ECMA

Standardizing Information and Communication Systems

**Private Integrated Services Network (PISN) -
Inter-Exchange Signalling Protocol -
Wireless Terminal Location
Registration Supplementary Service
and Wireless Terminal Information
Exchange Additional Network
Feature**

Standard ECMA-302

2nd Edition - December 2001

ECMA

Standardizing Information and Communication Systems

Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Wireless Terminal Location Registration Supplementary Service and Wireless Terminal Information Exchange Additional Network Feature

(QSIG-WTMLR)

Brief History

This Standard is one of a series of ECMA Standards defining Wireless Terminal Mobility (WTM) services and signalling protocols 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 particular Standard specifies the signalling protocol for use at the Q reference point in support of the WTM Wireless Terminal Location Registration supplementary service and the Wireless Terminal Information Exchange additional network feature. The protocol defined in this Standard forms part of the PSS1 protocol (informally known as QSIG).

This 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.

Compared to the 1st edition of Standard ECMA-302 (published by ECMA in June 2000), this 2nd Edition incorporates migration to ASN.1 version 1997.

Adopted as 2nd Edition of Standard ECMA-302 by the General Assembly of December 2001.

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1 Scope

This Standard specifies the signalling protocol for the support of the Wireless Terminal Location Registration supplementary service (SS-WTLR) and the Wireless Terminal Information exchange additional network feature (ANF-WTINFO) at the Q reference point between Private Integrated services Network eXchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

SS-WTLR is a supplementary service which enables a WTM user to register at, or deregister from, the current location within the PISN. The ability to register at different locations in the PISN at different times enables the WTM user to maintain the provided services (including the ability to make and receive calls) at different access points. Deregistration is used to inform the PISN that the WTM user is temporarily unable to make use of the provided services (including the receipt of calls).

ANF-WTINFO is an additional network feature which enables transfer of restriction information between Home PINX and Visitor PINX. ANF-WTINFO also enables the Visitor PINX or Home PINX to initiate a check of the current location information.

The Q reference point is defined in ECMA-133.

Supplementary Service specifications and Additional Network Feature specifications are produced in three stages and according to the method specified in ITU-T Rec. I.130. This Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ECMA-301.

The signalling protocol for SS-WTLR and ANF-WTINFO uses certain aspects of the generic procedures for the control of supplementary services specified in ECMA-165.

This Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-WTLR and other supplementary services and ANFs.

This Standard is applicable to PINXs which can interconnect to form a PISN.

2 Conformance

In order to conform to this Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

3 References (normative)

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

In the case of references to ECMA Standards that are aligned with ISO/IEC International Standards, the number of the appropriate ISO/IEC International Standard is given in brackets after the ECMA reference.

ECMA-133   Private Integrated Services Network (PISN) - Reference Configuration for PISN Exchanges (PINX) (International Standard ISO/IEC 11579-1)

ECMA-142   Private Integrated Services Network (PISN) - Circuit Mode 64kbit/s Bearer Services - Service Description, Functional Capabilities and Information Flows (International Standard ISO/IEC 11574)

ECMA-155   Private Integrated Services Networks - Addressing (International Standard ISO/IEC 11571)

ECMA-165   Private Integrated Services Network (PISN) - Generic Functional Protocol for the Support of Supplementary Services - Inter-Exchange Signalling Procedures and Protocol (International Standard ISO/IEC 11582)

ECMA-174   Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Call Diversion Supplementary Services (International Standard ISO/IEC 13873)

ECMA-242   Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Message Waiting Indication Supplementary Service (International Standard ISO/IEC 15506)

ECMA-301   Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Wireless Terminal Location Registration Supplementary Service and Wireless Terminal Information Exchange Additional Network Feature (International Standard ISO/IEC 15428)

ECMA-306   Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Wireless Terminal Authentication Supplementary Services (International Standard ISO/IEC 15433)

ITU-T Rec. I.112   Vocabulary of terms for ISDNs (1993)

ITU-T Rec. I.130   Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book) (1988)

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

ITU-T Rec. Q.950   Supplementary services protocols, structure and general principles (2000)

ITU-T Rec. Z.100   Specification and description language (1999)

4   Terms and definitions

For the purposes of this Standard the following definitions apply.

4.1   External definitions

This Standard uses the following terms defined in other documents:

– Application Protocol Data Unit (APDU)   (ECMA-165)

– Basic Service   (ITU-T Rec. I.210)

– Call, Basic Call   (ECMA-165)

– Complete Number   (ECMA-155)

– Co-ordination Function   (ECMA-165)

– Directory PINX   (ECMA-301)

– End PINX   (ECMA-165)

– Home PINX   (ECMA-301)

– Home data base (HDB)   (ECMA-301)

– Interpretation APDU   (ECMA-165)

– Location Area (LA)   (ECMA-301)

– Network Facility Extension (NFE)   (ECMA-165)

– Originating PINX   (ECMA-165)

– PISN Number   (ECMA-155)

– Private Integrated Services Network (PISN)   (ECMA-133)

– Private Integrated services Network eXchange (PINX) (ECMA-133)

– Signalling   (ITU-T Rec. I.112)

– Supplementary Service   (ITU-T Rec. I.210)

– Supplementary Services Control Entity   (ECMA-165)

– Terminating PINX   (ECMA-165)

–   Transit PINX   (ECMA-165)

–   User   (ECMA-142)

–   Visitor area   (ECMA-301)

–   Visitor data base (VDB)   (ECMA-301)

–   Visitor PINX   (ECMA-301)

–   Wireless Terminal Mobility (WTM)   (ECMA-301)

–   WTM user's identity   (ECMA-301)

4.2   Other definitions

4.2.1   WTM user

The user of SS-WTLR or other WTM services.

5   Symbols and abbreviated terms

ANF	Additional Network Feature
ANF-WTINFO	Wireless Terminal Information exchange
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
HDB	Home Data Base
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS-MWI	Message Waiting Indication supplementary service
SS-WTLR	Wireless Terminal Location Registration supplementary service
VDB	Visitor Data Base
WTM	Wireless Terminal Mobility

6   Signalling protocol for the support of SS-WTLR

6.1   SS-WTLR description

SS-WTLR is a supplementary service which makes the location of a WTM user known to the PISN. By updating location information in the PISN, incoming calls can be routed to a WTM user, and the WTM user can access the PISN services from the current location area. SS-WTLR also enables a WTM user to inform the PISN that the current location area is no longer to be used to make and receive calls.

6.2   SS-WTLR operational requirements

6.2.1   Requirements on the Visitor PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Originating and Terminating PINX, shall apply.

6.2.2   Requirements on the Home PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for a Terminating and an Originating PINX, shall apply.

6.2.3 Requirements on a Transit PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for a Transit PINX, shall apply.

6.2.4 Requirements on the Directory PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for a Terminating PINX, shall apply.

6.3 SS-WTLR coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply. The notation is in accordance with ITU-T Rec. X.680 and X.690. The ITU-T Rec. X.208 and X.209 superseded version is in annex E.

Table 1 - Operations in support of SS-WTLR and ANF-WTINFO

```
WTM-Location-Registration-Operations-asn1-97
                    {iso standard pss1-location-registration (15429) wtlr-operations-asn1-97 (1)}


DEFINITIONS EXPLICIT TAGS ::=


BEGIN
IMPORTS          OPERATION, ERROR FROM Remote-Operations-Information-Objects
                       {joint-iso-itu-t remote-operations(4) informationObjects(5) version1(0)}
                 EXTENSION, Extension{} FROM Manufacturer-specific-service-extension-class-asn1-97
                       {iso standard
                       pss1-generic-procedures (11582) msi-class-asn1-97(11)}
                 notAvailable, invalidServedUserNr
                       FROM General-Errors-List
                       {ccitt recommendation q 950 general-error-list (1)}
                 PartyNumber FROM Addressing-Data-Elements-asn1-97
                       {iso(1) standard(0) pss1-generic-procedures(11582)
                       addressing-data-elements-asn1-97(20)}
                 BasicService FROM Call-Diversion-Operations-asn1-97
                       { iso (1) standard (0) pss1-call-diversion (13873)
                       call-diversion-operations-asn1-97 (1) };

WTMLR-Operations OPERATION ::= {locUpdate | locDelete | locDeReg | pisnEnquiry | getRRCInf | locInfoCheck}



locUpdate        OPERATION ::={
                 -- Sent from the Visitor PINX to the Home PINX.
                       ARGUMENT        LocUpdArg
                       RESULT          DummyRes
                       ERRORS          { invalidServedUserNr | notAuthorized | unspecified }
                       CODE            local: 50}
```

Table 1 - Operations in support of SS-WTLR and ANF-WTINFO (continued)

locDelete	OPERATION ::= {
	-- Sent from the Home PINX to the previous Visitor PINX.
	ARGUMENT LocDelArg
	RESULT DummyRes
	ERRORS { temporarilyUnavailable	unspecified }
	CODE local: 51}
locDeReg	OPERATION ::= {
	-- Sent from the Visitor PINX to the Home PINX.
	ARGUMENT LocDeRegArg
	RESULT DummyRes
	ERRORS { notAvailable	unspecified }
	CODE local: 52}
pisnEnquiry	OPERATION ::= {
	-- Sent from the Visitor PINX to the previous Visitor PINX or a Directory PINX.
	ARGUMENT PisnEnqArg
	RESULT PisnEnqRes
	ERRORS { invalidServedUserNr	unspecified}
	CODE local: 53}
getRRCInf	OPERATION ::= {
	-- Sent from the Visitor PINX to the Home PINX.
	ARGUMENT GetRRCInfArg
	RESULT GetRRCInfRes
	ERRORS { notAvailable	unspecified }
	CODE local: 97}
locInfoCheck	OPERATION ::= {
	-- Sent from the Visitor PINX to the Home PINX or vice versa.
	ARGUMENT LocInfoCheckArg
	RESULT LocInfoCheckRes
	ERRORS { notAvailable	unspecified }
	CODE local: 98}
LocUpdArg ::=	SEQUENCE { wtmUserId WtmUserId,
	basicService BasicService DEFAULT allServices,
	visitPINX PartyNumber,
	-- The pisnNumber of the Visitor PINX,
	-- always a Complete Number.
	argExtension LrExtension OPTIONAL }
DummyRes ::=	CHOICE { null NULL,
	extension [1] IMPLICIT Extension{{WTMLRExtSet}},
	sequOfExtn [2] IMPLICIT SEQUENCE OF
	Extension{{WTMLRExtSet}} }
LocDelArg ::=	SEQUENCE { wtmUserId WtmUserId,
	basicService BasicService DEFAULT allServices,
	argExtension LrExtension OPTIONAL }
LocDeRegArg ::=	SEQUENCE { wtmUserId WtmUserId,
	basicService BasicService DEFAULT allServices,
	argExtension LrExtension OPTIONAL }

Table 1 - Operations in support of SS-WTLR and ANF-WTINFO (concluded)

PisnEnqArg ::=	SEQUENCE	{ alternativeId AlternativeId, -- Can be a temporary identifier, e.g. Network Assigned -- Identity structure, or a fixed handset identifier. argExtension LrExtension OPTIONAL }
PisnEnqRes ::=	SEQUENCE	{ wtmUserId WtmUserId, resExtension LrExtension OPTIONAL }
GetRRCInfArg ::=	SEQUENCE	{ wtmUserId WtmUserId, basicService BasicService DEFAULT allServices, argExtension LrExtension OPTIONAL }
GetRRCInfRes ::=	SEQUENCE	{ alternativeId AlternativeId OPTIONAL, rrClass RRClass OPTIONAL, argExtension LrExtension OPTIONAL }
LocInfoCheckArg ::=	SEQUENCE	{ wtmUserId WtmUserId, basicService BasicService DEFAULT allServices, visitPINX PartyNumber, -- The PISN number of the Visitor PINX, -- always a Complete Number. argExtension LrExtension OPTIONAL }
LocInfoCheckRes ::=	SEQUENCE	{ checkResult CheckResult, argExtension LrExtension OPTIONAL }
WtmUserId ::=	CHOICE	{ pisnNumber PartyNumber, -- The PISN number of the WTM user, -- always a Complete Number. alternativeId AlternativeId }
AlternativeId ::=	OCTET STRING(SIZE(1..20))	
LrExtension ::=	CHOICE	{ extension [1] IMPLICIT Extension{{WTMLRExtSet}}, sequOfExtn [2] IMPLICIT SEQUENCE OF Extension{{WTMLRExtSet}} }
RRClass ::=	INTEGER (0..99)	
CheckResult ::=	ENUMERATED	{ locInfChk-correct (0), locInfChk-incorrect (1) }
WTMLRExtSet EXTENSION ::= {...}		
notAuthorized	ERROR ::=	{CODE local: 1007}
temporarilyUnavailable	ERROR ::=	{CODE local: 1000}
unspecified	ERROR ::= {	
	PARAMETER	Extension{{WTMLRExtSet}}
	CODE	local: 1008}
END	-- of WTM-Location-Registration-Operations-asn1-97	

NOTE
Element visitPINX in LocUpdArg can either be a roaming number for the individual WTLR user or a single number for all WTLR users currently registered in this PINX. In the latter case the individual WTLR users are distinguished by their own WtmUserId.

