Source:	TSG CN WG4
Title:	Corrections on small Technical Enhancements and Improvements Rel-5
Agenda item:	8.8
Document for:	APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.003	074	4	N4-031346	Rel-5	Changes to enable the GSMA root DNS architecture	F	5.7.0
23.003	079	1	N4-031347	Rel-6	Changes to enable the GSMA root DNS architecture	A	6.0.0

CR-Form-v7

CHANGE REQUEST

| ⌘ | **23.003** CR **074** | ⌘**rev** **4** ⌘ | Current version: | **5.7.0** | ⌘ |

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

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

Title: ⌘	Changes to enable the GSMA root DNS architecture	
Source: ⌘	CN4	
Work item code: ⌘	TEI5	***Date:*** ⌘ 30/10/2003
Category: ⌘ **F**		***Release:*** ⌘ Rel-5

Use one of the following categories:	*Use one of the following releases:*
F (correction)	*2 (GSM Phase 2)*
A (corresponds to a correction in an earlier release)	*R96 (Release 1996)*
B (addition of feature),	*R97 (Release 1997)*
C (functional modification of feature)	*R98 (Release 1998)*
D (editorial modification)	*R99 (Release 1999)*
Detailed explanations of the above categories can	*Rel-4 (Release 4)*
be found in 3GPP TR 21.900.	*Rel-5 (Release 5)*
	Rel-6 (Release 6)

Reason for change: ⌘	**Essential Correction** In an LS from the GSMA IREG working group (N4-030932) it was stated that a root DNS architecture for the ".gprs" top level domain is being set up by the GSMA for the private, inter-PLMN IP backbone known as the GRX. The LS identified some inconsistencies with definitions of the ".gprs" domain and asked that these be corrected. In a subsequent LS from the GSMA IREG PACKET working group (N4-031288), 3GPP are also asked to consistently use the ".gprs" domain name in all URL/URI addressing which involves the GRX so that GSM/UMTS operators only have to administer **one** DNS domain name on the GRX.
Summary of change: ⌘	1. All occurences of the ".IMSI.3gppnetwork.org" domain are replaced with the domain "ims.mnc<MNC>.mcc<MCC>.gprs"; where MNC is 3 digits (with a zero added at the beginning for 2 digit MNCs) and MCC is 3 digits. 2. The label "ims" is added as a reserved string for an APN network identifier. 3. The temporary private ID and temporary public ID is specifically mandated to be used only when the access method requires the use of the GRX (e.g. GPRS). 4. A few miscellaneous errors in grammar and punctuation are corrected.
Consequences if not approved: ⌘	1. Two different DNS systems will have to be maintained and used by operators, resulting in more work for 3GPP to run the "3gppnetwork.org" domain and more work for operators in configuring extra local DNS servers. 2. If only Rel-6 and onwards is changed, there will be backward compatibility issues for SIP clients in UEs which do not have access to an ISIM (which is defined from Rel-5 onwards).

Clauses affected:	⌘	9.1.1, 13.2, 13.3, 13.4		

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

Other comments:	⌘	This CR reflects the changes agreed on the GSMA IREG PACKET telephone conference on the 16th October 2003. Please refer to the LS produced at this meeting for more information on the driver for this CR. In this particular revision, the corrections to the structure of the ".gprs" TLD have been moved out to a separate CR.

**** First Modified Section ****

---

9   Definition of Access Point Name

In the GPRS backbone, an Access Point Name (APN) is a reference to a GGSN. To support inter-PLMN roaming, the internal GPRS DNS functionality is used to translate the APN into the IP address of the GGSN.

9.1   Structure of APN

The APN is composed of two parts as follows:

- The APN Network Identifier; this defines to which external network the GGSN is connected and optionally a requested service by the MS. This part of the APN is mandatory.

- The APN Operator Identifier; this defines in which PLMN GPRS backbone the GGSN is located. This part of the APN is optional.

The APN Operator Identifier is placed after the APN Network Identifier. An APN consisting of both the Network Identifier and Operator Identifier corresponds to a DNS name of a GGSN; it has a maximum length of 100 octets.

