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# Information technology — Distributed Application Platforms and Services (DAPS) — Access Systems

*Technologies de l'information — Services et plate-formes d'application distribuées — Systèmes d'accès*



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# Contents

Page

## 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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ISO/IEC 20933 was prepared by Ecma International (as ECMA-412) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

## Introduction

Technology for real-time access control is widely used for many situations such as entrance gate 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 International Standard 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.

# Information technology — Distributed Application Platforms and Services (DAPS) — Access Systems

## 1 Scope

This International Standard specifies:

1) an ID triggered modular access system, the functions of the modules and the messages they exchange, and the sequence of messages, i.e. transitions of the transaction;

2) the system responsibility from receiving an access request until sending the result. i.e. a complete transaction;

3) the responsibilities of the modules, including time stamping and responding to the requests they received; and

4) the sequence and semantics of the messages and their elements.

## 2 Conformance



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



## 3 Normative references

None.

## 4 Terms, definitions and acronyms

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

**4.1**
**ID**
Identifier

**4.2**
**RED**
Rule Evaluation and Dispatching

**4.3**
**transaction**
request for access

## 5 Model

Figure 1 illustrates the Access System structure.

The Access System has 5 modules "Access-point, Policy, Processing, RED and Storage" and 4 interfaces "Access-interface, Policy-interface, Processing-interface and Storage-interface".

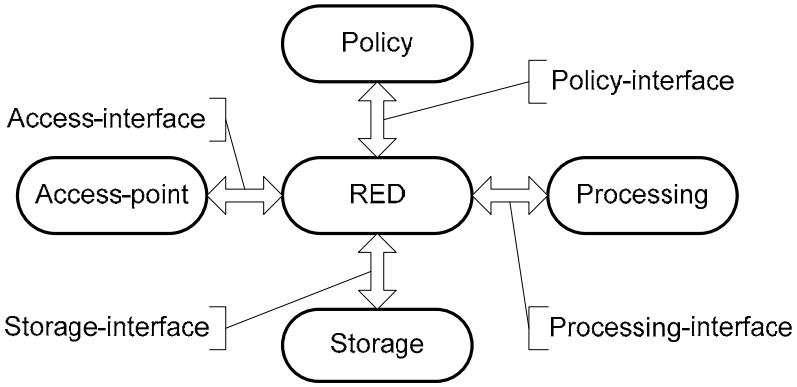


**Figure 1 — Access System**

The Access System progresses a transaction by exchanging messages between modules and decides the final result (grant or deny). A transaction starts when an Access-point module obtains Access_request and completes when the RED module sends Final_Result_Notification. Each module shall have a time stamping function. The message exchanging and the time stamping function are managed by the RED module according to rules which are set by the Policy module.



## 6 Transaction

Transaction ID identifies a transaction. Transaction ID shall consist of Access ID, Access-point ID and time at which the Access_request is obtained. Access ID is included in Access_request.



Figure 2 specifies the state machine of a transaction.

A transaction is generated at the time of Access_request acceptance by an Access-point module. After that the transaction changes to on-going state by sending a Transaction_start_request including Transaction ID from the Access-point module to the RED module.

At the on-going state, the RED module evaluates rules until final result is obtained. According to the result of the evaluation, the RED module sends a request message to Processing or Storage module and receives a response message.

When the RED module obtains the final result, it sends Final_Result_Notification and the transaction is completed.

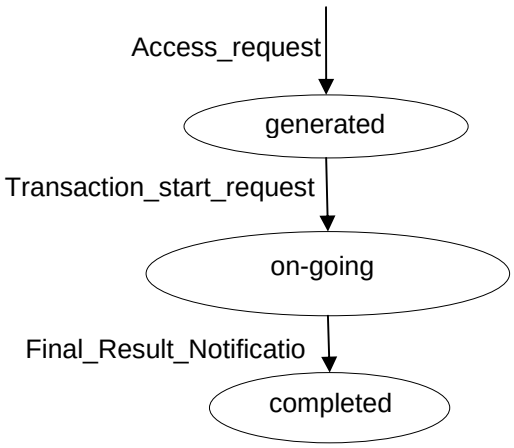


**Figure 2 — Transaction State Machine**

## 7 Time stamping function

The purpose of Time stamping function is to measure the duration of transaction and request processing.

The Access-point modules shall set the Access_ID, obtained_time in the Transaction_start_request message. For the other modules, time stamping shall be activated and deactivated through time stamping rules. Upon evaluating of the time stamping rules, the RED module shall set the TimeStampingFlag value in the requests to TRUE or FALSE according to the evaluation. Depending on the TimeStampingFlag value in the requests, modules shall either time stamp the ReceivedTime and SendingTime or exclude those elements in the corresponding response.



The RED module shall send the time stamping measurements by responding to the Time_stamp_Notification.

