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Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

3G Security;

Wireless Local Area Network (WLAN) interworking security

(Release 16)

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# 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

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# 1 Scope

The present document provides an index to the set of specifications for interworking between 3GPP systems and Wireless Local Area Networks (WLAN ).

No further changes to this specification are intended. If any future evolution of the procedures in this specification is necessary, it should be documented in other specifications.

# 2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] Void

[2] Void

[3] Void.

[4] Void.

[5] Void.

[6] Void.

[7] Void.

[8] Void

[9] Void.

[10] Void.

[11] Void.

[12] Void.

[13] 3GPP TS 23.234: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP system to Wireless Local Area Network (WLAN) Interworking; System Description" (Release 12).

[14] Void.

[15] Void.

[16] Void.

[17] Void..

[18] Void.

[19] Void.

[20] Void.

[21] Void.

[22] Void.

[23] Void.

[24] Void.

[25] Void.

[26] Void.

[27] Void.

[28] Void.

[29] Void.

[30] Void.

[31] Void.

[32] Void.

[33] - [35] Void.

[36] Void.

[37] Void.

[38] Void.

[39] Void.

[40] Void.

[41] Void.

[42] Void.

[43] Void.

[44] Void.

[45] Void.

[46] Void.

[47] Void.

[48] Void.

[49] Void.

[50] Void.

[51] Void.

[52] 3GPP TS 22.234: "Requirements on 3GPP system to Wireless Local Area Network (WLAN) interworking (Release 13)".

[53] 3GPP TS 32.252: "Telecommunication management; Charging management; Wireless Local Area Network (WLAN) charging (Release 11)".

[54] 3GPP TS 24.235: "3GPP System to Wireless Local Area Network (WLAN) interworking Management Object (MO) (Release 12)".

[55] 3GPP TS 24.327: "Mobility between 3GPP Wireless Local Area Network (WLAN) interworking (I-WLAN) and 3GPP systems; General Packet Radio System (GPRS) and 3GPP I-WLAN aspects; Stage 3 (Release 12)".

[56] 3GPP TS 29.161: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services with Wireless Local Area Network (WLAN) access and Packet data (Release 11)".

[57] 3GPP TS 29.234: "3GPP system to Wireless Local Area Network (WLAN) interworking; Stage 3 (Release 11)".

# 3 Definitions and abbreviations

## 3.1 Definitions

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## 3.2 Abbreviations

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# 4 Security Requirements for 3GPP-WLAN Interworking

This feature has been discontinued since Release 13 and the present specification is used to provide references to the latest versions of the stage-1, 2 and 3 specifications.

- TS 22.234 [52].

- TS 24.234 [47].

- TS 24.235 [54].

- TS 24.327 [55].

- TS 29.161 [56].

- TS 29.234 [57].

- TS 23.234 [13].

- TS 32.252 [53].

