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Digitalno omrežje z integriranimi storitvami (ISDN) - Protokola digitalne naročniške signalizacije št. 1 (DSS1) in signalizacije št. 7 (SS7) - Aplikacija signalizacije za storitev upravljanja mobilnosti v vmesniku alfa - 1. del: Specifikacija protokola

Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) and Signalling System No.7 (SS7) protocols; Signalling application for the mobility management service on the alpha interface; Part 1: Protocol specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part deliverable covering the signalling application for the mobility management service on the alpha interface, as identified below:

Part 1: "Protocol specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

National transposition dates	
Date of adoption of this EN:	13 October 2000
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1 Scope

This first part of EN 301 144 specifies the stage 3 of the signalling application for the mobility management service on the alpha interface. The mobility management service functions include Cordless Terminal Mobility (CTM) for CTM phase 1 (DECT/GAP limitation) and DECT access to GSM via an Integrated Services Digital Network (ISDN) user-network interface at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [18]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [15]).

The signalling application for the alpha interface describes the mobility management procedures required to allow users of cordless terminals to be mobile within and between networks. Whenever radio coverage is provided and the cordless terminal has appropriate access rights, the user is able to make calls from and to receive calls at, any location within the network.

The signalling application for the alpha interface is applicable to the telephony 3,1 kHz teleservice (see ETS 300 111 [3]), speech bearer service (see ETS 300 109 [1]) and 3,1 kHz audio bearer service (see ETS 300 110 [2]).

Further parts of EN 301 144 specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment supporting the signalling application for the alpha interface, to be attached at either side of a T reference point and coincident S and T reference point when used as an access to the public ISDN or GSM network.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETS 300 109 (1992): "Integrated Services Digital Network (ISDN); Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for speech information transfer; Service description".

[2] ETS 300 110 (1992): "Integrated Services Digital Network (ISDN); Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer; Service description".

[3] ETS 300 111 (1992): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Service description".

[4] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

[5] EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".

[6] EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

[7] EN 300 196-1 (V1.2): "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[8] EN 300 370: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); DECT/GSM Interworking Profile (IWP); Access and mapping (protocol/procedure description for 3,1 kHz speech service)".

[9] EN 300 403-1 (V1.2): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[10] EN 300 444 (V1.2): "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[11] ETS 300 557: "Digital cellular telecommunications system (Phase 2); Mobile radio interface; Layer 3 specification (GSM 04.08 version 4.19.2)".

[12] ETS 300 788: "Digital Enhanced Cordless Telecommunications (DECT); Global System for Mobile communications (GSM); Integrated Services Digital Network (ISDN); DECT access to GSM via ISDN; Functional capabilities and information flows".

[13] ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".

[14] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

[15] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[16] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

[17] ITU-T Recommendation I.221 (1993): "Common specific characteristics of services".

[18] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - reference configurations".

[19] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

[20] CCITT Recommendation X.219 (1988): "Remote operations: Model, notation and service definition".

[21] ITU Recommendation X.229 (1992): "Remote operations: Protocol specification".

[22] Amendment 1 to ITU-T Recommendation X.680 (04/95): "Information technology - Abstract Syntax Notation One (ASN.1); Specification of basic notation - Amendment 1: Rules of extensibility".

[23] ITU Recommendation X.880: "Information technology - Remote Operations: Concepts, model and notation".

3 Definitions and abbreviations

3.1 Definitions

For the purpose of the present document, the following terms and definitions apply:

Authentication Code: may be held in non-volatile memory within the PP or may be manually entered by the user when required for an authentication service, depending on the application; see EN 300 175-7 [6].

access rights: an indication that the cordless terminal has appropriate access allowance to the CTM service.

Access Rights Identity: an identity which is globally unique to a service provider and which shows the access rights related to the service provider.

authentication: a security mechanism allowing the verification of the provided identity.

cipher key: see EN 300 175-7 [6] clause 3.

cordless terminal: a physical entity that provides access to the telecommunication service of a network via a radio interface.

cordless terminal mobility: the ability of a cordless terminal to be mobile within and between fixed parts; the mobility may be continuous while the terminal is accessing and using the telecommunication services offered by the network, and it may include the capability of the networks to keep track of the cordless terminal's location throughout the entire network.

core service feature: particular service feature fundamental to the telecommunication services, i.e. in the absence of this service feature, the telecommunication service does not make sense as a commercial offering to the service subscriber.

coverage area: the area within the radio coverage area in which the user has subscribed to use the mobility management service.

