INTERNATIONAL STANDARD

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Do Not Disturb and Do Not Disturb Override supplementary services

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseau privé à intégration de services — Protocole de signalisation d'interéchange — Services supplémentaires ne pas déranger et dérogation à ne pas déranger

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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

ISO/IEC 14844 was prepared by ECMA (as ECMA-194) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This second edition cancels and replaces the first edition (ISO/IEC 14844:1996), which has been technically revised.

Introduction

This International Standard is one of a series of Standards defining 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 International Standard specifies the signalling protocol for use at the Q reference point in support of the Do Not Disturb (DND) and Do Not Disturb Override (DNDO) supplementary services. The protocol defined in this International Standard forms part of the PSS1 protocol (informally known as QSIG).

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC 1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Do Not Disturb and Do Not Disturb Override supplementary services

1 Scope

This International Standard specifies the signalling protocol for the support of the Do Not Disturb and Do Not Disturb Override supplementary services (SS-DND and SS-DNDO) at the Q reference point between Private Integrated services Network eXchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

SS-DND is a supplementary service which enables a served user to cause the PISN to reject any calls, or just those associated with a specified basic service, addressed to the served user's PISN number. The calling user is given an indication. Incoming calls are rejected as long as the service is active. The served user's outgoing service is unaffected.

SS-DNDO is a supplementary service which enables a served user to override SS-DND at a called number; that is, to allow the call to proceed as if the called user had not activated SS-DND.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in ETS 300 387. This International 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 ISO/IEC 14842.

The signalling protocols for SS-DND(O) operate on top of the signalling protocol for basic circuit switched call control, as specified in ISO/IEC 11572, and use certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

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

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

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

2 Conformance

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

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11572:2000, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol*

ISO/IEC 11574:2000, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services - Service description, functional capabilities and information flows*

ISO/IEC 11579-1:1994, *Information technology - Telecommunications and information exchange between systems - Private integrated services network - Part 1: Reference configuration for PISN Exchanges (PINX)*

ISO/IEC 11582:2002, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol*

ISO/IEC 13870:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Completion supplementary services*

ISO/IEC 13873:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Diversion supplementary services*

ISO/IEC 14842:1996, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Do not disturb and do not disturb override supplementary services*

ISO/IEC 14843:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Offer supplementary service*

ISO/IEC 14846:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Intrusion supplementary service*

ETS 300 387:1994, *Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services*

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

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

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

ITU-T Rec. Z.100:1999, *Specification and description language (SDL)*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1 External definitions

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

- Application Protocol Data Unit (APDU) (ISO/IEC 11582)
- Basic Service (ITU-T Rec. I.210)
- Call, Basic Call (ISO/IEC 11582)
- Coordination Function (ISO/IEC 11582)
- End PINX (ISO/IEC 11582)
- Gateway PINX (ISO/IEC 11572)
- Interpretation APDU (ISO/IEC 11582)
- Network Facility Extension (NFE) (ISO/IEC 11582)
- Originating PINX (ISO/IEC 11582)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated services Network eXchange (PINX) (ISO/IEC 11579-1)
- Rerouteing PINX (ISO/IEC 13873)
- Served user (ISO/IEC 14842)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- Supplementary Services Control Entity (ISO/IEC 11582)
- Terminating PINX (ISO/IEC 11582)

– Transit PINX (ISO/IEC 11582)

– User (ISO/IEC 11574)

4.2 Other definitions

4.2.1 Activating PINX

The PINX serving the activating user.

4.2.2 Deactivating PINX

The PINX serving the deactivating user.

4.2.3 Inter-PINX link

The totality of a signalling channel and a number of information channels at the Q reference point**.**

4.2.4 Interrogating PINX

The PINX serving the interrogating user.

4.2.5 Path retention

The retaining of the network connection between the Originating PINX and the Terminating PINX so that a supplementary service (such as SS-DNDO) can be invoked without establishing a new connection.

4.2.6 Served User PINX

The PINX serving the served user.

5 Acronyms

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
DNDOCL	DNDO Capability Level
DNDPL	DND Protection Level
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-DND	Supplementary Service Do Not Disturb
SS-DNDO	Supplementary Service Do Not Disturb Override
TE	Terminal Equipment

6 Signalling protocol for the support of SS-DND and SS-DNDO

6.1 SS-DND and SS-DNDO description

SS-DND is a supplementary service which enables a served user to cause the PISN to reject any calls, or just those associated with a specified basic service, addressed to the served user's PISN number. The calling user is given an appropriate indication. Incoming calls are rejected as long as the service is active. The served user's outgoing service is unaffected.

SS-DNDO is a supplementary service which enables a calling user to override SS-DND at a called user, allowing the call to proceed as if the called user had not activated SS-DND.

Both SS-DND and SS-DNDO are applicable to all circuit mode basic services defined in ISO/IEC 11574.

6.2 SS-DND and SS-DNDO operational requirements

6.2.1 Provision/withdrawal

6.2.1.1 Provision/withdrawal of SS-DND

SS-DND is provided or withdrawn after pre-arrangement with the service provider.

SS-DND is provided on a per PISN number basis and per basic service basis. For each PISN number, the supplementary service can be subscribed to for every basic service subscribed to by that PISN number, or for only some of the basic services subscribed to by that PISN number.

SS-DND subscription parameters may apply separately to each basic service to which SS-DND is subscribed, or for all the basic services to which SS-DND is subscribed.

