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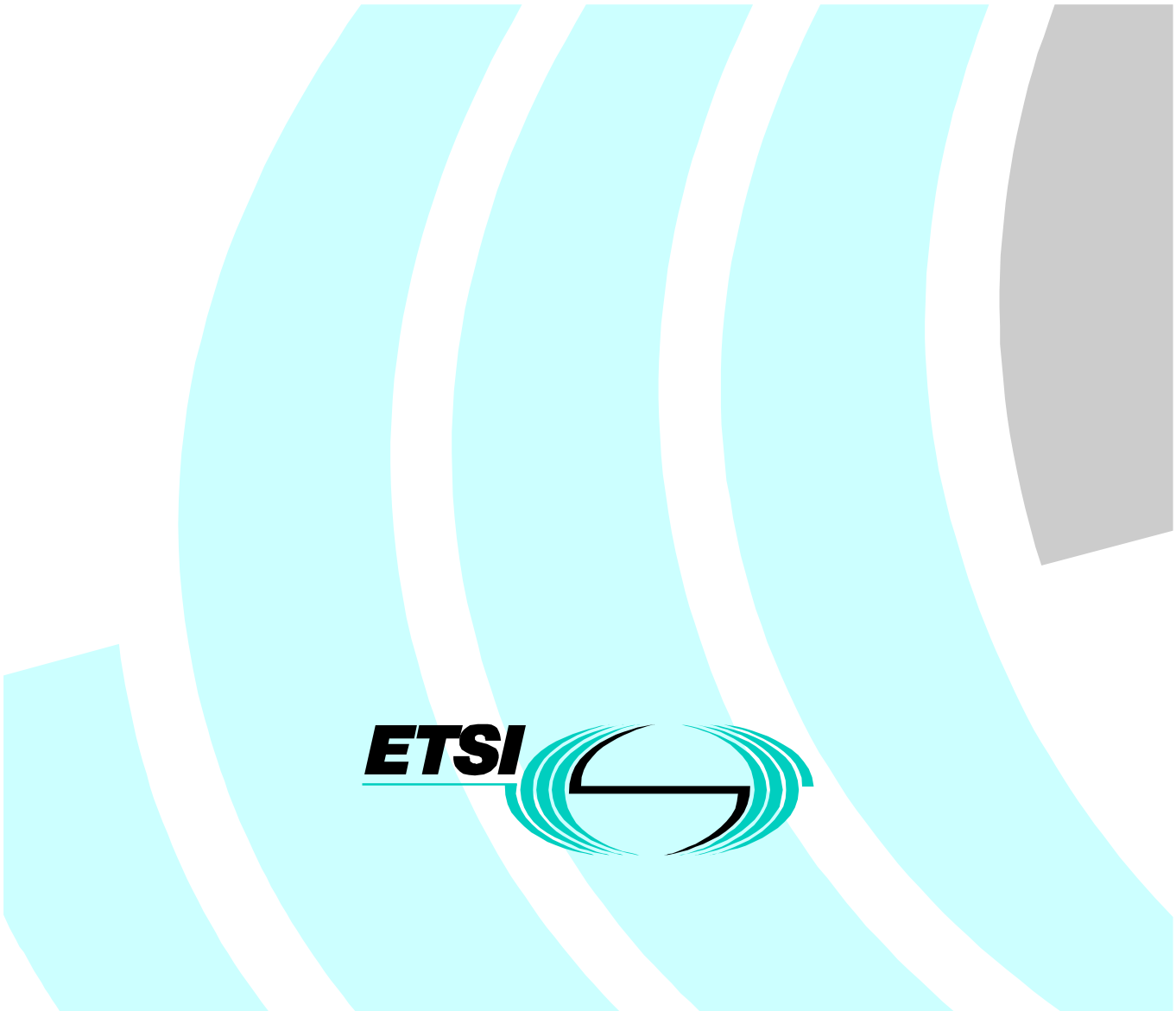
Technical Report

Services and Protocols for Advanced Networks (SPAN); Message Waiting Indication (MWI); Service Aspects



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Contents

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document describes the general requirements and service aspects for the Message Waiting Indication (MWI) supplementary service for both, PSTN and ISDN subscriber lines and only for the receiving user parts. It does not deal with the underlying technology or kind of network used to provide the service.

