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Information technology — Security techniques — A framework for identity management —

Part 3: Practice

Technologies de l'information — Techniques de sécurité — Cadre pour la gestion de l'identité —

Partie 3: Mise en oeuvre

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Foreword

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 27, *IT Security techniques*.

ISO/IEC 24760 consists of the following parts, under the general title *Information technology — Security techniques — A framework for identity management*

— *Part 1: Terminology and concepts*

— *Part 2: Reference architecture and requirements*

— *Part 3: Practice*

Introduction

Data processing systems commonly gather a range of information on their users, be it a person, piece of equipment, or piece of software connected to it and make decisions based on the gathered information. Such identity-based decisions may concern access to applications or other resources.

To address the need to efficiently and effectively implement systems that make identity-based decisions, ISO/IEC 24760 specifies a framework for the issuance, administration, and use of data that serves to characterize individuals, organizations or information technology components, which operate on behalf of individuals or organizations.

For many organizations, the proper management of identity information is crucial to maintain security of the organizational processes. For individuals, correct identity management is important to protect privacy.

This part of ISO/IEC 24760 specifies fundamental concepts and operational structures of identity management with the purpose to realize information system management, so that information systems can meet business, contractual, regulatory and legal obligations.

This part of ISO/IEC 24760 presents practices for identity management. These practices cover assurance in controlling identity information use, controlling the access to identity information and other resources based on identity information, and controlling objectives that should be implemented when establishing and maintaining an identity management system.

This part of ISO/IEC 24760 consists of the following parts:

— ISO/IEC 24760-1: Terminology and concepts;

— ISO/IEC 24760-2: Reference architecture and requirements;

— ISO/IEC 24760-3: Practice.

ISO/IEC 24760 is intended to provide foundations for other identity management related International Standards including the following:

— ISO/IEC 29100, Privacy framework;

— ISO/IEC 29101, Privacy reference architecture;

— ISO/IEC 29115, Entity authentication assurance framework;

— ISO/IEC 29146, A framework for access management.

Information technology — Security techniques — A framework for identity management —

Part 3: Practice

1 Scope

This part of ISO/IEC 24760 provides guidance for the management of identity information and for ensuring that an identity management system conforms to ISO/IEC 24760-1 and ISO/IEC 24760-2.

This part of ISO/IEC 24760 is applicable to an identity management system where identifiers or PII relating to entities are acquired, processed, stored, transferred or used for the purposes of identifying or authenticating entities and/or for the purpose of decision making using attributes of entities. Practices for identity management can also be addressed in other standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 24760-1, *Information technology — Security techniques — A framework for identity management — Part 1: Terminology and concepts*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 24760-1 and the following apply.

3.1
identity management system
system comprising of policies, procedures, technology and other resources for maintaining identity information including meta data

[SOURCE: ISO/IEC 24760-2:2015, 3.3]

3.2
identity profile
identity containing attributes specified by an identity template

3.3
identity template
definition of a specific set of attributes

Note 1 to entry: Typically, the attributes in a profile are to support a particular technical or business purpose as needed by relying parties.

3.4
identity theft
result of a successful false claim of identity

3.5
federation manager
actor in a federation responsible for managing the issues arising from the operation of the federation

Note 1 to entry: An existing federation member or an independent third party can carry out the role of federation manager.

3.6
principal
entity to which identity information in an identity management system pertains

[SOURCE: ISO/IEC 24760-2:2015, 3.4]

4 Symbols and abbreviated terms

For the purposes of this document, the following symbols and abbreviated terms apply.

ICT Information and Communication Technology

IIP Identity Information Provider

IIA Identity Information Authority

PII Personally Identifiable Information

RP Relying Party

5 Mitigating identity related risk in managing identity information

5.1 Overview

Clause 5 presents practices to address identity related risk when operating an identity management system conforming to ISO/IEC 24760-1, ISO/IEC 24760-2 and ISO/IEC 29115.

