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Smart Secure Platform (SSP); Requirements Specification (Release 16) Document Preview

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Contents

Intellectual Property Rights	7
Foreword.....	7
Modal verbs terminology.....	8
Introduction	8
1 Scope	9
2 References	9
2.1 Normative references	9
2.2 Informative references.....	11
3 Definition of terms, symbols and abbreviations.....	11
3.1 Terms.....	11
3.2 Symbols.....	13
3.3 Abbreviations	13
4 Abstract (informative)	13
5 SSP concept description	14
5.1 Introduction	14
5.2 Core features	15
5.3 Security	15
5.4 Electrical characteristics and physical interfaces	15
5.4.1 Unlinking electrical characteristics of the SSP from its physical interfaces	15
5.4.2 Operational stages.....	15
6 Background (informative)	16
6.1 Overview of the use cases	16
6.2 Use Case 1 - Embedded secure element.....	16
6.2.1 Overview	16
6.2.2 Sub use cases	16
6.2.2.1 Use case 1.1 - Embedded secure element, electrical interface	16
6.2.2.2 Use case 1.2 - Embedded secure element, physical interface	17
6.2.2.3 Use case 1.3 - Embedded secure element, independence from hardware form factor	17
6.2.2.4 Use case 1.4 - Embedded secure element, protocol interface	17
6.2.3 Interaction with existing features.....	17
6.3 Use case 2 - Securing IoT devices.....	17
6.3.1 Overview	17
6.3.2 Sub use cases	18
6.3.2.1 Use case 2.1 - Management of IoT devices.....	18
6.3.2.2 Use case 2.2 - Constrained terminals for M2M.....	18
6.3.2.3 Use case 2.3 - General power efficiency	18
6.3.3 Interaction with existing features.....	18
6.4 Use case 3 - Storage of large data	18
6.4.1 Overview	18
6.4.2 Sub use cases	18
6.4.2.1 Use case 3.1 - Storage of large configuration data	18
6.4.2.2 Use case 3.2 - Storage of identification data	18
6.4.2.3 Use case 3.3 - Storage of user data.....	18
6.4.2.4 Use case 3.4 - Storage of emails	18
6.4.3 Interaction with existing features (informative).....	18
6.5 Use case 4 - Security token/HSM.....	19
6.5.1 Overview	19
6.5.2 Sub use cases	19
6.5.2.1 Use case 4.1 - Security for VPN	19
6.5.2.2 Use case 4.2 - Security token for email.....	19
6.5.2.3 Use case 4.3 - Security token for network elements	19
6.5.2.4 Use case 4.4 - Secure boot	19

6.5.3	Interaction with existing features.....	19
6.6	Use case 5 - Multiple applications.....	19
6.6.1	Overview	19
6.6.2	Sub use cases	20
6.6.2.1	Use case 5.1 - Multiple applications active at the same time	20
6.6.2.2	Use case 5.2 - Multiple applications from independent stakeholders	20
6.6.3	Interaction with existing features.....	20
6.7	Use case 6 - Optimization for LPWA IoT.....	20
6.7.1	Overview	20
6.8	Use case 7 - Tamper resistant secure hardware component for 3GPP next generation system.....	21
6.8.1	Overview	21
6.8.2	Sub use cases	21
6.8.2.1	Use case 7.1 - Storage and processing of network access credentials.....	21
6.8.2.2	Use case 7.2 - Interworking with non-3GPP systems	21
6.8.3	Interaction with existing features.....	21
6.9	Use case 8 - IMEI protection.....	21
6.10	Use case 9 - Integrated secure element.....	22
6.11	Use case 10 - Evolution of UICC functionality to support 3GPP requirements.....	22
6.11.1	Introduction.....	22
6.11.2	Existing features	22
6.11.2.1	Introduction.....	22
6.11.2.2	File Storage	22
6.11.2.2.1	Introduction	22
6.11.2.2.2	Examples from 3GPP specifications	23
6.11.2.3	Internet of Things.....	23
6.11.2.3.1	Power efficiency	23
6.11.2.3.2	Hardware flexibility.....	25
6.11.2.3.3	Electrical Interface and protocols	25
6.11.2.4	Toolkit.....	25
6.11.2.4.1	User-related applications	25
6.11.2.4.2	System applications	26
6.11.2.5	Concurrent operation of applications	26
6.11.3	Possible new features.....	26
6.11.3.0	General	26
6.11.3.1	Storage of data	27
6.11.3.1.1	The ability to provide the ME with storage space	27
6.11.3.1.2	The ability to provide the new secure platform with storage space in the ME	27
6.11.3.2	Extensibility of functionality.....	27
6.11.3.3	Multiple application environment	27
6.12	Use Case 11 - SSP remote management.....	27
6.12.1	Overview	27
6.12.2	Telecommunication industry use cases.....	27
6.13	Use Case 12 - Discovery service	28
6.13.1	Overview	28
6.14	Use Case 13 - SSP device change	28
6.14.1	Overview	28
7	SSP Classes overview	28
7.1	Introduction	28
7.2	iSSP: integrated SSP	28
7.3	eSSP: embedded SSP	28
7.3.0	General.....	28
7.3.1	eSSP: Type 1.....	28
7.3.2	eSSP: Type 2.....	29
7.4	rSSP: removable SSP	29
8	Requirements applicable for all SSP classes.....	29
8.1	General	29
8.1.0	Introduction.....	29
8.1.1	General - mandatory requirements.....	30
8.1.2	General - optional requirements.....	30
8.1.3	General - use case specific requirements	30

