

Agenda item:

Source: Ericsson

Title: CR 25.212-011: Connection between TTI and CFN

Document for: Decision

Transport channels within one CCTrCH shall have aligned transmission time instants as illustrated in figure 8 in TS 25.212. Figure 8 is equivalent with the following equation, using the connection frame number CFN (defined in TS 25.402) as reference:

$$CFN_i \bmod (TTI_i/10ms) = 0.$$

CFN_{*i*} denotes the connection frame number of the first radio frame within transmission time interval TTI_{*i*} of transport channel *i*. This relation gives a requirement on the start timing of transport channels that are multiplexed into one CCTrCH.

Due to downlink rate matching rules, the rate matching calculations per TrCH are performed once per transmission time interval for the downlink. This results in the limitation that the transport format combination of one CCTrCH can be changed only each TTI in the downlink. Hence, new TrCHs can only be added into one CCTrCH at these time instants.

This can be expressed as:

$CFN_i \bmod (TTI_{max}/10ms) = 0$, where TTI_{max} denotes the maximum transmission time interval of all transport channels that are multiplexed into the same CCTrCH, including the new transport channel *i*.

By defining when transport channels may be started, the alignment of the transport channel's TTI timing follows directly.

It is proposed to replace figure 8 with the equation $CFN_i \bmod (TTI_{max}/10ms) = 0$ and to add a reference to TS 25.402 where CFN is defined.

1 Scope

This specification describes the documents being produced by the 3GPP TSG RAN WG1 and first complete versions expected to be available by end of 1999. This specification describes the characteristics of the Layer 1 multiplexing and channel coding in the FDD mode of UTRA.

The 25.2xx series specifies Um point for the 3G mobile system. This series defines the minimum level of specifications required for basic connections in terms of mutual connectivity and compatibility.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] 3GPP RAN TS 25.201: "Physical layer – General Description"
- [2] 3GPP RAN TS 25.211: "Transport channels and physical channels (FDD)"
- [3] 3GPP RAN TS 25.213: "Spreading and modulation (FDD)"
- [4] 3GPP RAN TS 25.214: "Physical layer procedures (FDD)"
- [5] 3GPP RAN TS 25.215: "Measurements (FDD)"
- [6] 3GPP RAN TS 25.221: "Transport channels and physical channels (TDD)"
- [7] 3GPP RAN TS 25.222: "Multiplexing and channel coding (TDD)"
- [8] 3GPP RAN TS 25.223: "Spreading and modulation (TDD)"
- [9] 3GPP RAN TS 25.224: "Physical layer procedures (TDD)"
- [10] 3GPP RAN TS 25.225: "Measurements (TDD)"
- [11] 3GPP RAN TS 25.302: "Services Provided by the Physical Layer"
- [12] [3GPP RAN TS 25.402: "Synchronisation in UTRAN, Stage 2"](#)

4.2.14 Multiplexing of different transport channels into one CCTrCH, and mapping of one CCTrCH onto physical channels

The following rules shall apply to the different transport channels which are part of the same CCTrCH:

- 1) Transport channels multiplexed into one CCTrCh shall ~~have~~ have co-ordinated timings, ~~in the sense that transport blocks arriving from higher layers on different transport channels of potentially different transmission time intervals shall have aligned transmission~~ When a new transport channel i is multiplexed into a CCTrCH, the TTI of the transport channel may only start in radio frames with CFN fulfilling the relation

$$CFN_i \bmod (TTI_{\max}/10\text{ms}) = 0,$$

where TTI_{\max} denotes the maximum transmission time interval among all transport channels that are multiplexed into the same CCTrCH, including the transport channel i to be added to the CCTrCH, and CFN_i denotes the connection frame number of the first radio frame within the transmission time interval of transport channel i .

time instants as shown in figure 8.

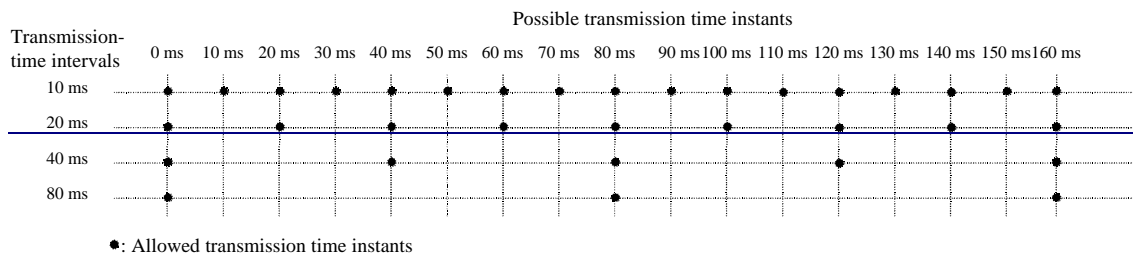


Figure 8: Possible transmission time instants regarding CCTrCH

- 2) Only transport channels with the same active set can be mapped onto the same CCTrCH.
- 3) Different CCTrCHs cannot be mapped onto the same PhCH.
- 4) One CCTrCH shall be mapped onto one or several PhCHs. These physical channels shall all have the same SF.
- 5) Dedicated Transport channels and common transport channels cannot be multiplexed into the same CCTrCH
- 6) For the common transport channels, only the FACH and PCH may belong to the same CCTrCH

There are hence two types of CCTrCH

- 1) CCTrCH of dedicated type, corresponding to the result of coding and multiplexing of one or several DCHs.
- 2) CCTrCH of common type, corresponding to the result of the coding and multiplexing of a common channel, RACH in the uplink, DSCH ,BCH, or FACH/PCH for the downlink.

4.2.14.1 Allowed CCTrCH combinations for one UE

4.2.14.1.1 Allowed CCTrCH combinations on the uplink

A maximum of one CCTrCH is allowed for one UE on the uplink. It can be either

- 1) one CCTrCH of dedicated type
- 2) one CCTrCH of common type

4.2.14.1.2 Allowed CCTrCH combinations on the downlink

The following CCTrCH combinations for one UE are allowed :

x CCTrCH of dedicated type + y CCTrCH of common type

The allowed combination of CCTrCHs of dedicated and common type are FFS.

NOTE 1: There is only one DPCCH in the uplink, hence one TPC bits flow on the uplink to control possibly the different DPDCHs on the downlink, part of the same or several CCTrCHs.

NOTE 2: There is only one DPCCH in the downlink, even with multiple CCTrCHs. With multiple CCTrCHs, the DPCCH is transmitted on one of the physical channels of that CCTrCH which has the smallest SF among the multiple CCTrCHs. Thus there is only one TPC command flow and only one TFCI word in downlink even with multiple CCTrCHs.