6.3.2 Information elements

6.3.2.1 Facility information element

APDUs of the operations defined in 6.3.1 shall be coded in the Facility information element in accordance with ECMA-165.

When conveying the invoke APDU of operations defined in 6.3.1, the destinationEntity data element of the NFE shall contain value endPINX.

When conveying the invoke APDU of operations defined in 6.3.1, the Interpretation APDU shall either be omitted or be included with value rejectAnyUnrecognisedInvokePdu.

6.3.2.2 Other information elements

Any other information elements (e.g. Calling party number, Called party number) shall be coded in accordance with the rules of ECMA-165.

6.3.3 Messages

The Facility information element shall be conveyed in the messages as specified in clause 10 of ECMA-165.

6.4 SS-WTLR state definitions

6.4.1 States at the Visitor PINX

The procedures for the Visitor PINX are written in terms of the following conceptual states existing within the SS-WTLR Supplementary Service Control entity in that PINX in association with a particular location handling request.

6.4.1.1 State VisitIdle

SS-WTLR is not operating.

6.4.1.2 State VisitUpdate

A locUpdate invoke APDU has been sent.

6.4.1.3 State VisitEnquiry

A pisnEnquiry invoke APDU has been sent.

6.4.1.4 State VisitDeReg

A locDeReg invoke APDU has been sent.

6.4.2 States at the Home PINX

The procedures for the Home PINX are written in terms of the following conceptual states existing within the SS-WTLR Supplementary Service Control entity in that PINX in association with a particular location handling request.

6.4.2.1 State HomeIdle

Ready for receipt of a locUpdate or locDeReg APDU.

6.4.2.2 State HomeDelete

A locDelete invoke APDU has been sent.

6.4.3 States at the Directory PINX

The procedures for the Directory PINX are written in terms of the following conceptual states existing within the SS-WTLR Supplementary Service Control entity in that PINX in association with a particular location handling request.

6.4.3.1 State DirectoryIdle

Ready for receipt of a pisnEnquiry APDU.

6.5 SS-WTLR Signalling procedures for location registration

Examples of message sequences are shown in annex C.

6.5.1 Actions at the Visitor PINX for location registration

The SDL representation of procedures at the Visitor PINX is shown in D.1 of annex D.

6.5.1.1 Normal procedures

On receipt of a valid location registration request from a WTM user that is not already registered in the Visitor area, and if the Visitor PINX possesses sufficient addressing information to make a location registration request to the Home PINX, the Visitor PINX shall send a locUpdate invoke APDU to the Home PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId, the basic service for which the WTM user is to be registered may be included in element basicService, and a PISN number identifying the Visitor PINX shall be included in element visitPINX. This PISN number shall be suitable for use in the Called party number information element of a call or call independent signalling connection that is to be routed to the Visitor PINX. The Visitor PINX shall enter state VisitUpdate and start timer T1.

NOTE 1
Validation of the registration request can involve authentication of the WTM user.

NOTE 2
In the absence of sufficient addressing information, the Visitor PINX can, before sending a locUpdate invoke APDU, use the procedures of 6.5.2 to make an enquiry to the previous Visitor PINX or the procedures of 6.5.3 to make an enquiry to a Directory PINX in order to translate an identifier provided by the WTM user in the registration request into a PISN number.

NOTE 3
The number to be used in the Called party number information element when establishing the call independent signalling connection to the Home PINX is outside the scope of this Standard. It can, for example, be a PISN number provided by the WTM user in the location registration request or optionally the PISN number provided by the previous Visitor PINX or Directory PINX.

On receipt of the locUpdate return result APDU, the Visitor PINX shall stop timer T1, update the information in the VDB, revert to state VisitIdle and indicate acceptance to the WTM user.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.1.2 Exceptional procedures

On receipt of a locUpdate return error or reject APDU from the Home PINX, the Visitor PINX shall stop timer T1, revert to state VisitIdle and indicate rejection to the WTM user.

If timer T1 expires (i.e. the locUpdate invoke APDU is not answered by the Home PINX), the Visitor PINX shall indicate rejection to the WTM user and enter state VisitIdle.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T1. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.2 Additional actions at the Visitor PINX for enquiry to the previous Visitor PINX

The SDL representation of procedures at the Visitor PINX is shown in D.1 of annex D.

6.5.2.1 Normal procedures

In order to make an enquiry to the previous Visitor PINX to translate an identifier provided by the WTM user in the location registration request into a WTM user's identity, the Visitor PINX may send a pisnEnquiry invoke APDU to the previous Visitor PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, element alternativeId shall contain the identifier provided by the WTM user. The Visitor PINX shall enter state VisitEnquiry and start timer T2.

NOTE 4
The number to be used in the Called party number information element when establishing the call

independent signalling connection to the previous Visitor PINX is outside the scope of this Standard.
It can, for example, be derived from the identifier provided by the WTM user.

On receipt of the pisnEnquiry return result APDU, the Visitor PINX shall stop timer T2. The WTM user's identity received in the pisnEnquiry return result APDU can be used for location registration.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the previous Visitor PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.2.2 Exceptional procedures

On receipt of a pisnEnquiry return error or reject APDU from the previous Visitor PINX, the Visitor PINX shall stop timer T2 and enter state VisitIdle. If timer T2 expires, the Visitor PINX shall enter state VisitIdle.

NOTE 5
In any of these situations the Visitor PINX will be unable to proceed with location registration and
should indicate rejection to the WTM user, unless there is another means available for obtaining the
WTM user's identity of the WTM user.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the previous Visitor PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T2. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.3 Additional actions at the Visitor PINX for enquiry to a Directory PINX

The SDL representation of procedures at the Visitor PINX is shown in D.1 of annex D.

6.5.3.1 Normal procedures

In order to make an enquiry to a Directory PINX to translate an identifier provided by the WTM user in the location registration request into a WTM user's identity, the Visitor PINX may send a pisnEnquiry invoke APDU to the Directory PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, element alternativeId shall contain the identifier provided by the WTM user. The Visitor PINX shall enter state VisitEnquiry and start timer T2.

NOTE 6
The number to be used in the Called party number information element when establishing the call
independent signalling connection to the Directory PINX is outside the scope of this Standard.

On receipt of the pisnEnquiry return result APDU, the Visitor PINX shall stop timer T2. The WTM user's identity received in the pisnEnquiry return result APDU can be used for location registration.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Directory PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.3.2 Exceptional procedures

On receipt of a pisnEnquiry return error or reject APDU from the Directory PINX, the Visitor PINX shall stop timer T2 and enter state VisitIdle. If timer T2 expires, the Visitor PINX shall enter state VisitIdle.

NOTE 7
In any of these situations the Visitor PINX will be unable to proceed with location registration and
should indicate rejection to the WTM user, unless there is another means available for obtaining the
WTM user's identity of the WTM user.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Directory PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T2. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.4 Actions at the Home PINX for location registration

The SDL representation of procedures at the Home PINX is shown in D.2 of annex D.

6.5.4.1 Normal procedures

On receipt of a locUpdate invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Home PINX shall check the received WTM user's identity (element wtmUserId), and may check the requested basic service (element basicService) to verify that the WTM user may update the location information.

If the WTM user may update the location information, the Home PINX shall update the location information in the HDB using the Visitor PINX number received in element visitPINX and answer the locUpdate invoke APDU with a return result APDU. If the Visitor area has changed (i.e. the PISN number of the Visitor PINX optionally related to a basic service has changed), the Home PINX shall send a locDelete invoke APDU to the previous Visitor PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId and the basic service for which the WTM user has registered may be included in element basicService. The Home PINX shall enter state HomeDelete and start timer T4.

On receipt of the locDelete return result APDU, the Home PINX shall stop timer T4 and enter state HomeIdle.

The Home PINX is responsible for clearing the call independent signalling connection towards the previous Visitor PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.5.4.2 Exceptional procedures

If the Visitor area optionally related to a basic service is unchanged, the Home PINX shall revert to state HomeIdle after sending locUpdate return result.

If the WTM user is not found in the HDB, the Home PINX shall answer the locUpdate invoke APDU with a return error APDU containing the error invalidServedUserNr.

If the WTM user is not allowed to update the location information, the Home PINX shall answer the locUpdate invoke APDU with a return error APDU containing the error notAuthorized.

On receipt of a locDelete return error or reject APDU from the previous Visitor PINX, the Home PINX shall stop timer T4 and enter state HomeIdle.

If timer T4 expires (i.e. the locDelete invoke APDU is not answered by the previous Visitor PINX), the Home PINX shall enter state HomeIdle.

NOTE 8
Expiry of timer T4 or receipt of a locDelete return error or reject APDU may invoke management actions to correct the VDB data in the previous Visitor PINX.

6.5.5 Actions at a Transit PINX for location registration

No special actions are required in support of location registration.

6.5.6 Actions at the previous Visitor PINX for location registration

The SDL representation of procedures at the previous Visitor PINX is shown in D.3 of annex D.

6.5.6.1 Normal procedures

On receipt of a locDelete invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the previous Visitor PINX shall check the WTM user's identity (element wtmUserId), the basic service (element basicService) if received, and delete the corresponding VDB entry for the WTM user and answer the locDelete invoke APDU with a return result APDU.

6.5.6.2 Exceptional procedures

If the WTM user is not found in the VDB, the previous Visitor PINX shall answer the locDelete invoke APDU with a return result APDU.

If the VDB is temporarily unavailable, the previous Visitor PINX shall answer the locDelete invoke APDU with a return error APDU containing the error temporarilyUnavailable.

6.5.7 Additional actions at the previous Visitor PINX for enquiry from the Visitor PINX

The SDL representation of procedures at the previous Visitor PINX is shown in D.3 of annex D.

6.5.7.1 Normal procedures

On receipt of a pisnEnquiry invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the previous Visitor PINX shall check if the VDB contains an entry for the WTM user. If there is an entry, the WTM user's identity shall be returned in a pisnEnquiry return result APDU.

6.5.7.2 Exceptional procedures

If the WTM user is not found in the VDB, the previous Visitor PINX shall answer the pisnEnquiry invoke APDU with a return error APDU containing the error invalidServedUserNr.

NOTE 9
If a PINX that receives a pisnEnquiry invoke APDU is capable of behaving as a Visitor PINX and as a Directory PINX, it should respond with a return error APDU only if the WTM user is present in neither the VDB nor the directory.

6.5.8 Actions at the Directory PINX for enquiry from the Visitor PINX

The SDL representation of procedures at the Directory PINX is shown in D.4 of annex D.

6.5.8.1 Normal procedures

On receipt of a pisnEnquiry invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Directory PINX shall attempt to translate the identity received in the pisnEnquiry invoke APDU to a WTM user's identity. The WTM user's identity shall be returned in a pisnEnquiry return result APDU.

