3GPP TSG-T (Terminals) Meeting #24
Seoul, Korea
2 - 4 June, 2004

TP-040094

Agenda Item: 5.2.3

Source: T2

Title: Change Request on SMS

Document for: Approval

Spec	CR	Rev	Rel	Subject	Cat	Vers-Current	Vers-New	Doc-2nd-Level	Workitem
23.040	072	-	Rel-6	Enhanced Voice Mail Information	B	6.3.0	6.4.0	T2-040238	TEI6
23.040	073	-	Rel-6	Optional IEI's	F	6.3.0	6.4.0	T2-040245	TEI6

3GPP TSG-T2 #25
Edinburgh Scotland
19th-23rd April 2004

T2-040238

CR-Form-v7

CHANGE REQUEST

⌘ **23.040** CR **072** ⌘ rev **-** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Enhanced Voice Mail Information
Source:	⌘	T2 (RIM)
Work item code:	⌘	TEI6
Date:	⌘	21/04/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	Although SMS has been used for Voice mail notification in many operators networks for some years, the current Voice Mail Notification via SMS is somewhat limited in the information conveyed to the mobile. This CR allows voice mail systems to convey via SMS to the user enhanced information regarding voice mail messages and voice mail box status such as a list of voice messages, the time a particular voice message was left, who it was from – if known, message duration etc.
Summary of change:	⌘	Enhanced Voice Mail Information is an option using Information Element Identifiers in the User Data Header already being used for optional features such as interaction with e-mail systems. One new IEI value is defined together with a number of sub parameters that convey more detailed information concerning Voice Mail box status and individual Voice mail messages.
Consequences if not approved:	⌘	An opportunity to increase SMS revenue and improve a users experience using SMS for voice mail notification will have been lost

Clauses affected:	⌘	Table of IEI values 9.2.3.24 and new sub section 9.2.3.24.13

		Y	N			
Other specs affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘	The existing simpler Voice Mail Notifications currently specified in 23.040 have been left unchanged to avoid the risk of problems for existing products.				

9.2.3.23 TP-User-Data-Header-Indicator (TP-UDHI)

The TP-User-Data-Header-Indicator is a 1 bit field within bit 6 of the first octet of the following six PDUs:

- SMS-SUBMIT,
- SMS-SUBMIT-REPORT
- SMS-DELIVER,
- SMS-DELIVER-REPORT,
- SMS-STATUS-REPORT,
- SMS-COMMAND.

TP-UDHI has the following values.

Bit no. 6 0 The TP-UD field contains only the short message

1 The beginning of the TP-UD field contains a Header in addition to the short message.

9.2.3.24 TP-User Data (TP-UD)

The length of the TP-User-Data field is defined in the PDU's of the SM-TL (see clause 9.2.2).

The length of the TP-User-Data field is defined in the PDU's of the SM-TL (see clause 9.2.2).

The TP-User-Data field may comprise just the short message itself or a Header in addition to the short message depending upon the setting of TP-UDHI.

Where the TP-UDHI value is set to 0 the TP-User-Data field comprises the short message only, where the user data can be 7 bit (default alphabet) data, 8 bit data, or 16 bit (UCS2 [24]) data.

Where the TP-UDHI value is set to 1 the first octets of the TP-User-Data field contains a Header in the following order starting at the first octet of the TP-User-Data field.

Irrespective of whether any part of the User Data Header is ignored or discarded, the MS shall always store the entire TPDU exactly as received.

FIELD		LENGTH
Length of User Data Header		1 octet
Information-Element-Identifier "A"	1 octet	
Length of Information-Element "A"	1 octet	
Information-Element "A" Data		0 to "n" octets
Information-Element-Identifier "B"		1 octet
Length of Information-Element "B"	1 octet	
Information-Element "B" Data		0 to "n" octets
Information-Element-Identifier "X"		1 octet

Length of Information-Element "X"	1 octet
Information-Element "X" Data	0 to "n" octets

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for uncompressed GSM 7 bit default alphabet data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

