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TECHNICAL SPECIFICATION

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(U)SIM API for Java™ Card
(3GPP TS 31.130 version 15.1.0 Release 15)**

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Contents

Foreword

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1 Scope

The present document defines the (U)SIM Application Programming Interface extending the "UICC API for Java Card™" [2].

This API allows to develop a (U)SAT application running together with a (U)SIM application and using GSM/3G network features.

The present document includes information applicable to network operators, service providers, server – (U)SIM – 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. 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]   ETSI TS 101 220: "Integrated Circuit Cards (ICC); ETSI numbering system for telecommunication; Application providers (AID)".

[2]   ETSI TS 102 241 V13.0.0: "UICC API for Java Card™"

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

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

[5]   3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[6]   3GPP TS 31.101: "UICC-terminal interface; Physical and logical characteristics".

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

[8]   3GPP TS 51.014 Release 4: "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]   ORACLE "Application Programming Interface, Java Card™ Platform, 3.0.1 Classic Edition".

[12]   ORACLE "Runtime Environment Specification, Java Card™ Platform, 3.0.1 Classic Edition".

[13]   ORACLE "Virtual Machine Specification Java Card™ Platform, 3.0.1 Classic Edition".

Note: ORACLE Java Card™ Specifications can be downloaded at http://docs.oracle.com/javame/javacard/javacard.html

[14]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[15]   IEC 61162-1: "Maritime navigation and radio communication equipment and systems – Digital interfaces".

3 Definitions and abbreviations

3.1 Definitions

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

(U)SAT Framework : (U)SAT extension of the CAT Runtime Environment.

3.2 Abbreviations

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

4 Description

4.0 Overview

This API is an extension to the ETSI TS 102 241 [2] "UICC API for Java Card™" and requires the implementation of this specification.

The classes and interfaces described in this specification inherit functionality from the classes and interfaces specified in the "UICC API for Java Card™".

The (U)SAT Framework described in this specification is an extension of the CAT Runtime Environment defined in ETSI TS 102 241 [2].

4.1　　(U)SIM Java Card™ Architecture

The overall architecture of the (U)SIM API is based on the "UICC API for Java Card™" defined in ETSI TS 102 241 [2].
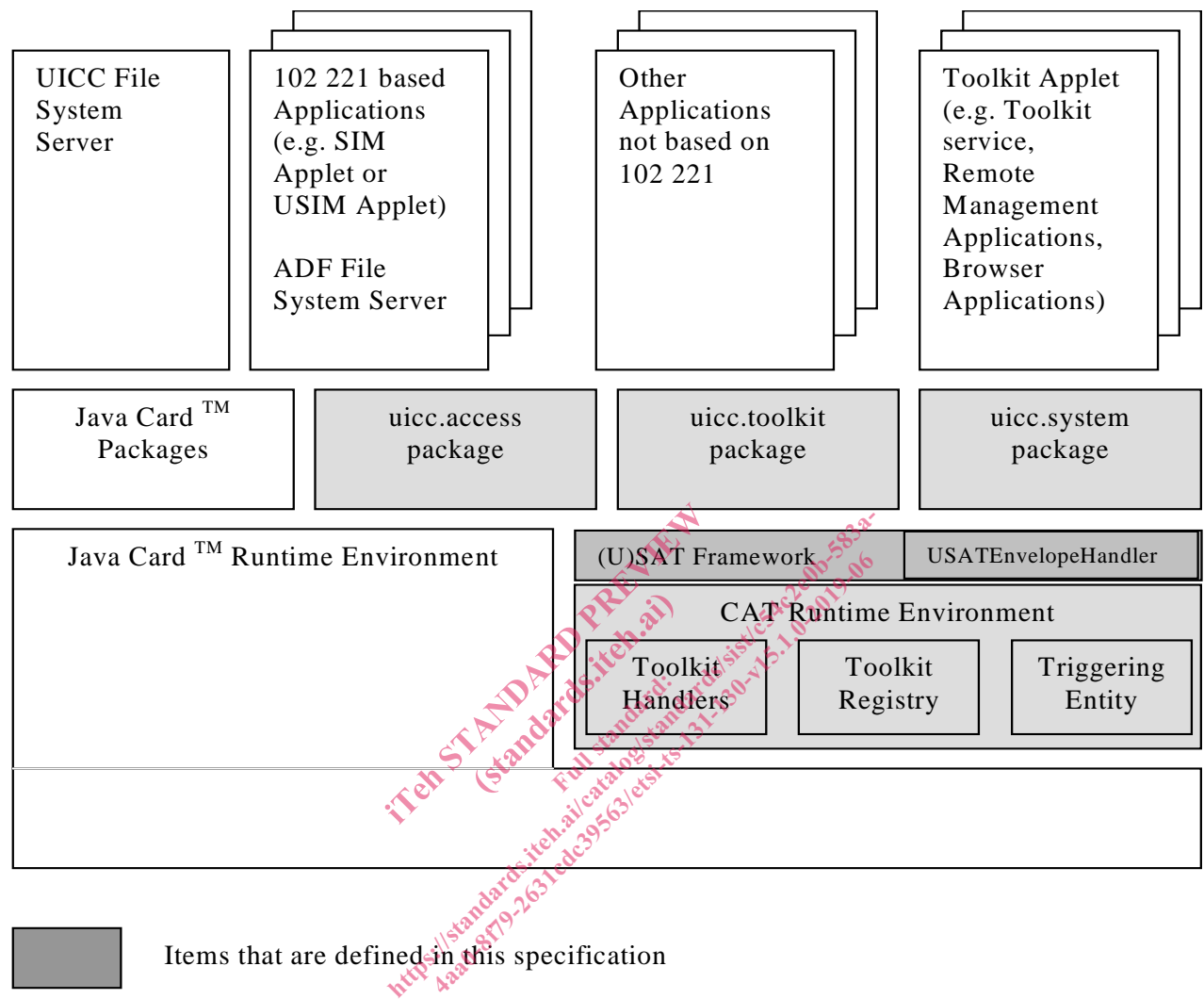