In accordance with ITU-T Recommendation I.130 [1], the following three level structures are used to describe the supplementary telecommunications 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.

The present document details the stage 1 aspects (overall service description) for the Message Waiting Indication (MWI) supplementary service.

1 Scope

The present document defines the stage one of the Message Waiting Indication (MWI) supplementary service for the pan-European network as provided by European telecommunications operators. Stage one is an overall service description from the user's point of view (see ITU-T Recommendation I.130 [1]), but does not deal with the details of the human interface itself.

The present document provided hereafter takes into account ETS 300 650 [2] for an ISDN MWI service and it provides a wider scope of the service description. It shall be noted that ETS 300 650 [2]:

- covers only ISDN situations;
- includes both the receiving user's and the controlling user's perspective instead of concentrating on the service as seen by the receiving user;
- is a restricted view on the facilities that need to be offered commercially (e.g. multiple Mailbox providers);
- includes some constraints.

NOTE 1: In case of conflict between the present document and ETS 300 650 [2], it is assumed that ETS 300 650 [2] will take precedence.

NOTE 2: The detailed specifications of the procedures used by the controlling user to activate and deactivate the MWI supplementary service are outside the scope of the present document. It can be based on ISDN procedures (an example is given in ETS 300 650 [2]) or on other type of operations on other user-network interfaces (e.g. leased lines etc...).

NOTE 3: It is worth noting that the network capabilities supporting the MWI supplementary service can be used for other purposes e.g. notification of events other than related to Voice Mail e.g. E-mail...

NOTE 4: The definition of the Man Machine Interface (e.g. light, display, ..) on the terminal equipment is outside the scope of the present document.

2 References

For the purposes of this Technical Report (TR) the following references apply:

[1] ITU-T Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[2] ETSI ETS 300 650: "Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Service description".

[3] ETSI ETS 300 345: "Integrated Services Digital Network (ISDN); Interworking between public ISDNs and private ISDNs for the provision of telecommunication services; General aspects".

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

[5] ITU-T Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

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

3 Definitions and abbreviations

3.1 Definitions

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

Basic Telephone: standard DTMF telephone without display having the normal 0 - 9, * and # keypad

Confirmation Message: it is used to confirm that a specific action has taken place and may also be used implicitly to prompt for user digits. It is interruptible

Controlling user: user that activates, deactivates and invokes the MWI supplementary service

NOTE: The controlling user is likely to be a mailbox.

Error Message: it is used to notify the user of an incorrect operation code selection or to inform the user that the requested operation could not be successfully performed. It may also be used to prompt implicitly for user digits. It is not interruptible

General Information Message: it is a message with a general significance i.e. relating to the waiting situation only but not containing extra information, i.e. parameters provided by the network or the mailbox provider. It is interruptible.

This general information message can be:

- a text message; or
- a voice message (announcement); or
- a text message combined with voice message (using SDSS capabilities); or
- a visual indication; or
- a special dial tone.

Information Message: it provides information such as feature status or special instructions to the user. It is followed by either another information message or by a prompt message and is interruptible.