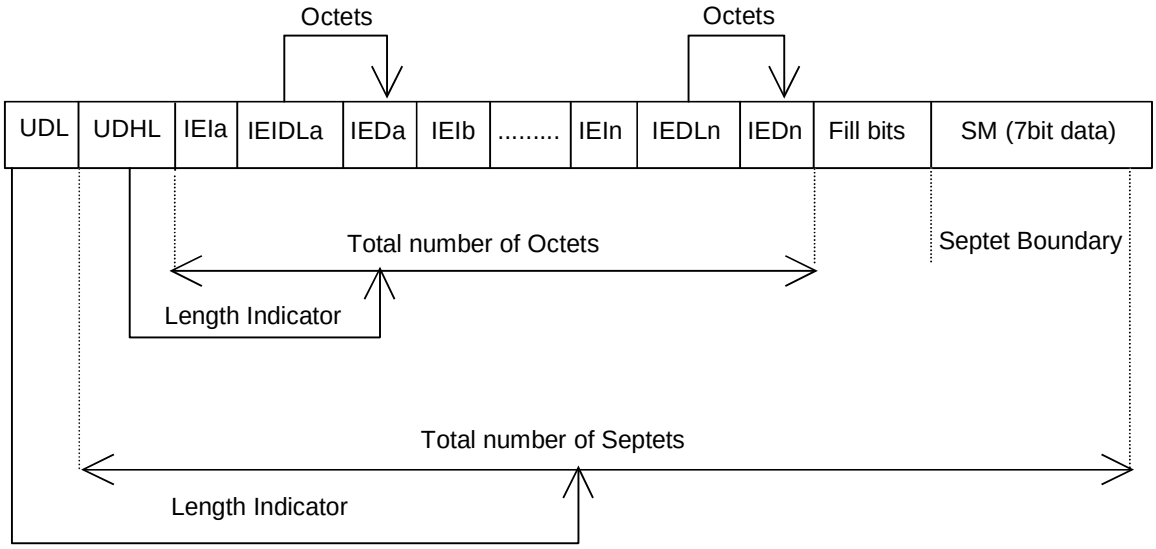

Figure 9.2.3.24 (a)

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for uncompressed 8 bit data or uncompressed UCS2 data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

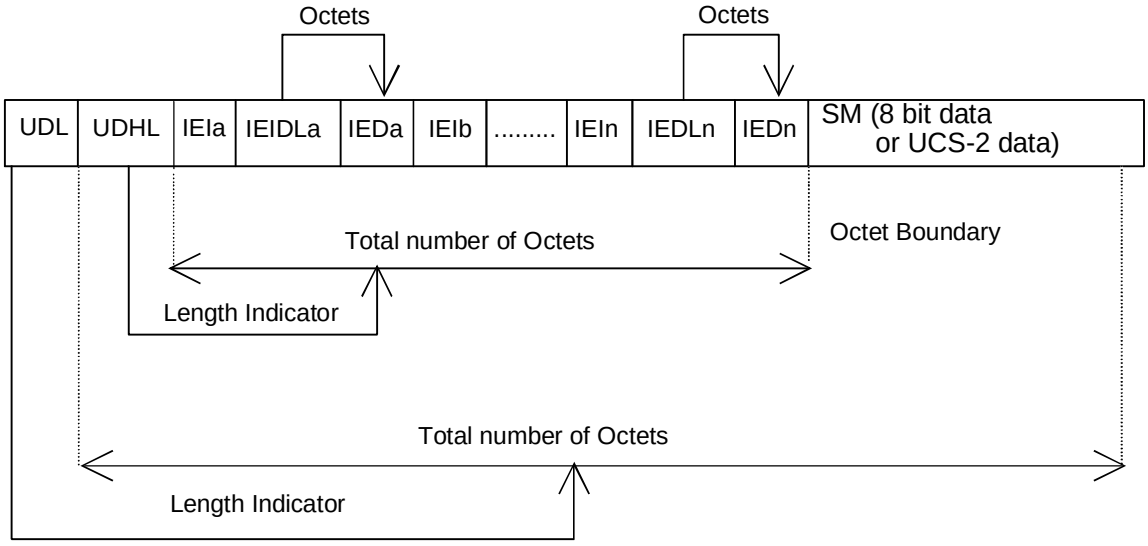

Figure 9.2.3.24 (b)

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for compressed GSM 7 bit default alphabet data, compressed 8 bit data or compressed UCS2 data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

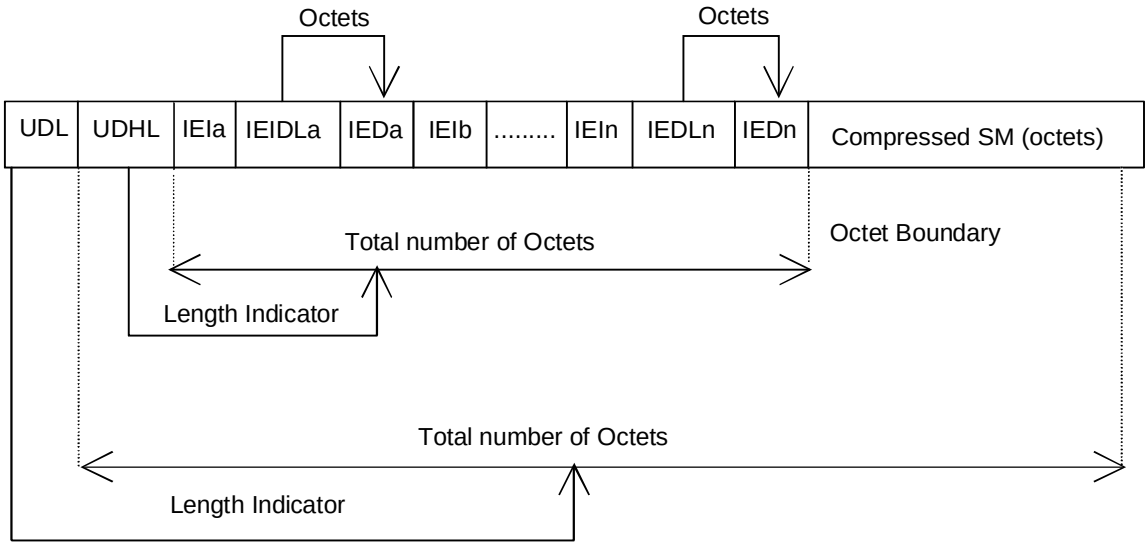

Figure 9.2.3.24 (c)

The definition of the TP-User-Data-Length field which immediately precedes the "Length of User Data Header" is unchanged and shall therefore be the total length of the TP-User-Data field including the Header, if present. (see 9.2.3.16).

