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Integrated Services Digital Network (ISDN); Signalling System No.7; Transaction Capabilities (TC) version 2; Message Waiting Indication (MWI) supplementary service; Part 1: Protocol specification

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Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

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 Integrated Services Digital Network (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.

This ETS 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.

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This first part of ETS 300 754 specifies the stage three of the Message Waiting Indication (MWI) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by the European public telecommunications operators by means of the Signalling System No.7 Transaction Capabilities (TC) application protocol. The stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [7]).

This ETS specifies the additional requirements where the service is provided to the user via an intermediate ISDN.

This ETS does not specify the additional requirements where the service is provided to the user via a telecommunication network that is not an ISDN.

Charging principles are outside the scope of this ETS.

Testing and maintenance requirements are outside the scope of this ETS.

The MWI supplementary service enables a controlling user to indicate to a receiving user that there are one or more messages waiting.

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

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 009 (1991): "Integrated Services Digital Network (ISDN); CCITT Signalling System No.7; Signalling Connection Control Part (SCCP) [connectionless service] to support international interconnection".

[2] ETS 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] ETS 300 287 (1993): "Integrated Services Digital Network (ISDN); CCITT signalling System No.7; Transaction Capabilities Application Part (TCAP) version 2".

[4] ETS 300 356-1 (1995): "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]".

[5] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".

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

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

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

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

[10] ITU-T Recommendation X.680 | ISO/IEC 8824-1 (1994) including amendment 1 (1995): "Information Technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".

3 Definitions

For the purposes of this ETS, the following definitions apply:

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

controlling user: The user who is connected to the originating public local exchange and that activates and deactivates the MWI supplementary service.

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

deferred notification: A message waiting indication sent to the receiving user when that user makes an outgoing call attempt.

immediate notification: A message waiting indication transferred to the receiving user immediately upon reception.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [6], definition 308.

ISDN number: A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [5].

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

NOTE 2: The definition of the mail box and its service are outside the scope of this ETS.

network operator: Entity which provides the network operating elements and resources for the execution of the MWI supplementary service.

receiving user: The user who is connected to the destination public local exchange and that receives the message waiting indication.

service; telecommunication service: See ITU-T Recommendation I.112 [6], definition 201.

service provider: Entity which offers the MWI supplementary service subscription. The network operator may be the service provider.

supplementary service: See ITU-T Recommendation I.210 [8], subclause 2.4.

4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ASE	Application Service Element
ASN.1	Abstract Syntax Notation one
GT	Global Title
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
SCCP	Signalling Connection Control Part
SSN	Sub System Number
TC	Transaction Capabilities

5 Description

The MWI supplementary service enables a controlling user to indicate to a receiving user, that at least one message is available in his/her mail box.

NOTE: Having received this indication, the receiving user can subsequently access the mail box, to have the mail delivered.

6 Operational requirements

6.1 Provision and withdrawal

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

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

At provisioning the ISDN number(s) of the controlling user that can activate and deactivate the MWI supplementary service for the receiving user shall be registered. Registration of controlling user numbers shall take place on a per basic service basis. The maximum number of ISDN numbers that can be registered for a receiving user is a network operator's option.

In addition, the subscription option shown in table 1 is available to the receiving user.

Table 1

Subscription option	Values
Invocation mode	a) invocation when the service is activated and the receiving user makes an outgoing call; b) invocation as soon as the service has been activated.

6.2 Requirements on the controlling user's network side

The controlling user's exchange needs the capabilities of Signalling Connection Control Part (SCCP, see ETS 300 009 [1]) and TC (see ETS 300 287 [3]) with an MWI-ASE.

6.3 Requirements on intermediate exchanges

The intermediate exchanges involved in the transmission of the MWI operation need the capability of SCCP (see ETS 300 009 [1]).

6.4 Requirements on the receiving user's network side

The receiving user's exchange needs the capabilities of SCCP (see ETS 300 009 [1]) and TC (see ETS 300 287 [3]) with an MWI-ASE.

7 Coding requirements

7.1 Application Service Element (ASE) for MWI

7.1.1 Protocol element list

From the controlling user's exchange to the receiving user's exchange:

a) MWISet (invoke) class 1;

b) MWIReset (invoke) class 1.

From the receiving user's exchange to the controlling user's exchange:

a) MWISet (result, error) class 1;

b) MWIReset (result, error) class 1.

