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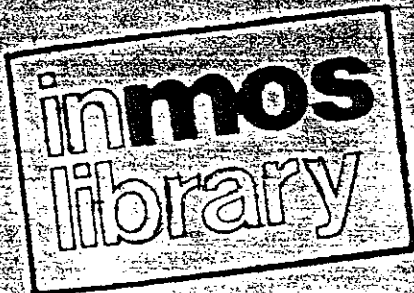
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Draft for Development

Open Systems Interconnection
service conventions (ISO/DP 8509)



British Standards Institution

National foreword

This Draft for Development has been prepared under the direction of the Office and Information Standards Committee.

The primary objective of this Draft for Development is to give advance guidance to product and systems designers concerned with service conventions of the Basic Reference Model of Open Systems Interconnection (OSI).

The text of this Draft for Development is identical with the second Draft Proposal 8509 which is issued by the International Organization for Standardization (ISO).

For ease of reproduction the ISO text has been reproduced unchanged.

The UK is actively participating through BSI Technical Committee OIS/121 in the development of the ISO Draft Proposal.

Sub-committee ISO/TC 97/SC 21, Information Retrieval, Transfer and Management for Open Systems Interconnection, of the International Organization for Standardization has resolved that ISO DP 8509 will no longer be progressed to an International Standard, but that it will become a Technical Report Type 2. The first draft of this Technical Report is being prepared on the basis of the comments accompanying the vote on the Second Draft Proposal. The text of this Draft will be revised when the draft Technical Report is issued for ballot to members of ISO/TC 97/SC 21.

The conventions specified in this Draft for Development are not identical to those used in the Drafts for Development for the session service (DD 111), the transport service (DD 115) and some of those relating to the network layer (see national appendix A) which are currently being prepared as International Standards. The differences, however, are such that this Draft for Development can be used as a guide to the conventions used in the service standards.

For information, a list of published British Standards and Drafts for Development (together with those scheduled for publication at the time of publication of this Draft for Development) for OSI, data communications and computer graphics is attached as national appendix A. Press releases for new OSI, data communications and computer graphics British Standard publications will be issued to the computing press, and details of all new publications will be recorded in full in *BSI News*.

Terminology and conventions. The text of the Draft Proposal has been approved as suitable for publication as a Draft for Development without deviation. Some terminology and certain conventions are not identical with those used in Drafts for Development; attention is drawn especially to the following.

Wherever the words 'International Standard' appear, referring to this Draft for Development, they should be read as 'Draft for Development'.

Wherever page numbers are quoted, they are ISO page numbers.

Cross-reference

International standard	Corresponding British Standard
ISO 7498-1984	BS 6568 : 1984 Description of basic reference model for open systems interconnection (Identical)

1. SCOPE

This International Standard establishes definition of terms and conventions for reference by standards defining the connection-oriented (N)-services provided by the Reference Model for Open Systems Interconnection. In particular, it is concerned with conventions relating to a single connection with a layer of the Reference Model.

Note : The scope of this Standard has been deliberately restricted to meet a specific urgent need for the Network, Transport and Session layers. Conventions for the other types of (N)-service, and wider issues of the underlying semantic model for (N)-services are the subject of further study, which will result in an addendum to the Reference Model.

2. REFERENCE

ISO 7498 - Information processing systems - Open Systems Interconnection - Basic Reference Model

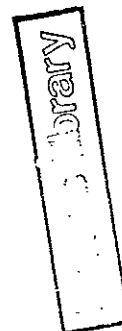
3. DEFINITIONS

3.1 This International Standard builds on the concepts developed in and makes use of the following terms defined in that Standard :

- a) (N) layer ;
- b) (N) service ;
- c) (N) entity ;
- d) (N) service-access-point ;
- e) (N) service-access-point-address.

Note : The term "service-access-point" is used when describing the relationship between primitives associated with a single connection. Further study is required to include the concept of connection endpoints in this description.

3.2 For the purpose of this International Standard, the following definitions also apply :



[ISO page 2]

- 3.2.1 service-user : An abstract representation of the totality of those entities in a single system that make use of a service through a single access-point.
- 3.2.2 service-provider : An abstract machine which models the behaviour of the totality of the entities providing the service, as viewed by the user.
- 3.2.3 service primitive ; primitive : An abstract, implementation independent interaction between a service-user and the service-provider.
- 3.2.4 request (primitive) : A primitive issued by a service-user to invoke some procedure.
- 3.2.5 indication (primitive) : A primitive issued by a service-provider either :
- a) to invoke some procedure ; or
 - b) to indicate that a procedure has been invoked by the service-user at the peer service-access-point.
- 3.2.6 response (primitive) : A primitive issued by a service-user to complete, at a particular service-access-point, some procedure previously invoked by an indication at that service-access-point.
- 3.2.7 confirm (primitive) : A primitive issued by a service-provider to complete, at a particular service-access-point, some procedure previously invoked by a request at that service-access-point.
- Note : Confirms and responses can be positive or negative as appropriate to the circumstances.
- 3.2.8 (N)-mandatory-service : A service which must be provided in the (N)-service.
- 3.2.9 (N)-provider-optional-service : A service which may or may not be provided in the (N)-service.
- 3.2.10 (N)-user-optional-service : A service which will only be provided if the (N)-service-user requests it, and it is available in the (N)-service.

