



**BSI Standards Publication**

# **Card and security devices for personal identification — Programming interface for security devices**

---

Part 3: Proxy

## National foreword

This Published Document is the UK implementation of ISO/IEC TS 23465-3:2023.

The UK participation in its preparation was entrusted to Technical Committee IST/17, Cards and security devices for personal identification.

A list of organizations represented on this committee can be obtained on request to its committee manager.

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2023  
Published by BSI Standards Limited 2023

ISBN 978 0 539 04214 6

ICS 35.240.15

### Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2023.

### Amendments/corrigenda issued since publication

| Date  | Text affected |
|-------|---------------|
| <hr/> |               |

---

---

# Card and security devices for personal identification — Programming interface for security devices —

## Part 3: Proxy

*Cartes et dispositifs de sécurité pour l'identification personnelle —  
L'interface du logiciel pour dispositifs de sécurité —*

*Partie 3: Proxy*





## **COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

|                                                                                             |           |
|---------------------------------------------------------------------------------------------|-----------|
| <b>Foreword</b>                                                                             | <b>iv</b> |
| <b>Introduction</b>                                                                         | <b>v</b>  |
| <b>1 Scope</b>                                                                              | <b>1</b>  |
| <b>2 Normative references</b>                                                               | <b>1</b>  |
| <b>3 Terms and definitions</b>                                                              | <b>1</b>  |
| <b>4 Symbols and abbreviated terms</b>                                                      | <b>2</b>  |
| <b>5 Proxy related requirements</b>                                                         | <b>2</b>  |
| 5.1 Link between client application and security device                                     | 2         |
| 5.2 Proxy layers                                                                            | 3         |
| 5.2.1 Proxy layer model                                                                     | 3         |
| 5.2.2 Resolution layer of ISO/IEC 23465-API calls                                           | 3         |
| 5.2.3 Layer representing/resolving class model                                              | 4         |
| 5.2.4 Administration layer for security devices                                             | 4         |
| 5.2.5 Security related layer                                                                | 4         |
| 5.2.6 Translation layer                                                                     | 4         |
| 5.2.7 Exception handler                                                                     | 5         |
| 5.2.8 Connectivity related layer                                                            | 5         |
| 5.3 Conditional proxy functionality                                                         | 5         |
| 5.3.1 Multitasking/Multiplexing                                                             | 5         |
| 5.3.2 Crypto functionality                                                                  | 5         |
| 5.3.3 Discovery functionality                                                               | 6         |
| 5.3.4 Registration functionality                                                            | 6         |
| <b>6 Instantiation of class objects</b>                                                     | <b>6</b>  |
| 6.1 Class model                                                                             | 6         |
| 6.2 Process of instantiation                                                                | 7         |
| 6.3 Life cycle of an instance                                                               | 8         |
| <b>7 Services of the proxy</b>                                                              | <b>8</b>  |
| 7.1 Security device management                                                              | 8         |
| 7.1.1 Identification of security device                                                     | 8         |
| 7.1.2 Retrieval of security device information                                              | 9         |
| 7.1.3 Security device related functionality                                                 | 9         |
| 7.2 Security related layer                                                                  | 10        |
| 7.2.1 General                                                                               | 10        |
| 7.2.2 Security conditions and fulfilment                                                    | 10        |
| 7.2.3 Interpretation of ISO/IEC 7816-4 security conditions                                  | 11        |
| 7.2.4 Security attributes for complex multistep authentication                              | 12        |
| 7.2.5 Security attribute “user verification”                                                | 12        |
| 7.2.6 Security attribute “authentication”                                                   | 12        |
| 7.2.7 Security attribute “secure messaging” (SM)                                            | 12        |
| 7.2.8 Implicit fulfilment of security conditions                                            | 13        |
| 7.3 Connectivity layer                                                                      | 13        |
| 7.4 Multi-client/multi-security device support                                              | 13        |
| 7.4.1 Task management                                                                       | 13        |
| 7.4.2 Management of security devices                                                        | 13        |
| <b>8 Life cycle model of the proxy</b>                                                      | <b>14</b> |
| 8.1 Start-up phase                                                                          | 14        |
| 8.2 Initialization and administration                                                       | 14        |
| <b>Annex A (informative) Example of client API call processing with proxy functionality</b> | <b>15</b> |
| <b>Bibliography</b>                                                                         | <b>19</b> |

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives) or [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)) or the IEC list of patent declarations received (see <https://patents.iec.ch>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html). In the IEC, see [www.iec.ch/understanding-standards](http://www.iec.ch/understanding-standards).

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

A list of all parts in the ISO/IEC 23465 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

## Introduction

Integrated circuit card (ICC) technologies and solutions are widely deployed around the world, but systems for identity tokens and credentials are quickly changing. In this context, the application protocol data unit (APDU) protocol outlined in the ISO/IEC 7816 series is becoming, in some cases, a hindrance to the integration of integrated circuits (ICs) in environments such as mobile phones, handheld devices, connected devices (e.g. M2M, IoT) or other application using security devices.

Stakeholders often request an abstraction layer hiding IC specifics to avoid the complexity of APDU protocols. However, even solutions based on those kinds of middleware are perceived as cumbersome in some systems. The market looks for a middleware memory footprint to be as low as possible. This document aims to overcome or mitigate those issues by proposing a new approach that would preserve ICC functionality and allow for a seamless ICC portability onto new systems.

The ISO/IEC 23465 series focuses on a solution by designing an application programming interface (API) and a system with these characteristics:

- It offers a subset, from the ISO/IEC 7816 series, of mostly used multi-sectorial ICC functions.
- It results in no further middleware or very little middleware memory footprint (i.e. simplified drivers).
- It requires a simplified ICC capability discoverability (i.e. with significantly less complexity than ISO/IEC 24727-1).<sup>[3]</sup>

The ISO/IEC 23465 series is comprised of three parts, each focusing on a specific topic:

- ISO/IEC 23465-1: provides an introduction to the series and a short overview of the architecture;
- ISO/IEC TS 23465-2: defines the API for client applications allowing incorporation and usage of security devices;
- ISO/IEC TS 23465-3 (this document): describes the software (SW) called "proxy" which provides different services, e.g. to convert the API calls into serialized messages to be sent to the security device.

The ISO/IEC 23465 series is intended to be used by any sector relying on the interchange defined, but not limited to, the ISO/IEC 7816 series.



# Card and security devices for personal identification — Programming interface for security devices —

## Part 3: Proxy

### 1 Scope

This document describes the software (SW) layer called “proxy”. It supports the programming interface to security devices and the application using this API to access the application related security devices defined in ISO/IEC TS 23465-2.

This document is applicable to:

- proxy requirements, functionality and layers;
- resolving mechanisms for API functions;
- data structures related to security device handling;
- translation for security device communication;
- serialization/de-serialization syntax and methods.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 23465-1, *Card and security devices for personal identification — Programming interface for security devices — Part 1: Introduction and architecture description*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 23465-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1

##### **access rule**

data element containing an access mode referring to an action and security conditions to be fulfilled before acting

#### 3.2

##### **client application**

implemented application using the ISO/IEC 23465-API requesting services from a security device