

INTERNATIONAL STANDARD

ISO/IEC 10166-1

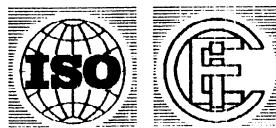
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Information technology — Text and office systems — Document Filing and Retrieval (DFR) —

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Part 1:
Abstract service definition and procedures
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*Technologies de l'information — Bureautique — Classement et
récupération de documents*
Partie 1: Procédures et définition de service abstrait



Reference number
ISO/IEC 10166-1:1991(E)

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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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10166-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 10166 consists of the following parts, under the general title *Information technology — Text and office systems — Document Filing and Retrieval (DFR)*:

— *Part 1: Abstract service definition and procedures*

— *Part 2: Protocol specification* [ISO/IEC 10166-1:1991](https://standards.iteh.ai/catalog/standards/sist/73df14e0-140f-44a3-8c73-)

Annexes B, C, D and E form an integral part of this part of ISO/IEC 10166.

Annexes A and F are for information only.

Introduction

The Document Filing and Retrieval (DFR) application provides the capability for large capacity non-volatile document storage to multiple users in a distributed office system. This facility is particularly useful in an environment where a large population of desktop workstations that have limited storage capacity require access to large expensive storage devices.

Documents have associated attributes, to facilitate and control retrieval. Use of these attributes according to given algorithms will enable documents in the document storage to be browsed, retrieved, managed and deleted in a variety of ways. Access control protects documents from unauthorized operations. Documents can be stored in nested groups. References to documents and groups can be created and also stored in nested groups. With specific attributes a document can be designated a version of another document. Single documents, references or groups can be moved from one group into another group. Enumeration of groups, identification by other attributes besides names, identification by conditions over attributes, search for documents meeting search criteria, concurrent access to the same document, reference or group of documents are further functions provided by this standard for the user requirements in an office environment.

The Document Filing and Retrieval application is one of a series of International Standards defining applications needed in the area of office automation, as described in the Distributed-office-application model [ISO/IEC 10031-1]. ISO/IEC 10166 provides the functionality of document filing and retrieval which directly supports the user in an office environment. Thus Document Filing and Retrieval is not a general standardization of all types of filestores as they may exist in computing systems. Rather it concentrates on the filing and retrieval of documents, as related to the task of office work. Document Filing and Retrieval aims only at standardizing the model of such document stores and the associated services and protocols defining the principles of how clients can access such document store servers, where clients and servers reside on different nodes of a distributed office system.

The Document Filing and Retrieval application is a distributed application located in the Application Layer of the Reference Model for Open Systems Interconnection (see ISO 7498).

It should be noted that a Document Filing and Retrieval application will provide storage for an open-ended set of document types. The content of the documents stored is transparent to the Document Filing and Retrieval server.

NOTES

1 ISO/IEC 10166 deals with individual Document Filing and Retrieval servers, it defines the Document Filing and Retrieval (DFR-) protocol. This International Standard governs the interactions of a Document Filing and Retrieval client and a single Document Filing and Retrieval server. Future standardization will consider the facilities of a Distributed Filing and Retrieval server system and the need for inter-server protocols and a DFR administration protocol. It is intended that the results of the initial standardization work be extensible and support this future work.

2 ISO/IEC 10166 does not presently include administration aspects of the Document Filing and Retrieval abstract-service. For the time being these aspects are left to local implementation, although they are candidates for future standardization.

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Information technology — Text and office systems — Document Filing and Retrieval (DFR) — Part 1: Abstract service definition and procedures

Section 1: General

1 Scope

This part of ISO/IEC 10166 specifies the Document Filing and Retrieval Abstract Service that enables a user to communicate with a remote Document Filing and Retrieval server (DFR-Server) in order to access a remote document store.

This part of ISO/IEC 10166

- specifies a client-server type model in accordance with the Distributed-Office-Application Model [ISO/IEC 10031-1];
- specifies functions and services provided by Document Filing and Retrieval servers;
- specifies a specific Document Filing and Retrieval model for managing documents and groups of documents;
- specifies the Document Filing and Retrieval Abstract Service using the principles established by the Abstract Service Definition Conventions (ISO/IEC 10021-3);
- specifies the usage of other services.

