

Agenda Item:

Source: Samsung Electronics Research Institute,...

Title: Proposed Liaison statement on Physical Layer Service Implementation Capabilities

To: TSG T WG2

Cc: TSG RAN WG2

TSG RAN WG1 has considered the liaison statement from TSG T WG2 requesting the identification of physical layer service implementation capabilities. RAN WG1 has identified the following service implementation capabilities that are required in addition to the baseline implementation capabilities (sent in LS T2-99474), to support speech and circuit switched data services with rates up to 64 kbps. Details of physical layer service implementation capabilities for packet switched services are expected to be provided in a separate Liaison Statement. TSG T WG2 is requested to note that the tables below are an initial indication of what is required to support the identified services, and are subject to revision based upon further work carried out within this group. TSG T WG2 is also requested to note that TSG RAN WG1 may use different terminology to that used by TSG T WG2, in order to describe certain aspects of the UTRAN. This liaison statement is copied to TSG RAN WG2 to help ensure consistency in responses between R1 and R2. TSG RAN WG1 would welcome feedback from TSG T WG2 and TSG RAN WG2 on the identified service implementation capabilities. Tables 1 and 2 show physical layer implementation capabilities for FDD and TDD modes respectively.

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:			
Handover	25.231 25.212	5.1.1, 5.1.2, 5.1.3, 5.1.4 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 25.231	5.1.2, 5.2.3 7.3	Support of closed loop power control is mandatory for all terminals. Not yet decided if there is a need to standardise measurements in relation to power control.
Multiplexing and Channel Coding	25.212	4.2.3.2, 4.2.4 – 4.2.15, 4.3	Turbo coding to be used for BER requirement of less than 10 ⁻³ .
Modulation	25.213	4.4.3	

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.

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 feedback mode transmit diversity is mandatory in Terminals supporting dedicated channels.
Support for Site Selection Diversity Transmission	25.214	5.3.2.4	Support of SSDT is mandatory for all terminals supporting soft handover.
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	

Table 2. TDD 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) ²	Comments
Physical Layer UE procedures and measurements:			
Handover	25.231	5.1.5, 5.1.6, 5.1.7	Support of Intra and Inter Frequency hard handover is mandatory for all terminals. Terminals shall support measurements commensurate with their mode/system capabilities, to facilitate inter-frequency, inter-mode & inter-system handover.
Dynamic Channel Allocation	25.231	5.4	Terminals shall support measurement of SIR in different timeslots.
Power control	25.224 25.231	4.3	Support of closed loop control for DL power. Support of open loop control for UL power.
Multiplexing and Channel Coding	25.222	6.2.3.2, 6.2.4 – 6.2.11, 6.3	Turbo coding to be used for BER requirement of less than 10^{-3} .
Spreading and Scrambling Code Generation	25.223	6	Terminals shall support spreading factors 8 and 16 for uplink transmission of speech and data services up to 16 kbps. SF4 shall be supported by Terminals supporting 64 kbps data. Simultaneous transmission of up to two codes shall be supported.
Code de-spreading and de-scrambling	25.223	6	Terminals shall support simultaneous reception of up to 2 codes using spreading factor 16 for speech. Up to 5 codes with SF 16 shall be supported simultaneously by terminals supporting 64 kbps.
Support for Downlink Transmit diversity	25.221 25.224	5.2.4 4.8	Support channel estimation on different midambles
Timing Advance	25.224	4.4	Support of TA adjustment according to higher layer signalling
Discontinuous transmission	25.224	4.7	
Transport channels necessary for the above:			
DCH	25.221	4.1.1, 6	
USCH	25.221	6.2.8	The requirement for USCH in the case of CS connections is for further study.
Physical channels necessary for above:			
Dedicated Physical CHannel (DPCH)	25.221	5.2, 6	
PUSCH	25.221	5.5	The requirement for USCH in the case of CS connections is for further study.

² 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.