3GPP TSG-T2 #27　　　　　　　　　　　　　　　　　　　　　　　*T2-040471*
Cape Town, South Africa
8 - 12 November 2004

Title:	LS on EAP Authentication commands for WLAN interworking and improved security for UICC generic access
Response to:	LS (S3-040876) (T2-040388) on EAP Authentication commands for WLAN interworking from SA3
Release:	Rel-6
Work Item:	WLAN Security

Source:	T2
To:	SA3
Cc:	T3

Contact Person:
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Attachments:　　　T2-040453 CR 27.007-6.6.0 Improve security in UICC generic access command +CGLA

　　　　　　　　　　　T2-040468 CR 27.007-6.6.0 Support of EAP authentication command

1. Overall Description:

T2 thanks SA3 for the LS in S3-040876 (T2-040388) providing additional information about the WLAN authentication concepts. The actions placed on T2 in the SA3 LS are copied below

ACTION1: *SA3 kindly asks T2 to consider options A) and B) above, and possibly other solutions, and implement the required functionality within Rel-6 time frame. It would also be appreciated if T2 could indicate that a unified solution was seen as possible, but not in the Rel-6 timeframe.*

ACTION2: *SA3 kindly asks T2 to address SA3's concerns pointed out in section 1.2, e.g. by mandating a secure lock mechanism on the "Generic access" command*

T2's interpretation of the LS were that there were additional requirements as follows:

1. SA3 desires a generic AT command to run EAP authentication with the MT. This generic command shall be used by the TE regardless the functional split applied between the MT and the UICC.

2. SA3 has identified security risks with the 2G/3G authentication data leakage into an open platform like a PC-based TE via the UICC generic access commands.

T2 have studied and debated the content of the SA3 LS and came to the following conclusions:

T2 outcome for Action 1 above

For the provision of the generic AT command to run EAP authentication from the TE, T2 has implemented option B and has satisfied the common interface requirements as proposed by SA3, i.e. to define new AT commands for this purpose of EAP authentication independent of Implementations 1 and 2 in the SA3 LS. T2 have approved a corresponding CR against 27.007 introducing these commands which will be presented for approval by TSG T at TSG T#26. The CR is provided in T2-040468, attached for information only.

T2 outcome for Action 2 above

1. The T2 solution is to forbid the transmission of the authenticate command by the MT in 2G context to the SIM/UICC, but enable the transmission of the authenticate command by the MT in other contexts. T2 have approved a corresponding CR against 27.007 to improve the security in the usage of the UICC generic access command which will be presented for approval by TSG T at TSG T#26. The CR is provided in T2-040453, attached for information only.

2. Actions:

To SA3 group.

ACTION: T2 suggests that SA3 considers updating TS 33.234 to modify the EAP authentication procedure description by utilising the AT commands introduced in TS 27.007

3. Date of next T2 Meetings:

T2#28	8th – 10th Feb 2005	Sophia Antipolis, France

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CHANGE REQUEST

| ⌘ | **27.007** CR **CRNum** | ⌘**rev** | **-** | ⌘ | Current version: | **6.6.0** | ⌘ |

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

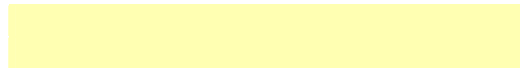**Proposed change affects:** | UICC apps⌘ ☐   ME **X**   Radio Access Network ☐   Core Network ☐

Title: ⌘	Improve security in UICC generic access command +CGLA
Source: ⌘	Axalto
Work item code: ⌘	TEI6 ***Date:*** ⌘ 10/11/2004

Category: ⌘ **C**	***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:
    Ph2   *(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)*
    Rel-7   *(Release 7)*

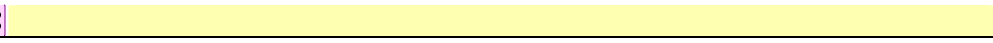|	
Reason for change: ⌘	SA3 points out, in their LS S3-040840 sent to T2, the risks of 2G authentication data leakage into an open platform like a PC-based TE, and decided that this leakage must be avoided. Therefore, SA3 considers that it is necessary to prevent illegal or accidental use of the "Generic access" command to arbitrarily run Authenticate commands on the card in GSM context.
	Also it shall be noted that as network connections are managed by MT, then there is no use of making these commands available for the TE.
	As pointed out by SA3, the presence of appropriate filter rules out the security risk. Therefore the suggested solution is to forbid the transmission by the MT of the authenticate command in 2G context to the SIM/UICC, but enable the transmission by the MT of the authenticate command in other contexts
Summary of change: ⌘	Introduce this new filtering rule in Generic UICC Logical Channel access +CGLA command regarding the network authentication
Consequences if not approved: ⌘	SA3 issue presented in LS S3-040840 will remain unsolved.

