ETSI TS 101 347 V7.10.0 (2002-12)

Technical Specification

Digital cellular telecommunications system (Phase 2+);
General Packet Radio Service (GPRS);
GPRS Tunnelling Protocol (GTP)
across the Gn and Gp Interface
(3GPP TS 09.60 version 7.10.0 Release 1998)

Reference
RTS/TSGN-040960v7a0

Keywords
GSM

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, send your comment to:
editor@etsi.org

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2002.
All rights reserved.

DECT™, **PLUGTESTS**™ and **UMTS**™ are Trade Marks of ETSI registered for the benefit of its Members.
TIPHON™ and the **TIPHON logo** are Trade Marks currently being registered by ETSI for the benefit of its Members.
3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

All published ETSI deliverables shall include information which directs the reader to the above source of information.

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp .

Contents

Intellectual Property Rights 2
Foreword 2
Foreword 6
1 Scope 7
2 References 7
3 Definitions and abbreviations 8
3.1 Definitions 8
3.2 Abbreviations 9
4 General 9
5 Transmission order and bit definitions 10
6 GTP header 10
7 Signalling Plane 12
7.1 Signalling protocol 12
7.2 Signalling Message Formats 12
7.3 Usage of the GTP Header 13
7.4 Path Management messages 14
7.4.1 Echo Request 14
7.4.2 Echo Response 15
7.4.3 Version Not Supported 15
7.5 Tunnel Management messages 15
7.5.1 Create PDP Context Request 15
7.5.2 Create PDP Context Response 17
7.5.3 Update PDP Context Request 19
7.5.4 Update PDP Context Response 20
7.5.5 Delete PDP Context Request 21
7.5.6 Delete PDP Context Response 21
7.5.7 Create AA PDP Context Request 22
7.5.8 Create AA PDP Context Response 23
7.5.9 Delete AA PDP Context Request 24
7.5.10 Delete AA PDP Context Response 25
7.5.11 Error Indication 25
7.5.12 PDU Notification Request 26
7.5.13 PDU Notification Response 26
7.5.14 PDU Notification Reject Request 27
7.5.15 PDU Notification Reject Response 27
7.6 Location Management messages 28
7.6.1 Send Routeing Information for GPRS Request 28
7.6.2 Send Routeing Information for GPRS Response 29
7.6.3 Failure Report Request 30
7.6.4 Failure Report Response 30
7.6.5 Note MS GPRS Present Request 30
7.6.6 Note MS GPRS Present Response 31
7.7 Mobility Management messages 31
7.7.1 Identification Request 31
7.7.2 Identification Response 32
7.7.3 SGSN Context Request 32
7.7.4 SGSN Context Response 33
7.7.5 SGSN Context Acknowledge 34
7.8 Reliable delivery of signalling messages 35
7.9 Information elements 35
7.9.1 Cause 36

7.9.2 International Mobile Subscriber Identity (IMSI) 38
7.9.3 Routeing Area Identity (RAI) 38
7.9.4 Temporary Logical Link Identity (TLLI) 38
7.9.5 Packet TMSI (P-TMSI) 39
7.9.6 Quality of Service (QoS) Profile 39
7.9.7 Reordering Required 39
7.9.8 Authentication Triplet 40
7.9.9 MAP Cause 40
7.9.10 P-TMSI Signature 41
7.9.11 MS Validated 41
7.9.12 Recovery 41
7.9.13 Selection mode 42
7.9.14 Flow Label Data I 42
7.9.15 Flow Label Signalling 42
7.9.16 Flow Label Data II 43
7.9.16A MS Not Reachable Reason 43
7.9.17 Charging ID 43
7.9.18 End User Address 43
7.9.19 MM Context 46
7.9.20 PDP Context 47
7.9.21 Access Point Name 50
7.9.22 Protocol Configuration Options 50
7.9.23 GSN Address 50
7.9.24 MS International PSTN/ISDN Number (MSISDN) 51
7.9.25 Charging Gateway Address 51
7.9.26 Private Extension 51

8 Transmission Plane 52
8.1 Protocol Stack 52
8.1.1 Usage of the GTP Header 52
8.1.1.1 Usage of the Sequence Number 53
8.2 Tunnelling between SGSNs 53
8.3 Tunnelling between GGSNs 53

9 Path Protocols 53
9.1 UDP/IP 53
9.1.1 UDP Header 54
9.1.1.1 Signalling request messages 54
9.1.1.2 Signalling response messages 54
9.1.1.3 Encapsulated T-PDUs 54
9.1.2 IP Header 54
9.1.2.1 Signalling request messages and Encapsulated T-PDUs 54
9.1.2.2 Signalling response messages 54
9.2 TCP/IP 54
9.2.1 TCP Header 54
9.2.2 IP Header 54

10 Error handling 55
10.1 Protocol errors 55
10.1.1 Different GTP versions 55
10.1.2 GTP Message too short 55
10.1.3 Unknown GTP signalling message 55
10.1.4 Unexpected GTP signalling message 55
10.1.5 Missing mandatorily present information element 55
10.1.6 Invalid Length 56
10.1.7 Invalid mandatory information element 56
10.1.8 Invalid optional information element 56
10.1.9 Unknown information element 56
10.1.10 Out of sequence information elements 56
10.1.11 Unexpected information element 56
10.1.12 Repeated information elements 57
10.1.13 Incorrect optional information elements 57
10.2 Path failure 57

10.3 MS detach....57
10.4 Restoration and Recovery....57

11 Inter-PLMN GTP communication over the Gp interface....57

12 IP, the networking technology used by GTP....57
12.1 IP version....57
12.2 IP fragmentation....58
12.2.1 MO direction....58
12.2.2 MT direction....58
12.2.3 Tunnelling from old to new SGSN....58

13 GTP parameters....58
13.1 Timers....59
13.2 Others....59

Annex A (informative): Naming convention....64

A.1 Routing Area Identities....64

A.2 GPRS Support Nodes....64

Annex B (informative): A method for sequence number checking....65

Annex C (informative): Document change history....66

History....68