8.2	Application and file structure	30
8.2.1	SSP applications	30
8.2.1.1	SSP applications - mandatory requirements.....	30
8.2.1.2	SSP applications - optional requirements.....	31
8.2.1.3	SSP applications - use case specific requirements	31
8.2.2	File system	31
8.2.2.1	File system - mandatory requirements	31
8.2.2.2	File system - optional requirements	31
8.2.2.3	File system - class dependent requirements	31
8.2.2.4	File system - use case specific requirements.....	31
8.2.3	SSP application and file system access conditions	32
8.2.3.1	SSP application and file system access conditions - mandatory requirements.....	32
8.2.3.2	SSP application and file system access conditions - optional requirements.....	32
8.2.4	Terminal support for SSP applications	32
8.2.4.1	Terminal support for SSP applications - mandatory requirements.....	32
8.2.4.2	Terminal support for SSP applications - optional requirements.....	32
8.3	Protocols.....	32
8.3.1	Protocols - mandatory requirements	32
8.3.2	Protocols - optional requirements	33
8.3.2.1	SCL network layer requirements.....	33
8.3.2.2	SCL Transport layer requirements	33
8.3.2.3	SCL session layer requirements	33
8.3.2.4	Presentation layer requirements	33
8.3.2.5	Common underlying protocol stack requirements	34
8.3.3	Protocols - class dependent requirements	34
8.3.3.1	Protocols - requirements for SPI	34
8.4	Electrical and physical Interface	34
8.4.1	Electrical and physical Interface - mandatory requirements.....	34
8.4.2	Electrical and physical Interface - class dependent requirements	34
8.4.2.1	Electrical and physical Interface requirements.....	34
8.4.2.2	Electrical and physical Interface: SPI requirements.....	35
8.4.2.3	Electrical and physical Interface: I2C requirements	35
8.5	Form factor.....	35
8.5.1	Form factor - mandatory requirements	35
8.6	Security	35
8.6.1	Security - mandatory requirements.....	35
8.6.2	Security - optional requirements.....	36
8.7	SSP management.....	36
8.7.1	SSP management - mandatory requirements	36
8.7.2	SSP management - optional requirements	36
8.8	Backwards compatibility.....	36
8.8.1	Backwards compatibility - mandatory requirements	36
8.8.2	Backwards compatibility - optional requirements	36
8.9	Primary/secondary platform architecture	37
8.9.1	Primary/secondary platform architecture - class dependent requirements.....	37
8.9.1.1	General	37
8.9.1.2	Primary/secondary platform external interfaces and SPB provisioning and management.....	39
8.9.1.2.1	General description.....	39
8.9.1.2.2	Primary/secondary platform external interfaces requirements	40
8.9.1.2.3	SPB metadata requirements.....	41
8.9.1.2.4	SPB provisioning information requirements	42
8.9.1.2.5	Primary/secondary platform PKI requirements	42
8.9.1.2.6	SSP discovery service requirements	43
8.9.1.2.7	SSP device change requirements	43
8.9.1.3	APIs.....	45
8.9.1.4	Platform applications	45
8.9.1.5	Primary/secondary platform security requirements.....	45
8.9.1.6	Primary/secondary platform core security requirements.....	46
8.9.1.7	Access rights requirements	46
8.9.1.8	Certification requirements.....	46
8.9.1.9	SSP remote management requirements.....	46

