

# ETSI TS 123 304 V18.8.0 (2025-04)



## 5G; Proximity based Services (ProSe) in the 5G System (5GS) (3GPP TS 23.304 version 18.8.0 Release 18)

Document Preview

[ETSI TS 123 304 V18.8.0 \(2025-04\)](https://standards.iteh.ai/catalog/standards/etsi/06eeef3b-14f8-441d-894a-29fa9887187d/etsi-ts-123-304-v18-8-0-2025-04)

<https://standards.iteh.ai/catalog/standards/etsi/06eeef3b-14f8-441d-894a-29fa9887187d/etsi-ts-123-304-v18-8-0-2025-04>



---

**Reference**RTS/TSGS-0223304vi80

---

**Keywords**5G

---

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

---

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° w061004871

---

**Important notice**

---

The present document can be downloaded from the  
[ETSI Search & Browse Standards application](#).

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver repository](#).

Users should be aware that the present document may be revised or have its status changed, this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our [Coordinated Vulnerability Disclosure \(CVD\)](#) program.

---

**Notice of disclaimer & limitation of liability**

---

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

---

**Copyright Notification**

---

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2025.  
All rights reserved.

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

---

## Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables. (2025-04)

The cross reference between 3GPP and ETSI identities can be found at [3GPP to ETSI numbering cross-referencing](#).

---

## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

# Contents

Intellectual Property Rights .....	2
Legal Notice .....	2
Modal verbs terminology.....	2
Foreword.....	9
1 Scope .....	11
2 References .....	11
3 Definitions of terms and abbreviations.....	12
3.1 Terms.....	12
3.2 Abbreviations .....	14
4 Architecture model and concepts .....	14
4.1 General concept.....	14
4.2 Architectural reference model .....	14
4.2.1 Non-roaming reference architecture .....	14
4.2.2 Roaming reference architecture .....	16
4.2.3 Inter-PLMN reference architecture.....	17
4.2.4 AF-based service parameter provisioning.....	19
4.2.5 Reference points .....	20
4.2.6 Service-based interfaces .....	21
4.2.7 5G ProSe UE-to-Network Relay reference architecture .....	21
4.2.7.1 5G ProSe Layer-3 UE-to-Network Relay reference architecture .....	21
4.2.7.2 5G ProSe Layer-2 UE-to-Network Relay reference architecture .....	23
4.2.8 5G ProSe UE-to-UE Relay reference architecture.....	24
4.3 Functional Entities.....	24
4.3.1 UE.....	24
4.3.2 5G DDNMF.....	25
4.3.2.1 General.....	25
4.3.2.2 5G DDNMF Discovery .....	26
4.3.3 PCF .....	26
4.3.4 AMF.....	26
4.3.5 UDM.....	27
4.3.6 UDR.....	27
4.3.7 NRF .....	27
4.3.8 ProSe Application Server.....	27
4.3.9 5G ProSe UE-to-Network Relay.....	28
4.3.9.1 General .....	28
4.3.9.2 5G ProSe Layer-3 UE-to-Network Relay .....	28
4.3.9.3 5G ProSe Layer-2 UE-to-Network Relay .....	29
4.3.10 SMF .....	29
4.3.11 NEF.....	29
4.3.12 5G ProSe UE-to-UE Relay .....	29
4.3.12.1 General .....	29
4.3.12.2 5G ProSe Layer-3 UE-to-UE Relay .....	30
4.3.12.3 5G ProSe Layer-2 UE-to-UE Relay .....	30
5 High level functionality and features .....	30
5.1 Authorization and Provisioning for ProSe service .....	30
5.1.1 General.....	30
5.1.1a General principles for applying policy/parameters .....	32
5.1.2 Authorization and Provisioning for 5G ProSe Direct Discovery .....	33
5.1.2.1 Policy/Parameter provisioning for 5G ProSe Direct Discovery .....	33
5.1.2.2 Principles for applying parameters for 5G ProSe Direct Discovery.....	35
5.1.3 Authorization and Provisioning for 5G ProSe Direct Communication.....	35
5.1.3.1 Policy/Parameter provisioning for 5G ProSe Direct Communication.....	35
5.1.3.2 Principles for applying parameters for 5G ProSe Direct Communication .....	36

