

Agenda Item : Ad hoc 14

Source : LG Information & Communications, Ltd.

Title : Transmission of CPCH status information on Down-link DPCCH

Document for : Proposal

Abstract

This document proposes a scheme that informs UE of CPCH status information on DL (Down Link) - DPCCH. The suggested scheme can solve the problem that UE transmitting on CPCH can not monitor CPCH status. There is no change of the current system because this method uses the existing TFCI scheme.

Introduction

In the current CPCH, UE doesn't monitor the AICH while transmitting on the CPCH [1]. If an UE tries to set up another CPCH immediately after disconnecting the original one, the CPCH status information that the UE retains would be out of date. It would give rise to inefficiency and large delays.

In order to make the CPCH be more robust, we suggest a method that resolves this problem with easy approach. It's helpful to the current system, though it's not significant. Since it utilizes the existing TFCI scheme, any further components are not needed.

Proposal

We introduce an easy way for an UE to get the recent CPCH status. The scheme utilizes the unemployed downlink TFCI part. In the document, we define CSI (CPCH Status Information) and CSI unit. CSI means information that indicates whether each CPCH is busy or idle and CSI unit means a CPCH status information bit stream that is mapped onto one frame.

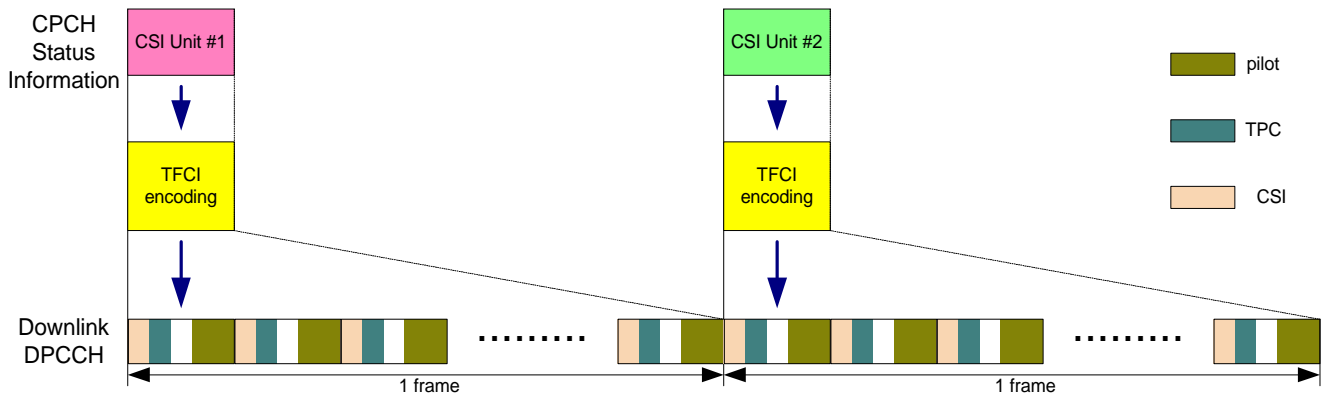
If 16 CPCHs are considered, CSI will be represented as 16 bit data. This CSI is split into two CSI units. If each CSI unit has 1 bit CSI unit identifier that indicates CSI unit number, the total bit of a CSI unit will be 9 bit. Table 1 shows the structure of two CSI units of 9 bit data.

U1	C1	C2	C3	C4	C5	C6	C7	C8	CSI Unit #1
U2	C9	C10	C11	C12	C13	C14	C15	C16	CSI Unit #2

Table 1. The structure of CSI unit

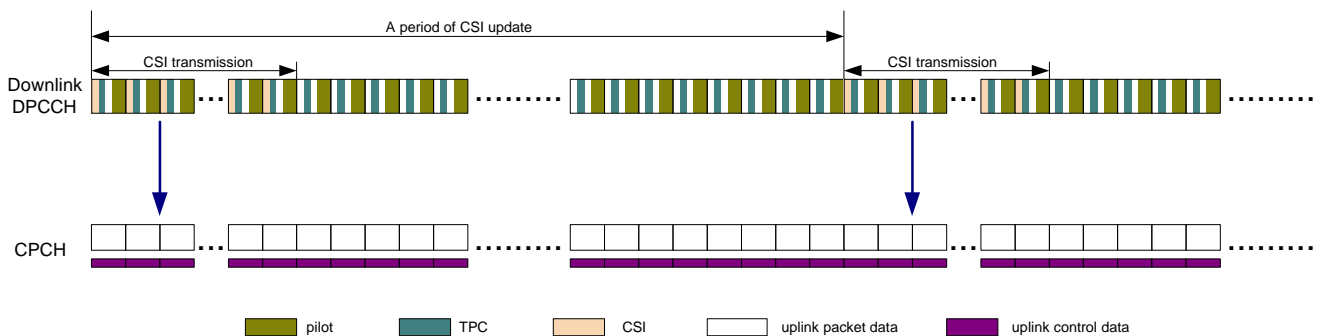
(Ui of 1 bit indicates CSI unit identifier and Cj of 1 bit indicates that CPCH #j is busy or idle.)

In the proposed scheme, each CSI unit is encoded by the same encoding method of extended TFCI word. Then, each encoded CSI unit is 30 bit and mapped onto the position of current TFCI bit over 15 slots of a radio frame. Figure 1 shows the configuration of mapping of CSI onto DL-DPCCH. The scheme uses the existing TFCI configuration. Therefore, there is no additional part at receiver as well as transmitter.



[Fig. 1] The mapping of CPCH status information onto DL-DPCCH

In the scheme, three ways can be considered for the transmission of CSI. Firstly, BS simply continues to transmit CSI in the TFCI field on DL-DPCCH. Then, CSI is periodically updated and transmitted. Secondly, BS intermittently carries CSI to UE, shown in figure 2. In this case, CSI is periodically updated. The transmission of CSI is activated at the preset time. If there are 2 CSI units, the duration of transmitting CSI is 2 frames. Information about the timing and duration of transmitting CSI would be broadcast by BS. Thirdly, if the length of packet data that UE transmits is known to BS, CSI can be only transmitted in the first and last 2 frames of the DL-DPCCH for 2 CSI units. We prefer the third way. But if BS doesn't have any information about the length of packet data, the second way is recommended as shown in figure 2.



[Fig. 2] The possible configuration of the transmission of CPCH status information on DL-DPCCH

Conclusion

The current scheme requires that UE carrying some packet on the CPCH doesn't receive the AICH. Therefore, we propose the scheme of transmitting CPCH status information using the TFCI field on DL-DPCCH. The suggested scheme makes it possible for UE to receive the latest CPCH status information while UE transmits data on CPCH. It is recommended that the scheme described above be adopted as a working assumption for CPCH.

Reference

- [1] GBT, "CPCH-related issues and concerns", TSGR1#6(99)799