TSG-RAN Working Group 3 meeting #6
Sophia-Antipolis, France, 23 - 27 August 1999

TSGR3#6(99)836

3GPP TSG-N WG2
Visby, Sweden
July 19 – 23, 1999

Tdoc N2-99920

To: TSG-R WG3

Source: TSG-N WG2

Title: Liaison Statement on the evolution of GTP for Release'99

CN WG2 would like to thank RAN WG3 for their response liaison on the GTP Evolution.

CN WG2 notes the agreement on the CN WG2 responsibility for the GTP specification and also notes the agreement on the need for co-operation between CN WG2 and RAN WG3. Further on it is noted that there seems no need for any joint meetings at the moment.

CN WG2 has reviewed the RAN WG3 requirements on GTP-U and attached below you can find the current CN WG2 working assumptions on GTP for Release'99. The plan now for CN WG2 is to start the work with specific CRs towards UMTS 29.060.

RAN WG3 is very welcome to comment on our current GTP working assumptions.

1. GTP RELEASE'99 WORKING ASSUMPTIONS

1.1 General

It was agreed at the last TSG-N WG2 meeting in Edinburgh that there shall preferably only be one single version of the Release 99 specification of GTP, which shall be used over both Iu (GTP-U) and Gn/Gp in UMTS, and over Gn/Gp (GTP-C and GTP-U) in GSM/GPRS.

For the Release 99 GTP protocol, the user data and the control signalling should be more clearly separated. User traffic will be transported using GTP-U tunnels. Signalling for path management will be part of the GTP-U tunnel protocol.

In GTP for GPRS (Release 97 and 98), control signalling for tunnel management, location management, and mobility management is transported using the GTP tunnel protocol. In UMTS the RANAP protocol will be used for control signalling over Iu. Over Gn/Gp, control signalling will be made by the control part of GTP, i.e. GTP-C.

1.2 New version of the GTP specification

In order to be able to distinguish earlier GPRS versions of GTP from the Release 99 GPRS/UMTS version of GTP, it is proposed that the GTP version be increased to version 2. This will for example ease interworking between 2G-GSNs and 3G-GSNs at GSM ←→ UMTS Handover and provide for backward compatibility.

1.3 More clear separation of GTP into GTP-C and GTP-U

Since only the GTP-U part of GTP will be used over Iu, it is needed to have a clear definition of what is part of GTP-C and GTP-U respectively.

1.3.1 Contents of GTP-C

GTP-C will consist of the following main GTP parts:

- Tunnel management,
- Location management, and
- Mobility management.

1.3.2 Contents of GTP-U

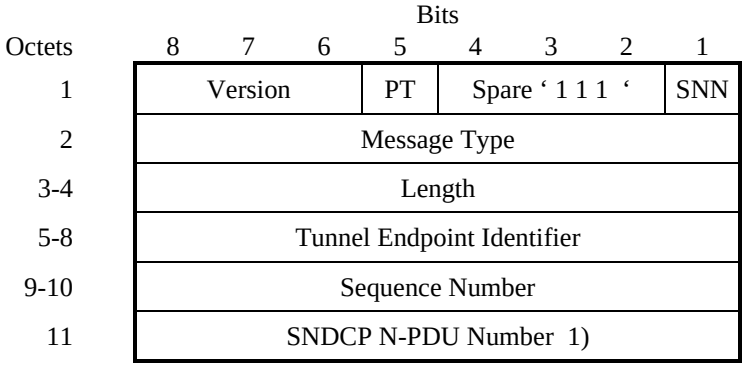
GTP-U will consist of the following main GTP parts:

- Transmission part, i.e. tunnelling of T-PDUs in the user plane, and
- Path management, including the Echo Request/Response and Version not Supported messages.

1.4 Common header for GTP-C and GTP-U

Preferably, there should be a common header for GTP-C and GTP-U in GTP Release 99. It is proposed that the header should have the following outline, see Figure 1.

The main difference between this new GTP version and the current version, is that here it is proposed that Tunnel Endpoint Identifier replaces both the Tunnel ID (TID) and the Flow Label used in the current version of GTP. The main reasons for this is to minimise the header size (now down from today's 20 to 10 octets in the normal case) and to allow for faster processing of the T-PDUs. For more information about the use of Tunnel Endpoint Identifiers see section 0.



1) This octet is only present when indicated by the SNN flag.

Figure 1: Outline of common header for GTP-C and GTP-U

1.4.1 Version

The Version field is used to separate different versions of the GTP protocol. Version shall be set to the second version of GTP for the Release’99 of GTP.

1.4.2 PT (Protocol Type)

Bit 5 of the first octet is used as a protocol discriminator. It is used to separate the GTP protocol from GTP’, a protocol that is used for charging purposes in the UMTS network.

1.4.3 Spare ‘111’

These bits are reserved for future use. Their use is FFS.

They shall be set to ‘1’ by the sending side and shall not be evaluated by the receiving side.

1.4.4 SNN

SNN is a flag indicating if SNDCP N-PDU number is included or not.

1.4.5 Message Type

The Message Type field indicates the type of the GTP message.

This is needed to indicate whether the message consists of transparent user data (T-PDUs), Path management messages or other signalling messages.

1.4.6 Length

The Length field indicates the length in octets of the GTP-U message excluding the GTP-U header. Bit 8 of octet 3 is the most significant bit and bit 1 of octet 4 is the least significant bit of the length field.

Length field is needed to enable volume based charging.

1.4.7 Tunnel Endpoint Identifier

The Tunnel Endpoint Identifier field identifies unambiguously a GTP-U tunnel within a node. The Tunnel Endpoint Identifier is negotiated through a RANAP or GTP-C dialogue during the setup phase of a GTP-U tunnel.

Over Iu, the SGSN locally assigns the Tunnel Endpoint Identifier to be used for upstream traffic and the RNC locally assigns the Tunnel Endpoint Identifier to be used for downstream traffic. Over Gn/Gp, the SGSN locally assigns the Tunnel Endpoint Identifier to be used for downstream traffic and the GGSN locally assigns the Tunnel Endpoint Identifier to be used for upstream traffic.

1.4.8 Sequence Number

The Sequence Number field is a transaction identity for signalling messages and an increasing sequence number for tunnelled T-PDUs.

Sequence numbers can be used to enable re-ordering of tunneled T-PDUs if that is required.

1.4.9 SNDCP N-PDU Number

SNDCP N-PDU Number is used at, for example, Inter SGSN Routeing Area Update procedures and SRNS Relocation procedures to co-ordinate the data transmission for acknowledged mode of communication between the MS and SGSN or RNC (in case of GSM and UMTS respectively).