7.1.2 List of parameter types

Addressing and identification parameters:

a) Receiving user number;

b) Controlling user number.

Service management parameters:

a) Number of messages;

b) Basic service;

c) Time;

d) Mail box provided number;

e) Deferred notification;

f) Immediate notification.

7.1.3 Error types

a) Receiving user not subscribed;

b) Confirmation not received;

c) Supplementary service interaction;

d) Remote resource unavailable;

e) Invalid receiving user number;

f) Invalid controlling user number;

g) Basic service not subscribed.

7.1.4 Abstract syntax, general

Subclause 7.2 specifies the abstract syntax for the MWI-ASE protocol, using the Abstract Syntax Notation one (ASN.1), as defined in CCITT Recommendation X.208 [9] and ITU-T Recommendation X.680 [10].

The mapping of OPERATION, RESULT and ERROR components to TC primitives is described in subclause 9.4.

The ASN.1 data type which follows the keywords "PARAMETER" or "RESULT" (for OPERATION and ERROR) is always optional from a syntactic point of view. However, except when explicitly specified otherwise, it has to be considered as mandatory from a semantic point of view.

When a mandatory element is missing in any component or inner data structure, a reject component is returned (if the dialogue still exists). The problem cause to be used is "Mistyped parameter".

7.2 ASN.1 module

The operations, errors and types required for the MWI supplementary services are defined in ASN.1 as specified in CCITT Recommendation X.208 [9] and ITU-T Recommendation X.680 [10] using the OPERATION and ERROR macros as defined in ETS 300 287 [3].

The formal definition of the component types to encode these operations, errors and types is provided in ETS 300 287 [3].

```
MWI-Operations-and-Errors {ccitt identified-organization etsi(0) 754 modules(2)
                           operations-and-errors(1) version1(1)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

IMPORTS     OPERATION,
            ERROR
            FROM TCAPMessages
                {ccitt recommendation q 773 modules(2) messages(1) version2(2)}

            BasicService
            FROM Basic-Service-Elements                                  -- from ETS 300 196-1 [2]
                {ccitt identified-organization etsi(0) 196 basic-service-elements(8)}
;

-- operation types

MWISet      ::= OPERATION
                PARAMETER SEQUENCE {
                    receivingUserNumber         CalledPartyNumber,
                    controllingUserNumber       CallingPartyNumber,
                    basicService                BasicService,
                    numberOfMessages        [1] MessageCounter      OPTIONAL,
                    time                    [2] GeneralizedTime     OPTIONAL,
                    mailBoxProvidedNumber   [3] CallingPartyNumber  OPTIONAL,
                    deferredNotification    [4] BOOLEAN TRUE        OPTIONAL,
                    immediateNotification   [5] BOOLEAN TRUE        OPTIONAL,
                    ...}
                RESULT
                ERRORS {
                    receivingUserNotSubscribed,
                    confirmationNotReceived,
                    supplementaryServiceInteraction,
                    remoteResourceUnavailable,
                    invalidReceivingUserNumber,
                    invalidControllingUserNumber,
                    basicServiceNotSubscribed,
                    ...}
-- Timer T = MWI-Tsup
-- End of MWISet operation definition
```

```
MWIReset    ::= OPERATION
                PARAMETER SEQUENCE {
                    receivingUserNumber         CalledPartyNumber,
                    controllingUserNumber       CallingPartyNumber,
                    basicService                BasicService,
                    deferredNotification    [1] BOOLEAN TRUE OPTIONAL,
                    immediateNotification   [2] BOOLEAN TRUE OPTIONAL,
                    ...}
                RESULT
                ERRORS {
                    receivingUserNotSubscribed,
                    confirmationNotReceived,
                    supplementaryServiceInteraction,
                    remoteResourceUnavailable,
                    invalidReceivingUserNumber,
                    invalidControllingUserNumber,
                    basicServiceNotSubscribed,
                    ...}
-- Timer T = MWI-Tsup
-- End of MWIReset operation definition

--error type definitions

ReceivingUserNotSubscribed      ::= ERROR
InvalidControllingUserNumber    ::= ERROR
InvalidReceivingUserNumberr     ::= ERROR
NotAvailable                    ::= ERROR
SupplementaryServiceInteraction ::= ERROR
RemoteResourceUnavailable       ::= ERROR
BasicServiceNotSubscribed       ::= ERROR

-- constants and data type definitions

CalledPartyNumber   ::= OCTET STRING (SIZE(1..10))
-- the number shall be coded as called party number as described in ETS 300 356-1 [4]

CallingPartyNumber  ::= OCTET STRING (SIZE(1..10))
-- the number shall be coded as calling party number as described in ETS 300 356-1 [4]

MessageCounter      ::= INTEGER (0..65535)

GeneralizedTime     ::= [UNIVERSAL 24] IMPLICIT VisibleString

mWIOID OBJECT IDENTIFIER    ::= {ccitt identified-organization etsi(0) 754
                                 operations-and-errors(1)}

mWISet                          MWISet                          ::= globalValue {mWIOID 1}
mWIReset                        MWIReset                        ::= globalValue {mWIOID 2}

receivingUserNotSubscribed      ReceivingUserNotSubscribed      ::= globalValue {mWIOID 10}
invalidControllingUserNumber    InvalidControllingUserNumber    ::= globalValue {mWIOID 11}
invalidReceivingUserNumber      InvalidReceivingUserNumber      ::= globalValue {mWIOID 12}
confirmationNotReceived         ConfirmationNotReceived         ::= globalValue {mWIOID 13}
supplementaryServiceInteraction SupplementaryServiceInteraction ::= globalValue {mWIOID 14}
remoteResourceUnavailable       RemoteResourceUnavailable       ::= globalValue {mWIOID 15}
basicServiceNotSubscribed       BasicServiceNotSubscribed       ::= globalValue {mWIOID 16}

END -- of MWI-Operations-and-Errors
```