Mailbox provider: provider of a message system that provides a mailbox service to the receiving user

Mailbox service: provides the possibility to record, store, interrogate and delete messages in a message system

Message: verbal or other auditory data recorded by users of a service. Messages may be recorded by callers, subscribers or system administrators (including automatic system-generated messages)

Message system: stores different kind of messages and initiates activation/deactivation of the MWI supplementary service. It will be referred as the controlling user

Message Waiting Indication (MWI): supplementary service that enables a receiving user to be informed that there are one or more messages waiting in a message system. It is typically used between a controlling user and a receiving user

MWI Service Provider: entity (network operator) which provides the MWI service to both the receiving user and the controlling user

Network operator: entity which provides the network operating elements and resources for the execution of the MWI supplementary service. There may be one or more network operators between a receiving user and a MWI service provider

Prompt Message: message that asks the user to enter digits and is interruptible. Upon completion or interruption of the message, a timer is initiated to set a maximum amount of time to wait for user input

Receiving User: user to whom the MWI supplementary service is provided. The receiving user receives the Message Waiting Indication (notification) as a result of a MWI invocation originated by a controlling user (e.g. mailbox provider)

Service provider: entity which offers a service to a user. A network operator may also be a service provider

Service; telecommunications service: see ITU T Recommendation I.112 [4], clause 2.2. definition 201

Subscriber line: see ITU T Recommendation Q.9 [5], clause 1 definition 0050

Supplementary service: see ITU T Recommendation I.210 [6], clause 2.4

User: anyone who uses services at a telecommunication access of a network (as calling or called party)

Voice Mail Server: service provider's voice messaging system to which a user is connected for the provision of the voice mail service

Voice Mail User Agent: user interface that enables a user to control the voice mail server for the recording, forwarding, storage, etc. of messages

Voice Mail: voice messaging service that allows users, to record voice messages, address and send them to other users, listen to messages recorded by other users, and store, forward or delete such messages. Many additional features are possible for such a service, and these will be determined by the service provider according to market needs, technical capability, etc

Voice Mailbox: logical storage location for messages. This will have a unique address, e.g. it could be the subscriber's telephone or separate mailbox number

Voice message process: any of the procedures of recording, editing, inserting, storing, deleting, appending, forwarding, addressing voice mail messages. This is not an exhaustive list

3.2 Abbreviations

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

CU	Controlling User
DTMF	Dual Tone Multi Frequency
ISDN	Integrated Services Digital Network
MWI	Message Waiting Indication
PNO	Public Network Operator
PSTN	Public Switched Telephone Network
RU	Receiving User
SDSS	Server Display and Script Services (European equivalent of the ADSI protocol)

4 Description

The Message Waiting Indication (MWI) supplementary service enables a receiving user (RU) to be informed that there are one or more messages waiting in a message system.

The MWI supplementary service is typically used between a controlling user (CU, e.g. mailbox provider) and a user of the message service provided (receiving user). The controlling user invokes the MWI supplementary service and the receiving user receives the notification (or message waiting indication).

It can be activated or deactivated in the receiving user network, upon a request of the controlling user, and shall be available for receiving users connected to PSTN or ISDN subscriber lines.

See annex C for an example of use of the service.

The MWI supplementary service enables the network, upon an invocation request of a Controlling user, to notify the receiving user that at least one message is awaiting in a message system.

The receiving user shall be notified by the network that a message is awaiting in the following situations:

- as an **immediate notification**, which is expected to be a persistent indication for the receiving user, as soon as the MWI supplementary service has been invoked by the controlling user; and/or
- as a **deferred notification**, which is expected to be a general information message (e.g. announcement), when the receiving user makes an outgoing call attempt after the MWI service has been invoked by the controlling user.

Having received this notification, the receiving user can subsequently access the message system to have the message delivered. The means by which the RU accesses and manages the message system are outside the scope of the present document.

After this action has been completed, the controlling user may invoke the MWI supplementary service either:

- to deactivate the notification associated with the corresponding message; or
- to deactivate notifications in a global mode (i.e. for all messages in the message system at the time of the notification, even if not yet delivered).

Depending on the situation (MWI service option), this operation shall result, as soon as the MWI supplementary service has been invoked for notification deactivation by the controlling user in:

- an immediate notification of deactivation; or
- a deactivation of the deferred notification.