9	Requirements for iSSP class.....	47
9.1	Introduction	47
9.2	Additional requirements for iSSP.....	47
9.2.0	General Requirements.....	47
9.2.1	Void (clause is now clause 8.9.1.3)	48
9.2.2	Filesystem	48
9.2.3	Void (clause is now clause 8.9.1.4)	48
9.2.4	Transport protocol	48
9.2.5	Link layer protocol.....	48
9.2.6	Physical and electrical interface.....	48
9.2.7	Form factor	48
9.2.8	Power modes and related timings	48
9.2.9	Security	48
9.2.9.1	Generic security requirements.....	48
9.2.9.2	Core platform security requirements	49
9.2.9.3	Void.....	49
9.2.9.4	Void.....	49
9.2.9.5	System on chip security requirements.....	50
9.2.10	Void (clause is now clause 8.9.1.1)	50
9.2.11	Void (clause is now clause 8.9.1.2)	50
9.2.11.1	Void (clause is now clause 8.9.1.2.1).....	50
9.2.11.2	Void (clause is now clause 8.9.1.2.2).....	50
9.2.11.3	Void (clause is now clause 8.9.1.2.3).....	50
9.2.11.4	Void (clause is now clause 8.9.1.2.4).....	50
9.2.11.5	Void (clause is now clause 8.9.1.2.5).....	50
10	Requirements for eSSP class.....	50
10.1	Introduction	50
10.2	Additional requirements for the eSSP Type 1 class	50
10.2.1	Application and file structure.....	50
10.2.1.1	SSP application requirements.....	50
10.2.1.2	File system	50
10.2.1.3	SSP application and file system access conditions.....	50
10.2.2	Protocols	51
10.2.2.1	Required protocol support.....	51
10.2.3	Electrical and physical Interface	51
10.2.3.1	General electrical and physical interface requirements	51
10.2.4	Form factor	51
10.2.5	Security	51
10.2.5.1	Generic security requirements.....	51
10.2.5.2	Certification requirements.....	51
10.2.6	SSP management	51
10.2.7	Backwards compatibility	52
10.3	Additional requirements for the eSSP Type 2 class	52
10.3.1	General requirements.....	52
Annex A (normative):	Telecom bundle requirements	53
Annex B (informative):	Change history	54
History		55

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Introduction

The current specification of the (e)UICC is based on the ISO/IEC 7816 series [1] of specifications for IC-cards. This series of specifications has been developed in the 1980s and was suitable at that point in time but today limits the capabilities that are required by the market. The current (e)UICC specifications also link the form factor to the electrical interface and the logical protocol. This link limits the (e)UICC implementations to specified form factors.

New requirements are emerging, for example, inspired by embedded secure elements in terminals that are intended to provide security services or store data securely. Such embedded secure elements may come in different form factors and are intended to be integrated into the terminals architecture and using electrical and physical interfaces other than those used by the (e)UICC. Such secure elements could also provide the capability to store large amount of data to be protected which requires new and more efficient ways to store and manage data.

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1 Scope

The present document defines the use cases and requirements for the definition of the interfaces and protocols for interfacing with a secure element. This secure element is called Smart Secure Platform (SSP).

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] ISO/IEC 7816 (all parts): "Identification cards -- Integrated circuit cards".
- [2] ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics".
- [3] ETSI TS 102 671: "Smart Cards; Machine to Machine UICC; Physical and logical characteristics".
- [4] ETSI TS 102 613: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Physical and data link layer characteristics".
- [5] SOG-IS: "Protection Profiles".

NOTE: Available at https://www.sogis.eu/uk/pp_en.html.

- [6] ETSI TS 102 622: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Host Controller Interface (HCI)".
- [7] ISO/IEC 7816-3: "Identification cards -- Integrated circuit cards -- Part 3: Cards with contacts -- Electrical interface and transmission protocols".
- [8] ISO/IEC 7816-4: "Identification cards -- Integrated circuit cards -- Part 4: Organization, security and commands for interchange".
- [9] Void.
- [10] ETSI TS 133 501: "5G; Security architecture and procedures for 5G System (3GPP TS 33.501)".
- [11] Security IC Platform BSI Protection Profile 2014 with Augmentation Packages
BSI-CC-PP-0084-2014.

