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Contents

Foreword

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

The present document specifies or references procedures used on the Base Station System (BSS) to Serving GPRS Support Node (SGSN) interface for control of GSM packet data services within the digital cellular telecommunications system (Phase 2+).

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:

x   the first digit:

1   presented to TSG for information;

2   presented to TSG for approval;

3   or greater indicates TSG approved document under change control.

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

z   the third digit is incremented when editorial only changes have been incorporated in the document.

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 03.60 [3].

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 TS 01.04 (ETR 350): "Abbreviations and acronyms".

[2]   3GPP TS 02.60: "General Packet Radio Service (GPRS); Service description; Stage 1".

[3]   3GPP TS 03.60: "Stage 2 Service Description of the General Packet Radio Service (GPRS)".

[4]   3GPP TS 08.04: "Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".

[5]   FRF 1.1 (January 19, 1996): "The Frame Relay Forum User-to-Network Implementation Agreement (UNI)".

[6]   CCITT Recommendation G.704 (Blue Book): "Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44 736 kbit/s hierarchical levels".

[7]   ANSI T1.403 (1995): "Carrier to Customer Installation DS1 Metallic Interface".

[8]   Bellcore TR-NWT-001203 Issue 2, December 1992: "Generic Requirements for the Switched DS1/Switched Franctional Capability from an ISDN Interface".

3 Definitions, symbols and abbreviations

3.1 Definitions

Refer to 3GPP TS 02.60 [2].

3.2 Symbols

Refer to 3GPP TS 03.60 [3].

3.3   Abbreviations

For the purposes of the present document the following abbreviations apply. Additional applicable abbreviations can be found in 3GPP TS 01.04 [1] and 3GPP TS 03.60 [3].

DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
E1	A four wire symmetrical digital transmission path carrying PCM signal at 2048 kbit/s.
FRF	Frame Relay Forum
T1	A four wire symetrical digital transmission path carrying PCM signal at 1544 kbit/s.

4   Layer 1 specification

Since Frame Relay shall be used on the Gb interface for phase 1 of GPRS, see TS 3GPP TS 03.60 [3], this version of this Technical Specification refers to "The Frame Relay Forum User-to-Network Implementation Agreement (UNI)" [5] which recommends physical layer interfaces to be used in conjunction with Frame Relay.

4.1   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 this Technical Specification.

For 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.

4.2   Physical layer interface

Each of the physical layer of the Gb interface shall conform to one of the following FRF 1.1 [5] 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 1.1 [5].

    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: ANSI-530-A-1992.
    g) clause 2.1.7: HSSI.

The Gb interface may be multiplexed with the A interface on the same E1 (2048 kbit/s), or T1 (1544 Kbit/s) digital path. In case of E1 interface, CCITT Recommendation G.704 [6] shall be applied according to FRF 1.1 [5] and 3GPP TS 08.04 [4] as appropriate, and in case of T1 interface ANSI Recommendation T1.403 [7] shall be applied according to FRF 1.1 [5] and 3GPP TS 08.04 [4] 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 CCITT Recommendation G.704 [6], clause 5 and included sub-clauses. In case where multiple 64kbit/s channels are used on a T1 (1544 kbit/s) digital path on the Gb interface, it is recommended to aggregate them into nx64kbit/s (where 2<=n<=24) channel, see Bellcore TR-NWT-1203 [8]. 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.

4.3   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.

4.4 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

Date / Meeting	Tdoc	CR	Subject
			Creation of R99 version
May 2002	-	-	Updated to 3GPP TS style format. Reference clause cleaned up