3GPP TSG CN Plenary Meeting #17 **NP-020364**
4th - 6th September 2002. Biarritz, France.

Source: **MCC**

Title: **All LSs sent from CN1 since TSG CN#16 meeting,- pack 2**

Agenda item: **6.1.1**

Document for: **INFORMATION**

Introduction:

This document contains **4 agreed** LSs sent from **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #17 for information only.

Meeting	TDoc #	Status	Source	Tdoc Title	Comments
N1-25	N1-021764	AGREED	Inma C.	LS on Indication of successful establishment of Signalling PDP context	Linked to 1541. To: SA2
N1-25	N1-021782	AGREED	Atle M.	LS on Media grouping	Related to 1675. To: SA, CN, SA2, Cc: CN3
N1-25	N1-021834	AGREED	Atle M.	LS on Request for DNS server address by SM procedure	Related to 1677. To: SA2, CN Cc: CN3 Revised from 1785
N1-25	N1-021835	AGREED	Roland G.	LS on " Terminal determination of network support of EDGE "	To: GERAN, GERAN2 Cc: , Revised from 1805

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021764***
Helsinki, Finland, 29 July – 2 August

Title:	LS on Indication of successful establishment of Signalling PDP context
Response to:	LS (S2-022053) on Modification of IMS signalling PDP context from TSG SA WG2
Release:	Rel-5
Work Item:	-
Source:	TSG CN WG1
To:	TSG SA WG2
Cc:	

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Attachments: N1-021704 "Indication of successful establishment of Signalling PDP context to the UE"

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1. Overall Description:

CN1 thank SA2 on their LS indicating the problem when a pre-Rel-5 SGSN will not pass the signalling flag, set by the UE in either Secondary PDP context activation or PDP context modification, to the GGSN.

CN1 would like to inform SA2 that a solution for this problem, where the GGSN sends an indication of successful dedicated signalling PDP context establishment to the UE, has been agreed in this meeting. The related CR to 24.008 is attached for information.

2. Actions:

None.

3. Date of Next TSG-CN1 Meetings:

CN1_26	23rd – 27th September 2002	?, USA
CN1_27	11th – 15th November 2002	Bangkok, Thailand

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021704***
Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **675** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Indication of successful establishment of Dedicated Signalling PDP context to the UE
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	23/07/2002
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:	⌘	SA#25 discussed the problem when the signalling flag is not transferred in PDP context Modification and Secondary PDP context activation by a Rel-4 SGSN, see incoming LS S2-022053 (LS on Modification of IMS signalling PDP context). The proposed solution is to indicate to the UE when the activation/modification of the dedicated signalling PDP context was successful. An UE not receiving this indication will consider the PDP context as a general purpose PDP context.
Summary of change:	⌘	IM CN Subsystem Signalling flag added in network to MS direction in PCO IE.
Consequences if not approved:	⌘	A PDP context may be charged as a general purpose PDP context while the user believes the PDP context is for free.

Clauses affected:	⌘	10.5.6.3 Protocol configuration options

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

Other comments: ⌘

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.

10.5.6.3 Protocol configuration options

The purpose of the *protocol configuration options* information element is to:

- transfer external network protocol options associated with a PDP context activation, and
- transfer additional parameters and/or requests (such as, P-CSCF Address Request; 3GPP TS 24.229 [95]) that may serve any purpose other than defining network protocol options.

The *protocol configuration options* is a type 4 information element with a minimum length of 2 octets and a maximum length of 253 octets.

The *protocol configuration options* information element is coded as shown in figure 10.5.136/3GPP TS 24.008 and table 10.5.154/3GPP TS 24.008.

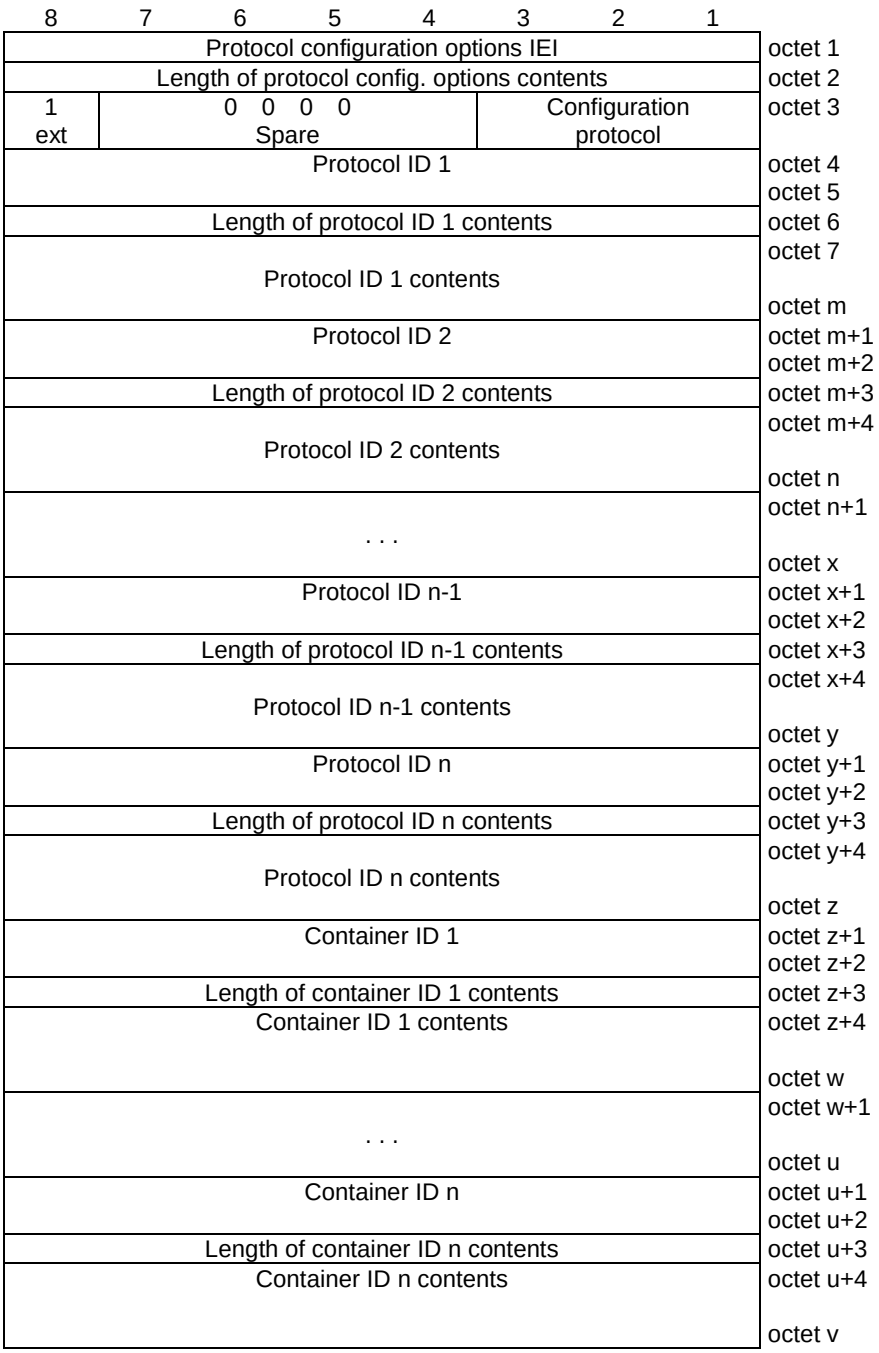

Figure 10.5.136/3GPP TS 24.008: *Protocol configuration options* information element

Table 10.5.154/3GPP TS 24.008: *Protocol configuration options* information element

Configuration protocol (octet 3)
Bits
3 2 1
0 0 0 PPP for use with IP PDP type

All other values are interpreted as PPP in this version of the protocol.

After octet 3, i.e. from octet 4 to octet v, two logical lists are defined:

- the Configuration protocol options list (octets 4 to z), and

- the Additional parameters list (octets z+1 to v).

Configuration protocol options list (octets 4 to z)

The *configuration protocol options list* contains a variable number of logical units, the may occur in an arbitrary order within the *configuration protocol options list*.

Each unit is of variable length and consists of a:

- protocol identifier (2 octets);
- the length of the protocol identifier contents of the unit (1 octet); and
- the protocol identifier contents itself (n octets).

The *protocol identifier* field contains the hexadecimal coding of the configuration protocol identifier. Bit 8 of the first octet of the *protocol identifier* field contains the most significant bit and bit 1 of the second octet of the *protocol identifier* field contains the least significant bit.

If the *configuration protocol options list* contains a protocol identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *length of the protocol identifier contents* field contains the binary coded representation of the length of the *protocol identifier contents* field of a unit. The first bit in transmission order is the most significant bit.

The *protocol identifier contents* field of each unit contains information specific to the configuration protocol specified by the *protocol identifier.*

PPP

At least the following protocol identifiers (as defined in RFC 1700) shall be supported in this version of the protocol:

- C021H (LCP;
- C023H (PAP);
- C223H (CHAP);and
- 8021H (IPCP).

The support of other protocol identifiers is implementation dependent and outside the scope of the present document.

The *protocol identifier contents* field of each unit corresponds to a “Packet” as defined in RFC 1661 that is stripped off the “Protocol” and the “Padding” octets.

The detailed coding of the *protocol identifier contents* field is specified in the RFC that is associated with the protocol identifier of that unit.

Additional parameters list (octets z+1 to v)

The *additional parameters list* is included when special parameters and/or requests (associated with a PDP context) need to be transferred between the MS and the network. These parameters and/or requests are not related to a specific configuration protocol (e.g. PPP), and therefore are not encoded as the "Packets" contained in the *configuration protocol options list*.

The *additional parameters list* contains a list of special parameters, each one in a separate container. The type of the parameter carried in a container is identified by

a specific *container identifier*. In this version of the protocol, the following container identifiers are specified:

MS to network direction:

- 0001H (P-CSCF Address Request);
- 0002H (IM CN Subsystem Signaling Flag).

Network to MS direction:

- 0001H (P-CSCF Address).
- 0003H (IM CN Subsystem Signaling Flag).

If the *additional parameters list* contains a container identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *container identifier* field is encoded as the *protocol identifier* field and the *length of container identifier contents* field is encoded as the *length of the protocol identifier contents* field.

When the *container identifier* indicates P-CSCF Address, the *container identifier contents* field contains one IPv6 address corresponding to a P-CSCF address (see 3GPP TS 24.229 [95]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 (IP version 6 addressing architecture). When there is need to include more than one P-CSCF address, then more logical units with *container identifier* indicating P-CSCF Address are used.

When the *container identifier* indicates P-CSCF Address Request, the *container identifi*er contents field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored.

When the *container identifier* indicates IM CN Subsystem Signaling Flag (see 3GPP TS 24.229 [95]), the *container identifier contents* field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored. In Network to MS direction this information may be used by the MS to indicate to the user whether the requested dedicated signalling PDP context was successfully established.

NOTE 1: The *additional parameters list* and the *configuration protocol options list* are logically separated since they carry different type of information. The beginning of the *additional parameters list* is marked by a logical unit, which has an identifier (i.e. the first two octets) equal to a *container identifier* (i.e. it is not a *protocol identifier*).

NOTE 2: The *additional parameters list* is discarded by a receiver, which does not support this list (e.g. a R99 GGSN).

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021834***
Helsinki, Finland, 29 July – 2 August

Title: LS on Request for DNS server address by SM procedure
Response to:
Release: REL-5
Work Item: IMS-CCR

Source: CN1
To: SA2, TSG CN
Cc: CN3

Contact Person:
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Tel. Number: +47 372 93 665
E-mail Address: atle.monrad@ericsson.com

Attachments:
N1-021678 (CR 669 revision – for 24.008 v 5.4.0)
N1-021833 (CR 177 revision 2 for 24.229 v 5.1.0)
N3-020669 (CR 054 revision 2 for 27.060 v 5.1.0)
N3-020688 (CR 061 revision 2 for 29.061 v 5.2.0)

1. Overall Description:

There is currently no support for dynamic configuration of Domain Name System (DNS) server IPv6 addresses in a UE not supporting the DHCPv6 protocol, as the necessary internet-drafts are not ready.

As a "back-up" solution to the internet-drafts that most likely will be late for Rel-5, a mechanism is introduced in CN1 and CN3 specifications to allow the possibility of dynamic configuration of Domain Name System (DNS) server IPv6 addresses via the Session Management procedures.

The solution proposes to use the PCO-IE to request the IPv6 address for DNS servers. This will be a generic solution for 3GPP and described in 27.060 and 29.061.

The coding within the PCO-IE is outlined in 24.008.

As IMS may use the IPv6 address for DNS servers, this solution is also mentioned in 24.229.

2. Actions:

To SA2 group.

ACTION: CN1 asks SA2 to consider the outlined solution and respond to CN1 if the solution cannot be accepted in Rel-5. The package with the above mentioned CRs are agreed in CN1 and CN3 and will be submitted to CN#17 for final approval if SA2 does not have any objections.

3. Date of Next TSG-CN1 Meetings:

CN1_26	23rd – 27th September 2002	Miami, USA
CN1_27	11th – 15th November 2002	Bangkok, Thailand

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021833~~784~~

CR-Form-v7

CHANGE REQUEST

⌘ **24.229** **CR** **177** ⌘ **rev** **2** ⌘ Current version: **5.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [ ]

Title:	⌘	Request for DNS IPv6 server address
Source:	⌘	Ericsson
Work item code:	⌘	IMS-CCR
Date:	⌘	01/08/2002
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:	⌘	For stateless autoconfiguration, the UE should use RFC 2462 and draft-ietf-ipv6-dns-discovery-05.txt or draft-ietf-pppext-ipv6-dns-addr-00.txt to aquire the IPv6 address(es) for DNS server(s). As the ready date of the mentioned internet-drafts are not defined, it may be a risk that these drafts do not reach RFC status in REL-5 timeframe.
Summary of change:	⌘	As an alternative to draft-ietf-ipv6-dns-discovery-05.txt or draft-ietf-pppext-ipv6-dns-addr-00.txt, it is proposed to allow the use of the PCO IE to request DNS server address(es).
Consequences if not approved:	⌘	IPv6 stateless DNS discovery for IMS will not pe possible.

Clauses affected:	⌘	2, 9.2.1			
		Y	**N**		
Other specs affected:	⌘	**X**		Other core specifications	⌘ 24.008, 27.060, 29.061
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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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 modification **********

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 23.002: "Network architecture".

[3] 3GPP TS 23.003: "Numbering, addressing and identification".

[4] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[5] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IM call model".

[6] 3GPP TS 23.221: "Architectural requirements".

[7] 3GPP TS 23.228: "IP multimedia subsystem; Stage 2".

[8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

[9] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[10] 3GPP TS 26.235: "Packet switched conversational multimedia applications; Default codecs".

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

[11] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting Packet Based Services and Packet Data Networks (PDN)".

[12] 3GPP TS 29.207: "Policy control over Go interface".

[13] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows".

[14] 3GPP TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents".

[15] 3GPP TS 29.229: "Cx and Dx Interfaces based on the Diameter protocol, Protocol details".

[16] 3GPP TS 32.200: "Telecommunication management; Charging management; Charging principles".

[17] 3GPP TS 32.225: "Telecommunication management; Charging management; Charging data description for the IP Multimedia subsystem".

[18] 3GPP TS 33.102: "3G Security; Security architecture".

[19] 3GPP TS 33.203: "Access security for IP based services".

[20] 3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[21] RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

[22] RFC 2806: "URLs for Telephone Calls".

[23] RFC 2833 (May 2000): "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[24] RFC 2916: "E.164 number and DNS".

[25] RFC 2976 (October 2000): "The SIP INFO method".

[26] RFC 3261 (March 2002): "SIP: Session Initiation Protocol".

[27] RFC 3262 (March 2002): "Reliability of provisional responses in Session Initiation Protocol".

[28] RFC 3265 (March 2002): "Session Initiation Protocol Specific Event Notification".

[29] RFC 3311 (April 2002): "The SIP UPDATE method".

[30] RFC 3312 (May 2002): "Integration of resource management and SIP".

[31] RFC 3313 (February 2002): "SIP extensions for media authorization".