NOTE: Available at https://www.commoncriteriaportal.org/files/ppfiles/pp0084b_pdf.pdf.

- [12] Application of Attack Potential to Smartcards (V2.9) (01-2013).

NOTE: Available at <https://sogis.org/documents/cc/domains/sc/JIL-Application-of-Attack-Potential-to-Smartcards-v2-9.pdf>.

[13] GlobalPlatform Card Technology: "Open Firmware Loader for Tamper Resistant Element".

NOTE: Available at <https://globalplatform.org/specs-library/open-firmware-loader-for-tamper-resistant-element-v1-3/>.

[14] ETSI TS 102 223: "Smart Cards; Card Application Toolkit (CAT)".

[15] ETSI TS 131 102: "Universal Mobile Telecommunications System (UMTS); LTE; 5G; Characteristics of the Universal Subscriber Identity Module (USIM) application (3GPP TS 31.102)".

[16] Recommendation ITU-T X.680: "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[17] IETF RFC 7252: "The Constrained Application Protocol (CoAP)".

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

[19] ETSI TS 102 705: "Smart Cards; UICC Application Programming Interface for Java Card™ for Contactless Applications".

[20] Void.

[21] Void.

[22] Void.

[23] Void.

[24] Void.

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

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

[27] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[28] ETSI TS 134 108: "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108)".

[29] GSMA TS.37 (V4.0) (06/2018): "Requirements for Multi SIM Devices".

[30] IETF RFC 5280: "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile".

[31] ETSI TS 123 003: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Numbering, addressing and identification (3GPP TS 23.003)".

[32] Void.

[33] Void.

[34] Recommendation ITU-T E.212: "The international identification plan for public networks and subscriptions".

2.2 Informative 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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- [i.1] Void.
- [i.2] ETSI TR 102 216: "Smart cards; Vocabulary for Smart Card Platform specifications".
- [i.3] ETSI TR 131 970: "LTE; Universal Mobile Telecommunications System (UMTS); UICC power optimisation for Machine-Type Communication (MTC) (3GPP TR 31.970)".
- [i.4] ETSI TS 102 600: "Smart Cards; UICC-Terminal interface; Characteristics of the USB interface".
- [i.5] ETSI TS 124 383: "LTE; Mission Critical Push To Talk (MCPTT) Management Object (MO) (3GPP TS 24.383)".
- [i.6] ETSI TS 124 334: "Universal Mobile Telecommunications System (UMTS); LTE; Proximity-services (ProSe) User Equipment (UE) to ProSe function protocol aspects; Stage 3 (3GPP TS 24.334)".
- [i.7] ETSI TS 132 277: "Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; Proximity-based Services (ProSe) charging (3GPP TS 32.277)".
- [i.8] ETSI TS 124 333: "Universal Mobile Telecommunications System (UMTS); LTE; Proximity-services (ProSe) Management Objects (MO) (3GPP TS 24.333)".
- [i.9] ETSI TS 124 385: "LTE; V2X services Management Object (MO) (3GPP TS 24.385)".
- [i.10] GSMA SGP.02 (V3.2) (06/2017): "Remote Provisioning Architecture for Embedded UICC Technical Specification".
- [i.11] GSMA SGP.22 (V2.2.1) (12/2018): "RSP Technical Specification".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI TR 102 216 [i.2] and the following apply:

Certificate Issuer (CI): root CA which issues digital certificates to the certified entities in the SSP ecosystem

custodian: organization that defines family identifier specific requirements (e.g. trusted CIs, product certification) within its SSP ecosystem (e.g. iSSP and SPB Manager)

family identifier: identifier specified by GP OFL [13] that can be used to categorize secondary platform bundles

image: generic data format encapsulating a secondary platform bundle version and its cryptographic data to be used by the SPBL

internal Non Volatile Memory (iNVM): non volatile memory physically located inside an SSP

Local Bundle Assistant (LBA): entity in the terminal managing the secondary platform bundles

non-shareable memory regions: memory space that is declared by, and accessed by a single program

primary platform: hardware platform along with a low-level operating system managing the exceptions, the hardware platform resources and their accesses

NOTE: The primary platform is use case independent and technology dependent.

remote Non Volatile Memory (rNVM): non volatile memory physically located outside an iSSP

secondary platform: software platform using the primary platform interface and containing the high-level operating system on top of which the SSP applications are running

Secondary Platform Bundle (SPB): secondary platform along with its SSP applications