6.5.8.2 Exceptional procedures

If the Directory PINX is unable to translate the identity received in the pisnEnquiry invoke APDU, a pisnEnquiry return error APDU containing the error invalidServedUserNr shall be returned.

NOTE 10
If a PINX that receives a pisnEnquiry invoke APDU is capable of behaving as a Visitor PINX and as a Directory PINX, it should respond with a return error APDU only if the WTM user is present in neither the VDB nor the directory.

6.6 SS-WTLR signalling procedures for location deregistration

Examples of message sequences are shown in annex C.

6.6.1 Actions at the Visitor PINX for location deregistration

The SDL representation of procedures at the Visitor PINX is shown in D.1 of annex D.

6.6.1.1 Normal procedures

When a Visitor PINX determines that a WTM user is deregistered or on receipt of a valid location deregistration request from a WTM user, the Visitor PINX shall send a locDeReg invoke APDU to the Home PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId and the basic service for which the WTM user has deregistered may be included in element basicService. The Visitor PINX shall enter state VisitDeReg and start timer T3.

NOTE 11
Validation of the deregistration request can involve authentication of the WTM user.

On receipt of the locDeReg return result APDU, the Visitor PINX shall stop timer T3, delete the corresponding VDB information, revert to state VisitIdle and, if applicable, indicate acceptance to the WTM user.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.6.1.2   Exceptional procedures

On receipt of a locDeReg return error or reject APDU from the Home PINX, the Visitor PINX shall stop timer T3, revert to state VisitIdle and, if applicable, indicate rejection to the WTM user.

If timer T3 expires (i.e. the locDeReg invoke APDU is not answered by the Home PINX), the Visitor PINX shall enter state VisitIdle and, if applicable, indicate rejection to the WTM user.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T3. Alternatively, the signalling connection may be retained for other applications, if appropriate.

6.6.2   Actions at the Home PINX for location deregistration

The SDL representation of procedures at the Home PINX is shown in D.2 of annex D.

6.6.2.1   Normal procedures

On receipt of a locDeReg invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Home PINX shall check the received WTM user's identity (element wtmUserId), and may check the requested basic service (element basicService) to verify that the WTM user may deregister.

If the WTM user may deregister, the Home PINX shall update the location information in the HDB and answer the locDeReg invoke APDU with a return result APDU.

6.6.2.2   Exceptional procedures

If the WTM user may not deregister, the Home PINX shall answer the locDeReg invoke APDU with a return error APDU containing the error notAvailable.

6.6.3   Actions at a Transit PINX for location deregistration

No special actions are required in support of SS-WTLR.

6.7   SS-WTLR Impact of interworking with public ISDNs

Not applicable.

6.8   SS-WTLR Impact of interworking with non-ISDNs

Not applicable.

6.9   Protocol interactions between SS-WTLR and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 Standards had been published at the time of publication of this Standard. For interactions with supplementary services and ANFs for which stage 3 Standards are published subsequent to the publication of this Standard, see those other stage 3 Standards.

NOTE 12
Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

NOTE 13
Simultaneous conveyance of APDUs for SS-WTLR and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 Standard, does not, on its own, constitute a protocol interaction.

6.9.1   Interaction with Calling Name Identification Presentation (SS-CNIP)

No protocol interaction.

6.9.2   Interaction with Connected Name Identification Presentation (SS-CONP)

No protocol interaction.

6.9.3   Interaction with Completion of Calls to Busy Subscriber (SS-CCBS)

No protocol interaction.

NOTE 14
SS-CCBS may need to be cancelled if the WTM user (as either the calling user or called user) changes location or deregisters.

6.9.4   Interaction with Completion of Calls on No Reply (SS-CCNR)

No protocol interaction.

NOTE 15
SS-CCNR may need to be cancelled if the WTM user (as either the calling user or called user) changes location or deregisters.

6.9.5   Interaction with Call Transfer (SS-CT)

No protocol interaction.

6.9.6   Interaction with Call Forwarding Unconditional (SS-CFU)

No protocol interaction.

6.9.7   Interaction with Call Forwarding Busy (SS-CFB)

No protocol interaction.

6.9.8   Interaction with Call Forwarding No Reply (SS-CFNR)

No protocol interaction.

6.9.9   Interaction with Call Deflection (SS-CD)

No protocol interaction.

6.9.10   Interaction with Path Replacement (ANF-PR)

No protocol interaction.

6.9.11   Interaction with Call Offer (SS-CO)

No protocol interaction.

6.9.12   Interaction with Call Intrusion (SS-CI)

No protocol interaction.

6.9.13   Interaction with Do Not Disturb (SS-DND)

No protocol interaction.

6.9.14   Interaction with Do Not Disturb Override (SS-DNDO)

No protocol interaction.

6.9.15   Interaction with Advice Of Charge (SS-AOC)

No protocol interaction.

6.9.16   Interaction with Recall (SS-RE)

No protocol interaction.

6.9.17   Interaction with Call Interception (ANF-CINT)

No protocol interaction.

6.9.18   Interaction with Transit Counter (ANF-TC)

No protocol interaction.

6.9.19   Interaction with Route Restriction Class (ANF-RRC)

No protocol interaction.

6.9.20   Interaction with Message Waiting Indication (SS-MWI)

The following interaction shall apply if SS-MWI is supported in accordance with ECMA-242.

6.9.20.1 Interaction at the previous Visitor PINX

On receipt of a locDelete invoke APDU using the call reference of a call independent signalling connection, the previous Visitor PINX shall check if there are any stored mwiActivate APDU's, and if so include the mwiActivate APDU's together with the locDelete return result APDU sent to the Home PINX.

6.9.20.2 Interaction at the Home PINX

On receipt of mwiActivate APDU's together with the locDelete return result APDU from the previous Visitor PINX, the Home PINX shall forward the mwiActivate APDU's to the new Visitor PINX if applicable.

6.9.21 Interaction with Wireless Terminal information exchange (ANF-WTINFO)

No protocol interaction.

6.9.22 Interaction with Wireless Terminal Incoming Call (SS-WTMI)

No protocol interaction.

6.9.23 Interaction with Wireless Terminal Outgoing Call (SS-WTMO)

No protocol interaction.

6.9.24 Interaction with Wireless Terminal Authentication of Terminal (SS-WTAT)

No protocol interaction.

6.9.25 Interaction with Wireless Terminal Authentication of Network (SS-WTAN)

No protocol interaction.

6.10 SS-WTLR parameter values (timers)

6.10.1 Timer T1

Timer T1 operates at the Visitor PINX during state VisitUpdate. Its purpose is to protect against the absence of a response to the locUpdate invoke APDU.

Timer T1 shall have a value not less than 15 s.

6.10.2 Timer T2

Timer T2 operates at the Visitor PINX during state VisitEnquiry. Its purpose is to protect against the absence of a response to the pisnEnquiry invoke APDU.

Timer T2 shall have a value not less than 15 s.

6.10.3 Timer T3

Timer T3 operates at the Visitor PINX during state VisitDeReg. Its purpose is to protect against the absence of a response to the locDeReg invoke APDU.

Timer T3 shall have a value not less than 15 s.

6.10.4 Timer T4

Timer T4 operates at the Home PINX during state HomeDelete. Its purpose is to protect against the absence of a response to the locDelete invoke APDU.

Timer T4 shall have a value not less than 15 s.

7 Signalling protocol for the support of ANF-WTINFO

7.1 ANF-WTINFO description

ANF-WTINFO is an additional network feature for information exchange between the Home PINX and the Visitor PINX. ANF-WTINFO is used for transfer of restriction information for a WTLR user from the Home PINX to the Visitor PINX. ANF-WTINFO also enables the Visitor PINX or the Home PINX to initiate a check of the current location information.

7.2 ANF-WTINFO operational requirements

7.2.1 Requirements on the Visitor PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Originating and Terminating PINX, shall apply.

7.2.2 Requirements on the Home PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for a Terminating and an Originating PINX, shall apply.

7.2.3 Requirements on a Transit PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for a Transit PINX, shall apply.

7.3 ANF-WTINFO coding requirements

7.3.1 Operations

The operations GetRRCInf and LocInfoCheck defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply.

7.3.2 Information elements

7.3.2.1 Facility information element

APDUs of the operations defined in 7.3.1 shall be coded in the Facility information element in accordance with ECMA-165.

When conveying the invoke APDU of operations defined in 7.3.1, the destinationEntity data element of the NFE shall contain value endPINX.

When conveying the invoke APDU of operations defined in 7.3.1, the Interpretation APDU shall either be omitted or be included with value rejectAnyUnrecognisedInvokePdu.

7.3.2.2 Other information elements

Any other information elements (e.g. Calling party number, Called party number) shall be coded in accordance with the rules of ECMA-165.

7.3.3 Messages

The Facility information element shall be conveyed in the messages as specified in clause 10 of ECMA-165.

7.4 ANF-WTINFO state definitions

7.4.1 States at the Visitor PINX

The procedures for the Visitor PINX are written in terms of the following conceptual states existing within the ANF-WTINFO Supplementary Service Control entity in that PINX in association with a particular information transfer request.

7.4.1.1 State VisitIdle

ANF-WTINFO is not operating.

7.4.1.2 State VisitWaitRRC

A getRRCInf invoke APDU has been sent.

7.4.1.3 State VisitWaitIC

A locInfoCheck invoke APDU has been sent.

7.4.2 States at the Home PINX

The procedures for the Home PINX are written in terms of the following conceptual states existing within the ANF-WTINFO Supplementary Service Control entity in that PINX in association with a particular information transfer request.

7.4.2.1 State HomeIdle

ANF-WTINFO is not operating.

7.4.2.2 State HomeWaitIC

A locInfoCheck invoke APDU has been sent.

7.5 ANF-WTINFO signalling procedures for transfer of restriction information

Examples of message sequences are shown in annex C.

7.5.1 Actions at the Visitor PINX for transfer of restriction information

The SDL representation of procedures at the Visitor PINX is shown in D.5 of annex D.

7.5.1.1 Normal procedures

On determining that transferring of restriction information is to be invoked for a WTM user, the Visitor PINX shall send a getRRCInf invoke APDU to the Home PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId, the basic service for the WTM user may be included in element basicService. The Visitor PINX shall enter state VisitWaitRRC and start timer T5.

On receipt of the getRRCInf return result APDU, the Visitor PINX shall stop timer T5, and may update the VDB with the retrieved restriction information and shall revert to state VisitIdle.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

7.5.1.2 Exceptional procedures

On receipt of a getRRCInf return error or reject APDU from the Home PINX, the Visitor PINX shall stop timer T5 and revert to state VisitIdle.

If timer T5 expires (i.e. the getRRCInf invoke APDU is not answered by the Home PINX), the Visitor PINX shall enter state VisitIdle.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T5. Alternatively, the signalling connection may be retained for other applications, if appropriate.

7.5.2 Actions at the Home PINX for transfer of restriction information

The SDL representation of procedures at the Home PINX is shown in D.6 of annex D.

7.5.2.1 Normal procedures

On receipt of a getRRCInf invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Home PINX shall attempt to retrieve the requested restriction information from the HDB and shall return a getRRCInf return result APDU. If applicable, the route restriction class and/or the alternative identity for the WTM user shall be included in the APDU.

7.5.2.2 Exceptional procedures

If the Home PINX is unable to retrieve the requested information (e.g. WTM user not known), a getRRCInf return error APDU shall be returned.

7.6 ANF-WTINFO signalling procedures for check of location data

Examples of message sequences are shown in annex C.

7.6.1 Actions at the Visitor PINX for check of location data

The SDL representation of procedures at the Visitor PINX is shown in D.5 of annex D.

7.6.1.1 Normal procedures

On determining that check of location data is to be invoked for a WTM user, the Visitor PINX shall send a locInfoCheck invoke APDU to the Home PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of

ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId, the basic service for which the WTM user is registered may be included in element basicService, and the PISN number identifying the Visitor PINX shall be included in element visitPINX. The Visitor PINX shall enter state VisitWaitIC and start timer T6.