Clauses affected: ⌘	8.43

	Y	**N**	
Other specs ⌘		**X**	Other core specifications ⌘

affected:		**X**	Test specifications	
		X	O&M Specifications	
Other comments:	⌘			

8.43   Generic UICC Logical Channel access +CGLA

Table 103: +CGLA action command syntax

Command	Possible response(s)
+CSIM=<sessionid>,<length>,<command>	+CSIM: <length>,<response> *+CME ERROR: <err>*
+CSIM=?	

Description

Set command transmits to the MT the <command> it then shall send as it is to the UICC. In the same manner the UICC <response> shall be sent back by the MT to the TA as it is. Refer subclause 9.2 for <err> values.

This command allows a direct control of the UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.

Although Generic UICC Logical Channel Access command +CGLA allows TE to take control over the UICC-MT interface, there are some functions of the UICC-MT interface that logically do not need to be accessed from outside the TA/MT. Moreover, for security reason the GSM network authentication should not be handled outside the TA/MT. Therefore it shall not be allowed to execute a Run GSM Algorithm command or an Authenticate command in GSM context from the TE using +CGLA at all time whether the +CGLA is locked or unlocked. This shall not forbid the TE to send Authenticate commands in other security contexts (e.g. EAP security context).

For example, the TA/MT shall forbid the transfer of the Authenticate command to a USIM application when parameters P2 = 0 (GSM security context). See TS 31.102 [59] for USIM authenticate command definition.

NOTE: Compared to Restricted UICC Access command +CRLA, the definition of +CGLA allows TE to take more control over the UICC-MT interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking.

Defined values

<sessionid>: integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is manadatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").

<length> : integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response)

<command> : command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer +CSCS)

<response> : response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer +CSCS)

Implementation

Optional.

CR-Form-v7.1

CHANGE REQUEST

⌘	**27.007** CR **CRNum**	⌘**rev**	**-**	⌘	Current version:	**6.6.0**	⌘

*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 **X** Radio Access Network ☐ Core Network ☐

Title: ⌘	Support of EAP authentication command	
Source: ⌘	T-Mobile	
Work item code:⌘	TEI6	*Date:* ⌘ 21/10/2004
Category: ⌘	**B**	*Release:* ⌘ Rel-6

Use <u>one</u> 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 <u>one</u> of the following releases:
Ph2 (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)
Rel-7 (Release 7)

Reason for change: ⌘	SA3 points out, in their LS S3-040840 sent to T2, the need for a dedicated command to transfer EAP authentication messages to the UICC and to the MT. The following CR is a technical proposal that fulfils the requirement described in SA3 liaison.
Summary of change:⌘	Introduction of a new EAP authentication related commands allowing the TE to send the EAP Authenticate command to the UICC or to the MT, and to retreive the resulting parameters.
Consequences if not approved: ⌘	No common interface will be defined for the EAP mechanism and split WLAN-UE according to TS 33.234 will not be completely implementable in Rel-6.

Clauses affected: ⌘	2, 8xx, 8.yy, 9.2.1

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

Other comments: ⌘	1) This CR is linked to T2-040407. 2) The <EAPMethod> Parameter may not be needed for WLAN authentication according to TS33.234 section 6.1. However, addition of this parameter allows re-using the +CEAP command for other EAP methods.

2   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TS 22.002: "3rd Generation Partnership Project; Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[2]   3GPP TS 22.003: "3rd Generation Partnership Project; Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[3]   3GPP TS 22.081: "3rd Generation Partnership Project; Line identification supplementary services - Stage 1".

[4]   3GPP TS 22.082: "3rd Generation Partnership Project; Call Forwarding (CF) supplementary services - Stage 1".

