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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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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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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. It is expected that such additional functionality does not compromise conformance to the core requirements of the service.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

[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".

[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; Physical and data link layer characteristics".

[6] ETSI TS 102 600: "Smart Cards; UICC-Terminal interface; Characteristics of the USB interface".

[7] ETSI TS 102 483: "Smart cards; UICC-Terminal interface; Internet Protocol connectivity between UICC and terminal".

[8] ETSI TS 102 484: "Smart Cards; Secure channel between a UICC and an end-point terminal".

[9] OMA: "Smartcard Web Server Enabler Architecture", OMA-AD-Smartcard-Web-Server-V1-0-20070209-C.

[10] ETSI TS 102 412: "Smart Cards; Smart Card Platform Requirements Stage 1".

[11] ETSI TS 102 127: "Smart Cards; Transport protocol for CAT applications; Stage 2".

[12] ETSI TS 102 225: "Smart Cards; Secured packet structure for UICC based applications".

[13] ETSI TS 102 226: "Smart Cards; Remote APDU structure for UICC based applications".

[14] ETSI TS 131 130: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; (U)SIM Application Programming Interface (API); (U)SIM API for Java Card (3GPP TS 31.130 Release 9)".

[15] ETSI TS 102 267: "Smart Cards; Connection Oriented Service API for the Java Card (™) platform".

[16] ETSI TS 102 241: "Smart Cards; UICC Application Programming Interface (UICC API) for Java Card (™)".

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

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

application: in the scope of the present document either an applet or a web-application

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: 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

logical Secure Element (SE): SE functionalities, applications and files grouped together to act like a SE (e.g. UICC) when multiple logical SE interfaces are supported

logical SE interface: logical connection between an endpoint in the terminal and one logical SE

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

Secure Element (SE): tamper-resistant dedicated platform, consisting of hardware and software, capable of securely hosting applications and their confidential and cryptographic data and providing a secure application execution environment, e.g. the UICC

servlet: application built up using a number of modules responding to incoming Internet protocol request (e.g. TCP, HTTP, HTTPS, etc.)

NOTE: A Servlet runs under the control of a Servlet engine.

servlet engine: part of the enhanced UICC API framework, responsible for handling incoming requests via the TCP/IP protocol (e.g. HTTP/HTTPS) and dispatching them to the web-application

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

Universal Integrated Circuit Card Application Programming Interface (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.

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

web-application: at least one Servlet or a combination of one or more Servlets, additional modules, applets, and static content

3.2 Symbols

Void.

3.3 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
CLF	ContactLess Front-end
EPOS	Electronic Point Of Sale
HCI	Host Controller Interface
HTTP	Hypertext Transfer Protocol
IFD	InterFace Device
IP	Internet Protocol
LSE	Logical SE
LSI	Logical SE Interface
MExE	Mobile Execution Environment
NAA	Network Access Application
OTA	Over The Air
P2P	Peer to Peer
PSK	Pre shared Secret Key
RF	Radio Frequency technology
RPC	Remote Procedure Call
SE	Secure Element
SSL	Secure Socket Layer
TAG	nominal datum that encodes the name of a data object

TCP	Transmission Control Protocol
TLS	Transport Layer Security
TLV	Tag, Length, Value
UDP	User Datagram Protocol
UICC	Universal Integrated Circuit Card
WAP	Wireless Application Protocol

4 Description

4.0 System overview

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 ETSI TS 102 221 [1] and ETSI 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. Figure 1 shows a high level system architecture.