The RED module is able to measure following time.

1) transaction processing time

2) request processing time.

When the Time stamping function of each module is activated, the RED module shall measure the following time.

3) module processing time.

The RED module shall measure the transaction processing time by calculating the difference between the time that the RED module received Transaction_start_request and the time that Final_Result_Notification is sent.

The RED module shall measure the request processing time by recording the sending time of the request and the received time of the response, and calculating the difference between them.

Processing_response, Store_response and Retrieve_response have the information about the received time of the corresponding request and the sending time of the response itself as long as the Time stamping function is activated. By using them, the RED module is able to measure the module processing time. For example, the module processing time of the Processing module for one request from the RED module is measured by the difference between RecievedTime and SendingTime in the corresponding Processing_response.

Annex C illustrates the usage of time stamping.

# 8 Module

## 8.1 Common requirements

Modules shall have a time stamping function.

## 8.2 Policy module

The Policy module shall have the source of rules, and shall set the rules to the RED module. Each rule shall be identified by its Rule ID. The rules shall define the progress of transactions and the edition of this International Standard that the Access System modules conform with. And the rules shall identify the receiver(s) of the Final_Result_Notification and the receiver(s) of the Time_stamp_Notification.

## 8.3 Access-point module

When an Access-point module obtains an Access_request, It shall generate a Transaction_start_request and send it to the RED module.

The Access-point module shall have its own identifier as Access-point ID.

## 8.4 RED module

The RED module shall accept and hold rules that are set by the Policy module.



Rules are composed of procedure rules and branch rules, Figure 3 illustrates a procedure rule and Figure 4 illustrates a branch rule. A procedure rule determines the next execution. A branch rule selects the next rule depending on the branch condition. At least one rule is linked to Access ID.



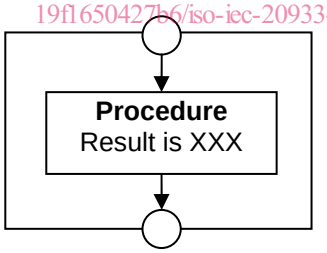


**Figure 3 — procedure rule**

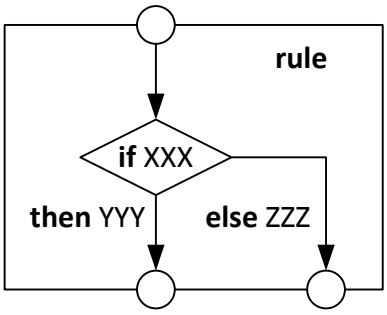


**Figure 4 — branch rule**

During a transaction, the RED module is driven by messages. When the RED module receives messages, It shall evaluate the rules. The RED module shall dispatch the request and response from one module to

another according to the rules. When the result of the transaction is settled as grant or deny, the RED module shall send the Final_Result_Notification to the receiver(s) specified in the rules.

The RED module makes a Processing_request according to the rules and sends it to the Processing module. The RED module shall receive a Processing_response corresponding to the Processing_request.

When the RED module receives a Store_request from the Processing module, it shall transfer it to the Storage module. When the RED module receives a Retrieve_request from Processing module, the RED module shall transfer it to the Storage module. When the RED module receives Store_response from the Storage module, the RED module shall transfer it to the Processing module. When the RED module receives a Retrieve_response from Storage module, it shall transfer it to the Processing module.

To manage time stamping information, the RED module shall log time when it sends and receives messages as long as the Time stamping function is activated. The RED module shall send Time_stamp_Notification to the receiver(s) specified in the rules.

### 8.5 Processing module

The Processing module shall have at least one function. Each function shall be identified by its Function ID.

When the Processing module receives a Processing_request from the RED module, it shall execute the function identified by the Function ID in the request, make Processing_response including execution result and send it to the RED module.

The Processing module may request the RED module to store and retrieve data.



### 8.6 Storage module

When the Storage module receives Store_request, it shall store data, make Store_response and send it to the RED module. When the Storage module receives Retrieve_request, it shall retrieve data, make Retrieve_response including retrieved data and send it to the RED module. Data is specified by Data_type.



The Storage module may be used for sharing information between different transactions in the same Access System or different Access System as illustrated in Annex B; Annex A is an example use case that does not use Storage module.

## 9 Message definition and Interface

### 9.1 General

This clause specifies the messages exchanged via interfaces. Each message shall include the elements defined in clause 9 and may include other elements. In this document, the messages are specified by ASN.1 expression. Encoding rules are not specified.

Requests and responses include a Transaction ID. The type of Transaction ID is:

```
TransactionID_TYPE ::= SEQUENCE {
    Access_ID                 OCTET_STRING,
    Access-point_ID           OCTET_STRING,
    Access_ID_obtained_time   GeneralizedTime
}
```