3GPP TSG CN Plenary Meeting #17 **NP-020417**
4th - 6th September 2002. Biarritz, France.

Source: **TSG CN WG 3**

Title: **CR to Rel-5 on Work Item "TEI [GPRS]"**

Agenda item: **8.8**

Document for: **APPROVAL**

Introduction:

This document contains **1** CR on **Rel-5** Work Item **"TEI [GPRS]"**, that has been agreed by **TSG CN WG3**, and is forwarded to TSG CN Plenary meeting #17 for approval.

Doc-2nd-	Spec	CR	Rev	Subject	Cat	Phase	Version-	Workitem
N3-020716	29.061	057	8	Actions within the GGSN for IMS parameters sent in PDP context activation	F	Rel-5	5.2.0	TEI [GPRS]

3GPP TSG-CN WG3 Meeting #24
Helsinki, Finland, 28th July - 2nd Aug 2002.

Tdoc ⌘N3-020716

CR-Form-v7

CHANGE REQUEST

⌘ **29.061** **CR** **057** ⌘ **rev** **8** ⌘ Current version: **5.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Actions within the GGSN for IMS parameters sent in PDP context activation
Source:	⌘	Ericsson
Work item code:	⌘	TEI
Date:	⌘	22/07/2002
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	Specify GGSN specific behaviour when interworking with IMS. This does also include a proposal for a solution on policing restrictions imposed in the GGSN for the Signalling PDP context, as SA2#24 asked CN3 in the LS 'Clarification of IMS signalling flag' (N3-020475/S2-021530) in the answer to question 3, to study. An earlier release of this CR (N3-020503) was presented in CN3#23 in Budapest, but it was withdrawn because of unclear status of IMS related MS – GGSN interworking in CN1. It has now been updated and is in line with approved CN1 TS'es. The report from CN3#23 stated that the content of this CR "is still an open issue for Rel-5".
Summary of change:	⌘	Added a new clause 13a, describing Packet Domain interworking with a IMS-PDN. References and abbreviations added in clause 2 and 3.
Consequences if not approved:	⌘	Unclear GGSN actions when interworking with IMS.

Clauses affected:	⌘	2, 3.2, & 3.3 affected. 13a introduced

Other specs Affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	This CR shall be in line with the MS procedures specified 24.229 and 24.008.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

First amended section

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.

[1] Void.

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

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

[4] Void.

[5] Void.

[6] Void.

[7] Void.

[8] Void.

[9] Void.

[10] 3GPP TS 27.060: "Packet Domain; Mobile Station (MS) supporting Packet Switched Services".

[11] ITU-T Recommendation E.164: "Numbering plan for the ISDN era".

[12] <VOID>

[13] <VOID>

[14] <VOID>

[15] IETF RFC 768 (1980): "User Datagram Protocol" (STD 6).

[16] IETF RFC 791 (1981): "Internet Protocol" (STD 5).

[17] IETF RFC 792 (1981): "Internet Control Message Protocol" (STD 5).

[18] IETF RFC 793 (1981): "Transmission Control Protocol" (STD 7).

[19] IETF RFC 1034 (1987): "Domain Names - Concepts and Facilities" (STD 7).

[20] <VOID>

[21] IETF RFC 1661 and 1662 (1994): "The Point-to-Point Protocol (PPP)" (STD 51).

[22] IETF RFC 1700 (1994): "Assigned Numbers" (STD 2).3.

[23] 3GPP TS 44.008: "Mobile radio interface layer 3 specification; Core Network Protocols – Stage 3".

[24] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface".

[25] IETF RFC2794 (2000), Pat R. Calhoun and Charles E. Perkins: "Mobile IP Network Address Identifier Extension for IPv4", March 2000.

[26] IETF RFC 2131 (1997): "Dynamic Host Configuration Protocol".

[27] IETF RFC 1542 (1993): "Clarification and Extensions for the Bootstrap Protocol".

[28] IETF RFC2373 (1998): "IP version 6 Addressing Architecture".

[29] IETF RFC 2462 (1998): "IPv6 Stateless Address Autoconfiguration".

[30] IETF RFC 2002 (1996), C. Perkins: "IP Mobility Support".

