Technical Specification Group Services and System Aspects **TSGS#22(04) 0100**
Meeting #23, Phoenix, Arizona, USA, 15-18 March 2004

TSG-SA WG1 #23 **S1-040256**
Innsbruck, Austria, 12 - 16 Jan 2004 **Agenda Item:**

Presentation of Specification to TSG

Presentation to: **TSG SA Meeting #23**

Document for presentation: **Requirements on 3GPP system to Wireless Local Area Network (WLAN) interworking; TS 22.234, Version 2.0.0**

Presented for: **Information and approval as Release 6 TS**

Abstract of document:

This document provides a repository for all agreed I-WLAN requirements. The content has been extracted from existing specifications and is based upon previously approved text.

Changes since last presentation to TSG-SA Meeting #:

None, initial presentation.

Outstanding Issues:

General requirements text clause 4 required

Approval for CRs to remove text from the Rel-6 source stage 1 documents to prevent duplication.

Contentious Issues:

None

3GPP TS 22.234 V2.0.0 (2004-03)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Requirements on 3GPP system to Wireless Local Area Network (WLAN) interworking; (Release 6)

Select keywords from list provided in specs database.

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

Interworking of WLAN systems with the 3GPP system was the subject of a feasibility study [2]. Suitable requirements were derived and incorporated into existing specifications. For this release, all requirements will be contained in the present document with suitable references in other specifications to guide the reader to I-WLAN requirements.

1 Scope

The present document specifies the functional requirements placed on the 3GPP system for interworking WLAN with the 3GPP system. Guidance is given for WLAN operators intending to provide the interworked WLAN capability.

2 References

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

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

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[2] 3GPP TR 22.934 (V6): "Feasibility study on 3GPP system to Wireless Local Area Network (WLAN) interworking"

[3] RFC 2486: "The Network Access Identifier"

[4] 3GPP TS 22.101: "Service principles"

[5] 3GPP TS 22.129: "Handover Requirements between UTRAN and GERAN or other Radio Systems"

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the [following] terms and definitions [given in ... and the following] apply.

APN: Access Point Name

Environment: The type of area to be covered by the WLAN network of a 3GPP - WLAN interworking; e.g. public, corporate and residential.

Home WLAN: The WLAN that is interworking with the HPLMN of the 3GPP - WLAN interworking user.

Interworking WLAN : WLAN that interworks with a 3GPP system**.**

Online Charging : See [1]

Offline Charging : See [1]

Serving WLAN : The interworking WLAN that the user is connected to, i.e. either a visited or a home WLAN.

Visited WLAN: An interworking WLAN that Interworks only with a visited PLMN.

WLAN coverage: an area where wireless local area network access services are provided for interworking by an entity in accordance with WLAN standards.

WLAN roaming: The ability for a 3GPP - WLAN interworking user (subscriber) to function in a serving WLAN different from the home WLAN

3GPP - WLAN Interworking: Used generically to refer to interworking between the 3GPP system and the WLAN family of standards**.**

3.2 Abbreviations

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

I-WLAN Interworked / interworking WLAN

4 General description

The main text of the document should start here, after the above clauses have been added.

The following styles and editing techniques are aimed to help in the formatting of the document using the 3GPP Template: 3GPP_70.dot, available from the 3GPP FTP site (ftp://ftp.3gpp.org/Information).

5 High level requirements

5.1 Service principles

5.1.1 Numbering

When the UE is connected via a I-WLAN, the addressing shall be based on Network Access Identifier (NAI) format (user@realm) as defined in RFC 2486 [3].

5.1.2 USIM and UICC

Access via a I-WLAN shall be possible using earlier releases (than the current release) of the UICC or using a SIM.

Access to services via an I-WLAN with a single UICC shall be possible.

5.1.3 Roaming

Roaming from the home environment to I-WLANs is required. The I-WLAN may be part of the home environment or a visited network. The interworking shall support the case where a 3GPP operator does not operate the I-WLAN.

5.1.4 Charging

Charging in the 3GPP system shall not be compromised when access is via an I-WLAN.

5.1.5 Subscription

The subscription to a network operator may identify the radio access technologies over which the subscriber may access their services e.g. I-WLAN.

5.1.6 Emergency calls

Any attempt to make an emergency call shall be handled as defined for a Data Only network in 3GPP TS 22.101[4].

