
**Information technology —
Telecommunications and information
exchange between systems — Private
Integrated Services Network —
Specification, functional model and
information flows — Private User Mobility
(PUM) — Registration supplementary
service**

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de
services — Spécification, modèle fonctionnel et flux d'informations —
Mobilité de l'utilisateur privé (PUM) — Service supplémentaire
d'enregistrement*

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Contents

Foreword		v
Introduction		vi
1	Scope	1
2	Conformance	1
3	Normative references	1
4	Definitions	2
4.1	External definitions	2
4.2	AllCall registration	3
4.3	Additional network feature (ANF)	3
4.4	Alternative identifier	3
4.5	Destination number	3
4.6	Home Data Base (HDB)	3
4.7	Home PINX	3
4.8	Hosting address	3
4.9	InCall registration	3
4.10	Incoming PUM call	3
4.11	Originating number	3
4.12	OutCall registration	3
4.13	Outgoing PUM call	3
4.14	PUM user identity	3
4.15	Private User Mobility (PUM)	3
4.16	(PUM) de-registration	3
4.17	PUM registration	3
4.18	PUM number	3
4.19	PUM user	3
4.20	Registration session	3
4.21	Visitor area	3
4.22	Visitor Data Base (VDB)	3
4.23	Visitor PINX	3
5	List of acronyms	3
6	SS-PUMR stage 1 specification	5
6.1	Description	5
6.1.1	General description	5
6.1.2	Qualifications on applicability to telecommunication services	5
6.2	Procedure	5
6.2.1	Provision/withdrawal	5
6.2.2	Normal procedures	6
6.2.3	Exceptional procedures	7
6.3	Interaction with other supplementary services and ANFs	7
6.3.1	Number identification services (SS-CLIP, SS-COLP, SS-CLIR)	7
6.3.2	Calling Name Identification Presentation (SS-CNIP)	7
6.3.3	Connected Name Identification Presentation (SS-CONP)	7
6.3.4	Calling/Connected Name Identification Restriction (SS-CNIR)	7
6.3.5	Call Completion to Busy Subscriber (SS-CCBS)	8
6.3.6	Call Completion on No Reply (SS-CCNR)	8
6.3.7	Call Transfer (SS-CT)	8
6.3.8	Call Forwarding Unconditional (SS-CFU)	8
6.3.9	Call Forwarding Busy (SS-CFB)	8

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6.3.10	Call Forwarding No Reply (SS-CFNR)	8
6.3.11	Call Deflection (SS-CD)	8
6.3.12	Path Replacement (ANF-PR)	8
6.3.13	Call Offer (SS-CO)	8
6.3.14	Call Intrusion (SS-CI)	8
6.3.15	Do not Disturb (SS-DND)	8
6.3.16	Do not Disturb Override (SS-DNDO)	8
6.3.17	Advice of Charge (SS-AOC)	8
6.3.18	Recall (SS-RE)	8
6.3.19	Call Interception (ANF-CINT)	8
6.3.20	Transit Counter (ANF-TC)	8
6.3.21	Route Restriction Class (ANF-RRC)	8
6.3.22	Message Waiting Indication (SS-MWI)	8
6.3.23	Wireless Terminal Location Registration (SS-WTLR)	8
6.3.24	Wireless Terminal Incoming Call (ANF-WTMI)	9
6.3.25	Wireless Terminal Outgoing Call (ANF-WTMO)	9
6.3.26	Wireless Terminal Authentication of a WTM User (SS-WTAT)	9
6.3.27	Wireless Terminal Authentication of the PISN (SS-WTAN)	9
6.3.28	Private User Mobility Incoming Call (ANF-PUMI)	9
6.3.29	Private User Mobility Outgoing Call (ANF-PUMO)	9
6.3.30	Common Information (ANF-CMN)	9
6.3.31	Call Priority Interruption (Protection) (SS-CPI(P))	9
6.4	Interworking considerations	9
6.5	Overall SDL	10
7	SS-PUMR stage 2 specification	10
7.1	Functional model	10
7.1.1	Functional model description	10
7.1.2	Description of Functional Entities	11
7.1.3	Relationship of functional model to basic call functional model	12
7.2	Information flows	12
7.2.1	Definition of information flows	12
7.2.2	Relationship of information flows to basic call information flows	18
7.2.3	Information flow sequences	18
7.3	Functional Entity actions	24
7.3.1	Actions of FE1	24
7.3.2	Actions of FE2	25
7.3.3	Actions of FE3	25
7.3.4	Actions of FE4	25
7.3.5	Actions of FE5	25
7.3.6	Actions of FE6	26
7.3.7	Actions of FE7	26
7.3.8	Actions of FE8	26
7.4	Functional entity behaviour	27
7.4.1	Behaviour of FE1	27
7.4.2	Behaviour of FE2	29
7.4.3	Behaviour of FE3	32
7.4.4	Behaviour of FE4	33
7.4.5	Behaviour of FE5	37
7.4.6	Behaviour of FE6	40
7.4.7	Behaviour of FE7	41
7.4.8	Behaviour of FE8	42
7.5	Allocation of Functional Entities to physical equipment	43
7.6	Interworking considerations	43