8 State definitions

No specific states are required.

9 Signalling procedures

9.1 Activation, deactivation and registration

9.1.1 Activation

9.1.1.1 Actions at the controlling user's exchange

9.1.1.1.1 Normal procedure

On receipt of an MWI supplementary service activation request the controlling user's exchange shall send an mWISet invoke component to the Receiving user's exchange. The invoke component shall contain a Receiving user number parameter, a controlling user number parameter, the basic service parameter and as a controlling user's option the time parameter, the number of messages parameter, the mail box provided number parameter, the deferred/immediate notification parameter(s).

The use of the deferred/immediate notification parameter(s) is based on agreement between the controlling and the receiving users. It has been assumed that the two parameters can be sent simultaneously, in the same operation.

In case the MWI supplementary service activation request provides the mail box provided number information, the controlling user's exchange shall code the mailBoxProvidedNumber parameter with the address presentation restricted indicator set to "presentation allowed" and the screening indicator set to "user provided, not verified".

The TC-INVOKE primitive shall include the value of the MWI supervision operation timer MWI-Tsup.

If the controlling user's exchange receives an mWISet return result component, the operation has been successfully performed, the access signalling system shall be informed accordingly and the TC resources shall be released.

NOTE: The MWI supervision operation timer MWI-Tsup is stopped by TC when the TC-RESULT primitive is received.

Multiple activations are possible without a deactivation in between.

9.1.1.1.2 Exceptional procedure

a) mWISet return error component is received

If the controlling user’s network receives an mWISet return error component, the exchange will consider that the operation has not been successfully performed. The received error value shall be forwarded to the access signalling system and the TC resources shall be released.

b) TC cancellation or SCCP routing failure

On receipt of either a TC-P-ABORT, TC-U-ABORT, TC-U-REJECT, TC-L-Cancel or a TC-NOTICE primitive as response to the mWISet invoke component, the exchange shall consider the activation request as not successful and the controlling user shall be notified via the access, indicating "remote resource unavailable" as a reason and the TC-resources shall be released.

9.1.1.2 Actions at the Receiving user's exchange

9.1.1.2.1 Normal operation

On receipt of the mWISet invoke component, depending on the receiving user's invocation mode and the received parameter(s) indicating deferred/immediate notification(s), the Receiving user's exchange shall apply one of the following procedures:

a) The deferred notification parameter is received and/or the receiving user has subscribed to invocation mode a) (see table 1):

   if the deferred notification parameter is received and/or the receiving user has subscribed to the invocation mode option a), then the receiving user's exchange shall validate the activation request and store information per received basic service and controlling user's number that the receiving user shall be given an indication when the receiving user makes an outgoing call attempt;

   if a new activation request is received indicating an identical basic service and controlling user's number to an already stored indication for that receiving user, then the receiving user's exchange shall validate the incoming request and replace the stored MWI information with the new received MWI information.

b) The immediate notification parameter is received and/or the receiving user has subscribed to the invocation mode b) (see table 1):

   if the immediate notification parameter is received and/or the receiving user has subscribed to the invocation mode b), then the receiving user's exchange shall validate the activation request, send the activation request to the access and awaits the result.

