
**Information technology —
Telecommunications and information
exchange between systems — Private
Integrated Services Network —
Inter-exchange signalling protocol —
Message waiting indication supplementary
service**

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de services —
Protocole de signalisation d'interéchange — Service supplémentaire
d'indication d'attente de message*



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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. 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.

International Standard ISO/IEC 15506 was prepared by ECMA (as ECMA-242) 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.

Annex A forms an integral part of this International Standard. Annexes B, C and D are for information only.

Introduction

This International Standard is one of a series of standards defining services and signalling protocols applicable to Private Integrated Services Networks. The series uses the ISDN concepts as developed by ITU-T and is also within the framework of standards for open systems interconnection as defined by ISO.

This International Standard specifies the signalling protocol for use at the Q reference point in support of the Message Waiting Indication supplementary service.

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

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Message waiting indication supplementary service

1 Scope

This International Standard specifies the signalling protocol for the support of the Message Waiting Indication supplementary service (SS-MWI) at the Q reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

The supplementary service MWI enables a Served User to be sent a Message Waiting Indication and also enables this Message Waiting Indication to be cancelled. The Served User may also be permitted to interrogate the Message Centre for any Message Waiting Indication.

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 CCITT Rec. I.130. 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 International Standard ISO/IEC 15505.

The signalling protocol for SS-MWI uses 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-MWI 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 A.

Conformance to this International Standard includes conforming to those clauses that specify protocol interactions between SS-MWI and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

3 Normative references

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

ISO/IEC 8601:1988,	<i>Data elements and interchange formats — Information interchange — Representation of dates and times.</i>
ISO/IEC 11579-1:1994,	<i>Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Part 1: Reference configuration for PISN Exchanges (PINX).</i>
ISO/IEC 11582:1995,	<i>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.</i>
ISO/IEC 13873:1995,	<i>Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Call diversion supplementary services.</i>

ISO/IEC 15505:1997, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Message waiting indication supplementary service.*

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

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

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

ITU-T Rec. Q.950:1993, *Digital subscriber signalling system no.1 (DSS1) — Supplementary services protocols, structure and general principles.*

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

4 Definitions

For the purposes of this International Standard, the following definitions apply:

4.1 External definitions

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

- Application Protocol Data Unit (APDU) (ISO/IEC 11582)
- Basic Service (ITU-T Rec. I.210)
- Call-Independent (ISO/IEC 11582)
- Gateway PINX (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)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- Supplementary Service Control Entity (ISO/IEC 11582)
- Terminating PINX (ISO/IEC 11582)
- Transit PINX (ISO/IEC 11582)

4.2 Other definitions

- 4.2.1 **Message Centre PINX** : The PINX serving the Message Centre entity for activation, deactivation.
- 4.2.2 **Served User** : The user to whom the Message Waiting Indication is sent on initiative of the Message Centre.
- 4.2.3 **Message Centre** : The entity which activates or deactivates the Message Waiting Indication as a result of storage or retrieval of messages.
- 4.2.4 **Message Waiting Indication** : An indication to the Served User when messages are waiting for the Served User.

5 List of acronyms

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
NFE	Network Facility Extension

PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS	Supplementary Service

6 Signalling protocol for the support of SS-MWI

6.1 SS-MWI description

SS-MWI enables a Served User to be sent a Message Waiting Indication and also enables this Message Waiting Indication to be cancelled.

This service also includes an option to interrogate the Message Waiting Indication stored against the Served User.

6.2 SS-MWI operational requirements

6.2.1 Requirements on a Message Centre PINX

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

6.2.2 Requirements on a 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 and for 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 ISO/IEC 11582 for a Transit PINX, shall apply.

6.3 SS-MWI coding requirements

6.3.1 Operations

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

Table 1 - Operations in support of SS-MWI

SS-MWI-Operations			
{ iso (1) standard (0) pss1-message-waiting-indication (15506) message-waiting-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 (1) standard (0)		
	pss1-generic-procedures (11582) msi-definition (0)}		
	basicServiceNotProvided, notActivated, notSubscribed, invalidServedUserNr		
	FROM General-Error-List		
	{ccitt (2) recommendation (0) q (17) 950 general-error-list (1) }		
	PartyNumber FROM Addressing-Data-Elements		
	{iso (1) standard (0)		
MWIActivate	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) }		
	;		
	::= OPERATION		
	ARGUMENT MWIActivateArg		
	RESULT DummyRes		
	ERRORS { notSubscribed,		
	invalidServedUserNr,		
	basicServiceNotProvided,		
MWIDeactivate	unspecified }		
	::= OPERATION		
	ARGUMENT MWIDeactivateArg		
	RESULT DummyRes		
	ERRORS { notSubscribed,		
	invalidServedUserNr,		
	basicServiceNotProvided,		
	unspecified }		

Table 1 - Operations in support of SS-MWI (continued)

MWIIInterrogate	::=	OPERATION ARGUMENT RESULT ERRORS {	MWIIInterrogateArg MWIIInterrogateRes notSubscribed, invalidServedUserNr, notActivated, invalidMsgCentreId, unspecified }
MWIIActivateArg	::=	SEQUENCE{ servedUserNr basicService msgCentreId nbOfMessages originatingNr timestamp priority argumentExt	PartyNumber, BasicService, MsgCentreId OPTIONAL, [3] IMPLICIT NbOfMessages OPTIONAL, [4] PartyNumber OPTIONAL, TimeStamp OPTIONAL, [5] IMPLICIT INTEGER (0..9) OPTIONAL, -- The value 0 means the highest priority and 9 the lowest CHOICE { extension [6] IMPLICIT Extension, multipleExtension [7] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
DummyRes	::=	CHOICE { null extension multipleExtension	NULL, [1] IMPLICIT Extension, [2] IMPLICIT SEQUENCE OF Extension }
MWIDeactivateArg	::=	SEQUENCE{ servedUserNr basicService msgCentreId argumentExt	PartyNumber, BasicService, MsgCentreId OPTIONAL, CHOICE { extension [3] IMPLICIT Extension, multipleExtension [4] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
MWIIInterrogateArg	::=	SEQUENCE{ servedUserNr basicService msgCentreId argumentExt	PartyNumber, BasicService, MsgCentreId OPTIONAL, CHOICE { extension [3] IMPLICIT Extension, multipleExtension [4] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
MWIIInterrogateRes	::=	SEQUENCE SIZE(1..10) OF MWIIInterrogateResElt	