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 17875 was prepared by ECMA (as ECMA-281) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

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Introduction

This International Standard is one of a series of standards defining services and signalling procedures applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC.

This International Standard specifies the Private User Mobility Registration (PUMR) supplementary service.

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

There is currently no equivalent service specified by ITU-T or ETSI for public ISDN.

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Private User Mobility (PUM) — Registration supplementary service

1 Scope

This International Standard specifies the Supplementary Service (SS) Private User Mobility Registration (PUMR), which is applicable to various basic services supported by Private Integrated Services Networks (PISN). Basic services are specified in ISO/IEC 11574.

SS-PUMR is a supplementary service that enables a PUM user to register at, or de-register from, any wired or wireless terminal within the PISN. The ability to register at different wired and wireless terminals in the PISN at different times enables the PUM user to maintain the provided services (including the ability to make and receive calls) at different access points.

Supplementary service specifications are produced in three stages, according to the method described in CCITT Rec. I.130. This International Standard contains the stage 1 and stage 2 specifications of SS-PUMR. The stage 1 specification (clause 6) specifies the general feature principles and capabilities. The stage 2 specification (clause 7) identifies the Functional Entities involved in the supplementary service and the information flows between them.

2 Conformance

In order to conform to this International Standard, a stage 3 standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary service specified in this International Standard. This means that, to claim conformance, a stage 3 standard is required to be adequate for the support of those aspects of clause 6 (stage 1) and clause 7 (stage 2) which are relevant to the interface or equipment to which the stage 3 standard applies.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11571:1998, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Addressing*.

ISO/IEC 11574:1994, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Circuit-mode 64 kbit/s bearer services — Service description, functional capabilities and information flows*.

ISO/IEC 11579-1:1994, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Part 1: Reference configuration for PISN exchanges (PINX)*.

ISO/IEC 13866:1995, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Call completion supplementary services*.

ISO/IEC 15428:1999, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Wireless Terminal Location Registration supplementary service and Wireless Terminal Information Exchange additional network feature*.

ISO/IEC 15430:1999, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Wireless terminal call handling additional network features*.

ISO/IEC 15432:1999, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Wireless Terminal Authentication supplementary services (WTAT and WTAN)*.

ISO/IEC 17877:2000, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Private User Mobility (PUM) — Call handling additional network features*.

CCITT Rec. I.130,1988, *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book)*.

ITU-T Rec. I.112:1993, *Vocabulary of terms for ISDNs*.

ITU-T Rec. I.210:1993, *Principles of telecommunication services supported by an ISDN and the means to describe them*.

ITU-T Rec. Z.100:1993, *Specification and description language*.

4 Definitions

For the purposes of this International Standard the following definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

- Basic service (ITU-T Rec. I.210)
- Call (Basic call) (ISO/IEC 11574)
- PISN Number (ISO/IEC 11571)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated Services Network Exchange (PINX) (ISO/IEC 11579-1)
- Service (ITU-T Rec. I.112)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- User (ISO/IEC 11574)

This International Standard refers to the following basic call Functional Entities (FE) defined in ISO/IEC 11574:

- Call Control (CC)
- Call Control Agent (CCA)

This International Standard refers to the following basic call inter-FE relationships defined in ISO/IEC 11574:

- r1
- r2
- r3

This International Standard refers to the following basic call information flows defined in ISO/IEC 11574:

- SETUP request/indication
- SETUP response/confirm
- RELEASE request/indication

This International Standard refers to the following service elements defined for basic call control in ISO/IEC 11574:

- Call History
- Connection Type
- Destination Number
- Destination Subaddress

- Originating Category
- Originating Number
- Originating Subaddress

4.2 AllCall registration : PUM registration for both incoming and outgoing calls. These two components are combined into a single service option, and cannot be separated.

4.3 Additional network feature (ANF) : A capability provided by a PISN, not generally directly to a User, over and above that of the Basic call.

