



**International
Standard**

ISO/IEC 27565

**Information security, cybersecurity
and privacy protection —
Guidelines on privacy preservation
based on zero-knowledge proofs**

*Sécurité de l'information, cybersécurité et protection de la vie
privée — Lignes directrices relatives à la préservation de la vie
privée basée sur des preuves à divulgation nulle de connaissance*

**First edition
2026-02**

<https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026>

[ISO/IEC 27565:2026](#)

iTeh Standards

(<https://standards.iteh.ai>)

Document Preview

[ISO/IEC 27565:2026](#)

<https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2026

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
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	4
5 Introduction to zero-knowledge proofs	4
5.1 General	4
5.2 Interactive and Non-interactive ZKP	5
5.2.1 General	5
5.2.2 Interactive zero-knowledge proofs	5
5.2.3 Non-interactive zero-knowledge proofs	6
5.3 Components of a ZKP system	7
5.3.1 General	7
5.3.2 Setup module	7
5.3.3 Prover module	9
5.3.4 Verifier module	9
5.4 Characteristics of ZKPs	10
5.5 ZKP performance	11
6 Considerations of implementing ZKPs for attribute verification	11
6.1 Attribute providers	11
6.2 Replay attack detection or protection	11
6.3 Prevention of collusions between users	12
6.4 Use of an authoritative document or of a trusted authority	12
7 Use cases of ZKPs	12
7.1 Proving some properties of a hidden attribute	12
7.2 Proving the contents in an authoritative document	13
7.3 Proving the contents across several authoritative documents	14
7.4 Selective disclosure of attributes	14
7.4.1 General	14
7.4.2 Pre-generation of digital credentials	14
7.4.3 On-demand generation of digital credentials	15
8 Privacy preservation using zero-knowledge proofs	15
8.1 Privacy principles in the context of ZKP	15
8.2 Privacy risk assessment	15
8.3 Privacy functional requirements for ZKP	16
8.3.1 General	16
8.3.2 Collection limitation	16
8.3.3 Data minimization	16
8.3.4 Options and choice	17
8.3.5 Selective disclosure	17
8.3.6 Purpose legitimacy and specification	17
8.3.7 Anonymity of the authority that has issued the attestation	17
8.3.8 Non-disclosure of the identity of the verifiers to the attribute issuer	17
8.3.9 Use, retention and disclosure limitation	17
8.3.10 Accuracy and quality	17
8.3.11 Openness, transparency and notice	17
8.3.12 Individual participation and access	17
8.3.13 Accountability	17
8.3.14 Information security	18
8.3.15 Unlinkability	18
8.4 Security considerations	18

9	Functional use cases	18
9.1	Functional use examples	18
9.2	Selection of ZKP models	19
10	Business use examples	20
10.1	Age verification	20
10.2	Fraud prevention	20
10.3	Auction	20
10.4	Disability proof	20
10.5	Distributed ledger technologies and blockchains	21
10.6	Central bank digital currencies	21
Annex A (informative) Factors facilitating or hindering ZKP developments		22
Annex B (informative) Subject binding		23
Annex C (informative) Example of a consistency check between two documents		24
Annex D (informative) Example of ZKP for selective disclosure		26
Annex E (informative) Examples of selective disclosure without using ZKPs		28
Annex F (informative) Example of secure comparison of two numbers		29
Annex G (informative) Implementing digital credentials with ZKP		31
Bibliography		36

iTeh Standards

(<https://standards.iteh.ai>)

Document Preview

[ISO/IEC 27565:2026](https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026)

<https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026>

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 or www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents and <https://patents.iec.ch>. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *Information security, cybersecurity and privacy protection*.

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 and www.iec.ch/national-committees.

Introduction

The world is witnessing unprecedented data-driven innovation and growth in digital technologies that include use of big data, AI and blockchain. These technologies are providing societal and economic benefits, as well as improving efficiency, user experience and convenience. At the same time, there is a corresponding increase in privacy risks that requires stronger privacy preserving measures to minimize such risks when designing and implementing solutions. Legislators are introducing new data privacy laws and regulations, and strengthening existing ones, to make organizations accountable and compliant with data privacy protection requirements. They also require support for investigation and regulatory enforcement, where privacy protections are being misused to harm society.

A number of new technologies enable organizations to operate and do business in new ways that are compliant with many regulations, while still protecting privacy. These privacy-enhancing technologies (PETs) apply data protection principles intended to minimize the exposure and use of personal data.

Zero-knowledge proof (ZKP) technology is one such PET, which preserves privacy by eliminating the need to expose or share personal information and personally identifying information (PII), while achieving its desired function. ZKP is a privacy-enhancing technology that can be used to adhere to the principles of collection limitation, user consent and choice and disclosure limitation as mentioned in ISO/IEC 29100.

ZKP allows the validation of data held by an authoritative or an authentic source if it is known to both the prover and the verifier. This results in greater compliance with the data minimization principle of ISO/IEC 29100, since only necessary data are disclosed.

This document begins with an explanation of ZKP and its features. It then describes the privacy and functional requirements that ZKP can address and provides guidelines for using ZKP in a way that is most useful for privacy practitioners.

ITEH Standards

(<https://standards.iteh.ai>)

Document Preview

[ISO/IEC 27565:2026](https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026)

<https://standards.iteh.ai/catalog/standards/iso/775e6bb1-0835-437f-9d26-fe7aa535e7c3/iso-iec-27565-2026>