Secondary Platform Bundle Loader (SPBL): application, requiring system specific privileges, used to load a secondary platform bundle

Secondary Platform Bundle Loader agent: part of the local bundle assistant managing the communication with the secondary platform bundle manager and the transfer of the image to secondary platform bundle loader on the SSP

Secondary Platform Bundle Manager (SPBM): entity which builds an image on behalf of the service provider this image belongs to and securely delivers it to the SPBL on the target iSSP through the SPBL agent

Secondary Platform Bundle metadata: information belonging to a secondary platform bundle used for the purpose of management of the SPB

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

SSP activation code: information issued by a Service Provider used by the LBA to initiate the download of an SPB

SSP application: application running on the top of an SSP OS (e.g. USIM)

SSP class: configuration of the SSP in accordance with a business requirement

SSP Discovery Service (SSPDS): entity which stores an event associated with a specific SSP by the request from an SPBM, and provides the event to the LBA

SSP information: information of the primary platform and the SPBL which is used for the eligibility checking of the iSSP by the SPB manager

SSP maker: entity which manufactures the SSP

SSP OS: operating system compliant with the SSP specifications

SSPDS event: set of information stored on the SSPDS by the request from an SPBM, to be retrieved by the LBA to find the SPBM having a pending operation (e.g. provisioning of a new SPB or remote management on an existing SPB) prepared for a given SSP

telecom bundle: secondary platform bundle which contains or is intended to contain at least one 3GPP NAA

EXAMPLE: A secondary platform bundle providing functions as defined in the GSMA remote SIM provisioning specifications GSMA SGP.02 [i.10], GSMA SGP.22 [i.11] or 3GPP specification ETSI TS 131 102 [15] would be classified as a telecom bundle.

telecom bundle class: indicates the sort of a telecom bundle (e.g. operational, provisioning, test, eSIM), with which the iSSP and the terminal can handle the telecom bundle appropriately

telecom bundle concurrency capability: parameter which is set on the iSSP, indicating the number of distinct concurrent 3GPP/3GPP2 network registrations based on different subscriber identifier, supported by the cellular baseband capability inside the SoC containing the iSSP

EXAMPLE: "1" for a baseband supporting single-SIM, and "2" for a baseband supporting dual-SIM (either dual-SIM dual-active or dual-SIM dual-standby).

telecom family identifier: family identifier having a reserved value, used to class a secondary platform bundle as a telecom bundle

terminal information: information of the terminal which is used for the eligibility checking of the terminal by the SPB Manager

test telecom bundle: telecom bundle containing a 3GPP NAA which is intended to access a 3GPP test network (e.g. a network compliant with ETSI TS 134 108 [28])

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TR 102 216 [i.2] and the following apply:

CI	Certificate Issuer
eSSP	embedded SSP
HPSIM	Hosting Party Subscription Identity Module
iNVM	internal Non-Volatile Memory
iSSP	integrated SSP
LBA	Local Bundle Assistant
LPWA	Low Power Wide Area
M2M	Machine to Machine (communication)
MCPTT	Mission Critical Push To Talk
NVM	Non Volatile Memory
OFL	Open Firmware Loader
PPI	Primary Platform Interface
PPID	Primary Platform Identifier
rNVM	remote Non-Volatile Memory
rSSP	removable SSP
SCL	SSP Common Layers
SE ^{TS}	Secure Element
SOG-IS	Senior Officials Group - Information Systems Security
SPB	Secondary Platform Bundle
SPBL	Secondary Platform Bundle Loader
SPBM	Secondary Platform Bundle Manager
SSP	Smart Secure Platform
SSPDS	SSP Discovery Service

4 Abstract (informative)

The present document describes the use case and requirements for the definition of a new secure element and its interfaces, superseding the interfaces currently defined for a UICC. By defining these interfaces, a new type of secure element will be defined called a Smart Secure Platform (SSP). The present document aims at defining the requirements for the SSP interfaces related security, the power management, the access to common protocol layer and a common protocol layer in the protocol stack of the SSP which is independent of any of its optional underlying and upper communication layers. This common layer will be supported by several underlying communication layers defined in optional SSP classes. The goal is also to solve the obsolescence of the ISO/IEC 7816-4 [8].

Figure 1 shows the layout of the SSP protocol stack.