[5]   3GPP TS 22.083: "3rd Generation Partnership Project; Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[6]   3GPP TS 22.088: "3rd Generation Partnership Project; Call Barring (CB) supplementary services - Stage 1".

[7]   3GPP TS 23.003: "3rd Generation Partnership Project; Numbering, addressing and identification".

[8]   3GPP TS 24.008: "3rd Generation Partnership Project; Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3".

[9]   GSM MoU SE.13, GSM MoU Permanent Reference Document SE.13: "GSM Mobile Network Codes and Names".

[10]   ITU-T Recommendation E.212: "Identification plan for land mobile stations".

[11]   ITU-T Recommendation T.31: "Asynchronous facsimile DCE control, service class 1".

[12]   ITU-T Recommendation T.32: "Asynchronous facsimile DCE control, service class 2".

[13]   ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information exchange".

[14]   ITU-T Draft new Recommendation V.250: "Serial asynchronous automatic dialling and control".

[15]   Telecommunications Industry Association TIA IS-99: "Data Services Option Standard for Wideband Spread Spectrum Digital Cellular System".

[16]   Telecommunications Industry Association TIA IS-135: "800 MHz Cellular Systems, TDMA Services, Async Data and Fax".

[17]   Portable Computer and Communications Association PCCA STD-101 Data Transmission Systems and Equipment: "Serial Asynchronous Automatic Dialling and Control for Character Mode DCE on Wireless Data Services".

[18]   3GPP TS 24.022: "3rd Generation Partnership Project; Radio Link Protocol (RLP) for data and telematic services on the Mobile Station - Base Station System (MS - BSS) interface and the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[19]   3GPP TS 22.030: "3rd Generation Partnership Project; Man Machine Interface (MMI) of the Mobile Station (MS)".

[20]   3GPP TS 45.008: "Digital cellular telecommunication system (Phase 2+); Radio subsystem link control".

[21]   3GPP TS 22.085: "3rd Generation Partnership Project; Closed User Group (CUG) supplementary services - Stage 1".

[22]   3GPP TS 22.084: "3rd Generation Partnership Project; MultiParty (MPTY) supplementary services - Stage 1".

[23]   3GPP TS 22.090: "3rd Generation Partnership Project; Unstructured Supplementary Service Data (USSD) - Stage 1".

[24]   3GPP TS 27.005: "3rd Generation Partnership Project; Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[25]   3GPP TS 23.038: "3rd Generation Partnership Project; Alphabet and language specific information".

[26]   3GPP TS 22.024: "3rd Generation Partnership Project; Description of Charge Advice Information (CAI)".

[27]   3GPP TS 22.086: "3rd Generation Partnership Project; Advice of Charge (AoC) supplementary services - Stage 1".

[28]   3GPP TS 51.011: "Digital cellular telecommunication system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".

[29]   3GPP TS 22.034: "3rd Generation Partnership Project; High Speed Circuit Switched Data (HSCSD) - Stage 1".

[30]   3GPP TS 22.091: "3rd Generation Partnership Project; Explicit Call Transfer (ECT) supplementary service - Stage 1".

[31]   3GPP TS 22.072: "3rd Generation Partnership Project; Call Deflection (CD) supplementary service - Stage 1".

[32]   ISO/IEC10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.

[33]   3GPP TS 22.022: "3rd Generation Partnership Project; Personalization of GSM Mobile Equipment (ME) Mobile functionality specification".

[34]   3GPP TS 27.060: "3rd Generation Partnership Project; General requirements on Mobile Stations (MS) supporting General Packet Radio Bearer Service (GPRS)".

[35]   CCITT Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[36]   CCITT Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[37]   ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[38]   3GPP TS 45.005: "Digital cellular telecommunication system (Phase 2+); Radio transmission and reception".

[39]   3GPP TS 29.061: "3rd Generation Partnership Project; General Packet Radio Service (GPRS); Interworking between the Public Land Mobile Network (PLMN) supporting GPRS and Packet Data Networks (PDN)".

[40]   3GPP TS 23.081: "3rd Generation Partnership Project; Technical Specification Group Core Network; Line identification supplementary services - Stage 2".

[41]   3GPP TS 27.001: "3rd Generation Partnership Project; Technical Specification Group Core Network; General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[42]   3GPP TS 29.007: "3rd Generation Partnership Project; Technical Specification Group Core Network; General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[43]   Infrared Data Association; Specification of Ir Mobile Communications (IrMC).

