**3GPP TSG CN Plenary Meeting #22** **NP-030484**
**10th - 12th December 2003. Hawaii, USA.**

**Source:** **TSG CN WG 1**

**Title:** **CRs to Rel-6 on Work Item IMSCOOP towards 24.229**

**Agenda item:** **9.11**

**Document for:** **APPROVAL**

---

**Introduction:**

This document contains **6** CRs, **Rel-6** Work Item **"IMSCOOP"**, that have been agreed by **TSG CN WG1 in CN1#32 meeting**, and are forwarded to TSG CN Plenary meeting #22 for approval.

| TDoc # | Tdoc Title | Spec | CR # | Rev | CAT | C_Version | Rel |
|---|---|---|---|---|---|---|---|
| N1-031682 | UICC related changes for IMS commonality and interoperability | 24.229 | 510 | 1 | F | 6.0.0 | Rel-6 |
| N1-031427 | Interoperability and commonality; definition of scope | 24.229 | 511 | | D | 6.0.0 | Rel-6 |
| N1-031428 | Interoperability and commonality; addition of terminology | 24.229 | 512 | | D | 6.0.0 | Rel-6 |
| N1-031429 | Interoperability and commonality; media grouping | 24.229 | 513 | | D | 6.0.0 | Rel-6 |
| N1-031431 | Interoperability and commonality; charging information | 24.229 | 515 | | B | 6.0.0 | Rel-6 |
| N1-031684 | Clause 9 restructuring | 24.229 | 522 | 1 | D | 6.0.0 | Rel-6 |

**3GPP TSG-CN1 Meeting #32**
**Bangkok, Thailand, 27 – 31 October 2003**

**Tdoc N1-~~031426~~031682**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **510** ⌘ **rev** **1** ⌘ Current version: **6.0.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | UICC related changes for IMS commonality and interoperability |
| ***Source:*** | ⌘ | Lucent, Nokia, Qualcomm |
| ***Work item code:*** | ⌘ | IMSCOOP |
| ***Date:*** | ⌘ | 15/10/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** ⌘ To make the main body of 24.229 common for different types of access networks, some references to UICC and USIM need to be moved to a new annex.

***Summary of change:*** ⌘ Described below are UICC related changes to make the main body of 24.229 access independent, and to create a new annex that describes some specific usages of UICC and USIM to access IMS.

1. In the "Definitions" section, added references to ISIM (as defined in 33.203), UICC (as defined in 21.905), and USIM (as defined in 21.905), as suggested by Keith. For your information, these references contain the following definitions:

- **ISIM - IM Subscriber Identity Module:** For the purposes of this document the ISIM is a term that indicates the collection of IMS security data and functions on a UICC. The ISIM may be a distinct application on the UICC.
- **Universal Integrated Circuit Card (UICC):** a physically secure device, an IC card (or 'smart card'), that can be inserted and removed from the terminal equipment. It may contain one or more applications. One of the applications may be a USIM.
- **Universal Subscriber Identity Module (USIM):** An application residing on the UICC used for accessing services provided by mobile networks, which the application is able to register on with the appropriate security.

2. The acronym expansions for ISIM and USIM are corrected according to the above references.

| | | |
|---|---|---|
| | | 3. Changed bullet times 3) and 4) to refer to clause 5.1.1.1A. Also, the relevant statements are corrected to not mandate IMS parameter derivation in all cases where ISIM is not present, since this derivation should not be mandated if UICC is not present.<br><br>4. Removed references to UICC and USIM from clauses 5.1.1.1A, 5.1.1.2, 5.1.1.4, and 5.1.1.6.<br><br>5. Added a new normative annex (Annex C), to document UICC/USIM specific procedures used by 3GPP. The conditions for deriving IMS parameters are made more specific to: "In case the UE is loaded with a UICC that contains a USIM application but does not contain an ISIM application".<br><br>6. Added clause C.3 to contain some requirements from Release 5 TS 33.203. |
| ***Consequences if not approved:*** | ⌘ | Unavailability of access independent IMS specification. |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 3.1, 3.2, 4.2, 5.1.1.1A, 5.1.1.2, 5.1.1.4, 5.1.1.6, Annex C | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | | **N** | Other core specifications | ⌘ |
| | | | **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.

***** 1st Change *****

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

For the purposes of the present document, the following terms and definitions given in RFC 1594 [20B].

**Fully-Qualified Domain Name (FQDN)**

For the purposes of the present document, the following terms and definitions given in RFC 3261 [26] apply (unless otherwise specified see clause 6).

**Back-to-Back User Agent (B2BUA)**
**Client**
**Dialog**
**Final response**
**Header**
**Header field**
**Loose routeing**
**Method**
**Option-tag** (see RFC 3261 [26] subclause 19.2)
**Provisional response**
**Proxy, proxy server**
**Redirect server**
**Registrar**
**Request**
**Response**
**Server**
**Session**
**(SIP) transaction**
**Stateful proxy**
**Stateless proxy**
**Status-code** (see RFC 3261 [26] subclause 7.2)
**Tag** (see RFC 3261 [26] subclause 19.3)
**Target Refresh Request**
**User agent client (UAC)**
**User agent server (UAS)**
**User agent (UA)**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.002 [2] subclause 4.1.1.1 and subclause 4a.7 apply:

**Breakout Gateway Control Function (BGCF)**
**Call Session Control Function (CSCF)**
**Home Subscriber Server (HSS)**
**Media Gateway Control Function (MGCF)**
**Media Resource Function Controller (MRFC)**
**Subscription Locator Function (SLF)**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.218 [5] subclause 3.1 apply:

**Filter criteria**
**Initial filter criteria**
**Initial request**
**Standalone transacation**
**Subsequent request**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.228 [7] subclause 4.3.3.1 and subclause 4.6 apply:

**Interrogating-CSCF (I-CSCF)**
**Policy Decision Function (PDF)**
**Private user identity**
**Proxy-CSCF (P-CSCF)**
**Public user identity**
**Serving-CSCF (S-CSCF)**

For the purposes of the present document, the following terms and definitions given in 3GPP TR 33.203 [19] apply:

**Protected Server Port**
**Protected Client Port**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 33.203 [19] apply:

**IM Subscriber Identity Module (ISIM)**

For the purposes of the present document, the following terms and definitions given in 3GPP TR 21.905 [1] apply:

**Universal Integrated Circuit Card (UICC)**
**Universal Subscriber Identity Module (USIM)**
**User Equipment (UE)**

For the purposes of the present document, the following terms and definitions given in RFC 2401 [20A] Appendix A apply:

**Security association**

NOTE: A number of different security associations exist within the IM CN subsystem. Within this document the term specifically applies to the security association that exists between the UE and the P-CSCF, as this is the only security association that has direct impact on SIP.

For the purposes of the present document, the following terms and definitions given in ITU-T E.164 [57] apply:

**International public telecommunication number**

## 3.2 Abbreviations

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

| | |
|---|---|
| 1xx | A status-code in the range 101 through 199, and excluding 100 |
| 2xx | A status-code in the range 200 through 299 |
| AS | Application Server |
| APN | Access Point Name |
| AUTN | Authentication TokeN |
| B2BUA | Back-to-Back User Agent |
| BGCF | Breakout Gateway Control Function |
| c | conditional |
| CCF | Charging Collection Function |
| CDR | Charging Data Record |
| CK | Ciphering Key |
| CN | Core Network |
| CSCF | Call Session Control Function |
| DHCP | Dynamic Host Configuration Protocol |
| DNS | Domain Name System |
| DTD | Document Type Definition |
| ECF | Event Charging Function |
| FQDN | Fully Qualified Domain Name |
| GCID | GPRS Charging Identifier |
| GGSN | Gateway GPRS Support Node |
| GPRS | General Packet Radio Service |
| HSS | Home Subscriber Server |

| | |
|---|---|
| i | irrelevant |
| I-CSCF | Interrogating CSCF |
| ICID | IM CN subsystem Charging Identifier |
| IK | Integrity Key |
| IM | IP Multimedia |
| IMS | IP Multimedia core network Subsystem |
| IMSI | International Mobile Subscriber Identity |
| IOI | Inter Operator Identifier |
| IP | Internet Protocol |
| IPsec | IP security |
| IPv4 | Internet Protocol version 4 |
| IPv6 | Internet Protocol version 6 |
| ISC | IP multimedia Subsystem Service Control |
| ISIM | IM~~S~~ Subscriber Identity Module |
| m | mandatory |
| MAC | Message Authentication Code |
| MCC | Mobile Country Code |
| MGCF | Media Gateway Control Function |
| MGW | Media Gateway |
| MNC | Mobile Network Code |
| MRFC | Multimedia Resource Function Controller |
| MRFP | Multimedia Resource Function Processor |
| PDP | Packet Data Protocol |
| PLMN | Public Land Mobile Network |
| PSTN | Public Switched Telephone Network |
| n/a | not applicable |
| NAI | Netework Access Identifier |
| o | optional |
| P-CSCF | Proxy CSCF |
| PDU | Protocol Data Unit |
| RAND | RANDom challenge |
| RES | RESponse |
| RTCP | Real-time Transport Control Protocol |
| RTP | Real-time Transport Protocol |
| S-CSCF | Serving CSCF |
| SDP | Session Description Protocol |
| SGSN | Serving GPRS Support Node |
| SIP | Session Initiation Protocol |
| SLF | Subscription Locator Function |
| SQN | SeQuence Number |
| UA | User Agent |
| UAC | User Agent Client |
| UAS | User Agent Server |
| UE | User Equipment |
| UICC | Universal Integrated Circuit Card |
| URI | Universal Resource Identifier |
| URL | Universal Resource Locator |
| USIM | Universal ~~UMTS~~ Subscriber Identity Module |
| x | prohibited |
| XMAC | expected MAC |
| XML | eXtensible Markup Language |