4.4 Alternative identifier : An identifier, other than the PISN number, which identifies the PUM user uniquely.

4.5 Destination number : The PISN number of the original called user.

4.6 Home Data Base (HDB) : The database in which the data on the current location and associated parameters of a wireless terminal or a mobile user are stored.

4.7 Home PINX : The PINX that has direct access to the HDB entry for a particular PUM user.

4.8 Hosting address : The complete PISN number of the entity within the network to which incoming calls for the PUM user are directed by the Home PINX (i.e., the address where a PUM user is currently registered).

4.9 InCall registration : PUM registration for incoming calls.

4.10 Incoming PUM call : A call where the called user is a PUM user.

4.11 Originating number : The PISN number of the user initiating a call.

4.12 OutCall registration : PUM registration for outgoing calls.

4.13 Outgoing PUM call : A call originated by a PUM user.

4.14 PUM user identity : A PUM number or alternative identifier used to uniquely identify the PUM user.

4.15 Private User Mobility (PUM) : The capability of a PISN user to register at any PISN terminal, and so receive the PISN services at the hosting terminal.

4.16 (PUM) de-registration : The process whereby a PUM registration is cancelled.

4.17 PUM registration : The operation performed by a PUM user to inform the PISN of the PISN address that should be used for locating the user.

4.18 PUM number : A number which uniquely identifies a PUM user. This is the number used by the caller to reach the PUM user.

4.19 PUM user : For the purpose of this International Standard, a PUM user is defined as the user of the SS-PUMR supplementary service.

4.20 Registration session : The period following registration at a hosting address that the PUM user is registered to make calls, receive calls, or make and receive calls.

4.21 Visitor area : The coverage area of a visitor data base.

4.22 Visitor Data Base (VDB) : The database in which location information concerning a wireless terminal or a mobile user is stored, as long as the wireless terminal or the mobile user are localized in the corresponding visitor area.

4.23 Visitor PINX : The PINX that has direct access to the VDB currently associated with a particular PUM user.

5 List of acronyms

ANF	Additional Network Feature
AOC	Advice Of Charge
CC	Call Control (Functional Entity)
CCA	Call Control Agent (Functional Entity)
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply

ISO/IEC 17875:2000(E)

CD	Call Deflection
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CI	Call Intrusion
CICL	Call Intrusion Capability Level
CINT	Call INTerception
CLIP	Calling Line Identification Presentation
CLIR	Calling/Connected Line Identification Restriction
CMN	CoMmoN Information
CNIP	Calling Name Identification Presentation
CNIR	Calling/Connected Name Identification Restriction
CO	Call Offer
COLP	Connected Line Identification Presentation
CONP	Connected Name Identification Presentation
CPI	Call Priority Interruption
CPICL	Call Priority Interruption Capability Level
CPIP	Call Priority Interruption Protection
CPIPL	Call Priority Interruption Protection Level
CT	Call Transfer
DND	Do Not Disturb
DNDO	Do Not Disturb Override
FE	Functional Entity
FEA	Functional Entity Action
HDB	Home Data Base
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
PIN	Personal Identification Number
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
PR	Path Replacement
PUM	Private User Mobility
PUMI	PUM Incoming Call Handling
PUMO	PUM Outgoing Call Handling
PUMR	Private User Mobility Registration
RE	REcall
SDL	Specification and Description Language
SS	Supplementary Service
TC	Transit Counter

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TE	Terminal Equipment
VDB	Visitor Data Base
WT	Wireless Terminal
WTAU	Wireless Terminal AUthentication
WTLR	Wireless Terminal Location Registration
WTM	Wireless Terminal Mobility
WTM	Wireless Terminal Mobility
WTMI	Wireless Terminal Mobility Incoming call
WTMO	Wireless Terminal Mobility Outgoing call

6 SS-PUMR stage 1 specification

6.1 Description

6.1.1 General description

PUM Registration (PUMR) identifies to the PISN the address at which a PUM user will subsequently make calls, receive calls or make and receive calls.

A request to register a PUM user at an address can be rejected.

SS-PUMR also allows a PUM user to indicate to the PISN that the existing registration at the hosting address is to be terminated (de-registration).

6.1.2 Qualifications on applicability to telecommunication services

SS-PUMR is applicable to all basic services defined in ISO/IEC 11574.

6.2 Procedure

6.2.1 Provision/withdrawal

SS-PUMR shall be provided and withdrawn by arrangement with the PISN authority on a per PISN number basis. This service may be provided separately for each basic service subscribed to.

The mandatory and optional PUMR service options in a PISN are specified in table 1.