The syntax of the APN shall follow the Name Syntax defined in RFC 2181 [18], RFC 1035 [19] and RFC 1123 [20]. The APN consists of one or more labels. Each label is coded as a one octet length field followed by that number of octets coded as 8 bit ASCII characters. Following RFC 1035 [19] the labels shall consist only of the alphabetic characters (A-Z and a-z), digits (0-9) and the hyphen (-). Following RFC 1123 [20], the label shall begin and end with either an alphabetic character or a digit. The case of alphabetic characters is not significant. The APN is not terminated by a length byte of zero.

NOTE: A length byte of zero is added by the SGSN at the end of the APN before interrogating a DNS server.

For the purpose of presentation, an APN is usually displayed as a string in which the labels are separated by dots (e.g. "Label1.Label2.Label3").

9.1.1   Format of APN Network Identifier

The APN Network Identifier shall contain at least one label and shall have a maximum length of 63 octets. An APN Network Identifier shall not start with any of the strings "rac", "lac", "sgsn", ~~or~~ "rnc" or "ims", and it shall not end in ".gprs". Further, it shall not take the value "*".

**** Next Modified Section ****

---

13   Numbering, addressing and identification within the IP multimedia core network subsystem

13.1   Introduction

This clause describes the format of the parameters needed to access the IP multimedia core network subsystem. For further information on the use of the parameters see 3GPP TS 23.228 [24].

13.2   Home network domain name

The home network domain name shall be in the form of an Internet domain name, e.g. operator.com, as specified in RFC 1035 [19].

If there is no ISIM application and the access method requires the use of the GRX, the UE shall derive the home network domain name from the IMSI as described in the following steps:

1. take the first 5 or 6 digits, depending on whether a 2 or 3 digit MNC is used (see 3GPP TS 31.102 [27]) and separate them into MCC and MNC with ".";

2. use the MCC and MNC derived in step 1 to create the "mnc<MNC>.mcc<MCC>.gprs" domain name as described in subclause 9.1.2;

3~~2~~. ~~reverse the order of the MCC and MNC. Append to the result: ".IMSI.3gppnetwork.org"~~add the label "ims." to the beginning of the domain.

An example of a home network domain name is:

— IMSI in use: 234150999999999;

Where:

MCC = 234;

MNC = 15;

MSIN = 0999999999~~, which gives~~.

Which gives the home network domain name: ims.mnc015.mcc234.gprs~~IMSI.3gppnetwork.org.~~

13.3   Private user identity

The private user identity shall take the form of an NAI, and shall have the form username@realm as specified in clause 3 of RFC 2486 [25].

NOTE: It is possible for a representation of the IMSI to be contained within the NAI for the private identity.

If there is no ISIM application, the private user identity is not known. ~~In this case~~If the private user identity is not known and the access method requires the use of the GRX, the private user identity shall be~~is~~ derived from the IMSI.

The following steps show how to build the private user identity out of the IMSI:

1. use the whole string of digits as the username part of the private user identity;

2. convert the leading digits of the IMSI, i.e. MNC and MCC, into a domain name, as described in subclause 13.2.

The result will be a private user identity of the form "<IMSI>~~imsi~~@ims.mnc<MNC>.mcc<MCC>.gprs~~IMSI.3gppnetwork.org~~". For example: If the IMSI is 234150999999999 (MCC = 234, MNC = 15), the private user identity then takes the form 234150999999999@ims.mnc015.mcc234.gprs~~IMSI.3gppnetwork.org~~

13.4   Public user identity

The public user identity shall take the form of either a SIP URI (see RFC 3261 [26]) or a tel URL (see RFC 2806 [45]). A SIP URI shall take the form "sip:user@domain".