5 Procedures

5.1 Provision and withdrawal

The MWI supplementary service shall be provided to the receiving user after prior arrangement with the MWI service provider or, as a network operator option, generally available. The MWI supplementary service shall be withdrawn at the receiving user's request, or for administrative reasons.

- In the case of notification using modem transfer, it is assumed that the receiving user has appropriate capabilities to receive information transferred. Also, as a MWI service option, the receiving user can be prevented from receiving any notification;
- Provision of the MWI supplementary service shall be possible on an access or number basis.

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. The maximum number of controlling users numbers that can be registered for a receiving user shall be an integer value and is also a network operator option.

Depending on the MWI service provider option applying, the following subscription options can be made available to the receiving user:

- only immediate notification (as soon as the MWI supplementary service has been invoked by a controlling user);
- only deferred notification (when the MWI supplementary service has been invoked by a controlling user and the receiving user makes an outgoing call attempt);
- or both immediate and deferred notification.

The receiving user shall have a subscription option to allow or not an override of the default notification (immediate/deferred) on a given invocation mode by the controlling users.

Depending on a network operator option, the deferred notification can be:

- a general audible indication (e.g. announcement); and/or
- a general visual indication; and
- additional information.

5.2 Normal procedures

5.2.1 Registration and erasure

Not applicable.

5.2.2 Activation and deactivation

In order to allow the receiving user to be appropriately notified, it is assumed that actions need to be undertaken by the controlling user:

- activation of the MWI supplementary service for a specific receiving user;
- deactivation of the MWI supplementary service for a specific receiving user.

Several controlling users can simultaneously activate or deactivate the MWI supplementary service for a given receiving user.

NOTE: The following information has to be used for achieving these operations:

- the applicable basic service (ISDN);
- the type of operation (activation/deactivation);
- the kind of notification (immediate and/or deferred) to be provided;

and as an option:

- information provided by the controlling user and to be transferred transparently to the receiving user (e.g. name, date/time stamp and originating identity associated with the last message, additional identification of the mail box...);
- the identity (PSTN, ISDN) of the mailbox to be used by the receiving user to call back and get the message;
- the number of messages awaiting;
- local message reference;
- others.

Depending on service options applying to the receiving user, notification activation as requested by the controlling user results in notification of the receiving user, i.e.:

- immediate notification containing information delivered by the controlling user and addressed to the receiving user together with complementary information (e.g. date and time relating to notification transfer at the receiving user interface); or
- deferred notification (e.g. announcement or general information provided using modem transfer); or
- combined notification.

Depending on service options applying to the receiving user, notification deactivation as requested by the controlling user can result in the following actions from the receiving user's point of view:

- immediate notification relating to deactivation;
- immediate notification relating to an overall deactivation (i.e. for all messages relating to a given mailbox provider, see note 1);
- cancellation of deferred notification (e.g. announcement) or enhanced notification (see note 2).

NOTE 1: Depending on terminal capabilities, this possibility could be based on the provision by the PNO of capabilities allowing monitoring of operations occurring between the various controlling users and the receiving users. The architecture associated with this possible solution can be based on a dedicated equipment acting as a gateway between controlling users interfaces and the LEs concerned by the management of the MWI supplementary service at the receiving user's user-network interface.

NOTE 2: Deactivation of deferred notification should be also possible for the MWI service provider by using an administrative procedure as a consequence of a receiving user request.

5.2.3 Invocation and Operation

From the receiving user point of view, three modes of invocation are possible:

- immediate mode: invocation as soon as activation/deactivation of MWI has been requested by the controlling user; or
- deferred mode: invocation when the receiving user makes an outgoing call attempt;
- combined mode: i.e. both immediate and deferred mode apply.

