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Document for: Information

This document contains one Technical Specification including attachment for information as follows:

T3 Doc	Spec	Rel	Subject
T3-030452	3GPP TS 31 130	6	(U)SIM Application Programming Interface (U)SIM API; (U)SIM API for Java Card™

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Contents

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP) project based on work originally done by ETSI SCP.

The contents of the present document are subject to continuing work within the ETSI SCP and may change following formal approval. Should ETSI SCP modify the contents of the present document, it will be re-released by the ETSI with an identifying change of release date and an increase in version number as follows:

Version 1.y

where:

- x the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

The present document defines the Application Programming Interface for 2G/3G networks based on the "UICC API for Java Card™"

The present document includes information applicable to network operators, service providers and UICC, server and database manufacturers.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETSI TS 101 220 "Integrated Circuit Cards (ICC); ETSI numbering system for telecommunication; Application providers (AID)".

[2] ETSI TS 102 241 "UICC API for Java Card™"

[3] 3GPP TS 31.102 "Characteristics of the USIM Application"

[4] 3GPP TS 51.011 "Specification of the Subscriber Identity Module- Mobile Equipment (SIM – ME) interface."

[5] 3GPP TS 31.103 "Characteristics of the ISIM Application"

[7] 3GPP TS 31.111 "USIM Application Toolkit (USAT)"

[8] 3GPP TS 51.014 "Specification of the SIM Application Toolkit for the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface"

[9] 3GPP TS 31.115 "Secured packet structure for the (U)SIM Toolkit applications"

[10] 3GPP TS 23.040 "Technical realization of the Short Message Service (SMS)"

[11] Sun Microsystems Java Card™ Specification "Java Card™ 2.2 Application Programming Interface".

[12] Sun Microsystems Java Card™ Specification "Java Card™ 2.2 Runtime Environment (JCRE) Specification".

[13] Sun Microsystems Java Card™ Specification "Java Card™ 2.2 Virtual Machine Specification".

SUN Java Card™ Specifications can be downloaded at http://java.sun.com/products/javacard

[14] ETSI TS 102 223 "Card Application Toolkit (CAT)"

3 Definitions and abbreviations

3.1 Definitions

For the purpose of the present document, the terms and definitions defined in TS 102 241[2] apply.

3.2 Abbreviations

For the purpose of the present document, the abbreviations defined in TS 102 241[2] apply.

4 Description

This API is an extension to the TS 102 241[2] "UICC API for Java Card™" and requires the implementation of this specification. The classes and interfaces described in this specification are classes and interfaces that inherit functionality from the classes and interfaces specified in the "UICC API for Java Card™", and that are based on the functionality of the UICC Framework described in the same specification.

4.1 UICC with SIM and USIM Java Card™ Architecture

The over all architecture of the USIM API is based on the UICC API and on the Java Card™ 2.2 as defined in [11], [12] and [13]:

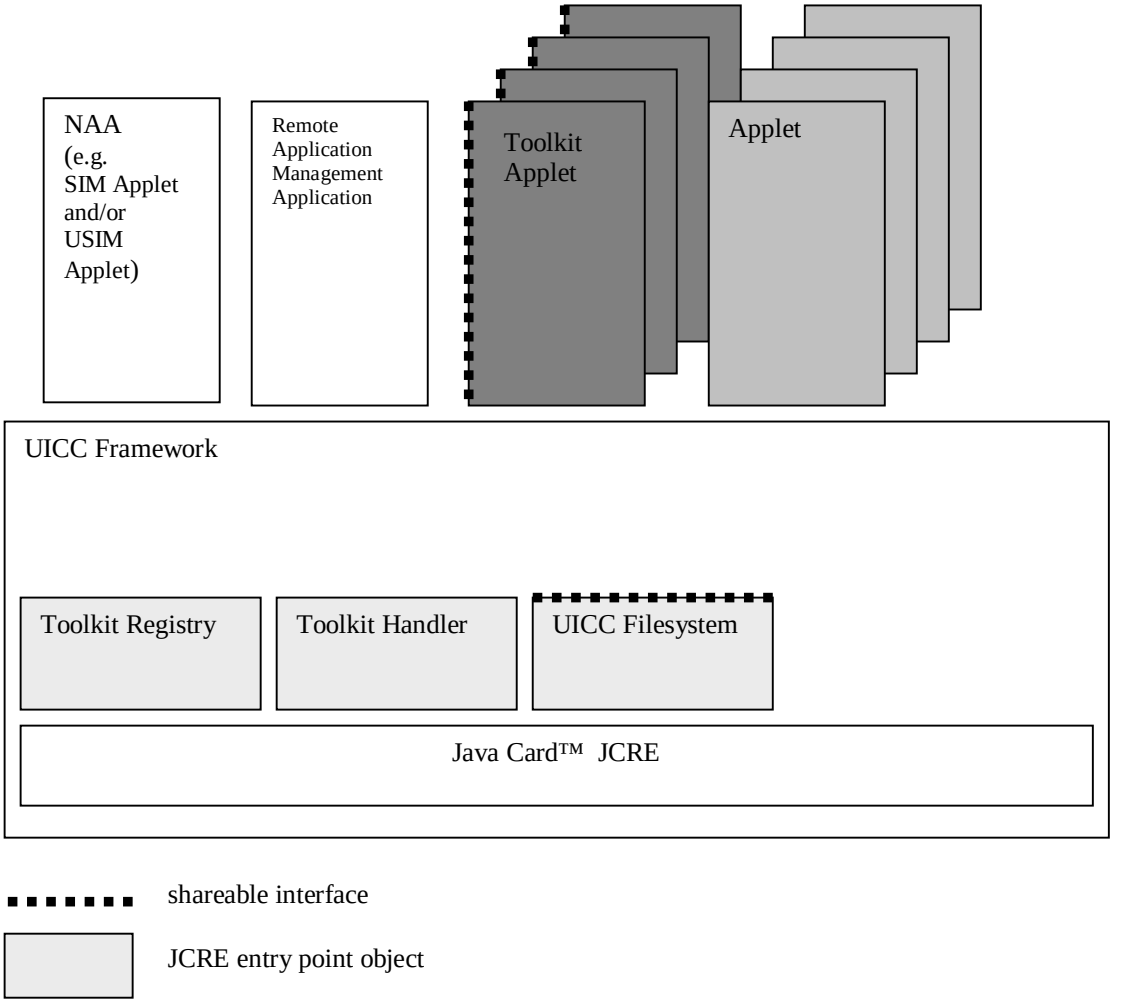

Figure 1: UICC Java Card™ Architecture

5 File Access API

The (U)SIM file access API consist of the package *uicc.usim.access*. This package defines additional constants to those defined in the *uicc.access* package from TS 102 241 [2]. The access to the file system defined in TS 51.011 [8] is specified in TS 102 241 [2] via the UICC *FileView*.

6 (U)SAT extension for the UICC Toolkit Framework

6.1 Overview

The USIM toolkit API consist of the *uicc.usim.toolkit* package for toolkit features defined in TS 31.111 [7] and TS 51.014 [8], and is based on the *uicc.toolkit* package and the "UICC Toolkit Framework" defined in TS 102 241 [2].

6.2 Definition of Events

The following events can trigger a Toolkit Applet in addition to the events defined in TS 102 241 [2], all short values are reserved in TS 102 241 [2]:

Table 1: UICC toolkit event list

Event Name	Reserved short value
EVENT_FORMATTED_SMS_PP_ENV	2
EVENT_FORMATTED_SMS_PP_UPD	3
EVENT_UNFORMATTED_SMS_PP_ENV	4
EVENT_UNFORMATTED_SMS_PP_UPD	5
EVENT_UNFORMATTED_SMS_CB	6
EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM	10
EVENT_FORMATTED_SMS_CB	24

EVENT_FORMATTED_SMS_PP_ENV, EVENT_UNFORMATTED_SMS_PP_ENV, EVENT_FORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_PP_UPD

A toolkit applet can be activated upon the reception of a short message.

There are two ways for a card to receive an SMS: via the Envelope SMS-PP Data Download or the Update Record EF_{SMS} instruction.

The received SMS may be:

- formatted according to TS 31.115 [9] or an other protocol to identify explicitly the toolkit applet for which the message is sent;
- unformatted or using a toolkit applet specific protocol the UICC Toolkit Framework will pass this data to all registered toolkit applets.

The Short Message may be received as Concatenated Short Messages as defined in TS 23.040 [11]. It is the responsibility of the UICC Toolkit Framework to link single Short Messages together to re-assemble the original message before any further processing. The original Short Message shall be placed in one SMS TPDU TLV (with TP-UDL field coded on one octet) included in the *EnvelopeHandler*. The concatenation control headers used to re-assemble the short messages in the correct order shall not be present in the SMS TPDU. The TP-elements of the SMS TPDU and the Address (TS-Service-Centre-Address) shall correspond to the ones in the last received Short Message (independently of the Sequence number of Information-Element-Data).