Annex A (informative):  
Change history

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | | | |
| Date | TSG # | TSG Doc. | CR | Rev | Cat | Subject/Comment | Old | New | WI |
| 2004-03 | SP-23 | SP-040167 | - | - |  | Presented for approval at TSG SA #23 | 1.0.1 | 2.0.0 |  |
| 2004-03 | SP-23 | - | - | - |  | Approved and placed under Change Control (Rel-6) | 2.0.0 | 6.0.0 |  |
| 2004-06 | SP-24 | SP-040384 | 001 | - |  | Profiling of IKEv2 and ESP for NAT traversal | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040385 | 002 | - |  | Sending of temporary identities from WLAN UE | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040386 | 003 | - |  | Extension of IKEv2 and IPsec profiles | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040462 | 004 | 1 |  | Support of EAP SIM and AKA in AAA server and WLAN UE | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040388 | 005 | - |  | Introduction of UE split alternative 2 in TS 33.234 | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040389 | 006 | - |  | Re-authentication failure notification to HSS | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040390 | 007 | - |  | Identity request procedure clarification | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040391 | 008 | - |  | WLAN mechanism to allow restrictions on simultaneous sessions | 6.0.0 | 6.1.0 | WLAN |
| 2004-06 | SP-24 | SP-040392 | 009 | - |  | Requirement on keeping WLAN access keys independent from 2G/3G access keys stored in USIM | 6.0.0 | 6.1.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 010 | - |  | Update reference to RFC3748 "Extensible Authentication Protocol (EAP)" | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 011 | - |  | References update | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 012 | - |  | Sending of temporary identities from WLAN UE | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 013 | - |  | Clarification on fast re-authentication procedure | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 014 | - |  | Correction of authentication procedure for WLAN UE split | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 016 | - |  | Wa interface security | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 017 | - |  | Introduction of protected result indications | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | SP-25 | SP-040622 | 018 | - |  | Tunnel authentication procedure in Wm interface | 6.1.0 | 6.2.0 | WLAN |
| 2004-09 | - | - | - | - |  | Resolution of CR 015 (see below) which modified the same parts as CR 017 (MCC) | 6.2.0 | 6.2.1 |  |
| 2004-09 | SP-25 | SP-040622 | 015 | - |  | Modification of mechanism to restrict simultaneous WLAN sessions | 6.2.0 | 6.2.1 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 019 | 2 |  | Profile for PDG certificates in Scenario 3 | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040868 | 020 | 5 |  | Impact of Feasibility Study on (U)SIM Security Reuse by Peripheral Devices on Local Interfaces | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 024 | 1 |  | Sending of W-APN identification | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 025 | 2 |  | Clean up of not completed chapters | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 027 | 6 |  | Correction of WLAN UE function split | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 028 | - |  | Passing keying material to the WLAN-AN during the Fast re-authentication procedure | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 029 | 1 |  | Clarification on Deletion of Temporary IDs | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 030 | - |  | Clarification on Protecting Re-authentication ID in FAST/FULL Re-Authentication procedure | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 031 | - |  | Assigning Remote IP Address to WLAN UE using IKEv2 configuration Payload | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 033 | 1 |  | Tunnel Establishment Procedure | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 036 | - |  | Deletion of inconclusive text on A5/2 countermeasures | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 037 | 1 |  | Alignment of IPsec profile with RFC2406 | 6.2.1 | 6.3.0 |  |