5.2.3.1 In case of an activation

If the immediate mode applies, then after the MWI supplementary service has been activated by the controlling user, the MWI supplementary service shall be invoked immediately and the network shall provide a MWI to the receiving user, indicating:

- the type of operation (activation);
- the controlling user number;

and as an option:

- the date and time relating to the transfer of the notification;
- information provided by the controlling user and transferred transparently by the network (e.g. name, date/time stamp and originating identity associated with the last message, additional identification of the mail box...);
- the number of messages awaiting;
- message identity, including information concerning adding/removal of the message;
- the receiving user number (MSN on PSTN lines);
- other.

If the deferred mode applies, then when the MWI supplementary service has been activated for the receiving user and the receiving user makes an outgoing call attempt, the MWI supplementary service shall be invoked and the network shall provide a MWI to the receiving user, indicating:

- a general information;

and/or as an option:

- the type of operation (activation);
- the basic service;
- the controlling user number;
- the number of messages;
- the date and time relating to the indicated message;
- message identity, including information concerning adding/removal of the message;
- the receiving user number (MSN on PSTN lines);
- other.

The network shall provide notifications assuming that the receiving user has no call engaged.

NOTE 1: The indication given at the MWI may be e.g. a visual indication, or alternatively a special dial tone or announcement.

NOTE 2: The MWI shall be invoked and provided after each outgoing call attempt until the MWI supplementary service receives a deactivation request for a specific active instance.

NOTE 3: If the combined mode applies, the procedure for the immediate and deferred mode shall both apply.

NOTE 4: If the receiving user allows override of the invocation mode and the controlling user has indicated the invocation mode, the activation shall be performed according to the mode indicated by the controlling user (deferred, immediate or combined).

5.2.3.2 Deactivation

If the immediate mode applies, in the case the MWI supplementary service has been deactivated by a controlling user, the MWI supplementary service shall be invoked and the network shall provide a MWI to the receiving user, indicating:

- the type of operation (deactivation);
- the basic service;
- the controlling user number;

and as an option:

- the receiving user number (MSN on PSTN lines).

If the deferred mode applies, then after the MWI supplementary service has been deactivated by a controlling user, the instance shall only be deactivated according to the MWI supplementary service (basic service and controlling user number).

5.2.4 Interrogation

Not applicable.

5.3 Exceptional procedures

5.3.1 Registration and erasure

Not applicable.

5.3.2 Activation and deactivation

From the controlling user's perspective, if the network cannot comply with the request to activate or deactivate the MWI supplementary service, the network shall reject explicitly the request and indicate the reason to the receiving user and the controlling user. Reasons for rejecting the request are:

- the controlling user has not subscribed to the MWI supplementary service;
- the controlling user provided an invalid receiving user number;
- an interaction with another supplementary service prohibits the activation of the MWI supplementary service;
- the receiving user has not subscribed to the MWI supplementary service;
- the controlling user is not registered for the indicated receiving user;
- the MWI cannot be delivered to the receiving user;
- the maximum number of controlling users has been reached (for activation);
- the maximum number of active instances has been reached (for activation).

The deactivation of one or more deferred notifications (instances) should also be possible for MWI service provider by using an administrative procedure, as a consequence on a receiving user request.

5.3.3 Invocation and operation

PSTN access only: if the receiving user is engaged in a call, the immediate notification is not given to the receiving user at that time. Further attempts will be made to deliver the immediate notification, the delay between attempts being MWI service provider options.

5.3.4 Interrogation

Not applicable.

6 Interworking requirements

Public and private networks shall cooperate in the provision of this MWI supplementary service. This implies that the receiving user and/or the controlling user can be a user in a private network.

Interworking between public and private ISDN shall include the requirements given in ETS 300 345 [3]. Interworking shall take place in a co-operative manner.