If SS-DNDO is implemented then the subscription parameter "DND protection level" (DNDPL) shall be provided. The DNDPL has a value in the range 0 to 3 where 0 means no protection against DNDO and 3 means total protection against DNDO. The values 0 and 3 shall be offered. The values 1 and 2 may, as an implementation option, be offered. The effect of the subscription parameter DNDPL shall be as described in subclause 6.3.15 of ISO/IEC 14842.

The subscription parameter "Served user notification of SS-DND" may be provided. If it is not provided, as an implementation option, the network may or may not notify the served user of DND invocation.

6.2.1.2 Provision/withdrawal of SS-DNDO

SS-DNDO is provided or withdrawn after pre-arrangement with the service provider.

SS-DNDO is provided on a per PISN number basis and per basic service basis. For each PISN number, the supplementary service can be subscribed to for every basic service subscribed to by that PISN number, or for only some of the basic services subscribed to by that PISN number.

SS-DNDO subscription parameters may apply separately to each basic service to which SS-DNDO is subscribed, or for all the basic services to which SS-DNDO is subscribed.

The subscription parameter "DNDO capability level" (DNDOCL) shall be provided. The DNDOCL has a value in the range 1 (lowest capability) to 3 (highest capability). At least one of the DNDOCL levels shall be offered. The effect of the subscription parameter DNDOCL shall be as described in subclause 6.3.15 of ISO/IEC 14842.

6.2.2 Requirements on a Terminating PINX

Call establishment procedures for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply. In addition, the generic procedures for notification, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.3 Requirements on an Originating PINX

Call establishment procedures for the outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply. In addition, the generic procedures for notification, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.4 Requirements on an Activating PINX

Generic procedures for the call-independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.2.5 Requirements on a Deactivating PINX

Generic procedures for the call-independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.2.6 Requirements on an Interrogating PINX

Generic procedures for the call-independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.2.7 Requirements on a SS-DND Served User PINX

Generic procedures for the call-independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX, shall apply.

6.2.8 Requirements on a Transit PINX

The basic call procedures for call establishment and call clearing at a Transit PINX, as specified in ISO/IEC 11572, shall apply.

Generic procedures for the call-related control and call-independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply. In addition, the generic procedures for notification, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.3 SS-DND and SS-DNDO 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 F.

Table 1 - Operations in support of SS-DND(O)

```
Do-Not-Disturb-Operations-asn1-97
                        {iso(1) standard(0) pss1-do-not-disturb(14844) do-not-disturb-operations-asn1-97 (2) }

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

IMPORTS                 OPERATION, ERROR FROM Remote-Operations-Information-Objects
                            {joint-iso-itu-t(2) remote-operations(4) informationObjects(5) version1(0)}
                        EXTENSION, Extension{} FROM Manufacturer-specific-service-extension-class-asn1-97
                            {iso(1) standard(0)
                            pss1-generic-procedures(11582) msi-class-asn1-97(11)}
                        basicServiceNotProvided, invalidServedUserNr, notAvailable,
                        userNotSubscribed, supplementaryServiceInteractionNotAllowed
                            FROM General-Error-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) }
                        ;

Do-Not-Disturb-Operations OPERATION ::= {doNotDisturbActivateQ | doNotDisturbDeactivateQ |
doNotDisturbInterrogateQ | doNotDisturbOverrideQ | doNotDisturbOvrExecuteQ | pathRetain | serviceAvailable}

doNotDisturbActivateQ   OPERATION ::= {
                        ARGUMENT                DNDActivateArg
                        RESULT  DNDActivateRes
                        ERRORS {                userNotSubscribed |
                                                    notAvailable |
                                                    invalidServedUserNr |
                                                    basicServiceNotProvided |
                                                    temporarilyUnavailable |
                                                    supplementaryServiceInteractionNotAllowed |
                                                    unspecified}
                        CODE                    local: 35}
```

Table 1 - Operations in support of SS-DND(O) (continued)

doNotDisturbDeactivateQ	OPERATION ::= {		
	ARGUMENT	DNDDeactivateArg	
	RESULT	DummyRes	
	ERRORS	{ userNotSubscribed |	
		notAvailable |	
		invalidServedUserNr |	
		notActivated |	
		temporarilyUnavailable |	
		supplementaryServiceInteractionNotAllowed |	
		unspecified}	
	CODE	local: 36}	
doNotDisturbInterrogateQ	OPERATION ::= {		
	ARGUMENT	DNDInterrogateArg	
	RESULT	DNDInterrogateRes	
	ERRORS	{ userNotSubscribed |	
		notAvailable |	
		invalidServedUserNr |	
		temporarilyUnavailable |	
		supplementaryServiceInteractionNotAllowed |	
		unspecified}	
	CODE	local: 37}	
doNotDisturbOverrideQ	OPERATION ::= {		
	ARGUMENT	DNDOverrideArg	
	RETURN RESULT	FALSE	
	ALWAYS RESPONDS	FALSE	
	CODE	local: 38}	
pathRetain	OPERATION ::= {		
	ARGUMENT	PathRetainArg	-- this operation may be used by other -- Supplementary Services using other -- values of the argument
	RETURN RESULT	FALSE	
	ALWAYS RESPONDS	FALSE	
	CODE	local: 41}	
serviceAvailable	OPERATION ::= {		
	ARGUMENT	ServiceAvailableArg	-- this operation may be used by other -- Supplementary Services using other -- values of the argument
	RETURN RESULT	FALSE	
	ALWAYS RESPONDS	FALSE	
	CODE	local: 42}	