
3GPP TSG-CN WG4 Meeting #25
Seoul, KOREA. 15th to 19th November 2004.

N4-041687

Title: Reservation of two new sub-domains under ".3gppnetwork.org"
Release: Rel-6
Work Item: WLAN Interworking, Generic Authentication Architecture

Source: 3GPP TSG-CN WG4
To: GSMA IREG PACKET
Cc: 3GPP TSG-CN WG 1, 3GPP TSG-CN

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Attachments: N4-041407, N4-041613

1. Introduction

3GPP TSG-CN WG4 (CN4) is currently working on Work Items which make use of an inter-operator IP backbone network. Two of these are "WLAN Interworking" and "Generic Authentication Architecture". It is expected that the GPRS Roaming eXchange network (known as the GRX) will be re-used to support these services between PLMNs. In order to have minimal impact on the GRX, it was identified during CN4 #25 that the ".3gppnetwork.org" domain should be re-used. Therefore, two additional sub-domains of this domain are required.

2. WLAN

CN4 notes that GSMA has previously allocated the "wlan" sub-domain of ".mnc<MNC.mcc<MCC>.3gppnetwork.org" for use in WLAN NAIs (Network Access Identifiers) and thanks GSMA for allocating this. However, the need for another sub-domain allocation has occurred.

Currently within 3GPP, mechanisms are being defined to allow the UE to perform a manual PLMN selection on WLAN access. That is, select which WLAN Access Network (AN) to attach to based on the PLMN(s) that the WLAN AN is connected to. For more information, please see the attached discussion document N4-041407 (paying particular attention to section 2.1).

The proposed mechanism requires a known non-routable domain to be reserved on the GRX under the ".3gppnetwork.org" domain in order to force a WLAN AN to fail in its attempt to automatically authenticate and authorise the UE when it attaches (the resulting error procedure of the WLAN AN right now being to send a list of PLMNs to which it is connected to the UE). As you may know, it is outside the scope of 3GPP to define logical processing for WLAN AN, therefore, 3GPP has to use this out of the ordinary technique. It is therefore proposed that this domain, although reserved, is never actually used or assigned to an entity. Just reserved.

During discussions in the CN4, the following domain name was agreed to be proposed to GSMA IREG PACKET for such use:

`nonrouteable.3gppnetwork.org`

3. Generic Authentication Architecture

The Generic Authentication Architecture (GAA) is a standardised method of subscriber certificate distribution by means of Generic Bootstrapping Architecture (GBA). Subscriber certificates support services whose provision the mobile operator assists, as well as services that are offered by the mobile operator. 3GPP is currently

defining the signalling procedures for the support of issuing certificates to subscribers and the standard format of certificates and digital signatures. Note that it is not the intention of 3GPP to duplicate existing standards being developed by other groups on these topics (references are given where appropriate). For more information on GAA/GBA, please see 3GPP TS 33.221 and 3GPP TS 33.220, respectively.

To enable the UE to discover the address of the Boot Strapping Function (BSF) in the PLMN, an identity can be pre-configured in the ISIM (IMS Subscriber Identity Module) on the UICC. However, in order to support GAA/GBA on a UICC which does *not* have an ISIM application (and therefore, does not have a pre-configured BSF address) the UE, using a defined procedure, has to "create" a BSF address from the IMSI and a default domain name. This is done in the same manner as for UEs that are capable of IMS but also do not have access to an ISIM. See the attached CR in N4-041613 (attached) for more information.

It was decided by CN4 to synergise the BSF discovery mechanism with the said IMS procedure as much as possible so it was proposed to use the same domain name and domain name structure. Thus, the following domain name was agreed to be proposed to GSMA IREG PACKET for such use:

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bsf.mnc<MNC>.mcc<MCC>.3gppnetwork.org
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4. Actions:

CN4 kindly asks GSMA IREG PACKET to:

- 1) reserve the proposed sub-domains of ".3gppnetwork.org" as defined above;
- 2) never service DNS requests to the former proposed domain name on the GRX so that all DNS look-ups to it will fail;
- 3) address their response LS to this LS directly to 3GPP TSG CN plenary (CN) – but copying CN4 and CN1 – because there are no more CN4 meetings (or any other CN WG meetings) before the next CN where it is expected that the 3GPP Rel-6 specification set will be frozen.