7 Interaction with other supplementary services

7.1 Advice of charge services

7.1.1 Charging information at call set-up time

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.1.2 Charging information during call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.1.3 Charging information at the end of the call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.2 Call Waiting

For PSTN access only, the MWI can not be given since the line is busy Immediate notification must not cause a Call Waiting tone to be sent to the busy receiving user, i.e. call waiting shall not be invoked by MWI supplementary service. Further attempts will be made to deliver the notification to the receiving user, the delay between attempts being MWI service provider options.

For ISDN access only, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.3 Call hold

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.4 Call transfer

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.5 Number Identification Services

7.5.1 Calling line identification presentation

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.5.2 Calling line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.5.3 Connected line identification presentation

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.5.4 Connected line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.6 Completion of Calls

7.6.1 Busy subscriber

For ISDN access only, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

For PSTN access only, the MWI cannot be given since the line is busy. The MWI shall never be diverted. Further attempts will be made to deliver the MWI to the receiving user, the delay between attempts being MWI service provider options. Any CCBS recall has priority on MWI.

7.6.2 Completion of calls on no reply

For ISDN access only, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

For PSTN access only, the MWI cannot be given since the line is busy. The MWI shall never be diverted. Further attempts will be made to deliver the MWI to the receiving user, the delay between attempts being MWI service provider options. Any CCNR recall has priority on MWI.

7.7 Conference

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.8 Direct dialling in

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.9 Call Forwarding

7.9.1 Call Forwarding unconditional

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service. The MWI will be forwarded as requested by the CFU supplementary service.

7.9.2 Call Forwarding Busy

For ISDN access only, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

For PSTN only, the immediate MWI is not given since the line is busy. Further attempts will be made to deliver the notification, the delay between attempts being MWI service provider options.

The deferred notification shall not be diverted.

7.9.3 Call Forwarding no reply

For ISDN access only, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

For PSTN only, the immediate MWI is not given since the line is busy. Further attempts will be made to deliver the notification, the delay between attempts being MWI service provider options.

The deferred notification shall not be diverted.

7.9.4 Selective Call deflection

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.10 Free phone

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.11 Malicious call identification

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.12 Multiple subscriber number

If the receiving user has subscribed to the MSN supplementary service, the MWI supplementary service can be activated for each assigned number individually.

In this case the MWI provided to the receiving user shall in addition contain the relevant receiving user's number.

7.13 Sub addressing

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.14 Three party

For ISDN access, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

For PSTN access, the MWI cannot be given since the line is busy. Further attempts will be made to deliver the notification, the delay between attempts being MWI service provider options.

7.15 Outgoing call barring

7.15.1 User controlled outgoing call barring

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.15.2 Fixed outgoing call barring

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Annex A (informative): Interactions tables

A.1 Interactions between receiving user's own service (column 1) and own other services

Table A.1

	Own other services															
Own service	**CLIP**	**CLIR**	**CW**	**CCBS**	**CFNR**	**CFB**	**CFU**	**OCB**	**SICB**	**CB**	**3PTY**	**AOC-E**	**AOC-D**	**VM**	**MWI**	**SLE**
CLIP	–	N	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	N	N
CLIR	N	–	N	N	Y	Y	Y	N	N	N	N	N	N	N	–	N
CW	Y	N	–	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y
CCBS	Y	Y	Y	–	N	Y	Y	N	N	Y	N	Y	Y	N	Y	N
CFNR	N	N	Y	N	–	N	Y	Y	Y	N	N	Y	Y	Y	Y	N
CFB	N	N	Y	N	N	–	Y	Y	Y	N	N	Y	Y	Y	Y	N
CFU	N	N	Y	Y	Y	Y	–	Y	Y	N	N	Y	Y	Y	Y	N
OCB	N	N	N	N	Y	Y	Y	–	N	Y	Y	N	N	N	N	N
SICB	Y	N	Y	N	Y	Y	Y	N	–	Y	N	N	N	N	N	N
CB	N	N	Y	Y	Y	Y	Y	Y	Y	–	N	N	N	N	Y	N
3PTY	N	N	N	N	N	N	N	Y	N	N	–	Y	Y	N	Y	N
AOC-E	Y	N	Y	Y	Y	Y	Y	N	N	N	Y	–	N	Y	N	N
AOC-D	N	N	N	Y	Y	Y	Y	N	N	N	Y	–	–	Y	N	N
VM	N	N	Y	N	Y	Y	Y	N	N	N	N	Y	Y	–	Y	N
MWI	N	–	Y	Y	Y	Y	Y	N	N	Y	Y	–	–	Y	–	–
SLE	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	–
NOTE: Y = interaction N = no interaction - = interaction not relevant.																