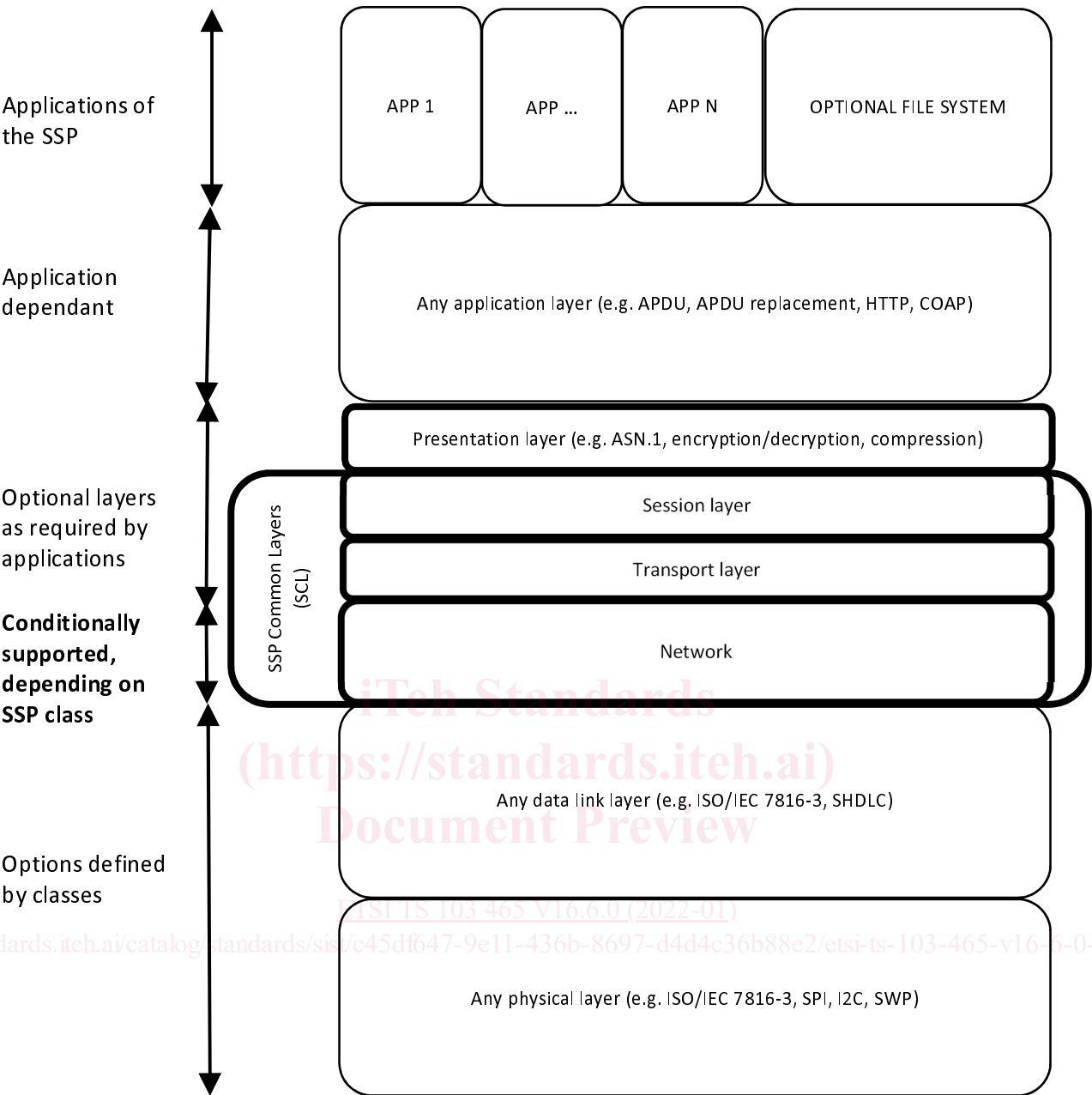


Figure 1: SSP protocol stack

This SSP is a modular platform allowing for its use in various use cases. In order to address these different contexts and in order to factorize the possible configuration some SSP classes will be defined. An SSP class will define a configuration of the SSP. One SSP class can correspond to the definition of the UICC.

5 SSP concept description

5.1 Introduction

The SSP is a secure platform intended for use in a number of use cases which may have very different requirements. For that reason, the SSP is designed to be a modular platform offering a core set of features as well as a number of options that need to be selected at the time of implementation based on the intended application. The goal is to enable the best fit for the targeted use case.