***** 2nd Change *****

## 4.2 URI and address assignments

In order for SIP and SDP to operate, the following preconditions apply:

1) I-CSCFs used in registration are allocated SIP URIs. Other IM CN subsystem entities may be allocated SIP URIs. For example sip:pcscf.home1.net and sip:<impl-specific-info>@pcscf.home1.net are valid SIP URIs. If the user part exists, it is an essential part of the address and shall not be omitted when copying or moving the address. How these addresses are assigned to the logical entities is up to the network operator. For example, a single SIP URI may be assigned to all I-CSCFs, and the load shared between various physical boxes by underlying IP capabilities, or separate SIP URIs may be assigned to each I-CSCF, and the load shared between various physical boxes using DNS SRV capabilities.

2) All IM CN subsystem entities are allocated IPv6 addresses in accordance with the constraints specified in 3GPP TS 23.221 [6] subclause 5.1.

3) The subscriber is allocated a private user identity by the home network operator, and this is contained within the ISIM application, if present~~, on the UICC~~. Where no ISIM application is present but USIM is present, the private user identity is derived ~~from the IMSI, which is contained on the USIM (see 3GPP TS 23.003 [3])~~(see clause 5.1.1.1A). This private user identity is available to the SIP application within the UE.

NOTE: The SIP URIs may be resolved by using any of public DNSs, private DNSs, or peer-to-peer agreements.

4) The subscriber is allocated one or more public user identities by the home network operator. At least one of these is contained within the ISIM application, if present~~, on the UICC~~. Where no ISIM application is present but USIM is present, the UE ~~shall~~ derives a temporary public user identity (see clause 5.1.1.1A)~~from the IMSI contained on the USIM (see 3GPP TS 23.003 [3])~~. All registered public user identities are available to the SIP application within the UE, after registration.

5) For the purpose of access to the IM CN subsystem, UEs are assigned IPv6 prefixes in accordance with the constraints specified in 3GPP TS 23.221 [6] subclause 5.1 (see subclause 9.2.1 for the assignment procedures).

## *** 3rd Change ***

### 5.1.1.1A Parameters contained in the ~~UICC~~ISIM

~~If there is an ISIM and a USIM application on a UICC, then the~~ The ISIM application shall always be used for IMS authentication, if it is present, as described in 3GPP TS 33.203 [19].

~~In case the UE is loaded with a UICC that contains the ISIM application, it will be~~The ISIM is preconfigured with all the necessary parameters to initiate the registration to the IM CN subsystem. These parameters include:

- the private user identity;
- one ore more public user identities; and
- the home network domain name used to address the SIP REGISTER request

In case the UE is loaded with a UICC that does not contain the ISIM application, the UE shall:

- ~~-~~generate a private user identity;
- generate a temporary public user identity; and
- generate a home network domain name to address the SIP REGISTER request to;~~-~~

~~All these three parameters are derived~~in accordance with the procedures in clause C.2.~~ from the IMSI parameter in the USIM, according to the procedures described in 3GPP TS 23.003 [3]. If the UICC does not contain the ISIM application, the UE shall derive new values every time the UICC is changed, and shall discard existing values if the UICC is removed.~~

The temporary public user identity is only used in REGISTER requests, i.e. initial registration, re-registration, mobile-initiated deregistration. After a successful registration, the UE will get the associated public user identities, and the UE may use any of them in subsequent non-REGISTER requests.

The UE shall not reveal to the user the temporary public user identity if the temporary public user identity is barred. The temporary public user identity is not barred if received by the UE in the P-Associated-URI header.

### 5.1.1.2 Initial registration

The UE can register a public user identity at any time that a valid PDP context exists. However, the UE shall only initiate a new registration procedure when it has received a final response from the registrar for the ongoing registration, or the previous REGISTER request has timed out.

A REGISTER request may be protected using a security association, see 3GPP TS 33.203 [19], established as a result of an earlier registration.

The UE shall extract or derive ~~from the UICC~~ a public user identity, the private user identity, and the domain name to be used in the Request-URI in the registration, according to the procedures described in subclause 5.1.1.1A. A public user identity may be input by the end user.

On sending a REGISTER request, the UE shall populate the header fields as follows:

a) the Authorization header, with the username field, set to the value of the private user identity;

b) the From header set to the SIP URI that contains the public user identity to be registered;

c) the To header set to the SIP URI that contains the public user identity to be registered;

d) the Contact header set to include SIP URI(s) containing the IP address of the UE in the hostport parameter or FQDN. If the REGISTER request is protected by a security association, the UE shall also include the protected server port value in the hostport parameter;

NOTE 1: If the UE specifies its FQDN in the host parameter in the Contact header, then it has to ensure that the given FQDN will resolve (e.g., by reverse DNS lookup) to the IP address that is bound to the security association.

NOTE 2: The UE associates two ports, a protected client port and a protected server port, with each pair of security association. For details on the selection of the protected port value see 3GPP TS 33.203 [19].

e) the Expires header, or the expires parameter within the Contact header, set to the value of 600 000 seconds as the value desired for the duration of the registration;

NOTE 3: The registrar (S-CSCF) might decrease the duration of the registration in accordance with network policy. Registration attempts with a registration period of less than a predefined minimum value defined in the registrar will be rejected with a 423 (Interval Too Brief) response.

f) a Request-URI set to the SIP URI of the domain name of the home network;

g) the Security-Client header field set to specify the security mechanism the UE supports, the IPsec layer algorithms the UE supports and the parameters needed for the security association setup. The UE shall support the setup of two pairs of security associations as defined in 3GPP TS 33.203 [19]. The syntax of the parameters needed for the security association setup is specified in Annex H of 3GPP TS 33.203 [19]. The UE shall support the "ipsec-3gpp" security mechanism, as specified in RFC 3329 [48]. The UE shall support the HMAC-MD5-96 (RFC 2403 [20C]) and HMAC-SHA-1-96 (RFC 2404 [20D]) IPsec layer algorithms, and shall announce support for them according to the procedures defined in RFC 3329 [48];

h) the Supported header containing the option tag "path"; and

i) if a security association exists, a P-Access-Network-Info header that contains information concerning the access network technology and, if applicable, the cell ID (see subclause 7.2A.4).

On receiving the 200 (OK) response to the REGISTER request, the UE shall:

a) store the expiration time of the registration for the public user identities found in the To header value;

b) store the list of URIs contained in the P-Associated-URI header value. This list contains the URIs that are associated to the registered public user identity;

c) store as the default public user identity the first URI on the list of URIs present in the P-Associated-URI header;

d) treat the identity under registration as a barred public user identity, if it is not included in the P-Associated-URI header;

e) store the list of Service-Route headers contained in the Service-Route header, in order to build a proper preloaded Route header value for new dialogs; and

f) set the security association lifetime to the longest of either the previously existing security association lifetime (if available), or the lifetime of the just completed registration plus 30 seconds.

When a 401 (Unauthorized) response to a REGISTER is received the UE shall behave as described in subclause 5.1.1.5.1.

On receiving a 423 (Interval Too Brief) too brief response to the REGISTER request, the UE shall:

- send another REGISTER request populating the Expires header or the expires parameter with an expiration timer of at least the value received in the Min-Expires header of the 423 (Interval Too Brief) response.

***** 4th Change *****

### 5.1.1.4 User-initiated re-registration

The UE can reregister a previously registered public user identity at any time.

Unless either the user or the application within the UE has determined that a continued registration is not required the UE shall reregister the public user identity either 600 seconds before the expiration time if the initial registration was for greater than 1200 seconds, or when half of the time has expired if the initial registration was for 1200 seconds or less.

