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BSI Standards Publication

Information technology — Distributed application platforms and services (DAPS) — Framework for distributed real-time access systems

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National foreword

This British Standard is the UK implementation of ISO/IEC 20933:2019. It supersedes BS ISO/IEC 20933:2016, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/-/99, Participating IST members.

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Information technology — Distributed application platforms and services (DAPS) — Framework for distributed real-time access systems

Technologies de l'information — Services et plate-formes d'application distribuées — Structure pour les contrôles d'accès diffusés en temps réel

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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 (see www.iso.org/directives).

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) or the IEC list of patent declarations received (see http://patents.iec.ch).

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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.

This document was prepared by Ecma International (as ECMA-412) and drafted in accordance with its editorial rules. It was assigned to Joint Technical Committee ISO/IEC JTC 1, *Information technology*, and adopted under the "fast-track procedure".

This second edition cancels and replaces the first edition (ISO/IEC 20933:2016), which has been technically revised.

The main changes compared to the previous edition are as follows:

— added new functionalities on performance management mechanisms;

— editorial improvements and clarifications to the text of the document.

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.

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Introduction

Technology for real-time access control is widely used in many situations such as entrance gates of facilities and service access control systems. Membership and settlement services also benefit from real-time access control systems connected via networks and using database information.

Sophisticated cloud, virtualisation, database, networking technology and services and the evolution of authentication technology such as biometrics, NFC, QR codes used in distributed and modular access control systems enable previously underserved users and operators to innovate around new use cases.

Taking into account the many technologies, this document specifies the reference model and common control functions. It gives direction for ongoing innovation and development of technology and system integration of distributed real-time access control system.

This 2nd edition of the Standard introduces new functionalities on performance management mechanisms. Performance management mechanisms allow an Access system to be evaluated for performance by using specific elements and metrics. This edition also provides a number of editorial improvements and clarifications to the text of the Standard.

NOTE In the 1st edition the title of the Standard was Access systems.

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Information technology — Distributed application platforms and services (DAPS) — Framework for distributed real-time access systems

1 Scope

This document specifies a framework for a distributed real-time Access system. It includes:

1) an ID triggered modular system architecture, the functions of the modules, the semantics of messages those modules exchange, and elements of messages;

2) the system behaviour from the time it receives an access request until the time it sends the result along with the sequence;

3) performance measurement mechanisms using a time stamping function that can be employed for the evaluation of the system.

2 Normative references

There are no normative references in this document.

3 Terms and definitions and acronyms

For the purposes of this document, the following terms, definitions and acronyms apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
Accessor
someone or something that interacts with the Access system

3.2
access-ID
identifier in an Access request

3.3
access-ID-obtained-time
time when an Access-point module obtains an access-ID

3.4
access-point-ID
identifier of an Access-point module

3.5
Access-request
request trigger of processing for access system

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3.6
Distributed real-time access system
data processing system distributed in the network which is activated by an access request and completed when the processing result accepts or denies that request within a reasonable period of time

3.7
Final-Result-Notification
notification of the final result of a transaction

3.8
function-ID
identifier of function

3.9
Policy-getter
message to request the Policy module to set the rules

3.10
Policy-setter
message to set the rules to the RED module

3.11
Processing-request
request to execute a function

3.12
Processing-response
response to a Processing-request

3.13
RED
Rule Evaluation and Dispatching

3.14
receivedTime
time when a module receives a request from another module

3.15
Retrieve-request
request to retrieve data from storage

3.16
Retrieve-response
response to a Retrieve-request

3.17
rule-ID
identifier of rules

3.18
sendingTime
time when a module sends a response or a Transaction-start-request to another module

3.19
Store-request
request to store data to storage

3.20
Store-response
response to a Store-request

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3.21
Time-stamp-Notification
notification to provide time stamp information

3.22
transaction-ID
identifier of a transaction

3.23
Transaction-start-request
request to initiate a transaction

4 Conformance

Conformant Access systems progress transactions by interpreting the applicable rules. Conformant modules implement the requests on their interfaces, the corresponding responses and time stamping as specified herein.

