

Agenda item:

Source: Ericsson

Title: CR 25.212-069: Removal of BTFD for flexible positions in Release 99

Document for: Decision

1 Introduction

At WG1#11 meeting, CR 25.212-029r1 “Limitations on blind transport format detection” (Tdoc R1-00-0241) has been agreed and was approved at RAN#7 for Release 99. With the limitations contained in the CR, the use of BTFD in the downlink is only possible in Release 99, when fixed positions of transport channels are used. The rationale was, that up to now no efficient method has been proposed supporting BTFD for flexible positions of transport channels in the downlink. The problem for flexible positions is that there is no guarantee that the rate matching pattern for a lower bit rate TF is the first part of the pattern of a higher bit rate TF, which would mean that the decoder needs to be restarted each time before testing a new TF.

2 Proposal

To make the specification text consistent, it is proposed to align the other sections of TS 25.212 with the limitations on BTFD. It is particularly proposed to delete the last paragraph in section 4.2.12.2 (Physical channel mapping; Downlink), which is specifying the use of fixed or flexible positions depending on the type of transport format detection. It is further proposed to delete the informative Annex A.2, which provides examples for BTFD with flexible positions. A corresponding CR for TS 25.212 is attached.

4.2.12 Physical channel mapping

The PhCH for both uplink and downlink is defined in [2]. The bits input to the physical channel mapping are denoted by $v_{p1}, v_{p2}, \dots, v_{pU}$, where p is the PhCH number and U is the number of bits in one radio frame for one PhCH. The bits v_{pk} are mapped to the PhCHs so that the bits for each PhCH are transmitted over the air in ascending order with respect to k .

In compressed mode, no bits are mapped to certain slots of the PhCH(s). If $N_{first} + TGL \leq 15$, no bits are mapped to slots N_{first} to N_{last} . If $N_{first} + TGL > 15$, i.e. the transmission gap spans two consecutive radio frames, the mapping is as follows:

- In the first radio frame, no bits are mapped to slots $N_{first}, N_{first}+1, N_{first}+2, \dots, 14$.
- In the second radio frame, no bits are mapped to the slots $0, 1, 2, \dots, N_{last}$.

TGL , N_{first} , and N_{last} are defined in section 4.4.

4.2.12.1 Uplink

In uplink, the PhCHs used during a radio frame are either completely filled with bits that are transmitted over the air or not used at all. The only exception is when the UE is in compressed mode. The transmission can then be turned off during consecutive slots of the radio frame.

4.2.12.2 Downlink

In downlink, the PhCHs do not need to be completely filled with bits that are transmitted over the air. Bits $v_{pk} \notin \{0, 1\}$ are not transmitted.

During compressed mode by reducing the spreading factor by 2, no bits are mapped to the DPDCH field as follows:

If $N_{first} + TGL \leq 15$, i.e. the transmission gap spans one radio frame,

if $N_{first} + 7 \leq 14$

no bits are mapped to slots $N_{first}, N_{first} + 1, N_{first} + 2, \dots, N_{last} + (7 - TGL)$

no bits are mapped to the first $(N_{Data1} + N_{Data2})/2$ bit positions of slot $N_{last} + (8 - TGL)$

else

no bits are mapped to slots $N_{first}, N_{first} + 1, N_{first} + 2, \dots, 14$

no bits are mapped to slots $N_{first} - 1, N_{first} - 2, N_{first} - 3, \dots, N_{first} - (7 - TGL - (14 - N_{last}))$

no bits are mapped to the last $(N_{Data1} + N_{Data2})/2$ bit positions of slot $N_{first} - (8 - TGL - (14 - N_{last}))$

end if

If $N_{first} + TGL > 15$, i.e. the transmission gap spans two consecutive radio frames,

In the first radio frame, no bits are mapped to last $(N_{Data1} + N_{Data2})/2$ bit positions in slot 7 as well as to slots 8, 9, 10, ..., 14.

In the second radio frame, no bits are mapped to slots 0, 1, 2, ..., 6 as well as to first $(N_{Data1} + N_{Data2})/2$ bit positions in slot 7.

N_{Data1} and N_{Data2} are defined in [2].

~~The following rules should be used for the selection of fixed or flexible positions of the TrCHs in the radio frame:~~

- ~~— For TrCHs not relying on TFCI for transport format detection (blind transport format detection), the positions of the transport channels within the radio frame should be fixed. In a limited number of cases, where there are a small number of transport format combinations, it is possible to allow flexible positions.~~
- ~~— For TrCHs relying on TFCI for transport format detection, higher layer signal whether the positions of the transport channels should be fixed or flexible.~~

A.2 ~~Blind transport format detection with flexible positions~~

~~In certain cases where the CCTrCH consists of multiple transport channels and a small number of transport format combinations are allowed, it is possible to allow blind transport format detection with flexible positions.~~

~~Several examples for how the blind transport format detection with flexible positions might be performed are:~~

- ~~— The blind transport format detection starts at a fixed position and identifies the transport format of the first present transport channel and stops. The position of the other transport channels and their transport format being derived on the basis of the allowed transport format combinations, assuming that there is a one to one relationship between the transport format combination and the transport format of the first present transport channel.~~
- ~~— The blind rate detection evaluates all transport format combinations and picks the most reliable one.~~