5.2 Risk assessment

One function of an identity management system is to manage the risk of identity errors, and the confidentiality, integrity and availability of identity information that it stores, processes and communicates. It is necessary to understand the level of risk, which will depend on the application. The owner of the application should conduct a risk assessment to determine the level of risk. The result will provide information, which can be used to determine the necessary risk management criteria and processes for the identity management system. The information an identity management system needs includes the level of assurance in identity information required and the requirements for confidentiality, integrity and availability of this information.

ISO/IEC 24760-2 specifies tools to manage risks as policies, regulation, design and architecture. In some contexts involving consumers, protecting personally identifiable information and giving principals control over the use of their personally identifiable information is paramount. ISO/IEC 29100, ISO/IEC 29101, ISO/IEC 29134 and ISO/IEC 29151 (to be published) specify requirements and provide guidance for the protection of privacy.

Identity information managed by an identity management system may also be managed by reference to identity information providers in another domain. For example, identity proofing may be undertaken by a service provider, which operates in a different domain to that of the identity management system.

When identity information is collected and stored, risk management measures shall be implemented by the identity management service to mitigate the risks identified by a risk assessment carried out in the

application domain by the relying party. Levels of assurance in regard to identity information and access services shall be determined and specified by the relying party according to assessed levels of risk.

5.3 Assurance in identity information

5.3.1 General

Confidence in identity information provided by an identity management system comes from processes that assure the validity of the information from its collection through its subsequent storage and maintenance by the system. Assurance is typically quantified in terms of assurance levels with higher levels corresponding to greater assurance. The level of assurance achieved depends on the quality of the identity information and the rigour of the identity validation processes. Levels of assurance are described in ISO/IEC 29115.

5.3.2 Identity proofing

Identity proofing, i.e. validating identity information for enrolment of an entity in a domain, shall meet a defined level of assurance. The level of assurance of identity proofing achievable depends on the type and characteristics of information and, in some case, the scope of this information, e.g. the number of independent identity information providers used as sources of the information.

An increased level of assurance in identity verification may be achieved

— with verification of additional credentials issued from multiple sources, and

— using a trusted external party that knows the entity to validate claimed identity information.

NOTE 1 ISO/IEC 29003 provides requirements for identity proofing.

NOTE 2 ISO/IEC 29115 specifies how to achieve different levels of assurance.

5.3.3 Credentials

An identity management system may issue multiple types of credential differing in the level of assurance of the identity information represented by the credential.

An identity management system issuing credentials with a high level of assurance supported by a cryptographic mechanism should provide a service for relying parties to actively support the cryptographic validation process.

5.3.4 Identity profile

An identity management system may use one or more identity profiles for gathering, structuring, or presenting identity information.

NOTE Although a profile can contain identity information, it is not intended for identification. Its purpose is to provide identity information about an entity to system processes that need the information for their processes.

An entity may have multiple identity profiles, each containing a different set of attributes for the entity. For instance, a language preference may be present in a profile for an access interface and not in a profile for book interests.

An identity template may be established as an international or industry standard. The use of a standardised identity template to record identity attributes would facilitate the usage of identity profiles across domains.

An identity profile may be used in access management to determine the required identity attributes for being authorized for a role or privilege in accessing information. An identity profile may be used as a pre-configured subset of identity information to be presented when interacting with a service.

An attribute in an identity profile may be associated with a level of assurance. Using an identity profile with associated levels of assurance to present identity information shall imply that each item of information has been validated at minimally its associated level of assurance. An identity profile specifying requirements for access to services or resources may be associated with a specific additional entity identifier that may indicate the activities linked to the specific privileges.

6 Identity information and identifiers

6.1 Overview

Organizations should understand the information security concerns for their business and for compliance with relevant legislation and should provide management support to meet the business needs. In regard to identity management, organizations should understand their liabilities and ensure that adequate controls are implemented to mitigate the risks and consequences of identity information leakage, corruption and loss of availability when collecting, storing, using, transmitting and disposing of identity information. Organizations should specify control objectives and controls to ensure that information security requirements are met.