[44]   IrDA Object Exchange Protocol.

[45]   3GPP TS 27.010: "3rd Generation Partnership Project; Terminal Equipment to User Equipment (TE-UE) multiplexer protocol User Equipment (UE)".

[46]   3GPP TS 23.107: "3rd Generation Partnership Project; Quality of Service, Concept and Architecture".

[47]   3GPP TS 23.060: "3rd Generation Partnership Project; General Packet Radio Service (GPRS) Service description; Stage 2".

[48]   3GPP TS 23.067: "3rd Generation Partnership Project; Enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 2".

[49]   3GPP TS 43.068: "Digital cellular telecommunication system (Phase 2+); Voice Group Call service (VGCS) - Stage 2".

[50]   3GPP TS 43.069: "Digital cellular telecommunication system (Phase 2+); Voice Broadcast Service (VBS) - Stage 2".

[51]   3GPP TS 24.067: "3rd Generation Partnership Project; Enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 3".

[52]   3GPP TS 44.068: "Digital cellular telecommunication system (Phase 2+); Voice Group Call service (VGCS) - Stage 3".

[53]   3GPP TS 44.069: "Digital cellular telecommunication system (Phase 2+); Voice Broadcast Service (VBS) - Stage 3".

[54]   3GPP TS 22.067: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1".

[55]   3GPP TS 42.068: "Digital cellular telecommunication system (Phase 2+); Voice Group Call service (VGCS) - Stage 1".

[56]   3GPP TS 42.069: "Digital cellular telecommunication system (Phase 2+); Voice Broadcast Service (VBS) - Stage 1".

[57]   void

[58]   3GPP TS 22.087: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects;User-to-User Signalling (UUS) - Stage 1"

[59]   3GPP TS 31.102: "3rd Generation Partnership Project; Technical Specification Group Terminals; Characteristics of the USIM Application".

[60]   ETSI TS 102 221 "Smart Cards; UICC-Terminal interface; Physical and logical characteristics (Release 1999)".

[61]   3GPP TS 44.065: "3rd Generation Partnership Project; General Packet Radio Service (GPRS); Mobile Station (MS) – Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[62]   3GPP TS 25.323: "3rd Generation Partnership Project; Packet Data Convergence Protocol (PDCP)".

[63]   3GPP TS 23.227 "3rd Generation Partnership Project; Applications and User interaction in the UE-Principles and specific requirements".

[64]   3GPP TS 23.101: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General UMTS Architecture "

[65]   3GPP TS 31.101: "UICC-Terminal Interface; Physical and Logical Characteristics"

[xx]   ETSI TS 102.310: "Smart Cards; Extensible Authentication Protocol support in the UICC".

[yy]   ETSI TS 102.221: "Smart cards; UICC-Terminal interface; Physical and logical characteristics".

[zz]   RFC 3748, June 2004, Extensible Authentication Protocol (EAP)

8.xx   EAP authentication +CEAP

Table yyy: +CEAP parameter command syntax

Command	Possible response(s)
+CEAP=<dfname>, <EAPMethod>, <EAP packet data>	+CEAP: <EAPsessionid>, <EAP packet response> +CEAP ERROR: <err>
+CEAP=?	

Description

This command allows a TE to exchange EAP packets with the UICC or the ME.

Prior to the execution of this command, the TE shall retrieve the available AIDs using the +CUAD command. The TE shall select one appropriate AID to be addressed. Selection may include asking the user, and considering EAP methods supported by the AIDs. The TE shall set the <dfname> value using the selected AID and shall set the <EAPMethod> value to the requested EAP method.

If the targeted application on the UICC does support the requested EAP method, the MT shall derive the directory file identifier (see ETSI TS 102.310 [xx]) from <dfname> and <EAPMethod>, and it shall transmit the <EAP packet data> to the UICC application using the Authenticate APDU command as defined in ETSI TS 102.310 [xx]. The appropriate DF$_{EAP}$ in the ADF must be selected prior to the submission of an EAP Authenticate command with the <EAP packet data>. Then the EAP Response data sent by the UICC application in its response to the Authenticate command shall be provided to the TE in <EAP packet response>.