On receipt of the locInfoCheck return result APDU, the Visitor PINX shall stop timer T6, and may take appropriate actions depending on the indicated result.

The originator of the call independent signalling connection is also responsible for clearing it. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

On receipt of a locInfoCheck invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Visitor PINX shall verify the location information in the VDB for the WTM user identified by element wtmUserId. The result of the verification shall be returned in a locInfoCheck return result APDU.

7.6.1.2   Exceptional procedures

On receipt of a locInfoCheck return error or reject APDU from the Home PINX, the Visitor PINX shall stop timer T6 and revert to state VisitIdle.

If timer T6 expires (i.e. the locInfoCheck invoke APDU is not answered by the Home PINX), the Visitor PINX shall enter state VisitIdle.

The Visitor PINX is responsible for clearing the call independent signalling connection towards the Home PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T6. Alternatively, the signalling connection may be retained for other applications, if appropriate.

On receipt of a locInfoCheck invoke APDU where the indicated WTM user is not found in the VDB, the Visitor PINX shall answer the locInfoCheck invoke APDU with a return error APDU containing the error notAvailable.

7.6.2   Actions at the Home PINX for check of location data

The SDL representation of procedures at the Home PINX is shown in D.6 of annex D.

7.6.2.1   Normal procedures

On receipt of a locInfoCheck invoke APDU using the call reference of a call independent signalling connection (as specified in 7.3 of ECMA-165), the Home PINX shall verify the location information in the HDB for the WTM user identified by element wtmUserId. The result of the verification shall be returned in a locInfoCheck return result APDU.

On determining that check of location data is to be invoked for a WTM user, the Home PINX shall send a locInfoCheck invoke APDU to the Visitor PINX using the call reference of a call independent signalling connection. The call independent signalling connection shall be established (or used, if an appropriate connection is already available) in accordance with the procedures specified in 7.3 of ECMA-165. Within the argument of the invoke APDU, the WTM user's identity shall be included in element wtmUserId, the basic service for which the WTM user is registered may be included in element basicService, and the PISN number identifying the Visitor PINX shall be included in element visitPINX. The Home PINX shall enter state HomeWaitIC and start timer T6.

On receipt of the locInfoCheck return result APDU, the Home PINX shall stop timer T6, and may take appropriate actions depending on the indicated result.

The originator of the call independent signalling connection is also responsible for clearing it. This may occur on receipt of a return result APDU. Alternatively, the signalling connection may be retained for other applications, if appropriate.

7.6.2.2   Exceptional procedures

If the indicated WTM user is not found in the HDB, the Home PINX shall answer the locInfoCheck invoke APDU with a return error APDU containing the error notAvailable.

On receipt of a locInfoCheck return error or reject APDU from the Visitor PINX, the Home PINX shall stop timer T6 and revert to state VisitIdle.

If timer T6 expires (i.e. the locInfoCheck invoke APDU is not answered by the Visitor PINX), the Home PINX shall enter state VisitIdle.

The Home PINX is responsible for clearing the call independent signalling connection towards the Visitor PINX. This may occur on receipt of a return error or reject APDU or on expiry of timer T6. Alternatively, the signalling connection may be retained for other applications, if appropriate.

7.6.3 Actions at a Transit PINX for support of ANF-WTINFO

No special actions are required in support of ANF-WTINFO.

7.7 ANF-WTINFO Impact of interworking with public ISDNs

Not applicable.

7.8 ANF-WTINFO Impact of interworking with non-ISDNs

Not applicable.

7.9 Protocol interactions between ANF-WTINFO and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 Standards had been published at the time of publication of this Standard. For interactions with supplementary services and ANFs for which stage 3 Standards are published subsequent to the publication of this Standard, see those other stage 3 Standards.

NOTE 16
Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

NOTE 17
Simultaneous conveyance of APDUs for ANF-WTINFO and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 Standard, does not, on its own, constitute a protocol interaction.

7.9.1 Interaction with Calling Name Identification Presentation (SS-CNIP)

No protocol interaction.

7.9.2 Interaction with Connected Name Identification Presentation (SS-CONP)

No protocol interaction.

7.9.3 Interaction with Completion of Calls to Busy Subscriber (SS-CCBS)

No protocol interaction.

7.9.4 Interaction with Completion of Calls on No Reply (SS-CCNR)

No protocol interaction.

7.9.5 Interaction with Call Transfer (SS-CT)

No protocol interaction.

7.9.6 Interaction with Call Forwarding Unconditional (SS-CFU)

No protocol interaction.

7.9.7 Interaction with Call Forwarding Busy (SS-CFB)

No protocol interaction.

7.9.8 Interaction with Call Forwarding No Reply (SS-CFNR)

No protocol interaction.

7.9.9 Interaction with Call Deflection (SS-CD)

No protocol interaction.

7.9.10 Interaction with Path Replacement (ANF-PR)

No protocol interaction.

7.9.11 Interaction with Call Offer (SS-CO)
No protocol interaction.

7.9.12 Interaction with Call Intrusion (SS-CI)
No protocol interaction.

7.9.13 Interaction with Do Not Disturb (SS-DND)
No protocol interaction.

7.9.14 Interaction with Do Not Disturb Override (SS-DNDO)
No protocol interaction.

7.9.15 Interaction with Advice Of Charge (SS-AOC)
No protocol interaction.

7.9.16 Interaction with Recall (SS-RE)
No protocol interaction.

7.9.17 Interaction with Call Interception (ANF-CINT)
No protocol interaction.

7.9.18 Interaction with Transit Counter (ANF-TC)
No protocol interaction.

7.9.19 Interaction with Route Restriction Class (ANF-RRC)
No protocol interaction.

7.9.20 Interaction with Message Waiting Indication (SS-MWI)
No protocol interaction.

7.9.21 Interaction with Wireless Terminal Location Registration (SS-WTLR)
No protocol interaction.

7.9.22 Interaction with Wireless Terminal Incoming Call (SS-WTMI)
No protocol interaction.

7.9.23 Interaction with Wireless Terminal Outgoing Call (SS-WTMO)
No protocol interaction.

7.9.24 Interaction with Wireless Terminal Authentication of Terminal (SS-WTAT)
The following protocol interaction shall apply if SS-WTAT is supported in accordance with ECMA-306.

7.9.24.1 Actions at the Home PINX
On receipt of a getRRCInf invoke APDU the Home PINX may obtain authentication parameters and include a transferAuthParam invoke APDU in the same message as the getRRCInf return result APDU. The invoke APDU shall contain element wtatParamInfo with choice authKey or challLen.

7.9.24.2 Actions at the Visitor PINX
When the element wtatParamInfo is received in the transferAuthParam invoke APDU, the authentication information may be stored in the Visitor PINX. It may later be used by the Visitor PINX during authentication of the WTM user.

7.9.25 Interaction with Wireless Terminal Authentication of Network (SS-WTAN)
No protocol interaction.

7.10 ANF-WTINFO parameter values (timers)

7.10.1 Timer T5
Timer T5 operates at the Visitor PINX during state VisitWaitRRC. Its purpose is to protect against the absence of a response to the getRRCInf invoke APDU.

Timer T5 shall have a value not less than 15 s.

7.10.2 Timer T6

Timer T6 operates at the Visitor PINX during state VisitWaitIC and at the Home PINX during state HomeWaitIC. Its purpose is to protect against the absence of a response to the locInfoCheck invoke APDU.

Timer T6 shall have a value not less than 15 s.

Annex A
(normative)

Protocol Implementation Conformance Statement (PICS) proforma

A.1   Introduction

The supplier of a protocol implementation which is claimed to conform to this Standard shall complete the following Protocol Implementation Conformance Statement (PICS) proforma.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use:

– by the protocol implementor, as a check list to reduce the risk of failure to conform to the Standard through oversight;

– by the supplier and acquirer, or potential acquirer, of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the Standard's PICS proforma;

– by the user or potential user of the implementation, as a basis for initially checking the possibility of interworking with another implementation - while interworking can never be guaranteed, failure to interwork can often be predicted from incompatible PICS's;

– by a protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.2   Instructions for completing the PICS proforma

A.2.1   General structure of the PICS proforma

The PICS proforma is a fixed format questionnaire divided into sub-clauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered), and the reference(s) to the clause(s) that specifies (specify) the item in the main body of this Standard.

The "Status" column indicates whether an item is applicable and if so whether support is mandatory or optional. The following terms are used:

m   mandatory (the capability is required for conformance to the protocol);

o   optional (the capability is not required for conformance to the protocol, but if the capability is implemented it is required to conform to the protocol specifications);

o.<n>   optional, but support of at least one of the group of options labelled by the same numeral <n> is required;

x   prohibited;

c.<cond>   conditional requirement, depending on support for the item or items listed in condition <cond>;

<item>:m   simple conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;

<item>:o   simple conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable.

Answers to the questionnaire items are to be provided either in the "Support" column, by simply marking an answer to indicate a restricted choice (Yes or No), or in the "Not Applicable" column (N/A).

A.2.2 Additional information

Items of Additional Information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended or expected that a large quantity will be supplied, and a PICS can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of Additional Information may be entered next to any answer in the questionnaire, and may be included in items of Exception information.

A.2.3 Exception information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirement. No pre-printed answer will be found in the Support column for this. Instead, the supplier is required to write into the support column an x.<i> reference to an item of Exception Information, and to provide the appropriate rationale in the Exception item itself.

An implementation for which an Exception item is required in this way does not conform to this Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

A.3   PICS proforma for SS-WTLR

A.3.1   Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g., name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g., Type, Series, Model).

A.3.2   Protocol summary

Protocol version	1.0
Addenda Implemented (if applicable)	
Amendments Implemented	
Have any exception items been required (see A.2.3)?	No [ ] Yes [ ] (The answer Yes means that the implementation does not conform to this Standard)

Date of statement	

A.3.3   General

Item	Question/feature	References	Status	N/A	Support
A1	Behaviour as Visitor PINX and previous Visitor PINX for SS-WTLR		o.1		Yes [ ] No [ ]
A2	Behaviour as Home PINX for SS-WTLR		o.1		Yes [ ] No [ ]
A3	Behaviour as Directory PINX for SS-WTLR		o.1		Yes [ ] No [ ]
A4	Support as a Visitor PINX of enquiry to previous Visitor PINX		A1:o	[ ]	o: Yes [ ] No [ ]
A5	Support as a Visitor PINX of enquiry to Directory PINX		A1:o	[ ]	o: Yes [ ] No [ ]

A.3.4   Procedures

Item	Question/feature	References	Status	N/A	Support
B1	Support of ECMA-165 procedures at a Visitor and previous Visitor PINX	6.2.1	A1:m	[ ]	m: Yes [ ]
B2	Support of ECMA-165 procedures at a Home PINX	6.2.2	A2:m	[ ]	m: Yes [ ]
B3	Support of ECMA-165 procedures at a Directory PINX	6.2.4	A3:m	[ ]	m: Yes [ ]
B4	Signalling procedures at a Visitor and previous Visitor PINX	6.5.1 6.5.6	A1:m	[ ]	m: Yes [ ]
B5	Additional signalling procedures at a Visitor PINX and previous Visitor PINX for enquiry from Visitor PINX to the previous Visitor PINX	6.5.2 6.5.7	A4:m	[ ]	m: Yes [ ]
B6	Additional signalling procedures at a Visitor PINX for enquiry from Visitor PINX to a Directory PINX	6.5.3	A5:m	[ ]	m: Yes [ ]
B7	Signalling procedures at a Home PINX	6.5.4	A2:m	[ ]	m: Yes [ ]
B8	Signalling procedures at a Directory PINX	6.5.8	A3:m	[ ]	m: Yes [ ]
B9	Signalling procedures at a Visitor PINX for location de-registration	6.6.1	A1:o	[ ]	o: Yes [ ] No [ ]
B10	Signalling procedures at a Home PINX for location de-registration	6.6.2	A2:o	[ ]	o: Yes [ ] No [ ]