The "Length-of-Information-Element" fields shall be the integer representation of the number of octets within its associated "Information-Element-Data" field which follows and shall not include itself in its count value.

The "Length-of-User-Data-Header" field shall be the integer representation of the number of octets within the "User-Data-Header" information fields which follow and shall not include itself in its count or any fill bits which may be present (see text below).

Information Elements may appear in any order and need not follow the order used in the present document. Information Elements are classified into 3 categories as described below.

- SMS Control – identifies those IEIs which have the capability of dictating SMS functionality.
- EMS Control – identifies those IEIs which manage EMS Content IEIs.
- EMS Content – identifies those IEIs containing data of a unique media format.

It is permissible for certain IEs to be repeated within a short message, or within a concatenated message. There is no restriction on the repeatability of IEs in the EMS Content classification. The repeatability of SMS Control and EMS Control IEs is determined on an individual basis. See the IE table below for the repeatability of each IE.

In the event that IEs determined as not repeatable are duplicated, the last occurrence of the IE shall be used. In the event that two or more IEs occur which have mutually exclusive meanings (e.g. an 8bit port address and a 16bit port address), then the last occurring IE shall be used.

If the length of the User Data Header is such that there are too few or too many octets in the final Information Element then the whole User Data Header shall be ignored.

If any reserved values are received within the content of any Information Element then that part of the Information Element shall be ignored.

The Information Element Identifier octet shall be coded as follows:

VALUE (hex)	MEANING	Classification	Repeatability
00	Concatenated short messages, 8-bit reference number	SMS Control	No
01	Special SMS Message Indication	SMS Control	Yes
02	Reserved	N/A	N/A
03	Value not used to avoid misinterpretation as <LF> character	N/A	N/A
04	Application port addressing scheme, 8 bit address	SMS Control	No
05	Application port addressing scheme, 16 bit address	SMS Control	No
06	SMSC Control Parameters	SMS Control	No
07	UDH Source Indicator	SMS Control	Yes
08	Concatenated short message, 16-bit reference number	SMS Control	No
09	Wireless Control Message Protocol	SMS Control	Note 3
0A	Text Formatting	EMS Control	Yes
0B	Predefined Sound	EMS Content	Yes
0C	User Defined Sound (iMelody max 128 bytes)	EMS Content	Yes
0D	Predefined Animation	EMS Content	Yes
0E	Large Animation (16*16 times 4 = 32*4 =128 bytes)	EMS Content	Yes
0F	Small Animation (8*8 times 4 = 8*4 =32 bytes)	EMS Content	Yes
10	Large Picture (32*32 = 128 bytes)	EMS Content	Yes
11	Small Picture (16*16 = 32 bytes)	EMS Content	Yes
12	Variable Picture	EMS Content	Yes
13	User prompt indicator	EMS Control	Yes
14	Extended Object	EMS Content	Yes
15	Reused Extended Object	EMS Control	Yes
16	Compression Control	EMS Control	No
17	Object Distribution Indicator	EMS Control	Yes
18	Standard WVG object	EMS Content	Yes
19	Character Size WVG object	EMS Content	Yes
1A	Extended Object Data Request Command	EMS Control	No
1B-1F	Reserved for future EMS features (see subclause 3.10)	N/A	N/A
20	RFC 822 E-Mail Header	SMS Control	No
21	Hyperlink format element	SMS Control	Yes
22	Reply Address Element	SMS Control	No
23	Enhanced Voice Mail Information	SMS Control	No
24~~3~~ – 6F	Reserved for future use	N/A	N/A
70 – 7F	(U)SIM Toolkit Security Headers	SMS Control	Note 1
80 – 9F	SME to SME specific use	SMS Control	Note 2
A0 – BF	Reserved for future use	N/A	N/A
C0 – DF	SC specific use	SMS Control	Note 2
E0 – FF	Reserved for future use	N/A	N/A

Note 1: The functionality of these IEIs is defined in 3GPP TSG 23.048 [28], and therefore, the repeatability is not within the scope of this document and will not be determined here.

Note 2: The functionality of these IEIs is used in a proprietary fashion by different SMSC vendors, and therefore, are not within the scope of this technical specification.

Note 3: The functionality of these IEIs is defined by the WAP Forum and therefore the repeatability is not within the scope of this document and will not be determined here.

9.2.3.24.13 Enhanced Voice Mail Information

Enhanced Voice Mail Information allows a Voice Mail system to convey to a mobile subscriber, comprehensive information regarding individual voice mail messages and mailbox status.

