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Agenda Item: **AH 14**
Source: **Golden Bridge Technology**
Title: **Use of TFCI**
Document for: **Discussion and Approval**

Problem Statement

Is there a need for TFCI in the CPCH scheme? (FFS item)

The desired data rate is determined by choice of access slot or signature code. So, the question has been raised on why TFCI is needed for CPCH?

Discussion

1. The value of N-Max-Frames could be high for lower rate CPCH channels, so there is a possibility of changing rate during transmission.

2. Even if we do not accept the dynamic rate change, there is value in having the capability to lower the rate if required by UTRAN. In that case the UE can signal this event through a change in TFCI.

Another compelling reason is the ability to lower rate if signaled by UTRAN. The down-rating indication could come over a Downlink Common Channel when UTRAN identifies the need to lower the CPCH traffic loading immediately.

3. Once the value of N_Max_Frame is more than 12, then the probability of receiving data from various logical channels during transmission increases. So, various transport channels (same QoS or different QoS) can be multiplexed at the physical layer.

4. For low values of N_Max_Frames < =8, MAC will have the choice of various interleaving depths and therefore can deliver 10,20,40,80 ms transport blocks every TTI.

5. Flexibility in building packets:

Examples: However, for service multiplexing of services with different QoS and flexibility in building packets longer than 80 ms, we should keep the TFCI concept for CPCH.

While the service multiplexing can be done at the MAC, it imposes limitation on the size of the transport block, which will be appended by CRC. As an example, if we were to have Turbo coding with 80 ms interleaving operating at 384 kbps, then we will be limited to using a CRC for the entire 80 ms packet which is inefficient.

Another example is the case where N_Max_Frames = 11, then a block of size 80 ms, 20 ms and 10 ms can be used to build the 110 ms packet by the MAC. However, one can use different Transport Format for each transport blocks.

Recommendation

Keep TFCI for CPCH and remove the FFS from the S documents.