[32] RFC 3320 (March 2002): "Signaling Compression (SigComp)"

[33] RFC 3323 (May 2002): "A Privacy Mechanism for the Session Initiation Protocol (SIP)".

[34] RFC 3325 (May 2002): "Private Extensions to the Session Initiation Protocol (SIP) for Network Asserted Identity within Trusted Networks".

[35] RFC 3327 (May 2002): "SIP Extension for Registering Non-Adjacent Contacts".

[36] draft-sparks-sip-refer-split-00 (April 2002): "The REFER method".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[37] draft-sparks-sip-mimetypes (April 2002): "Internet Media Type message/sipfrag".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[38] draft-willis-scvrtdisco-03 (May 2002): "SIP Extension Header for Service Route Discovery in Private Networks".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[39] draft-ietf-mmusic-sdp-new-04 (November 2001): "SDP: Session Description Protocol".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[40] draft-ietf-dhc-dhcpv6-2~~6~~3 (June~~February~~ 2002): "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[41] draft-ietf-sip-dhcpv6-00 (April 2002): "DHCPv6 options for SIP servers".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[42] draft-ietf-sipping-sigcomp-sip-dictionary-00.txt (May 2002): "The SIP/SDP static dictionary for Signaling Compression".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[43] draft-beckmann-sip-reg-event-01 (May 2002): "Registration event package".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[44] draft-garcia-sip-visited-network-id-00 (March 2002): "Private SIP extension for Visited Network Identifier".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[45] draft-henrikson-sip-charging-information-01 (May 2002): "Private SIP Extension for Mobile Charging Information".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[46] draft-henrikson-sip-original-dialog-id-01 (May 2002): "Private SIP Extension for Original Dialog Identifier".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[47] draft-mills-sip-access-network-info-01.txt (April 2002): “SIP Access Network Information header”

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

********** Second modification **********

9 GPRS aspects when connected to the IM CN subsystem

9.1 Introduction

A UE accessing the IM CN subsystem, and the IM CN subsystem itself, utilise the services provided by GPRS to provide packet-mode communication between the UE and the IM CN subsystem.

Requirements for the UE on the use of these packet-mode services are specified in this clause. Requirements for the GGSN in support of this communication are specified in 3GPP TS 29.061 [11] and 3GPP TS 29.207 [12].

9.2 Procedures at the UE

9.2.1 PDP context activation and P-CSCF discovery

Prior to communication with the IM CN subsystem, the UE shall:

a) perform a GPRS attach procedure;

b) establish a PDP context used for SIP signalling according to the APN and GGSN selection criteria described in 3GPP TS 23.060 [4] and 3GPP TS 27.060 [10A]. This PDP context shall remain active throughout the period the UE is connected to the IM CN subsystem, i.e. from the initial registration and at least until the deregistration. As a result, the PDP context provides the UE with information that makes the UE able to construct an IPv6 address;

The UE shall choose one of the following options when performing establishment of this PDP context:

I. A dedicated PDP context for SIP signalling:

The UE shall indicate to the GGSN that this is a PDP context intended to carry IM CN subsystem-related signalling only by setting the IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE at PDP Context activation. The UE may also use this PDP context for DNS and DHCP signalling according to the static packet filters described in 3GPP TS 29.207 [12];

II. A general-purpose PDP context:

The UE may decide to use a general purpose PDP Context to carry IM CN subsystem-related signaling. The UE shall indicate to the GGSN that this is a general-purpose PDP context by not setting the IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE;

NOTE 1: A general purpose PDP Context is completely IM CN subsystem-unaware, and as such, it does not have any IM CN subsystem-specific mechanisms applied to it.

NOTE 2: A general purpose PDP Context may carry both IM CN subsystem signaling and media, in case the media does not need to be authorized by Service Based Local Policy mechanisms defined in 3GPP TS 29.207 [12] and the media component is not mandated by the P-CSCF to be carried in a separate PDP Context.

c) aquire a P-CSCF address(es).

The methods for P-CSCF discovery are:

I. Employ Dynamic Host Configuration Protocol for IPv6 (DHCPv6) draft-ietf-dhc-dhcpv6 [40], the DHCPv6 options for SIP servers draft-ietf-sip-dhcpv6 [41] and if needed DNS after PDP context activation.

The UE shall either:

- in the DHCP query, request a list of SIP server domain names of P-CSCF(s) and the list of Domain Name Servers (DNS); or

- request a list of SIP server IPv6 addresses of P-CSCF(s).

II. Transfer P-CSCF address(es) within ~~T~~the PDP context activation procedure.

The UE shall indicate the request for a P-CSCF address to the GGSN within the Protocol Configuration Options IE of the ACTIVATE PDP CONTEXT REQUEST message or ACTIVATE SECONDARY PDP CONTEXT REQUEST message.

If the GGSN provides the UE with a list of P-CSCF IPv6 addresses in the ACTIVATE PDP CONTEXT ACCEPT message or ACTIVATE SECONDARY PDP CONTEXT ACCEPT message, the UE shall assume that the list is prioritised with the first address within the Protocol Configuration Options IE as the P-CSCF address with the highest priority.

The UE can freely select method I or II for P-CSCF discovery. In case several P-CSCF addresses are provided to the UE, the selection of P-CSCF address shall be performed according to the resolution of host name as indicated in RFC 3261 [26]. If sufficient information for P-CSCF address selection is not available, selection of the P-CSCF address by the UE is implementation specific.

If the UE is designed to use I above, but receives P-CSCF address(es) according to II, then the UE shall either ignore the received address(es), or use the address(es) in accordance with II, and not proceed with the DHCP request according to I.

The UE may request a DNS Server IPv6 address(es) via draft-ietf-dhc-dhcpv6-26 [40] or by the Protocol Configuration Options IE when activating a PDP context according to 3GPP TS 27.060 [10A].

Detailed description of how the request and response for IPv6 address(es) for DNS server(s) and list of P-CSCF address(es) are carried in the Protocol Configuration Options IE is provided in 3GPP TS 24.008 [8].

9.2.2 Session management procedures

The existing procedures for session management as described in 3GPP TS 24.008 [8] shall apply while the UE is connected to the IM CN subsystem.

9.2.3 Mobility management procedures

The existing procedures for mobility management as described in 3GPP TS 24.008 [8] shall apply while the UE is connected to the IM CN subsystem.

9.2.4 Cell selection and lack of coverage

The existing mechanisms and criteria for cell selection as described in 3GPP TS 25.304 [9] and 3GPP TS 44.018 [20] shall apply while the UE is connected to the IM CN subsystem.

9.2.5 PDP contexts for media

During establishment of a session, the UE establishes data streams(s) for media related to the session. Such data stream(s) may result in activation of additional PDP context(s). Such additional PDP context(s) shall be established as secondary PDP contexts associated to the PDP context used for signalling.

The P-CSCF shall indicate to the UE in SIP/SDP if a separate PDP Context is required for a media component as per procedures defined in 3GPP TS 23.228 [7]. The UE shall establish an additional PDP context for a media component if so indicated by the P-CSCF.

The UE shall pass the authorisation token received from the P-CSCF in the 183 (Session Progress) response to an INVITE request at originating setup or in the INVITE request at terminating setup to the GGSN by inserting it within the Traffic Flow Template IE at PDP Context activation/modification.

In order to identify to the GGSN which flow(s) (identified by m-lines within the SDP) are to be transferred within a particular PDP context, the UE shall set the flow identifier(s) within the Traffic Flow Template IE at PDP Context activation modification. Detailed description of how the flow identifiers are constructed is provided in 3GPP TS 29.207 [12].

Detailed description of how the authorization token and flow identifiers are carried in the Traffic Flow Template IE is provided in 3GPP TS 24.008 [8].

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021678***
Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **669** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Request for DNS IPv6 server address
Source:	⌘	Ericsson
Work item code:	⌘	IMS-CCR
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:	⌘	As the progress of draft-ietf-ipv6-dns-discovery-05.txt and draft-ietf-pppext-ipv6-dns-addr-00.txt are not predictable, it may be a risk that these drafts do not reach RFC status in REL-5 timeframe.
Summary of change:	⌘	As an alternative to internet-drafts, it is proposed to allow the use of the PCO IE to request DNS IPv6 server address(es).
Consequences if not approved:	⌘	IPv6 stateless DNS discovery will not be possible.

Clauses affected:	⌘	2, 10.5.6.3

		Y	N			
Other specs Affected:	⌘	X		Other core specifications	⌘	24.229, 27.060, 29.061
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

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 change **********

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] Void.

[2] Void.

[2a] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications"

[3] 3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[4] 3GPP TS 22.003: "Teleservices supported by a Public Land Mobile Network (PLMN)".

[5] 3GPP TS 42.009: " Digital cellular telecommunications system (Phase 2+); Security aspects".

[6] 3GPP TS 22.011: " Digital cellular telecommunications system (Phase 2+); Service accessibility".

[7] 3GPP TS 42.017: " Digital cellular telecommunications system (Phase 2+); Subscriber Identity Modules (SIM); Functional characteristics".

[8] 3GPP TS 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[9] 3GPP TS 03.01: "Digital cellular telecommunications system (Phase 2+); Network functions".

[10] 3GPP TS 23.003: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[11] 3GPP TS 43.013: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".

[12] 3GPP TS 23.014: "Digital cellular telecommunications system (Phase 2+); Support of Dual Tone Multi-Frequency (DTMF) signalling".

[12a] Void.

[13] 3GPP TS 43.020: "Digital cellular telecommunications system (Phase 2+); Security-related network functions".

[14] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[15] 3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16] 3GPP TS 44.003: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface; Channel structures and access capabilities".

[17] 3GPP TS 44.004: "Digital cellular telecommunications system (Phase 2+); Layer 1; General requirements".

[18] 3GPP TS 44.005: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer; General aspects".

[19] 3GPP TS 44.006: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[20] 3GPP TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".

[21] 3GPP TS 24.010: "Digital cellular telecommunications system ; Mobile radio interface layer 3; Supplementary services specification; General aspects".

[22] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23] 3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a] 3GPP TS 24.071: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 location services specification."

[23b] 3GPP TS 44.031 "Digital cellular telecommunication system (Phase 2+); Location Services LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c] 3GPP TS 25.331: "3rd Generation Partnership Project;Technical Specification Group Radio Access Network; Radio Resource Control (RRC) protocol specification"

[24] 3GPP TS 24.080: "Digital cellular telecommunications system (Phase 2+); Mobile radio Layer 3 supplementary service specification; Formats and coding".

[25] 3GPP TS 24.081: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services; Stage 3".

[26] 3GPP TS 24.082: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services; Stage 3".

[27] 3GPP TS 24.083: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[28] 3GPP TS 24.084: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services; Stage 3".

[29] 3GPP TS 24.085: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services; Stage 3".

[30] 3GPP TS 24.086: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services; Stage 3".

[31] 3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[32] 3GPP TS 45.002: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

[33] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[34] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[35] 3GPP TS 45.010: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization".

[36] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[36a] 3GPP TS 27.060: " Mobile Station (MS) supporting Packet Switched Services ".

[37] 3GPP TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[38] 3GPP TS 29.007: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39] 3GPP TS 51.010: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification".

[40] 3GPP TS 51.021: "Digital cellular telecommunications system (Phase 2); GSM radio aspects base station system equipment specification".

[41] ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43] ISO 8348 (1987): "Information technology -- Open Systems Interconnection -- Network Service Definition".

[44] ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[46] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[47] ITU-T Recommendation F.69 (1993): "The international telex service - Service and operational provisions of telex destination codes and telex network identification codes".

[48] ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49] ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50] ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51] ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52] ITU-T Recommendation T.50: "International Alphabet No. 5".

[53] ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54] ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55] ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56] ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57] Void.

[58] ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60] ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[61] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

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

[63] Void.

[64] Void.

[65] ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[66] ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67] Void.

[68] Void.

[69] ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70] ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[71] ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams".

[72] ISO/IEC 10646: "Information technology -- Universal Multiple-Octet Coded Character Set (UCS)".

[73] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75] 3GPP TS 43.064: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76] 3GPP TS 44.060: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[77] IETF RFC 1034: "Domain names - concepts and facilities.

[78] 3GPP TS 44.065: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[79] ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[80] 3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[81] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[82] 3GPP TS 43.022: " Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83] 3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[84] 3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[85] 3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification".

[86] 3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[87] 3GPP TS 43.055: "Dual Transfer Mode (DTM); Stage 2".

[88] 3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2"

[89] 3GPP TS 22.042: "Network Identity and Time Zone (NITZ), Stage 1".

[90] 3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[91] 3GPP TS 44.056: "GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification".

[92] 3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[93] 3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[94] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[95] 3GPP TS 24.229: "3rd Generation Partnership Project; Technical Specification Group Core Network; IP Multimedia Call Control Protocol based on SIP and SDP"

[96] 3GPP TS 23.205: "3rd Generation Partnership Project; Technical Specification Group Core Network; Bearer-independent circuit-switched core network; Stage 2".

[97] 3GPP TS 23.172: "UDI/RDI Fallback and Service Modification; Stage 2".

[98] 3GPP TS 25.304: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[99] RFC 2373 (July 1998): " IP Version 6 Addressing Architecture".

********** Second change **********

10.5.6.3 Protocol configuration options

The purpose of the *protocol configuration options* information element is to:

- transfer external network protocol options associated with a PDP context activation, and
- transfer additional parameters and/or requests (such as, P-CSCF Address Request; 3GPP TS 24.229 [95]) that may serve any purpose other than defining network protocol options.

The *protocol configuration options* is a type 4 information element with a minimum length of 2 octets and a maximum length of 253 octets.

The *protocol configuration options* information element is coded as shown in figure 10.5.136/3GPP TS 24.008 and table 10.5.154/3GPP TS 24.008.

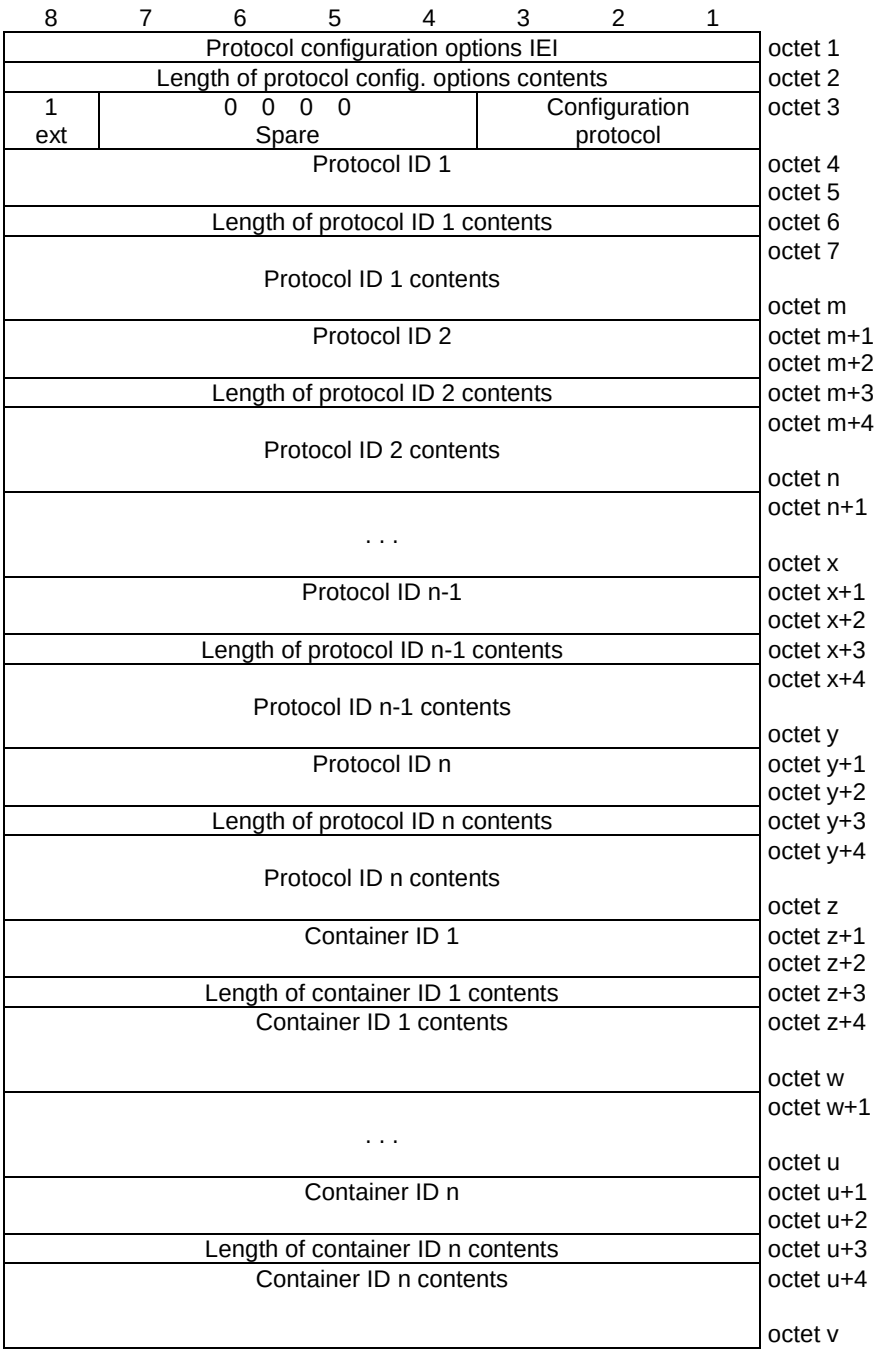

Figure 10.5.136/3GPP TS 24.008: *Protocol configuration options* information element

Table 10.5.154/3GPP TS 24.008: *Protocol configuration options* information element

Configuration protocol (octet 3)
Bits
3 2 1
0 0 0 PPP for use with IP PDP type

All other values are interpreted as PPP in this version of the protocol.