A.3.5 Coding

Item	Question/feature	References	Status	N/A	Support
C1	Sending of locUpdate invoke APDU and receipt of return result and return error APDUs	6.3	A1:m	[ ]	m: Yes [ ]
C2	Sending of locDelete invoke APDU and receipt of return result and return error APDUs	6.3	A2:m	[ ]	m: Yes [ ]
C3	Sending of locDeReg invoke APDU and receipt of return result and return error APDUs	6.3	B9:m	[ ]	m: Yes [ ]
C4	Sending of pisnEnquiry invoke APDU and receipt of return result and return error APDUs	6.3	c.1	[ ]	m: Yes [ ]
C5	Receipt of locUpdate invoke APDU and sending of return result and return error APDUs	6.3	A2:m	[ ]	m: Yes [ ]
C6	Receipt of locDelete invoke APDU and sending of return result and return error APDUs	6.3	A1:m	[ ]	m: Yes [ ]
C7	Receipt of locDeReg invoke APDU and sending of return result and return error APDUs	6.3	B10:m	[ ]	m: Yes [ ]
C8	Receipt of pisnEnquiry invoke APDU and sending of return result and return error APDUs	6.3	c.2	[ ]	m: Yes [ ]

c.1: if A4 or A5 then m else N/A
c.2: if A3 or A4 then m else N/A

A.3.6 Timers

Item	Question/feature	References	Status	N/A	Support
D1	Support of Timer T1	6.10.1	A1:m	[ ]	m: Yes [ ] Value [. . . .]
D2	Support of Timer T2	6.10.2	c.3	[ ]	m: Yes [ ] Value [. . . .]
D3	Support of Timer T3	6.10.3	A1:m	[ ]	m: Yes [ ] Value [. . . .]
D4	Support of Timer T4	6.10.4	A2:m	[ ]	m: Yes [ ] Value [. . . .]

c.3: if A4 or A5 then m else N/A

A.3.7 Protocol interactions with SS-MWI

Item	Question/feature	Reference	Status	N/A	Support
E1	Support of SS-MWI	ECMA-242	o		Yes [ ] No [ ]
E2	Interactions at previous Visitor PINX	6.9.20.1	E1:m	[ ]	m: Yes [ ]
E3	Interactions at Home PINX	6.9.20.2	E1:m	[ ]	m: Yes [ ]

A.4   PICS proforma for ANF-WTINFO

A.4.1   Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g., name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g., Type, Series, Model).

A.4.2   Protocol summary

Protocol version	1.0
Addenda Implemented (if applicable)	
Amendments Implemented	
Have any exception items been required (see A.2.3)?	No [ ] Yes [ ] (The answer Yes means that the implementation does not conform to this Standard)

Date of statement	

A.4.3 General

Item	Question/feature	References	Status	N/A	Support
A1	Behaviour as Visitor PINX for ANF-WTINFO		o.1		Yes [ ] No [ ]
A2	Behaviour as Home PINX for ANF-WTINFO		o.1		Yes [ ] No [ ]

A.4.4 Procedures

Item	Question/feature	References	Status	N/A	Support
B1	Support of ECMA-165 procedures at a Visitor PINX	7.2.1	A1:m	[ ]	m: Yes [ ]
B2	Support of ECMA-165 procedures at a Home PINX	7.2.2	A2:m	[ ]	m: Yes [ ]
B3	Signalling procedures at a Visitor PINX for transfer of restriction information	7.5.1	A1:o.2	[ ]	o: Yes [ ] No [ ]
B4	Signalling procedures at a Home PINX for transfer of restriction information	7.5.2	A2:o.3	[ ]	o: Yes [ ] No [ ]
B5	Signalling procedures at a Visitor PINX for check of location information	7.6.1	A1:o.2	[ ]	o: Yes [ ] No [ ]
B6	Signalling procedures at a Home PINX for check of location information	7.6.2	A2:o.3	[ ]	o: Yes [ ] No [ ]

A.4.5 Coding

Item	Question/feature	References	Status	N/A	Support
C1	Sending of getRRCInf invoke APDU and receipt of return result and return error APDUs	7.3	B3:m	[ ]	m: Yes [ ]
C2	Sending of locInfoCheck invoke APDU and receipt of return result and return error APDUs	7.3	c.1	[ ]	m: Yes [ ]
C3	Receipt of getRRCInf invoke APDU and sending of return result and return error APDUs	7.3	B4:m	[ ]	m: Yes [ ]
C4	Receipt of locInfoCheck invoke APDU and sending of return result and return error APDUs	7.3	c.1	[ ]	m: Yes [ ]

c.1: if B5 or B6 then m else N/A

A.4.6 Timers

Item	Question/feature	References	Status	N/A	Support
D1	Support of Timer T5	7.10.1	B3:m	[ ]	m: Yes [ ] Value [. . . .]
D2	Support of Timer T6	7.10.2	c.2	[ ]	m: Yes [ ] Value [. . . .]

c.2: if B5 or B6 then m else N/A

A.4.7 Protocol interactions with SS-WTAT

Item	Question/feature	Reference	Status	N/A	Support
E1	Support of SS-WTAT		o		Yes [ ] No [ ]
E2	Interactions at Home PINX	7.9.24.1	E1:o	[ ]	o: Yes [ ] No [ ]
E3	Interactions at Visitor PINX	7.9.24.2	E1:o	[ ]	o: Yes [ ] No [ ]

Annex B
(informative)

Imported ASN.1 definitions

The content of this annex has been deleted to remove duplicate ASN.1 definitions defined elsewhere.

Annex C
(informative)

Examples of message sequences

This annex describes some typical message flows for SS-WTLR and ANF-WTINFO. The following conventions are used in the figures of this annex.

1. The following notation is used:

    ➤➤➤➤➤➤➤➤➤➤   Call indepenent signalling connection message containing SS-WTLR or ANF-WTINFO information

    ---------------------------------►   Call indepenent signalling connection message without SS-WTLR or ANF-WTINFO information

    ⋯⋯⋯⋯⋯⋯⋯⋯⋯►   Symbolic primitive carrying SS-WTLR or ANF-WTINFO information

xxx.inv	Invoke APDU for operation xxx
xxx.res	Return result APDU for operation xxx
xxx.err	Return error APDU for operation xxx

2. The figures show messages exchanged via Protocol Control between PINXs involved in SS-WTLR or ANF-WTINFO. Only messages relevant to SS-WTLR or ANF-WTINFO are shown.

3. Only the relevant information content (e.g. remote operation APDUs, notifications, information elements) is listed below each message name. The Facility and Notification indicator information elements containing remote operation APDUs and notifications are not explicitly shown. Information with no impact on SS-WTLR or ANF-WTINFO is not shown.

4. Some interactions with users are included in the form of symbolic primitives. The actual protocol at the terminal interface is outside the scope of this Standard.

C.1   Message flows for SS-WTLR

C.1.1   Successful location registration

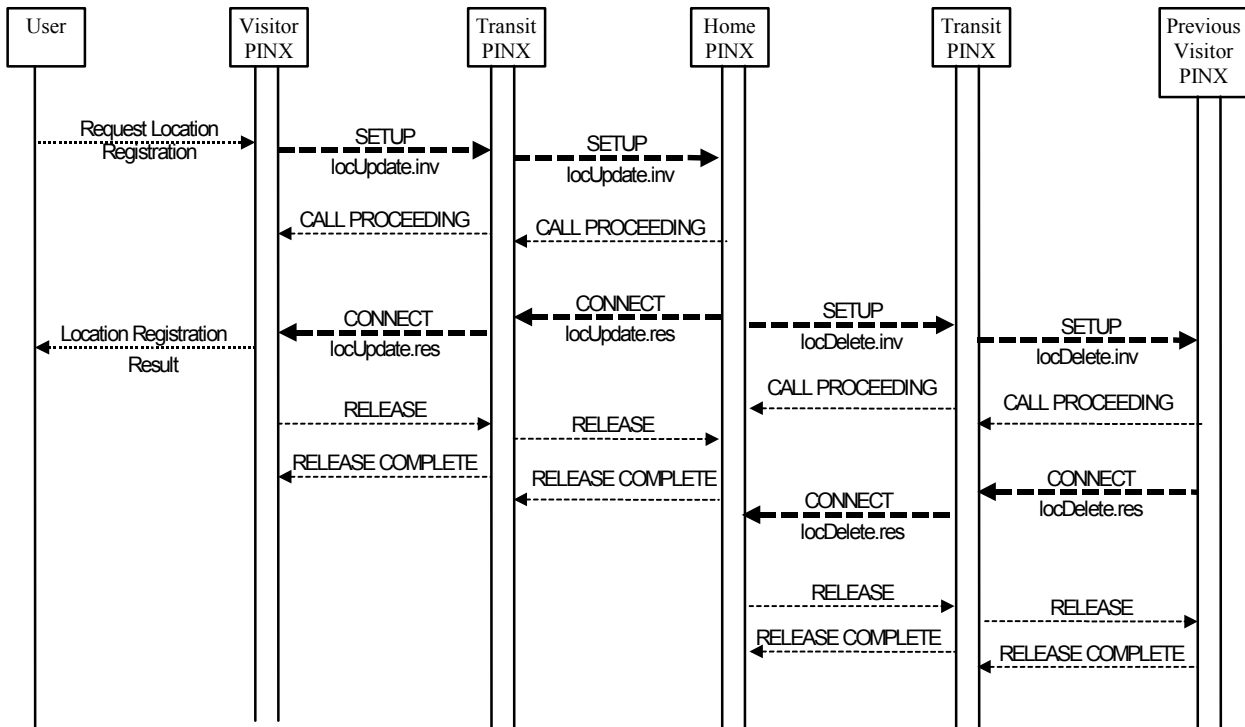Figure C.1 shows an example message flow of successful location registration.

