

Agenda Item: Adhoc 4 (Adhoc 11 ?)
Source: Nokia
Title: Proposed Physical Layer Service Implementation Capabilities for CS data services up to 64 kbps to be included in T2 report

1. Introduction

In last WG1 meeting a liaison statement was sent to T2, containing a proposal for physical layer implementation capabilities for support of the default speech service and of CS data services up to 64 kbps. Here we try to further improve the contents of T2 report.

Our proposal is to split the table into two tables, a) one for AMR and b) one for CS data services up to 64 kbps, since in that way it is easier to define the capabilities clearly.

This contribution includes the proposed table to be included for T2 report for CS data services up to 64 kbps. The basis has been the table 8 from TR 21.904, v. 0.0.4 from T2, "Terminal capability requirements". The corresponding proposal for AMR can be found from a separate contribution from Nokia.

2. Comments to the contents of the table

Here are some explanatory comments to certain parts of the table.

Error detection: For CS data services all possible CRC lengths: 0, 8, 12, 16 and 24 bit CRC has to be supported. There is no reason why some CRC length would not be needed.

Channel coding: The support of turbo coding is required, since BER requirement for CS data services is $< 10^{-3}$. However, it should be noted that the smallest possible turbo interleaver size is for a block of 320 bits. For this reason, convolutional coding has to be supported also, to allow data rates below 32 kbit/s & 10 ms interleaving (or <16 kbit/s & 20 ms interleaving etc).

Multiplexing: The number of transport channels that all terminals has to support is 2, in order to support CS data services. This includes one transport channel for CS data and one transport channel for dedicated signaling channel. The support of TTI={10 ms, 20 ms, 40 ms, 80 ms} for all transport channels has to mandatory for all terminals

Transport format detection : All terminals have to support the transport format detection by TFCI, both with fixed and flexible TrCH positions. The support of detecting 1024 transport format combinations is mandatory for all terminals. The reason for this requirement is that it is quite difficult to probably agree a lower value for that.

3. Proposed table for CS data up to 64 kbps to be included in liaison

Table 1. FDD mode Physical Layer Service implementation capabilities for support ~~of the default speech service and~~ of CS data services up to 64 kbps

Service Implementation Capability	Specification	Section(s) ¹	Comments
Physical Layer UE procedures and measurements:			

¹ The list of references to the 25.2 series should not be considered exhaustive. References will need to be refined and updated as the standard is further elaborated.

Handover	25.215 25.212	6.1.1, 6.1.4, 6.1.5, 6.1.9, 7.1.1.2, 7.1.2, 7.1.3 4.4	Support of soft handover is mandatory for all terminals supporting CS services. Support of Inter-Frequency handover is mandatory for all terminals. Support of intra-frequency hard handover is FFS. Terminals shall support measurements commensurate with their mode/system capabilities, to facilitate inter-frequency, inter-mode & inter-system handover.
Power control	25.214 25.215	5.1.2, 5.2.3 6.1.1, 6.1.3, 6.1.6, 6.1.7	Support of closed loop power control is mandatory for all terminals.
<u>Error detection</u>	<u>25.212</u>	<u>4.2.1</u>	<u>Support of 0, 8, 12, 16 and 24 bits CRC per transport block is mandatory for all terminals.</u>
<u>Multiplexing and Channel Coding</u>	25.212	<u>4.2.3.2, 4.2.4— 4.2.15, 4.3</u>	<u>Turbo coding to be used for BER requirement of less than 10^{-3}. Support of turbo coding with code rate 1/3 for coding block sizes greater or equal to 320 bits is mandatory for all terminals.</u> <u>Support of no coding and convolutional coding with rates 1/2 and 1/3 is mandatory for all terminals.</u>
<u>Multiplexing</u>	<u>25.212</u>	<u>4.2.4 -4.2.14</u>	<u>The number of transport channels that all terminals have to support is 2, 1 of which is for CS data and 1 for dedicated signaling.</u> <u>Support of TTI={10 ms,20 ms ,40 ms,80 ms} for each transport channel is mandatory for all terminals.</u>
<u>Transport format detection</u>	<u>25.212</u>	<u>4.2.15</u>	<u>It is mandatory for all terminals to support transport format detection by TFCI, with fixed and flexible TrCH positions.</u> <u>Support of 1024 transport format combinations is mandatory for all terminals.</u>
Modulation	25.213	4.4.3	
Spreading and Scrambling Code Generation	25.213	4.3	Required Spreading Factor is dependent on channel coding rate, and on whether services are to be supported simultaneously. Terminals shall support all spreading factors between the maximum (256) and minimum (SFs of 16 & 64 are required for support of individual 64 kbps and 16 kbps services respectively). There is no specified manner for mapping given data rates to physical channels. That function is performed in Layer 2/3.
Code de-spreading and de-scrambling	25.213	5.2	
Support for downlink Transmit Diversity	25.211 25.214	5.3.2 8	Support of <u>feedback mode open loop and closed loop</u> transmit diversity is mandatory <u>in for all terminals supporting dedicated channels.</u>
Support for Site Selection Diversity Transmission	25.214	5.3.2.4	Support of SSDT is mandatory for all terminals <u>supporting soft handover.</u>
Transport channels required:			
Dedicated channel (DCH)	25.211	4.1.1, 6	
Physical channels required:			
Dedicated Physical Data Channel (DPDCH)	25.211	5.2.1, 5.3.2, 6	

Dedicated Physical Control Channel (DPCCH)	25.211	5.2.1, 5.3.2, 6	
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