CTM number: number that uniquely and unambiguously identifies each CTM subscriber. It is used by a calling party to reach the CTM subscriber. The number is independent of the calling terminal, network or service used and conform to ITU-T Recommendation E.164 [13].

DECT paging: a DECT procedure which establishes a link on the DECT interface.

Fixed Part: a physical grouping that contains all elements in the cordless network between the local network and the cordless terminal air interface.

Fixed Termination: a logical group of functions that contain all of the Cordless Terminal (CT) Network specific processes and procedures on the fixed side of the air interface. A Fixed Radio Termination only includes elements that are defined in the relevant CT specifications. This includes radio transmission elements (layer1) together with a selection of layer 2 and layer 3 elements.

handover: the process by which a call in progress is maintained when the user moves with the cordless terminal with a call in progress within a network where continuous radio coverage is provided.

IMSI attach: see ETS 300 557 [11].

location area: the radio coverage area in which a cordless terminal may receive calls as a result of a single location registration.

network: the entity which provides the mobility management function and basic call functionality to the user.

network operator: an entity that provides the network operating elements and resources for the execution of the mobility management service.

optional service feature: a service feature added to core feature to optionally enhance a service offering.

portable application: a logical grouping that contains all the elements that lie beyond the CT Network boundary on the portable side.

portable identity: the identity by which a subscriber is known to the mobility management service providers and networks supporting mobility management, and used for flexibility and security purposes; identifies a subscriber unambiguously; does not need to be known by subscriber.

Portable Part: a physical grouping that contains all elements between the user and air interface; a generic term that may describe one or several physical pieces.

portable termination: a logical group of functions that contains all of the CT processes and procedures on the portable side of the CT air interface; only includes elements that are defined in the relevant CT specification.

public land mobile network: see ETS 300 788 [12].

radio coverage: the area in which cordless terminals may be used to establish and maintain telecommunication services via the radio base stations supported by the network supporting the mobility management service.

RANDom challenge: a parameter used for authentication; see EN 300 175-7 [6].

RES1: a parameter containing the result of the terminal authentication challenge; see EN 300 175-7 [6].

RES2: a parameter containing the result of the network authentication challenge, see EN 300 175-7 [6].

RS: a value used to establish authentication session keys, as defined in subclause 4.4.3 of EN 300 175-7 [6].

roaming: movement of the cordless terminal user without a call in progress from one location area to another location area within the same or between different networks supporting the mobility management service.

service feature: a specific aspect of a telecommunication service that can be used in conjunction with other telecommunication services or service features as part of a commercial offering; either a core part of a telecommunication service or an optional part offered as an enhancement to a telecommunication service.

service profile: a record containing all the service information related to a user.

service provider: an actor who provides mobility management services to its service subscribers on a contractual basis and who is responsible for the mobility management services offered; the same organization may act as a network operator and a service provider.

service subscriber: an entity that contracts for services offered by service providers.

service: that which is offered by an administration or a public or private service provider to its service subscriber in order to satisfy a telecommunication requirement.

telecommunication service: see ITU-T Recommendation I.112 [14].

terminal mobility: the ability of a terminal to access telecommunication services, while in motion, and the capability of the network to locate and identify that terminal as it moves.

User Authentication Key: secret authentication data contained within the subscriber's registration data, uniquely associated with the particular subscriber (user) and the subscription; held in non-volatile memory within the PP (or within a detachable DECT Authentication Module (DAM); see EN 300 175-7 [6].

user: the DSS1 protocol entity at the user side of the user-network interface; see EN 300 196-1 [7].

3.2 Abbreviations

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

AC	Authentication Code
ARC	Access Right Class
ARD	Access Right Details
ARI	Access Right Identity
ASN.1	Abstract Syntax Notation one
BA	Basic Access
CT	Cordless Terminal
CTM	Cordless Terminal Mobility
DCK	Derived Cipher Key
DECT	Digital Enhanced Cordless Telecommunication
DSSA	DECT Standard Authentication Algorithm
DSS1	Digital Subscriber Signalling System 1
FT	Fixed Termination
FP	Fixed Part
GAP	Generic Access Profile
GSM	Global System for Mobile communications
IMEI	International Mobile station Equipment Identity
IMEISV	International Mobile station Equipment Identity Software Version
IMSI	International Mobile Subscriber Identity
IPEI	International Portable Equipment Identity
IPUI	International Portable User Identity
ISDN	Integrated Services Digital Network
LE	Local Exchange
MM	Mobility Management
MSC	Mobile Switching Centre