After octet 3, i.e. from octet 4 to octet v, two logical lists are defined:

- the Configuration protocol options list (octets 4 to z), and

- the Additional parameters list (octets z+1 to v).

Configuration protocol options list (octets 4 to z)

The *configuration protocol options list* contains a variable number of logical units, the may occur in an arbitrary order within the *configuration protocol options list*.

Each unit is of variable length and consists of a:

- protocol identifier (2 octets);
- the length of the protocol identifier contents of the unit (1 octet); and
- the protocol identifier contents itself (n octets).

The *protocol identifier* field contains the hexadecimal coding of the configuration protocol identifier. Bit 8 of the first octet of the *protocol identifier* field contains the most significant bit and bit 1 of the second octet of the *protocol identifier* field contains the least significant bit.

If the *configuration protocol options list* contains a protocol identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *length of the protocol identifier contents* field contains the binary coded representation of the length of the *protocol identifier contents* field of a unit. The first bit in transmission order is the most significant bit.

The *protocol identifier contents* field of each unit contains information specific to the configuration protocol specified by the *protocol identifier.*

PPP

At least the following protocol identifiers (as defined in RFC 1700) shall be supported in this version of the protocol:

- C021H (LCP;
- C023H (PAP);
- C223H (CHAP);and
- 8021H (IPCP).

The support of other protocol identifiers is implementation dependent and outside the scope of the present document.

The *protocol identifier contents* field of each unit corresponds to a “Packet” as defined in RFC 1661 that is stripped off the “Protocol” and the “Padding” octets.

The detailed coding of the *protocol identifier contents* field is specified in the RFC that is associated with the protocol identifier of that unit.

Additional parameters list (octets z+1 to v)

The *additional parameters list* is included when special parameters and/or requests (associated with a PDP context) need to be transferred between the MS and the network. These parameters and/or requests are not related to a specific configuration protocol (e.g. PPP), and therefore are not encoded as the "Packets" contained in the *configuration protocol options list*.

The *additional parameters list* contains a list of special parameters, each one in a separate container. The type of the parameter carried in a container is identified by

a specific *container identifier*. In this version of the protocol, the following container identifiers are specified:

MS to network direction:

- 0001H (P-CSCF Address Request);
- 0002H (IM CN Subsystem Signaling Flag)
- 0003H (DNS Server Address Request).

Network to MS direction:

- 0001H (P-CSCF Address)
- 0002H (DNS Server Address).

If the *additional parameters list* contains a container identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *container identifier* field is encoded as the *protocol identifier* field and the *length of container identifier contents* field is encoded as the *length of the protocol identifier contents* field.

When the *container identifier* indicates P-CSCF Address, the *container identifier contents* field contains one IPv6 address corresponding to a P-CSCF address (see 3GPP TS 24.229 [95]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]~~(IP version 6 addressing architecture)~~. When there is need to include more than one P-CSCF address, then more logical units with *container identifier* indicating P-CSCF Address are used.

When the *container identifier* indicates DNS Server Address, the *container identifier contents* field contains one IPv6 DNS server address (see 3GPP TS 27.060 [36a]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]. When there is need to include more than one DNS server address, then more logical units with *container identifier* indicating DNS Server Address are used.

When the *container identifier* indicates P-CSCF Address Request or DNS Server Address Request, the *container identifi*er contents field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored.

When the *container identifier* indicates IM CN Subsystem Signaling Flag (see 3GPP TS 24.229 [95]), the *container identifier contents* field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored.

NOTE 1: The *additional parameters list* and the *configuration protocol options list* are logically separated since they carry different type of information. The beginning of the *additional parameters list* is marked by a logical unit, which has an identifier (i.e. the first two octets) equal to a *container identifier* (i.e. it is not a *protocol identifier*).

NOTE 2: The *additional parameters list* is discarded by a receiver, which does not support this list (e.g. a R99 GGSN).

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

Tdoc ⌘N3-020669

CR-Form-v7

CHANGE REQUEST

⌘ **27.060** **CR** **054** ⌘ **rev** **2** ⌘ Current version: **5.1.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [ ]

Title:	⌘	Configuration of Domain Name System (DNS) server IPV6 addresses
Source:	⌘	Ericsson
Work item code:	⌘	TEI [GPRS]
Date:	⌘	22/06/2002
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)*
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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:	⌘	There is currently no support for dynamic configuration of Domain Name System (DNS) server IPV6 addresses in a MS not supporting the DHCPv6 protocol.
Summary of change:	⌘	Introduces the possibility of dynamic configuration of Domain Name System (DNS) server IPV6 addresses via existing Session Management procedures by use of the protocol Configuration Options IE.
Consequences if not approved:	⌘	No support for dynamic configuration of Domain Name System (DNS) server IPV6 addresses in a MS not supporting the optional DHCPv6 protocol.

Clauses affected:	⌘	2, 3.2, 9.1.2

	Y	N			
Other specs affected:	Y		Other core specifications	⌘	24.008, 24.229, 29.061
		N	Test specifications		
		N	O&M Specifications		

Other comments:	⌘	

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First modified section

2 References

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- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] Void.

[2] Void.

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

[4] Void.

[5] Void.

[6] Void.

[7] Void.

[8] Void.

[9] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service Description Stage 2".

[10] Void.

[11] Void.

[12] Void.

[13] Void.

[14] Void.

[15] Void.

[16] 3GPP TS 27.007: "AT command set for 3GPP User Equipment (UE)".

[17] 3GPP TS 29.061: "Packet Domain; Interworking between the Public Land Mobile Network (PLMN) supporting Packet Based Services and Packet Data Networks (PDN)".

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

[19] ITU-T Recommendation V.42 bis: "Data communication over the telephone network – Data compression procedures for data circuit-terminating equipment (DCE) using error correction procedures".

[20] Void.

[21] Void.

[22] Void.

[23] Void.

[24] Void.

[25] Void.

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

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

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

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

[30] ITU-T Recommendation V.250 (ex V.25ter): "Serial asynchronous automatic dialling and control".

[31] ITU-T Recommendation V.24: "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[32] ITU-T Recommendation V.28: "Electrical Chracteristics for unbalanced double-current interchange circuits".

[33] ITU-T Recommendation V.80: "In-band DCE control and synchronous data modes for asynchronous DTE".

[34] IETF RFC 1661 (1994): “The Point-to-Point Protocol (PPP)” (STD 51).

[35] IETF RFC 1662 (1994): “PPP in HDLC-like framing” (STD 51).

[36] IETF RFC 1700 (1994): “Assigned Numbers” (STD 2).

[37] IETF RFC 1570 (1994): ”PPP LCP Extensions“.

[38] IETF RFC 1989 (1996): ”PPP Link Quality Monitoring“.

[39] IETF RFC 1332 (1992): ”The PPP Internet Protocol Control Protocol (IPCP)“.

[40] IETF RFC 1877 (1995): ”PPP IPCP Extensions for Name Server Addresses “.

[41] IETF RFC 2153 (1997): ”PPP Vendor Extensions“.

[42] IETF RFC 1334 (1992): ”PPP Authentication Protocols“.

[43] IETF RFC 1994 (1996): ”PPP Challenge Handshake Authentication Protocol“.

[44] IETF RFC 2686 (1999): ”The Multi-Class Extension to Multi-Link PPP”.

[45] IETF RFC 1990 (1996): ”The PPP Multilink Protocol (MP)“.

[46] IETF RFC 2472 (1998): ”IP Version 6 over PPP".

[47] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[48] 3GPP TS 23.221: "Architectural requirements".

[49] IETF RFC 2373 (1998): "IP version 6 Addressing Architecture".

[50] IETF RFC 1034 (1987): "Domain Names - Concepts and Facilities" (STD 13).

[51] IETF RFC 1035 (1987): "Domain Names - Implementation and Specification" (STD 13).

[52] IETF RFC 1886 (1995): "DNS Extensions to support IP version 6".

Next modified section

3.2 Abbreviations

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

APN	Access Point Name
DNS	Domain Name System
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSN	GPRS Support Node
GTP-U	GPRS Tunnelling Protocol for user plane
HDLC	High Level Data Link Control
ICMP	Internet Control Message Protocol
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPV6CP	IPv6 Control Protocol
LA	Location Area
LCP	Link Control Protocol
LLC	Logical Link Control
MAC	Medium Access Control
MCML	Multi-Class Multi-Link PPP
ME	Mobile Equipment
MP	Multilink PPP
MS	Mobile Station
MT	Mobile Termination
NCP	Network Control Protocol
PDCP	Packet Data Convergence Protocol
PDN	Packet Data Network
PDP	Packet Data Protocol , e.g., IP or PPP
PDU	Protocol Data Unit
PPP	Point-to-Point Protocol
PS	Packet Switched
PTM	Point To Multipoint
PTP	Point To Point
PVC	Permanent Virtual Circuit
RA	Routing Area
SGSN	Serving GPRS Support Node
SNDCP	SubNetwork Dependent Convergence Protocol
TCP	Transmission Control Protocol
TE	Terminal Equipment
TFT	Traffic Flow Template
UDP	User Datagram Protocol

Next modified section

9.1.2 IPv6 over PPP

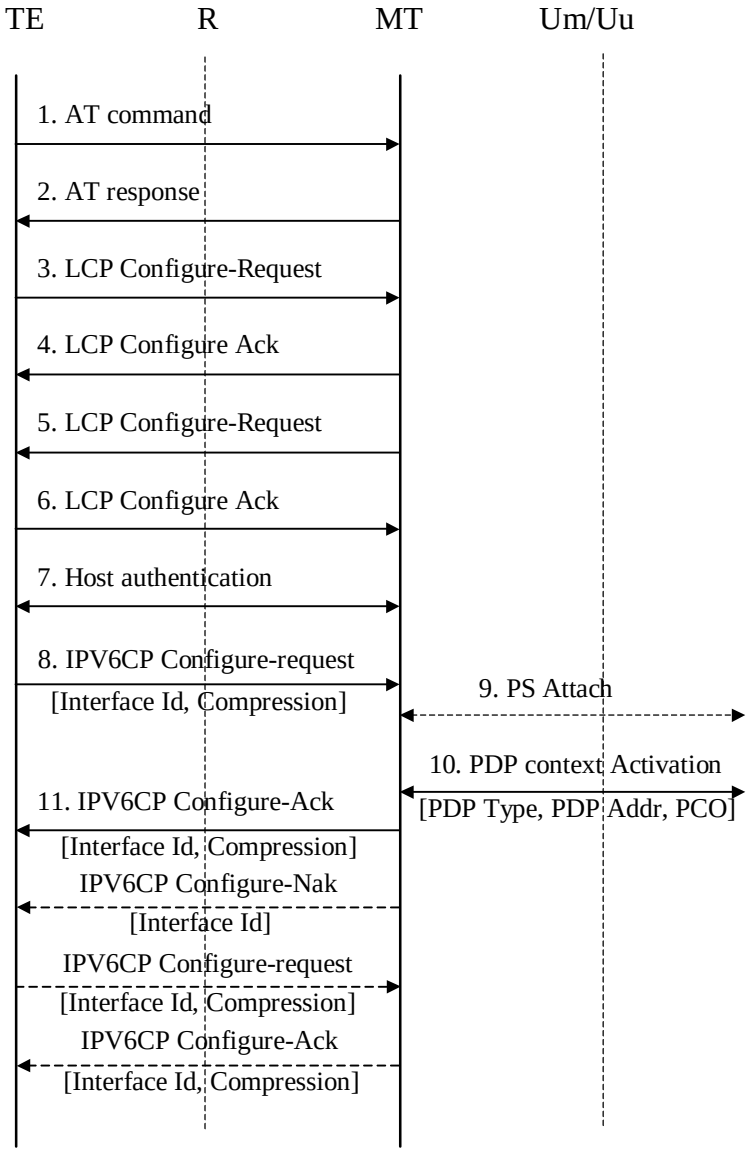


Figure 7b: PDP Context Activation for the IPv6 over PPP based services

1) The TE issues AT commands to set up parameters and enter PPP mode (refer to subclause on- AT commands for further details).

2) The MT sends AT responses to the TE.

3) The PPP protocol in the TE sends a LCP Configure-Request. This command is to establish a PPP link between the TE and the MT.

4) The MT returns LCP Configure-Ack to the TE to confirm that the PPP link has been established. The MT might previously have sent a LCP Configure-Nak in order to reject some options proposed by the TE. This in turn might have triggered a retransmission of the LCP Configure-Request with different options.

5) The PPP protocol in the MT sends a LCP Configure-Request in order to negotiate for the authentication protocol used for authentication of the host TE towards the MT. The MT shall initially negotiate for CHAP, and if this is unsuccessful, for PAP.

6) The TE returns a LCP Configure-Ack to the MT to confirm the use of the specified authentication protocol. The MT might previously have sent a LCP Configure-Nak in order to reject the protocol proposed by the TE. This in turn might have triggered a retransmission of the LCP Configure-Request with different options.

7) If the negotiated authentication protocol is either of CHAP or PAP, the TE authenticates itself towards the MT by means of that protocol. The MT stores the necessary authentication data and sends a locally generated positive acknowledgement of the authentication to the TE. If none of the protocols is supported by the host TE no authentication shall be performed. Refer to 3GPP TS 29.061 for further details on the authentication.

8) The TE requests IPv6 Interface-Identifier negotiation by sending the IPV6CP Configure-Request message to the MT indicating the tentative Interface-Identifier chosen by the TE. The tentative Interface-Identifier has only local significance in the MT and shall not forwarded to the GGSN.

9) If the MS is not yet PS attached, the MT performs the PS Attach procedure as described in 3GPP TS 23.060.

10) The MT sends the Activate PDP context request message to the network, including the PDP Type, PDP Address and Protocol Configuration Options. The Protocol Configuration Options IE may contain negotiated LCP options such as negotiated Authentication Protocol as well as any authentication data previously stored in the MT. It may also contain a request for dynamic configuration of DNS server IPv6 addresses as described in 3GPP TS 29.061 [17]. The MS shall leave PDP Address empty and set PDP Type to 'IPv6'.
Note: The protocol between the TE and MT may not support the same set of information as the interface from the MT to the network (eg. DNS).

    The network responds with an Activate PDP Context Accept or an Activate PDP Context Reject, to the MS. The Protocol Configuration Options IE may contain configuration data such as a list of DNS server IPv6 addresses as described in 3GPP TS 29.061 [17]. In cases where the MS receives more than one server address, the MS shall adhere to the explicit prioritisation order of the list. The PDP Address shall contain an IPv6 address composed of a -Prefix and an Interface-Identifier. The size of the Prefix shall be according to the maximum prefix length for a global IPv6 address as specified in the IPv6 Addressing Architecture, see RFC 2373 [49]. The Interface-Identifier shall be used to create a link-local IPv6 address, to be used in continued MS – GGSN user-plane signalling. The Prefix in the PDP Address shall be ignored by the MS.