ISO/IEC 10166 serves the following important fields of application:

- supports large capacity document storage for use by multiple users in a distributed system;
- supports ordered filing and multi-key retrieval of documents;
- supports structured organization of groups of documents;
- supports storage of an open-ended number of different document types;
- supports referencing documents and groups ;
- supports filing and referencing of documents outside of the document storage (for example, non-electronic hard copy documents);
- supports the association of attributes to documents, groups, references and search result lists independent of the content;
- supports storage, retrieval and deletion of documents of the document store whatever their content;
- supports searching for, ordering, retrieval, and deletion of single documents or groups of documents using document attributes;
- supports management of different versions of a document, including such concepts as "previous version", "next version" and "last version";
- supports protection against unauthorized storage and retrieval of documents;
- supports the control of concurrent access to DFR objects.

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2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10166. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 10166 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

- ISO 7498:1984, *Information processing systems - Open Systems Interconnection - Basic Reference Model.*
- ISO/IEC 7498-2:1989, *Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 2: Security Architecture.*
- ISO 8613-1:1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format - Part 1: Introduction and general principles.*
- ISO 8613-4:1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format - Part 4: Document profile.*
- ISO 8613-5:1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format - Part 5: Office Document Interchange Format (ODIF).*
- ISO 8649:1988, *Information processing systems - Open Systems Interconnection - Service definition for the Association Control Service Element.*
- ISO 8650:1988, *Information processing systems - Open Systems Interconnection - Protocol specification for the Association Control Service Element.*
- ISO/IEC 8824:1990, *Information technology - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1).*
- ISO/IEC 8825:1990, *Information technology - Open Systems Interconnection - Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*
- ISO/IEC 9066-1:1989, *Information processing systems - Text communication - Reliable Transfer - Part 1: Model and service definition.*
- ISO/IEC 9066-2:1989, *Information processing systems - Text communication - Reliable Transfer - Part 2: Protocol specification.*
- ISO/IEC 9072-1:1989, *Information processing systems - Text communication - Remote Operations - Part 1: Model, notation and service definition.*
- ISO/IEC 9072-2:1989, *Information processing systems - Text communication - Remote Operations - Part 2: Protocol specification.*
- ISO/IEC 9594-1:1990, *Information technology - Open Systems Interconnection - The Directory - Part 1: Overview of concepts, models and services.*

- ISO/IEC 9594-2:1990, *Information technology - Open Systems Interconnection - The Directory - Part 2: Models.*
- ISO/IEC 9594-3:1990, *Information technology - Open Systems Interconnection - The Directory - Part 3: Abstract service definition.*
- ISO/IEC 10021-3:1990, *Information technology - Text communication - Message Oriented Text Interchange Systems (MOTIS) - Part 3: Abstract service definition conventions.*
- ISO/IEC 10031-1:1991, *Information technology - Text and office systems - Distributed-office-applications model - Part 1: General model.*
- ISO/IEC 10031-2:1991, *Information technology - Text and office systems - Distributed-office-applications model - Part 2: Distinguished-object-reference and associated procedures.*
- ISO/IEC 10166-2:1991, *Information technology - Text and office systems - Document Filing and Retrieval (DFR) - Part 2: Protocol specification.*

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3 Definitions

3.1 General Terminology

3.1.1 The following terms are used with the meanings defined in ISO 7498:

Application Layer
application-entity
Presentation Layer
protocol
service definition

3.1.2 The following terms are used with the meanings defined in ISO/IEC 7498-2:

access control
authentication
authorization
credentials
security policy

3.1.3 The following terms are used with the meanings defined in ISO 8824:

macro

3.1.4 The following terms are used with the meanings defined in ISO 8649:

application context
Association Control Service Element

3.1.5 The following terms are used with the meanings defined in ISO/IEC 9066-1:

Reliable Transfer Service Element

3.1.6 The following terms are used with the meanings defined in ISO/IEC 9072-1:

Remote Operations: bind-operation, unbind-operation, operation
Remote Operation Service Element

3.1.7 The following terms are used with the meanings defined in ISO/IEC 10031:

accessee
accessor
consume-operation
distributed-office-application
data-object-value
distinguished-object-reference
document
produce-operation
privilege-attributes
referenced-object-access
ROA-operation
ROA-protocol

security-attributes
 security-object
 security-subject
 user

3.2 Specific Terminology

For the purpose of ISO/IEC 10166 the following definitions apply:

- 3.2.1 ancestor:** The *parent* of a *DFR-object* and, recursively, any ancestor of the former, including the *DFR-root-group*.
- 3.2.2 attribute-type:** That component of an attribute which indicates the type of information given by the *attribute-value*.
- 3.2.3 attribute-value:** A particular instance of that class of information indicated by an *attribute-type*.
- 3.2.4 attribute-value-assertion:** A proposition, which may be true, false, or undefined, concerning the values of *DFR-attributes* in a *DFR-entry*.
- 3.2.5 conceptual-document:** A set of *DFR-documents*, considered to be "different versions of the same document".
- 3.2.6 Control-Attribute-Package:** A collection of attributes used to control access to a *DFR-object*.
- 3.2.7 descendant:** For a given *DFR-group*, any of the *DFR-group-members*, and recursively, any descendant thereof.
- 3.2.8 DFR-attribute:** A data item that identifies a *DFR-object*, describes its *DFR-content*, helps control access to it, or in some other way is associated with the *DFR-object*.
- 3.2.9 DFR-basic-attribute-set:** The set of *DFR-attributes*, that will mandatorily be supported by every *DFR-server*.
- 3.2.10 DFR-content:** The prime information content of a *DFR-object*. The nature of the *DFR-content* depends on the *DFR-object-class* of the *DFR-object*.
- 3.2.11 DFR-document:** A structured amount of information that can be filed, retrieved, and interchanged consisting of a *DFR-document-content* and associated *DFR-attributes*.
- 3.2.12 DFR-document-content:** A body of information actually contained within the document, e.g. an office document, and not interpreted by DFR.
- 3.2.13 DFR-document-store:** A named collection of *DFR-objects* which is logically arranged in a hierarchical structure.
- 3.2.14 DFR-entry:** A *DFR-object* together with additional *DFR-attributes* describing its hierarchical place in the *DFR-document-store*.
- 3.2.15 DFR-extension-attribute-set:** The set of *DFR-Attributes* (beyond the *DFR-basic-attribute-set*) which are optionally supported by some *DFR-server*.

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- 3.2.16 DFR-group:** A collection of *DFR-objects* in a *DFR-document-store* which are called *DFR-group-members* of the *DFR-group*. A *DFR-group* consists of *DFR-attributes* which are associated with the *DFR-group* as a whole and a *DFR-group-content*.
- 3.2.17 DFR-group-content:** A sequence of UPIs identifying all *DFR-group-members* of the *DFR-group*.
- 3.2.18 DFR-group-member:** A *DFR-object* which is identified in the *DFR-content* of its parent *DFR-group*.
- 3.2.19 DFR-membership-criteria:** A *DFR-attribute* of a *DFR-group* establishing constraints on *DFR-group* membership based on attribute values.
- 3.2.20 DFR-object:** One of a set of information entities managed by a *DFR-server*. *DFR-objects* defined are *DFR-documents*, *DFR-groups*, *DFR-references* and *DFR-search-result-lists*.
- 3.2.21 DFR-object-class:** A *DFR-attribute* indicating the class of a *DFR-object* (*DFR-document*, *DFR-group*, *DFR-reference* or *DFR-search-result-list*).
- 3.2.22 DFR-object-tree:** The *DFR-object-tree* of a *DFR-group* is the tree formed by this *DFR-group* and all its *descendants*.
- 3.2.23 DFR-pathname:** A *DFR-attribute* used to help identify a *DFR-object* in a *DFR-document-store*. The *DFR-pathname* is formed by a sequence of values of the *DFR-title* attribute of all *ancestors* of the *DFR-object* to be identified with the *DFR-title* of the *DFR-object* itself being the last in the sequence.
- 3.2.24 DFR-proper-group:** Any *DFR-group* other than the *DFR-root-group*.
- 3.2.25 DFR-reference:** A *DFR-object* which acts as a link to another *DFR-object*, which is called the *referent* of the *DFR-reference*.
- 3.2.26 DFR-reference-content:** The information stored in a *DFR-reference* for the purpose of identifying the *referent*.
- 3.2.27 DFR-root-group:** The distinguished *DFR-group* within a *DFR-document-store* having no *Ancestor* and whose *DFR-object-tree* encompasses all *DFR-objects* in the *DFR-document-store*.
- 3.2.28 DFR-search-criteria:** A *filter*.
- 3.2.29 DFR-search-result-list:** A *DFR-object* which has information about a set of *DFR-objects* satisfying specified search criteria.
- 3.2.30 DFR-search-result-list-content:** Information about the result of a *DFR Search* abstract operation.
- 3.2.31 DFR-server:** That part of the *DFR* application which supplies *Document* filing and retrieval services.
- 3.2.32 DFR-Unique-Permanent-Identifier:** A *DFR-attribute* assigned to every *DFR-object* by the *DFR-server* to identify unambiguously a *DFR-object* within the *DFR-document-store*.