The UE shall protect the REGISTER request using a security association, see 3GPP TS 33.203 [19], established as a result of an earlier registration, if IK is available.

The UE shall extract or derive ~~from the UICC~~ a public user identity, the private user identity, and the domain name to be used in the Request-URI in the registration, according to the procedures described in subclause 5.1.1.1A.

On sending a REGISTER request that does not contain a challenge response, the UE shall populate the header fields as follows:

a) an Authorization header, with the username field set to the value of the private user identity;

b) a From header set to the SIP URI that contains the public user identity to be registered;

c) a To header set to the SIP URI that contains the public user identity to be registered;

d) a Contact header set to include SIP URI(s) that contain(s) in the hostport parameter the IP address of the UE or FQDN and protected server port value bound to the security association;

NOTE 1: If the UE specifies its FQDN in the host parameter in the Contact header, then it has to ensure that the given FQDN will resolve (e.g., by reverse DNS lookup) to the IP address that is bound to the security association.

NOTE 2: The UE associates two ports, a protected client port and a protected server port, with each pair of security associations. For details on the selection of the protected port value see 3GPP TS 33.203 [19].

e) an Expires header, or an expires parameter within the Contact header, set to 600 000 seconds as the value desired for the duration of the registration;

NOTE 2: The registrar (S-CSCF) might decrease the duration of the registration in accordance with network policy. Registration attempts with a registration period of less than a predefined minimum value defined in the registrar will be rejected with a 423 (Interval Too Brief) response.

f) a Request-URI set to the SIP URI of the domain name of the home network;

g) a Security-Client header field, set to specify the security mechanism it supports, the IPsec layer algorithms it supports and the parameters needed for the setup of two new pairs of security associations. For further details see 3GPP TS 33.203 [19] and RFC 3329 [48];

h) the Supported header containing the option tag "path"; and

i) the P-Access-Network-Info header that contains information concerning the access network technology and, if applicable, the cell ID (see subclause 7.2A.4).

On receiving the 200 (OK) response to the REGISTER request, the UE shall:

a) store the new expiration time of the registration for this public user identity found in the To header value;

b) store the list of URIs contained in the P-Associated-URI header value. This list contains the URIs that are associated to the registered public user identity;

c) store the list of Service-Route headers contained in the Service-Route header, in order to build a proper preloaded Route header value for new dialogs; and

d) set the security association lifetime to the longest of either the previously existing security association lifetime, or the lifetime of the just completed registration plus 30 seconds.

When a 401 (Unauthorized) response to a REGISTER is received the UE shall behave as described in subclause 5.1.1.5.1.

On receiving a 423 (Interval Too Brief) response to the REGISTER request, the UE shall:

- send another REGISTER request populating the Expires header or the expires parameter with an expiration timer of at least the value received in the Min-Expires header of the 423 (Interval Too Brief) response.

***** 5th Change *****

### 5.1.1.6 Mobile-initiated deregistration

The UE can deregister a previously registered public user identity at any time.

The UE shall integrity protect the REGISTER request using a security association, see 3GPP TS 33.203 [19], established as a result of an earlier registration, if one is available.

The UE shall extract or derive ~~from the UICC~~ a public user identity, the private user identity, and the domain name to be used in the Request-URI in the registration, according to the procedures described in subclause 5.1.1.1A.

Prior to sending a REGISTER request for deregistration, the UE shall release all dialogs related to the public user identity that is going to be deregistered or to one of the implicitly registered public user identities.

On sending a REGISTER request, the UE shall populate the header fields as follows:

a) the Authorization header, with the username field, set to the value of the private user identity;

b) the From header set to the SIP URI that contains the public user identity to be deregistered;

c) the To header set to the SIP URI that contains the public user identity to be deregistered;

d) the Contact header set to either the value of "*" or SIP URI(s) that contain(s) in the hostport parameter the IP address of the UE or FQDN and the protected server port value bound to the security association;

e) the Expires header, or the expires parameter of the Contact header, set to the value of zero, appropriate to the deregistration requirements of the user;

f) a Request-URI set to the SIP URI of the domain name of the home network; and

g) a P-Access-Network-Info header that contains information concerning the access network technology and, if applicable, the cell ID (see subclause 7.2A.4).

On receiving the 200 (OK) response to the REGISTER request, the UE shall remove all registration details relating to this public user identity.

If there are no more public user identities registered, the UE shall delete the security associations and related keys it may have towards the P-CSCF.

If all public user identities are deregistered and the security association is removed, then the UE shall consider subscription to the reg event package cancelled (i.e. as if the UE had sent a SUBSCRIBE request with an Expires header containing a value of zero).

NOTE: When the UE has received the 200 (OK) response for the REGISTER request of the only public user identity currently registered with its associated set of implicitly registered public user identities (i.e. no other is registered), the UE removes the security association established between the P-CSCF and the UE. Therefore further SIP signalling (e.g. the NOTIFY request containing the deregistration event) will not reach the UE.

***** 5th Change *****

# Annex C (normative): UICC and USIM Aspects for access to the IM CN subsystem

## C.1 Scope

This clause describes the UICC and USIM aspects for access to the IM CN subsystem. Additional requirements related to UICC usage for access to the IM CN subsystem are described in TS 33.203 [19].

## C.2 Derivation of IMS parameters from USIM

In case the UE is loaded with a UICC that contains a USIM application but does not contain an ISIM application, the UE shall:

- generate a private user identity;
- generate a temporary public user identity; and
- generate a home network domain name to address the SIP REGISTER request to.

All these three parameters are derived from the IMSI parameter in the USIM, according to the procedures described in 3GPP TS 23.003 [3]. Also in this case, the UE shall derive new values every time the UICC is changed, and shall discard existing values if the UICC is removed.

NOTE: If there is an ISIM and a USIM application on a UICC, the ISIM application is used for IMS authentication, as described in 3GPP TS 33.203 [19]. See clause 5.1.1.1A.

## C.3 ISIM Location in 3GPP Systems

For 3GPP systems, if ISIM application is present, it is contained in UICC.

***** End of Changes *****

**3GPP TSG-CN1 Meeting #32** **Tdoc N1-031427**
**Bangkok, Thailand, 27 – 31 October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **511** ⌘**rev** ⌘ Current version: **6.0.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Interoperability and commonality; definition of scope |
| ***Source:*** | ⌘ | Ericsson, Lucent, Nokia, Qualcomm, Siemens |
| ***Work item code:*** | ⌘ | IMSCOOP |
| ***Date:*** | ⌘ | 15/10/2003 |
| ***Category:*** | ⌘ | **D** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** | ⌘ | Text changes are needed to make the main body of 24.229 access independent, to gather GPRS specific information into Annex B, and to align 24.229 with 23.228. |
| ***Summary of change:*** | ⌘ | This CR updates the scope of the main body of 24.229 and the scope of Annex B. It also adds a new clause 3A to introduce the concept of multiple IP-CANs in 24.229.<br>The title for Annex B is also changed to align with 23.228. |
| ***Consequences if not approved:*** | ⌘ | Unavailability of access independent IMS specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 1, 3A, Annex B, B.1, B.2.1 |

| ***Other specs affected:*** ⌘ | Y | N | | |
|---|---|---|---|---|
| | | N | Other core specifications | ⌘ |
| | | 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.

***** 1st Change *****

# 1 Scope

The present document defines a call control protocol for use in the IP Multimedia (IM) Core Network (CN) subsystem based on the Session Initiation Protocol (SIP), and the associated Session Description Protocol (SDP).

The present document is applicable to:

- the interface between the User Equipment (UE) and the Call Session Control Function (CSCF);
- the interface between the CSCF and any other CSCF;
- the interface between the CSCF and an Application Server (AS);
- the interface between the CSCF and the Media Gateway Control Function (MGCF);
- the interface between the S-CSCF and the Media Resource Function Controller (MRFC)
- the interface between the CSCF and the Breakout Gateway Control Function (BGCF);
- the interface between the BGCF and the MGCF;
- the interface between the BGCF and any other BGCF; and
- the interface between the CSCF and an external Multimedia IP network.

Where possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP and SDP. Where this is not possible, extensions to SIP and SDP are defined within the present document. The document has therefore been structured in order to allow both forms of specification.

As the IM CN subsystem is designed to interwork with different IP-CANs (IP-Connectivity Access Networks), the IP-CAN independent aspects of the IM CN subsystem are described in the main body and Annex A of this specification. Aspects for connecting a UE to the IM CN subsystem through specific types of IP-CANs are documented separately in the annexes or in separate documents.