5. Date of Next 3GPP TSG-CN WG4 Meetings:

CN4 #25	14th – 18th February 2005	Sydney, Australia
CN4 #26	25th -30th April 2005	Cancun, Mexico

Source: Telecom Italia
Title: PLMN Selection procedure
Agenda item: 7.1
Document for: Discussion

1 Introduction

The network selection procedure within WLAN access network, as defined by 3GPP SA1 requirements, needs that the WLAN UE selects the WLAN AN that is interconnected with the selected PLMN. On this issue, the IETF has defined two new draft documents: the first one is the draft-adrangi-eap-network-discovery-04 "Identity selection hints for EAP"; the second is the draft-ietf-radext-rfc2486bis "The Network Access Identifier".

The first draft on "Identity selection hints for EAP", which has been proposed for RFC approval, describes the procedure to provide the identity hints, i.e. the PLMN identifier to the user, in order to allow the client to select the requested PLMN. The mechanism is based on the transport of the identity hints (i.e. PLMN list) in the EAP messages, from the network (AAA server or Access Point in case of WLAN) to the client. The PLMN list can be sent within the first Access-Challenge (EAP Identity/Request) message either as a reply to the reception of an EAP-Start message, or when the AAA proxy receives a EAP Identity Response with a non-routable NAI.

The second draft is the revision of the RFC 2486 and defines the Decorated NAI to enable the routing of the authentication messages from the client to the AAA server via the intermediate network selected by the client.

The present version of 3GPP TSs define the automatic and manual PLMN selection procedure as a step-by-step procedure describing the generic actions to be performed. Furthermore the IETF procedure is proposed for PLMN selection, but some points are still open, as described in the following.

2 PLMN Selection procedure

The PLMN Selection procedure shall allow the WLAN UE to select a PLMN from a list containing all PLMNs available in the site/location where the user is present independently from the number of available WLAN ANs. This means that the WLAN UE shall be able to receive the list of "All" PLMNs from the WLAN AN. The IETF procedure states that the AAA Proxy/Server which receives a non-routable NAI should send the list of PLMNs supported by the WLAN AN to the WLAN UE. At this point the selection of the PLMN can be done either automatically by the terminal or manually by the user.

2.1 Manual Selection procedure

In the automatic procedure it is enough to find either the HPLMN or a VPLMN (not necessarily the highest priority VPLMN). For the Manual selection procedure it is important to note that the WLAN UE shall have the list of "All" PLMNs reachable from each WLAN AN present in that area. Thus in this case it is required to trigger the AAA server of each WLAN AN available within the location to download the list of PLMN. In order to trigger such download, the AAA should receive a non-routable NAI, i.e. a NAI which does not corresponds to any of the PLMN at which the AAA is connected.

In the current version of the TSs (23.003, 29.234) two type of NAI are defined: the Root NAI and the Decorated NAI. Both NAIs have the realm part that indicate an existing Network, so this NAI is routable and it is not suitable to trigger the download of PLMN list. Hence in manual selection an alternative NAI which is not routable by any AAA server should be defined in order to trigger the download of PLMN list.

This alternative NAI shall have a valid format and it is needed that its realm part shall not be registered as a public internet domain. Since according to IANA/ICANN rules it is not possible to reserve a domain name for special purposes, it is proposed to use a realm part based on "3gppnetwork.org" domain (which is under control of GSMA).

The above proposal does not solve the problem completely, since the real part shall be non-routable an addition is required. Hence it is proposed to add to the domain name a string of character, so that the resulting realm:

- is non-routable
- does not conflict with other NAI definition;
- is future proof;

Hence it is proposed to add the string “plmnselection” to “3gppnetwork.org”. In line of principle any other string can be used, but such one has the advantage to recall its purpose, i.e. PLMN selection.

2.2. IETF Draft status

The current version of TSs does not reflect the existing status of IETF documents.

For PLMN selection procedure, two new IETF Drafts should be considered:

- the draft-adrangi-eap-network-discovery-04 “Identity selection hints for EAP” which defines a mechanism for providing the network identity to the client;
- the revision of RFC 2486 draft-radext-rfc2486bis-01 “The Network Access Identifier” which revises the NAI definition extending it for defining the NAI decoration. This draft has superseded “draft-arkko-roamps-rfc2486bis-02”.

In addition, two other RFCs should be taken into account:

- the RFC 3748 (revision of 2284) that defines the EAP protocol;
- the RFC 3579 (revision of 2869) that defines the transport of EAP over RADIUS.