If the targeted application on the UICC does not support the requested EAP method and if the MT does support this method then the <EAP packet data> shall be handled by the MT. During the handling of the EAP method, the MT shall run the authentication algorithm on the SIM or USIM, respectively.

Also the MT has to allocate an <EAPsessionid> in order to identify an EAP session and its corresponding keys and parameters.

If neither the MT nor the appropriate UICC application support the requested EAP method, the MT shall respond with "EAP method not supported".

Refer subclause 9.2 for possible <err> values.

Defined values

<dfname>: string type; all selectable applications represented in the UICC by an AID are referenced by a DF name coded on 1 to 16 bytes.

<EAPMethod>: octet type; this is the EAP Method Type as defined in [zz]

<EAP packet data>: as defined in ETSI TS 102.310 [xx]

<EAPsessionid>: integer type; this is the identifier of the EAP session to be used in order to retrieve the EAP parameters with EAP Retreive Parameters +CERP command.

<EAP packet response>: as defined in ETSI TS 102.310 [xx]

Implementation

Optional.

8.yy   EAP Retrieve Parameters +CERP

Table yyy: +CERP parameter command syntax

Command	Possible response(s)
+CERP=<EAPsessionid>,< EAPparameter>	*+CERP:<EAP packet response>* *+CERP ERROR: <err>*
+CERP=?	

Description

This command allows a TE to retrieve EAP session parameters / derived keys after a run of the +CEAP command. If the EAP session is handled by the UICC then the MT shall return the content of the elementary file corresponding to the indicated <EAPparameter>. Those EFs are defined in ETSI TS 102.310 [xx].

If the MT handles the EAP session then the MT shall return the corresponding parameter encoded as defined for EAP files, see ETSI TS 102.310 [xx].

For example, the keys shall be retrieved in the TLV format described in ETSI TS 102.310 [xx].

If neither the MT nor the appropriate UICC application can provide the requested information (e.g. because the requested EAP session ID does not exist), the MT shall respond with "Incorrect parameters".

Refer subclause 9.2 for possible <err> values.

Defined values

   <EAPparameter>:

      01   Keys

      02   Status

      03   Identity

      04   Pseudonym

   <EAPsessionid>: integer type; this is the identifier of the EAP session to be used in order to retrieve the EAP
        parameters corresponding to an active EAP session with EAP Retreive Parameters +CERP command.

   <EAP parameter response>: depends on the value of <EAPparameter>; format of the parameter
   retrieved is as defined in ETSI TS 102.310 [xx].

Implementation

Optional.

9.2 Mobile Termination error result code +CME ERROR

The operation of `+CME ERROR: <err>` result code is similar to the regular `ERROR` result code: if `+CME ERROR: <err>` is the result code for any of the commands in a command line, none of the following commands in the same command line is executed (neither `ERROR` nor `OK` result code shall be returned as a result of a completed command line execution). The format of `<err>` can be either numeric or verbose. This is set with command `+CMEE` (refer previous subclause).

NOTE: ITU-T V.250 [14] command `V` does not affect the format of this result code.

`<err>` values (numeric format followed by verbose format):

9.2.1 General errors

0 phone failure

1 no connection to phone

2 phone-adaptor link reserved

3 operation not allowed

4 operation not supported

5 PH-SIM PIN required

6 PH-FSIM PIN required

7 PH-FSIM PUK required

10 SIM not inserted (Note)

11 SIM PIN required

12 SIM PUK required

13 SIM failure (Note)

14 SIM busy (Note)

15 SIM wrong (Note)

16 incorrect password

17 SIM PIN2 required

18 SIM PUK2 required

20 memory full

21 invalid index

22 not found

23 memory failure

24 text string too long

25 invalid characters in text string

26 dial string too long

27 invalid characters in dial string

30 no network service

31 network timeout

32 network not allowed - emergency calls only

40 network personalization PIN required

41 network personalization PUK required

42 network subset personalization PIN required

43 network subset personalization PUK required

44 service provider personalization PIN required

45 service provider personalization PUK required

46 corporate personalization PIN required

47 corporate personalization PUK required

48 hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)

49 EAP method not supported

50 Incorrect parameters

100 unknown

NOTE: This error code is also applicable to UICC.