- 3.2.33 DFR-user:** The consumer of services supplied by a *DFR-server*. At any time it is acting for a security subject and takes on the privileges of that security subject.
- 3.2.34 filter:** A construct specifying assertions about the presence or value of *DFR-attributes*, it is the same as in Directory (ISO/IEC 9594).
- 3.2.35 member:** see *DFR-group-member*.
- 3.2.36 owner:** A security subject, with owner access right to a specific *DFR-object*.
- 3.2.37 parent:** Each *DFR-object*, except the *DFR-root-group*, is a *DFR-group-member* of a *DFR-group*, which is termed its *parent*.
- 3.2.38 Privilege-Attribute-Certificate:** A certified set of access privileges that can be presented by a *DFR-user* to establish access rights.
- 3.2.39 referent:** That *DFR-Object* to which a *DFR-Reference* refers.
- 3.2.40 version:** *DFR-document* specified by the user as a derivation of one or more other *DFR-documents* by means of specific *DFR-attributes*.

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4 Abbreviations

AE	application-entity
ASN.1	Abstract Syntax Notation One
CAP	Control-Attribute-Package
DFR	Document filing and retrieval
DOAM	Distributed-office-application model
DOR	Distinguished-object-reference
DS	DFR-Document-Store
PAC	Privilege-Attribute-Certificate
QoS	Quality of Service
ROA	Referenced-object-access
ROSE	Remote Operations Service Element
UPI	DFR-Unique-Permanent-Identifier

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5 Conventions

This part of ISO/IEC 10166 uses the description conventions listed in the following clauses.

5.1 Conventions for Abstract-services

This part of ISO/IEC 10166 uses the following ASN.1-based descriptive conventions for the indicated purposes:

- a) ASN.1 itself, to specify the abstract-syntax of information-objects and their components, common data-types, and state-variables.
- b) The ASN.1 OBJECT and PORT macros and associated abstract-service definition conventions of ISO/IEC 10021-3, to specify the DFR port.
- c) The ASN.1 ABSTRACT-BIND, ABSTRACT-UNBIND, ABSTRACT-OPERATION, and ABSTRACT-ERROR macros of ISO/IEC 10021-3, to specify the DFR abstract-service.
- d) The ASN.1 ATTRIBUTE MACRO and ATTRIBUTE SYNTAX MACRO from ISO/IEC 9594-2, to specify attributes and attribute syntaxes.

NOTE - ASN.1 specifications in this International Standard make full use of ISO 8824:1990 features, especially such syntactical constructs as "WITH COMPONENTS" (subtyping of sequences, sets and choices). All specifications are written using "IMPLICIT TAGS" convention, which means systematic omission, at the time of ASN.1 encoding, of all unnecessary "nested" tags, especially those "recovered" by context-specific ones.

The DFR as a ROSE-based International Standard does not exploit the Presentation Layer facilities for coping with difference between the local encoding and local syntaxes of each open system (see the use of EXTERNAL in 6.3.2.1).

5.2 Conventions for Text in General

For the terms used in this part of ISO/IEC 10166 the following rules apply:

- a) Single terms beginning with a capital letter and compound terms (chained by hyphens and each word also beginning with a capital letter), are defined terms. For the definitions refer to clause 3 (if it is an attribute see also clause 9); exceptions are titles of other International Standards which also begin with capital letters, see clause 2.
- b) Single terms and compound terms (written together without hyphens) which are rendered in **bold** are either ASN.1-specified data-type names or their component identifiers. For the definitions refer to the annexes or to the corresponding sections in the main text.

The following characters are used in this part of ISO/IEC 10166 to indicate whether a parameter, an attribute or other items described are mandatory, optional or conditional. That is:

- M (Mandatory) stands for the condition that an item shall be present in any case (shall be supported by DFR);

- O (Optional) stands for the condition that an item shall be present at the discretion of a DFR entity;
- C (Conditional) stands for the condition that an item shall be present under some circumstances defined in this part of ISO/IEC 10166.

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