NOTE: The present document covers only the usage of SIP and SDP to communicate with the enitities of the IM CN subsystem. It is possible, and not precluded, to use the capabilities of GPRS to allow a terminal containing a SIP UA to communicate with SIP servers or SIP UAs outside the IM CN subsystem, and therefore utilise the services provided by those SIP servers. The usage of SIP and SDP for communicating with SIP servers or SIP UAs outside the IM CN subsystem is outside the scope of the present document.

***** 2nd Change *****

# 3A Interoperability with different IP-CAN

The IM CN subsystem can be accessed by UEs resident in different types of IP-CAN. The main body of this document, and annex A, are general to UEs and IM CN subsystems that are accessed using any type of IP-CAN. Requirements that are dependent on the type of IP-CAN are covered in Annex B, or in separate specifications.

***** 3rd Change *****

# Annex B (normative): IP-Connectivity Access Network specific concepts when using GPRS to access IM CN subsystem ~~GPRS aspects when connected to the IM CN subsystem~~

## B.1 Scope

~~Editor's note: To be drafted.~~ The present annex defines IP-CAN specific requirements for a call control protocol for use in the IP Multimedia (IM) Core Network (CN) subsystem based on the Session Initiation Protocol (SIP), and the associated Session Description Protocol (SDP), where the IP-CAN is General Packet Radio Service (GPRS).

***** 4th Change *****

### B.2.1 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].

When using the GPRS, each IP-CAN bearer is provided by a PDP context.

***** End of Changes *****

**3GPP TSG-CN1 Meeting #32** **Tdoc N1-031428**
**Bangkok, Thailand, 27 – 31 October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **512** ⌘ **rev** ⌘ Current version: **6.0.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Interoperability and commonality; addition of terminology |
| ***Source:*** | ⌘ | Ericsson, Lucent, Nokia, Qualcomm, Siemens |
| ***Work item code:*** | ⌘ | IMSCOOP |
| ***Date:*** | ⌘ | 15/10/2003 |
| ***Category:*** | ⌘ | **D** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** | ⌘ | Terminology changes are needed to make the main body of 24.229 access independent and to align 24.229 with 23.228. |
| ***Summary of change:*** | ⌘ | Described below are changes that are needed to make the main body of 24.229 access independent and to align 24.229 with 23.228.<br>Terminology replacements of GPRS by IP-CAN, and PDP context by IP-CAN bearer:<br>Similar terminology replacements were done in SA2 to create Release 6 TS 23.228 from Release 5 TS 23.228. These replacements are now done in many clauses throughout TS 24.229. |
| ***Consequences if not approved:*** | ⌘ | Unavailability of access independent IMS specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 1, 3.1, 3.2, 4.5.2, 5.1.1.2 |

| ***Other specs affected:*** ⌘ | Y | N | |
|---|---|---|---|
| | | N | Other core specifications ⌘ |
| | | 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.

***** 1st Change *****

# 1 Scope

The present document defines a call control protocol for use in the IP Multimedia (IM) Core Network (CN) subsystem based on the Session Initiation Protocol (SIP), and the associated Session Description Protocol (SDP).

The present document is applicable to:

- the interface between the User Equipment (UE) and the Call Session Control Function (CSCF);
- the interface between the CSCF and any other CSCF;
- the interface between the CSCF and an Application Server (AS);
- the interface between the CSCF and the Media Gateway Control Function (MGCF);
- the interface between the S-CSCF and the Media Resource Function Controller (MRFC)
- the interface between the CSCF and the Breakout Gateway Control Function (BGCF);
- the interface between the BGCF and the MGCF;
- the interface between the BGCF and any other BGCF; and
- the interface between the CSCF and an external Multimedia IP network.

Where possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP and SDP. Where this is not possible, extensions to SIP and SDP are defined within the present document. The document has therefore been structured in order to allow both forms of specification.

NOTE: The present document covers only the usage of SIP and SDP to communicate with the enitities of the IM CN subsystem. It is possible, and not precluded, to use the capabilities of ~~GPRS~~IP-CAN to allow a terminal containing a SIP UA to communicate with SIP servers or SIP UAs outside the IM CN subsystem, and therefore utilise the services provided by those SIP servers. The usage of SIP and SDP for communicating with SIP servers or SIP UAs outside the IM CN subsystem is outside the scope of the present document.

***** 2nd Change *****

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

For the purposes of the present document, the following terms and definitions given in RFC 1594 [20B].

**Fully-Qualified Domain Name (FQDN)**

For the purposes of the present document, the following terms and definitions given in RFC 3261 [26] apply (unless otherwise specified see clause 6).

**Back-to-Back User Agent (B2BUA)**
**Client**
**Dialog**
**Final response**
**Header**

**Header field**
**Loose routeing**
**Method**
**Option-tag** (see RFC 3261 [26] subclause 19.2)
**Provisional response**
**Proxy, proxy server**
**Redirect server**
**Registrar**
**Request**
**Response**
**Server**
**Session**
**(SIP) transaction**
**Stateful proxy**
**Stateless proxy**
**Status-code** (see RFC 3261 [26] subclause 7.2)
**Tag** (see RFC 3261 [26] subclause 19.3)
**Target Refresh Request**
**User agent client (UAC)**
**User agent server (UAS)**
**User agent (UA)**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.002 [2] subclause 4.1.1.1 and subclause 4a.7 apply:

**Breakout Gateway Control Function (BGCF)**
**Call Session Control Function (CSCF)**
**Home Subscriber Server (HSS)**
**Media Gateway Control Function (MGCF)**
**Media Resource Function Controller (MRFC)**
**Subscription Locator Function (SLF)**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.218 [5] subclause 3.1 apply:

**Filter criteria**
**Initial filter criteria**
**Initial request**
**Standalone transacation**
**Subsequent request**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.228 [7] subclauses 3.1, 4.3.3.1 and ~~subclause~~ 4.6 apply:

**Interrogating-CSCF (I-CSCF)**
**IP-Connectivity Access Network (IP-CAN)**
**Policy Decision Function (PDF)**
**Private user identity**
**Proxy-CSCF (P-CSCF)**
**Public user identity**
**Serving-CSCF (S-CSCF)**

For the purposes of the present document, the following terms and definitions given in 3GPP TR 33.203 [19] apply:

**Protected Server Port**
**Protected Client Port**

For the purposes of the present document, the following terms and definitions given in 3GPP TR 21.905 [1] apply:

**User Equipment (UE)**

For the purposes of the present document, the following terms and definitions given in RFC 2401 [20A] Appendix A apply:

**Security association**

NOTE: A number of different security associations exist within the IM CN subsystem. Within this document the term specifically applies to the security association that exists between the UE and the P-CSCF, as this is the only security association that has direct impact on SIP.

For the purposes of the present document, the following terms and definitions given in ITU-T E.164 [57] apply:

**International public telecommunication number**

## 3.2 Abbreviations

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

| | |
|---|---|
| 1xx | A status-code in the range 101 through 199, and excluding 100 |
| 2xx | A status-code in the range 200 through 299 |
| AS | Application Server |
| APN | Access Point Name |
| AUTN | Authentication TokeN |
| B2BUA | Back-to-Back User Agent |
| BGCF | Breakout Gateway Control Function |
| c | conditional |
| CCF | Charging Collection Function |
| CDR | Charging Data Record |
| CK | Ciphering Key |
| CN | Core Network |
| CSCF | Call Session Control Function |
| DHCP | Dynamic Host Configuration Protocol |
| DNS | Domain Name System |
| DTD | Document Type Definition |
| ECF | Event Charging Function |
| FQDN | Fully Qualified Domain Name |
| GCID | GPRS Charging Identifier |
| GGSN | Gateway GPRS Support Node |
| GPRS | General Packet Radio Service |
| HSS | Home Subscriber Server |
| i | irrelevant |
| I-CSCF | Interrogating CSCF |
| ICID | IM CN subsystem Charging Identifier |
| IK | Integrity Key |
| IM | IP Multimedia |
| IMS | IP Multimedia core network Subsystem |
| IMSI | International Mobile Subscriber Identity |
| IOI | Inter Operator Identifier |
| IP | Internet Protocol |
| IP-CAN | IP-Connectivity Access Network |
| IPsec | IP security |
| IPv4 | Internet Protocol version 4 |
| IPv6 | Internet Protocol version 6 |
| ISC | IP multimedia Subsystem Service Control |
| ISIM | IMS Suscriber Identity Module |
| m | mandatory |
| MAC | Message Authentication Code |
| MCC | Mobile Country Code |
| MGCF | Media Gateway Control Function |
| MGW | Media Gateway |
| MNC | Mobile Network Code |
| MRFC | Multimedia Resource Function Controller |
| MRFP | Multimedia Resource Function Processor |
| PDP | Packet Data Protocol |
| PLMN | Public Land Mobile Network |
| PSTN | Public Switched Telephone Network |

| | |
|---|---|
| n/a | not applicable |
| NAI | Netework Access Identifier |
| o | optional |
| P-CSCF | Proxy CSCF |
| PDU | Protocol Data Unit |
| RAND | RANDom challenge |
| RES | RESponse |
| RTCP | Real-time Transport Control Protocol |
| RTP | Real-time Transport Protocol |
| S-CSCF | Serving CSCF |
| SDP | Session Description Protocol |
| ~~SGSN~~ | ~~Serving GPRS Support Node~~ |
| SIP | Session Initiation Protocol |
| SLF | Subscription Locator Function |
| SQN | SeQuence Number |
| UA | User Agent |
| UAC | User Agent Client |
| UAS | User Agent Server |
| UE | User Equipment |
| UICC | Universal Integrated Circuit Card |
| URI | Universal Resource Identifier |
| URL | Universal Resource Locator |
| USIM | UMTS Subscriber Identity Module |
| x | prohibited |
| XMAC | expected MAC |
| XML | eXtensible Markup Language |

