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Technical Specification

Smart Cards;
UICC Application Programming Interface and Loader Requirements;
Service description
(Release 8)

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Smart Card Platform (SCP).

It is based on work originally done by the 3GPP group in "TSG-Terminals WG3" and by "ETSI Special Mobile Group (SMG)".

The present document details the stage 1 aspects (overall service description) for the support of a UICC Application Programming Interface (API).

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1 Scope

The present document defines the service description of the UICC Application Programming Interface (UICC API) internal to the UICC. Stage one is an overall service description, and does not deal with the implementation details of the API.

The present document includes information applicable to network operators, service providers and terminal, UICC, Network Access Application (NAA) providers, switch and database manufacturers.

The present document contains the core requirements, which are sufficient to provide a complete service.

It is highly desirable however, that technical solutions for a UICC API should be sufficiently flexible to allow for possible enhancements. Additional functionalities not documented in the present document may implement requirements which are considered outside the scope of the present document. This additional functionality may be on a network wide basis, nation-wide basis or particular to a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

2 References

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

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

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI TS 102 221: "Smart cards; UICC-Terminal interface; Physical and logical characteristics (Release 7)".

[2] ETSI TS 102 223: "Smart cards; Card Application Toolkit (CAT) (Release 7)".

[3] ISO/IEC 7816-4: " Identification cards - Integrated circuit cards Part 4: Organization, security and commands for interchange".

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[4] ETSI TS 102 622: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Host Controller Interface (HCI)".

[5] ETSI TS 102 613: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Part 1: Physical and data link layer characteristics".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

applet: application built up using a number of modules which will run under the control of a virtual machine

bytecode: machine independent code generated by a bytecode compiler and executed by a bytecode interpreter

data structure: collection of related data values such as the age, birth date and height of an individual

framework: defines a set of Application Programming Interface (API) functions and data structures for developing applications and for providing system services to those applications

function: callable and executable body of computer instructions which perform a specific computation or data processing task

module: collection of functions and data structures which implement an entire application or a particular application feature or capability

UICC API framework: part of the UICC responsible for the handling of applications (including triggering and loading)

NOTE: It also contains the library for the proactive API.

toolkit applet: applet loaded onto the UICC seen by the mobile as being part of the UICC toolkit application and containing only the code necessary to run the application

NOTE: These applets might be downloaded over the radio interface.

trusted party: entity trusted by the card issuer with respect to security related services and activities

virtual machine: part of the run-time environment responsible for interpreting the bytecode

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AID	Applet IDentifier
APDU	Application Protocol Data Unit
API	Application Programming Interface
AVN	Applet Version Number
BER	Bit Error Rate
CAD	Card Acceptance Device
CAT	Card Application Toolkit

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CLF	Contactless Front-end
EPOS	Electronic Point Of Sale
IFD	InterFace Device
MExE	Mobile Execution Environment
NAA	Network Access Application
RPC	Remote Procedure Call
TLV	Tag, Length, Value
UICC	Universal Integrated Circuit Card
WAP	Wireless Application Protocol

4 Description

The present document describes the high level requirements for an API for the UICC. This API shall allow application programmers easy access to the functions and data described in TS 102 221 [1] and TS 102 223 [2], such that UICC based services can be developed and loaded onto UICCs, quickly and, if necessary, remotely, after the UICC has been issued.