3 Network Advertising and PLMN selection

The I-WLAN reference architecture considers mainly three cases of WLAN AN ownership:

- WLAN AN belongs to a third party operator, (e.g. a WISP) and has its own AAA Proxy/Server;
- WLAN AN belongs to a third party operator, (e.g. a WISP) but it does not have any AAA Proxy/Server (e.g. in case of free-of-charge access);
- WLAN AN belongs to the Mobile operator.

In the first case, the user can be authenticated by the WISP, using the AAA Proxy/Server, to obtain the access to the WLAN AN. Thus the list of PLMN shall be sent by the WLAN AAA proxy/server which is the first AAA which can be reached by the WLAN UE.

In the second case, the user is not authenticated by the WLAN AN since no AAA Proxy/Server is present within WLAN AN (it can be authenticated by 3GPP AAA proxy/Server, if needed). Thus the list of PLMN shall be sent by the 3GPP AAA proxy/server which is the first AAA which can be reached by the WLAN UE.

In the third case, the user is authenticated by the 3GPP operator, using the 3GPP AAA Proxy/Server, to obtain the access to the WLAN AN. Thus the list of PLMN shall be sent by the 3GPP AAA proxy/server which is the first AAA which can be reached by the WLAN UE.

It is proposed that the TSs reflect such reasoning.

4 Conclusion

Considering the above reasoning the following CRs are proposed:

- CR 23.003 for addition of Alternative NAI
- CR 29.234 for revision of references to IETF RFC and addition of PLMN procedure in case of WLAN AN belonging to PLMN.

CHANGE REQUEST

⌘ **23003 CR 011** ⌘ 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:	⌘ BSF address		
Source:	⌘ Ericsson		
Work item code:	⌘ GAA	Date:	⌘ 04/11/2004
Category:	⌘ F	Release:	⌘ Rel-6
	<i>Use one of the following categories:</i> 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 .		<i>Use one of the following releases:</i> Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ SA3 removed the BSF discovery address mechanism and replaced the text by the format of the BSF address. This CR includes the text agreed in S3-040831 by which the BSF address is derived from either IMSI or IMPI depending on the UICC application that was used in the bootstrapping.
Summary of change:	⌘ Include a new section for GAA to indicate the BSF address format.
Consequences if not approved:	⌘ Misalignment between Stage 2 and 3 for the Online charging failure

Clauses affected:	⌘ 1.1.1,added a new section X										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘	Y	N	⌘	X	⌘	X	⌘	X		
Y	N										
⌘	X										
⌘	X										
⌘	X										
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.

1.1.1 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 21.905: "3G Vocabulary".
- [2] 3GPP TS 23.008: "Organization of subscriber data".
- [3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2"
- [4] 3GPP TS 23.070: "Routeing of calls to/from Public Data Networks (PDN)".
- [5] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".
- [6] 3GPP TS 29.060: "GPRS Tunnelling protocol (GPT) across the Gn and Gp interface".
- [7] 3GPP TS 43.020: "Digital cellular telecommunications system (Phase 2+); Security related network functions".
- [8] void
- [9] 3GPP TS 51.011: " Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".
- [10] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [11] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".
- [12] ITU-T Recommendation E.213: "Telephone and ISDN numbering plan for land Mobile Stations in public land mobile networks (PLMN)".
- [13] ITU-T Recommendation X.121: "International numbering plan for public data networks".
- [14] IETF RFC 791: "Internet Protocol".
- [15] IETF RFC 2373: "IP Version 6 Addressing Architecture".
- [16] 3GPP TS 25.401: "UTRAN Overall Description".
- [17] 3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling".
- [18] IETF RFC 2181: "Clarifications to the DNS Specification".
- [19] IETF RFC 1035: "Domain Names - Implementation and Specification".
- [20] IETF RFC 1123: "Requirements for Internet Hosts -- Application and Support".
- [21] IETF RFC 2462: "IPv6 Stateless Address Autoconfiguration".