11) In case a PDP Context Accept was sent to the MS, the MT extracts the Interface-Identifier from the address received in the PDP Address IE and ignores the Prefix part. If this Interface-Identifier is identical to the tentative Interface-Identifier indicated in the IPV6CP Configure-Request message sent from the TE, the MT sends an IPV6CP Configure Ack packet, indicating this Interface-Identifier, to the TE.

    If the Interface-Identifier extracted from the address contained in the PDP Address IE is not identical to the tentative Interface-Identifier indicated in the IPV6CP Configure-Request message sent from the TE, the MT sends an IPV6CP Configure Nak packet, indicating the Interface-Identifier extracted from the address contained in the PDP Address IE, to the TE. The TE then sends a new IPV6CP Configure-Request message to the MT, indicating the same Interface-Identifier as was indicated in the received IPV6CP Configure Nak. Finally the MT responds with an IPV6CP Configure Ack packet. The negotiated Interface-Identifier shall be used in the TE to create a link-local address.

    After finalisation of the IPV6CP negotiations between TE and MT, the user plane link is established. Before the MS can communicate with other hosts on the Intranet/ISP it shall obtain an IPv6 Global or a Site-Local Unicast address. Given that exactly one Prefix is included in the Router Advertisement, depending upon whether the advertised Prefix is globally unique or Site-local unique, the MS can only generate either IPv6 Global address(es) or Site-local address(es) using this Prefix during the lifetime of a particular PDP Context. This is done using either Stateless or Stateful Address Autoconfiguration as described in 3GPP TS 29.061 [17].

    When creating a Global or Site-Local Unicast Address, the MS may use the Interface-Identifier received during the PDP Context Activation phase or it may generate a new Interface-Identifier. There is no restriction on the uniqueness of the Interface-Identifier of the Global or Site-Local Unicast Address, since the Prefix itself is unique. Interface-Identifiers shall in any case be 64-bit long and follow standard interface-identifier guidelines as per IETF RFC 2373 [49] and RFC 2472 [46].

    In case a PDP Context Reject was sent to the MS the MT sends an LCP Terminate-Request to the TE, the TE and MT negotiate for link termination. The MT may then send a final AT-response to inform the TE about the rejected PDP Context activation.

~~Note. When this version of this specification was released, work was still in progress within IETF for how to provide DNS configuration for MS not supporting Stateful Autoconfiguration, i.e. MS not supporting DHCP DNS configuration.~~

End of modified sections

3GPP TSG-CN WG3 Meeting #24 **Tdoc ⌘N3-020688**
Helsinki, Finland, 28th July - 2nd Aug 2002.

CR-Form-v7

CHANGE REQUEST

⌘ **29.061** **CR** **061** ⌘ **rev** **2** ⌘ 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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Configuration of Domain Name System (DNS) server IPV6 addresses
Source:	⌘	Ericsson
Work item code:	⌘	TEI [GPRS]
Date:	⌘	22/06/2002
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:	⌘	There is currently no support for dynamic configuration of Domain Name System (DNS) server IPV6 addresses in a MS not supporting the DHCPv6 protocol.
Summary of change:	⌘	Introduces the possibility of dynamic configuration of Domain Name System (DNS) server IPV6 addresses via existing Session Management procedures by use of the protocol Configuration Options IE.
Consequences if not approved:	⌘	No support for dynamic configuration of Domain Name System (DNS) server IPV6 addresses in a MS not supporting the optional DHCPv6 protocol.

Clauses affected:	⌘	2, 11.2.1.3.1

	Y	N			
Other specs affected:	Y		Other core specifications	⌘	24.008, 24.229, 27.060
		N	Test specifications		
		N	O&M Specifications		

Other comments:	⌘	

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 modified 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] IETF RFC 1034 (1987): "Domain Names - Concepts and Facilities" (STD 13).

[53] IETF RFC 1035 (1987): "Domain Names - Implementation and Specification" (STD 13).

[54] IETF RFC 1886 (1995): "DNS Extensions to support IP version 6".

[55] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols - Stage 3".

Next modified section

11.2.1.3.1 IPv6 PDP Context Activation

In this case:

- The GGSN provides the MS with an IPv6 Prefix belonging to the Intranet/ISP addressing space. A dynamic IPv6 address shall be given using either stateless or stateful address autoconfiguration. This IPv6 address is used for packet forwarding within the packet domain and for packet forwarding on the Intranet/ISP;
- the MS may send an authentication request at PDP context activation and the GGSN may request user authentication from a server, e.g. AAA, …, belonging to the Intranet/ISP;
- the protocol configuration options are retrieved (if requested by the MS at PDP context activation) from some server, e.g. AAA, …, belonging to the Intranet/ISP;
- in order to avoid any conflict between the link-local address of the MS and that of the GGSN, the Interface-Identifier used by the MS to build its link-local address shall be assigned by the GGSN. The GGSN ensures the uniqueness of this interface-identifier. The MT shall then enforce the use of this Interface-Identifier by the TE. This is valid for both stateless and stateful address autoconfiguration.
- the communication between the Packet Domain and the Intranet/ISP may be performed over any network, even an insecure e.g. the Internet. In case of an insecure connection between the GGSN and the Intranet/ISP there may be a specific security protocol over the insecure connection. This security protocol is defined by mutual agreement between PLMN operator and Intranet/ISP administrator.
- the MS may request for DNS server IPv6 addresses using the PCO IE in e.g. the PDP Context Request message. In that case the GGSN may return the IP address of one or more DNS servers in the PCO in the PDP Context Response message. The DNS address(es) shall be coded in the PCO as specified in 3GPP TS 24.008 [55]. If a list of servers is received, the MS shall adhere to the explicit prioritisation order of the list.

In the following signalling flow example, PPP is used as layer 2 protocol over the R reference point. The MT behaves as a PPP server and translates Protocol Configuration Options into SM message IEs. GTP-C carries this information unchanged to the GGSN which uses the information e.g. for RADIUS authentication. The result of the host authentication is carried via GTP-C back to the SGSN, which then relays the result to the MT. The MT finalises the IPV6CP negotiation by sending an IPV6CP Configure-Ack message to the TE with the appropriate options included, e.g, Interface-Identifier. The Interface-Identifier shall be used in the TE to create a link-local address to be able to perform the IPv6 address autoconfiguration (see subclauses 11.2.1.3.2 and 11.2.1.3.3).

1) The TE sends an AT-command to the MT to set up parameters and enter PPP mode. The MT responds with an AT-response.
2) LCP negotiates Maximum-Receive-Unit and authentication protocol. The negotiated authentication protocol is either CHAP, PAP or 'none'. The MT shall try to negotiate for CHAP as first priority.
3) If the negotiated authentication protocol is either of CHAP or PAP, the TE authenticates itself towards the MT by means of that protocol. The MT stores the necessary authentication data and sends a forced positive acknowledgement of the authentication to the TE.
4) The TE requests IPv6 Interface-Identifier negotiation by sending the IPV6CP Configure-Request message to the MT.
5) The MT sends the Activate PDP Context Request message to the SGSN, including the Protocol Configuration Options. The Protocol Configuration Options IE may contain negotiated LCP options such as negotiated

Authentication Protocol as well as any authentication data previously stored in the MT. It may also contain a request for dynamic configuration of DNS server IPv6 addresses. The MS shall for dynamic address allocation leave PDP Address empty and set PDP Type to IPv6. The SGSN sends the Create PDP context request message to the chosen GGSN including the unmodified Protocol Configuration Options.

6) The GGSN deduces from local configuration data associated with the APN:

   - IPv6 address allocation type (stateless or stateful);
   - the source of IPv6 Prefixes in the stateless case (GGSN internal prefix pool, or external address allocation server);
   - any server(s) to be used for address allocation, authentication and/or protocol configuration options retrieval (e.g. IMS related configuration, see [47]);
   - the protocol e.g. RADIUS, to be used with the server(s);
   - the communication and security feature needed to communicate with the server(s);

   As an example the GGSN may use one of the following options:

   - GGSN internal Prefix pool for IPv6 prefix allocation and no authentication;
   - GGSN internal Prefix pool for IPv6 prefix allocation and RADIUS for authentication. The AAA server responds with either an Access-Accept or an Access-Reject to the RADIUS client in the GGSN;
   - RADIUS for authentication and IPv6 prefix allocation. The AAA server responds with either an Access-Accept or an Access-Reject to the RADIUS client in the GGSN;

   NOTE: DHCPv6 may be used for IPv6 prefix allocation when an appropriate RFC becomes available.

   IPv6 Prefixes in a GGSN internal Prefix pool shall be configurable and structured per APN.

   The GGSN shall in the PDP Address IE in the Create PDP Context Response return an IPv6 address composed of a Prefix and an Interface-Identifier. The Interface-Identifier may have any value and it does not need to be unique within or across APNs. It shall however not conflict with the Interface-Identifier the GGSN has selected for its own side of the MS-GGSN link. The Prefix assigned by the GGSN or the external AAA server shall be globally or site-local unique, if stateless address autoconfiguration is configured on this APN. If, on the other hand, stateful address autoconfiguration is configured on the APN, the Prefix part of the IPv6 address returned in the PDP Address IE shall be set to the link-local prefix (FE80::/64).

   The GGSN shall analyse the requested values of all the protocol options contained in the received Protocol Configurations Options IE. The contents of the Protocol Configurations Options IE sent in the GGSN response shall be in accordance with the relevant standards e.g. the PPP ~~or IPCPv6~~ standard~~s~~ [21] ~~and [43]~~.

7) The GGSN sends back to the SGSN a Create PDP Context Response message, containing the PDP Address IE and the Protocol Configuration Options IE. The Protocol Configuration Options IE may contain configuration data such as a list of DNS server IPv6 addresses. The cause value shall be set according to the outcome of the host authentication and configuration.

8) Depending on the cause value received in the Create PDP Context Response, the SGSN either stores the PDP Address and sends an Activate PDP Context Accept to the MS or, sends an Activate PDP Context Reject, to the MS.

   If Protocol Configuration Options are received from the GGSN, the SGSN shall relay those to the MS.

9) The MT extracts the Interface-Identifier from the address received in the PDP Address IE and ignores the Prefix part. If this Interface-Identifier is identical to the tentative Interface-Identifier indicated in the IPV6CP Configure-Request message sent from the TE-, the MT sends an IPV6CP Configure Ack packet, indicating this Interface-Identifier, to the TE.

   If the Interface-Identifier extracted from the address contained in the PDP Address IE is not identical to the tentative Interface-Identifier indicated in the IPV6CP Configure-Request message sent from the TE, the MT sends an IPV6CP Configure-Nak packet, indicating the Interface-Identifier extracted from the address contained in the PDP Address IE, to the TE. The TE then sends a new IPV6CP Configure-Request message to the MT,

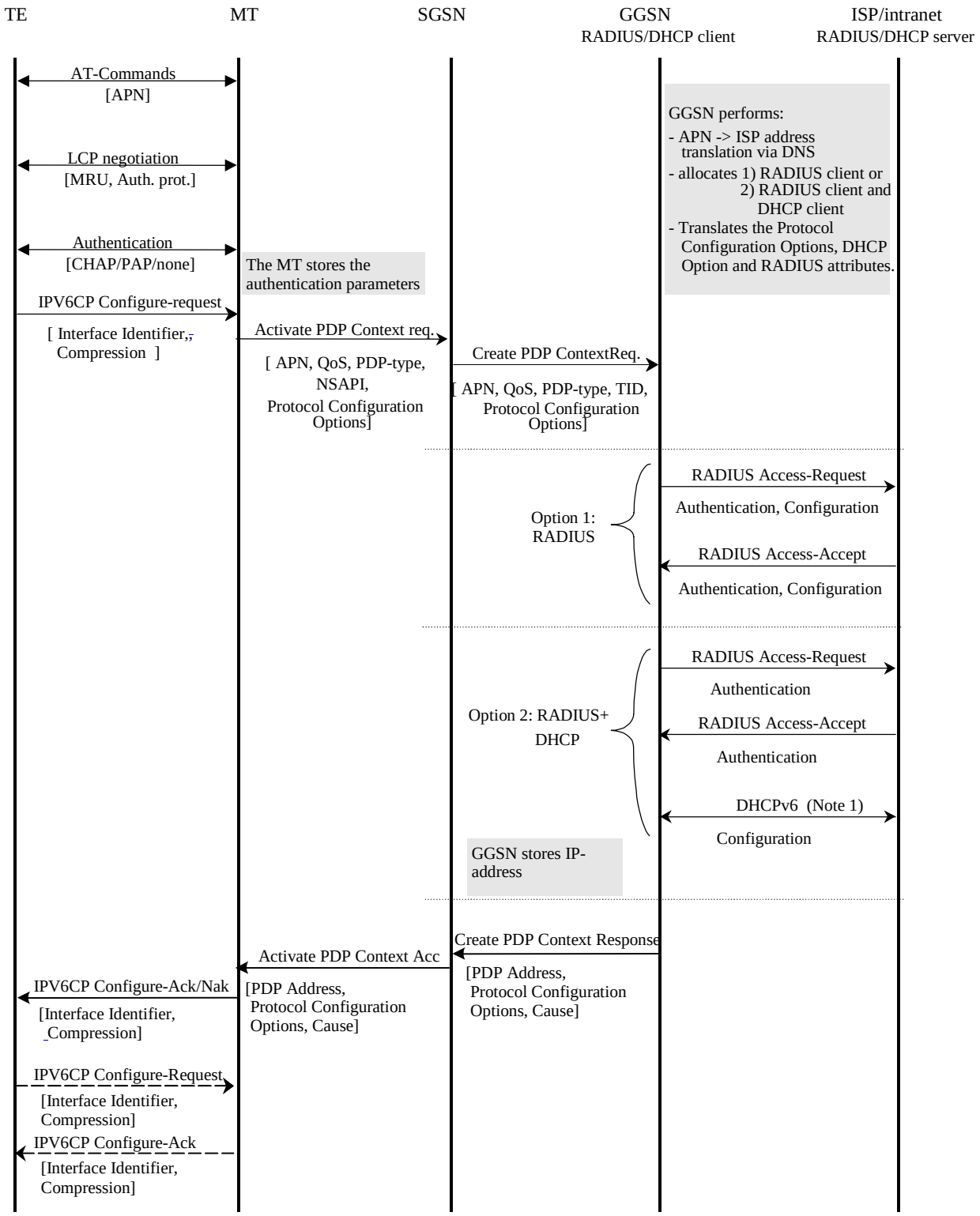
indicating the same Interface-Identifier as was indicated in the received IPV6CP Configure Nak (as indicated by the dotted IPV6CP Configure-Request and Configure-Ack in the figure below). Finally the MT responds with a IPV6CP Configure Ack packet.

In case a PDP Context Reject was sent to the MS the MT sends an LCP Terminate-Request to the TE.

10) When the TE has accepted the Interface-Identifier given by the MT, the user plane link from the TE to the GGSN and the external ISP/Intranet is established and the IPv6 address autoconfiguration may proceed.

In case a link terminate request packet was sent to the TE, the TE and MT negotiates for link termination. The MT may then send a final AT-response to inform the TE about the rejected PDP Context activation.

An LCP Terminate-request causes a PDP context deactivation.



Note 1: DHCPv6 may be used for IPv6 prefix allocation when an appropriate RFC becomes available.

Figure 11ba: PDP Context Activation for the IPv6 Non-transparent case

Figure 11ba above is valid for both Stateless and Stateful Address Autoconfiguration case. In the Stateful case though, option 2 does not apply and option 1 may only be used for authentication. The use of DHCPv6 above is different and used in a different context than when used for Stateful Address Autoconfiguration as in subclause 11.2.1.3.3.

