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Technical Specification

Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1 (3GPP TS 48.014 version 7.0.0 Release 7)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

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Foreword

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

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y   the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

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1 Scope

The present document specifies the physical layer on the Base Station System (BSS) to Serving GPRS Support Node (SGSN) interface (Gb interface) and references layer 1 standards to be used on this interface.

The protocol stack on the Gb interface is defined in the stage 2 3GPP TS 23.060.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2]   3GPP TS 22.060: "General Packet Radio Service (GPRS); Service description; Stage 1".

[3]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[4]   3GPP TS 48.004: "Base Station System - Mobile-services Switching Centre (BSS-MSC) interface; Layer 1 specification".

[5]   FRF.1.2 (July 2000): "User-to-Network Interface (UNI) Implementation Agreement".

[6]   ITU-T Recommendation G.704 (Blue Book): "Synchronous frame structures used at 1 544, 6 312, 2 048, 8 488 and 44 736 kbit/s hierarchical levels".

[7]   ANSI T1.403-1999: "Network and Customer Installation Interfaces - DS1 - Electrical Interface".

[8]   Bellcore TR-NWT-001203 Issue 2 (December 1992): "Generic Requirements for the Switched DS1/Switched Fractional DS1 Service Capability From an ISDN Interface (SWF-DS1/ISDN)".

[9]   ITU-T Recommendation V.35: "Data transmission at 48 kilobits per second using 60-108 kHz group band circuits".

[10]   ITU-T Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".

[11]   ITU-T Recommendation X.21: "Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks".

[12]   TIA/EIA-530-A: "High Speed 25-Position Interface for Data Terminal Equipment and Data Circuit-Terminating Equipment, Including Alternative 26-Position Connector (ANSI/TIA/EIA-530-A-92) (R98)".

3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 and 3GPP TS 23.060, and the following apply:

DCE   Data Circuit-terminating Equipment
DTE   Data Terminal Equipment
FRF   Frame Relay Forum

4 Definitions

4.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 22.060 and the following apply:

E1: a four wire symmetrical digital transmission path carrying PCM signal at 2 048 kbit/s.

T1: a four wire symetrical digital transmission path carrying PCM signal at 1 544 kbit/s.

4.2 Symbols

For the purposes of the present document, the symbols given in 3GPP TS 23.060 apply.

5 Layer 1 specification

Since Frame Relay shall be used on the Gb interface for phase 1 of GPRS, see 3GPP TS 23.060, the present document refers to "The Frame Relay Forum User-to-Network Implementation Agreement (UNI)" which recommends physical layer interfaces to be used in conjunction with Frame Relay.

5.1 Physical configuration of the Gb interface

The detailed physical configuration of the Gb interface is subject to negociation between operators and equipment providers and is out of the scope of the present document.

EXAMPLE: Point-to-point physical lines or an intermediate Frame Relay network may be used. In the latter case, the two ends of the Gb interface may use different types of physical interfaces.

5.2 Physical layer interface

Each of the physical layer of the Gb interface shall conform to one of the following FRF 1.2 clauses. This does not mean that each BSS and SGSN equipment has to support all of these physical interfaces, it means that the supported physical interfaces shall be compliant with the corresponding clause of FRF 1.2.

a) clause 2.1.1: ANSI T1.403.

b) clause 2.1.2: V.35, physical circuit and DTE/DCE interface clauses.

c) clause 2.1.3: G.703.

d) clause 2.1.4: G.704.

e) clause 2.1.5: X.21.

f) clause 2.1.6: TIA/EIA-530-A.

g) clause 2.1.7: HSSI.

The Gb interface may be multiplexed with the A interface on the same E1 (2 048 kbit/s), or T1 (15 44 kbit/s) digital path. In case of E1 interface, ITU-T Recommendation G.704 shall be applied according to FRF 1.2 and 3GPP TS 48.004 as appropriate, and in case of T1 interface ANSI T1.403 shall be applied according to FRF 1.1 and 3GPP TS 48.004 as appropriate.

In the case where multiple 64 kbit/s channels are used on an E1 (2048 kbit/s), digital path on the Gb interface, it is recommended to aggregate them into one nx64 kbit/s channel, see ITU-T Recommendation G.704, clause 5 and included clauses. In case where multiple 64 kbit/s channels are used on a T1 (1 544 kbit/s) digital path on the Gb interface, it is recommended to aggregate them into nx64kbit/s (where $2 \leq n \leq 24$) channel, see Bellcore TR-NWT-1203. This approach optimises the use of the available bandwidth by taking advantage of the statistical multiplexing at the upper layer. However, this approach requires that no slipping occurs between individual 64 kbit/s channels e.g. when passing through intermediate equipment between BSS and SGSN.

5.3 Error rate

The error rate experienced at the physical layer between the BSS and the SGSN shall be compatible with the operation of the upper layers.

5.4 Provision of physical channels

The physical channels on the Gb interface shall be permanently reserved by means of administrative procedures.

Annex A (informative): Change History

TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
GP-34	-	-	-	Rel-7 version created based on v6.0.0	7.0.0

History

Document history		
V7.0.0	October 2007	Publication