NCICS	Networked Call Independent Connection-Oriented Signalling
NT	Network Termination
NT2	Network Termination type 2
PA	Portable Application
PARK	Portable Access Right Key
PLI	Park Length Indicator
PLMN	Public Land Mobile Network
PP	Portable Part
RAND	RANDom challenge
RBS	Radio Base Station
RE	Radio Exchange
RES	RESponse
RES1	RESponse1
RES2	RESponse2
RFPI	Radio Fixed Part Identity
Rs	Result
TMSI	Temporary Mobile Subscriber Identity
UAK	User Authentication Key

4 Void

5 Description

The Cordless Terminal Mobility (CTM) service phase 1 allows subscribers of Cordless Terminals (CTs) to be mobile within and between networks. Where radio coverage is provided and the CT has appropriate access rights the subscriber shall be able to make calls from, and to receive calls at, any location within the fixed public and/or private networks.

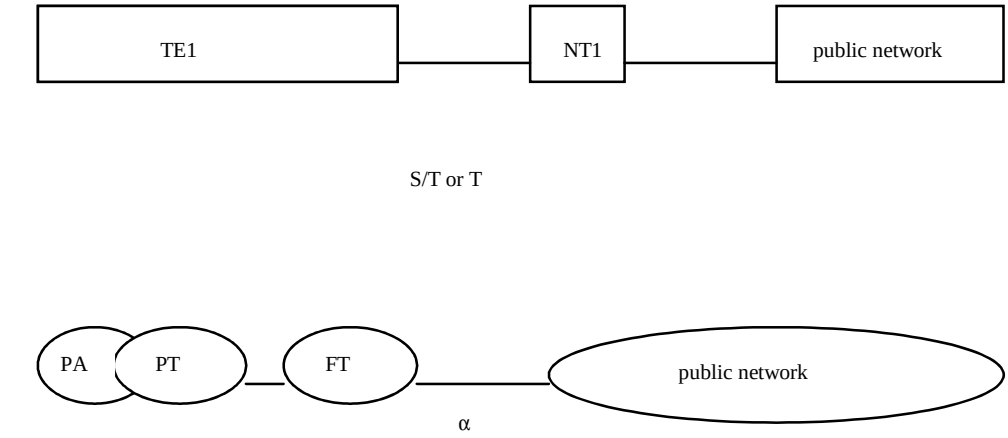
The provision of GSM basic service over the DECT air interface for the case that the DECT access network is connected with the GSM PLMN via an ISDN user-network interface enables GSM subscribers to be mobile within and between DECT access networks using the GSM PLMN infrastructure. Where DECT radio coverage is provided and the DECT portable part has appropriate access rights the subscriber shall be able to make calls from, and to receive calls at, any location within the network.

The signalling procedures in the present document are supporting features required for CTM phase 1 and features to provide GSM basic services over the DECT air interface via the public ISDN user-network interface.

Table 1: Procedures required for CTM phase 1 and DECT/GSM access

	initiated by	CTM phase 1		DECT/GSM access	
Procedure		user	network	user	network
9.1 Registration and deregistration					
Subscription registration	user	optional	optional	-	-
Subscription deregistration	network	optional	optional	-	-
9.2 Activation and deactivation					
Location registration	user	mandatory	mandatory	mandatory (note)	mandatory
Location cancellation	network	mandatory	mandatory	optional	optional
Detach	user	-	-	mandatory	mandatory
9.3 Invocation and operation					
Location Registration Suggest	network	mandatory	optional	-	-
Terminal authentication	network	mandatory	mandatory	mandatory	mandatory
Network authentication	user	mandatory	mandatory	-	-
Network initiated ciphering	network	mandatory	mandatory	mandatory	mandatory
Portable initiated ciphering	user	optional	optional	-	-
Temporary identity assignment	network	-	-	mandatory	mandatory
Linked temporary identity assignment	network	-	-	mandatory	optional
Key allocation	network	mandatory	mandatory	-	-
Identity request	network	mandatory	optional	mandatory	mandatory
Outgoing call	user	mandatory	mandatory	mandatory	mandatory
Incoming call	network	mandatory	mandatory	mandatory	mandatory
NOTE: The location update procedure as described in ETS 300 788 [12] is identical to the location registration procedure described in the present document.					

For CTM phase 1, the following reference configurations of figures 1 and 2 are applicable at the alpha interface:



The public network may be represented either as an ISDN or a PLMN.
The FT in the residential configuration is a simple single-cell Radio Base Station (RBS).
On the S/T reference point (BA), ISDN terminals may also be connected.

Figure 1: Residential configuration