



SLOVENSKI STANDARD
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Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 1 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Message Waiting Indication (MWI) supplementary service, as described below:

Part 1: "Protocol specification";

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

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European ISDN:

- Stage 1: is an overall service description, from the user's standpoint;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

The present document details the stage 3 aspects (signalling system protocols and switching functions) needed to support the MWI supplementary service. The stage 1 aspects are detailed in ETS 300 650. The stage 2 aspects of the MWI supplementary service have not been specified.

The present version updates the references to the basic call specifications.

National transposition dates	
Date of adoption of this EN:	19 June 1998
Date of latest announcement of this EN (doa):	30 September 1998
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 1999
Date of withdrawal of any conflicting National Standard (dow):	31 March 1999

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1 Scope

This first part of EN 300 745 specifies the stage three of the Message Waiting Indication (MWI) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [7]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [5]).

In addition, the present document specifies the protocol requirements at the T reference point where the service is provided to the user via an intermediate private ISDN.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunication network that is not an ISDN but it does include interworking requirements of other networks with the public ISDN.

The MWI supplementary service is provided independently of a call and is therefore applicable to a number of telecommunication services.

Charging principles are outside the scope of the present document.

The MWI supplementary service enables the network, upon request of a controlling user to indicate to the receiving user, that there is at least one message waiting.

NOTE: The MWI supplementary service is typically used between a mailbox service provider (controlling user) and a user (receiving user) of the mailbox service provided .

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

The present document is applicable to equipment supporting the MWI supplementary service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

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2 Normative references

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

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

- [1] EN 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [2] EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [3] ITU-T Recommendation E.164: "Numbering plan for the ISDN era".
- [4] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".

- [5] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [6] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [7] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".
- [8] CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".
- [9] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".
- [10] CCITT Recommendation X.219 (1988): "Remote Operations: Model, notation and service definition".
- [11] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

3 Definitions

For the purposes of the present document, the following definitions apply:

basic access: See CCITT Recommendation Q.9 [8], definition 1551.

basic call procedures: The procedures by which a call (as an instance of a telecommunications service) is established and terminated.

controlling user: The user that activates and deactivates the message waiting indication.

NOTE 1: The controlling user is likely to be a voice mail box.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [4], definition 308.

ISDN number: A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [3].

invoke component: See EN 300 196-1 [2], subclause 8.2.2.1. Where reference is made to a "xxxx" invoke component, an invoke component is meant with its operation value set to the value of the operation "xxxx".

mail box: A system, inside or outside the public network infrastructure, capable to handle mail.

NOTE 2: The definition of the mail box service is outside the scope of the present document.

network: The DSS1 protocol entity at the network side of the user-network interface.

public network: The DSS1 protocol entity at the network side of the user-network interface at the T reference point.

primary rate access: See CCITT Recommendation Q.9 [8], definition 1552.

private network: The DSS1 protocol entity at the user side of the user-network interface at the T reference point.

receiving user: The user that receives the message waiting indication.

reject component: See EN 300 196-1 [2], subclause 8.2.2.4.

return error component: See EN 300 196-1 [2], subclause 8.2.2.3. Where reference is made to a "xxxx" return error component, a return error component is meant which is related to a "xxxx" invoke component.

return result component: See EN 300 196-1 [2], subclause 8.2.2.2. Where reference is made to a "xxxx" return result component, a return result component is meant which is related to a "xxxx" invoke component.

service; telecommunication service: See ITU-T Recommendation I.112 [4], definition 201.

supplementary service: See ITU-T Recommendation I.210 [6], subclause 2.4.

user: The DSS1 protocol entity at the user side of the user-network interface.

4 Abbreviations

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

ASN.1	Abstract Syntax Notation One
DSS1	Digital Subscriber Signalling System No. one
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
SDL	Specification and Description Language

5 Description

The MWI supplementary service shall be available to users who are connected to the network via a basic access or primary rate access.

The MWI supplementary service enables the network, upon the request of a controlling user to indicate to the receiving user, that there is at least one message waiting. The indication is delivered to the receiving user:

- when the MWI supplementary service is activated for a certain basic service and the receiving user makes an outgoing call attempt; and/or
- as soon as the MWI supplementary service has been activated or deactivated.

NOTE: Having received this indication, the receiving user can subsequently access the mail box, to have the mail delivered. The means by which the receiving user accesses and manages the mail box are outside the scope of the present document.

The controlling user can activate and deactivate the message waiting indication when appropriate.

6 Operational requirements

6.1 Provision and withdrawal

The MWI supplementary service shall be provided to the controlling user after prior arrangements with the service provider. The MWI supplementary service shall be withdrawn at the controlling user's request, or for administrative reasons.

The MWI supplementary service shall be provided to the receiving user after prior arrangements with the service provider. The MWI supplementary service shall be withdrawn at the receiving user's request, or for administrative reasons. As a network option, the receiving user can have a subscription option to register the controlling user numbers that can activate and deactivate the MWI supplementary service.