***** 3rd Change *****

## 4.5.2 IM CN subsystem charging identifier (ICID)

The ICID is the session level data shared among the IM CN subsystem entities including ASs in both the calling and called IM CN subsystems.

The first IM CN subsystem entity involved in a dialog (session) or standalone (non-session) method will generate the ICID and include it in the icid parameter of the P-Charging-Vector header in the SIP request. See 3GPP TS 32.225 [17] for requirements on the format of ICID. The P-CSCF will generate an ICID for mobile-originated calls. The I-CSCF will generate an ICID for mobile-terminated calls if there is no ICID received in the initial request (e.g. the calling party network does not behave as an IM CN subsystem). The AS will generate an ICID when acting as an originating UA. The MGCF will generate an ICID for PSTN/PLMN originated calls. Each entity that processes the SIP request will extract the ICID for possible later use in a CDR. The I-CSCF and S-CSCF are also allowed to generate a new ICID for mobile terminated calls received from another network.

There is also an ICID generated by the P-CSCF with a REGISTER request that is passed in a unique instance of P-Charging-Vector header. This ICID is valid for the duration of the registration and is associated with the signalling ~~PDP context~~IP-CAN bearer.

The icid parameter is included in any requests that include the P-Charging-Vector header. However, the P-Charging-Vector (and ICID) is not passed to the UE.

The ICID is also passed from the P-CSCF to the ~~GGSN~~ IP-CAN via PDF~~, but the ICID is not passed to the SGSN~~. The interface supporting this operation is outside the scope of this document.

***** 4th Change *****

### 5.1.1.2 Initial registration

The UE can register a public user identity at any time ~~that a valid PDP context exists~~after it has acquired an IP address, discovered a P-CSCF, and established an IP-CAN bearer that can be used for SIP signalling. However, the UE shall only initiate a new registration procedure when it has received a final response from the registrar for the ongoing registration, or the previous REGISTER request has timed out.

A REGISTER request may be protected using a security association, see 3GPP TS 33.203 [19], established as a result of an earlier registration.

The UE shall extract or derive from the UICC a public user identity, the private user identity, and the domain name to be used in the Request-URI in the registration, according to the procedures described in subclause 5.1.1.1A. A public user identity may be input by the end user.

On sending a REGISTER request, the UE shall populate the header fields as follows:

a) the Authorization header, with the username field, set to the value of the private user identity;

b) the From header set to the SIP URI that contains the public user identity to be registered;

c) the To header set to the SIP URI that contains the public user identity to be registered;

d) the Contact header set to include SIP URI(s) containing the IP address of the UE in the hostport parameter or FQDN. If the REGISTER request is protected by a security association, the UE shall also include the protected server port value in the hostport parameter;

NOTE 1: If the UE specifies its FQDN in the host parameter in the Contact header, then it has to ensure that the given FQDN will resolve (e.g., by reverse DNS lookup) to the IP address that is bound to the security association.

NOTE 2: The UE associates two ports, a protected client port and a protected server port, with each pair of security association. For details on the selection of the protected port value see 3GPP TS 33.203 [19].

e) the Expires header, or the expires parameter within the Contact header, set to the value of 600 000 seconds as the value desired for the duration of the registration;

NOTE 3: The registrar (S-CSCF) might decrease the duration of the registration in accordance with network policy. Registration attempts with a registration period of less than a predefined minimum value defined in the registrar will be rejected with a 423 (Interval Too Brief) response.

f) a Request-URI set to the SIP URI of the domain name of the home network;

g) the Security-Client header field set to specify the security mechanism the UE supports, the IPsec layer algorithms the UE supports and the parameters needed for the security association setup. The UE shall support the setup of two pairs of security associations as defined in 3GPP TS 33.203 [19]. The syntax of the parameters needed for the security association setup is specified in Annex H of 3GPP TS 33.203 [19]. The UE shall support the "ipsec-3gpp" security mechanism, as specified in RFC 3329 [48]. The UE shall support the HMAC-MD5-96 (RFC 2403 [20C]) and HMAC-SHA-1-96 (RFC 2404 [20D]) IPsec layer algorithms, and shall announce support for them according to the procedures defined in RFC 3329 [48];

h) the Supported header containing the option tag "path"; and

i) if a security association exists, a P-Access-Network-Info header that contains information concerning the access network technology and, if applicable, the cell ID (see subclause 7.2A.4).

On receiving the 200 (OK) response to the REGISTER request, the UE shall:

a) store the expiration time of the registration for the public user identities found in the To header value;

b) store the list of URIs contained in the P-Associated-URI header value. This list contains the URIs that are associated to the registered public user identity;

c) store as the default public user identity the first URI on the list of URIs present in the P-Associated-URI header;

d) treat the identity under registration as a barred public user identity, if it is not included in the P-Associated-URI header;

e) store the list of Service-Route headers contained in the Service-Route header, in order to build a proper preloaded Route header value for new dialogs; and

f) set the security association lifetime to the longest of either the previously existing security association lifetime (if available), or the lifetime of the just completed registration plus 30 seconds.

When a 401 (Unauthorized) response to a REGISTER is received the UE shall behave as described in subclause 5.1.1.5.1.

On receiving a 423 (Interval Too Brief) too brief response to the REGISTER request, the UE shall:

- send another REGISTER request populating the Expires header or the expires parameter with an expiration timer of at least the value received in the Min-Expires header of the 423 (Interval Too Brief) response.

***** End of Changes *****

**3GPP TSG-CN1 Meeting #32** **Tdoc N1-031429**
**Bangkok, Thailand, 27 – 31 October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **513** ⌘ **rev** ⌘ Current version: **6.0.0** ⌘

*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:*** | ⌘ | Interoperability and commonality; media grouping |
| ***Source:*** | ⌘ | Ericsson, Lucent, Nokia, Qualcomm, Siemens |
| ***Work item code:*** | ⌘ | IMSCOOP |
| ***Date:*** | ⌘ | 15/10/2003 |
| ***Category:*** | ⌘ | **D** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** | ⌘ | Text changes are needed to make the main body of 24.229 access independent and to align 24.229 with 23.228. |
| ***Summary of change:*** | ⌘ | Described below are changes that are needed to make the main body of 24.229 access independent.<br><br>Terminology replacements of GPRS by IP-CAN, and PDP context by IP-CAN bearer:<br><br>Similar terminology replacements were done in SA2 to create Release 6 TS 23.228 from Release 5 TS 23.228. These replacements are now done in many clauses throughout TS 24.229. The changes proposed in this CR affect text on media grouping. |
| ***Consequences if not approved:*** | ⌘ | Unavailability of access independent IMS specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 6.1, 6.2 |

| ***Other specs affected:*** ⌘ | Y | N | |
|---|---|---|---|
| | | N | Other core specifications |
| | | 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.

***** 1st Change *****

## 6.1 Procedures at the UE

Usage of SDP by the UE:

1. In order to authorize the media streams, the P-CSCF and S-CSCF have to be able to inspect the SDP payloads. Hence, the UE shall not encrypt the SDP payloads.

2. An INVITE request generated by a UE shall contain SDP payload. The SDP payload shall reflect the calling user's terminal capabilities and user preferences for the session. The UE shall order the SDP payload with the most preferred codec listed first. In addition, the calling user shall indicate the desired QoS for the session, using the segmented status type. In an initial INVITE request the UE shall indicate that it mandates local QoS and that this precondition is not yet satisfied, i.e. the UE shall include the following preconditions:

   a=des: qos mandatory local sendrecv

   a=curr: qos local none

3. Providing that the INVITE request received by the UE contains an SDP offer including one or more "m=" media descriptions, the first 183 (Session Progress) provisional response that the UE sends, shall contain the answer for the SDP received in the INVITE. The said SDP answer shall reflect the called user's terminal capabilities and user preferences.