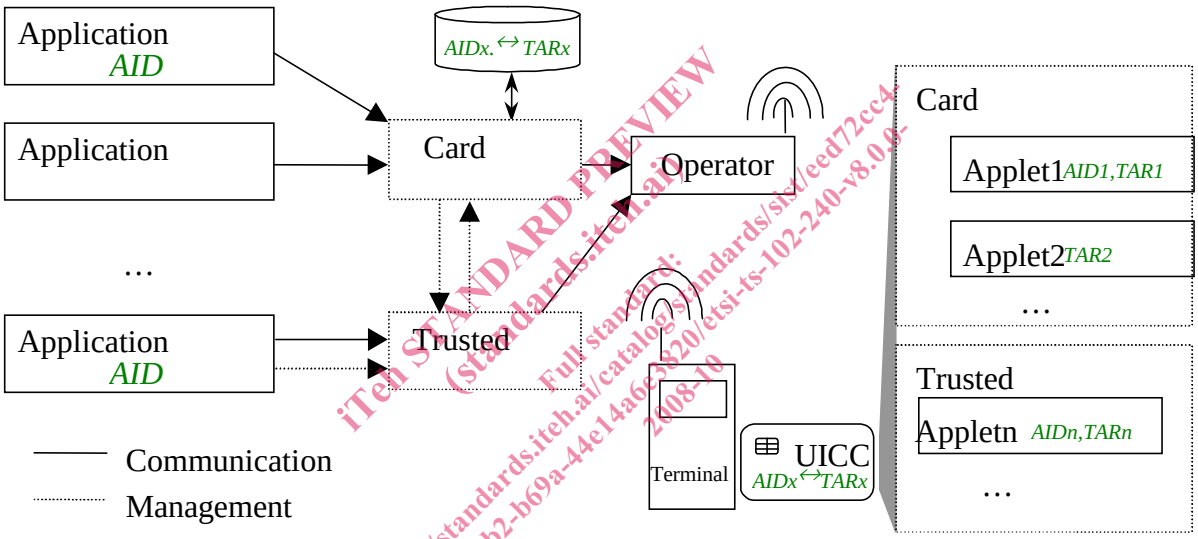

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Figure 1: Toolkit applet management and communication

4.1 Design of UICC based applications using the UICC API

Figure 2 shows how UICC applications can be developed in a standard development environment and converted into an interpreted format, then loaded into the UICC.