Enhanced Voice Mail Information has two types of Information Element Data

- Enhanced Voice Mail Notification which conveys to the MS information regarding newly deposited Voice Mail messages and Voice Mailbox Status
- Enhanced Voice Mail Delete Confirmation which allows an MS to maintain Voice mailbox status information synchronisation between the MS and the Voice Mailbox in the event of Voice Mail Message deletion.

The first 'bit' of the Enhanced Voice Mail Information Element Data is known as Enhanced Voice Mail PDU Type and discriminates between whether the Enhanced Voice Mail Information PDU is an Enhanced Voice Mail Notification or an Enhanced Voice Mail Delete Confirmation.

9.2.3.24.13.1 Enhanced Voice Mail Notification

The Enhanced Voice Mail Notification Information Element Data has the following format where the parameters are in strict order following the IEDL. All parameters are mandatory except where otherwise specified in the description for each parameter.

In the event of a contradiction between Enhanced Voice Mail Notification and either the DCS (23.038) [9] indicating Voicemail Message Waiting or the Special SMS Message Indication (9.2.3.24.2) indicating Voice Message Waiting or both then the Enhanced Voice Mail Notification specified here shall take precedence.

Parameter	**Parameter Length**
ENHANCED_VOICE_MAIL_PDU_TYPE	Bit 0 Octet 1
RESERVED_FOR_FUTURE_USE	Bits 2..3 Octet 1
SM_STORAGE	Bit 4 Octet 1
VM_MAILBOX_ALMOST_FULL	Bit 5 Octet 1
VM_MAILBOX_FULL	Bit 6 Octet 1
OCTET_EXTENSION	Bit 7 Octet 1
VM_MAILBOX_ACCESS_ADDRESS	Octets 2… n+2 (2
NUMBER_OF_VOICE_MESSAGES	Bits 0..7 Octet n+3
NUMBER_OF_VM_NOTIFICATIONS	Bits 0..4 Octet n+4
RESERVED_FOR_FUTURE_USE	Bits 5..7 Octet n+4
VM_MESSAGE_ID (1	Bits 0..15 Octets n+5..n+6
VM_LENGTH (1	Bits 0..7 Octet n+7
VM_RETENTION_DAYS (1	Bits 0..4 Octet n+8
RESERVED_FOR_FUTURE_USE (1	Bit 5 Octet n+8
VM_PRIORITY_INDICATION (1	Bit 6 Octet n+8
OCTET_EXTENSION (1	Bit 7 Octet n+8
VM_CALLING_LINE_IDENTITY (1	Octets n+9.. n+9+m (2

NOTE 1.	This sequence of parameters are repeated a number of times according to the number of Voice Mail notifications conveyed in this IE.
NOTE:2	'n' and 'm' denote the number of octets required for the VM_MAILBOX_ACCESS_ADDRESS and the VM_CALLING_LINE_IDENTITY as appropriate including the Address-Length, Type-of-address and Address-value See 9.1.2.5.
ENHANCED_VOICE_MAIL_PDU_TYPE	This parameter shall be set to 0 to specify that the following Information Element Data Parameters is an Enhanced Voice Mail Notification.
RESERVED_FOR_FUTURE_USE	This parameter is set to 0 and is reserved for future use.
SM_STORAGE	This parameter shall be set to 0 to indicate that this SM shall be discarded after evaluating its contents; otherwise it shall be set to a 1 to indicate to the MS that this SM shall be stored in the ME or the USIM.
VM_MAILBOX_ALMOST_FULL	This parameter shall be set to 1 if the Voice Mailbox in the Voice Mail system is almost full; otherwise this field shall be set to 0. The point at which the voice mailbox is considered almost full is Voice Mail System specific.
VM_MAILBOX_FULL	This parameter shall be set to 1 if the Voice Mailbox in the Voice Mail system is full; otherwise this field shall be set to 0.
OCTET_EXTENSION	This parameter shall be set to a 0 to indicate that the following Octet is the VM_MAILBOX_ACCESS_ADDRESS. This parameter is set to a 1 to indicate that additional octets precede the VM_MAILBOX_ACCESS_ADDRESS.
	NOTE: Additional octets are not yet defined but may be defined later by 3GPP. Any additional octets shall have their bit 7set to 0 so that implementations complying to this release shall be able to identify the VM_MAILBOX_ACCESS_ADDRESS by virtue of the fact that bit 7 in its first octet is always set to 1 (see 9.1.2.5 SM-TL format) and thus ignore the preceding additional octets added in later releases.
VM_MAILBOX_ACCESS_ADDRESS	This parameter shall contain the address to be used by the mobile subscriber to access the mobile subscribers Voice Mailbox. This parameter coding shall comply with the the SM-TL address format specified in 9.1.2.5 above.
NUMBER_OF_VOICE_MESSAGES	This octet shall contain a value in the range 0 to 255 indicating the current number of Voice Mail messages that are unread.