If there is no ISIM application to host the public user identity and the access method requires the use of the GRX, a temporary public user identity shall be derived, based on the IMSI. The temporary public user identity shall be of the form "user@domain" and shall therefore be equal to the private user identity. The private user identity is derived as described in subclause 13.2. That is, the private user identity will be appended to the string "sip:"

EXAMPLE: "sip:234150999999999@ims.mnc015.mcc234.gprs~~IMSI.3gppnetwork.org~~".

**** End of document ****

CHANGE REQUEST

| ⌘ | **23.003** CR **079** | ⌘**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 **X**

Title:	⌘	Changes to enable the GSMA root DNS architecture
Source:	⌘	CN4

Work item code:⌘	TEI5		***Date:*** ⌘	30/10/2003

Category:	⌘	**A**	***Release:*** ⌘	Rel-6

	Use <u>one</u> of the following categories:	*Use <u>one</u> of the following releases:*
	F (correction)	*2 (GSM Phase 2)*
	A (corresponds to a correction in an earlier release)	*R96 (Release 1996)*
	B (addition of feature),	*R97 (Release 1997)*
	C (functional modification of feature)	*R98 (Release 1998)*
	D (editorial modification)	*R99 (Release 1999)*
	Detailed explanations of the above categories can	*Rel-4 (Release 4)*
	be found in 3GPP TR 21.900.	*Rel-5 (Release 5)*
		Rel-6 (Release 6)

Reason for change:	⌘	**Essential Correction**
		In an LS from the GSMA IREG working group (N4-030932) it was stated that a root DNS architecture for the ".gprs" top level domain is being set up by the GSMA for the private, inter-PLMN IP backbone known as the GRX. The LS identified some inconsistencies with definitions of the ".gprs" domain and asked that these be corrected.
		In a subsequent LS from the GSMA IREG PACKET working group (N4-031288), 3GPP are also asked to consistently use the ".gprs" domain name in all URL/URI addressing which involves the GRX so that GSM/UMTS operators only have to administer **one** DNS domain name on the GRX.
Summary of change:⌘		1. All occurences of the ".IMSI.3gppnetwork.org" domain are replaced with the domain "ims.mnc<MNC>.mcc<MCC>.gprs"; where MNC is 3 digits (with a zero added at the beginning for 2 digit MNCs) and MCC is 3 digits.
		2. The label "ims" is added as a reserved string for an APN network identifier.
		3. The temporary private ID and temporary public ID is specifically mandated to be used only when the access method requires the use of the GRX (e.g. GPRS).
		4. A few miscellaneous errors in grammar and punctuation are corrected.
Consequences if not approved:	⌘	1. Two different DNS systems will have to be maintained and used by operators, resulting in more work for 3GPP to run the "3gppnetwork.org" domain and more work for operators in configuring extra local DNS servers.
		2. If only Rel-6 and onwards is changed, there will be backward compatibility issues for SIP clients in UEs which do not have access to an ISIM (which is defined from Rel-5 onwards).

Clauses affected:	⌘	9.1.1, 13.2, 13.3, 13.4		

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

Other comments:	⌘	This CR reflects the changes agreed on the GSMA IREG PACKET telephone conference on the 16th October 2003. Please refer to the LS produced at this meeting for more information on the driver for this CR. In this particular revision, the corrections to the structure of the ".gprs" TLD have been moved out to a separate CR.

**** First Modified Section ****

---

9   Definition of Access Point Name

In the GPRS backbone, an Access Point Name (APN) is a reference to a GGSN. To support inter-PLMN roaming, the internal GPRS DNS functionality is used to translate the APN into the IP address of the GGSN.

9.1   Structure of APN

The APN is composed of two parts as follows:

- The APN Network Identifier; this defines to which external network the GGSN is connected and optionally a requested service by the MS. This part of the APN is mandatory.

- The APN Operator Identifier; this defines in which PLMN GPRS backbone the GGSN is located. This part of the APN is optional.

The APN Operator Identifier is placed after the APN Network Identifier. An APN consisting of both the Network Identifier and Operator Identifier corresponds to a DNS name of a GGSN; it has a maximum length of 100 octets.

