INTERNATIONAL STANDARD

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Information technology — Open Systems Interconnection — Distributed Transaction Processing —

Part 6:
Unstructured Data Transfer

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Traitement transactionnel réparti —

Partie 6: Transfert de données non structuré

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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 10026-6 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 21, *Open systems interconnection, data management and open distributed processing*.

ISO/IEC 10026 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Distributed Transaction Processing*:

— *Part 1: OSI TP Model*

— *Part 2: OSI TP Service*

— *Part 3: Protocol specification*

— *Part 4: Protocol Implementation Conformance Statement (PICS) proforma*

— *Part 5: Application context proforma and guidelines when using OSI TP*

— *Part 6: Unstructured Data Transfer*

Annex A forms an integral part of this part of ISO/IEC 10026. Annexes B and C are for information only.

Introduction

ISO/IEC 10026 is one of a set of standards produced to facilitate the interconnection of computer systems. It is related to other International Standards in the set as defined by the Reference Model for Open Systems Interconnection (ISO 7498). The Reference Model subdivides the area of standardization for interconnection into a series of layers of specification, each of manageable size.

The aim of Open Systems Interconnection is to allow, with a minimum of technical agreement outside the interconnection standards, the interconnection of computer systems

a) from different manufacturers;

b) under different management;

c) of different levels of complexity; and

d) of different technologies.

ISO/IEC 10026-1, -2 and -3 define the OSI TP Model, OSI TP Service and OSI TP Protocol available within the Application Layer of the OSI Reference Model. ISO/IEC 10026-4 is the OSI TP PICS and ISO/IEC 10026-5 defines the Application Context Proforma and Guidelines When Using OSI TP.

This part of ISO/IEC 10026 defines a model for unstructured data transfer within the OSI TP environment. UDT operates within the constraints specified for U-ASEs in ISO/IEC 10026. UDT is not suitable for use outside the OSI TP environment.

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Information technology — Open Systems Interconnection — Distributed Transaction Processing —

Part 6:
Unstructured Data Transfer

1 Scope

This part of ISO/IEC 10026 provides a model for the transfer of application data for transaction processing applications whose application-specific protocol has not been standardized within the OSI environment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10026. 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 10026 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid international Standards.

ISO/IEC 9646-1:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts.*

ISO/IEC 9646-2:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 2: Abstract Test Suite specification.*

ISO/IEC 9646-3:1992, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework — Part 3: The Tree and Tabular Combined Notation (TTCN).*

ISO/IEC 9646-4:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 4: Test realization.*

ISO/IEC 9646-5:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 5: Requirements on test laboratories and clients for the conformance assessment process.*

ISO/IEC 9834-1:1993 *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities — Part 1: General procedures.*

ISO/IEC 10026-1:1992, *Information technology — Open Systems Interconnection — Distributed Transaction Processing — Part 1: OSI TP Model.*

ISO/IEC 10026-2:1992, *Information technology — Open Systems Interconnection — Distributed Transaction Processing — Part 2: OSI TP Service.*

ISO/IEC 10026-3:1992, *Information technology — Open Systems Interconnection — Distributed Transaction Processing — Part 3: Protocol specification.*

ISO/IEC 10731:1994, *Information technology — Open Systems Interconnection — Basic Reference Model — Conventions for the definition of OSI services.*

3 Definitions

For the purposes of this part of ISO/IEC 10026, the definitions given in ISO/IEC 10026-1 and the following definition apply:

3.1 non-OSI-standard: A specification not formally approved by the recognized world-wide standardization bodies for OSI.

4 Abbreviations

Abbreviations used in this part of ISO/IEC 10026 are defined in ISO/IEC 10026-1, except the following:

UD	Unstructured Data
UDT	Unstructured Data Transfer

5 Conventions

This part of ISO/IEC 10026 uses the conventions defined in ISO/IEC 10731.

6 Unstructured Data Transfer in OSI TP

6.1 Purpose

This part of ISO/IEC 10026 defines two approaches for transferring application data which allow non-OSI-standardized applications to operate in the OSI TP environment. UDT, thus, provides for the rapid migration of networked transaction programs which were originally written for operation in networks without facilities similar to those of the OSI Application and Presentation Layers (i.e., for interoperation between heterogeneous systems).