5.1.4	Authorization and Provisioning for 5G ProSe UE-to-Network Relay .....	37
5.1.4.1	Policy/Parameter provisioning for 5G ProSe UE-to-Network Relay .....	37
5.1.4.2	Principles for applying parameters for 5G ProSe UE-to-Network Relay .....	39
5.1.4.2.1	Principles for applying parameters for ProSe UE-to-Network Relay discovery .....	39
5.1.4.2.2	Principles for applying parameters for 5G ProSe UE-to-Network Relay communication .....	39
5.1.4.3	Network controlled security procedures for 5G ProSe UE-to-Network Relay .....	39
5.1.4.3.1	General .....	39
5.1.4.3.2	Control Plane based security procedures for 5G ProSe UE-to-Network Relay .....	40
5.1.4.3.3	User Plane based security procedures .....	40
5.1.5	Authorization and Provisioning for 5G ProSe UE-to-UE Relay .....	40
5.1.5.1	Policy/Parameter provisioning for 5G ProSe UE-to-UE Relay .....	40
5.1.5.2	Principles for applying parameters for 5G ProSe UE-to-UE Relay .....	42
5.1.5.2.1	Principles for applying parameters for ProSe UE-to-UE Relay discovery .....	42
5.1.5.2.2	Principles for applying parameters for 5G ProSe UE-to-UE Relay communication .....	42
5.2	5G ProSe Direct Discovery .....	42
5.2.1	General .....	42
5.2.2	5G ProSe Direct Discovery Models .....	43
5.2.3	5G ProSe UE-to-Network Relay Discovery .....	43
5.2.4	5G ProSe Direct Discovery Characteristics .....	43
5.2.5	5G ProSe UE-to-UE Relay Discovery .....	44
5.3	5G ProSe Direct Communication .....	44
5.3.1	General .....	44
5.3.2	Broadcast mode 5G ProSe Direct Communication .....	44
5.3.3	Groupcast mode 5G ProSe Direct Communication .....	44
5.3.4	Unicast mode 5G ProSe Direct Communication .....	45
5.4	5G ProSe UE-to-Network Relay .....	45
5.4.1	5G ProSe Layer-3 UE-to-Network Relay .....	45
5.4.1.1	General .....	45
5.4.1.2	5G ProSe Layer-3 UE-to-Network Relay with N3IWF support .....	46
5.4.1.3	Policy control and session binding to support 5G ProSe Layer-3 UE-to-Network Relay without N3IWF .....	46
5.4.2	5G ProSe Layer-2 UE-to-Network Relay .....	47
5.4.3	Mobility Restrictions for 5G ProSe UE-to-Network Relaying .....	47
5.4.4	Support of emergency service from 5G ProSe Remote UE via 5G ProSe UE-to-Network Relay .....	48
5.4.4.1	General .....	48
5.4.4.2	Emergency service from 5G ProSe Remote UE via via 5G ProSe Layer-2 UE-to-Network Relay .....	48
5.4.4.3	Emergency service from 5G ProSe Remote UE via 5G ProSe Layer-3 UE-to-Network Relay .....	49
5.5	IP address allocation .....	49
5.5.1	General .....	49
5.5.1.1	IP address allocation for unicast mode of 5G ProSe direct communication .....	49
5.5.1.2	IP address allocation for broadcast and groupcast modes of 5G ProSe direct communication .....	50
5.5.1.3	IP address allocation for communication with a 5G ProSe Layer-3 ProSe UE-to-Network Relay .....	50
5.5.1.4	IP address allocation for communication with a 5G ProSe Layer-3 UE-to-UE Relay .....	51
5.5.2	IPv6 Prefix Delegation via DHCPv6 for 5G ProSe Layer-3 UE-to-Network Relay .....	51
5.6	QoS handling .....	51
5.6.1	QoS handling for 5G ProSe Direct Communication .....	51
5.6.2	QoS handling for 5G ProSe UE-to-Network Relay operations .....	52
5.6.2.1	QoS handling for 5G ProSe Layer-3 UE-to-Network Relay without N3IWF .....	52
5.6.2.2	QoS handling for 5G ProSe Layer-3 UE-to-Network relay with N3IWF .....	54
5.6.2.3	QoS handling for 5G ProSe Layer-2 UE-to-Network Relay .....	55
5.6.3	QoS handling for 5G ProSe UE-to-UE Relay operations .....	55
5.6.3.1	QoS handling for 5G ProSe Layer-3 UE-to-UE Relay .....	55
5.6.3.2	QoS handling for 5G ProSe Layer-2 UE-to-UE Relay .....	56
5.7	Subscription to 5G ProSe .....	56
5.8	Identifiers .....	57
5.8.1	Identifiers for 5G ProSe Direct Discovery .....	57
5.8.1.0	General .....	57
5.8.1.1	ProSe Application ID .....	58
5.8.1.2	Destination Layer-2 ID .....	58
5.8.1.3	Source Layer-2 ID .....	58
5.8.1.4	ProSe Application Code .....	58
5.8.1.5	ProSe Restricted Code .....	58