| 2004-12 | SP-26 | SP-040858 | 040 | 2 |  | Control of simultaneous sessions in WLAN 3GPP IP access | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 041 | 1 |  | Completion of definition and abbreviations | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 042 | 1 |  | Fallback from re-authentication to full authentication | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 043 | - |  | Clarification on the use of IMSI in WLAN 3GPP IP access | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 044 | 2 |  | Clarification on the use of MAC addresses | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 045 | - |  | Clarifications and corrections on the use of pseudonyms | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 047 | - |  | Wn Reference Point Description | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 048 | - |  | Removal of word "scenario" | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 049 | 1 |  | Correction of WRAP to CCMP | 6.2.1 | 6.3.0 | WLAN |
| 2004-12 | SP-26 | SP-040858 | 050 | 1 |  | Removal of resolved editors' notes | 6.2.1 | 6.3.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 051 | - |  | Wu Reference Point Description | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 052 | 1 |  | Replacing PDGW with PDG | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 055 | 1 |  | Clarification on EAP-AKA(SIM) description in 3GPP IP access authentication and authorization | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 056 | 2 |  | Threat of users accessing each other in link layer and corresponding security requirements of user traffic segregation | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 057 | 1 |  | Clarifying the status that can’t be changed in the security requirement of WLAN-UE split | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 058 | 2 |  | WLAN AN providing protection against IP address spoofing | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 059 | 1 |  | Clarification on the handling of simultaneous sessions | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 060 | 2 |  | Removal of editors' notes | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 061 | 1 |  | Detecting the start of a WLAN Direct IP Access session based on Wa/Wd Accounting Messages | 6.3.0 | 6.4.0 | WLAN |
| 2005-03 | SP-27 | SP-050142 | 063 | 1 |  | Adding verification method of PDG certification by OSCP protocol | 6.3.0 | 6.4.0 | WLAN |
| 2005-06 | SP-28 | SP-050265 | 064 | 2 | F | Specify the number of the IPsec SAs under the same IKE SA in WLAN 3GPP IP access | 6.4.0 | 6.5.0 | WLAN |
| 2005-06 | SP-28 | SP-050265 | 065 | 1 | F | Terminate WLAN session by AAA server | 6.4.0 | 6.5.0 | WLAN |
| 2005-06 | SP-28 | SP-050265 | 066 | - | F | Correction to the definition of the Wn Reference Point | 6.4.0 | 6.5.0 | WLAN |
| 2005-06 |  |  |  |  |  | Corrects version number on cover page | 6.5.0 | 6.5.1 |  |
| 2005-09 | SP-29 | SP-050547 | 0067 | - | F | Correction of reference | 6.5.1 | 6.6.0 | WLAN |
| 2005-09 | SP-29 | SP-050547 | 0068 | - | F | Clarification on obtaining Remote IP address during Tunnel Establishment Procedure | 6.5.1 | 6.6.0 | WLAN |
| 2005-09 | SP-29 | SP-050547 | 0069 | - | F | Profiling of IKEv2 to support Re-keying of IPsec SAs and IKE SAs | 6.5.1 | 6.6.0 | WLAN |
| 2005-09 | SP-29 | SP-050547 | 0070 | - | F | Separation of authentication and authorization in WLAN 3GPP IP access | 6.5.1 | 6.6.0 | WLAN |
| 2005-09 | SP-29 | SP-050547 | 0071 | - | F | Support for simultaneous WLAN direct IP access sessions | 6.5.1 | 6.6.0 | WLAN |
| 2005-12 | SP-30 | SP-050765 | 0072 | - | F | IMSI availability at PDG | 6.6.0 | 6.7.0 | WLAN |
| 2006-03 | SP-31 | SP-060047 | 0073 | - | F | Correction of the incorrect statement in Tunnel fast re-authentication and authorization | 6.7.0 | 6.8.0 | WLAN |
| 2006-03 | SP-31 | SP-060047 | 0074 | - | F | updating the reference | 6.7.0 | 6.8.0 | WLAN |
| 2006-03 | SP-31 | SP-060047 | 0076 | - | F | Correction to authentication information retrieval between 3GPP AAA Server and HSS | 6.7.0 | 6.8.0 | WLAN |
| 2006-03 | SP-31 | SP-060058 | 0075 | - | C | Addition of in-band OCSP support | 6.7.0 | 7.0.0 | WLAN |
| 2006-06 | SP-32 | SP-060414 | 0078 | 1 | F | Correction of reference | 7.0.0 | 7.1.0 | WLAN |
