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Digitalni celiļ ni telekomunikacijski sistem (faza 2+) - Sploġna radijska storitev s paketiranimi podatki (GPRS) - Mobilna postaja (MS) - Vmesnik sistema baznih postaj (BSS): protokol kontrole radijske povezave in dostopa do prenosnega medija (RLC/MAC) (GSM 04.60, razliļ ica 7.4.1, izdaja 1998)

Digital cellular telecommunications system (Phase 2+) (GSM); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol (GSM 04.60 version 7.4.1 Release 1998)

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Special Mobile Group (SMG).

The present document specifies the procedures used at the radio interface (Reference Point Um, see GSM 04.02) for the General Packet Radio Service (GPRS) Medium Access Control /Radio Link Control (MAC/RLC) layer within the digital cellular telecommunications system (Phase 2+).

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1 Scope

The present document specifies the procedures used at the radio interface (Reference Point Um, see GSM 04.02) for the General Packet Radio Service (GPRS) Medium Access Control /Radio Link Control (MAC/RLC) layer.

When the notations for "further study" or "FS" or "FFS" are present in the present document they mean that the indicated text is not a normative portion of the present document.

The present document is applicable to the following GPRS Um functional layers:

- Radio Link Control functions;
- Medium Access Control functions; and
- Physical Link Control functions.

The procedures described in the present document are for the RLC/MAC functions of the GPRS radio interface (Um) when operating on a Packet Data Channel (PDCH).

GSM 03.64 contains an overview of the GPRS radio interface (Um).

GSM 04.03 and GSM 04.04 contains the definition of the control channels used in the present document.

GSM 04.07 contains a description in general terms of the structured functions and procedures of this protocol and the relationship of this protocol with other layers and entities.

GSM 04.08 contains the definition of GPRS RLC/MAC procedures when operating on the Common Control Channel (CCCH).

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GSM 04.64 contains functional procedures for the Logical Link Control (LLC) layer.

Application to interface structure

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The RLC/MAC procedures apply to the interface structures defined in GSM 04.03. They use the functions and services provided by layer 1 defined in GSM 04.04. GSM 04.07 gives the general description of layer 3 including procedures, messages format and error handling.

Test procedures

Test procedures of the GSM radio interface signalling are described in GSM 11.10 and GSM 11.2x series.

Use of logical control channels

The logical control channels are defined in GSM 05.02. Two similar sets of logical channels are defined. The first set consists of the logical channels:

- Broadcast Control Channel (BCCH): downlink only, used to broadcast Cell specific information;
- Paging Channel (PCH): downlink only, used to send page requests to Mobile Stations (MSs);
- Random Access Channel (RACH): uplink only, used to request GPRS resources or a Dedicated Control Channel;
- Access Grant Channel (AGCH): downlink only, used to allocate GPRS resources or a Dedicated Control Channel;
- The second set consists of the logical channels:
- Packet Broadcast Control Channel (PBCCH): downlink only, used to broadcast Cell specific information;
- Packet Paging Channel (PPCH): downlink only, used to send page requests to Mobile Stations (MSs);
- Packet Random Access Channel (PRACH): uplink only, used to request GPRS resources;
- Packet Access Grant Channel (PAGCH): downlink only, used to allocate GPRS resources;

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- Packet Associated Control Channel (PACCH): bi-directional, associated with a Temporary Block Flow (TBF);
- Packet Timing advance control channel uplink (PTCCH/U): used to transmit random access bursts to allow estimation of the timing advance for one MS in transfer state;
- Packet Timing advance control channel downlink (PTCCH/D): used to transmit timing advance updates for several MS. One PTCCH/D is paired with several PTCCH/U's.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

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[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 02.60: "Digital cellular telecommunications system (Phase 2+); Stage 1 Service Description of the General Packet Radio Service (GPRS)".

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[3] GSM 03.03: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[4] GSM 03.13: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".

[5] GSM 03.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS);Overall description of GPRS radio Interface; Stage 2".

[6] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".

[7] GSM 04.03: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".

[8] GSM 04.04: "Digital cellular telecommunications system (Phase 2+); Layer 1 General requirements".

[9] GSM 04.05: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer General aspects".

[10] GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

[11] GSM 04.08: "Digital cellular telecommunications system (Phase 2+);Mobile radio interface layer 3 specification".

[12] GSM 04.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Logical Link Control (LLC)".

[13] GSM 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

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[14] GSM 05.03: "Digital cellular telecommunications system (Phase 2+); Channel coding".

[15] GSM 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[16] GSM 05.10: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronisation".

[17] GSM 11.10: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformity specification".

[18] GSM 11.21: "Digital cellular telecommunications system (Phase 2); The GSM Base Station System (BSS) equipment specification".

3 Definitions and abbreviations

Abbreviations used in the present document are listed in GSM 01.04 and GSM 02.60.

3.1 Vocabulary

For the purposes of the present document, the following terms and definitions apply:

Block period: block period is the sequence of four timeslots on a PDCH used to convey one radio block.

GPRS multislot class: term GPRS multislot class refers to the different mobile station capabilities to transmit and receive on different combinations of multiple PDCHs. The multislot classes are defined in GSM 05.02. Note that the mobile station may indicate different multislot classes for circuit mode services and for GPRS (see GSM 04.08). Different multislot class mobile stations are capable of supporting different medium access modes (see subclause 5.2.4).

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Packet idle mode: in packet idle mode, the mobile station is prepared to transfer LLC PDUs on packet data physical channels (see subclause 5.3). The mobile station is not allocated any radio resource on a packet data physical channel; it listens to the PBCCH and PCCCH or, if those are not provided by the network, to the BCCH and the CCCH.

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Packet transfer mode: in packet transfer mode, the mobile station is prepared to transfer LLC PDUs on packet data physical channels (see subclause 5.4). The mobile station is allocated radio resource on one or more packet data physical channels for the transfer of LLC PDUs.

Radio block: radio block is the sequence of four normal bursts carrying one RLC/MAC protocol data unit (see GSM 04.04). (The one exception is a radio block occasionally used on PACCH consisting of a sequence of four access bursts, each carrying a repetition of one short RLC/MAC block.)

Random values: in a number of places in this Technical Specification, it is mentioned that some value must take a "random" value, in a given range, or more generally with some statistical distribution. For such random values refer to GSM 04.08.

RLC/MAC block: RLC/MAC block is the protocol data unit exchanged between RLC/MAC entities (see clause 10 and GSM 04.04).

RLC/MAC control block: RLC/MAC control block is the part of a RLC/MAC block carrying a control message between RLC/MAC entities (see subclause 10.3).

RR connection: RR connection is a physical connection established between a mobile station and the network to support the upper layers' exchange of information flows. An RR connection is maintained and released by the two peer entities.

RLC data block: RLC data block is the part of a RLC/MAC block carrying user data or upper layers' signalling data (see subclause 10.2).

TBF abort: term "abort" as applied to TBF is used when the TBF is abruptly stopped without using the Release of TBF procedures defined in clause 9.