4. When the UE sends a 183 (Session Progress) response with SDP payload including one or more "m=" media descriptions, it shall request confirmation for the result of the resource reservation at the originating end point.

5. During session establishment procedure, SIP messages shall only contain SDP payload if that is intended to modify the session description.

6. For "video" and "audio" media types that utilize the RTP/RTCP, the UE shall specify the proposed bandwidth for each media stream utilizing the "b=" media descriptor and the "AS" bandwidth modifier in the SDP.

   If the media line in the SDP indicates the usage of RTP/RTCP, in addition to the "AS" bandwidth modifier in the media-level "b=" line, the UE shall include two media-level "b=" lines, one with the "RS" bandwidth modifier and the other with the "RR" bandwidth modifier as described in RFC 3556 [56] to specify the required bandwidth allocation for RTCP.

   For other media streams the "b=" media descriptor may be included. The value or absence of the "b=" parameter will affect the assigned QoS which is defined in 3GPP TS 29.208 [13].

NOTE 1: In a two-party session where both participants are active, the RTCP receiver reports are not sent, therefore, the RR bandwidth modifer will typically get the value of zero.

7. The UE shall include the MIME subtype "telephone-event" in the "m=" media descriptor in the SDP for audio media flows that support both audio codec and DTMF payloads in RTP packets as described in RFC 2833 [23].

8. The UE shall inspect the SDP contained in any SIP request or response, looking for possible indications of grouping of media streams according to RFC 3524 [54] and perform the appropriate actions ~~outlined in subclause B.2.2.5~~for IP-CAN bearer establishment for media according to IP-CAN specific procedures (see subclause B.2.2.5 for IP-CAN implemented using GPRS).

9. If ~~a PDP context~~an IP-CAN bearer ~~-~~is rejected or modified, the UE shall, if the SDP is affected, update the remote SIP entity according to RFC 3261 [26] and RFC 3311 [29].

10. If the UE builds SDP for an INVITE request generated after receiving a 488 (Not Acceptable Here) response, as described in subclause 5.1.3.1, the UE shall include SDP payload containing a subset of the allowed media types, codecs and other parameters from the SDP payload of all 488 (Not Acceptable Here) responses related to the same session establishment attempt (i.e. a set of INVITE requests used for the same session establishment). The UE shall order the codecs in the SDP payload according to the order of the codecs in the SDP payload of the 488 (Not Acceptable Here) response.

NOTE 2: The UE may be attempting a session establishment through multiple networks with different policies and potentially may need to send multiple INVITE requests and receive multiple 488 (Not Acceptable Here) responses from different CSCF nodes. The UE therefore takes into account the SDP contents of all the 488 (Not Acceptable Here) responses received related to the same session establishment when building a new INVITE request.

## 6.2 Procedures at the P-CSCF

When the P-CSCF receives any SIP request containing SDP, the P-CSCF shall examine the media parameters in the received SDP. If the P-CSCF finds any media parameters which are not allowed on the network by local policy, the P-CSCF shall return a 488 (Not Acceptable Here) response containing SDP payload. This SDP payload contains either all the media types, codecs and other SDP parameters which are allowed according to the local policy, or, based on configuration by the operator of the P-CSCF, a subset of these allowed parameters. This subset may depend on the content of the received SIP request. The P-CSCF shall build the SDP payload in the 488 (Not Acceptable Here) response in the same manner as a UAS builds the SDP in a 488 (Not Acceptable Here) response as specifed in RFC 3261 [26]. The P-CSCF shall order the SDP payload with the most preferred codec listed first.

When the P-CSCF receives an initial INVITE request for a terminating session setup or a 183 (Session Progress) response to an INVITE request for an originating session setup, the P-CSCF may modify the SDP according to RFC 3524 [54] to indicate to the UE that particular media stream(s) is grouped according to a local policy. The policy is used to determine whether the P-CSCF will request the UE to keep media stream(s) grouped in different ~~PDP contexts~~IP-CAN bearers and identify the relation between different media streams and ~~PDP contexts~~IP-CAN bearers (see subclause B.2.2.5 for IP-CAN implemented using GPRS).

The P-CSCF shall apply and maintain the same policy within the SDP from the initial request or response containing SDP and throughout the complete SIP session. If a media stream is added and grouping apply to the session, the P-CSCF shall modify the SDP according to RFC 3524 [54] to indicate to the UE that the added media stream(s) will be grouped into either a new group or into one of the existing groups. The P-CSCF shall not indicate re-grouping of media stream(s) within the SDP.

The P-CSCF shall not apply RFC 3524 [54] to the SDP for additional media stream(s), if grouping of media stream(s) was not indicated in the initial INVITE request or 183 (Session Progress) response.

The P-CSCF may inspect, if present, the "b=RS" and "b=RR" lines in order to find out the bandwidth allocation requirements for RTCP.

***** End of Changes *****

**3GPP TSG-CN1 Meeting #32** **Tdoc N1-031431**
**Bangkok, Thailand, 27 – 31 October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **515** ⌘ **rev** ⌘ Current version: **6.0.0** ⌘

*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:*** | ⌘ | Interoperability and commonality; charging information |
| ***Source:*** | ⌘ | Ericsson, Nokia, Qualcomm, Siemens |
| ***Work item code:*** | ⌘ | IMSCOOP |
| ***Date:*** | ⌘ | 15/10/2003 |
| ***Category:*** | ⌘ | **B** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** | ⌘ | Text changes are needed to make the main body of 24.229 access independent and to gather GPRS specific information into Annex B. This CR is needed to align 24.229 with 23.228. |
| ***Summary of change:*** | ⌘ | Described below are changes that are needed to make the main body of 24.229 access independent and to gather GPRS specific information into Annex B. These changes are related to P-Charging-Vector SIP header.<br><br>Access network charging information:<br><br>Clause 5.4.3.2 of Release 5 TS 24.229 describes operations related to GPRS charging information. This clause is modified to replace "GPRS charging information" by "access network charging information", and the reference to gprs-charging-info parameter is replaced by the reference to the more generic P-Charging-Vector section. The statement "the GPRS charging information is populated in the P-Charging-Vector using the gprs-charging-info parameter" is added to clause B.3.2.<br><br>Clause 4.5.1 is also corrected to remove the redundant bullet 2.a.<br><br>P-Charging-Vector header:<br><br>GPRS specific descriptions in clause 7.2A.5 (P-Charging-Vector header) of are moved into a new clause B.3.2. |
| ***Consequences if not approved:*** | ⌘ | Unavailability of access independent IMS specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.5.1, 4.5.3.2, 7.2A.5.2, B.3, B.3.1, B.3.2 |

| | | | | | |
|---|---|---|---|---|---|
| | | Y | N | | |
| ***Other specs affected:*** | ⌘ | | N | Other core specifications | ⌘ |
| | | | 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.

***** 1st Change *****

## 4.5.1 Overview

This subclause describes charging correlation principles to aid with the readability of charging related procedures in clause 5. See 3GPP TS 32.200 [16] and 3GPP TS 32.225 [17] for further information on charging.

The IM CN subsystem generates and retrieves the following charging correlation information for later use with offline and online charging:

1. IM CN subsystem Charging Identifier (ICID);
2. Access network charging information:
   ~~a. GPRS Charging Information;~~
3. Inter Operator Identifier (IOI);
4. Charging function addresses:
   a. Charging Collection Function (CCF);
   b. Event Charging Function (ECF).

How to use and where to generate the parameters in IM CN subsystems are described further in the subclauses that follow. The charging correlation information is encoded in the P-Charging-Vector header as defined in subclause 7.2A.5. The P-Charging-Vector header contains the following parameters: icid, access network charging information and ioi.

The offline and online charging function addresses are encoded in the P-Charging-Function-Addresses as defined in RFC 3455 [52]. The P-Charging-Function-Addresses header contains the following parameters: CCF and ECF.

***** 2nd Change *****

## 4.5.3 Access network charging information

### 4.5.3.1 General

The access network charging information are the media flow level data shared among the IM CN subsystem entities for one side of the session (either the calling or called side). GPRS charging information (GGSN identifier and PDP context information) is an example of access network charging information.

### 4.5.3.2 ~~GPRS~~ Access network charging information

The ~~GGSN~~ IP-Connectivity Access Network provides ~~the GPRS~~ access network charging information to the IM CN subsystem. ~~, which is the common~~This information used to correlate ~~GGSN~~ IP-CAN CDRs with IM CN subsystem CDRs, i.e. the ~~. The GPRS~~ access network charging information is used to correlate the bearer level ~~(i.e. PDP context)~~ with the session level.

