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Usage of the UUIE in the GSM-R Environment

ACCESS : ☑ Public ❒ Restricted ❑ Confidential

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EVOLUTION SHEET

Version	Date	Author	MODIFICATION
A	27/03/2000	Nortel Networks	Creation
1	17/05/2000	Nortel Networks	First issue
C	05/07/2000	PMT	Update following the decisions in the WP22 meeting on 21/06/00
2	11/08/2000	PMT	Second issue

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1. SCOPE

This document describes the contents of the User to User Information Element for features in the GSM-R environment. These include MORANE defined features such as Functional Addressing, Location Dependant Addressing, Confirmation of High Priority Calls and Presentation of Functional Number. In addition this document describes the capability for the operators to define specific fields for national and or network use. These specific operator fields are outside the scope of this document.

2. NORMATIVE REFERENCES

[1] MORANE SSRS A 04/02 T 6002
[2] MORANE FIS for Functional Addressing E 12 T 6001
[3] MORANE FIS for Presentation of Functional Numbers to Called and Calling Parties F 12 T 6003
[4] MORANE FIS for Location Dependant Addressing F 12 T 6001
[5] MORANE FIS for Confirmation of High Priority Calls F 12 T 6002
[6] 3G TS 22.087, v 3.1.0: User-To-User Signalling (UUS) Service Description - Stage 1
[7] 3G TS 23.087, v 3.0.0: User-To-User Signalling (UUS) Service Description - Stage 2
[8] 3G TS 24.087, v 3.0.0: User-To-User Signalling (UUS) Service Description - Stage 3

3. ABBREVIATIONS

UUIE	User to User Information Element
UUS1	User to User Signalling Service 1

4. GENERAL UUI FORMAT

The maximum length of user defined information is limited to 32 bytes (35 bytes for the overall maximum length of the User to user IE).

< User-to-User protocol discriminator >00000000 User specific protocol

8	7	6	5	4	3	2	1	
	User-to-User IEI							octet 1
Length of user-user contents								octet 2
User-to-User protocol discriminator								
0	0	0	0	0	0	0	0	octet 3
Tag representing contents feature information								octet 4
Feature specific information depending on above tag								

Table 1 General MORANE coding format for User to User Information Elements

The usage of tags within the UUIE allows the proper recognition of the information following the tag. Tag numbers 0 to 127 are reserved for international use and tag numbers 128 to 255 are reserved for national use. The following table identifies the tags which are currently defined for international use.

Tag Number	Feature
2	Acknowledgement for Receiver of Confirmation of High Priority Calls
3	Acknowledgement for Initiator of Confirmation of High Priority Calls
5	Functional Number

Table 2 Identification of GSM R specific tags for international use

5. DEFINITION OF UUIE FIELDS FOR INTERNATIONAL USE

5.1. Presentation of Functional Number

For transfer of messages the usage of the values shown below is described.

FN = RAC + RSN = RAC + FUNCTIONAL NUMBER TYPE + *ROOT* + *BRANCH*

8	7	6	5	4	3	2	1	
	User-to-User IEI							octet 1
Length of user-user contents								octet 2
User-to-User protocol discriminator								
0	0	0	0	0	0	0	0	octet 3
Tag representing Numeric FN								
0	0	0	0	0	1	0	1	octet 4
Length of Numeric FN								octet 5
Numeric FN								
digit 2				digit 1				octet 6
digit m				digit m-1				octet n

Table 3: User-to-User information element for presentation of functional numbers

Encoding Note: The FN length field specifies the length of the FN in octets. Each digit of a numeric FN is encoded as a BCD digit (one nibble). The first FN digit is in bits 1-4 and the next digit is in bits 5-8 of octet 6; the following digit is in bits 1-4 of octet 7 and so on. If the FN is an odd number of digits, then the last half octet (bits 4 to 7) of the FN must contain '#F' as a filler. Therefore '#F' can never be a valid digit within the FN.

As an example the table 4 shows the contents of the UUIE in case of a transferred FN composed by the following field:

RAC	123
FNT	2
ROOT	45678
BRANCH	01

8	7	6	5	4	3	2	1	
	User-to-User IEI							octet 1
Length of user-user contents (=11)								
0	0	0	0	1	0	1	1	octet 2
User-to-User protocol discriminator								
0	0	0	0	0	0	0	0	octet 3
Tag representing Numeric FN								
0	0	0	0	0	1	0	1	octet 4
Length of Numeric FN (=6)								
0	0	0	0	0	1	1	0	octet 5
Numeric FN								
digit 2 (=2)				digit 1 (=1)				
0	0	1	0	0	0	0	1	octet 6
digit 4 (=2)				digit 3 (=3)				
0	0	1	0	0	0	1	1	octet 7
digit 6 (=5)				digit 5 (=4)				
0	1	0	1	0	1	0	0	octet 8
digit 8 (=7)				digit 7 (=6)				
0	1	1	1	0	1	1	0	octet 9
digit 10 (=0)				digit 9 (=8)				
0	0	0	0	1	0	0	0	octet 10
Filler				digit 11 (=1)				
1	1	1	1	0	0	0	1	octet 11

If no valid functional number for transfer is available an empty User-to-User IEI with fixed length according to the table below is used.