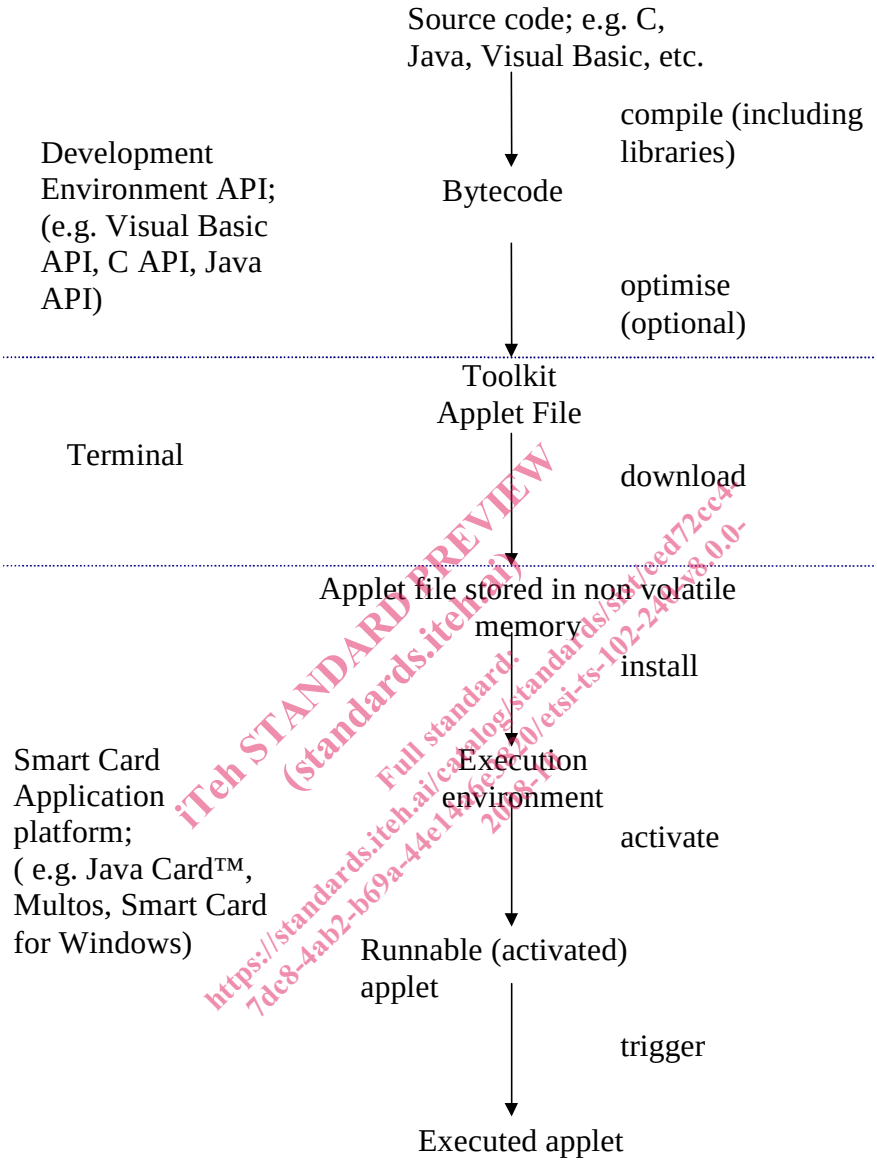

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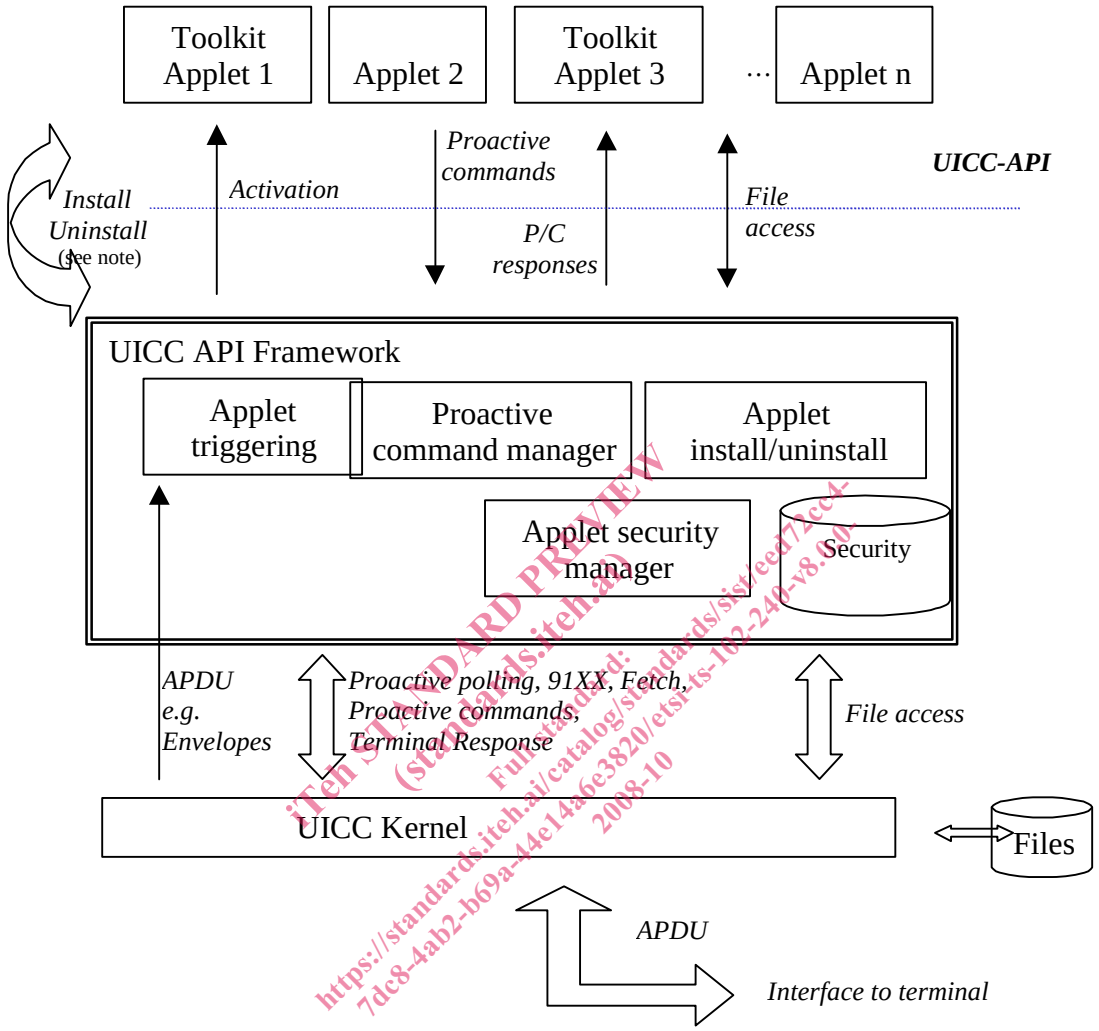
Figure 2: Flow diagram of the development of a UICC application

4.2 UICC API architecture

The UICC API shall consist of APIs for TS 102 223 [2] (pro-active functions) and TS 102 221 [1] (transport functions). Figure 3 illustrates the interactions between these APIs.



NOTE: The install / uninstall process does not form part of the API. Its requirements are outlined in clause 7.

Figure 3: UICC API architecture

In this model, the UICC data field structure is viewed as a series of data structures and data access functions to the API. In the physical model of course, they may still be stored in elementary files, but the functions will access these data as values within those data structures.

A general requirement of the UICC API is that applets should not interfere with the basic UICC services.

The UICC API framework shall prevent the toolkit applets from sending proactive commands which would interfere with the correct execution of the UICC operating system and/or other toolkit applets.

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