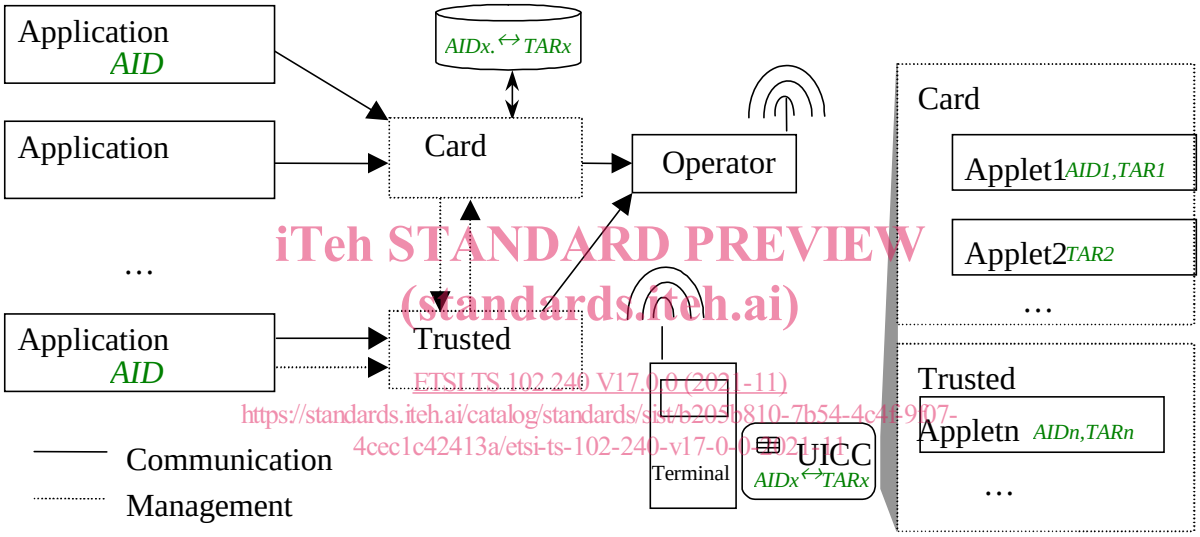

Figure 1: Toolkit applet management and communication

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.

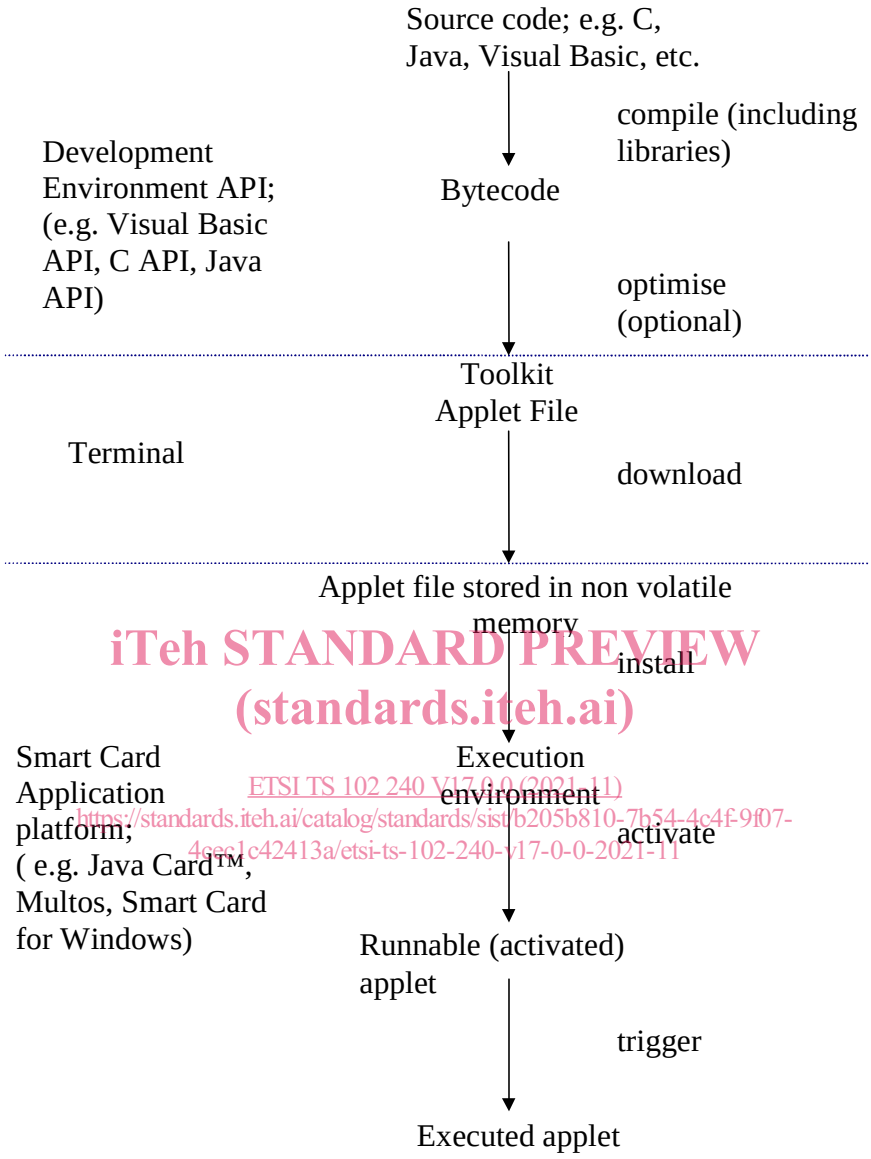

Figure 2: Flow diagram of the development of a UICC application