5.8.1.6	ProSe Query Code.....	58
5.8.1.7	ProSe Response Code .....	58
5.8.1.8	User Info ID .....	58
5.8.1.9	ProSe Discovery UE ID .....	59
5.8.1.10	Restricted ProSe Application User ID.....	59
5.8.1.11	Announcing PLMN ID.....	59
5.8.1.12	Announcer Info .....	59
5.8.1.13	Discoverer Info .....	59
5.8.1.14	Target Info.....	59
5.8.1.15	Discoveree Info .....	59
5.8.1.16	Application Layer Group ID .....	59
5.8.1.17	Monitored PLMN ID.....	59
5.8.2	Identifiers for 5G ProSe Direct Communication .....	59
5.8.2.1	General .....	59
5.8.2.2	Identifiers for broadcast mode 5G ProSe direct communication.....	60
5.8.2.3	Identifiers for groupcast mode 5G ProSe direct communication .....	60
5.8.2.4	Identifiers for unicast mode 5G ProSe direct communication .....	60
5.8.3	Identifiers for 5G ProSe UE-to-Network Relay.....	61
5.8.3.1	Common identifiers for 5G ProSe UE-to-Network Relay.....	61
5.8.3.2	Identifiers for 5G ProSe Layer-3 UE-to-Network Relay.....	62
5.8.3.3	Identifiers for 5G ProSe Layer-2 UE-to-Network Relay.....	62
5.8.4	Identifiers for 5G ProSe UE-to-UE Relay Discovery .....	62
5.8.4.1	General .....	62
5.8.4.2	Common identifiers for 5G ProSe UE-to-UE Relay Discovery .....	63
5.8.5	Identifiers for 5G ProSe UE-to-UE Relay Communication with integrated Discovery.....	64
5.9	Support for 5G ProSe for UEs in limited service state .....	65
5.10	PC5 operation in EPS for Public Safety UE.....	65
5.11	Communication path selection between PC5 and Uu reference points .....	65
5.12	NAS level congestion control for 5G ProSe UE-to-Network Relay.....	66
5.13	Support for PC5 DRX operations .....	66
5.13.1	General.....	66
5.13.2	PC5 DRX operations for 5G ProSe Direct Discovery, 5G ProSe UE-to-Network Relay Discovery and 5G ProSe UE-to-UE Relay Discovery .....	66
5.13.3	PC5 DRX operations for 5G ProSe Direct Communication, 5G ProSe UE-to-Network Relay Communication and 5G ProSe UE-to-UE Relay Communication .....	67
5.14	5G ProSe UE-to-UE Relay Communication .....	67
5.14.1	5G ProSe Layer-3 UE-to-UE Relay Communication .....	67
5.14.2	5G ProSe Layer-2 UE-to-UE Relay Communication .....	68
5.15	Path switching between two UE-to-Network Relays .....	68
5.16	Communication path switching between PC5 and Uu reference points.....	68
5.17	Multi-path communication via Uu and via 5G ProSe UE-to-Network Relay .....	70
5.17.1	General.....	70
5.17.2	Multi-path communication via direct Uu path and via 5G ProSe Layer-3 UE-to-Network Relay .....	70
5.18	Support of Public Warning Notification Relaying .....	70
6	Functional description and information flows.....	71
6.1	Control and user plane stacks .....	71
6.1.1	Control Plane .....	71
6.1.1.1	General .....	71
6.1.1.2	UE - UE.....	71
6.1.1.2.1	Discovery plane PC5 interface .....	71
6.1.1.2.2	PC5 Signalling Protocol .....	72
6.1.1.3	UE - 5G DDNMF.....	72
6.1.1.4	5G DDNMF – UDM .....	72
6.1.1.5	5G DDNMF – 5G DDNMF .....	72
6.1.1.6	5G DDNMF – ProSe Application Server .....	72
6.1.1.7	5G ProSe UE-to-Network Relay .....	73
6.1.1.7.1	5G ProSe Layer-3 UE-to-Network Relay .....	73
6.1.1.7.2	5G ProSe Layer-2 UE-to-Network Relay .....	73
6.1.1.8	5G ProSe UE-to-UE Relay.....	74
6.1.1.8.1	5G ProSe Layer-2 UE-to-UE Relay .....	74
6.1.1.8.2	5G ProSe Layer-3 UE-to-UE Relay .....	74