8	7	6	5	4	3	2	1	
	User-to-User IEI							octet 1
Length of user-user contents								
0	0	0	0	0	1	0	1	octet 2
User-to-User protocol discriminator								
0	0	0	0	0	0	0	0	octet 3
Tag representing numeric FN								
0	0	0	0	0	1	0	1	octet 4
Length of Numeric FN								
0	0	0	0	0	0	0	0	octet 5

User defined

Table 5: Empty User-to-User information element for presentation of functional numbers

5.2. Confirmation of High Priority Calls

5.2.1. User-User Information Element in SETUP-message for CHPC

The User-User information element in the SETUP- message for CHPC shall be either in the format A defined in table 6 or in the format B defined in table 7.

8	7	6	5	4	3	2	1		
	User-User IEI							Octet 1	Binary
Length of user-user contents								Octet 2	
User-User protocol discriminator								Octet 3	
0	0	0	0	0	0	0	0		
Tag defines confirmation of high priority calls								Octet 4	
Length of Confirmation message								Octet 5	
T_DUR_m low byte								Octet 6	
T_DUR_m mid byte								Octet.7	
T_DUR_m high byte								Octet 8	Binary
T_REL_m low byte								Octet 9	
T_REL_m mid-low byte								Octet 10	
T_REL_m mid-high byte								Octet 11	
T_REL_m high byte								Octet 12	
Priority level of broadcast/group call PL_CALL								Octet 13	
Cause of termination CAUSE								Octet 14	
Group call reference (max. 8 digits) GR_REF									
digit 2				Digit 1				Octet 15	
digit 4				Digit 3					BCD
digit 6				Digit 5					
digit 8				Digit 7				Octet 18	
Tag representing Numeric FN								Octet 19	
0	0	0	0	0	1	0	1		
Length of Numeric FN								Octet 20	
Numeric FN									
digit 2				Digit 1				Octet 21	
according SSRS									BCD
Digit m				Digit m-1				Octet n	
								octet 35	

Please note: Digit m shall be F_{hex} in case the amount of digits for the FN is odd.

Table 6: User-User Information Element in SETUP-message for CHPC Format A

8	7	6	5	4	3	2	1		
	User-User IEI							Octet 1	Binary
Length of user-user contents								Octet 2	
User-User protocol discriminator								Octet 3	
0	0	0	0	0	0	0	0		
Tag representing Numeric FN								Octet 4	
0	0	0	0	0	1	0	1		
Length of Numeric FN								Octet 5	
Numeric FN									
digit 2				Digit 1				Octet 6	
according SSRS									BCD
Digit m				Digit m-1				Octet n	
Tag defines confirmation of high priority calls								Octet n+1	
Length of Confirmation message								Octet n+2	
T_DUR_m low byte								Octet n+3	
T_DUR_m mid byte								Octet. n+4	
T_DUR_m high byte								Octet n+5	Binary
T_REL_m low byte								Octet n+6	
T_REL_m mid-low byte								Octet n+7	
T_REL_m mid-high byte								Octet n+8	
T_REL_m high byte								Octet n+9	
Priority level of broadcast/group call PL_CALL								Octet n+10	
Cause of termination CAUSE								Octet n+11	
Group call reference (max. 8 digits) GR_REF									
digit 2				Digit 1				Octet n+12	
digit 4				Digit 3					BCD
digit 6				Digit 5					
digit 8				Digit 7				Octet n+15	
								octet 35	

Please note: Digit m shall be F_{hex} in case the amount of digits for the FN is odd.

Table 7: User-User Information Element in SETUP-message for CHPC Format B

Tag value for CHP shall be

0000 0011 when the acknowledgement is sent by the initiator of the high priority call
0000 0010 when the acknowledgement is sent by a receiver of the high priority call

Both timers T_DUR and T_REL are measured in tenth of seconds.
The digits not used shall be filled up with 1111

CAUSE values:
0x00 no error
Bits #1-4 (least significant bits) system errors:
Bit #1 mobile was powered off when receiving (power fail)
Bit #2 call was interrupted due to radio link error
Bit #3 reserved
Bit #4 reserved

Bits #5-8 (most significant bits) user actions:
Bit #5 call was left on user command
Bit #6 reserved
Bit #7 reserved
Bit #8 reserved

5.2.2. User-User Information Element in DISCONNECT or RELEASE COMPLETE -message for CHPC

8	7	6	5	4	3	2	1		
	User-User IEI							Octet 1	Binary
Length of user-user contents								octet 2	
User-User protocol discriminator								octet 3	
0	0	0	0	0	0	0	0		
Tag defines confirmation of high priority calls								octet 4	
0	0	0	0	0	0	1	0		
ACK/CAUSE								octet 5	Binary

Table 7: User-User Information Element in RELEASE_COMPLETE or DISCONNECT -message for CHPC

ACK/CAUSE values:

0x00	ACK	no error
0x01...0x7f	NACK-1	error, value is cause, repetition should take place
0x80...0xff	NACK-2	fatal error, value is cause, NO repetition should take place

0x02...0x7f reserved for internal use
0x81...0xff reserved

5.3. Location Dependant Addressing

Reference format used for Presentation of Functional Numbers in section 5.1.

5.4. Functional Addressing

Reference format used for Presentation of Functional Numbers in section 5.1.