If both deferred notification and immediate notification parameters are received in the mWISet invoke component and if the receiving user subscribes to both modes, the two procedures shall be performed in parallel by the receiving user's exchange.

In either option, when the activation request has been accepted the receiving user's exchange shall send an mWISet return result component to the controlling user's exchange. Any reserved resources shall be released.

9.1.1.2.2 Exceptional procedures

a) The MWI supplementary service cannot be activated

If the MWI supplementary service cannot be activated, the receiving user's exchange shall send an mWISet return error component to the controlling user's exchange and indicate one of the following reasons:

- "confirmationNotReceived", if the confirmation timer used at the access expires when a sent message waiting indication to the receiving user has not been confirmed, e.g. due to access signalling failure;

- "invalidReceivingUserNumber", if the ISDN number provided to identify the receiving user is not a valid number;

- "supplementaryServiceInteraction", if the provision of the MWI supplementary service is precluded due to an interaction with one or more other supplementary services;

- "remoteResourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidControllingUserNumber", if the received ISDN number identifying the controlling user is a non authorised number;

- "basicServiceNotSubscribed", if the basic service indicated in the basic service parameter is not a valid basic service;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user.

b) Deferred/immediate notification parameter(s) conflict with the receiving user's subscribed invocation mode

If any of the received deferred/immediate notification parameter(s) conflict with the receiving user's subscribed invocation mode, then the receiving user's exchange shall ignore the received parameter(s), and apply the normal procedure for the subscribed invocation mode.

9.1.2 Deactivation

9.1.2.1 Actions at the controlling user's exchange

9.1.2.1.1 Normal operation

On receipt of an MWI supplementary service deactivation request the controlling user's exchange shall send a mWIReset invoke component to the Receiving user's exchange. The invoke component shall contain a Receiving user number parameter, a controlling user number parameter, the basic service parameter and as a controlling user's option the deferred/immediate notification parameter(s).

The use of the deferred/immediate notification parameter(s) is based on agreement between the controlling and the receiving users. It has been assumed that the two parameters can be sent simultaneously, in the same operation.

The TC-INVOKE primitive shall include the value of the MWI supervision operation timer MWI-Tsup.

If the controlling user’s exchange receives an mWIReset return result component, the operation has been successfully performed, the access signalling system shall be informed accordingly and the TC resources shall be released.

NOTE: The MWI supervision operation timer MWI-Tsup is stopped by TC when the TC-RESULT primitive is received.

9.1.2.1.2 Exceptional procedures

a) mWIReset return error component is received

If the controlling user’s network receives an mWIReset return error component, the exchange will consider that the operation has not been successfully performed. The received error value shall be forwarded to the access signalling system that shall be informed accordingly and the TC resources shall be released.

b) TC cancellation or SCCP routing failure

On receipt of either a TC-P-ABORT, TC-U-ABORT, TC-U-REJECT, TC-L-Cancel or a TC-NOTICE primitive as response to the mWIReset invoke component, the exchange shall consider the deactivation request as not successful and the controlling user shall be notified via the access, indicating "remote resource unavailable" as a reason and the TC-resources shall be released.

9.1.2.2 Actions at the receiving user's exchange

9.1.2.2.1 Normal operation

On receipt of the mWIReset invoke component, depending on the receiving user's invocation mode and the received parameter(s) indicating deferred/immediate notification(s), the Receiving user's exchange shall apply one of the following procedures:

a) The deferred notification parameter is received and/or the receiving user has subscribed to invocation mode a) (see table 1):

   if the deferred notification parameter is received and/or the receiving user has subscribed to the invocation mode a), then the receiving user's exchange shall validate the deactivation request, delete the stored information per received basic service and controlling user's number that the receiving user shall receive an indication when an outgoing call attempt is made.

b) The immediate notification parameter is received and/or the receiving user has subscribed to the invocation mode b) (see table 1):

   if the immediate notification parameter is received and/or the receiving user has subscribed to the invocation mode b), then the receiving user's exchange shall validate the deactivation request, send the activation request to the access and awaits the result.

If both deferred notification and immediate notification parameters are received in the mWIReset invoke component and if the receiving user subscribes to both modes, the two procedures shall be performed in parallel by the receiving user's exchange.