The minimum requirement for the UICC Toolkit Framework is to process a concatenated short message with the following properties:

- the Information Element Identifier is equal to the 8-bit reference number.
- it contains uncompressed 8 bit data or uncompressed UCS2 data.

EVENT_FORMATTED_SMS_PP_ENV

This event is generated when a Short Message Point to Point (Single or Concatenated) is received by Envelope SMS-PP download APDU(s) and is formatted according to TS 31.115 [9].

The UICC Toolkit Framework shall:

- verify the security of the Short Message as per TS 31.115 [9];
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading;
- take the optional Application Data posted by the triggered toolkit applet if present;
- secure and send the response packet using SMS-DELIVER-REPORT or SMS-SUBMIT .

When the toolkit applet is triggered, data shall be provided deciphered.

EVENT_UNFORMATTED_SMS_PP_ENV

This event is generated when a Short Message Point to Point (Single or Concatenated) is received by Envelope SMS-PP download APDU(s) and is unformatted.

The registered toolkit applets will be triggered by this event and get the data transmitted in the Envelope APDU(s).

Note: As a consequence of the *EnvelopeResponseHandle*r availability rules specified in clause 6.6, only the first triggered toolkit applet is guaranteed to be able to send back a response.

EVENT_FORMATTED_SMS_PP_UPD

This event is generated when a Short Message Point to Point (Single or Concatenated) is received by Update Record EF_{SMS} APDU(s) and is formatted according to TS 31.115 [9].

The UICC Toolkit Framework shall:

- update the EF_{SMS} file with the data received, it is then up to the receiving toolkit applet to change the SMS stored in the file (i.e. the toolkit applet need to have access to the EF_{SMS} file)
- verify the security of the Short Message as per TS 31.115 [9];
- convert the Update Record EF_{SMS} in the Envelope Handler TLV List;
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading;

When the toolkit applet is triggered, data shall be provided deciphered.

The Update Record EF_{SMS} APDU shall be converted in a TLV list as defined below:

UPDATE RECORD APDU	nb bytes	Handler TLV LIST	size
CLA, INS	2		1
P1, P2	2	device Identity Absolute Record Number	1
P3 = 176	1		1
status	1	device Identity Record Status	1
TS-SCA (RP-OA)	<= 12	Address	Y
SMS TPDU	var	SMS TPDU	Y
padding bytes	var		Y

The EnvelopeHandler provided to the applet shall:

- return *BTAG_SMS_PP_DOWNLOAD* to the *getEnvelopeTag()* method call**;**
- return the Simple TLV list length to the *getLength( )* method call;
- contain the Simple TLV list :

EnvelopeHandler TLV List
Device identities
Address
SMS TPDU
AID

The applet should use the *findTLV()* methods to get each Simple TLV.

The Device Identity Simple TLV is used to store the information about the absolute record number in the EF_{SMS} file and the value of the EF_{SMS} record status byte, and formatted as defined below:

Device identities Simple TLV
Device identities tag
length = 02
Absolute Record Number
Record Status

With the absolute record number the toolkit applet can update EF_{SMS} in absolute mode to change the received SMS in a readable text.

For Concatenated Short Message the Absolute Record Number and the Record Status will correspond to the last Update Record EF_{SMS} APDU received.

The AID comprehension TLV is present only if the EF_{SMS} file updated is under an ADF. The AID value is the AID of the USIM as defined TS 102 223 [14] ???.

EVENT_UNFORMATTED_SMS_PP_UPD

This event is generated when a Short Message Point to Point (Single or Concatenated) is received by Update Record EF_{SMS} APDU(s) and is unformatted.

The UICC Toolkit Framework will first update the EF_{SMS} file, convert the received APDU as described above, and then trigger all the registered toolkit applets. All of them may modify the content of EF_{SMS} (i.e. the toolkit applets need to have access to the EF_{SMS} file).

EVENT_FORMATTED_SMS_CB, EVENT_UNFORMATTED_SMS_CB

The received cell broadcast page can be either:
- formatted according to TS 31.115 [9] or an other protocol to identify explicitly the toolkit applet for which the message is sent ;
- unformatted or using a toolkit applet specific protocol the UICC Toolkit Framework will pass this data to all registered toolkit applets.