	The value 255 shall be taken to mean 255 or greater. The NUMBER_OF_VOICE_MESSAGES shall be stored on the USIM in accordance with the procedure for storage of Message Waiting Indication Status described in Special SMS Message Indication (9.2.3.24.2).
NUMBER_OF_VM_NOTIFICATIONS	This parameter has a range 0 to 15. This parameter shall indicate the number of specific Voice Message notifications to follow within this IE.
RESERVED_FOR_FUTURE_USE	This parameter shall be set to 0 and is reserved for future use.
VM_MESSAGE_ID	This parameter shall be set to the message ID of the Voice Mail message in this specific Voice Message notification. This parameter is binary and has a range 0 to 65535, modulus 65536. It is the responsibility of the Voice Mail system to set this parameter to uniquely identify a Voice Mail message within the modulus.
VM_LENGTH	This parameter shall be set to the length of the Voice Mail message in this notification in seconds. This parameter has a range 0 to 255. For voice mail messages that are longer than 255 seconds, this parameter shall be set to its maximum 255.
VM_RETENTION_DAYS	This parameter shall be set to the number of days after which the specific Voice Mail message in this notification is anticipated to be automatically deleted from the Voice Mail system timed from the GSM Timestamp (TP-SCTS 9.2.3.11) for this Enhanced Voice Mail Notification. This parameter has a range 0 to 31. For Voice Mail messages that have a longer retention time than 31 days, this parameter shall be set to its maximum 31. NOTE: The GSM Timestamp is the time that the SC received the SM from the Voice Mail system which is not necessarily the time that the voice message was deposited into the Voice Mail system.
RESERVED_FOR_FUTURE_USE	This parameter is set to 0 and is reserved for future use.
VM_PRIORITY_INDICATION	This parameter shall be set to 1 to indicate that the specific Voice Mail message in this notification held in the Voice Mailbox is urgent; otherwise the parameter shall be set to 0.
OCTET_EXTENSION	This parameter shall be set to a 0 to indicate that the following Octet is the VM_CALLING_LINE_IDENTITY. This parameter is set to a 1 to indicate that additional octets precede the VM_CALLING_LINE_IDENTITY. NOTE: Additional octets are not yet defined but may be defined later by 3GPP. Any additional octets shall have their bit 7set to 0 so that implementations complying to this release

	shall be able to identify the VM_CALLING_LINE_IDENTITY by virtue of the fact that bit 7 in its first octet is always set to 1 (see 9.1.2.5 SM-TL format) and thus ignore the preceding additional octets added in later releases.
VM_CALLING_LINE_IDENTITY	This parameter shall contain the address to be used by the mobile subscriber to contact the originator of the specific Voice Mail message in this notification. Where the CLI is not available then the coding of this parameter shall indicate that there is no address. i.e The length indicator in this parameter shall be set to 0 This parameter coding shall comply with the the SM-TL address format specified in 9.1.2.5 above.

9.2.3.24.13.2 Enhanced Voice Mail Delete Confirmation

The Enhanced Voice Mail Delete Confirmation Information Element Data contains synchronization information. A Voice Mail system may send an Enhanced Voice Mail Delete Confirmation in order to indicate to the ME that certain voice mail messages that have been deleted and to indicate the updated status of the Voice Mailbox.

The Enhanced Voice Mail Delete Confirmation Information Element Data has the following format where the parameters are in strict order following the IEDL. All parameters are mandatory except where otherwise specified in the description for each parameter.

:

Parameter	Parameter Length
ENHANCED_VOICE_MAIL_PDU_TYPE	Bit 0 Octet 1
RESERVED_FOR_FUTURE_USE	Bits 1..3 Octet 1
SM_STORAGE	Bit 4 Octet 1
VM_MAILBOX_ALMOST_FULL	Bit 5 Octet 1
VM_MAILBOX_FULL	Bit 6 Octet 1
OCTET_EXTENSION	Bit 7 Octet 1
VM_MAILBOX_ACCESS_ADDRESS	Octets 2..n+2 (2
NUMBER_OF_VOICE_MESSAGES	Bits 0..7 Octet n+3
NUM_OF_VM_DELETES	Bits 0..4 Octet n+4
RESERVED_FOR_FUTURE_USE	Bits 5..7 Octet n+4
VM_MESSAGE_ID (1	Octets n+5..n+6
RESERVED_FOR_FUTURE_USE (1	Bits 0..6 Octet n+7
OCTET_EXTENSION (1	Bit 7 Octet n+7

NOTE 1. This sequence of parameters are repeated a number of times according to the number of Voice Mail Delete Confirmations conveyed in this IE

NOTE:2 'n' denotes the number of octets required for the VM_MAILBOX_ACCESS_ADDRESS including the Address-Length, Type-of-address and Address-value See 9.1.2.5

ENHANCED_VOICE_MAIL_PDU_TYPE This parameter shall be set to 1 to specify that the following Information Element Data is an Enhanced Voice Mail Delete Confirmation

RESERVED_FOR_FUTURE_USE This parameter is set to 0 and is reserved for future use.

SM_STORAGE See section 9.2.3.24.13.1

VM_MAILBOX_ALMOST_FULL See section 9.2.3.24.13.1

VM_MAILBOX_FULL See section 9.2.3.24.13.1

OCTET_EXTENSION This parameter shall be set to a 0 to indicate that the following Octet is the VM_MAILBOX_ACCESS_ADDRESS. This parameter is set to a 1 to indicate that additional octets precede the VM_MAILBOX_ACCESS_ADDRESS.

