report UL out-of-synch events to RRC and to let RRC decide on DL-TX shutdown.* – **Answer by WG3:** This is in line with the above mentioned "Radio Link Failure" and "Radio Link Restoration" procedures.

4 Questions on Out-of-Synch Procedure

Q 4-1: 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.

Comment by WG3: Out-of-Synch detection is requested for dedicated physical channels. The procedure should also work – with suitable adaptation - in cases where DTX is applied to these channels. Out-of-Synch detection for RACH or FACH has not been requested by WG3. For TDD PUSCH, Out-of-synch detection should preferably be applicable, using a suitable definition.

Q 4-2: 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.

Comment by WG3: Currently, the Radio Link Failure procedure does not support periodic reporting on frame or TTI basis, due to the use of the L3 signalling.

Q 4-3: 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.

Comment by WG3: Currently, no SFN or CFN exists in the Radio Link Failure message from NodeB to RNC. The CFN of the respective failed radio link may be added to the message if required.

References

[1] Document R3-000297, RAN#10, Jan. 24-28, 2000, LS from WG1 on Out-of-Synch and DTX.

[2] TS 25.433 v.3.0.0, UTRAN Iub Interface NBAP Signalling

[3] TS 25.423 v.3.0.0, UTRAN Iur Interface RNSAP Signalling