The ~~GPRS~~ access network charging information is generated at the first opportunity after the resources are allocated at the ~~GGSN~~IP-CAN. The ~~GPRS~~ access network charging inf~~g~~ormation is passed from ~~GGSN~~ IP-CAN to P-CSCF via PDF, over the Go and Gq Interfaces. ~~GPRS~~ Access network charging information will be updated with new information during the session as media flows are added or removed. The P-CSCF provides the ~~GPRS~~ access network charging information to the S-CSCF. The S-CSCF may also pass the information to an AS, which may be needed for online pre-pay applications. The ~~GPRS~~ access network charging information for the originating network is used only within that network, and similarly the ~~GPRS~~ access network charging information for the terminating network is used only within that network. Thus the ~~GPRS~~ access network charging information are not shared between the calling and called

networks. The ~~GPRS~~ access network charging information is not passed towards the external ASs from its own network.

The ~~GPRS~~ access network charging information is populated in the P-Charging-Vector header ~~using the gprs-charging-info parameter. The details of the gprs-charging-info parameter is described in subclause 7.2A.5~~.

***** 3rd Change *****

## 7.2A.5 P-Charging-Vector header

### 7.2A.5.1 Introduction

The P-Charging-Vector header field is ~~is~~ extended to include specific charging correlation information needed for IM CN subsystem functional entities.

### 7.2A.5.2 Syntax

The syntax of the P-Charging-Vector header field is ~~has the syntax~~ described in RFC 3455 [52]. There may be additional coding rules for this header depending on the type of IP-CAN, according to access technology specific descriptions. ~~Table 7.3 describes extensions required for 3GPP to that syntax.~~

**~~Table 7.3: Syntax of extensions to P-Charging-Vector header~~**

```
~~access-network-charging-info = (gprs-charging-info / generic-param)~~
~~gprs-charging-info = ggsn *(SEMI pdp-info) [SEMI extension-param]~~
~~ggsn = "ggsn" EQUAL gen-value~~
~~pdp-info = pdp-sig SEMI gcid SEMI auth-token *(SEMI flow-id)~~
~~pdp-sig = "pdp-sig" EQUAL ("yes" / "no")~~
~~gcid = "gcid" EQUAL gen-value~~
~~auth-token = "auth-token" EQUAL gen-value~~
~~flow-id = "flow-id" EQUAL gen-value~~
~~extension-param = token [EQUAL (token | quoted-string)]~~
```

~~The access-network-charging-info parameter is an instance of generic-param from the current charge-params component of P-Charging-Vector header~~

~~The access-network-charging-info parameter includes alternative definitions for different types access networks.~~

~~GPRS is the initially supported access network (gprs-charging-info parameter). For GPRS there are the following components to track: GGSN address (ggsn parameter) and one or more PDP contexts (pdp-info parameter). Each PDP context has an indicator if it is an IM CN subsystem signalling PDP context (pdp-sig parameter), an associated GPRS Charging Identifier (gcid parameter), a media authorization token (auth-token parameter) and one or more flow identifiers (flow-id parameter) that identify associated m-lines within the SDP from the SIP signalling. These parameters are transferred from the GGSN to the P-CSCF via the PDF over the Go and Gq interfaces, see 3GPP TS 29.207 [12].~~

~~For a dedicated PDP context for SIP signalling, i.e. no media stream requested for a session, then there is no authorisation activity or information exchange over the Go and Gq interfaces. Since there are no GCID, media authorization token or flow identifiers in this case, the GCID and media authorization token are set to zero and no flow identifier parameters are constructed by the PDF.~~

### 7.2A.5.3 Operation

The operation of this header is described in subclauses 5.2, 5.3, 5.4, 5.5, 5.6, 5.7 and 5.8.

***** 4th Change *****

# B.3 3GPP specific encoding for SIP header Extensions

## B.3.1 P-Access-Network-Info header

## B.3.2 P-Charging-Vector header

The access network charging information is populated in the P-Charging-Vector using the gprs-charging-info parameter. Table 6.1 describes 3GPP-specific extensions to the P-Charging-Vector header field defined in RFC 3455 [52].

**Table 6.1: Syntax of extensions to P-Charging-Vector header**

```
access-network-charging-info = (gprs-charging-info / generic-param)
gprs-charging-info = ggsn *(SEMI pdp-info) [SEMI extension-param]
ggsn = "ggsn" EQUAL gen-value
pdp-info = pdp-sig SEMI gcid SEMI auth-token *(SEMI flow-id)
pdp-sig = "pdp-sig" EQUAL ("yes" / "no")
gcid = "gcid" EQUAL gen-value
auth-token = "auth-token" EQUAL gen-value
flow-id = "flow-id" EQUAL gen-value
extension-param = token [EQUAL (token | quoted-string)]
```

The access-network-charging-info parameter is an instance of generic-param from the current charge-params component of P-Charging-Vector header.

The access-network-charging-info parameter includes alternative definitions for different types access networks.

GPRS is the initially supported access network (gprs-charging-info parameter). For GPRS there are the following components to track: GGSN address (ggsn parameter) and one or more PDP contexts (pdp-info parameter). Each PDP context has an indicator if it is an IM CN subsystem signalling PDP context (pdp-sig parameter), an associated GPRS Charging Identifier (gcid parameter), a media authorization token (auth-token parameter) and one or more flow identifiers (flow-id parameter) that identify associated m-lines within the SDP from the SIP signalling. These parameters are transferred from the GGSN to the P-CSCF via the PDF over the Go and Gq interfaces, see 3GPP TS 29.207 [12].

For a dedicated PDP context for SIP signalling, i.e. no media stream requested for a session, then there is no authorisation activity or information exchange over the Go and Gq interfaces. Since there are no GCID, media authorization token or flow identifiers in this case, the GCID and media authorization token are set to zero and no flow identifier parameters are constructed by the PDF.

***** End of Changes *****

**3GPP TSG-CN1 Meeting #32** **Tdoc N1-031684~~442~~**
**Bangkok, Thailand, 27 – 31 October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **24.229** **CR** **CR 522** ⌘ **rev** **1** ⌘ Current version: **6.0.0** ⌘

*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:*** | ⌘ | Claues 9 restructuring |
| ***Source:*** | ⌘ | Lucent Technologise |
| ***Work item code:*** | ⌘ | **IMSCOOP** |
| ***Date:*** | ⌘ | 18/10/2003 |
| ***Category:*** | ⌘ | **D** |
| ***Release:*** | ⌘ | *Rel-6* |

*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:*** | ⌘ | Currently, our document 24.229-550 (Clause 9) specifies two aspects pertaining to the wireless access network:<br><br>1. Generic services (and associated procedures) which must be provided by any wireless access network (i.e., IP-CAN), and<br><br>2. Description of the procedures "how are these services provided by the GPRS access technology."<br><br>The text that pertains to 1) should be kept in the main body of the document 24.229 (clause 9), while the text pertaining to 2) should be moved to the annex B. |
| ***Summary of change:*** | ⌘ | Proposed changes implemented |
| ***Consequences if not approved:*** | ⌘ | Incomplete main body of the decument 24.229 |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 9 and annex B |
| ***Other specs affected:*** | ⌘ | Y / N<br>☐ / ☒ Other core specifications ⌘<br>☐ / ☒ Test specifications<br>☐ / ☒ O&M Specifications |
| ***Other comments:*** | ⌘ | Modifications |

**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.

***** 1st Change *****

# 9 IP-Connectivity Access Network aspects when connected to the IM CN subsystem~~GPRS aspects when connected to the IM CN subsystem~~

~~Void~~.

## 9.1 Introduction

A UE accessing the IM CN subsystem utilises the services supported by the IP-CAN to provide packet-mode communication between the UE and the IM CN subsystem. General requirements for the UE on the use of these packet-mode services are specified in this clause.

Editor's Note: Annex B may include further generic material that needs to be included in this clause. Which material in annex B applies to IP-Connectivity Access Network in genral and which is specific to the GPRS access needs to be further investigated.

## 9.2 Procedures at the UE

### 9.2.1 Connecting to the IP-CAN and P-CSCF discovery

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

a) establish a connection with the IP-CAN;

b) obtain an IP address using either the standard IETF protocols (e.g., DHCP or IPCP) or a protocol that is particular to the IP-CAN technology that the UE is utilising. The obtained IP address shall be fixed throughout the period the UE is connected to the IM CN subsystem, i.e. from the initial registration and at least until the last deregistration; and

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

The methods for acquiring a P-CSCF address(es) are:

I. Employ Dynamic Host Configuration Protocol for IPv6 (DHCPv6) RFC 3315 [40] and the DHCPv6 options for SIP servers RFC 3319 [41].