The syntax of the APN shall follow the Name Syntax defined in RFC 2181 [18], RFC 1035 [19] and RFC 1123 [20]. The APN consists of one or more labels. Each label is coded as a one octet length field followed by that number of octets coded as 8 bit ASCII characters. Following RFC 1035 [19] the labels shall consist only of the alphabetic characters (A-Z and a-z), digits (0-9) and the hyphen (-). Following RFC 1123 [20], the label shall begin and end with either an alphabetic character or a digit. The case of alphabetic characters is not significant. The APN is not terminated by a length byte of zero.

NOTE: A length byte of zero is added by the SGSN at the end of the APN before interrogating a DNS server.

For the purpose of presentation, an APN is usually displayed as a string in which the labels are separated by dots (e.g. "Label1.Label2.Label3").

9.1.1   Format of APN Network Identifier

The APN Network Identifier shall contain at least one label and shall have a maximum length of 63 octets. An APN Network Identifier shall not start with any of the strings "rac", "lac", "sgsn", ~~or~~ "rnc" or "ims", and it shall not end in ".gprs". Further, it shall not take the value "*".

**** Next Modified Section ****

---

13   Numbering, addressing and identification within the IP multimedia core network subsystem

13.1   Introduction

This clause describes the format of the parameters needed to access the IP multimedia core network subsystem. For further information on the use of the parameters see 3GPP TS 23.228 [24].

13.2   Home network domain name

The home network domain name shall be in the form of an Internet domain name, e.g. operator.com, as specified in RFC 1035 [19].

If there is no ISIM application and the access method requires the use of the GRX, the UE shall derive the home network domain name from the IMSI as described in the following steps:

1. take the first 5 or 6 digits, depending on whether a 2 or 3 digit MNC is used (see 3GPP TS 31.102 [27]) and separate them into MCC and MNC with ".";

2. use the MCC and MNC derived in step 1 to create the "mnc<MNC>.mcc<MCC>.gprs" domain name as described in subclause 9.1.2;

3. 2. reverse the order of the MCC and MNC. Append to the result: ".IMSI.3gppnetwork.org"add the label "ims." to the beginning of the domain.

An example of a home network domain name is:

— IMSI in use: 234150999999999;

Where:

MCC = 234;

MNC = 15;

MSIN = 0999999999, which gives.

Which gives the home network domain name: ims.mnc015.mcc234.gprsIMSI.3gppnetwork.org.

13.3 Private user identity

The private user identity shall take the form of an NAI, and shall have the form username@realm as specified in clause 3 of RFC 2486 [25].

NOTE: It is possible for a representation of the IMSI to be contained within the NAI for the private identity.

If there is no ISIM application, the private user identity is not known. In this caseIf the private user identity is not known and the access method requires the use of the GRX, the private user identity shall beis derived from the IMSI.

The following steps show how to build the private user identity out of the IMSI:

1. use the whole string of digits as the username part of the private user identity;

2. convert the leading digits of the IMSI, i.e. MNC and MCC, into a domain name, as described in subclause 13.2.

The result will be a private user identity of the form "<IMSI>imsi@ims.mnc<MNC>.mcc<MCC>.gprs"IMSI.3gppnetwork.org". For example: If the IMSI is 234150999999999 (MCC = 234, MNC = 15), the private user identity then takes the form 234150999999999@ims.mnc015.mcc234.gprsIMSI.3gppnetwork.org

13.4 Public user identity

The public user identity shall take the form of either a SIP URI (see RFC 3261 [26]) or a tel URL (see RFC 2806 [45]). A SIP URI shall take the form "sip:user@domain".

If there is no ISIM application to host the public user identity and the access method requires the use of the GRX, a temporary public user identity shall be derived, based on the IMSI. The temporary public user identity shall be of the form "user@domain" and shall therefore be equal to the private user identity. The private user identity is derived as described in subclause 13.2. That is, the private user identity will be appended to the string "sip:"

EXAMPLE: "sip:234150999999999@ims.mnc015.mcc234.gprsIMSI.3gppnetwork.org".

**** End of document ****