- [22] IETF RFC 3041: "Privacy Extensions for Stateless Address Autoconfiguration in IPv6".
- [23] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes".
- [24] 3GPP TS 23.228: "IP Multimedia (IM) Subsystem – Stage 2"
- [25] IETF RFC 2486: "The Network Access Identifier"
- [26] IETF RFC 3261: "SIP: Session Initiation Protocol"
- [27] 3GPP TS 31.102: "Characteristics of the USIM Application."
- [28] void
- [29] 3GPP TS 44.118: "Radio Resource Control (RRC) Protocol, Iu Mode".
- [30] 3GPP TS 23.073: "Support of Localised Service Area (SoLSA); Stage 2"
- [31] 3GPP TS 29.002: "Mobile Application Part (MAP) specification"
- [32] 3GPP TS 22.016: "International Mobile Equipment Identities (IMEI)"
- [33] void
- [34] void
- [35] 3GPP TS 45.056: "CTS-FP Radio Sub-system"
- [36] 3GPP TS 42.009: "Security aspects" [currently not being raised to rel-5 – Pete H. looking into it]
- [37] 3GPP TS 25.423: "UTRAN Iur interface RNSAP signalling"
- [38] 3GPP TS 25.419: "UTRAN Iu-BC interface: Service Area Broadcast Protocol (SABP)"
- [39] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles"
- [40] ISO/IEC 7812: "Identification cards - Numbering system and registration procedure for issuer identifiers"
- [41] 3GPP TS 31.102 "Characteristics of the USIM Application"
- [42] 3GPP TS 33.102 "3G security; Security architecture"
- [43] 3GPP TS 43.130: "Iur-g interface; Stage 2"
- [45] IETF RFC 2806: "URLs for Telephone Calls"
- [46] 3GPP TS 44.068: "Group Call Control (GCC) protocol".
- [47] 3GPP TS 44.069: "Broadcast Call Control (BCC) Protocol".
- [48] 3GPP TS 24.234: "3GPP System to WLAN Interworking; UE to Network protocols; Stage 3".
- [49] IETF Internet-Draft: "Network Discovery and Selection within the EAP Framework". draft-adrangi-eap-network-discovery-and-selection-00, work in progress.
- [50] IETF Internet-Draft: "EAP AKA Authentication". draft-arkko-pppext-eap-aka-11, work in progress.
- [51] IETF Internet-Draft: "EAP SIM Authentication". draft-haverinen-pppext-eap-sim-12, work in progress.
- [52] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description"
- [53] IETF Internet-Draft: 'The Network Access Identifier'.draft-arkko-roamops-rfc2486bis-00, work in progress.

- [54] IETF RFC 2279: "UTF-8, a transformation format of ISO 10646".
- [55] 3GPP TS 33.234: "Wireless Local Area Network (WLAN) interworking security".
- [56] IETF Internet-Draft: 'The Network Access Identifier'.draft-arkko-roamops-rfc2486bis-00, work in progress.
- [xx] [3GPP TS 33.221 "Generic Authentication Architecture \(GAA\); Support for Subscriber Certificates \(rel-6\)".](#)

****** Second modified section ******

[x Numbering, addressing and identification within the GAA subsystem](#)

[x.1 Introduction](#)

[This clause describes the format of the parameters needed to access the GAA system. For further information on the use of the parameters see 3GPP TS 33.221 \[xx\]. For more information on the ".3gppnetwork.org" domain name and its applicability, see Annex D of the present document.](#)

[x.2 BSF address](#)

[The UE shall discover the address of the BSF \(BootStrapping Function\) from the identity information related to the UICC application that is used during bootstrapping procedure, i.e., IMSI for USIM, or IMPI for ISIM the following way:](#)

[- In the case where the USIM is used in bootstrapping, the address information shall be derived as follows:](#)

- [1. take the first 5 or 6 digits, depending on whether a 2 or 3 digit MNC is used \(see 3GPP TS 31.102 \[1\]\) and separate them into MCC and MNC; if the MNC is 2 digits then a zero shall be added at the beginning;](#)
- [2. use the MCC and MNC derived in step 1 to create the "bsf.mnc<MNC>.mcc<MCC>.3gppnetwork.org" domain name;](#)
- [3. add the label "bsf." to the beginning of the domain.](#)

[Example 1: If IMSI in use is "234150999999999", where MCC=234, MNC=15, and MSIN=0999999999, the BSF address would be "bsf.mnc015.mcc234.3gppnetwork.org".](#)

[- In the case where ISIM is used in bootstrapping, the address information shall be derived as follows:](#)

- [1. extract the domain name from the IMPI;](#)
- [2. add the label "bsf." to the beginning of the domain.](#)

[Example 2: If the IMPI in use is "user@operator.com", the BSF address would be "bsf.operator.com".](#)