It should be emphasized that the second form of UDT described in 6.2 ('restricted UDT') should only be used in specialized circumstances, i.e., where there is a need to exchange APDUs of existing applications in an OSI TP environment. Adopting this approach will prevent applications from exploiting the important features of the Presentation Layer.

6.2 Model for UDT

In order to transfer data between application programs (TPSUIs) in an OSI TP environment, the applications must make use of the facilities of the Presentation Service. This part of ISO/IEC 10026 does not define a service to offer Presentation facilities to the application; rather it assumes that the necessary elements of the Presentation Service will be made available to the application.

NOTE — In a real implementation, it is assumed that the API being provided for application communication (e.g. for 'peer-to-peer' operation) would include a service that would be mapped directly to the relevant Presentation Layer facilities.

In order to make correct use of the Presentation Layer, the application program must specify what abstract and transfer syntaxes are to be used. UDT assumes that cooperating TPSUIs exchanging the APDUs of a non-standardized protocol will have *a priori* knowledge of the syntax and semantics of the protocol APDUs, thus enabling the TPSUIs to correctly generate and interpret the data being exchanged. The abstract and transfer syntaxes being used must be registered with an OSI registration authority operating under the procedures of ISO/IEC 9834-1. The unambiguous names resulting from this registration are used to denote the application protocol's syntaxes during Presentation negotiation.

It is also necessary that the name of any application context being used be similarly registered. This registered application context name is used by ACSE; it implies the application layer semantics and mappings of all the application protocols that may be used during that instance of communication, including the one (or more) using the UDT approach.

UDT may be used in two ways as described below.

6.2.1 Using UDT with registered syntaxes

The recommended approach is to register the application protocol's abstract and transfer syntaxes, so that the resulting names may be used in transferring APDUs using Presentation Services. (Normally, the P-Data service will be used to transfer APDUs, although other Presentation services may also be used, so long as this is done in a manner which will not interfere with TP's use of the Presentation Layer.)

Typically, it will also be necessary to specify an application context name. Annex B contains an application context proforma that may be completed to yield a complete application context definition, for registration under the procedures of ISO/IEC 9834-1.

6.2.2 Using UDT with *a priori* knowledge of application syntax

In the case where it is not convenient to register a non-OSI-standardized application protocol's syntaxes, it may be possible to present application data values as sequences of octets. In support of this approach, annex A provides generic abstract and transfer syntax names (together with an application context name) which can be used to support the mapping of any application protocol's abstract and transfer syntax onto such a sequence of octets.

In other words, these generic abstract and transfer syntax names can be used to provide a means whereby APDUs may be transferred without the need to register or more specifically define the application protocol. It must be emphasized, however, that adopting this approach requires that cooperating TPSUIs have *a priori* knowledge of the syntax, semantics, and mapping of the APDUs; this is required if the TPSUIs are to correctly generate and interpret both the syntax and semantics of the messages thus exchanged using the octet string mapping described in annex A.

7 UDT ASE Specification

7.1 Overview

The UDT ASE is an essentially null ASE that acts as the User-ASE in the TP model when the application protocol requires no additional protocol support from the User-ASE within the TPPM other than the specification of the mapping to the Presentation service.

The UDT ASE has one service, UD-TRANSFER that models the transmission of data between the TPSUIs on a TP dialogue. The UD-TRANSFER service is subject to the constraints specified for the generic TP-DATA specified in ISO/IEC 10026-2 and 3. The service relates to a particular dialogue.

7.2 Primitives and their parameters

Primitive names:
UD-TRANSFER request
UD-TRANSFER indication

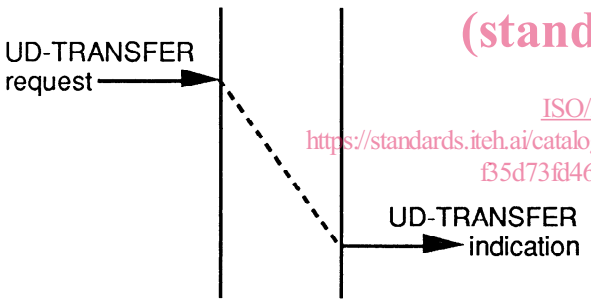
Parameter \ UD-TRANSFER	req	ind
User-data	M	M(=)

Key:
M : presence of the parameter is mandatory.
= : indicates that a parameter value is semantically equal to the value of the parameter of the preceding primitive in the table.