NOTE: Additional octets are not yet defined but may be defined later by 3GPP. Any additional octets shall have their bit 7set to 0 so that implementations complying to this release shall be able to identify the VM_MAILBOX_ACCESS_ADDRESS by virtue of the fact that bit 7 in its first octet is

	always set to 1 (see 9.1.2.5 SM-TL format) and thus ignore the preceding additional octets added in later releases.
VM_MAILBOX_ACCESS_ADDRESS	See section 9.2.3.24.13.1
NUMBER_OF_VOICE_MESSAGES	See section 9.2.3.24.13.1
NUM_OF_VM_DELETES	This parameter has a range 0 to 63. This parameter shall indicate the number of VM_MESSAGE_ID's that follow in this IE
RESERVED_FOR_FUTURE_USE	This parameter is set to 0 and is reserved for future use.
VM_MESSAGE_ID	This parameter shall be set to the message ID of the specific voice mail message(s) whose deletion is being confirmed. The range of this parameter is defined in section 9.2.3.24.13.1 and for a specific voice mail message the value of this parameter shall be identical to that used for the VM Notification.
RESERVED_FOR_FUTURE_USE	This parameter is set to 0 and is reserved for future use.
OCTET_EXTENSION	This parameter shall be set to a 0 to indicate that no Voice Mail specific parameters follow. This parameter is set to a 1 to indicate that additional Voice Mail specific parameters follow. NOTE: Additional octets are not yet defined but may be defined later by 3GPP.

9.2.3.25 TP-Reject-Duplicates (TP-RD)

The TP-Reject-Duplicates is a 1 bit field located within bit 2 of the first octet of SMS-SUBMIT and has the following values.

Bit no. 2:

0 Instruct the SC to accept an SMS-SUBMIT for an SM still held in the SC which has the same TP-MR and the same TP-DA as a previously submitted SM from the same OA.

1 Instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC which has the same TP-MR and the same TP-DA as the previously submitted SM from the same OA. In this case the response returned by the SC is as specified in 9.2.3.6..

3GPP TSG-T2 #25
Edinburgh Scotland
19th-23rd April 2004

T2-040245

CR-Form-v7

CHANGE REQUEST

⌘ **23.040** **CR** **073** ⌘ **rev** **-** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Optional IEI's
Source:	⌘	T2 (RIM)
Work item code:	⌘	TEI6
Date:	⌘	20/04/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Support for IEI's is optional but it is difficult to find this fact in 23.040 as it is by inference only.
Summary of change:	⌘	A clear statement is made that support for all IEI's is optional unless otherwise stated
Consequences if not approved:	⌘	Questions will continue to arise regarding this particularly when new IEI's are introduced

Clauses affected:	⌘	New sentence added to 9.2.3.24

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

9.2.3.24 TP-User Data (TP-UD)

The length of the TP-User-Data field is defined in the PDU's of the SM-TL (see clause 9.2.2).

The TP-User-Data field may comprise just the short message itself or a Header in addition to the short message depending upon the setting of TP-UDHI.

Where the TP-UDHI value is set to 0 the TP-User-Data field comprises the short message only, where the user data can be 7 bit (default alphabet) data, 8 bit data, or 16 bit (UCS2 [24]) data.

Where the TP-UDHI value is set to 1 the first octets of the TP-User-Data field contains a Header in the following order starting at the first octet of the TP-User-Data field.

Irrespective of whether any part of the User Data Header is ignored or discarded, the MS shall always store the entire TPDU exactly as received.

FIELD	LENGTH
Length of User Data Header	1 octet
Information-Element-Identifier "A"	1 octet
Length of Information-Element "A"	1 octet
Information-Element "A" Data	0 to "n" octets
Information-Element-Identifier "B"	1 octet
Length of Information-Element "B"	1 octet
Information-Element "B" Data	0 to "n" octets
Information-Element-Identifier "X"	1 octet
Length of Information-Element "X"	1 octet
Information-Element "X" Data	0 to "n" octets

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for uncompressed GSM 7 bit default alphabet data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