Internet Engineering Task Force
Internet Draft

SIP WG
G. Camarillo
Ericsson
A. Monrad
Ericsson

draft-camarillo-mmusic-separate-streams-00.txt
May 22, 2002
Expires: December 2002

Mapping of Media Streams to Resource Reservation Flows

STATUS OF THIS MEMO

Abstract

This document defines an extension to the SDP grouping framework. It allows to request that different media streams are mapped into different resource reservation flows.

Table of Contents

1 Introduction

Resource reservation protocols assign network resources to particular flows of IP packets. When a router receives an IP packet, it applies a filter in order to map the packet to the flow it belongs and provide it with the Quality of Service (QoS) corresponding to that flow. Routers typically use the source and the destination IP addresses and port numbers to filter packets.

Multimedia sessions typically contain multiple media streams (e.g. an audio stream and a video stream). In order to provide QoS for a multimedia session it is necessary to map all the media streams to resource reservation flows. This mapping can be performed in different ways. Two possibilities are to map all the media streams to a single resource reservation flow and to map every single media stream to a different resource reservation flow. Some applications require that the latter type of mapping is performed (i.e., a single media stream is mapped to a single resource reservation flow). This document defines the syntax needed to express that need in SDP [1]. For this purpose, we make use of the SDP grouping framework [2] and define a new "semantics" attribute called KIS (Keep It Separate).

1.1 Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in RFC 2119 [3] and indicate requirement levels for compliant SIP implementations.

2 KIS Semantics

We define a new "semantics" attribute within the SDP grouping framework [2]: KIS (Keep It Separate).

Media lines grouped using KIS semantics SHOULD NOT be mapped into the same resource reservation flow. A different resource reservation flow SHOULD be used (or established) for each media line of the KIS group.

3 Example

A user agent receives a SIP [4] INVITE with the SDP below:

```
v=0
o=Laura 289083124 289083124 IN IP4 one.example.com
t=0 0
c=IN IP4 192.0.0.1
```

```
a=group:KIS 1 2
m=audio 30000 RTP/AVP 0
a=mid:1
m=video 30002 RTP/AVP 31
a=mid:2
```

This user agent uses RSVP [5] to perform resource reservation. Since both media streams are part of a KIS group, the user agent will establish two different RSVP sessions; one for the audio stream and one for the video stream. An RSVP session is defined by the triple: (DestAddress, ProtocolId[, DstPort]). Table 1 shows the parameters used to establish both RSVP sessions.

Session Number	DestAddress	ProtocolId	DstPort
1	192.0.0.1	UDP	30000
2	192.0.0.1	UDP	30002

Table 1: Parameters needed to establish both RSVP sessions

If the same user agent received an SDP session description with the same media streams but without the group line, it would be free to map both media streams into the same RSVP session.

4 IANA Considerations

IANA needs to register the following new "semantics" attribute for the SDP grouping framework [2]:

KIS: Keep It Separate

5 Security Considerations

An attacker adding group lines using the KIS semantics to an SDP session description could force a user agent to establish a larger number of resource reservation flows than needed. It is thus RECOMMENDED that some kind of integrity protection is applied to SDP session descriptions.

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7 Normative References

[1] M. Handley and V. Jacobson, "SDP: session description protocol," RFC 2327, Internet Engineering Task Force, Apr. 1998.

[2] G. Camarillo, J. Holler, G. Eriksson, and H. Schulzrinne, "Grouping of m lines in SDP," Internet Draft, Internet Engineering Task Force, Feb. 2002. Work in progress.

[3] S. Bradner, "Key words for use in RFCs to indicate requirement levels," RFC 2119, Internet Engineering Task Force, Mar. 1997.

8 Informative References

[4] J. Rosenberg, H. Schulzrinne, et al. , "SIP: Session initiation protocol," Internet Draft, Internet Engineering Task Force, Feb. 2002. Work in progress.

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Internet Engineering Task Force
Internet draft

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February 2002
Expires August 2002
<draft-ietf-mmusic-fid-06.txt>

Grouping of media lines in SDP

Status of this Memo

Abstract

This document defines two SDP attributes: "group" and "mid". They allow to group together several "m" lines for two different purposes: for lip synchronization and for receiving media from a single flow (several media streams), encoded in different formats during a particular session, in different ports and host interfaces.

Grouping of media lines in SDP

TABLE OF CONTENTS

1 Introduction

An SDP session description typically contains a number (one or more) of media lines - they are commonly known as "m" lines. When a session description contains more than one "m" line, SDP does not provide any means to express a particular relationship between two or more of them. When an application receives an SDP session description with more than one "m" line it is up to the application what to do with them. SDP does not carry any information about grouping media streams.

While in some environments this information can be carried out of band, it would be desirable to have extensions to SDP that allowed to express how different media streams within a session description

relate to each other. This document defines such extensions.

2 Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in RFC 2119 [1] and indicate requirement levels for compliant implementations.

3. Media stream identification attribute

A new "media stream identification" media attribute is defined. It is used for identifying media streams within a session description. Its formatting in SDP [2] is described by the following BNF:

```
mid-attribute      = "a=mid:" identification-tag
identification-tag = token
```

The identification tag MUST be unique within an SDP session description.

4. Group attribute

A new "group" session level attribute is defined. It is used for grouping together different media streams. Its formatting in SDP is described by the following BNF:

```
group-attribute    = "a=group:" semantics
                     *(space identification-tag)
semantics          = "LS" | "FID"
```

This document defines two standard semantics: LS (Lip Synchronization) and FID (Flow Identification). If in the future it was needed to standardize further semantics they would need to be defined in a standards track document. However, defining new semantics apart from LS and FID is discouraged. Instead, it is RECOMMENDED to use other session description mechanisms such as SDPng.

5. Use of "group" and "mid"

All the "m" lines of a session description that uses "group" MUST be identified with an "mid" attribute whether they appear in the group line(s) or not. If a session description contains at least one "m" line that has no "mid" identification the application MUST NOT perform any grouping of media lines.

"a=group" lines are used to group together several "m" lines that are identified by their "mid" attribute. "a=group" lines that contain identification-tags that do not correspond to any "m" line within the session description MUST be simply ignored. The application acts as if the "a=group" line did not exist. The behavior of an application receiving an SDP with grouped "m" lines

is defined by the semantics field in the "a=group" line.

There MAY be several "a=group" lines in a session description. All the "a=group" lines of a session description MAY or MAY NOT use the same semantics. An "m" line identified by its "mid" attribute MAY appear in more than one "a=group" line as long as the "a=group" lines use different semantics. An "m" line identified by its "mid" attribute MUST NOT appear in more than one "a=group" line using the same semantics.

An application that wants to be compliant to this specification MUST support both "group" and "mid". An application that supported just one of them would not be compliant.

6. Lip Synchronization (LS)

An application that receives a session description that contains "m" lines that are grouped together using LS semantics MUST synchronize the playout of the corresponding media streams. Note that LS semantics not only apply to a video stream that has to be synchronized with an audio stream. The playout of two streams of the same type can perfectly be synchronized as well.

For RTP streams synchronization is typically performed using RTCP, which provides enough information to map time stamps from the different streams into a wall clock. However, the concept of media stream synchronization MAY also apply to media streams that do not make use of RTP. If this is the case, the application MUST recover the original timing relationship between the streams using whatever available mechanism.

6.1 Example of LS

The following example shows a session description of a conference that is being multicast. The first media stream (mid:1) contains the voice of the speaker, who speaks in English. The second media stream (mid:2) contains the video component and the third (mid:3) media stream carries the translation to Spanish of what he is saying. The first and the second media streams MUST be synchronized.

```
v=0
o=Laura 289083124 289083124 IN IP4 one.example.com
t=0 0
c=IN IP4 224.2.17.12/127
a=group:LS 1 2
m=audio 30000 RTP/AVP 0
a=mid:1
m=video 30002 RTP/AVP 31
a=mid:2
m=audio 30004 RTP/AVP 0
i=This media stream contains the Spanish translation
a=mid:3
```

Note that although the third media stream is not present in the group line it still MUST contain an mid attribute (mid:3), as stated before.

7. Flow Identification (FID)

An "m" line in an SDP session description defines a media stream. However, SDP does not define what a media stream is. This definition can be found in the RTSP specification. The RTSP RFC [3] defines a media stream as "a single media instance, e.g., an audio stream or a video stream as well as a single whiteboard or shared application group. When using RTP, a stream consists of all RTP and RTCP packets created by a source within an RTP session".

This definition assumes that a single audio (or video) stream maps into an RTP session. The RTP RFC [4] defines an RTP session as follows: "For each participant, the session is defined by a particular pair of destination transport addresses (one network address plus a port pair for RTP and RTCP)".

While the previous definitions cover the most common cases, there are situations where a single media instance, (e.g., an audio stream or a video stream) is sent using more than one RTP session. Two examples (among many others) of this kind of situation are cellular systems using SIP [5] and systems receiving DTMF tones on a different host than the voice.

7.1 SIP and cellular access

Systems using a cellular access and SIP as a signalling protocol need to receive media over the air. During a session the media can be encoded using different codecs. The encoded media has to traverse the radio interface. The radio interface is generally characterized by being bit error prone and associated with relatively high packet transfer delays. In addition, radio interface resources in a cellular environment are scarce and thus expensive, which calls for special measures in providing a highly efficient transport. In order to get an appropriate speech quality in combination with an efficient transport, precise knowledge of codec properties are required so that a proper radio bearer for the RTP session can be configured before transferring the media. These radio bearers are dedicated bearers per media type, i.e. codec.

Cellular systems typically configure different radio bearers on different port numbers. Therefore, incoming media has to have different destination port numbers for the different possible codecs in order to be routed properly to the correct radio bearer. Thus, this is an example in which several RTP sessions are used to carry a single media instance (the encoded speech from the sender).

7.2 DTMF tones

Some voice sessions include DTMF tones. Sometimes the voice handling is performed by a different host than the DTMF handling. It is common to have an application server in the network gathering DTMF tones for the user while the user receives the encoded speech on his user agent. In this situations it is necessary to establish two RTP sessions: one for the voice and the other for the DTMF tones. Both RTP sessions are logically part of the same media instance.

7.3 Media flow definition

The previous examples show that the definition of a media stream in [3] do not cover some scenarios. It cannot be assumed that a single media instance maps into a single RTP session. Therefore, we introduce the definition of a media flow:

Media flow consists of a single media instance, e.g., an audio stream or a video stream as well as a single whiteboard or shared application group. When using RTP, a media flow comprises one or more RTP sessions.

7.4 FID semantics

Several "m" lines grouped together using FID semantics form a media flow. A media agent handling a media flow that comprises several "m" lines MUST send a copy of the media to every "m" line part of the flow as long as the codecs and the direction attribute present in a particular "m" line allow it.

It is assumed that the application uses only one codec at a time to encode the media produced. This codec MAY change dynamically during the session, but at any certain moment only one codec is in use.

The application encodes the media using the current codec and checks one by one all the "m" lines that are part of the flow. If a particular "m" line contains the codec being used and the direction attribute is "sendonly" or "sendrecv" a copy of the encoded media is sent to the address/port specified in that particular media stream. If either the "m" line does not contain the codec being used or the direction attribute is neither "sendonly" nor "sendrecv" nothing is sent over this media stream.

The application typically ends up sending media to different destinations (IP address/port number) depending on the codec used at any moment.

7.4.1 Examples of FID

The session description below would be the SDP sent by a SIP user agent using a cellular access. The user agent supports GSM on port 30000 and AMR on port 30002. When the remote party sends GSM it will

send RTP packets to port number 30000. When AMR is the codec chosen,

packets will be sent to port 30002. Note that the remote party can switch between both codecs dynamically in the middle of the session. However, in this example, only one media stream at a time carries voice. The other remains "muted" while its corresponding codec is not in use.

```
      v=0
      o=Laura 289083124 289083124 IN IP4 two.example.com
      t=0 0
      c=IN IP4 131.160.1.112
      a=group:FID 1 2
      m=audio 30000 RTP/AVP 3
      a=rtpmap:3 GSM/8000
      a=mid:1
      m=audio 30002 RTP/AVP 97
      a=rtpmap:97 AMR/8000
      a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2; mode-change-
   neighbor; maxframes=1
      a=mid:2
```

In the previous example a system receives media on the same IP address on different port numbers. The following example shows how a system can receive different codecs on different IP addresses.

```
      v=0
      o=Laura 289083124 289083124 IN IP4 three.example.com
      t=0 0
      c=IN IP4 131.160.1.112
      a=group:FID 1 2
      m=audio 20000 RTP/AVP 0
      c=IN IP4 131.160.1.111
      a=rtpmap:0 PCMU/8000
      a=mid:1
      m=audio 30002 RTP/AVP 97
      a=rtpmap:97 AMR/8000
      a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2; mode-change-
   neighbor; maxframes=1
      a=mid:2
```

The cellular terminal of this example only supports the AMR codec. However, many current IP phones only support PCM (payload 0). In order to be able to interoperate with them, the cellular terminal uses a transcoder whose IP address is 131.160.1.111. The cellular terminal includes in its SDP support for PCM at that IP address. Remote systems will send AMR directly to the terminal but PCM will be sent to the transcoder. The transcoder will be configured (using whatever method) to convert the incoming PCM audio to AMR and send it to the terminal.

The next example shows that the "group" attribute used with FID semantics allows to express uni-directional codecs for a bi-directional media flow. That is, a codec that is only used in one

direction within a sendrecv media stream.

```
v=0
o=Laura 289083124 289083124 IN IP4 four.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2
m=audio 30000 RTP/AVP 0
a=mid:1
m=audio 30002 RTP/AVP 8
a=recvonly
a=mid:2
```

A user agent that receives the SDP above knows that at a certain moment it can send either PCM u-law to port number 30000 or PCM A-law to port number 30002. However, the media agent also knows that the other end will only send PCM u-law (payload 0).

The following example shows a session description with different "m" lines grouped together using FID semantics that contain the same codec.

```
v=0
o=Laura 289083124 289083124 IN IP4 five.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2 3
m=audio 30000 RTP/AVP 0
a=mid:1
m=audio 30002 RTP/AVP 8
a=mid:2
m=audio 20000 RTP/AVP 0 8
c=IN IP4 131.160.1.111
a=recvonly
a=mid:3
```

At a particular point of time, if the media agent is sending PCM u-law (payload 0) it sends RTP packets to 131.160.1.112 on port 30000 and to 131.160.1.111 on port 20000 (first and third "m" lines). If it is sending PCM A-law (payload 8) it sends RTP packets to 131.160.1.112 on port 30002 and to 131.160.1.111 on port 20000 (second and third "m" lines).

The system that generated the SDP above supports PCM u-law on port 30000 and PCM A-law on port 30002. Besides, it uses an application server whose IP address is 131.160.1.111 that records all the conversation. That is why the application server always receives a copy of the audio stream regardless of the codec being used at any given moment (it actually performs an RTP dump, so it can effectively receive any codec).

Remember that if several "m" lines grouped together using FID semantics contain the same codec the media agent MUST send media over several RTP sessions at the same time.

The last example of this section deals with DTMF tones. DTMF tones can be transmitted using a regular voice codec or can be transmitted as telephony events. The RTP payload for DTMF tones treated as telephone events is described in RFC 2833 [6]. Below there is an example of an SDP session description using FID semantics and this payload type.

```
v=0
o=Laura 289083124 289083124 IN IP4 six.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2
m=audio 30000 RTP/AVP 0
a=mid:1
m=audio 20000 RTP/AVP 97
c=IN IP4 131.160.1.111
a=rtpmap:97 telephone-events
a=mid:2
```

The remote party would send PCM encoded voice (payload 0) to 131.160.1.112 and DTMF tones encoded as telephony events to 131.160.1.111. Note that only voice or DTMF is sent at a particular point of time. When DTMF tones are sent the first media stream does not carry any data and when voice is sent there is no data in the second media stream. FID semantics provide different destinations for alternative codecs.

7.5 Scenarios that FID does not cover

It is worthwhile mentioning some scenarios where the "group" attribute using existing semantics (particularly FID) might seem to be applicable but it is not. This section has been included because we have observed some confusion within the community regarding the three scenarios described below. This section helps clarify them.

7.5.1 Parallel encoding using different codecs

FID semantics are useful when the application only uses one codec at a time. An application that encodes the same media using different codecs simultaneously MUST NOT use FID to group those media lines. Some systems that handle DTMF tones are a typical example of parallel encoding using different codecs.

