ETSI TS 131 130 V15.2.2 (2020-04)

TECHNICAL SPECIFICATION

**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
5G;
(U)SIM Application Programming Interface (API);
(U)SIM API for Java™ Card
(3GPP TS 31.130 version 15.2.2 Release 15)**

Reference

RTS/TSGC-0631130vf22

Keywords

5G,GSM,LTE,UMTS

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Contents

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2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

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 V15.0.0: "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].

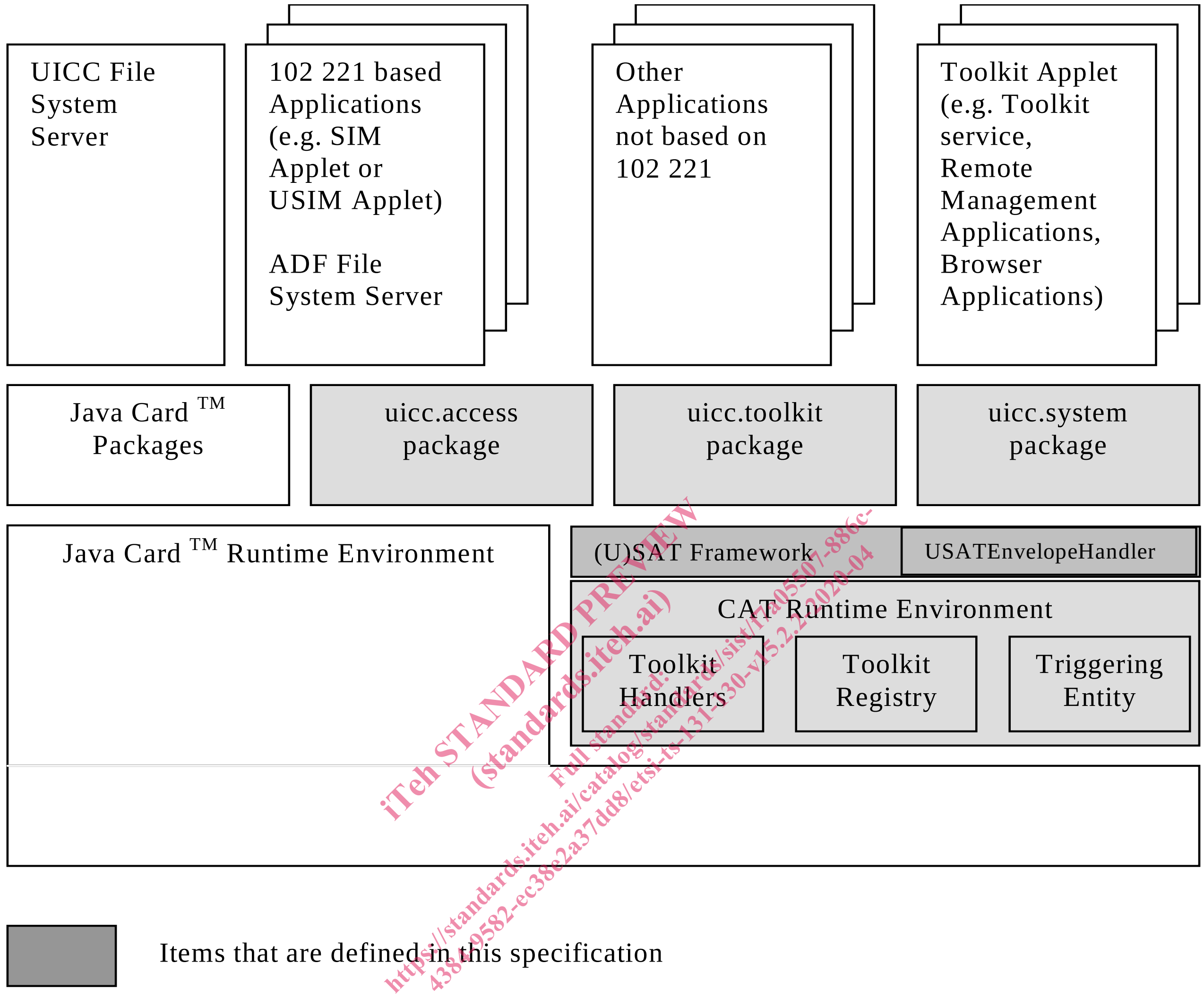

Figure 1: (U)SIM Java Card™ Architecture

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_EVENT_DOWNLOAD_DATA_CONNECTION_STATUS_CHANGE	37
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).