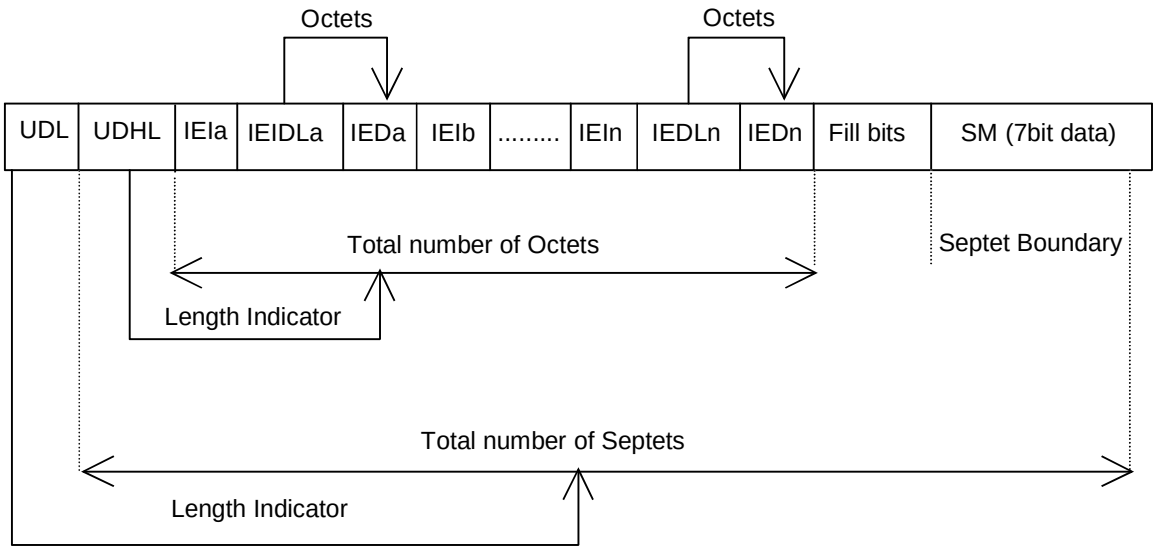

Figure 9.2.3.24 (a)

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for uncompressed 8 bit data or uncompressed UCS2 data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

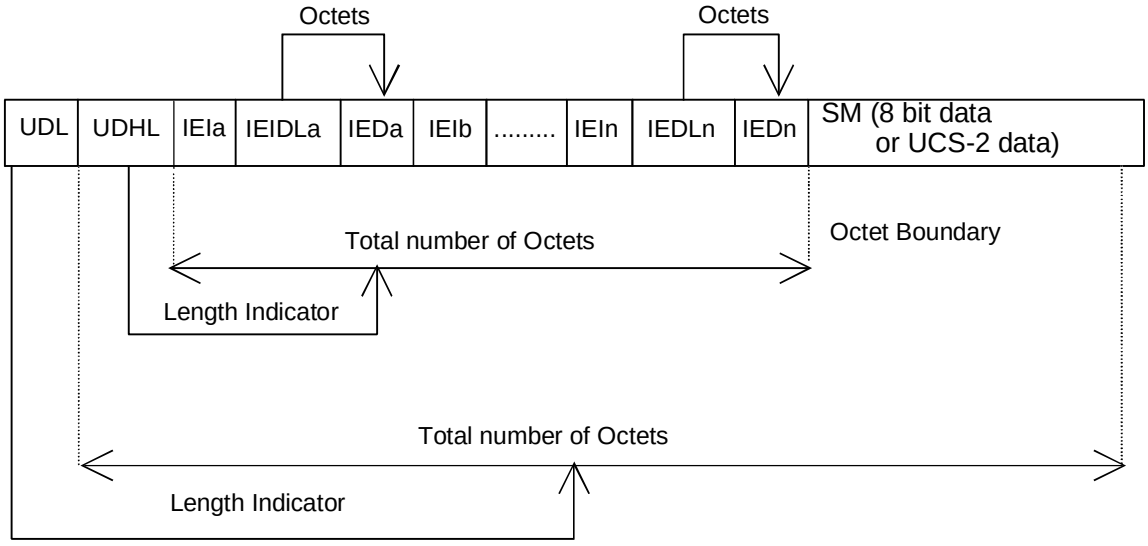

Figure 9.2.3.24 (b)

The diagram below shows the layout of the TP-User-Data-Length and the TP-User-Data for compressed GSM 7 bit default alphabet data, compressed 8 bit data or compressed UCS2 data. The UDHL field is the first octet of the TP-User-Data content of the Short Message.

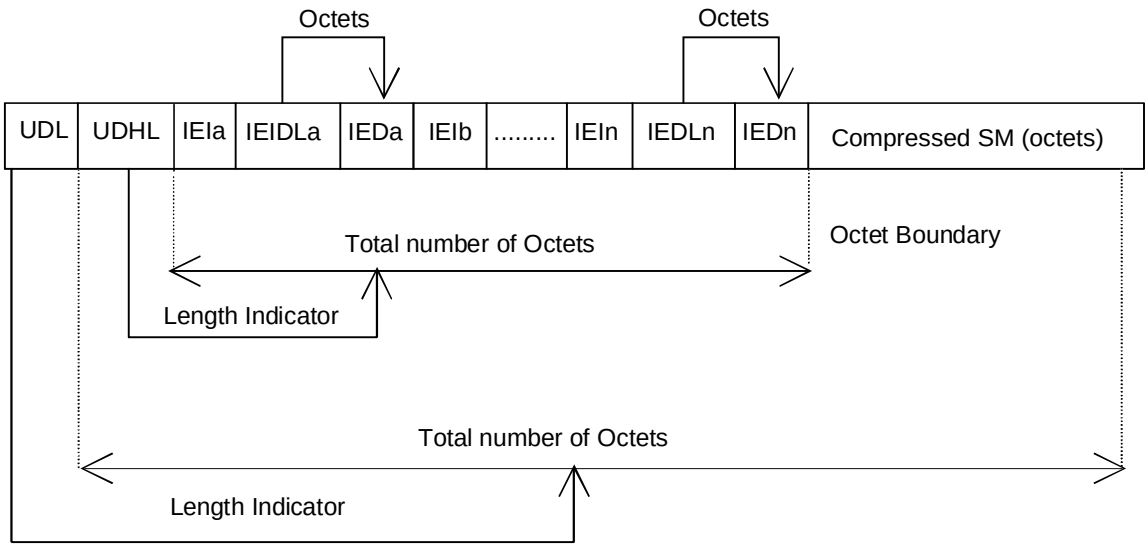

Figure 9.2.3.24 (c)