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. Obtain the P-CSCF address(es) by employing a procedure that the IP-CAN technology supports. (e.g. GPRS).

When acquiring a P-CSCF address(es) the UE can freely select either method I or II.

The UE may also request a DNS Server IPv6 address(es) as specified in RFC 3315 [40].

### 9.2.2 Special requirements applying to forked responses

Since the UE does not know that forking has occurred until a second provisional response arrives, the UE will request the radio/bearer resources as required by the first provisional response. For each subsequent provisional response that may be received, different alternative actions may be performed depending on the requirements in the SDP answer:

- the UE has sufficient radio/bearer resources to handle the media specified in the SDP of the subsequent provisional response, or
- the UE must request additional radio/bearer resources to accommodate the media specified in the SDP of the subsequent provisional response.

NOTE 1: When several forked responses are received, the resources requested by the UE is the "logical OR" of the resources indicated in the multiple responses to avoid allocation of unnecessary resources. The UE does not request more resources than proposed in the original INVITE request.

NOTE 2: When service-based local policy is applied, the UE receives the same authorization token for all forked requests/responses related to the same SIP session.

When a first final 200 (OK) response for the INVITE request is received for one of the early dialogues, the UE proceeds to set up the SIP session using the radio/bearer resources required for this session. Upon the reception of a first final 200 (OK) response for the INVITE request, the UE shall release all unneeded radio/bearer resources.

***** 2nd Change *****

# Annex B (normative): GPRS aspects when connected to the IM CN subsystem

## B.1 Scope

Editor's note: To be drafted.

## B.2 GPRS aspects when connected to the IM CN subsystem

### B.2.1 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].

### B.2.2 Procedures at the UE

#### B.2.2.1 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. The UE may also use this PDP context for DNS and DHCP signalling according to the static packet filters as described in 3GPP TS 29.061 [11]. The UE can also set the Signalling Indication attribute within the QoS IE;

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. The UE may carry both signalling and media on the general-purpose PDP context. The UE can also set the Signalling Indication attribute within the QoS IE.

The UE indicates the IM CN Subsystem Signalling Flag to the GGSN within the Protocol Configuration Options IE of the ACTIVATE PDP CONTEXT REQUEST message or ACTIVATE SECONDARY PDP CONTEXT REQUEST message. Upon successful signalling PDP context establishment the UE receives an indication from GGSN in the form of IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE. If the flag is not received, the UE shall consider the PDP context as a general-purpose PDP context.

The encoding of the IM CN Subsystem Signalling Flag within the Protocol Configuration Options IE is described in 3GPP TS 24.008 [8].

The UE can indicate a request for prioritised handling over the radio interface by setting the Signalling Indication attribute (see 3GPP TS 23.107 [4A]). The general QoS negotiation mechanism and the encoding of the Signalling Indication attribute within the QoS IE are described in 3GPP TS 24.008 [8].

NOTE: 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 stream is not mandated by the P-CSCF to be carried in a separate PDP Context.

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

The methods for P-CSCF discovery are:

I. Employ Dynamic Host Configuration Protocol for IPv6 (DHCPv6) RFC 3315 [40], the DHCPv6 options for SIP servers RFC 3319 [41] after PDP context activation as described in subclause 9.2.1.

~~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.

The UE may request a DNS Server IPv6 address(es) via RFC 3315 [40] or by the Protocol Configuration Options IE when activating a PDP context according to 3GPP TS 27.060 [10A].

The encoding of the request and response for IPv6 address(es) for DNS server(s) and list of P-CSCF address(es) within the Protocol Configuration Options IE is described in 3GPP TS 24.008 [8].

## B.2.2.1A Modification of a PDP context used for SIP signalling

The PDP context shall not be modified from a dedicated PDP context for SIP signalling to a general-purpose PDP context or vice versa. The IM CN Subsystem Signalling Flag shall not be set in the Protocol Configuration Options IE of the MODIFY PDP CONTEXT REQUEST message.

The UE shall not indicate the request for a P-CSCF address to the GGSN within the Protocol Configuration Options IE of the MODIFY PDP CONTEXT REQUEST message. The UE shall ignore P-CSCF address(es) if received from the GGSN in the Protocol Configuration Options IE of the MODIFY PDP CONTEXT RESPONSE message.

## B.2.2.1B Re-establishment of the PDP context for signalling

If the dedicated PDP context for SIP signalling is lost due to e.g. a GPRS routeing area update procedure, the UE shall attempt to re-establish the dedicated PDP context for SIP signalling. If this procedure does not succeed, the UE shall deactivate all PDP contexts established as a result of SIP signalling according to the 3GPP TS 24.008 [8].

## B.2.2.2 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.

## B.2.2.3 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.

## B.2.2.4 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.

## B.2.2.5 PDP contexts for media

### B.2.2.5.1 General requirements

The UE shall establish different PDP contexts for media streams that belong to different SIP sessions.

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.

When the UE has to allocate bandwidth for RTP and RTCP in a PDP context, the UE shall use the rules outlined in 3GPP TS 29.208 [13].

### B.2.2.5.1A Activation or modification of PDP contexts for media

If the UE receives indication within the SDP according to RFC 3524 [54] that media stream(s) belong to group(s), the media stream(s) shall be set up on separate PDP contexts according to the indication of grouping. The UE may freely group media streams to PDP context(s) in case no indication of grouping is received from the P-CSCF.

The UE can receive a media authorization token in the P-Media-Authorization header from the P-CSCF according to RFC 3313 [31]. The UE shall, if a media authorization token is received in the P-Media-Authorization header when a SIP session is initiated, establish separate PDP context(s) for the media. If a media authorization token is received in subsequent messages for the same SIP session, the UE shall:

- use the existing PDP context(s) for media;
- modify the existing PDP context(s) for media; or
- establish additional PDP context(s) for media.

The UE shall transparently pass the media authorization 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. The UE shall signal it by inserting it within the Traffic Flow Template IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message or the MODIFY PDP CONTEXT REQUEST message.

To identify to the GGSN which flow(s) (identified by m-lines within the SDP) that are 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. 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].

If the UE receives several media authorization tokens from the P-CSCF within the same SIP request or response, the first instance of the media authorization token shall be sent to the GGSN, and subsequent instances are discarded by the UE.

The UE shall not re-use a PDP context for other SIP sessions when the session has an associated media authorization token. The UE shall deactivate the PDP context when the SIP session that provided the media authorization token is terminated. When no media authorization token is used for a SIP session, the UE may reuse the PDP context between different SIP sessions.

The UE shall not include the IM CN Subsystem Signalling Flag when a PDP context for media is established or modified.

### B.2.2.5.2 Special requirements applying to forked responses

Since the UE does not know that forking has occurred until a second, provisional response arrives, the UE sets up the PDP context(s) as required by the initial response received. If a subsequent provisional response is received, different alternative actions may be performed depending on the requirements in the SDP answer:

1) **the bearer requirements of the subsequent SDP can be accommodated by the existing PDP context(s).** The UE performs no activation or modification of PDP contexts.

2) **the subsequent SDP introduces different QoS requirements or additional IP flows.** The UE modifies the existing PDP context(s), if necessary, according to subclause B.2.2.5.1A.

3) **the subsequent SDP introduces one or more additional IP flows.** The UE establishes additional PDP context(s) according to subclause B.2.2.5.1A.

NOTE 1: When several forked responses are received, the resources requested by the UE is are the “logical OR” of the resources indicated in the multiple responses to avoid allocation of unnecessary resources. The UE does not request more resources than proposed in the original INVITE request.

NOTE 2: When service-based local policy is applied, the UE receives the same authorization token for all forked requests/responses related to the same SIP session.

When a final answer is received for one of the early dialogues, the UE proceeds to set up the SIP session. The UE shall release all the unneeded radio/bearer resources. Therefore, upon the reception of a first final 200 (OK) response for the INVITE request (in addition to the procedures defined in RFC 3261 [26] subclause 13.2.2.4), the UE shall:

1) in case PDP context(s) were established or modified as a consequence of the INVITE request and forked provisional responses that are not related to the accepted 200 (OK) response, delete the PDP context(s) or modify the delete the PDP context(s) back to their original state.

#### B.2.2.5.3 Unsuccessful situations

One of the Go interface related error codes can be received by the UE in the ACTIVATE SECONDARY PDP CONTEXT REJECT message or the MODIFY PDP CONTEXT REJECT message. If the UE receives a Go interface related error code, the UE shall either terminate the session or retransmit the message up to three times. The Go interface related error codes are further specified in 3GPP TS 29.207 [12].