In either option, when the deactivation request has been accepted the receiving user's exchange shall send an mWIReset return result component to the controlling user's exchange. Any reserved resources shall be released.

9.1.2.2.2 Exceptional procedures

a) The MWI supplementary service cannot be deactivated

If the MWI supplementary service cannot be deactivated, the receiving user's exchange shall send a mWIReset return error component to the controlling user's exchange and indicate one of the following reasons:

- "confirmationNotReceived", if the confirmation timer used at the access expires when a sent message waiting indication to the receiving user has not been confirmed, e.g. due to access signalling failure;

- "invalidReceivingUserNumber", if the ISDN number provided to identify the receiving user is not a valid number;

- "supplementaryServiceInteraction", if the provision of the MWI supplementary service is precluded due to an interaction with one or more other supplementary services;

- "remoteResourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidControllingUserNumber", if the received ISDN number identifying the controlling user is a non authorised number;

- "basicServiceNotSubscribed", if the basic service indicated in the basic service parameter is not a valid basic service;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user.

b) Deferred/immediate notification parameter(s) conflict with the receiving user's subscribed invocation mode

If any of the received deferred/immediate notification parameter(s) conflict with the receiving user's subscribed invocation mode, then the receiving user's exchange shall ignore the received parameter(s), and apply the normal procedure for the subscribed invocation mode.

9.1.3 Registration

Not applicable.

9.2 Invocation and operation

9.2.1 Actions at the controlling user's exchange

No invocation procedure exist in the network.

9.2.2 Actions at the receiving user's exchange

No invocation procedure exist in the network.

9.3 Use of TC and SCCP

The service monitoring and management signals are defined as TC-based application messages (i.e. operations and corresponding results, see ETS 300 287 [3]). The coding of these messages is given in subclause 7.2.

9.3.1 Routing in the SCCP network

For routing based on the Global Title (GT) translation mechanism within the national network, the coding of the called party address and the calling party address in SCCP (see ETS 300 009 [1]) shall comply with the following restrictions:

SSN indicator	1	(SSN for ISDN supplementary services is always included)
GT indicator	0100	(includes a translation type, numbering plan, encoding scheme and nature of address)
Translation type	0001 0001	(translation table)
Numbering plan	0001	(ISDN/Telephony Numbering plan E.164)
Routing indicator	0	(Routing on global title)

9.3.2 Number information used for routing

The exchange which initiates a dialogue using the GT translation mechanism, shall give its ISDN number (see CCITT Recommendation E.164 [5]) as GT in the SCCP calling party address field and the receiving user’s ISDN number as the GT in the SCCP called party address field.

The exchange which respond to the MWI dialogue may give its ISDN number as GT in the SCCP calling party address field and shall give the received SCCP GT calling party address as the GT in the SCCP called party address field.

9.3.3 SCCP message return procedure

The SCCP message return procedure is always requested by means of TC-primitives between the MWI-ASE and the TC protocols.

9.4 ASE for MWI

9.4.1 Subsystem number

The subsystem number 000 1011 is dedicated to the ISDN supplementary services ASEs.

9.5 Dialogue

9.5.1 General

The dialogues defined for the MWI supplementary service between the peer-to-peer entities (TC-users) are structured dialogues. The dialogue ID parameter is used in both operation handling and transmission (dialogue) handling primitives to determine which component(s) pertain(s) to which dialogue.

Each TC-user has its own reference for a given dialogue. These references are local references and mapping of these local references into protocol references transaction ID, included in the messages, is done by TC.

Only class 1 operations are used.

Each TC message shall convey a single MWI operation.

9.5.2 Dialogue beginning

The controlling user's exchange establishes the dialogue by using a TC-BEGIN request primitive with a TC-INVOKE request primitive to transmit either a mWISet invoke component or a mWIReset invoke component to the receiving user's exchange.

9.5.3 Dialogue ending

Two ways of ending the dialogue are used.

a) Basic end

The dialogue end is requested by the receiving user's exchange by using a TC-END request primitive upon the following cases:

- with TC-INVOKE request primitive to transmit either an mWISet or mWIReset return result component if the result is positive;

- with TC-U-ERROR request primitive to transmit either an mWISet or mWIReset return error component if the result is negative;

- with TC-U-REJECT request primitive if the component check fails.

b) Abnormal end

- the TC-user may abandon the service. In this case a peer to peer information shall be delivered at the time the abort is issued, to the remote TC-user, by sending a TC-END request primitive to transmit the TC-U-ABORT request primitive without abort reason;

- when the MWI supervision operation timer MWI-Tsup expires, at the controlling user’s exchange, the MWI-ASE receives a TC-L-CANCEL indication primitive as response to either an MWI activation request or an MWI deactivation request. In this case the request shall be rejected without any rejecting reason;

- on receipt of TC-P-ABORT or a TC-NOTICE indication primitive, the TC-dialogue shall be terminated.