Figure C.1 - Example message flow for location registration

C.1.2 Location registration with additional enquiry to the previous Visitor PINX

Figure C.2 shows an example message flow of successful location registration using the additional procedure with enquiry to the previous Visitor PINX to obtain the WTM user's PISN number.
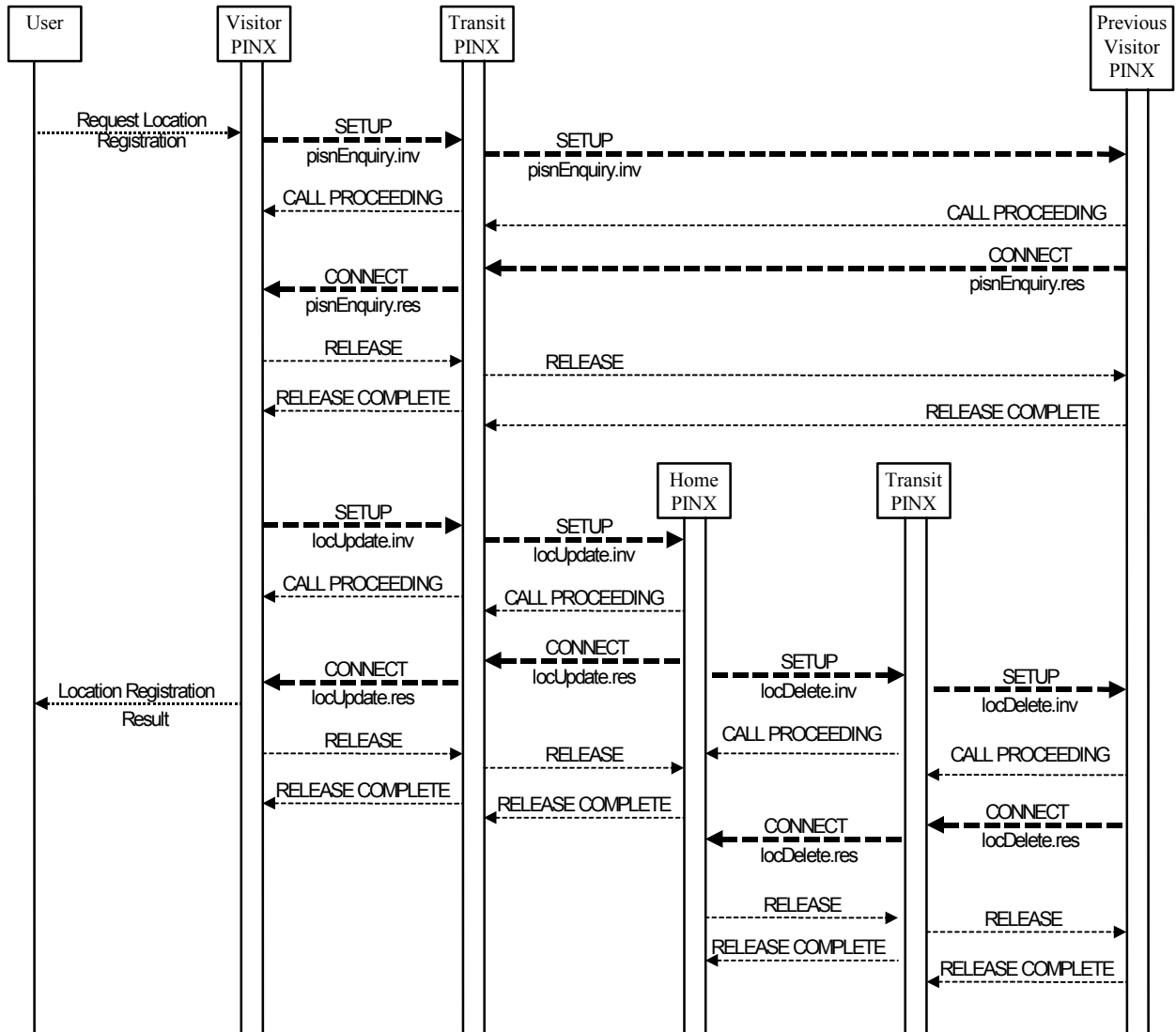

Figure C.2 - Example message flow for location registration with enquiry to the previous Visitor PINX

C.1.3   Location registration with additional enquiry to a Directory PINX

Figure C.3 shows an example message flow of successful location registration using the additional procedure with enquiry to a Directory PINX to obtain the WTM user's PISN number.
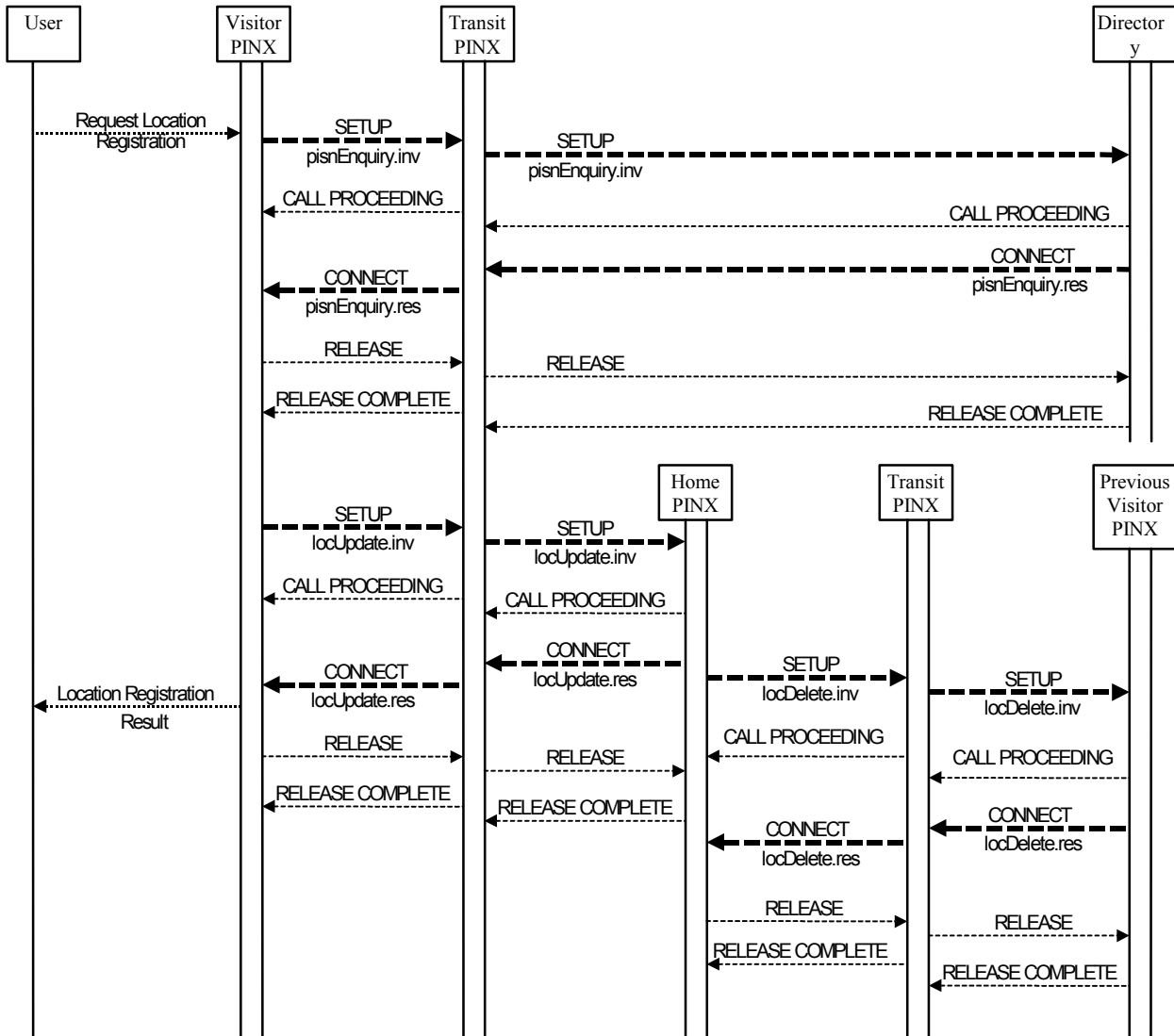

Figure C.3 - Example message flow for location registration with enquiry to a Directory PINX

C.1.4 Successful location deregistration

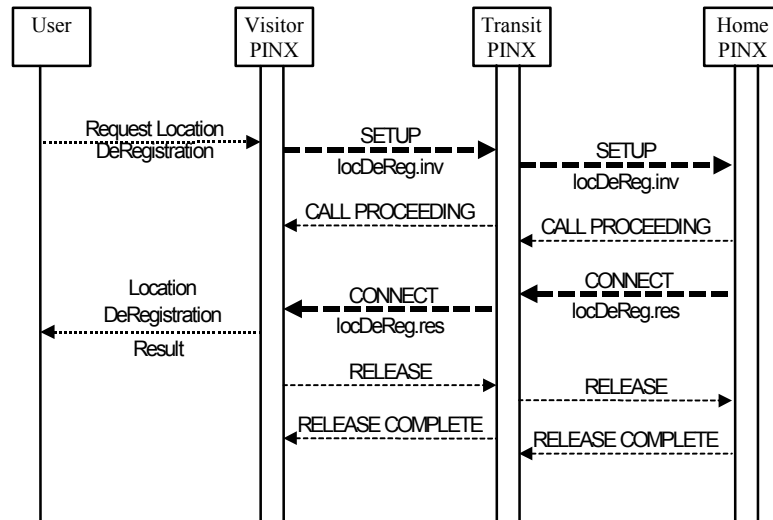Figure C.4 shows an example message flow of successful location deregistration.

Figure C.4 - Example message flow for location deregistration

C.2 Message flows for ANF-WTINFO

C.2.1 ANF-WTINFO transfer of restriction information

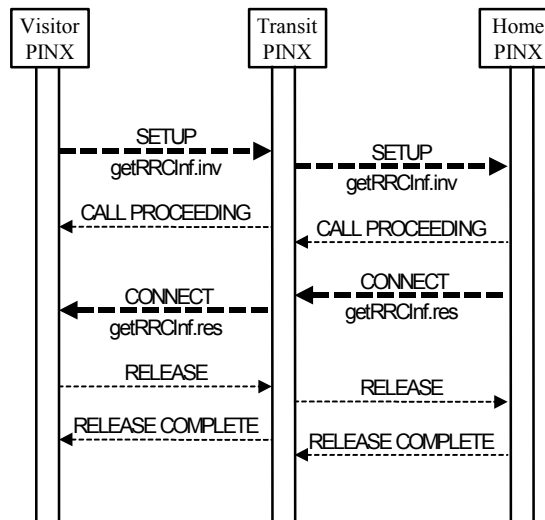Figure C.5 shows an example message flow of successful transfer of restriction information.

Figure C.5 - Example message flow for transfer of restriction information

C.2.2 ANF-WTINFO check of location information

Figure C.6 shows an example message flow of successful check of location information initiated from the Visitor PINX.
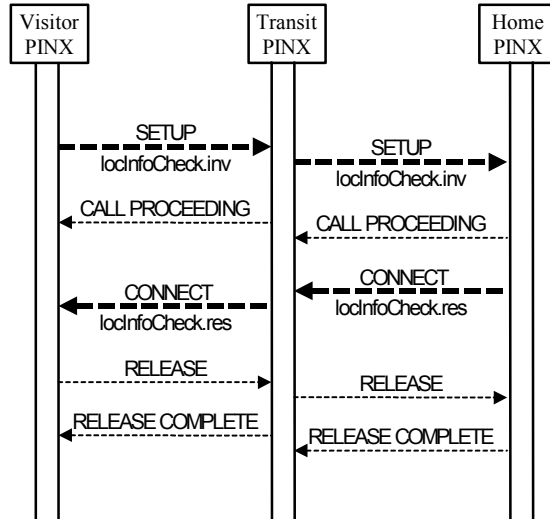

Figure C.6 - Example message flow for check of location information

Annex D

Specification and Description Language (SDL) representation of procedures

The diagrams in this annex use the Specification and Description Language defined in ITU-T Recommendation Z.100.

Each diagram represents the behaviour of an SS-WTLR Supplementary Service Control entity at a particular type of PINX. In accordance with the protocol model described in ECMA-165, the Supplementary Service Control entity uses, via the Coordination Function, the services of Generic Functional Transport Control and Basic Call Control.

Where an output symbol represents a primitive to the Coordination Function, and that primitive results in a message being sent, the output symbol bears the name of the message and any remote operations APDU(s) or notification(s) contained in that message.

Where an input symbol represents a primitive from the Coordination Function, and that primitive is the result of a message being received, the input symbol bears the name of the message and any remote operations APDU(s) or notification(s) contained in that message.

The following abbreviations are used:

inv.   invoke APDU

res.   return result APDU

err.   return error APDU
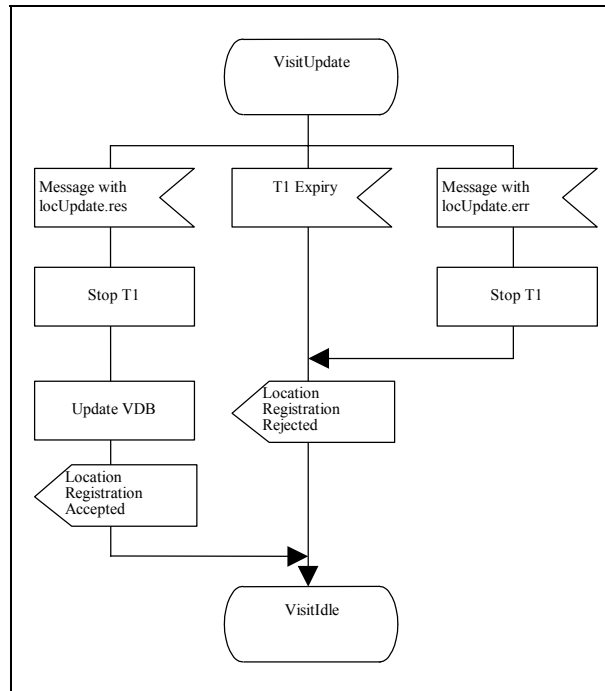
rej.   reject APDU

D.1   SDL representation of SS-WTLR at the Visitor PINX

Figure D.1 shows the behaviour of an SS-WTLR Supplementary Service Control entity within the Visitor PINX.