The definition of the TP-User-Data-Length field which immediately precedes the "Length of User Data Header" is unchanged and shall therefore be the total length of the TP-User-Data field including the Header, if present. (see 9.2.3.16).

The "Length-of-Information-Element" fields shall be the integer representation of the number of octets within its associated "Information-Element-Data" field which follows and shall not include itself in its count value.

The "Length-of-User-Data-Header" field shall be the integer representation of the number of octets within the "User-Data-Header" information fields which follow and shall not include itself in its count or any fill bits which may be present (see text below).

Information Elements may appear in any order and need not follow the order used in the present document. Information Elements are classified into 3 categories as described below.

- SMS Control – identifies those IEIs which have the capability of dictating SMS functionality.
- EMS Control – identifies those IEIs which manage EMS Content IEIs.
- EMS Content – identifies those IEIs containing data of a unique media format.

It is permissible for certain IEs to be repeated within a short message, or within a concatenated message. There is no restriction on the repeatability of IEs in the EMS Content classification. The repeatability of SMS Control and EMS Control IEs is determined on an individual basis. See the IE table below for the repeatability of each IE.

In the event that IEs determined as not repeatable are duplicated, the last occurrence of the IE shall be used. In the event that two or more IEs occur which have mutually exclusive meanings (e.g. an 8bit port address and a 16bit port address), then the last occurring IE shall be used.

If the length of the User Data Header is such that there are too few or too many octets in the final Information Element then the whole User Data Header shall be ignored.

If any reserved values are received within the content of any Information Element then that part of the Information Element shall be ignored.

The support of any Information Element Identifier is optional unless otherwise stated.

The Information Element Identifier octet shall be coded as follows:

VALUE (hex)	MEANING	Classification	Repeatability
00	Concatenated short messages, 8-bit reference number	SMS Control	No
01	Special SMS Message Indication	SMS Control	Yes
02	Reserved	N/A	N/A
03	Value not used to avoid misinterpretation as <LF> character	N/A	N/A
04	Application port addressing scheme, 8 bit address	SMS Control	No
05	Application port addressing scheme, 16 bit address	SMS Control	No
06	SMSC Control Parameters	SMS Control	No
07	UDH Source Indicator	SMS Control	Yes
08	Concatenated short message, 16-bit reference number	SMS Control	No
09	Wireless Control Message Protocol	SMS Control	Note 3
0A	Text Formatting	EMS Control	Yes
0B	Predefined Sound	EMS Content	Yes
0C	User Defined Sound (iMelody max 128 bytes)	EMS Content	Yes
0D	Predefined Animation	EMS Content	Yes
0E	Large Animation (16*16 times 4 = 32*4 =128 bytes)	EMS Content	Yes
0F	Small Animation (8*8 times 4 = 8*4 =32 bytes)	EMS Content	Yes
10	Large Picture (32*32 = 128 bytes)	EMS Content	Yes
11	Small Picture (16*16 = 32 bytes)	EMS Content	Yes
12	Variable Picture	EMS Content	Yes
13	User prompt indicator	EMS Control	Yes
14	Extended Object	EMS Content	Yes
15	Reused Extended Object	EMS Control	Yes
16	Compression Control	EMS Control	No
17	Object Distribution Indicator	EMS Control	Yes
18	Standard WVG object	EMS Content	Yes
19	Character Size WVG object	EMS Content	Yes
1A	Extended Object Data Request Command	EMS Control	No
1B-1F	Reserved for future EMS features (see subclause 3.10)	N/A	N/A
20	RFC 822 E-Mail Header	SMS Control	No
21	Hyperlink format element	SMS Control	Yes
22	Reply Address Element	SMS Control	No
23 – 6F	Reserved for future use	N/A	N/A
70 – 7F	(U)SIM Toolkit Security Headers	SMS Control	Note 1
80 – 9F	SME to SME specific use	SMS Control	Note 2
A0 – BF	Reserved for future use	N/A	N/A
C0 – DF	SC specific use	SMS Control	Note 2
E0 – FF	Reserved for future use	N/A	N/A

Note 1: The functionality of these IEIs is defined in 3GPP TSG 23.048 [28], and therefore, the repeatability is not within the scope of this document and will not be determined here.

Note 2: The functionality of these IEIs is used in a proprietary fashion by different SMSC vendors, and therefore, are not within the scope of this technical specification.

Note 3: The functionality of these IEIs is defined by the WAP Forum and therefore the repeatability is not within the scope of this document and will not be determined here.