10 Interaction with other networks

10.1 Interworking with a network part without MWI-ASE capability

In case when SCCP/TC capability is available from the controlling user's network towards a network part that does not support the MWI supplementary service, is not relevant. If a controlling user shall be able to offer the MWI supplementary service, the capability of an MWI-ASE is necessary, in both the controlling user's network and in the receiving user's network as described in subclause 6.2.

10.2 Interworking with a network without SCCP/TC capability

In case when the SCCP/TC capability is not supported by either the controlling user’s network or the receiving user’s network is not relevant. In case an intermediate network does not support SCCP/TC capability the message return procedure is invoked. The controlling user’s exchange will receive a TC-NOTICE indication. This may happen when the mWISetinvoke component or when the mWIReset component is sent. The reception of this indication shall be notified to the controlling user via the access.

10.3 Interworking with a Public Switched Telephone Network (PSTN)

This interworking scenario is a national matter.

10.4 Interworking with a Public Land Mobile Network (PLMN)

The MWI supplementary service may be supported in case of interworking with a PLMN. The signalling systems used to interwork with a PLMN supporting MWI shall be compatible, on a functional and a protocol level, with the signalling systems specified in this ETS.

10.5 Procedures for interworking with private ISDNs

When interworking with private ISDNs, the public network shall not process the received MWI information, but forward the incoming MWI requests towards the private network.

11 Interaction with other supplementary services

11.1 Advice of charge services

11.1.1 Charging information at call set-up time

No impact.

11.1.2 Charging information during the call

No impact.

11.1.3 Charging at the end of a call

No impact.

11.2 Call waiting

No impact.

11.3 Call hold

No impact.

11.4 Explicit call transfer

No impact.

11.5 Number identification services

11.5.1 Calling line identification presentation

No impact.

11.5.2 Calling line identification restriction

No impact.

11.5.3 Connected line identification presentation

No impact.

11.5.4 Connected line identification restriction

No impact.

11.6 Closed user group

No impact.

11.7 Completion of calls to busy subscriber

No impact.

11.8 Conference services

11.8.1 Conference call, add-on

No impact.

11.8.2 Meet-me conference

No impact.

11.9 Direct dialling in

No impact.

11.10 Diversion services

11.10.1 Call forwarding unconditional

No impact.

11.10.2 Call forwarding busy

No impact.

11.10.3 Call forwarding no reply

No impact.

11.10.4 Call deflection

No impact.

11.11 Freephone

No impact.

11.12 Malicious call identification

No impact.

11.13 Multiple subscriber number

No impact.

11.14 Subaddressing

No impact.

NOTE: In the TC MWI operations, the subaddress information is not supported.

11.15 Terminal portability

No impact.

11.16 Three party

No impact.

11.17 User-to-user signalling

No impact.

12 Parameter values (timers)

12.1 Timers in the controlling user's exchange

MWI-Tsup mWIsupervision operation timer.

Supervision of response to either an mWISet or an mWIReset operation, sent from the controlling user's exchange to the receiving user's exchange. MWI-Tsup will expire if signalling is not possible, at signalling failures or if the receiving user's exchange cannot respond. Duration = 10 seconds.

12.2 Timers in the receiving user's exchange

No need for timers has been identified.

13 Dynamic description (SDL diagrams)

No dynamic description is required.

Annex A (informative): Signalling flows

This annex contains arrow diagrams showing the MWI-ASE signal flows for different cases of the MWI supplementary service.