A.2 Interactions between receiving user's own service (column 1) and other call party's services

Table A.2

	Services of other call party															
Own service	**CLIP**	**CLIR**	**CW**	**CCBS**	**CFNR**	**CFB**	**CFU**	**OCB**	**SICB**	**CB**	**3PTY**	**AOC-E**	**AOC-D**	**VM**	**MWI**	**SLE**
CLIP	N	Y	Y	N	N	N	N	N	N	N	Y	N	N	Y	–	N
CLIR	Y	–	Y	N	Y	Y	Y	N	Y	Y	N	N	N	N	–	N
CW	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	Y	–	N
CCBS	N	N	N	Y	Y	Y	Y	N	Y	Y	N	N	N	N	–	N
CFNR	N	Y	N	Y	–	–	–	N	Y	N	N	N	N	N	–	N
CFB	N	Y	N	Y	–	–	–	N	Y	Y	N	N	N	N	–	N
CFU	N	Y	N	Y	–	–	–	N	Y	Y	N	N	N	N	–	N
OCB	N	N	N	N	N	N	N	–	N	N	N	N	N	N	–	N
SICB	N	Y	N	Y	N	N	N	N	–	Y	Y	Y	Y	Y	–	N
CB	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	Y	–	N
3PTY	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	–	N
AOC-E	N	N	Y	N	N	N	N	N	Y	N	Y	N	N	N	–	N
AOC-D	N	N	N	N	N	N	N	N	Y	N	Y	N	–	N	–	N
VM	Y	N	Y	N	N	N	N	N	Y	Y	N	N	N	Y	–	N
MWI	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SLE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

NOTE: Y = interaction N = no interaction - = interaction not relevant.

Annex B (informative): Details of interactions

All the interactions refer to other supplementary services that the receiving user of MWI service may also have.

Immediate Notification
In case of Immediate Notification, the visual message cannot be presented if the receiving user is busy. The Immediate Notification will be sent again at intervals specified by the MWI service provider, until the receiving user is finally not busy.

NOTE: The Enhanced Telephone or Add-on Display used to provide the CLIP service must be able to provide a special visual message indicating that a message is waiting.

Deferred Notification
In case of Deferred Notification an announcement should be given when the receiving user lifts the handset to make an outgoing call attempt, independently of whether other services are invoked or not.

B.1 Calling Line Identification Presentation (CLIP)

No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.2 Calling Line Identification Restriction (CLIR)

No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.3 Call Waiting (CW)

Immediate Notification
Receiving user A Customer B Mailbox service

<---------- Call in progress ---------->|**CW** - - - - NO OPERATION <---------- activation attempt ------

|---------- Call completed ----------| ⇓

⇓

MWI <---------- activation ----------

Immediate Notification must not cause a Call Waiting Tone to be sent to the busy receiving user who has the CW activated, i.e. CW shall not be invoked by MWI. The Immediate Notification will be sent again at intervals specified by the MWI service provider, until the receiving user is finally not busy.