Table 1 — Service options for PUM registration

Service option	Status
Registration for incoming calls (InCall registration)	Mandatory
Registration for outgoing calls (OutCall registration)	Optional
Registration for both incoming and outgoing calls (AllCall registration)	Optional

For each of the service options listed in table 1, at least the parameter(s) specified in table 2 shall be supported.

Table 2 — Parameters for the service options

Service option	Parameter(s)
InCall registration	Maximum duration of each InCall registration session
OutCall registration	Maximum duration of each OutCall registration session, or maximum number of outgoing calls per OutCall registration session
AllCall registration	Maximum duration of each AllCall registration session

In a PISN where the PUM user is not required to specify a service option parameter, the session may continue indefinitely until it is either terminated by the PISN or a PISN user.

6.2.2 Normal procedures

6.2.2.1 Activation, deactivation and interrogation

SS-PUMR shall be activated on provision and deactivated on withdrawal on a per PISN number basis.

The PUMR service may provide the PUM user with the ability to obtain information on the current registration sessions (interrogation). If interrogation is supported, it shall be possible to obtain the addresses of all current registration sessions, optionally requested on a per service option basis. Furthermore, the PUM user may be provided with the ability to request the following items of information for a specified registration session:

- Type of the registration session (InCall, OutCall, or AllCall);
- Time left in the registration session (if applicable);
- Number of outgoing calls left in the registration session (if applicable).

6.2.2.2 Invocation and operation

SS-PUMR shall be invoked to register the PUM user at a specified address. If, at the time of invocation, more than one of the options listed in table 1 are available, the PUM user shall indicate which option to select.

Upon successful completion of SS-PUMR, an indication of successful completion shall be sent to the PUM user.

6.2.2.2.1 Registration for incoming calls (InCall registration)

The PUM user may specify the duration of the InCall registration session.

A PISN may support InCall registration sessions for one or more PUM users concurrently at the same hosting address.

Upon successful completion of an InCall registration, the PISN shall terminate the PUM user's previous InCall registration session (if applicable). Similarly, upon successful completion of an InCall registration, the PISN shall terminate the PUM user's previous AllCall registration session (if applicable).

The invocation of an InCall registration may leave the PUM user's existing OutCall registration session (if applicable) unaffected.

6.2.2.2.2 Registration for outgoing calls (OutCall registration)

The PUM user may specify the number of outgoing calls or the duration of the OutCall registration session.

A PISN may support OutCall registration sessions for one or more PUM users concurrently at the same hosting address.

Upon successful completion of an OutCall registration, the PISN may leave the PUM user's existing OutCall, InCall, and AllCall registration sessions (if applicable) unaffected.

6.2.2.2.3 Registration for both incoming and outgoing calls (AllCall registration)

The PUM user may specify the duration of the AllCall session.

A PISN may support AllCall registration sessions for one or more PUM users concurrently at the same hosting address.

Upon successful completion of an AllCall registration, the PISN shall terminate the PUM user's previous AllCall registration session (if applicable). Similarly, upon successful completion of an AllCall registration, the PISN shall terminate the PUM user's previous InCall registration session (if applicable).

The invocation of an AllCall registration may leave the PUM user's existing OutCall registration session (if applicable) unaffected.

6.2.2.2.4 Local and remote registration

It shall be possible to invoke SS-PUMR from the hosting address (local registration). Additionally, as an implementation option, a PISN may allow SS-PUMR to be invoked from a PISN address other than the hosting address (remote registration).

6.2.2.2.5 PUM de-registration

SS-PUMR may be invoked to de-register a PUM user from the current hosting address. The following PUM de-registration mechanisms are specified:

- a) **Explicit de-registration:** The PUM user shall be able to de-register from the hosting address by means of a manual operation carried out on the hosting address. As an implementation option, the PUM user may be permitted to specify that the de-registration is to apply to:
- a specified remote hosting address;
 - a specified type of registration session; or
 - all registration sessions regardless of hosting address or type.
- b) **Conditional de-registration:** If finite values for the parameters listed in table 2 are supported, the PISN shall de-register the PUM user when a specified criterion is met.
- c) **Forced de-registration:** As an implementation option, an authorized user may be permitted to de-register a visiting PUM user by means of a manual operation carried out on the hosting address.

Upon successful completion of the de-registration process, the PUM de-registration may be confirmed to the PUM user.

NOTE 1 - During a period when a PUM user is not registered at any address, the PISN can assign a default address for incoming and / or outgoing calls. Alternatively, incoming PUM calls can receive implementation-specific processing (e.g., a voice announcement).