[31] IETF RFC 2486 (1999), B. Aboba and M. Beadles: "The Network Access Identifier".

[32] IETF RFC1112 (1989), S.E. Deering: "Host extensions for IP multicasting".

[33] IETF RFC2236 (1997), W. Fenner: "Internet Group Management Protocol, Version 2".

[34] IETF RFC2362 (1998), D. Estrin and al: "Protocol Independent Multicast-Sparse Mode (PIM-SM)".

[35] IETF RFC1075 (1988), D. Waitzman and al: "Distance Vector Multicast Routing Protocol".

[36] IETF RFC1585 (1994), J. Moy: "MOSPF"..

[37] IETF RFC2290 (1998), J. Solomon, S. Glass: "Mobile-IPv4 Configuration Option for PPP IPCP "

[38] IETF RFC2865 (2000), C. Rigney, S. Willens, A. Rubens, W. Simpson: "Remote Authentication Dial In User Service (RADIUS)".

[39] IETF RFC2866 (2000), C. Rigney, Livingston: " RADIUS Accounting ".

[40] 3GPP TS 23.003: "3rd Generation Partnership Project; Technical Specification Group Core Network; Numbering, addressing and identification".

[41] IETF RFC2882 (2000), D. Mitton: "Extended RADIUS Practices".

[42] 3GPP TR 21.905: " Vocabulary for 3GPP Specifications".

[43] IETF RFC 2472 (1998), D. Haskins, E. Allen: “IP Version 6 over PPP”

[44] IETF RFC 2461 (1998), T. Narten, E. Nordmark, W. Simpson: “Neighbor Discovery for IP Version 6”

[45] IETF RFC 3118 (2001), R. Droms, W. Arbaugh: “Authentication for DHCP Messages”

[46] IETF Internet-Draft: “Dynamic Host Configuration Protocol for IPv6 (DHCPv6)”, draft-ietf-dhc-dhcpv6-24.txt, work in progress.

[47] 3GPP TS 24.229: “IP Multimedia Call Control Protocol based on SIP and SDP”

[48] IETF RFC 2710 (1999), S. Deering, W. Fenner, B. Haberman: “Multicast Listener Discovery (MLD) for IPv6”

[49] IETF RFC 2460 (1998), S.Deering,, R.Hinden: “Internet Protocol, Version 6 (IPv6) Specification”

[50] IETF RFC 3162 (2001), B. Adoba, G. Zorn, D. Mitton: “RADIUS and IPv6”

[51] IETF RFC 2548 (1999), G.Zorn: “Microsoft Vendor-specific RADIUS Attributes”

[52] 3GPP TS 23.228: "IP Multimedia Core Network Subsystem (IMS)".

[53] 3GPP TS 29.207: "Policy control over Go interface".

[54] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols - stage 3".

[55] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[56] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows"

Next amended section

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

APN	Access Point Name
ATM	Asynchronous Transfer Mode
BG	Border Gateway
CHAP	Challenge Handshake Authentication Protocol
DHCP	Dynamic Host Configuration Protocol
DHCPv6	Dynamic Host Configuration Protocol version 6
DNS	Domain Name System
DVMRP	Distance Vector Multicast Routing Protocol
GGSN	Gateway GPRS Support Node
GTP-U	GPRS Tunnelling Protocol for user plane
ICMP	Internet Control Message Protocol
IETF	Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IMS	IP Multimedia Core Network Subsystem
IP	Internet Protocol
IPCP	IP Control Protocol (PPP NCP for IPv4)
IPV6CP	IPv6 Control Protocol (PPP NCP for IPv6)
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
LAC	L2TP Access Concentrator
LAN	Local Area Network
LNS	L2TP Network Server
MIP	Mobile IP
MLD	Multicast Listener Discovery
MOSPF	Multicast Open Shortest Path First
MS	Mobile Station
MT	Mobile Terminal
MTU	Maximum Transfer Unit
NAI	Network Access Identifier
PAP	Password Authentication Protocol
PCF	Policy Control Function
PDCP	Packet Data Convergence Protocol
PDN	Packet Data Network
PDU	Protocol Data Unit
PEP	Policy Enforcement Point
PIM-SM	Protocol Independant Multicast – Sparse Mode
PPP	Point-to-Point Protocol
PS	Packet Switched
RADIUS	Remote Authentication Dial In User Service
SBLP	Service Based Local Policy
SGSN	Serving GPRS Support Node
SMDS	Switched Multimegabit Data Service
TCP	Transmission Control Protocol
TE	Terminal Equipment
TEID	Tunnel End-point Identifier
UDP	User Datagram Protocol