Input signals from the left and output signals to the left represent primitives to and from the user.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function. Also protocol timer expiry is indicated by an input signal from the right.

Figure D.1 - Visitor PINX behaviour (sheet 1 of 2)

Figure D.1 - Visitor PINX behaviour (sheet 2 of 2)

D.2 SDL representation of SS-WTLR at the Home PINX

Figure D.2 shows the behaviour of an SS-WTLR Supplementary Service Control entity within the Home PINX.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function. Also protocol timer expiry is indicated by an input signal from the right.
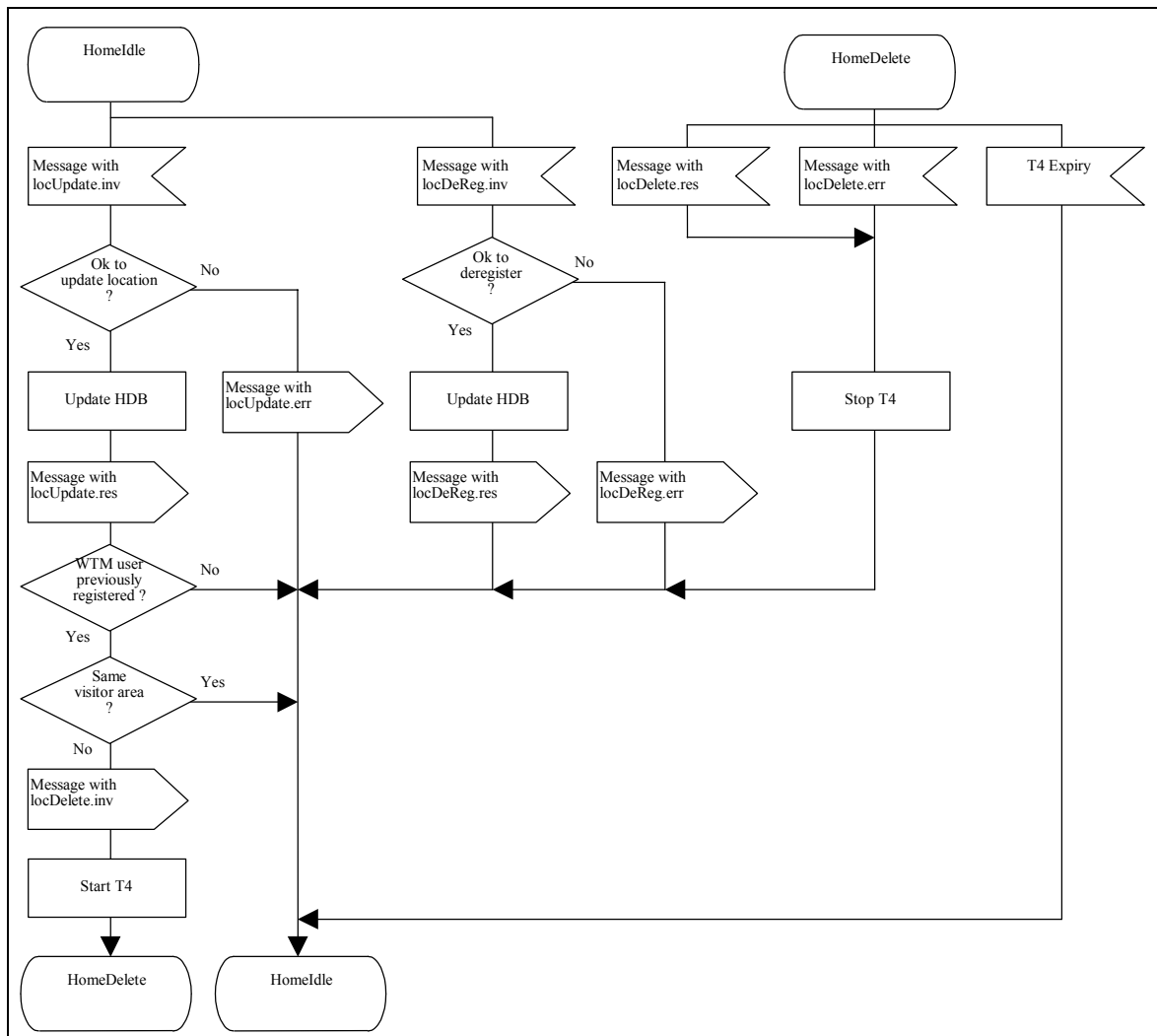

Figure D.2 - Home PINX behaviour

D.3 SDL representation of SS-WTLR at the previous Visitor PINX

Figure D.3 shows the behaviour of an SS-WTLR Supplementary Service Control entity within the previous Visitor PINX.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function.
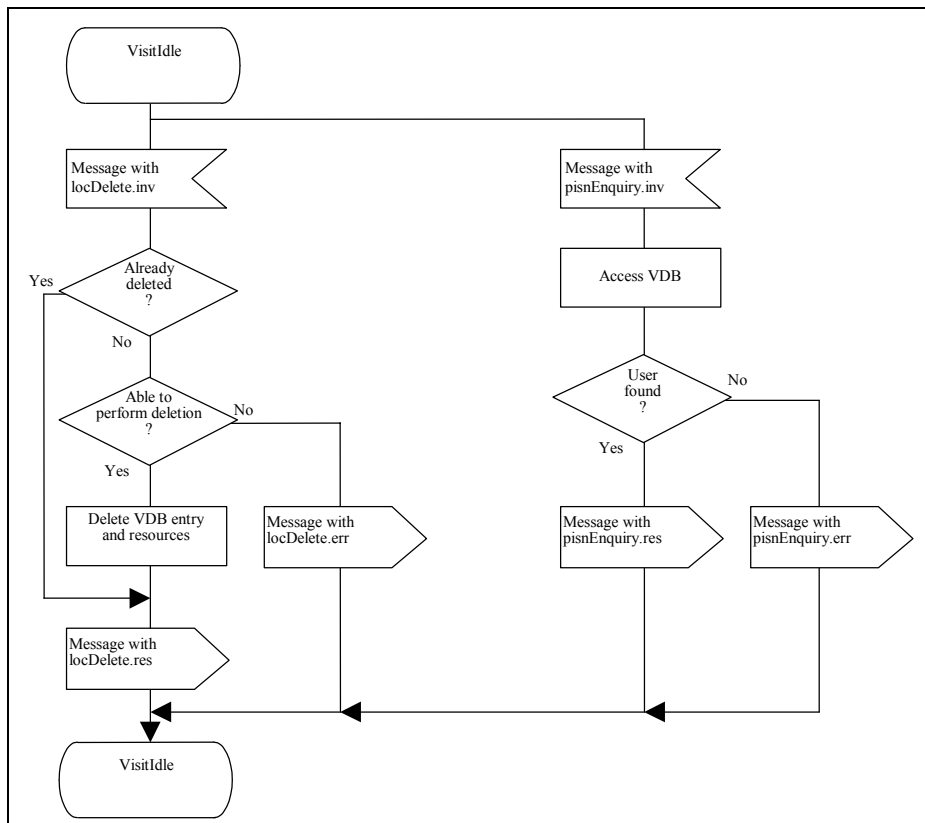

Figure D.3 - Previous Visitor PINX behaviour

D.4 SDL representation of SS-WTLR at the Directory PINX

Figure D.4 shows the behaviour of an SS-WTLR Supplementary Service Control entity within the Directory PINX.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function.
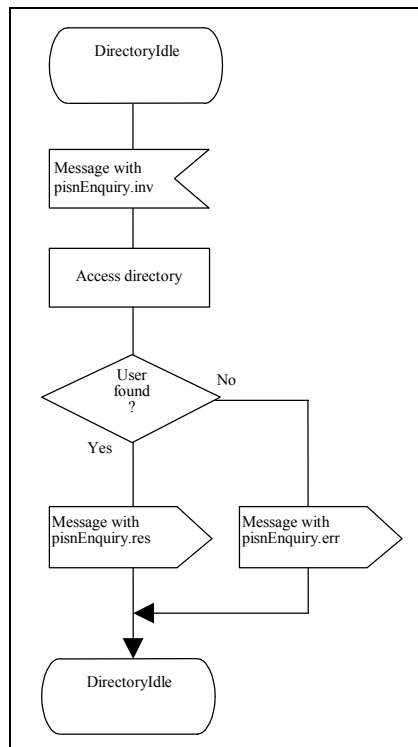

Figure D.4 - Directory PINX behaviour

D.5 SDL representation of ANF-WTINFO at the Visitor PINX

Figure D.5 shows the behaviour of an ANF-WTINFO Supplementary Service Control entity within the Visitor PINX.

Input signals from the left and output signals to the left represent internal stimuli.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function. Also protocol timer expiry is indicated by an input signal from the right.

Figure D.5 - Visitor PINX behaviour

D.6   SDL representation of ANF-WTINFO at the Home PINX

Figure D.6 shows the behaviour of an ANF-WTINFO Supplementary Service Control entity within the Home PINX.

Input signals from the left and output signals to the left represent internal stimuli.