Some systems implement the RTP payload defined in RFC 2833, but when they send DTMF tones they do not mute the voice channel. Therefore, effectively they are sending two copies of the same DTMF tone: encoded as voice and encoded as a telephony event. When the receiver gets both copies it typically uses the telephony event rather than

the tone encoded as voice. FID semantics MUST NOT be used in this

context to group both media streams since such a system is not using alternative codecs but rather different parallel encodings for the same information.

7.5.2 Layered encoding

Layered encoding schemes encode media in different layers. Quality at the receiver varies depending on the number of layers received. SDP provides a means to group together contiguous multicast addresses that transport different layers. The "c" line below:

```
c=IN IP4 224.2.1.1/127/3
```

is equivalent to the following three "c" lines:

```
c=IN IP4 224.2.1.1/127
c=IN IP4 224.2.1.2/127
c=IN IP4 224.2.1.3/127
```

FID MUST NOT be used to group "m" lines that do not represent the same information. Therefore, FID MUST NOT be used to group "m" lines that contain the different layers of layered encoding scheme. Besides, we do not define new group semantics to provide a more flexible way of grouping different layers because the already existing SDP mechanism covers the most useful scenarios.

7.5.3 Same IP address and port number

If several codecs have to be sent to the same IP address and port, the traditional SDP syntax of listing several codecs in the same "m" line MUST be used. FID MUST NOT be used to group "m" lines with the same IP address/port. Therefore, an SDP like the one below MUST NOT be generated.

```
v=0
o=Laura 289083124 289083124 IN IP4 six.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2
m=audio 30000 RTP/AVP 0
a=mid:1
m=audio 30000 RTP/AVP 8
a=mid:2
```

The correct SDP for the session above would be the following one:

```
v=0
o=Laura 289083124 289083124 IN IP4 six.example.com
t=0 0
c=IN IP4 131.160.1.112
m=audio 30000 RTP/AVP 0 8
```

If two "m" lines are grouped using FID they MUST differ in their transport addresses (i.e., IP address plus port).

8. Usage of the "group" attribute in SIP

SDP descriptions are used by several different protocols, SIP among them. We include a section about SIP because the "group" attribute will most likely be used mainly by SIP systems.

SIP [5] is an application layer protocol for establishing, terminating and modifying multimedia sessions. SIP carries session descriptions in the bodies of the SIP messages but is independent from the protocol used for describing sessions. SDP [2] is one of the protocols that can be used for this purpose.

At session establishment SIP provides a three-way handshake (INVITE-200 OK-ACK) between end systems. However, just two of these three messages carry SDP. SDPs MAY be present in INVITE and 200 OK or in 200 OK and ACK. The following sections assume that INVITE and 200 OK are the ones carrying SDP for the sake of clarity, but everything is also applicable to the other possible scenario (200 OK and ACK).

8.1 Mid value in responses

The "mid" attribute is an identifier for a particular media stream. Therefore, the "mid" value in the response MUST be the same as the "mid" value in the request. Besides, subsequent requests such as re-INVITEs SHOULD use the same "mid" value for the already existing media streams.

Appendix B of [5] describes the usage of SDP in relation to SIP. It states: "The caller and callee align their media description so that the nth media stream ("m=" line) in the caller³s session description corresponds to the nth media stream in the callee³s description."

The presence of the "group" attribute in an SDP session description does not modify this behavior.

Since the "mid" attribute provides a means to label "m" lines it would be possible to perform media alignment using "mid" labels rather than matching nth "m" lines. However this would not bring any gain and would add complexity to implementations. Therefore SIP systems MUST perform media alignment matching nth lines regardless of the presence of the "group" or "mid" attributes.

If a media stream that contained a particular "mid" identifier in the request contains a different identifier in the response the application ignores all the "mid" and "group" lines that might appear in the session description. The following example illustrates this scenario:

8.1.1 Example

Two SIP entities exchange SDPs during session establishment. The INVITE contained the SDP below:

```
v=0
o=Laura 289083124 289083124 IN IP4 seven.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2
m=audio 30000 RTP/AVP 0 8
a=mid:1
m=audio 30002 RTP/AVP 0 8
a=mid:2
```

The 200 OK response contains the following SDP:

```
v=0
o=Bob 289083122 289083122 IN IP4 eigth.example.com
t=0 0
c=IN IP4 131.160.1.113
a=group:FID 1 2
m=audio 25000 RTP/AVP 0 8
a=mid:2
m=audio 25002 RTP/AVP 0 8
a=mid:1
```

Since alignment of "m" lines is performed based on matching of nth lines, the first stream had "mid:1" in the INVITE and "mid:2" in the 200 OK. Therefore, the application MUST ignore every "mid" and "group" lines contained in the SDP.

A well-behaved SIP user agent would have returned the SDP below in the 200 OK:

```
v=0
o=Bob 289083122 289083122 IN IP4 nine.example.com
t=0 0
c=IN IP4 131.160.1.113
a=group:FID 1 2
m=audio 25002 RTP/AVP 0 8
a=mid:1
m=audio 25000 RTP/AVP 0 8
a=mid:2
```

8.2 Group value in responses

A SIP entity that receives a request that contains an "a=group" line with semantics that it does not understand MUST return a response without the "group" line. Note that, as it was described in the previous section, the "mid" lines MUST still be present in the response.

A SIP entity that receives a request that contains an "a=group" line which semantics that are understood MUST return a response that contains an "a=group" line with the same semantics. The identification-tags contained in this "a=group" lines MUST be the same that were received in the request or a subset of them (zero identification-tags is a valid subset). When the identification-tags in the response are a subset the "group" value to be used in the session MUST be the one present in the response.

SIP entities refuse media streams by setting the port to zero in the corresponding "m" line. "a=group" lines MUST NOT contain identification-tags that correspond to "m" lines with port zero.

Note that grouping of m lines MUST always be requested by the issuer of the request (the client), never by the issuer of the response (the server). Since SIP provides a two-way SDP exchange, a server that requested grouping in a response would not know whether the "group" attribute was accepted by the client or not. A server that wants to group media lines SHOULD issue another request after having responded to the first one (a re-INVITE for instance).

> Note that, as we mentioned previously, in this section we are assuming that the SDPs are present in the INVITE and in the 200 OK. Applying the statement above to the scenario where SDPs are present in the 200 OK and in the ACK, the entity requesting grouping would be the server.

8.2.1 Example

The example below shows how the callee refuses a media stream offered by the caller by setting its port number to zero. The "mid" value corresponding to that media stream is removed from the "group" value in the response.

SDP in the INVITE from caller to callee:

```
v=0
o=Laura 289083124 289083124 IN IP4 ten.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID 1 2 3
m=audio 30000 RTP/AVP 0
a=mid:1
m=audio 30002 RTP/AVP 8
a=mid:2
m=audio 30004 RTP/AVP 3
a=mid:3
```

SDP in the INVITE from callee to caller:

```
v=0
```

```
         o=Bob 289083125 289083125 IN IP4 eleven.example.com
```

```
t=0 0
c=IN IP4 131.160.1.113
a=group:FID 1 3
m=audio 20000 RTP/AVP 0
a=mid:1
m=audio 0 RTP/AVP 8
a=mid:2
m=audio 20002 RTP/AVP 3
a=mid:3
```

8.3 Capability negotiation

A client that understands "group" and "mid" but does not want to make use of them in a particular session MAY want indicate that it supports them. If a client decides to do that, it SHOULD add an "a=group" line with zero identification-tags for every semantics it understands.

If a server receives a request that contains empty "a=group" lines it SHOULD add its capabilities also in the form of empty "a=group" lines to its response.

8.3.1 Example

A system that supports both LS and FID semantics but does not want to group any media stream for this particular session generates the following SDP:

```
v=0
o=Bob 289083125 289083125 IN IP4 twelve.example.com
t=0 0
c=IN IP4 131.160.1.113
a=group:LS
a=group:FID
m=audio 20000 RTP/AVP 0 8
```

The server that receives that request supports FID but not LS. It responds with the SDP below:

```
v=0
o=Laura 289083124 289083124 IN IP4 thirteen.example.com
t=0 0
c=IN IP4 131.160.1.112
a=group:FID
m=audio 30000 RTP/AVP 0
```

8.4 Backward compatibility

This document does not define any SIP "Require" header. Therefore, if one of the SIP user agents does not understand the "group"

attribute the standard SDP fall back mechanism MUST be used (attributes that are not understood are simply ignored).

8.4.1 Client does not support "group"

This situation does not represent a problem because grouping requests is always performed by clients, not by servers. If the client does not support "group" this attribute will just not be used.

8.4.2 Server does not support "group"

The server will ignore the "group" attribute, since it does not understand it (it will also ignore the "mid" attribute). For LS semantics, the server might decide to perform or to not perform synchronization between media streams.

For FID semantics, the server will consider that the session comprises several media streams.

Different implementations would behave in different ways.

In the case of audio and different "m" lines for different codecs an implementation might decide to act as a mixer with the different incoming RTP sessions, which is the correct behavior.

An implementation might also decide to refuse the request (e.g. 488 Not acceptable here or 606 Not Acceptable) because it contains several "m" lines. In this case, the server does not support the type of session that the caller wanted to establish. In case the client is willing to establish a simpler session anyway, he SHOULD re-try the request without "group" attribute and only one "m" line per flow.

9. Security considerations

Using the "group" parameter with FID semantics an entity that managed to modify the session descriptions exchanged between the participants to establish a multimedia session could force the participants to send a copy of the media to any particular destination.

Integrity mechanism provided by protocols used to exchange session descriptions and media encryption can be used to prevent this attack.

10. IANA considerations

This document defines two SDP attributes: "mid" and "group".

The "mid" attribute is used to identify media streams within a session description and its format is defined in Section 3.

The "group" attribute is used for grouping together different media streams and its format is defined in Section 4.

Section 4 also defines two standard semantics related to the "group" attribute: LS (Lip Synchronization) and FID (Flow Identification). If in the future it was needed to standardize further semantics they would need to be defined in a standards track document.

11. Acknowledgments

The authors would like to thank Jonathan Rosenberg, Adam Roach, Orit Levin and Joerg Ott for their feedback on this document.

12. References

[1] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, IETF; March 1997.

[2] M. Handley/V. Jacobson, "SDP: Session Description Protocol", RFC 2327, IETF; April 1998.

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Grouping of media lines in SDP

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Grouping of media lines in SDP

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021675

CR-Form-v7

CHANGE REQUEST

⌘ **24.229** **CR** **175** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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 ☐

Title:	⌘	Clarifications of the binding and media grouping
Source:	⌘	Ericsson
Work item code:	⌘	IMS-CCR
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:	⌘	Reference to the internet drafts providing the detailed working assumption for the grouping of m-lines replace the reference of the stage-2 reference. Various clarifications of the text describing binding.
Summary of change:	⌘	Clarifications when and how a separate PDP context is required for media is needed in order to get consistant behaviour of the UE from different vendors.
Consequences if not approved:	⌘	The detailed description of binding and grouping information will not be complete.

Clauses affected:	⌘	2, 9.2.5				
		Y	**N**			
Other specs Affected:	⌘	**X**		Other core specifications	⌘	27.060
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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 modification **********

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 23.002: "Network architecture".

[3] 3GPP TS 23.003: "Numbering, addressing and identification".

[4] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[5] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IM call model".

[6] 3GPP TS 23.221: "Architectural requirements".

[7] 3GPP TS 23.228: "IP multimedia subsystem; Stage 2".

[8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

[9] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[10] 3GPP TS 26.235: "Packet switched conversational multimedia applications; Default codecs".

[11] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting Packet Based Services and Packet Data Networks (PDN)".

[12] 3GPP TS 29.207: "Policy control over Go interface".

[13] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows".

[14] 3GPP TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents".

[15] 3GPP TS 29.229: "Cx and Dx Interfaces based on the Diameter protocol, Protocol details".

[16] 3GPP TS 32.200: "Telecommunication management; Charging management; Charging principles".

[17] 3GPP TS 32.225: "Telecommunication management; Charging management; Charging data description for the IP Multimedia subsystem".

[18] 3GPP TS 33.102: "3G Security; Security architecture".

[19] 3GPP TS 33.203: "Access security for IP based services".

[20] 3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[21] RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

[22] RFC 2806: "URLs for Telephone Calls".

[23] RFC 2833 (May 2000): "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[24] RFC 2916: "E.164 number and DNS".

[25] RFC 2976 (October 2000): "The SIP INFO method".

[26] RFC 3261 (March 2002): "SIP: Session Initiation Protocol".

[27] RFC 3262 (March 2002): "Reliability of provisional responses in Session Initiation Protocol".

[28] RFC 3265 (March 2002): "Session Initiation Protocol Specific Event Notification".

[29] RFC 3311 (April 2002): "The SIP UPDATE method".

[30] RFC 3312 (May 2002): "Integration of resource management and SIP".

[31] RFC 3313 (February 2002): "SIP extensions for media authorization".

[32] RFC 3320 (March 2002): "Signaling Compression (SigComp)"

[33] RFC 3323 (May 2002): "A Privacy Mechanism for the Session Initiation Protocol (SIP)".

[34] RFC 3325 (May 2002): "Private Extensions to the Session Initiation Protocol (SIP) for Network Asserted Identity within Trusted Networks".

[35] RFC 3327 (May 2002): "SIP Extension for Registering Non-Adjacent Contacts".

[36] draft-sparks-sip-refer-split-00 (April 2002): "The REFER method".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[37] draft-sparks-sip-mimetypes (April 2002): "Internet Media Type message/sipfrag".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[38] draft-willis-scvrtdisco-03 (May 2002): "SIP Extension Header for Service Route Discovery in Private Networks".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[39] draft-ietf-mmusic-sdp-new-04 (November 2001): "SDP: Session Description Protocol".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[40] draft-ietf-dhc-dhcpv6-23 (February 2002): "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[41] draft-iet f-sip-dhcpv6-00 (April 2002): "DHCPv6 options for SIP servers".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[42] draft-ietf-sipping-sigcomp-sip-dictionary-00.txt (May 2002): "The SIP/SDP static dictionary for Signaling Compression".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[43] draft-beckmann-sip-reg-event-01 (May 2002): "Registration event package".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[44] draft-garcia-sip-visited-network-id-00 (March 2002): "Private SIP extension for Visited Network Identifier".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[45] draft-henrikson-sip-charging-information-01 (May 2002): "Private SIP Extension for Mobile Charging Information".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[46] draft-henrikson-sip-original-dialog-id-01 (May 2002): "Private SIP Extension for Original Dialog Identifier".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[47] draft-mills-sip-access-network-info-01.txt (April 2002): " "SIP Access Network Information header" ".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[48] draft-ietf-mmusic-fid-06 (August 2002): "Grouping of media lines in SDP".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[49] draft-camarillo-mmusic-separate-streams-00 (December 2002): "Mapping of Media Streams to Resource Reservation Flows".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

********** Second modification **********

9 GPRS aspects when connected to the IM CN subsystem

9.1 Introduction

A UE accessing the IM CN subsystem, and the IM CN subsystem itself, utilise the services provided by GPRS to provide packet-mode communication between the UE and the IM CN subsystem.

Requirements for the UE on the use of these packet-mode services are specified in this clause. Requirements for the GGSN in support of this communication are specified in 3GPP TS 29.061 [11] and 3GPP TS 29.207 [12].

9.2 Procedures at the UE

9.2.1 PDP context activation and P-CSCF discovery

Prior to communication with the IM CN subsystem, the UE shall:

a) perform a GPRS attach procedure;

b) establish a PDP context used for SIP signalling according to the APN and GGSN selection criteria described in 3GPP TS 23.060 [4]. This PDP context shall remain active throughout the period the UE is connected to the IM CN subsystem, i.e. from the initial registration and at least until the deregistration. As a result, the PDP context provides the UE with information that makes the UE able to construct an IPv6 address;

The UE shall choose one of the following options when performing establishment of this PDP context:

I. A dedicated PDP context for SIP signalling:

The UE shall indicate to the GGSN that this is a PDP context intended to carry IM CN subsystem-related signalling only by setting the IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE at PDP Context activation. The UE may also use this PDP context for DNS and DHCP signalling according to the static packet filters described in 3GPP TS 29.207 [12];

II. A general-purpose PDP context:

The UE may decide to use a general purpose PDP Context to carry IM CN subsystem-related signaling. The UE shall indicate to the GGSN that this is a general-purpose PDP context by not setting the IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE;

NOTE 1: A general purpose PDP Context is completely IM CN subsystem-unaware, and as such, it does not have any IM CN subsystem-specific mechanisms applied to it.