5.1.7 Interworking between PLMN and WLANs

5.1.7.1 General

WLAN-3GPP system interworking is defined as a wireless IP connectivity service where the user obtains access via a Wireless LAN technology. It shall be possible to deploy the WLAN as an integral part of the 3GPP system or the two systems can be separate.

The 3GPP system shall be capable of interworking with one or more WLANs and a WLAN shall be capable of interworking with one or more 3GPP systems see figure 1.

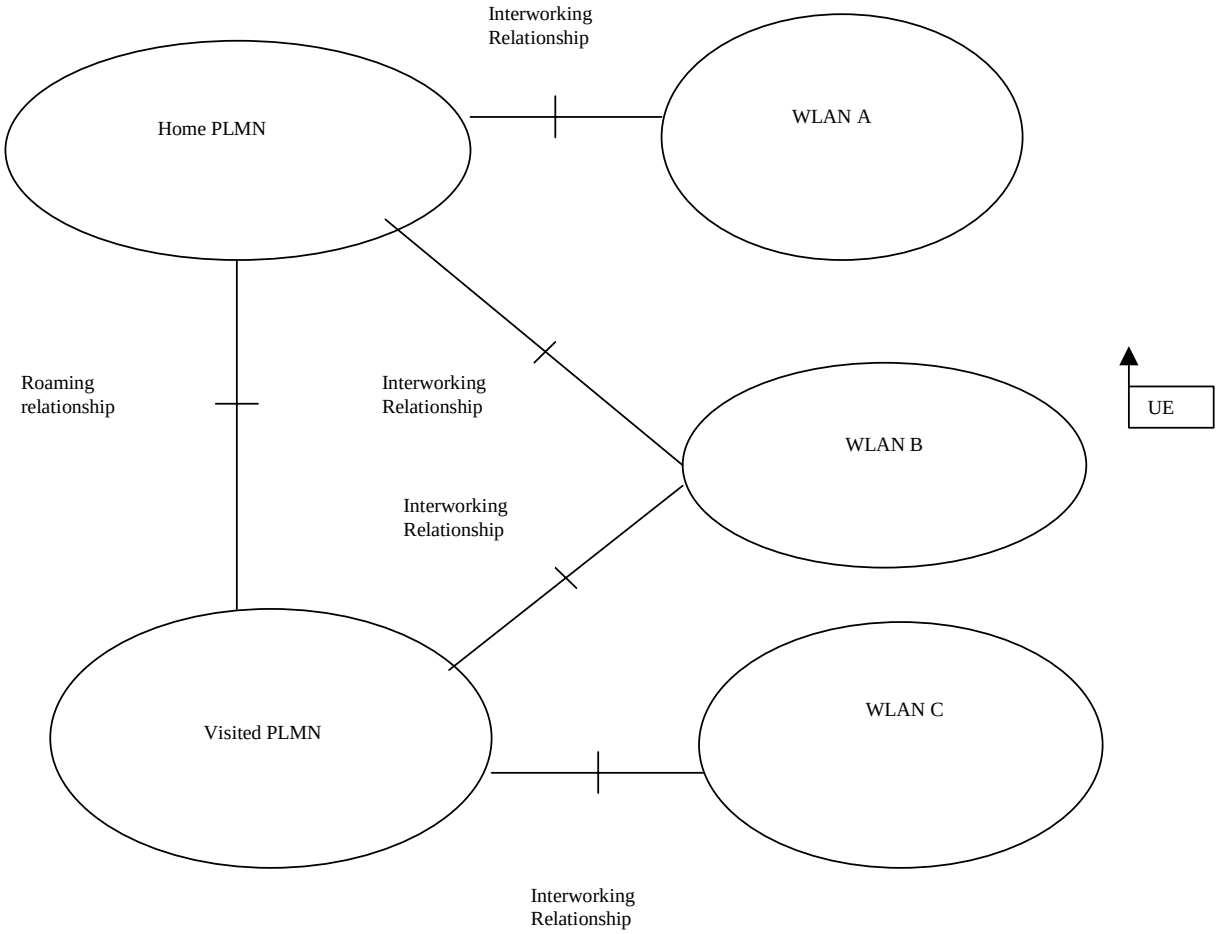

Figure 1: WLAN-3GPP system Interworking Relationships

The service is subject to a 3GPP system subscription see section 15. Both IPv4 and IPv6 connectivity via a Wireless LAN (WLAN) shall be supported.