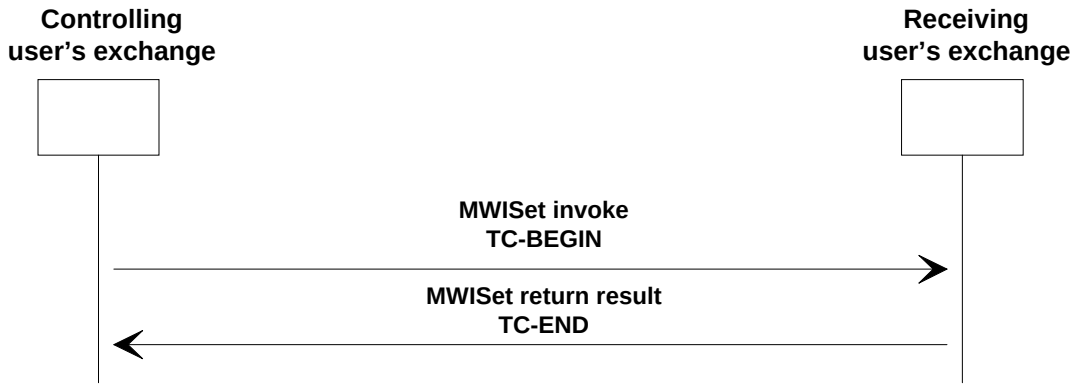

Figure A.1: Successful activation

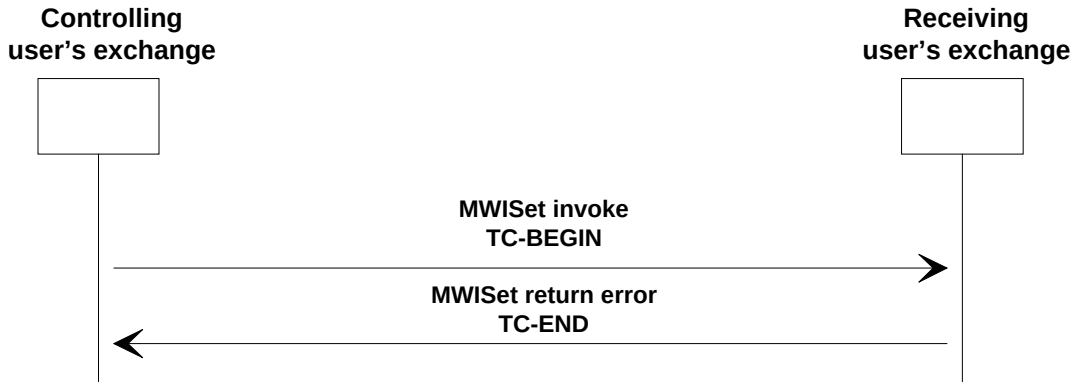

Figure A.2: Unsuccessful activation

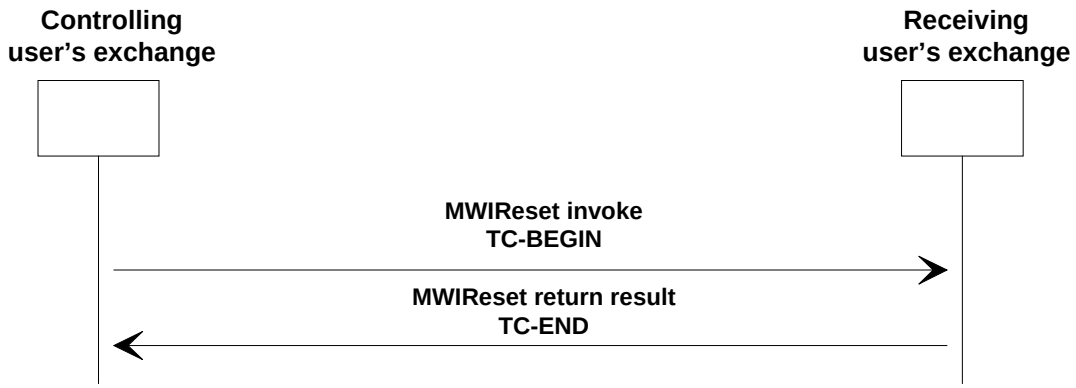

Figure A.3: Successful deactivation

Annex B (informative): Assignment of object identifier values

The following object identifier values are assigned in this ETS:

{ccitt identified-organization etsi(0) 754 operations-and-errors(1)}

{ccitt identified-organization etsi(0) 754 operations-and-errors(1) 1}

{ccitt identified-organization etsi(0) 754 operations-and-errors(1) 2}

{ccitt identified-organization etsi(0) 754 operations-and-errors(1) 10} to
{ccitt identified-organization etsi(0) 754 operations-and-errors(1) 16}

History

Document history			
May 1996	Public Enquiry	PE 106:	1996-05-20 to 1996-09-13