NOTE 2: A general purpose PDP Context may carry both IM CN subsystem signaling and media, in case the media does not need to be authorized by Service Based Local Policy mechanisms defined in 3GPP TS 29.207 [12] and the media component is not mandated by the P-CSCF to be carried in a separate PDP Context.

c) aquire a P-CSCF address(es).

The methods for P-CSCF discovery are:

I. Employ Dynamic Host Configuration Protocol for IPv6 (DHCPv6) draft-ietf-dhc-dhcpv6 [40], the DHCPv6 options for SIP servers draft-ietf-sip-dhcpv6 [41] and if needed DNS after PDP context activation.

The UE shall either:

- in the DHCP query, request a list of SIP server domain names of P-CSCF(s) and the list of Domain Name Servers (DNS); or

- request a list of SIP server IPv6 addresses of P-CSCF(s).

II. Transfer P-CSCF address(es) within The PDP context activation procedure.

The UE shall indicate the request for a P-CSCF address to the GGSN within the Protocol Configuration Options IE of the ACTIVATE PDP CONTEXT REQUEST message or ACTIVATE SECONDARY PDP CONTEXT REQUEST message.

If the GGSN provides the UE with a list of P-CSCF IPv6 addresses in the ACTIVATE PDP CONTEXT ACCEPT message or ACTIVATE SECONDARY PDP CONTEXT ACCEPT message, the UE shall assume that the list is prioritised with the first address within the Protocol Configuration Options IE as the P-CSCF address with the highest priority.

The UE can freely select method I or II for P-CSCF discovery. In case several P-CSCF addresses are provided to the UE, the selection of P-CSCF address shall be performed according to the resolution of host name as indicated in RFC 3261 [26]. If sufficient information for P-CSCF address selection is not available, selection of the P-CSCF address by the UE is implementation specific.

If the UE is designed to use I above, but receives P-CSCF address(es) according to II, then the UE shall either ignore the received address(es), or use the address(es) in accordance with II, and not proceed with the DHCP request according to I.

9.2.2 Session management procedures

The existing procedures for session management as described in 3GPP TS 24.008 [8] shall apply while the UE is connected to the IM CN subsystem.

9.2.3 Mobility management procedures

The existing procedures for mobility management as described in 3GPP TS 24.008 [8] shall apply while the UE is connected to the IM CN subsystem.

9.2.4 Cell selection and lack of coverage

The existing mechanisms and criteria for cell selection as described in 3GPP TS 25.304 [9] and 3GPP TS 44.018 [20] shall apply while the UE is connected to the IM CN subsystem.

9.2.5 PDP contexts for media

During establishment of a session, the UE establishes data streams(s) for media related to the session. Such data stream(s) may result in activation of additional PDP context(s). Such additional PDP context(s) shall be established as secondary PDP contexts associated to the PDP context used for signalling.

The P-CSCF shall indicate to the UE within the ~~SIP/~~SDP according to draft-ietf-mmusic-fid-06 [48] and draft-camarillo-mmusic-separate-streams-00 [49] if a separate PDP Context is required for a media component ~~as per procedures defined in 3GPP TS 23.228 [7]~~. The UE shall establish an additional PDP context for a media component if so indicated by the received SDP~~P-CSCF~~. Media streams from different SIP sessions shall be transported in different PDP contexts.

The UE shall pass the media authori~~z~~sation token received from the P-CSCF in the 183 (Session Progress) response to an INVITE request at originating setup or in the INVITE request at terminating setup to the GGSN by inserting it within the Traffic Flow Template IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message or the MODIFY PDP CONTEXT REQUEST message~~at PDP Context activation/modification~~. The SIP extensions for media authorization is described in RFC 3313 [29].

In order to identify to the GGSN which flow(s) (identified by m-lines within the SDP) are to be transferred within a particular PDP context, the UE shall set the flow identifier(s) within the Traffic Flow Template IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message or the MODIFY PDP CONTEXT REQUEST message~~at PDP Context activation modification~~. Detailed description of how the flow identifiers are constructed is provided in 3GPP TS 29.207 [12].

Detailed description of how the media authorization token and flow identifiers are carried in the Traffic Flow Template IE is provided in 3GPP TS 24.008 [8].

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021782***
Helsinki, Finland, 29 July – 2 August

Title: LS on Media grouping
Response to:
Release: REL-5
Work Item: IMS-CCR

Source: CN1
To: SA, CN, SA2
Cc: CN3

Contact Person:
Name: Atle Monrad
Tel. Number: +47 372 93 665
E-mail Address: atle.monrad@ericsson.com

Attachments: N1-021675
draft-ietf-mmusic-fid-06.txt
draft-camarillo-mmusic-separate-streams-00.txt

1. Overall Description:

CN1 would like to inform about the status for the requirements described in 23.228 v.5.5.0 clause 4.2.5.1 (copied below).

> **4.2.5.1 Relation of IMS media components and PDP contexts carrying IMS media**
>
> The relation between IMS media components and PDP contexts carrying IMS media is controlled by the IMS network on media component level in the following way:
> The P-CSCF shall have the capability to indicate to the UE that a separate PDP Context is required for each IMS media component indicated.
> - If the UE receives such an indication for a media component, it shall open a separate PDP Context for this media component. If the UE receives no such indication for a media component, the UE makes the decision whether to open a separate PDP Context or modify an existing PDP Context for this media component.
> - The criteria and information for setting this indication is determined by local policy in the network where the P-CSCF is located. The IMS network shall have the capability to transfer the media component level indication described above to the UE. This media component level indication shall be transferred in SIP/SDP signaling upon session initiation and addition of media component(s) to active IMS sessions.
>
> It is assumed that media components from different IMS sessions are not carried within the same PDP context. All associated IP flows (such as e.g. RTP / RTCP flows) used by the UE to support a single media component are assumed to be carried within the same PDP context.

From the referenced clause, it is the understanding of CN1 that separate media streams may be indicated from P-CSCF based on local policy. CN1 has evaluated the requirements and considered the following solutions:

1. Additions to SDP as described in draft-camarillo-mmusic-separate-streams-00.txt (additions to draft-ietf-mmusic-fid-06.txt currently close to being finalized in IETF).

2. Additions to SIP by e.g. a new p-header.

Both alternatives above require work in IETF, and CN1 has seen alternative 1 as the way forward and submitted draft-camarillo-mmusic-separate-streams-00.txt to IETF. The draft has got some comments but is not adopted as a working group item yet. The timeframe for this draft to possibly reach RFC status is not easy to predict, but it is the opinion of CN1 that the draft will at least need 6 months more to receive RFC status even if 3GPP puts effort into getting the document priority within IETF.

2. Actions:

To SA / CN groups.

ACTION:

CN1 asks SA / CN to consider the problem described above and come back to CN1 with guidance to the concerns for the Rel-5 timeframe.

Question 1.
It is a concern of CN1 that the functionality described above will cause a delay for finalising Rel-5 on time. Shall CN1 continue with the current working assumption and assume that draft-camarillo-mmusic-separate-streams-00.txt will reach RFC status in Rel-5 timeframe?

To SA2 group.

ACTION:

CN1 asks SA2 to consider the problem described above and come back to CN1 with further guidance to the questions below.

Question 2.
Does SA2 see other possible solutions to fulfil the requirement that does not cause additions to IETF and can be completed within the Rel-5 timeframe?

Question 3.
In case SA2 decides to move the requirement to indicate separate media streams as described in subclause 4.2.5.1 of 23.228 to Rel-6, CN1 would like to get guidance in how to proceed with this issue. Should CN1 continue the work as described in draft-camarillo-mmusic-separate-streams-00.txt for introduction in Rel-6?

3. Date of Next TSG-CN1 Meetings:

CN1_26	23rd – 27th September 2002	Miami, USA
CN1_27	11th – 15th November 2002	Bangkok, Thailand

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021835***
Helsinki, Finland, 29 July – 2 August

Title:	LS on **"Terminal determination of network support of EDGE"**
Response to:	LS (N1-021526 respectively GP-022115) on **Terminal determination of support of EGPRS in the network** from TSG GERAN
Release:	R99 and newer
Work Item:	EDGE
Source:	TSG CN1
To:	TSG GERAN, TSG GERAN WG2
Cc:	

Contact Person:

Name:	**Roland Gruber**
Tel. Number:	+49 89 722 46392
E-mail Address:	roland.gruber@mch.siemens.de

Attachments: N1-021836 24.007 CR 057 "Clarification of the CN release indicators"
N1-021837 44.018 Draft CR "Clarification of the CN release indicators"
N1-021838 44.060 Draft CR "Clarification of the CN release indicators"

---

1. Overall Description:

TSG CN1 would like to thank TSG GERAN for their LS on the determination of the network support of EGPRS by the terminals.

TSG GERAN confirms that the MSCR and the SGSNR bits are only indicating the release of the CN protocols and thus the version of the MSC or SGSN specific protocols. They are not applicable to access stratum protocols.

TSG CN1 has reviewed their specifications and agreed a CR to TS 24.007 which clarifies that the MSCR and the SGSNR bits in the system information broadcast are used by the MS to determine the release supported by the CN.

Furthermore TSG CN1 propose TSG GERAN WG2 to add notes in TS 44.018 and 44.060 in order to explain that the MSCR and the SGSNR bits are not applicable to access stratum protocols.

2. Actions:

To TSG GERAN group.

ACTION:
TSG CN1 kindly asks TSG GERAN to approve the proposed changes to TS 44.018 and TS 44.060 attached to this LS.

3. Date of Next TSG-CN1 Meetings:

CN1_26	23rd – 27th September 2002	?, USA
CN1_27	11th – 15th November 2002	Bangkok, Thailand

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021836
(rev of Tdoc N1-021806)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **057** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*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 ☐

Title:	⌘	Clarification of the CN release indicators
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	30.07.2002
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:	⌘	With the LS on "Terminal determination of support of EGPRS in the network" (N1-021526)TSG CN1 was requested by TSG GERAN to clarify the definitions of MSCR (MSC Release) and SGSNR (SGSN Release) in the core network specifications.
Summary of change:	⌘	It is proposed to explicitly state that the MSCR and SGSNR are indicating the release supported by the core network.
Consequences if not approved:	⌘	Risk of ambiguities how the release supported by the core network can be determined by the MS.

Clauses affected:	⌘	11.2.3.2.3.1.1

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

Other comments:	⌘	

11.2.3.2.3.1.1 Send state variable V(SD)

The mobile station shall have one associated send state variable V(SD) ("Send Duplicated") for each upper layer message flow. The send state variable denotes the sequence number of the next in sequence numbered message in the flow to be transmitted. The value of the corresponding send state variable shall be incremented by one with each numbered message transmission.

For the MM+CC+SS upper layer message flow, when the RR connection starts with a core network of release 98 or earlier, arithmetic operations on V(SD) are performed modulo 2. When the RR connection starts with a core network of Release 99 or later, arithmetic operations on V(SD) are performed modulo 4. The mobile station shall keep using the same modulo (2 or 4) for the duration of the RR connection.

For the GCC, BCC, and LCS upper layer message flows, arithmetic operations on V(SD) are performed modulo 2.

NOTE: In GSM, the release supported by the core network is indicated in the MSCR bit and in the SGSNR bit in the ~~broadcast as~~ system information broadcast (see 3GPP TS 44.018 [6b] and 3GPP TS 44.060 [10a]).

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021837

CR-Form-v7

CHANGE REQUEST

⌘ **44.018** **CR** **DRAFT** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Clarification of the CN release indicators
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	29.07.02
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:	⌘	As the MSCR and SGSNR bits are included in the GERAN system information, it is not quite clear whether these bits are only reflecting the release of the CN specific protocols, or whether they are also applicable on the access stratum protocols. TSG CN1 confirmed in the LS "Terminal determination of network support of EDGE" that the MSCR and SGSNR bits are only indicating the release of the CN protocols. As these bits are clearly CN specific, a MS shall not check them when determining whether a GERAN specific feature is supported by the network. One example is the case of a GERAN indicating EDGE support while the SGSNR is not indication R99. Here the MS may activate EDGE even the SGSNR is not set to R99.
Summary of change:	⌘	It is proposed to clarify in a note that the MSCR and SGSNR bits are indicating the version of the MSC/SGSN specific protocols and are not applicable to access stratum protocols.
Consequences if not approved:	⌘	Risk that the applicability of the MSCR and SGSNR bits is unclear and similar discussions and miss interpretations appear in the future.

Clauses affected:	⌘	10.5.2.11; 10.5.2.37b			
Other specs affected:	⌘	**Y**	**N**		
		X		Other core specifications	⌘ 44.060
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

10.5.2.11 Control Channel Description

The purpose of the *Control Channel Description* information element is to provide a variety of information about a cell.

The *Control Channel Description* information element is coded as shown in figure 10.5.2.11.1/3GPP TS 44.018 and table 10.5.2.11.1/3GPP TS 44.018.

The *Control Channel Description* is a type 3 information element with 4 octets length.

8	7	6	5	4	3	2	1	
	Control Channel Description IEI							octet 1
MSCR	ATT	BS-AG-BLKS-RES			CCCH-CONF			octet 2
0 spare	CBQ3		CBQ2		BS-PA-MFRMS			octet 3
T 3212 time-out value								octet 4

Figure 10.5.2.11.1/3GPP TS 44.018: *Control Channel Description* information element

Table 10.5.2.11.1/3GPP TS 44.018: *Control Channel Description* information element

```
MSCR, MSC Release (octet 2)
Bit
8
0           MSC is Release '98 or older
1           MSC is Release '99 onwards

ATT, Attach-detach allowed (octet 2)
 Bit
 7
 0          MSs in the cell are not allowed to apply
            IMSI  attach  and  detach procedure.
 1          MSs in the cell shall apply IMSI attach
            and detach procedure.


 BS-AG-BLKS-RES (octet 2)
 The  BS-AG-BLKS-RES  field  is  coded as the binary
 representation of the number of blocks reserved for
 access grant.

 Range 0 to 2 if CCCH-CONF = "001"
       0 to 7 for other values of CCCH-CONF

 All other values are reserved in the first case

CBQ3, Cell Bar Qualify 3 (octet 3)
 Bits
 7 6
 0 0        Iu mode not supported
 0 1        Iu mode capable MSs barred
 1 0        Iu mode supported, cell not barred
 1 1        Reserved

Note: See 3GPP TS 45.008 for information on Cell Bar Qualify 3

CBQ2, Cell Bar Qualify 2 (octet 3)
 Bits
 5 4
 0 0        Cell Bar Qualify 2 inactive
 0 1        Reserved, shall be interpreted as 11
 1 0        Voice not supported, cell not barred, norm. cell
selection priority
 1 1        Voice not supported, cell not barred, low cell
selection priority

Note: See 3GPP TS 45.008 for information on Cell Bar Qualify 2
```

```
CCCH-CONF (octet 2)
 bits
 3 2 1
 0 0 0      1 basic physical channel used for CCCH,
            not combined with SDCCHs
 0 0 1      1 basic physical channel used for CCCH,
            combined with SDCCHs
 0 1 0      2 basic physical channel used for CCCH,
            not combined with SDCCHs
 1 0 0      3 basic physical channel used for CCCH,
            not combined with SDCCHs
 1 1 0      4 basic physical channels used for CCCH,
            not combined with SDCCHs
  all other values are reserved

BS-PA-MFRMS (octet 3)
  Bits
 3 2 1
 0 0 0      2 multiframes period for transmission of
              PAGING  REQUEST  messages  to the same
              paging subgroup
 0 0 1      3 multiframes period for transmission of
              PAGING  REQUEST  messages  to the same
              paging subgroup
 0 1 0      4 multiframes period for transmission of
              PAGING  REQUEST  messages  to the same
   .          paging   subgroup
   .
   .
 1 1 1      9 multiframes period for transmission of
              PAGING  REQUEST  messages  to the same
              paging subgroup

 Note: The number of different paging subchannels on
       the CCCH is:

       MAX(1,(3 - BS-AG-BLKS-RES)) * BS-PA-MFRMS
               if CCCH-CONF = "001"
       (9 - BS-AG-BLKS-RES) * BS-PA-MFRMS
               for other values of CCCH-CONF

T3212 timeout value (octet 4)
 The  T3212  timeout  value  field  is  coded as the
 binary  representation  of  the  timeout  value for
 periodic updating in decihours.

 Range: 1 to 255

 The  value 0 is used for infinite timeout value
 i.e.  periodic  updating  shall not be used within
 the cell.
```

NOTE: The MSC Release bit indicates the version of the MSC specific protocols and is not applicable to access stratum protocols.