It is an operator decision as to the level of interworking supported. This can be broadly grouped as:

- 3GPP based access control and charging. The user shall be able to access general internet services and/or corporate intranets. (Scenario 2 of TR 22.934 [2])
- Access to 3GPP PS based services, e.g. IMS. (Scenario 3 of TR 22.934 [2])
- Access to 3GPP PS based services with service continuity. The user mayor may not notice a disruption in service, depending upon the level of service continuity supported. This is further defined in TS 22.129 [5]. (Scenarios 4 and 5 of TR 22.934 [2])

NOTE: Further information on these levels of interworking and the use cases supported can be found in TR 22.934 [2].

In addition to the general requirements on I-WLAN defined in the present document, the following requirements apply:

- When enabling access to 3GPP services that require separate authentication and access control, such as IMS, the service authentication and access control mechanisms for that service shall be used.
- It should be possible to provide access via I-WLAN on deployed WLAN devices.

5.1.7.2 Simultaneous Connection to I-WLANs and 3GPP systems

The 3GPP system shall support simultaneous connection to an I-WLAN and to the 3GPP systems for the following scenarios:

- For an integrated WLAN/3GPP device the user shall be able to make or receive a CS domain call without the need to drop the connection to the I-WLAN and visa versa.
- For an integrated WLAN/3GPP device the user shall be able to connect to both the PS domain and to the I-WLAN at the same time, to access different services. For example, this will allow the user to access the Presence service via the 3GPP system and the internet via the I-WLAN.
- The user shall be able to connect simultaneously to the 3GPP system and the I-WLAN with multiple devices (which have separate UICCs) on the same subscription.

6 Service requirements

6.1.1 Network selection

The UE shall support both manual and automatic network selection mechanisms (modes) as standardized.

The UE shall use the last network selection mode used, as the default mode, at every switch-on.

The user shall be given the opportunity to change the network selection mode at any time.

When selecting a PLMN that is accessed via an interworked WLAN the UE shall be able to determine if the home or preferred PLMNs are available. The I-WLAN and PLMN selection shall adhere to operator and end user preferences using similar procedures as for Network Selection without WLAN Interworking. This set of preferences may be different from the preferences used for direct 3GPP access. In manual network selection the user shall be able to request a list of available PLMNs via interworked WLANs.

NOTE 1: The 3GPP operator may have agreements with multiple I-WLANs in the area and has preference over which WLAN to connect to based on the services supported.

NOTE 2: The adaptation of the Network Selection procedures to the WLAN Interworking environment should take into account performance criteria (e.g. power consumption, network load).

6.1.2 Dual mode 3GPP / WLAN devices

The UE shall select between the available 3GPP systems and the WLANs by using similar procedures as for Network Selection without WLAN Interworking.

NOTE 1: The 3GPP operator may have agreements with multiple WLANs in the area and has preference over which WLAN to connect to based on the services supported.

6.2 Operator determined barring

Access to services via an Interworking WLAN is different in nature to Circuit and other 3GPP packet oriented services, and therefore has different requirements for Operator Determined Barring.

As described in the following categories, the Service Provider may at any time activate this feature and this shall terminate any relevant services in progress, and bar future requests for service covered by the barring category:

- It shall be possible to bar subscribers attached via an Interworking WLAN completely from the interworked service capabilities.
- It shall be possible to bar a subscriber from requesting interworking through access points that are within the HPLMN whilst the subscriber is WLAN connected via a VPLMN
- It shall be possible to bar a subscriber from requesting Packet Oriented Services from access points that are within the roamed to VPLMN.
- It shall be possible to bar a subscriber from requesting direct Internet access from access points that are within the I-WLAN

The term 'access point' is used to indicate the Network Element (e.g. PDG or GGSN) or part of the Network Element (e.g. PDG or GGSN) that is specified by a particular APN.

7 Charging

The advent of I-WLAN, may further enhance the ease of use for the mobile system user and virtually extend the effective coverage areas of each system. It shall be possible to charge the user for services offered by the interworking between WLAN and 3GPP system in terms of access, usage, etc which is an operator decision as to the level of interworking supported.

It shall be the role of the 3GPP system to process the I-WLAN access resource usage information into 3GPP compatible format (e.g. CDR).

Annex A (informative): Change history

It is usual to include an annex (usually the final annex of the document) for specifications under TSG change control which details the change history of the specification using a table as follows:

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
16-01-2004	*SA-23*	*S1-040250*			*Creation of TS*		*2.0.0*