Figure 1: (U)SIM Java Card™ Architecture

5　　File Access API

The (U)SIM file access API consists of the package *uicc.usim.access*. This package defines additional constants to those defined in the *uicc.access* package from ETSI TS 102 241 [2]. The access to the file system, defined in TS 51.011 [4] and TS 31.102 [3], is the one specified in ETSI TS 102 241 [2] via the UICC *FileView* Interface. When selecting a cyclic file the current record number is defined, this applies also to files located under DF$_{GSM}$.

6　　(U)SAT Framework

6.0　　Overview

The (U)SIM toolkit API consists 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 defined in ETSI TS 102 241 [2].

6.1 Applet triggering

See ETSI TS 102 241 [2].

6.1.1 Exception Handling

The following clause describes the handling of exceptions by the (U)SAT Framework in addition to the behaviour defined in ETSI TS 102 241 [2] for the CAT Runtime Environment.

If an Applet triggered by EVENT_FORMATTED_SMS_PP_ENV event throws an ISOException with the reason code (0x6FXX), it shall be sent to the terminal.

Other Exceptions shall not be propagated to the terminal.

6.2 Definition of Events

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

Table 1: (U)SAT 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_NAA	10
EVENT_FORMATTED_SMS_CB	24
EVENT_EVENT_DOWNLOAD_IWLAN_ACCESS_STATUS	30
EVENT_EVENT_DOWNLOAD_NETWORK_REJECTION	31
EVENT_EVENT_DOWNLOAD_CSG_CELL_SELECTION	33
EVENT_FORMATTED_USSD	121
EVENT_UNFORMATTED_USSD	122
EVENT_EVENT_DOWNLOAD_IMS_REGISTRATION	119
EVENT_EVENT_DOWNLOAD_INCOMING_IMS_DATA	120

EVENT_FORMATTED_SMS_PP_ENV, EVENT_UNFORMATTED_SMS_PP_ENV,
EVENT_FORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_PP_UPD

There are two ways for a card to receive a Short Message Point to Point: via an ENVELOPE(SMS-PP DOWNLOAD) APDU as defined in TS 31.111 [7] and TS 51.014 [8] or an UPDATE RECORD EF$_{SMS}$ APDU as defined in TS 31.102 [3] and TS 51.011 [4]. The EF$_{SMS}$ can be either located under the DF$_{Telecom}$ or under any ADF as defined in TS 31.102 [3] and TS 51.011 [4].

The received Short Message 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 (e.g. a toolkit applet specific protocol) then the (U)SAT Framework will pass this data to all registered toolkit applets.

When the Short Message is received as Concatenated Short Messages as defined in TS 23.040 [10], it is the responsibility of the (U)SAT 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 *USATEnvelopeHandler*. 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 (U)SAT 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

Upon reception of a TS 31.115 [9] formatted Short Message Point to Point (Single or Concatenated) via an ENVELOPE, the (U)SAT Framework shall:

- verify the security of the Short Message as per TS 31.115 [9];

- trigger the toolkit applet registered with the corresponding TAR;

- 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

Upon reception of an unformatted Short Message Point to Point (Single or Concatenated) via an ENVELOPE, the (U)SAT Framework shall trigger all the Toolkit Applets registered to this event.

NOTE: As a consequence of the *EnvelopeResponseHandler* 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

Upon reception of a TS 31.115 [9] formatted Short Message Point to Point (Single or Concatenated) via an UPDATE RECORD EF$_{SMS}$, the (U)SAT 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$_{SMS}$ APDU into a COMPREHENSION TLV List;

- trigger the toolkit applet registered with the corresponding TAR;

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

The *USATEnvelopeHandler* provided to the applet shall:

- return *BTAG_SMS_PP_DOWNLOAD* to the *getTag()* method call**;**

- return the Comprehension TLV list length to the *getLength()* method call;

The *USATEnvelopeHandler* provided to the applet shall contain the following COMPREHENSION TLVs:

- Device Identities TLV

The Device Identities Comprehension 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 is formatted as defined below:

Device identities Comprehension TLV
Device Identities tag
length = 02
Absolute Record Number
Record Status