| 2006-06 | SP-32 | SP-060382 | 0079 | - | B | Tunnel setup procedures for the private network access from WLAN 3GPP IP Access | 7.0.0 | 7.1.0 | I-WLAN Private NW access |
| 2006-06 | SP-32 | SP-060382 | 0080 | - | C | Clarification on PDG requirements for in-band OCSP support and update of reference | 7.0.0 | 7.1.0 | WLAN |
| 2006-09 | SP-33 | SP-060498 | 0081 | - | F | Correction to protocol used in Wx reference point | 7.1.0 | 7.2.0 | WLAN2 |
| 2006-09 | SP-33 | SP-060652 | 0082 | 1 | F | Corrections and updates of references | 7.1.0 | 7.2.0 | WLAN2 |
| 2006-12 | SP-34 | SP-060804 | 0085 | 1 | F | Correction of the Note re. fast re-authentication | 7.2.0 | 7.3.0 | WLAN |
| 2007-03 | SP-35 | SP-070149 | 0087 | 1 | F | CR 33.234-0087 - Update Reference | 7.3.0 | 7.4.0 | WLAN2 |
| 2007-03 | SP-35 | SP-070218 | 0091 | 1 | A | Mandate the format of PDG ID | 7.3.0 | 7.4.0 | WLAN |
| 2007-03 | SP-35 | SP-070144 | 0093 | 1 | A | Correction and clarification of 3GPP AAA Server behaviour | 7.3.0 | 7.4.0 | TEI6 |
| 2007-03 | SP-35 | SP-070161 | 0095 | 1 | D | Correction of reference | 7.3.0 | 7.4.0 | TEI7 |
| 2007-03 | SP-35 | SP-070141 | 0096 | - | A | Extension of scope of TS 33.234 | 7.3.0 | 7.4.0 | WLAN |
| 2007-03 | SP-35 | SP-070161 | 0098 | - | A | Clarification on certificate chain handling | 7.3.0 | 7.4.0 | TEI7 |
| 2007-06 | SP-36 | SP-070467 | 0088 | 2 | B | Support of IMS emergency call over I-WLAN | 7.4.0 | 7.5.0 | WLAN |
| 2007-06 | SP-36 | SP-070339 | 0089 | 2 | B | Support of IMS emergency call over I-WLAN for UICC-less case | 7.4.0 | 7.5.0 | WLAN |
| 2007-12 | SP-38 | SP-070911 | 0099 | 3 | B | Support of IMS emergency call over I-WLAN | 7.5.0 | 8.0.0 | WLAN |
| 2008-03 | SP-39 | SP-080144 | 0100 | 1 | F | Note on using an unauthenticated Diffie\_Hellman exchange for emergency calls | 8.0.0 | 8.1.0 | TEI8 |
| 2009-09 | SP-45 | SP-090526 | 0102 | 1 | F | Addition of cipher suite for interworking WLAN | 8.1.0 | 9.0.0 | TEI9 |
| 2010-03 | SP-47 | SP-100103 | 0103 | 1 | F | Use of EAP Request/AKA Identity message | 9.0.0 | 9.1.0 | TEI9 |
| 2010-06 | SP-48 | SP-100251 | 0104 | - | F | Use of EAP Request/AKA Identity message | 9.1.0 | 9.2.0 | TEI9 |
| 2010-06 | SP-48 | SP-100361 | 0105 | 1 | C | Deprecation of SHA-1 and other changes to certificate, CRL and OCSP profiles | 9.1.0 | 9.2.0 | TEI9 |
| 2010-06 | SP-49 | SP-100474 | 0106 | 2 |  | IPsec alignment | 9.2.0 | 10.0.0 | TEI10 |
| 2010-06 | SP-49 | SP-100482 | 0107 | 1 |  | Unification of certificate and CRL profiles in TS 33.234 with TS 33.310, clause 6.1 | 9.2.0 | 10.0.0 | TEI10 |
| 2011-03 | SP-51 | SP-110020 | 0108 | 1 | C | IPsec alignment | 10.0.0 | 11.0.0 | TEI11 |
| 2011-09 | SP-53 | SP-110563 | 0109 | - |  | IKEv2 profiling shall also point to TS 33.310 | 11.0.0 | 11.1.0 | Sec11 |
| 2011-09 | SP-53 | SP-110564 | 0111 | 1 |  | Removal of last step in tunnel authentications | 11.0.0 | 11.1.0 | TEI10 |
| 2011-12 | SP-54 | SP-110848 | 0110 | 1 | C | CR to 33.234: Removal of maximum number of IKEv2 SA limit | 11.1.0 | 11.2.0 | Sec11 |
| 2011-12 | SP-54 | SP-110848 | 0113 | 1 | C | Authentication for Private Network Access | 11.1.0 | 11.2.0 | Sec11 |
| 2012-03 | SP-55 | SP-120038 | 0117 | 1 | A | Corrections to IKEv2 procedure | 11.2.0 | 11.3.0 | TEI10 |
| 0120 | 2 | A | The identity of the UICC-less UE in emergency call |
| 2012-06 | SP-56 | SP-120341 | 0121 | 1 | F | Removal of void references in IMS emergency call over I-WLAN | 11.3.0 | 11.4.0 | SEC11 |
| 2013-12 | SP-62 | SP-130667 | 0122 | 1 | F | User profile fetching before authentication in WLAN interworking | 11.4.0 | 12.0.0 | TEI12,WLAN |
| 2014-09 | SP-65 | SP-140593 | 0123 | - | F | Adding a Note on new purpose of specification | 12.0.0 | 12.1.0 | TEI12 |
| 2016-01 | SP-70 |  |  |  |  | Upgrade to Rel-13 (MCC) | 12.1.0 | 13.0.0 |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2016-12 | SA#74 | SP-160787 | 0126 | 1 | C | Alignment according to withdrawal of I-WLAN feature | 13.1.0 |
| 2017-03 | SA#75 | - | - | - |  | Promotion to Release 14 without technical change | **14.0.0** |
| 2018-06 | - | - | - | - | - | Update to Rel-15 version (MCC) | **15.0.0** |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | **16.0.0** |