6.2.2.2.6 Identification

As part of the registration and explicit de-registration procedures, the PUM user shall provide identification which may be either the PUM number or an alternative unique identifier.

6.2.2.2.7 Authentication

As part of the registration and explicit de-registration procedures, the PUM user may be required to provide a PIN for authentication.

NOTE 2 - More complex authentication procedures can be used, but such procedures are outside the scope of this International Standard.

6.2.3 Exceptional procedures

6.2.3.1 Activation, deactivation, and interrogation

Not applicable.

6.2.3.2 Invocation and operation

The invocation of SS-PUMR shall be rejected under at least the following circumstances:

- PUM user identity not known;
- PUM user not permitted to register on the specified address;
- PUM user not subscribed to the specified option or parameter;
- PUM user failed authentication;
- PUM registration temporarily not possible.

An indication of the reason for rejection shall be sent to the PUM user.

PUM de-registration shall be rejected if the PUM user is not registered at the specified address.

6.3 Interaction with other supplementary services and ANFs

Interactions with other supplementary services and ANFs for which PISN standards were available at the time of publication of this International Standard are specified below.

6.3.1 Number identification services (SS-CLIP, SS-COLP, SS-CLIR)

No interaction.

6.3.2 Calling Name Identification Presentation (SS-CNIP)

No Interaction.

6.3.3 Connected Name Identification Presentation (SS-CONP)

No interaction.

6.3.4 Calling/Connected Name Identification Restriction (SS-CNIR)

No interaction.

6.3.5 Call Completion to Busy Subscriber (SS-CCBS)

If the PUM user is either the served (calling) user or the called user in a call completion attempt, the invocation of SS-PUMR may cause call completion to be cancelled.

6.3.6 Call Completion on No Reply (SS-CCNR)

If the PUM user is either the served (calling) user or the called user in a call completion attempt, the invocation of SS-PUMR may cause call completion to be cancelled.

6.3.7 Call Transfer (SS-CT)

No interaction.

6.3.8 Call Forwarding Unconditional (SS-CFU)

No interaction.

6.3.9 Call Forwarding Busy (SS-CFB)

No interaction.

6.3.10 Call Forwarding No Reply (SS-CFNR)

No interaction.

6.3.11 Call Deflection (SS-CD)

No interaction.

6.3.12 Path Replacement (ANF-PR)

No interaction.

6.3.13 Call Offer (SS-CO)

No interaction.

6.3.14 Call Intrusion (SS-CI)

No interaction.

6.3.15 Do not Disturb (SS-DND)

No interaction.

6.3.16 Do not Disturb Override (SS-DNDO)

No interaction.

6.3.17 Advice of Charge (SS-AOC)

No interaction.

6.3.18 Recall (SS-RE)

No interaction.

6.3.19 Call Interception (ANF-CINT)

No interaction.

6.3.20 Transit Counter (ANF-TC)

No interaction.

6.3.21 Route Restriction Class (ANF-RRC)

No interaction.

6.3.22 Message Waiting Indication (SS-MWI)

No interaction.

6.3.23 Wireless Terminal Location Registration (SS-WTLR)

The invocation of SS-PUMR may be rejected if attempted between the invocation and completion of the SS-WTLR procedures.

The invocation of SS-WTLR shall not cause a PUM registration which may exist on the relevant WT to be cancelled.

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6.3.24 Wireless Terminal Incoming Call (ANF-WTMI)

An incoming call to a wireless terminal may be rejected if it occurs between the invocation and completion of the SS-PUMR procedures on that terminal.

6.3.25 Wireless Terminal Outgoing Call (ANF-WTMO)

No interaction.

6.3.26 Wireless Terminal Authentication of a WTM User (SS-WTAT)

The invocation of SS-PUMR may be rejected if attempted between the invocation and completion of the SS-WTAT procedures.

6.3.27 Wireless Terminal Authentication of the PISN (SS-WTAN)

The invocation of SS-PUMR may be rejected if attempted between the invocation and completion of the SS-WTAN procedures.

6.3.28 Private User Mobility Incoming Call (ANF-PUMI)

An incoming call to a PUM user may be rejected if it occurs between the invocation and completion of the SS-PUMR procedures or if the incoming call occurs during a period of de-registration.

6.3.29 Private User Mobility Outgoing Call (ANF-PUMO)

No interaction.

6.3.30 Common Information (ANF-CMN)

No interaction.

6.3.31 Call Priority Interruption (Protection) (SS-CPI(P))

No interaction.

6.4 Interworking considerations

Not applicable.

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