Next amended section

3.3 Symbols

For the purposes of the present document, the following symbols apply:

Gb	Interface between an SGSN and a BSC.
Gi	Reference point between Packet Domain and an external packet data network.
Gn	Interface between two GSNs within the same PLMN.
Go	Interface between a GGSN and a PCF.
Gp	Interface between two GSNs in different PLMNs. The Gp interface allows support of Packet Domain network services across areas served by the co-operating PLMNs.
Gs	Interface between an SGSN and MSC.
Iu	Interface between the RNS and the core network. It is also considered as a reference point.
R	The reference point between a non-ISDN compatible TE and MT. Typically this reference point supports a standard serial interface.
Um	The interface between the MS and the fixed network part in A/Gb mode. The Um interface is the A/Gb mode network interface for providing packet data services over the radio to the MS. The MT part of the MS is used to access the GSM services through this interface.
Uu	Interface between the mobile station (MS) and the fixed network part in Iu mode. The Uu interface is the Iu mode network interface for providing packet data services over the radio to the MS. The MT part of the MS is used to access the UMTS services through this interface.

Next amended section
(To be inserted after clause 13)

13a Interworking with IMS

13a.1 General

Interworking with the IP Multimedia Core Network Subsystem (IMS) puts additional requirements on the GGSN. When the MS connects to the IP Multimedia Core Network Subsystem (IMS), specific parameters in Session Management messages may be handled. The IMS specific parameters are: IMS signalling flag, P-CSCF address request, returned P-CSCF address(es), media authorization token(s) and flow identifier(s).

For interworking with the IMS, the Go interface (see 3GPP TS 29.207 [53]) is used to correlate the session (SIP/SDP) and the bearer (PDP Contexts).

The mechanisms in GGSN to support IMS shall be:

- P-CSCF discovery
- Dedicated signalling PDP contexts; with associated static packet filters to permit signalling to/from designated servers
- Go interface for charging correlation and policy control of PDP contexts for IMS media flows

These mechanisms are however not restricted to the IMS and could be used for other services that could benefit from these mechanisms.

13a.2 IMS Interworking Model

The signalling interface between MS and P-CSCF is a logical interface, i.e. it is using GPRS as a bearer. The Go interface is used for network communication between the GGSN and the PCF. For a description of the IMS architecture, refer to 3GPP TS 23.228 [52]. For a more detailed view of GGSN IMS interworking, see 3GPP TS 29.207 [53].

13a.2.1 IMS Specific Configuration in the GGSN

The GGSN shall have a list of preconfigured addresses of signalling servers (P-CSCF servers). This list shall be provided to MSs on request. The list shall be possible to preconfigure per APN.

The GGSN shall have preconfigured static packet filters, to be applied on dedicated signalling PDP contexts. The static packet filters shall filter up-link and down-link packets and only allow traffic to/from the preconfigured signalling servers and to DNS and DHCP servers. The static packet filters shall be possible to pre-configure per APN.

It shall be possible to enable/disable the use of the Go interface per APN. If disabled, the GGSN may reject Create PDP Context Requests that include binding information based on operator policy.

The GGSN shall support IPv6 addresses and protocol for IMS signalling and IMS bearers.

The GGSN shall provide support for P-CSCF discovery in two different ways (see TS 23.228):

- GPRS procedure for P-CSCF discovery, i.e. request and provision of P-CSCF address(es) within the PCO IE in GPRS Session Management procedures (see TS 24.008).

- Via DHCPv6 servers i.e. the GGSN shall provide the functionality of a DHCPv6 relay agent

On APNs providing IMS services, the information advertised in Router Advertisements from GGSN to MSs shall be configured in the same manner as for other APNs prviding IPv6 services (see subclause 11.2.1.3.4), except that the “O-flag” shall be set even when the “M-flag” is cleared.