EVENT_FORMATTED_SMS_CB

This event is triggered by an envelope APDU containing an CELL_BROADCAST_DATADOWNLOAD BER TLV with a Cell Broadcast Page simple TLV according to TS 31.115 [9].

The UICC Toolkit Framework shall:
- verify the TS 31.115 [9] security of the Cell Broadcast Page;
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading.

The toolkit applet will only be triggered if the TAR is known and the security verified, application data will also be deciphered.

EVENT_UNFORMATTED_SMS_CB

The registered toolkit applets will be triggered by this event and get the data transmitted in the APDU envelope CELL_BROADCAST_DATADOWNLOAD.

EVENT_MO_SHORT_MESSAGE_CONTROL_BY_NAA

Upon reception of an ENVELOPE (MO SHORT MESSAGE CONTROL defined in TS 51.014 [8] and TS 31.111[7]) APDU as defined in TS 102 221 [6] and TS 51.011 [12] the UICC Toolkit Framework shall trigger the Toolkit Applet registered to this event. Regardless of the Toolkit Applet state the UICC Toolkit Framework shall not allow more than one Toolkit Applet to be registered to this event at a time, in particular, if a Toolkit Applet is registered to this event but not in selectable state the UICC Toolkit Framework shall not allow another Toolkit Applet to register to this event.

6.3 Registration

See TS 102 241 [2].

6.4 Proactive command handling

See TS 102 241 [2].

6.5 Envelope response handling

See TS 102 241 [2].

6.6 System Handler management

See TS 102 241 [2].

The following table describes the minimum availability of the handlers for all the events at the invocation of the *processToolkit()* method of the Toolkit Applet. The rules described in this table apply in addition to the rules described in "UICC API for Java Card™"

Table 2: Handler availability for each event

EVENT_	Reply busy allowed	Envelope Handler	EnvelopeResponse Handler	Nb of triggered / registrered Applet
_FORMATTED_SMS_PP_ENV	Y (see Note 1)	Y	Y	1 / n (per TAR)
_FORMATTED_SMS_PP_UPD	N	Y	N	1 / n (per TAR)
_UNFORMATTED_SMS_PP_ENV	Y	Y	Y	n / n
_UNFORMATTED_SMS_PP_UPD	N	Y	N	n / n
_FORMATTED_SMS_CB	Y	Y	N	1/n (per TAR)
_UNFORMATTED_SMS_CB	Y	Y	N	n / n
_MO_SHORT_MESSAGE_CONTROL_BY_NAA	N	Y	Y	1 / 1
NOTE 1: The framework may reply busy and not trigger the toolkit applet if a PoR using SMS SUBMIT is required in the incoming message and a proactive session is ongoing.				

6.7 UICC Toolkit Framework behaviour

See TS 102 241 [2].

7 UICC toolkit applet

See TS 102 241 [2].

Annex A (normative): Java Card™ (U)SIM API

The attached files "Annex_A_Java.zip" and "Annex_A_HTML.zip" contains source files for the Java Card™ (U)SIM API.

Annex B (normative): Java Card™ (U)SIM API identifiers

FFS: The attached file "Annex_B_Export_files.zip" will contain the export files for the xxx.* package, see the "Java Card™ 2.2 Virtual Machine Specification" [4].

Annex C (normative): (U)SIM API package version management

The following table describes the relationship between each TS 31.130 specification version and its packages AID and Major, Minor versions defined in the export files.

TS 31.130	uicc.usim.access package		uicc.usim.toolkit package	
	AID	Major, Minor	AID	Major, Minor
	A0 00 00 00 87 00 0X FF FF FF FF FF 11 00 00 00	1.0	A0 00 00 00 87 00 0X FF FF FF FF FF 12 00 00 00	1.0

The package AID coding is defined in TS 101 220 [10]. The (U)SIM API packages' AID are not modified by changes to Major or Minor Version.

The Major Version shall be incremented if a change to the specification introduces byte code incompatibility with the previous version.

The Minor Version shall be incremented if a change to the specification does not introduce byte code incompatibility with the previous version.

Change history

This annex lists all change requests approved for the present document since the first version was approved.

Meeting	Plenary tdoc	WG tdoc	VERS	CR	REV	REL	CAT	SUBJECT	Resulting Version

History

Document history		
v 0.9.0		Presented at T3 API#16
v 0.9.1		Presented at T3 API#17
v 0.9.2		including changes from API#17 send to the e-mail list and to T3#27-plenary for information
v0.9.3	May 2003	including changes from T3#27
v1.0.0	May 2003	Presented to T#20 for information