6.1.2	User Plane .....	75
6.1.2.1	General .....	75
6.1.2.2	UE - UE .....	75
6.1.2.3	5G ProSe UE-to-Network Relay .....	76
6.1.2.3.1	5G ProSe Layer-3 UE-to-Network Relay .....	76
6.1.2.3.2	5G ProSe Layer-2 UE-to-Network Relay .....	76
6.1.2.4	5G ProSe UE-to-UE Relay .....	77
6.1.2.4.1	5G ProSe Layer-2 UE-to-UE Relay .....	77
6.1.2.4.2	5G ProSe Layer-3 UE-to-UE Relay .....	77
6.2	Procedures for Service Authorization and Provisioning to UE .....	77
6.2.1	General .....	77
6.2.2	PCF based Service Authorization and Provisioning to UE .....	78
6.2.3	PCF discovery .....	78
6.2.4	Procedure for UE triggered ProSe Policy provisioning .....	78
6.2.5	AF-based service parameter provisioning for ProSe over control plane .....	79
6.3	5G ProSe Direct Discovery .....	79
6.3.1	5G ProSe Direct Discovery with 5G DDNMF .....	79
6.3.1.1	Overview .....	79
6.3.1.2	Overall procedure for 5G ProSe Direct Discovery (Model A) .....	80
6.3.1.3	Overall procedure for 5G ProSe Direct Discovery (Model B) .....	81
6.3.1.4	Discovery Request procedures .....	82
6.3.1.5	Discovery Reporting procedures .....	83
6.3.1.6	Announcing Alert Procedures for restricted discovery .....	83
6.3.1.7	Direct Discovery Update Procedures .....	83
6.3.2	5G ProSe Direct Discovery procedures over PC5 reference point .....	84
6.3.2.1	General .....	84
6.3.2.2	Group Member Discovery .....	85
6.3.2.2.1	General .....	85
6.3.2.2.2	Procedure for Group Member Discovery with Model A .....	86
6.3.2.2.3	Procedure for Group Member Discovery with Model B .....	86
6.3.2.3	5G ProSe UE-to-Network Relay Discovery .....	87
6.3.2.3.1	General .....	87
6.3.2.3.2	Procedure for 5G ProSe UE-to-Network Relay Discovery with Model A .....	87
6.3.2.3.3	Procedure for 5G ProSe UE-to-Network Relay Discovery with Model B .....	88
6.3.2.4	5G ProSe UE-to-UE Relay Discovery .....	89
6.3.2.4.1	General .....	89
6.3.2.4.2	Procedure for 5G ProSe UE-to-UE Relay Discovery with Model A .....	89
6.3.2.4.3	Procedure for 5G ProSe UE-to-UE Relay Discovery with Model B .....	90
6.3.2.4.4	Candidate 5G ProSe UE-to-UE Relay Discovery .....	91
6.3.2.4.5	Acquiring Direct discovery set by model A discovery .....	91
6.4	5G ProSe Direct Communication .....	91
6.4.1	Broadcast mode 5G ProSe Direct Communication .....	91
6.4.2	Groupcast mode 5G ProSe Direct Communication .....	93
6.4.3	Unicast mode 5G ProSe Direct Communication .....	94
6.4.3.1	Layer-2 link establishment over PC5 reference point .....	94
6.4.3.2	Link identifier update for a unicast link .....	98
6.4.3.3	Layer-2 link release over PC5 reference point .....	99
6.4.3.4	Layer-2 link modification for a unicast link .....	100
6.4.3.5	Layer-2 link maintenance over PC5 reference point .....	101
6.4.3.6	Layer-2 link management over PC5 reference point for 5G ProSe UE-to-Network Relay .....	102
6.4.3.7	Layer-2 link management over PC5 reference point for 5G ProSe UE-to-UE Relay .....	103
6.4.3.7.1	Common part for Layer-2 link management over PC5 reference point for 5G ProSe UE-to-UE Relay .....	103
6.4.3.7.2	Layer-2 link management over PC5 reference point for 5G ProSe Layer-2 UE-to-UE Relay .....	105
6.4.3.7.3	Layer-2 link management over PC5 reference point for 5G ProSe Layer-3 UE-to-UE Relay .....	105
6.4.3.7.4	Layer-2 link management over PC5 reference point for 5G ProSe UE-to-UE Relay Communication with integrated Discovery .....	106
6.5	5G ProSe UE-to-Network Relay Communication .....	107
6.5.1	5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay .....	107
6.5.1.0	General .....	107
6.5.1.1	5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay without N3IWF .....	108
6.5.1.2	5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay with N3IWF support .....	110