Note: When the “M-flag” is cleared, the “O- flag” shall be set in IPv6 Router Advertisement messages sent by the GGSN for APNs used for IMS services. This will trigger a DHCP capable MS to start a DHCPv6 session to retrieve server addresses and other configuration parameters. An MS which doesn’t support DHCP will simply ignore the “O-flag”. An MS may simultaneously use stateless address autoconfiguration for configuring its IPv6 address and stateful autoconfiguration for configuring IMS specific parameters. An MS which doesn’t support DHCP, shall request IMS specific configuration (e.g. P-CSCF address) in the PCO IE in the Create PDP Context message.

The GGSN shall support a DHCPv6 relay agent.

13a.2.2 IMS Specific Procedures in the GGSN

13a.2.2.1 Request for Signalling Server Address

When an MS indicates a request for a P-CSCF address in the PCO IE in a Create PDP Context Request message, the GGSN shall respond with one or more P-CSCF server addresses if available for this APN. If the GGSN has no P-CSCF address available, the GGSN shall ignore the request. If the GGSN provides more than one P-CSCF IPv6 address in the response, the GGSN shall sort the addresses with the highest priority P-CSCF server first in the PCO IE. The GGSN may use different prioritisations for different MSes, eg for load sharing between the P-CSCF servers. The coding of the PCO IE is described in the 3GPP TS 24.008 [54]. This procedure shall be followed regardless of whether or not the MS uses a dedicated signalling PDP context, and irrespective of the Go status for the APN.

13a.2.2.2 Establishment of a PDP Context Dedicated for Signalling

The GGSN shall allow IMS signalling on a “general-purpose PDP context”, in which case the IMS signalling shall be provided like any other transparent services provided by the packet domain.

The GGSN may (dependent on operator policy) also support dedicated signalling PDP Contexts for IMS services. An MS may request a dedicated signalling PDP context (see 3GPP TS 24.229 [55]). The operator may provide special

properties to dedicated signalling PDP contexts, e.g special charging and enhanced QoS. It is out of the current scope of this TS to further specify these properties.

For a PDP Context marked as a dedicated signalling PDP Context, the GGSN shall apply static packet filters, which shall only allow packets to be sent to and from a pre-configured set of signalling servers, such as P-CSCF(s), DHCP server(s) and DNS server(s). The static packet filters for down-link signalling traffic shall have the format of a TFT and be sorted so that they precede both the SBLP based filters and the UE specified TFT filters. This will secure the use of the correct PDP context for the signalling traffic, and that only authorized traffic uses the signalling PDP context. The static packet filters shall be pre-configured in the GGSN by the operator. For dedicated signalling PDP Contexts, any TFT specified by the MS shall be replaced by the GGSN pre-configured static packet filters.

13a.2.2.3 Creation of a PDP Context for IMS Media Flows

For PDP Contexts used to carry IMS media flows, specific policies may be applied. The policy includes packet filtering, which enables a specific charging for these PDP Contexts, see 3GPP TS 29.207 [53].

The creation of a PDP Context to be used to carry media flows involves interaction between the MS and the GGSN and between the GGSN and the P-CSCF/PCF. The interaction between the GGSN and the P-CSCF/PCF, i.e. the Go interface, is described in detail in 3GPP TS 29.207 [53]. The interaction between the MS and GGSN is described in 3GPP TS 29.208 [56].

If binding information (media authorization token and flow identifiers) is included in a Create PDP Context Request message, the GGSN shall use the Go interface to authorize the request and retrieve a policy for filtering. If the Go interface is not enabled for the APN, the request may be rejected based on operator policy.

The GGSN identifies the PCF to interact with using a PCF identifier. The PCF identifier is part of the media authorization token in the binding information, and is a fully qualified domain name (see 3GPP TS 29.207 [53]). Inclusion of both binding information and an indication for a dedicated signalling PDP Context in the same Create PDP Context Request message is not permitted. If both are received together, the GGSN shall reject the PDP context request.