10.5.2.37b SI 13 Rest Octets

The *SI 13 Rest Octets* information element is coded according to the syntax specified below and described in tables 10.5.2.37b.1/3GPP TS 44.018 and 10.5.2.37b.2/3GPP TS 44.018.

The *SI 13 Rest Octets* information element is a type 5 information element with 20 octets length.

Table 10.5.2.37b.1/3GPP TS 44.018: *SI 13 Rest Octets* information element content

```
< SI 13 Rest Octets > ::=
        { L | H
                < BCCH_CHANGE_MARK : bit (3) >
                < SI_CHANGE_FIELD : bit (4) >

                { 0 | 1    < SI13_CHANGE_MARK : bit (2) >
                                < GPRS Mobile Allocation : GPRS Mobile Allocation IE > }                    --
Defined in 3GPP TS 44.060

                { 0
                                                                                    -- PBCCH not present in cell :
                        < RAC : bit (8) >
                        < SPGC_CCCH_SUP : bit >
                        < PRIORITY_ACCESS_THR : bit (3) >
                        < NETWORK_CONTROL_ORDER : bit (2) >
                        < GPRS Cell Options : GPRS Cell Options IE >
                -- Defined in 3GPP TS 44.060
                        < GPRS Power Control Parameters : GPRS Power Control Parameters struct >

                | 1                                                 -- PBCCH present in cell :
                        < PSI1_REPEAT_PERIOD : bit (4) >
                        < PBCCH Description : PBCCH Description struct >
                }
                { null | L
                                        -- Receiver compatible with ealier release
                 | H
                                                -- Additions in release 99 :
                        < SGSNR : bit >
                { null | L
                                        -- Receiver compatible with earlier release
                 | H
                                                -- Additions in release R4°:
                        < SI_STATUS_IND°: bit > } }
        }
        < spare padding > ;

< GPRS Power Control Parameters struct > ::=
        < ALPHA : bit (4) >
        < T_AVG_W : bit (5) >
        < T_AVG_T : bit (5) >
        < PC_MEAS_CHAN : bit >
        < N_AVG_I : bit (4) >;

< PBCCH Description struct > ::=
        <Pb : bit (4)
        < TSC : bit (3) >
        < TN : bit (3) >
        { 00      -- BCCH carrier
        | 01      < ARFCN : bit (10) >
        | 1               < MAIO : bit (6) >} ;
```

Table 10.5.2.37b.2/3GPP TS 44.018: *SI 13 Rest Octets* information element

BCCH_CHANGE_MARK (3 bit field)
This field indicates the status of the information on BCCH. The value of this field may be changed when information on BCCH is changed, see 3GPP TS 44.060.

SI_CHANGE_FIELD (4 bit field)
This field is the binary representation of which information was changed at the last indication in BCCH_CHANGE_MARK, see 3GPP TS 44.060. Range 0 to 15:

0	Update of *unspecified* SI message or SI messages;
1	Update of SI1 message;
2	Update of SI2, SI2 bis or SI2 ter message or any instance of SI2quater messages ;
3	Update of SI3, SI4, SI7 or SI8 message;
4	Update of SI9 message;
5	Update of SI18 or SI20 message;
6	Update of SI19 message;

All other values shall be interpreted as 'update of unknown SI message type'.

SI13_CHANGE_MARK (2 bit field)
This field is the binary representation of the SI change mark identifying the GPRS Mobile Allocation provided in SI13 and PSI13 messages. Range: 0 to 3.

GPRS Mobile Allocation (information element)
This information element is the representation of the GPRS mobile allocation provided in SI13 and PSI13 messages. It is identified by MA_NUMBER = 14 when referenced from a packet assignment message. The *GPRS Mobile Allocation* information element is defined in 3GPP TS 44.060. When used in SI13 or PSI13 message, this information element shall refer to the cell allocation defined for the cell in SI1 or PSI2.

RAC (8 bit field)
This field is the binary representation of the Routing Area Code, see 3GPP TS 23.003.

SPGC_CCCH_SUP (bit field)
This field indicates the support of the parameter SPLIT_PG_CYCLE on CCCH from the network side:

0	SPLIT_PG_CYCLE is not supported on CCCH in this cell;
1	SPLIT_PG_CYCLE is supported on CCCH in this cell.

The **PRIORITY_ACCESS_THR** field (3 bit) is the binary representation of the parameter PRIORITY_ACCESS_THR:

0 0 0	packet access is not allowed in the cell;
0 0 1	spare, shall be interpreted as '000' (packet access not allowed);
0 1 0	spare, shall be interpreted as '000' (packet access not allowed);
0 1 1	packet access is allowed for priority level 1;
1 0 0	packet access is allowed for priority level 1 to 2;
1 0 1	packet access is allowed for priority level 1 to 3;
1 1 0	packet access is allowed for priority level 1 to 4;
1 1 1	spare, shall be interpreted as '110' (packet access allowed).

The **NETWORK_CONTROL_ORDER** field (2 bit) is the binary representation of the parameter NETWORK_CONTROL_ORDER, see 3GPP TS 44.060:

0 0	NC0: MS controlled cell re-selection, no measurement reporting.
0 1	NC1: MS controlled cell re-selection, MS sends measurement reports.
1 0	NC2: Network controlled cell re-selection, MS sends measurement reports.
1 1	Reserved for future use, interpreted as NC0 by mobile station.

GPRS Cell Options (information element)
The *GPRS Cell Option* information element is defined in 3GPP TS 44.060.

PSI1_REPEAT_PERIOD (4 bit field)
This field is the representation of the PSI1 repeat period. The field is coded according to the following table:

0000	PSI1 repeat period = 1 multiframe
0001	PSI1 repeat period = 2 multiframes
:	
1111	PSI1 repeat period = 16 multiframes

GPRS Power Control Parameters struct

The **ALPHA** field (4 bit) is the binary representation of the parameter α for MS output power control in units of 0.1, see 3GPP TS 45.008: Range: 0 to 10. Values greater than 10 shall be interpreted as 10 by the mobile station.

The **T_AVG_W** field (5 bit) is the binary representation of the parameter T_{AVG_W} for MS output power control, see 3GPP TS 45.008: Range: 0 to 25. Values greater than 25 shall be interpreted as 25 by the mobile station.

The **T_AVG_T** field (5 bit) is the binary representation of the parameter T_{AVG_T} for MS output power control, see 3GPP TS 45.008: Range: 0 to 25. Values greater than 25 shall be interpreted as 25 by the mobile station.

The **PC_MEAS_CHAN** field (bit) indicates the type of channel which shall be used for downlink measurements for power control:

0	BCCH;
1	PDCH.

The **N_AVG_I** field (4 bit) is the binary representation of the parameter N_{AVG_I} for MS output power control, see 3GPP TS 45.008: Range: 0 to 15.

PBCCH Description struct
The PBCCH description struct provides the channel description for the PBCCH. The frequency description for the PBCCH may be specified by an ARFCN (non-hopping radio frequency channel) or a MAIO (hopping radio frequency channel) field. In case of a hopping radio frequency channel, the PBCCH shall use the GPRS mobile allocation specified in this message. If none of the ARFCN or MAIO fields are present, the PBCCH shall use the BCCH carrier.

Pb (4bit) (for encoding and description see the Global Power Control Parameters IE)

The **TSC** field (3 bit) is the binary representation of the training sequence code used for PBCCH. Range: 0 to 7.

The **TN** field (3 bit) is the binary representation of the timeslot number for the PBCCH. Range: 0 to 7.

The **ARFCN** field (10 bit) is the binary representation of the absolute RF channel number. Range: 0 to 1023.

The **MAIO** field (6 bit) is the binary representation of the mobile allocation index offset. Range: 0 to 63.

SGSNR, SGSN Release (bit field)

0	SGSN is Release '98 or older
1	SGSN is Release '99 onwards

SI_STATUS_IND (1 bit field):

0	The network does not support the PACKET SI STATUS message;
1	The network supports the PACKET SI STATUS message.

NOTE: The SGSN Release bit indicates the version of the SGSN specific protocols and is not applicable to access stratum protocols.

3GPP TSG-CN1 Meeting #25
Helsinki, Finland, 29 July – 2 August

Tdoc N1-021838

CR-Form-v7

CHANGE REQUEST

⌘ **44.060** **CR** **DRAFT** ⌘ **rev** **-** ⌘ Current version: **5.1.1** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Clarification of the CN release indicators
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	29.07.02
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:	⌘	As the MSCR and SGSNR bits are included in the GERAN system information, it is not quite clear whether these bits are only reflecting the release of the CN specific protocols, or whether they are also applicable on the access stratum protocols. TSG CN1 confirmed in the LS "Terminal determination of network support of EDGE" that the MSCR and SGSNR bits are only indicating the release of the CN protocols. As these bits are clearly CN specific, a MS shall not check them when determining whether a GERAN specific feature is supported by the network. One example is the case of a GERAN indicating EDGE support while the SGSNR is not indication R99. Here the MS may activate EDGE even the SGSNR is not set to R99.
Summary of change:	⌘	It is proposed to clarify in a note that the MSCR and SGSNR bits are indicating the version of the MSC/SGSN specific protocols and are not applicable to access stratum protocols.
Consequences if not approved:	⌘	Risk that the applicability of the MSCR and SGSNR bits is unclear and similar discussions and miss interpretations appear in the future.

Clauses affected:	⌘	11.2.18			
Other specs affected:	⌘	**Y**	**N**		
		X		Other core specifications	⌘ 44.018
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

11.2.18 Packet System Information Type 1

This message is sent by the network on the PBCCH or PACCH giving information for Cell selection, for control of the PRACH, for description of the control channel(s) and optional global power control parameters. This message shall not be segmented across more than one RLC/MAC control block by using the procedures specified in clause 9.1.12a. Special requirements for the transmission of this message apply on the PBCCH, see 3GPP TS 45.002.

Message type: PACKET SYSTEM INFORMATION TYPE 1

Direction: network to mobile station

Classification: distribution message

Table 11.2.18.1: PSI1 information elements

```
< PSI1 message content > ::=
        < PAGE_MODE : bit (2) >
        < PBCCH_CHANGE_MARK : bit (3) >
        < PSI_CHANGE_FIELD : bit (4) >
        < PSI1_REPEAT_PERIOD : bit (4) >
        < PSI_COUNT_LR : bit (6) >
        { 0 | 1 < PSI_COUNT_HR : bit (4) > }
        < MEASUREMENT_ORDER: bit (1) >
        < GPRS Cell Options : < GPRS Cell Options IE > >
        < PRACH Control Parameters : < PRACH Control Parameters IE > >
        < PCCCH Organization Parameters : < PCCCH Organization Parameters IE > >
        < Global Power Control Parameters : < Global Power Control Parameters IE > >
        < PSI_STATUS_IND : bit >
        { null | 0                      -- Receiver backward compatible with earlier release
        | 1                                     -- Additions in release 99 :
                < MSCR : bit >
                < SGSNR : bit >
                < BAND_INDICATOR : bit >
                < padding bits > }
        ! < Distribution part error : bit (*) = < no string > > ;
```

Table 11.2.18.2: PSI1 information element details

GPRS Cell Options
This information element is defined in clause 12.24

Global Power Control Parameters
This information element is defined in clause 12.9.

MEASUREMENT ORDER (1 bit field)
The MEASUREMENT ORDER field indicates if set = 0 that the mobile station is in control of the cell re-selection in both packet idle mode and packet transfer mode (= NC0 in 3GPP TS 45.008) and that the mobile station shall not send any measurement reports to the network (= NC0 and = EM0 in 3GPP TS 45.008). It also indicates that the Optional PSI5 message is not broadcast.
If set = 1 the mobile station shall send measurement reports for cell re-selection and/or for extended measurements to the network. Further cell re-selection and measurement details are included in the PSI5 message.

PAGE_MODE (2 bit field)
This field describes which type of page mode used, i.e. either normal paging, extended paging, paging reorganization or same as before from the previous page mode. The mobile station shall ignore this field if the message is received on the PACCH. Coding of this field is defined in 3GPP TS 44.018.

PBCCH_CHANGE_MARK (3 bit field)
The PBCCH_CHANGE_MARK field is a 3 bit counter incremented with one each time information has been changed in one or more of the broadcast PSI2-PSIn messages on PBCCH (n>2).

PSI_CHANGE_FIELD (4 bit field)
The PSI_CHANGE_FIELD is a 4 bit value reflecting which PSI message or group of instantiated PSI message was most recent updated when the PBCCH_CHANGE_MARK was last incremented. If more than one PSI message or group of instantiated PSI message were changed at the same time, the PSI_CHANGE_FIELD indicates unspecified updates. Range 0 to 15.

Bit 4 3 2 1	
0 0 0 0	Update of unspecified PSI message(s);
0 0 0 1	Unknown
0 0 1 0	PSI2 updated
0 0 1 1	PSI3/PSI3bis/PSI3ter/PSI3quater updated
0 1 0 0	PSI4 updated
0 1 0 1	PSI5 updated
0 1 1 0	PSI6 updated
0 1 1 1	PSI7 updated
1 0 0 0	PSI8 updated

All other values shall be interpreted as 'Update of unknown SI message type'.

PSI1_REPEAT_PERIOD (4 bit field)
This field is the binary representation of the PSI1_REPEAT_PERIOD parameter value minus one, see 3GPP TS 45.002. The field is coded according to the following table:

Bit 4 3 2 1	
0 0 0 0	PSI1_REPEAT_PERIOD = 1
0 0 0 1	PSI1_REPEAT_PERIOD = 2
. . .	
1 1 1 1	PSI1_REPEAT_PERIOD = 16

PSI_COUNT_LR (6 bit field)
This field is the binary representation of the PSI_COUNT_LR parameter, see 3GPP TS 45.002. The field is coded according to the following table:

Bit 6 5 4 3 2 1	
0 0 0 0 0 0	PSI_COUNT_LR = 0
0 0 0 0 0 1	PSI_COUNT_LR = 1
. . .	
1 1 1 1 1 1	PSI_COUNT_LR = 63

PSI_COUNT_HR (4 bit field)
This field is the binary representation of the PSI_COUNT_HR parameter value minus one, see 3GPP TS 45.002. If PSI_COUNT_HR is not included in PSI1 message, the default value PSI_COUNT_HR = 0 applies. The field is coded according to the following table:

Bit 4 3 2 1	
0 0 0 0	PSI_COUNT_HR = 1
0 0 0 1	PSI_COUNT_HR = 2
. . .	
1 1 1 1	PSI_COUNT_HR = 16

PCCCH Organization Parameters
This information element is defined in clause 12.25

PRACH Control Parameters
This information element is defined in clause 12.14.

PSI_STATUS_IND (1 bit field):
0 The network does not support the PACKET PSI STATUS message;
1 The network supports the PACKET PSI STATUS message.

MSCR, MSC Release (1 bit field):
0 The MSC is Release '98 or older
1 The MSC is Release '99 onwards

SGSNR, SGSN Release (1 bit field)
0 The SGSN is Release '98 or older
1 The SGSN is Release '99 onwards

BAND_INDICATOR (1 bit field)
See 3GPP TS 45.005 for definition of this field, which is coded as follows:
0 ARFCN indicates 1800 band
1 ARFCN indicates 1900 band

NOTE 1: The MSC Release bit indicates the version of the MSC specific protocols and is not applicable to access stratum protocols.

NOTE 2: The SGSN Release bit indicates the version of the SGSN specific protocols and is not applicable to access stratum protocols.