Deferred Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.4 Completion of Calls to Busy Subscriber(CCBS)

Immediate Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

Deferred Notification
There is a problem with Deferred Notification in case the need for a message arises during the invocation of CCBS, i.e. the receiving user has invoked a CCBS and just after a deferred notification is requested by the controlling user. The MWI announcement must be given when the receiving user first lifts the handset at the completion of a call to a previously busy subscriber. Since another announcement (the announcement for CCBS) will also be given, a decision is needed for the correct sequence of announcements, as well as the necessary network requirements for resolving this interaction.

The MWI announcement should occur first.

B.5 Call Forwarding No Reply (CFNR)

Immediate Notification
Receiving user A Customer B Customer C Mailbox service

----------> CFNR ----------->

MWI <---------- activation ----------

In case of Immediate Notification, the visual message must be able to be presented at the receiving user's terminal independently of whether the CFNR service is activated and invoked or not.

Deferred Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other supplementary service.

B.6 Call Forwarding Busy (CFB)

Immediate Notification
Receiving user A Customer B Mailbox service

<---------- Call in progress ---------->|

CFB - - - NO OPERATION <---------- activation attempt ------

|---------- Call completed ----------| ⇓

⇓

MWI <---------- activation ----------

No Forwarding of the message must be performed. The Immediate Notification will be sent again at intervals specified by the MWI service provider, until the receiving user is finally not busy.

Deferred Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.7 Call Forwarding Unconditional (CFU)

Immediate Notification
In case of Immediate Notification, the visual message must be able to be presented at the terminal independently of whether the CFU service is activated and invoked or not. The message should not be forwarded to the new location, but be given to the receiving user's original location.

Deferred Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.8 Outgoing Call Barring (OCB)

No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.9 Selective Incoming Call Barring (SICB)

No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.10 Call Back (CB)

Immediate Notification
The visual message of the Immediate Notification should not be treated as an Incoming Call and, therefore, the CB service could not be used for calling back the Voice Mail service.

Deferred Notification
No interaction identified, i.e. neither supplementary service shall affect the operation of the other one.

B.11 Three Party Call (3-PTY)

Immediate Notification
In case of Immediate Notification, the visual message cannot be presented if the receiving user is busy. The Immediate Notification will be sent again at intervals specified by the MWI service provider, until the receiving user is finally not busy.

Deferred Notification
In case of Deferred Notification, the announcement must be given when the receiving user lifts the handset to make a call, independently of whether the 3-PTY service is activated or not.

B.12 Advice of Charge services

B.12.1 Charging Information at End of call (AOC-E)

Not applicable, i.e. neither supplementary service shall affect the operation of the other one.

B.12.2 Charging information during call (AOC-D)

Not applicable, i.e. neither supplementary service shall affect the operation of the other one.

B.13 Voice Mail (VM)

The Voice Mail provider will employ the MWI service for alerting the receiving user to the presence of stored messages.

B.14 Message Waiting Indicator (MWI)

Not applicable, i.e. neither supplementary service shall affect the operation of the other one.

B.15 Screening List Editing (SLE)

Not applicable, i.e. neither supplementary service shall affect the operation of the other one.

B.16 Incoming Call Barring

The ICB takes precedence over MWI. ICB shall operate normally on calls with active ACR. In particular, ICB shall continue to bar calls irrespective of MWI status.

Annex C (informative): Examples of use

- A receiving user has subscribed to a mailbox service (with notification);
- A caller stores a message in the mailbox;
- The controlling user (mailbox server) requests the MWI supplementary service to notify the receiving user that he got a message (in an immediate or deferred manner);
- The MWI informs the receiving user that there is one or more messages waiting in his/her mailbox (es);
- The receiving user accesses the mailbox and have the mail delivered;
- The controlling user (mailbox server) requests the MWI supplementary service to notify the receiving user that the message(s) has (ve) been read;
- The MWI informs the receiving user that no more messages are waiting.

Annex D (informative): Bibliography

- ETSI DTR/SPAN-110062: "Public Switched Telephone Network (PSTN); Display services List of information for PSTN services use".

History

Document history		
V1.1.1	January 2001	Publication