Input signals from the right and output signals to the right represent primitives to and from the Co-ordination Function. Also protocol timer expiry is indicated by an input signal from the right.
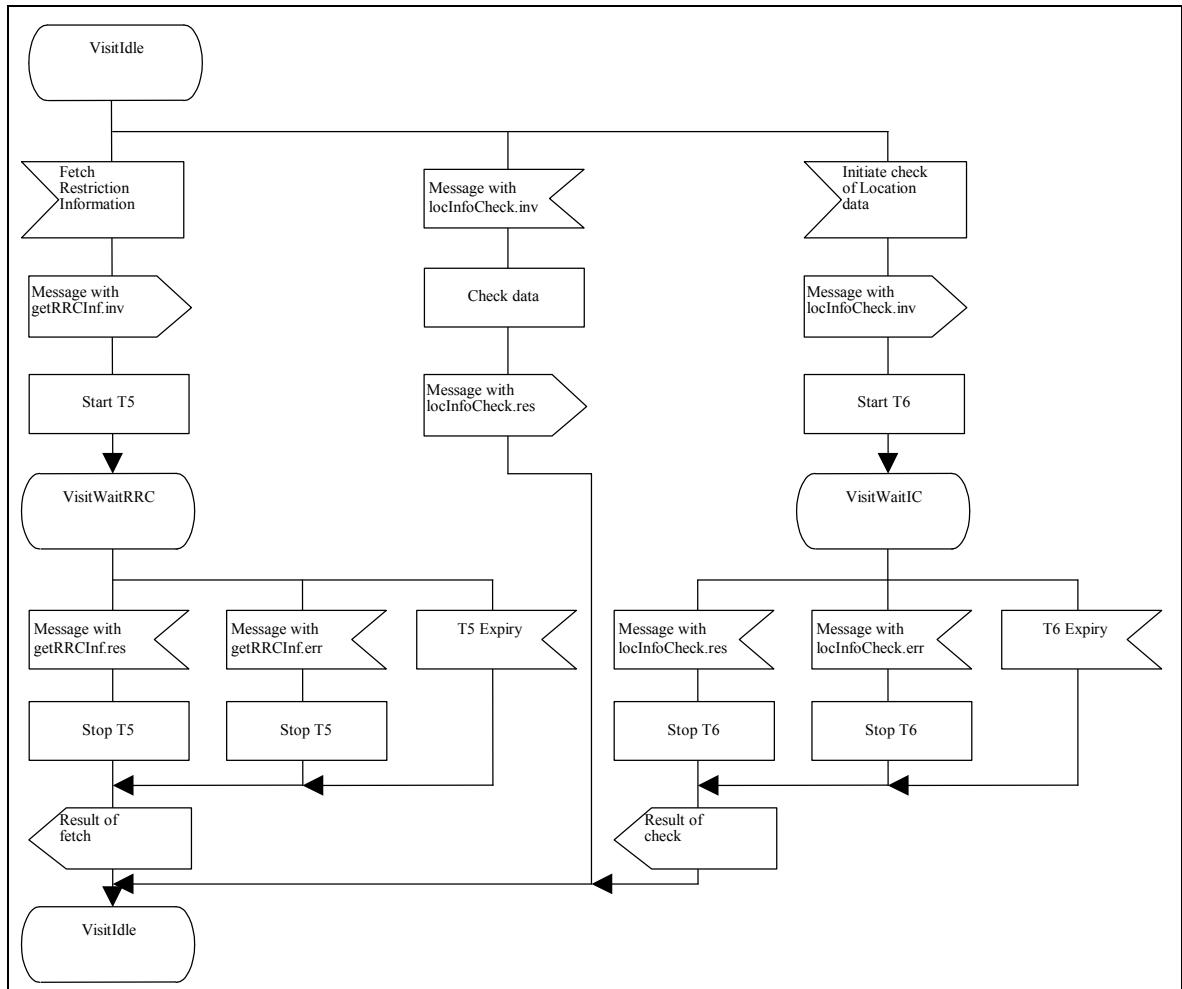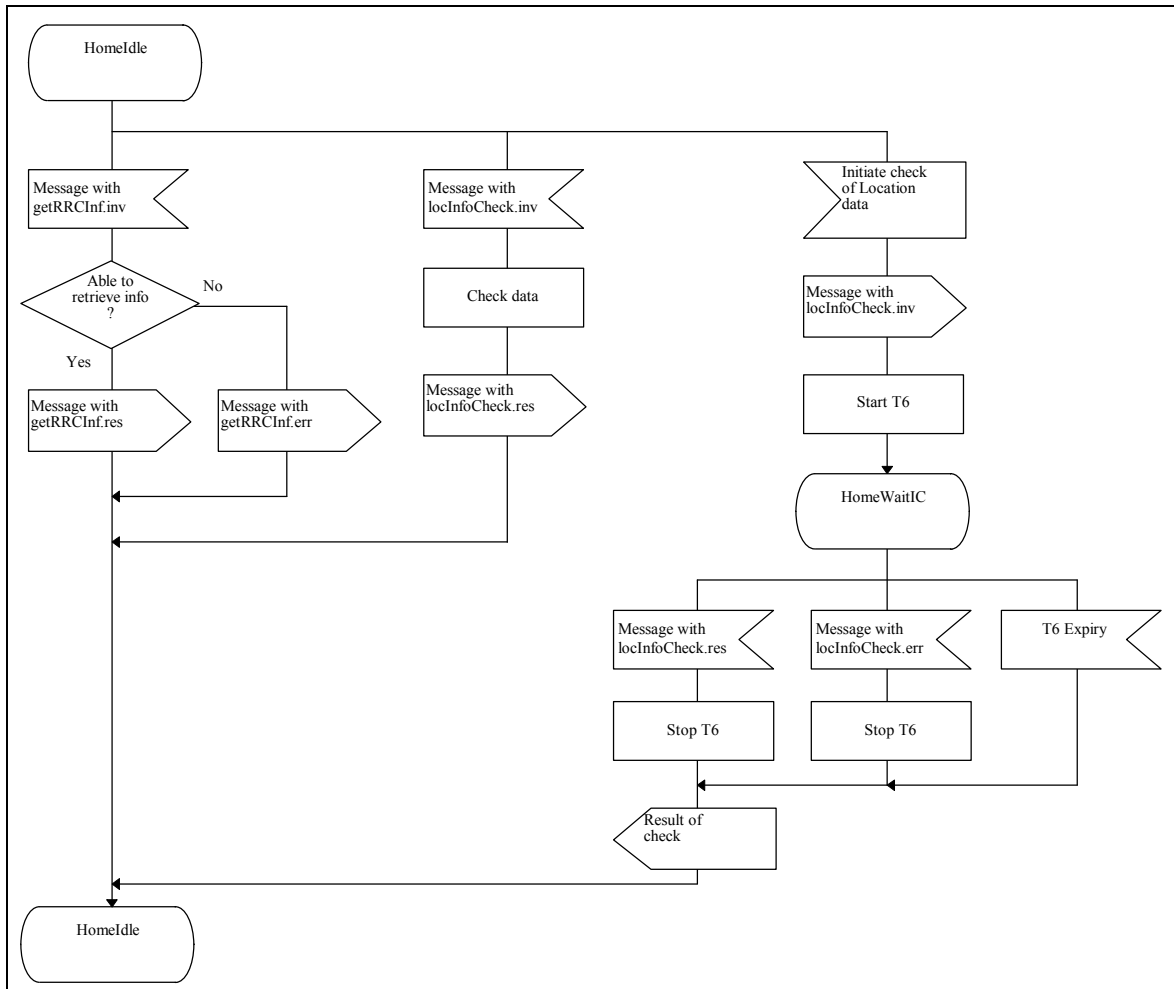

Figure D.6 - Home PINX behaviour

Annex E
(normative)

ASN.1 definitions according to ITU-T Recs. X.208 / X.209

This annex lists all ASN.1 modules as they were defined in the first edition of ECMA-302, i.e. based on ITU-T Recommendations X.208 / X.209. Starting with the second edition the ASN.1 modules within ECMA-302 comply with ITU-T Recommendations X.680 / X.690. Please note that regardless of which version of these modules is used as a base of a QSIG implementation, the line encoding remains unchanged. Changes in future editions to modules based on X.680 / X.690 ASN.1 are not reflected in the modules in this annex.

Table E.1 - WTM-Location-Registration-Operations – based on ITU-T Recs. X.208 / X.209

```
WTM-Location-Registration-Operations
                {iso standard pss1-location-registration (15429) wtlr-operations (0)}


DEFINITIONS EXPLICIT TAGS ::=


BEGIN


IMPORTS          OPERATION, ERROR FROM Remote-Operation-Notation
                        {joint-iso-ccitt(2) remote-operations(4) notation (0)}
                 Extension FROM Manufacturer-specific-service-extension-definition
                        {iso  standard
                        pss1-generic-procedures (11582) msi-definition (0)}
                 notAvailable, invalidServedUserNumber
                        FROM General-Error-List
                        {ccitt recommendation q 950 general-error-list (1)}
                 PartyNumber FROM Addressing-Data-Elements
                        {iso(1) standard(0) pss1-generic-procedures(11582)
                        addressing-data-elements(9)}
                 BasicService FROM Call-Diversion-Operations
                        { iso (1) standard (0) pss1-call-diversion (13873)
                        call-diversion-operations (0) };

LocUpdate ::=    OPERATION
                 -- Sent from the Visitor PINX to the Home PINX.
                        ARGUMENT        LocUpdArg
                        RESULT          DummyRes
                        ERRORS          { invalidServedUserNumber, notAuthorized, unspecified }

LocDelete ::=    OPERATION
                 -- Sent from the Home PINX to the previous Visitor PINX.
                        ARGUMENT        LocDelArg
                        RESULT          DummyRes
                        ERRORS          { temporarilyUnavailable, unspecified }
```

LocDeReg ::=	OPERATION	
	-- Sent from the Visitor PINX to the Home PINX.	
	ARGUMENT	LocDeRegArg
	RESULT	DummyRes
	ERRORS	{ notAvailable, unspecified }
PisnEnquiry ::=	OPERATION	
	-- Sent from the Visitor PINX to the previous Visitor PINX or a Directory PINX.	
	ARGUMENT	PisnEnqArg
	RESULT	PisnEnqRes
	ERRORS	{ invalidServedUserNumber, unspecified}
GetRRCInf ::=	OPERATION	
	-- Sent from the Visitor PINX to the Home PINX.	
	ARGUMENT	GetRRCInfArg
	RESULT	GetRRCInfRes
	ERRORS	{ notAvailable, unspecified }
LocInfoCheck ::=	OPERATION	
	-- Sent from the Visitor PINX to the Home PINX or vice versa.	
	ARGUMENT	LocInfoCheckArg
	RESULT	LocInfoCheckRes
	ERRORS	{ notAvailable, unspecified }
LocUpdArg ::=	SEQUENCE	{ wtmUserId WtmUserId,
		basicService BasicService DEFAULT allServices,
		visitPINX PartyNumber,
		-- The pisnNumber of the Visitor PINX,	
		-- always a Complete Number.	
		argExtension LrExtension OPTIONAL }
DummyRes ::=	CHOICE	{ null NULL,
		extension [1] IMPLICIT Extension,
		sequOfExtn [2] IMPLICIT SEQUENCE OF Extension }
LocDelArg ::=	SEQUENCE	{ wtmUserId WtmUserId,
		basicService BasicService DEFAULT allServices,
		argExtension LrExtension OPTIONAL }
LocDeRegArg ::=	SEQUENCE	{ wtmUserId WtmUserId,
		basicService BasicService DEFAULT allServices,
		argExtension LrExtension OPTIONAL }
PisnEnqArg ::=	SEQUENCE	{ alternativeId AlternativeId,
		-- Can be a temporary identifier, e.g. Network Assigned	
		-- Identity structure, or a fixed handset identifier.	
		argExtension LrExtension OPTIONAL }
PisnEnqRes ::=	SEQUENCE	{ wtmUserId WtmUserId,
		resExtension LrExtension OPTIONAL }
GetRRCInfArg ::=	SEQUENCE	{ wtmUserId WtmUserId,
		basicService BasicService DEFAULT allServices,
		argExtension LrExtension OPTIONAL }

Table E.1 - WTM-Location-Registration-Operations – based on ITU-T Recs. X.208 / X.209 (concluded)

GetRRCInfRes ::=	SEQUENCE	{ alternativeId	AlternativeId OPTIONAL,
		rrClass	RRClass OPTIONAL,
		argExtension	LrExtension OPTIONAL }
LocInfoCheckArg ::=	SEQUENCE	{ wtmUserId	WtmUserId,
		basicService	BasicService DEFAULT allServices,
		visitPINX	PartyNumber,
		-- The PISN number of the Visitor PINX,	
		-- always a Complete Number.	
		argExtension	LrExtension OPTIONAL }
LocInfoCheckRes ::=	SEQUENCE	{ checkResult	CheckResult,
		argExtension	LrExtension OPTIONAL }
WtmUserId ::=	CHOICE	{ pisnNumber	PartyNumber,
		-- The PISN number of the WTM user,	
		-- always a Complete Number.	
		alternativeId	AlternativeId }
AlternativeId ::=	OCTET STRING(SIZE(1..20))		
LrExtension ::=	CHOICE	{ extension [1] IMPLICIT Extension,	
		sequOfExtn [2] IMPLICIT SEQUENCE OF Extension }	
RRClass ::=	INTEGER (0..99)		
CheckResult ::=	ENUMERATED	{ locInfChk-correct (0),	
		locInfChk-incorrect (1) }	
locUpdate	LocUpdate ::=	localValue 50	
locDelete	LocDelete ::=	localValue 51	
locDeReg	LocDeReg ::=	localValue 52	
pisnEnquiry	PisnEnquiry ::=	localValue 53	
getRRCInf	GetRRCInf ::=	localValue 97	
locInfoCheck	LocInfoCheck ::=	localValue 98	
notAuthorized	ERROR ::=	localValue 1007	
temporarilyUnavailable	ERROR ::=	localValue 1000	
unspecified	Unspecified ::=	localValue 1008	
Unspecified ::=	ERROR	PARAMETER Extension	
END	-- of WTM-Location-Registration-Operations		

NOTE
Element visitPINX in LocUpdArg can either be a roaming number for the individual WTLR user or a single number for all WTLR users currently registered in this PINX. In the latter case the individual WTLR users are distinguished by their own WtmUserId.