3GPP TSG RAN WG1 ***TSGR1#15(00)1046***
Berlin, Germany, 22nd – 25th August, 2000

Agenda item:

Source: **Philips**

Title: **Uplink transmission with invalid set of transport blocks**

Document for: **Discussion**

Introduction

This document has been produced following discussion on the RAN1 reflector of what Layer 1 should transmit if higher layers provide an invalid set of transport blocks (i.e. a combination which is not one of those in the set of transport formats allowed for that CCTrCH).

The issues raised in the email discussion also covered some other conditions and addressed what should be sent on DPDCH and what should be sent on TFCI, by UTRAN and UE.

The following situations were identified to be relevant:-
1. invalid set of transport blocks provided to layer 1.
2. a transport format combination with no data
3. power control preamble
4. initialisation of DPCH (DPCCH is transmitted, but DPDCH has not started)

Current Specification Status

Refering to the above cases:-

1. In 25.427 (Iub/Iur Interface User Plane Protocol), the following statement in 5.1.2 (Downlink) appears:
"FDD- In case the Node B receives an unknown combination of DCH data
frames, it shall transmit only the DPCCH without TFCI bits."
This is unsatisfactory for the following reasons: Applying DTX to theTFCI means that this state should be detecatble at the UE and this is likely to increase decoding error rate; This cannot be applied to the UE and the UE behaviour under the same conditions is not covered; Such a statement, if present, should be in Layer 1 specifications. However, it seems reasonable that no DPDCH should be transmitted.

2. If no transport blocks are provided to layer 1, the TFCI is only defined if a transport format with no data is valid. This particular case of zero transport blocks may be one of the more likely error conditions.

3. During power control preamble, the TFCI field is filled with all "1"s. Note that this might correspond to a valid TFCI codeword, but this is probably not a serious problem if this is only used in the power control preamble.

4. The TFCI during DPCH initialisation is not specified. However, the TFCI for "no data" could be used, provided this is one of the valid TFCs

Requirements for Possible Improvements

1. It seems reasonable that in the event of invalid set of transport blocks, the only DPCCH is transmitted (for both uplink and downlink).

2. It is preferable to avoid the use of DTX in the TFCI field.

3. It is preferable that anything transmitted in the TFCI field corresponds to a valid TFCI codeword (to optimise decoding error rate).

4. There seems to be no need to be able to distinguish the different cases (identified above) at the receiver.

5. There is a need to define the contents of the TFCI field in both UE and UTRAN in all the cases considered, preferably in consistent way.

Solution

The proposed solution is as follows:-

1) Require that the Transport Format Combination Set (and Subset) include the case of no transport blocks. This also implies that every TFS includes the case of no transport blocks.

2) If Layer 1 receives an invalid set of transport blocks from higher layers, then only DPCCH is transmitted and the TFCI is set to the value for no transport blocks (for both UE and UTRAN)

3) During DPCH initialisation. Item 2) applies, (possibly also including the power control preamble).

4) Send a LS to RAN2 and RAN3 outlining the above proposals and requesting comments. RAN3 should also be asked to remove the description in 25.427 of Layer 1 behaviour in the event of invalid set of transport blocks.

Note that solution 1) implies that a DPCH must have at least one transport channel defined!