Table 1: Network options

Network options	Values
Support of subscription option for registration of the ISDN number(s) of the controlling user(s)	- yes - no
Provide additional information during deferred invocation	- yes - no
Maximum number of controlling users' ISDN numbers registered by the network	any integer value
Maximum number of active instances per receiving user	any integer value

The maximum number of ISDN numbers that can be registered for a receiving user is a network option.

Provision of the MWI supplementary service shall be possible on an access or ISDN number basis.

In addition, the subscription options shown in table 2 shall be made available to the receiving user.

Table 2: Subscription options

Subscription options	Values
Invocation mode	a) deferred mode: invocation when the supplementary service is activated and the receiving user makes an outgoing call; b) immediate mode: invocation as soon as the supplementary service has been activated or deactivated; c) combined mode: in this case both the deferred and immediate mode apply.
Override of invocation mode by controlling user allowed	- yes - no
Registration of the ISDN number(s) of the controlling user(s)	- yes - no

6.2 Requirements on the receiving user's network side

The network shall register whether the procedures of clause 9 or clause 10 of the present document shall apply.

6.3 Requirements on the controlling user's network side

The network shall register whether the procedures of clause 9 or clause 10 of the present document shall apply.

7 Coding requirements

7.1 Coding of the facility information element components

Table 3 shows the definitions of the operations and errors required for the MWI supplementary service using ASN.1 as specified in CCITT Recommendation X.208 [9] and using the OPERATION and ERROR macros as defined in figure 4 of CCITT Recommendation X.219 [10].

The formal definition of the component types to encode these operations and errors is provided in clause D.1 of EN 300 196-1 [2].

The inclusion of components in Facility information elements is defined in EN 300 196-1 [2], subclause 11.2.2.1.

All components (invoke, return result, return error and reject) shall be included within a Facility information element. This Facility information element may be included in any appropriate message as specified in EN 300 196-1 [2], subclause 8.3.1.1, unless a more restrictive specification is given in clause 9 of the present document.

Table 3: Definition of operations and errors for the MWI supplementary service

```

MWI-Operations-and-Errors {ccitt identified-organization etsi(0) 745 operations-and-errors(1)}
DEFINITIONS EXPLICIT TAGS ::=
BEGIN
EXPORTS
    MWIActivate,
    MWIDeactivate,
    MWIIndicate,
    InvalidReceivingUserNr,
    ReceivingUserNotSubscribed,
    ControllingUserNotRegistered,
    MaxNumOfControllingUsersReached,
    MaxNumOfActiveInstancesReached
;
IMPORTS
    OPERATION,
    ERROR
    FROM Remote-Operation-Notation
        {joint-iso-ccitt remote-operations(4) notation(0)}

    notSubscribed,
    supplementaryServiceInteractionNotAllowed,
    resourceUnavailable,
    invalidServedUserNr
    FROM General-Errors
        {ccitt identified-organization etsi(0) 196 general-errors(2)}

    BasicService
    From Basic-Service-Elements
        {ccitt identified-organization etsi(0) 196 basic-service-elements(8)}

    PartyNumber
    FROM Addressing-Data-Element
        {ccitt identified-organization etsi(0) 196 addressing-data-elements(6)}
;

MWIActivate ::= OPERATION
    ARGUMENT SEQUENCE {
        receivingUserNr      PartyNumber,
        basicService         BasicService,
        controllingUserNr    [1] PartyNumber OPTIONAL,
        numberOfMessages     [2] MessageCounter OPTIONAL,
        controllingUserProvidedNr [3] PartyNumber OPTIONAL,
        time                 [4] GeneralizedTime OPTIONAL,
        messageId            [5] MessageID OPTIONAL,
        mode                 [6] InvocationMode OPTIONAL}
    RESULT
    ERRORS {
        notSubscribed,
        supplementaryServiceInteractionNotAllowed,
        resourceUnavailable,
        invalidReceivingUserNr,
        invalidServedUserNr,
        receivingUserNotSubscribed,
        controllingUserNotRegistered,
        indicationNotDelivered,
        maxNumOfControllingUsersReached,
        maxNumOfActiveInstancesReached }
-- End of MWIActivate operation definition

MWIDeactivate ::= OPERATION
    ARGUMENT SEQUENCE {
        receivingUserNr      PartyNumber,
        basicService         BasicService,
        controllingUserNr    PartyNumber OPTIONAL,
        mode                 InvocationMode OPTIONAL }
    RESULT
    ERRORS {
        notSubscribed,
        supplementaryServiceInteractionNotAllowed,
        resourceUnavailable,
        invalidReceivingUserNr,
        invalidServedUserNr,
        receivingUserNotSubscribed,
        controllingUserNotRegistered,
        indicationNotDelivered }
-- End of MWIDeactivate operation definition

```