5 Overview

This clause is an overview of the system model and the functions of a distributed real-time Access system.

The Access system consists of 5 modules "Access-point, Policy, Processing, RED and Storage" and 4 interfaces "Access-interface, Policy-interface, Processing-interface and Storage-interface". There are also 2 external interfaces "In" and "Out".

The Access system model is shown in Figure 1.

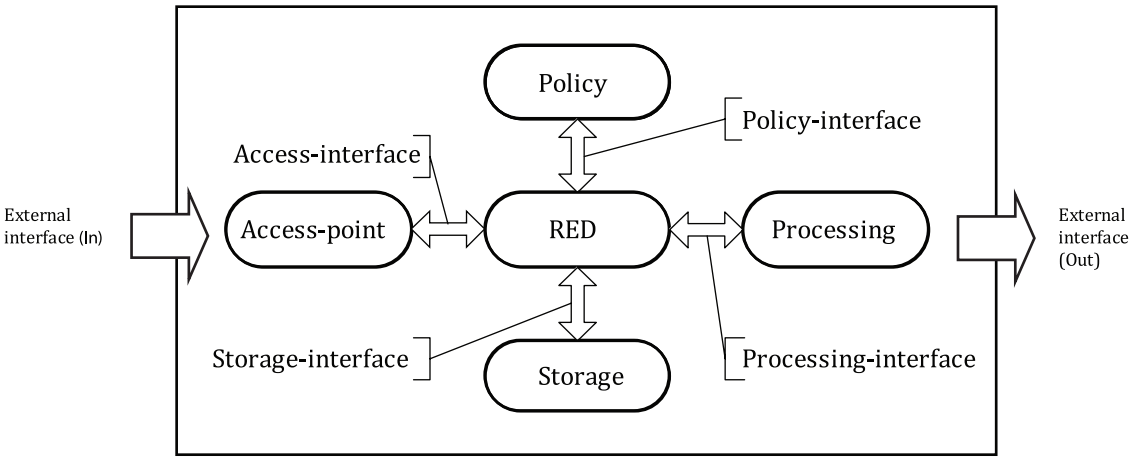

Figure 1 — Access system model

The Access system starts a transaction triggered by an Access ID which is included in Access request from the Accessor through the external interface (In). After the necessary process, the Access system completes the transaction by sending the final result to the receiver through the other external interface (Out).

The Access system has a mechanism, the time stamp function, to measure processing time for the evaluation of the Access system performance.

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6 Transaction

A transaction is a suite of functions and message exchanges to generate a final result and send it to a receiver. A transaction starts from the time an Access system receives an access request and completes after it sends the result.

When an Access-request is received by the Access-point module, a transaction proceeds to a generated state. In the generated state, the Access-point module generates a transaction-ID which identifies a transaction. The transaction_ID is created based on an activated access-ID. The Access-point module sends Transaction-start-request with the transaction-ID to the RED module.

After sending a Transaction-start-request, a transaction proceeds to an on-going state. At the on-going state, the RED module interprets the rules set by the Policy module. According to the result of the interpretation, the RED module sends request messages to the Processing or Storage module. Upon receiving a request message, the Processing module and the Storage module send response messages to the RED module. The RED module interprets the rules again. The RED module repeats the above procedure until the final result is decided based on rules and sends a final result (Final-Result-Notification) to the receiver through the external interface (Out).

After sending the final result, the transaction proceeds to a completed state. When a transaction is completed, the usage of the access-ID is also completed. An example of message sequence is shown in Annex A.

The state machine of a transaction is shown in Figure 2.

NOTE 1 access-ID is not defined in this document and is usually managed by a service provider. The life cycle and generation of an access-ID is not in the scope of this document.

NOTE 2 This behaviour of a transaction described above is for a transaction under stable condition when a response based on a request during a transaction is received within a reasonable period of time.

In the case of a system fault, such as power loss, network failure, or module malfunction when no response is received within a reasonable period of time, this document does not define any exceptional system management rules. However, the rules for providing such system failure, such as stopping a transaction, resetting the system, or making a re-access request to the Accessor, should be provided in the actual system.

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