7.2.1 User-data is a parameter that carries the non-OSI-standardized protocol to be exchanged between cooperating peer TPSUIs.

7.3 Sequence of primitives

The sequence of primitives for the UD-TRANSFER service is defined by the following time sequence diagram:



7.4 Procedures

When a TPSUI wishes to transmit an APDU, it issues a UD-Transfer request with the APDU as User-Data; this UD-Transfer request is mapped directly to the user data of an appropriate Presentation or TP service primitive, with the APDU being mapped according to the transfer syntax being used. The use made of Presentation services must be consistent with OSI TP's use of these services, and is constrained by the SACF and MACF rules of TP. The use of Presentation may be more precisely determined by the application context definition which is in use, or by bilateral agreement.

The user data parameter of the UD-Transfer request (i.e., the application data being transmitted) will be sent as one or more presentation data values in the UDT presentation context. These may or may not be concatenated according to the SACF rules in force.

On receipt, presentation data values received in a UDT presentation context are mapped to the user data of a UD-Transfer indication.

It is the responsibility of the specifications of the abstract syntax, transfer syntax and application context (together) to ensure that the user data on a single UD-Transfer indication has the same value as the user data on the corresponding UD-Transfer request.

7.5 Collisions

A collision of a UD-TRANSFER request and indication are not treated as a collision but are each handled separately.

7.6 Disruption

The UD-TRANSFER service does not disrupt any other service. The UD-TRANSFER service is disrupted by any service that disrupts the underlying service (i.e., P-DATA service or which ever other service is used). If the UD-TRANSFER service is used with OSI TP as the actual replacement for the TP-DATA service, then the disruption and purging rules given in ISO/IEC 10026-2 and -3 for the TP-DATA service apply.

NOTES

1. In particular, abort and resynchronization services may disrupt the UD-TRANSFER.

2. If the UD-TRANSFER service is mapped to another service, such as TP-BEGIN-DIALOGUE or TP-ABORT, then the disruption rules for that service apply.

8 Conformance

To conform to this part of ISO/IEC 10026, a system shall implement the procedures specified in clause 7 or, in the case of UDT with a priori knowledge of Application Syntax, the conformance statement in A.2.11 shall apply.

Annex A
(normative)

Unstructured data transfer — Procedures, abstract and transfer syntaxes, and application context for octet string mapping

This annex contains the procedures, abstract and transfer syntax names, and a full application context which apply when a non-ISO-standardized application protocol is transferred as the value of an octet string (with a bilateral agreement between communicating TPSUIs). See 6.2.2.

A.1 Procedures

These procedures apply only when the application APDUs are transferred as a sequence of octets.

A.1.1 Receiving a UD-TRANSFER request

Upon receipt of a UD-TRANSFER request, the application data contained in the user-data field is mapped to a single pdv (to ensure that all the application data is transmitted as a whole) for transmission (using the transfer syntax defined in A.1.4) according to the mapping rules in A.2.8.1.4.

NOTE — these procedures only apply to the UD-TRANSFER service, not to other services defined in ISO/IEC 10026-3.

A.1.2 Receiving application data

Upon receipt of a single presentation data value which is a presentation context for restricted UDT, a UD-Transfer indication is generated whose user-data is mapped from the received pdv.

A.1.3 Abstract syntax name

The OBJECT IDENTIFIER

{iso(1) standard(0) tp(10026) udt(6) generic-abstract-syntax(1) version(1)}

can be used as an abstract syntax name for any application protocol whose detailed abstract syntax is defined elsewhere and is known *a priori* to the communicating TPSUIs. This name is registered with this part of ISO/IEC 10026.