6.2 Policy on accessing identity information

The identity information pertaining to an entity should be managed to ensure that the following:

— identity information remains accurate and up-to-date over time;

— only authorized entities have access to the identity information and are accountable for all uses and changes in identity information, guaranteeing traceability of any processing of identity information by any entity, whether a person, a process or a system;

— the organization fulfils its obligations with respect to regulations and contractual agreements;

— principals are protected against the risk of identity-related theft and other identity related crime.

NOTE Typically, an information security policy highlights the necessity to securely manage identity information. The preservation and protection of any entities identity information is also required when dealing with third parties as typically documented within the operational procedures.

6.3 Identifiers

6.3.1 General

An identifier allows distinguishing unambiguously one entity from another entity in a domain of applicability. An entity may have multiple, different identifiers in the same domain. This may facilitate the representation of the entity in some situations, e.g. hiding the entity's identity when providing the entity's identity information for use in some processes or within some systems. An identifier created in one domain may be reused intentionally in another domain provided the reused identifier continues to provide uniqueness of identity within the other domain.

6.3.2 Categorization of identifier by the type of entity to which the identifier is linked

6.3.2.1 Person identifiers

A person identifier may be, e.g. a full name, a date of birth, a place of birth, or various pseudonyms, such as a number assigned by an authority as a reference, e.g. a passport number, a national identity number or an identity-card number.

The use of pseudonyms as identifiers is frequent for person identifiers; see.6.3.3.2.

NOTE A pseudonym can enhance the privacy of persons in an identity-authentication exchange with a relying party as a pseudonym may reveal less personally identifiable information than if a real name is used as an identifier.

6.3.2.2 Identifier assigned to a non-person entity

Non-person entities, e.g. devices or other information objects, may have their activities identified and recorded as for persons.

Device identifiers allow distinction between devices in the domain in which they operate.

NOTE 1 Example: The International Mobile Equipment Identity (IMEI) is an identifier of the mobile telephone handset in the domain of GSM mobile telephone services.

NOTE 2 Example 2: The GSM SIM card number (ICCID) is a unique device identifier in the domain of a mobile telephone service. A SIM card also contains other identifiers including that of the user who registered the SIM card.

Information object identifiers may also need to be distinguished in their domains. One of their attributes of a combination of their attributes is usually used as identifier.

NOTE 3 Example: Process name, session name, path name, uniform resource names (URN), uniform resource identifier (URI) are examples of information-object identifiers.

NOTE 4 Example: URI is an example of identifier for a location, but the object at that location may change at any time.

6.3.3 Categorization of identifier by the nature of linking

6.3.3.1 Verinymous identifier

A verinymous identifier is an identifier, persistent in its domain of applicability that may be used within and across domains and allows a relying party to obtain further identity information for the entity associated with the identifier. Commonly observed verinimous identifiers includes email address, mobile phone number, passport number, driving license number, social security number and the name-date of birth pair.

A verynimous identifier may allow identity information for entities known in different domains to be correlated. While it is fine to correlate the identities if so desired by the person, unexpected correlation, e.g. profiling, has a negative privacy impact. By the nature of the veronymous identifier, if information leakage incident happens, it allows adversaries to perform such correlation and create threats, e.g. of generating any privacy-related information that the principal did not intend to disclose.

6.3.3.2 Pseudonymous identifier

A pseudonymous identifier is an identifier, persistent in its domain that does not disclose additional identity information. As long as no other identifying information is available in the domain, identities from different domain cannot be correlated using a pseudonymous identifier. A pseudonymous identifier may be used to prevent unwanted correlation of identity information for entities across domains.

NOTE The mere use of pseudonymous identifiers does not equate with identity data being pseudonymous. Other attributes combined at one point in time or across multiple points in time may be enough to derive verinymous identifiers.