A.1.4 Transfer syntax name

The OBJECT IDENTIFIER

{joint-iso-ccitt asn1(1) basic-encoding(1)}

is used as the transfer syntax name for the transfer syntax formed by taking an ordered sequence of octets (which is the representation of a value of an abstract syntax identified by the OBJECT IDENTIFIER in A.1.3, encoded in a manner that is also known *a priori* to the communicating TPSUIs) as the value of an ASN.1 type OCTET STRING and encoding this according to the Basic Encoding Rules, with the restriction that the primitive encoding shall be used. A single pdv shall be treated as a separate and complete value of the type ASN.1 OCTET STRING.

NOTE — The effect of this is that the sequence of octets passed from the sending TPSUI is prefixed with the tag for OCTET STRING and a length field, and is treated as the "single-ASN.1-type" of the "presentation-data-values" CHOICE by the presentation protocol.

A.2 Application Context

This clause contains the full application context for use when application APDUs are transferred as a sequence of octets as defined by the procedures in this annex.

A.2.1 Application context name

The OBJECT IDENTIFIER for this application context is

{iso(1) standard(0) tp(10026) udt(6) application-context(2)}

This application context supports the serial execution of both application and provider supported transactions over an association. This name is registered with this part of ISO/IEC 10026.

A.2.2 Purpose and scope

The purpose of this application context is to provide the TPSUIs participating in a TP dialogue with an environment for exchanging application data by transferring it as a sequence of octets. A bilateral agreement will be required between the TPSUIs as to the syntax and semantics of the application data.

This application context is for the use of UDT both with and without the commit functional unit.

This application context also supports recovery using a channel when a failure occurs.

A.2.3 Referenced standards

This application context definition references in whole or in part the following specifications:

ISO 8649:1988[1], *Information processing systems - Open Systems Interconnection - Service definition for the Association Control Service Element.*

ISO 8650:1988[1], *Information processing systems - Open Systems Interconnection - Protocol specification for the Association Control Service Element.*

ISO/IEC 9804:1994, *Information technology - Open Systems Interconnection - Service definition for the commitment, concurrency and recovery service element.*

ISO/IEC 9805-1:1994, *Information technology - Open Systems Interconnection - Protocol specification for the commitment, concurrency and recovery service element: Protocol Specification.*

ISO/IEC 10026-1: 1992, *Information technology - Open Systems Interconnection - Distributed Transaction Processing - Part 1: OSI TP Model.*

ISO/IEC 10026-2: 1992, *Information technology - Open Systems Interconnection - Distributed Transaction Processing - Part 2: OSI TP Service.*

ISO/IEC 10026-3: 1992, *Information technology - Open Systems Interconnection - Distributed Transaction Processing - Part 3: Protocol specification.*

ISO/IEC 10026-5:—[2], *Information technology - Open Systems Interconnection - Distributed transaction processing - Part 5: Application context proforma and guidelines when using OSI TP.*

A.2.4 Referenced application contexts

This application context is based on the Application Context Proforma and Guidelines When Using OSI TP, ISO/IEC 10026-5.

A.2.5 Component ASEs and ASOs

The following ASEs shall be contained in this application context:

ACSE
TP-ASE
CCR (optional, included only if commit functional unit required)
UDT

A.2.5.1 Association Control Service Element (ACSE)

A.2.5.1.1 References

ISO/IEC 8650: 1988 and ISO/IEC 8650 Technical Corrigendum 1; see A.2.3.

A.2.5.1.2 Version number

Version 1 of the ACSE protocol shall be used.

A.2.5.1.3 Brief description

ACSE is used to establish and terminate associations. The ACSE functions are not exercised directly by UDT or through the TP service, but are exercised by association management facilities within the TP service provider.

A.2.5.2 Distributed Transaction Processing ASE (TP-ASE)

A.2.5.2.1 Reference

ISO/IEC 10026-3: 1992, clause 9; see A.2.3.

A.2.5.2.2 Version number

Version 1 of the OSI TP protocol shall be used.

A.2.5.2.3 Brief description

OSI TP provides communications mechanisms for the support of processing transactions across two or more separate systems.

1) Currently under revision.
2) To be published.