[ISO page 3]

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- 3.2.11 unconfirmed-service : A service which does not result in an explicit confirmation.
- 3.2.12 confirmed-service : A service which results in an explicit confirmation from the service-provider. There is not necessarily any relationship to a response from the peer service-user.
- 3.2.13 provider-initiated-service : A service which is generated by the service-provider.

4. MODEL FOR LAYER SERVICES

A layer service is defined in terms of an abstract model having the following elements :

- a) (N)-service-users ;
- b) (N)-service-provider.

For the lifetime of a particular connection each service-user gains access to the service-provider as indicated in Figure 1.

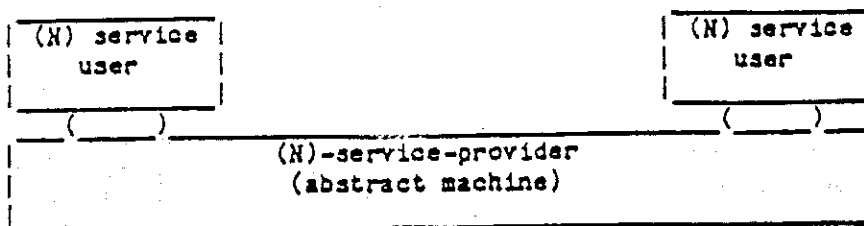


Figure 1 Layer Service Model

Each service-user interacts with the service-provider by issuing or receiving service-primitives. The layer service defines relations between interactions at one service-access-point and consequential interactions at service-access-points used by service-users in order to communicate.

The relationship among the terms service, boundary, service primitive, peer protocol, and peer entities are illustrated in Figure 2.

[ISO page 4]

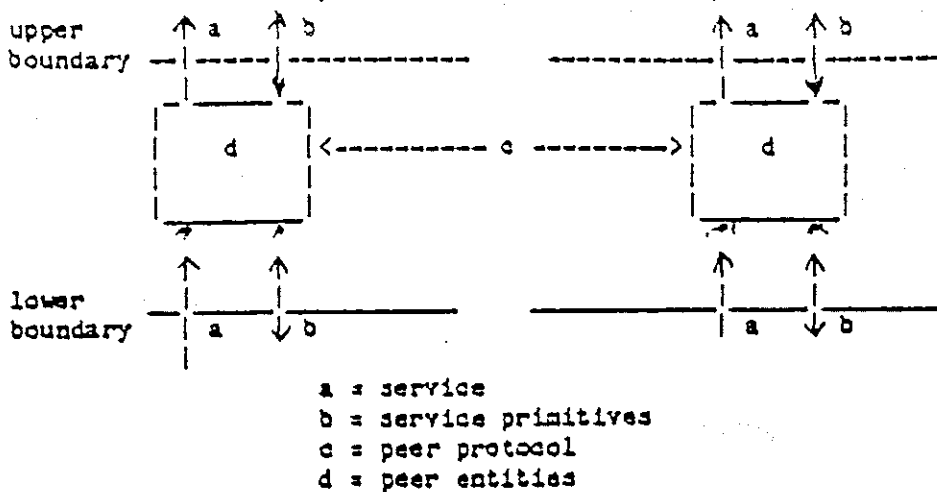


Figure 2 Relationship among Terms.

5. SERVICE PRIMITIVES

Note : The detailed properties of service primitives are for further study.

5.1 General

The use of primitives does not preclude any specific implementation of a service in terms of interface primitives. The following comments apply to this definition technique based on service primitives :

- a) service primitives are conceptual, and need not be either directly related to protocol elements, or seen as macro calls of an access method to the layer service ;
- b) there are other equivalent sets of service primitives which can describe the same layer service ;
- c) only service primitives which correspond to some element of the layer service involving two service-users need to be considered. The primitives which are only related to local conventions between the service-user and -provider do not relate to this description technique. For example, strictly local functions could be provided in some implementations. As they do not involve both users, such functions are not visible outside the local system.

5.2 Categories of Service

The following types of service are identified :

- a) mandatory-service (see 3.2.10) ;
- b) provider-optional-service (see 3.2.11) ;
- c) user-optional-service (see 3.2.12).

A user optional service may be either a mandatory service or a provider optional service.

5.3 Types of Service Primitives

Four types of service primitives are identified :

- a) request primitive (see 3.2.4) ;
- b) indication primitive (see 3.2.5) ;
- c) response primitive (see 3.2.6) ;
- d) confirm primitive (see 3.2.7).

5.4 Properties of Primitives

An individual service primitive is a logically separate interaction which cannot be interrupted by another interaction. A service primitive has a direction which is either :

- a) from a service-user to the service-provider ;
- b) from the service-provider to a service-user.

One or more parameters may be associated with a service primitive and each of these parameters has a defined range of values. Parameter values associated with a service primitive are passed in the direction of the service primitive.

5.5 Names of Primitives

The name of each service primitive contains three elements :

- a) an initial (or initials) which specifies the layer (see A.1)
- b) a name which specifies the service-element (see A.2)
- c) a name which specifies the type of primitive (see A.3).

6.0 Conventions for Time-Sequence Diagrams

Time-sequence diagrams are used to illustrate how sequences of interactions are related in time.

Time-sequence diagrams (see Figure 3) indicate :

- a) the sequence of events at each user/provider interface ;
- b) where appropriate, the sequence of events between peer users.

Each diagram is partitioned by two vertical lines into three fields. The central field represents the service-provider and the two side fields represent the two service-users. The lines represent the service-access-points between the service-users and the service-provider.

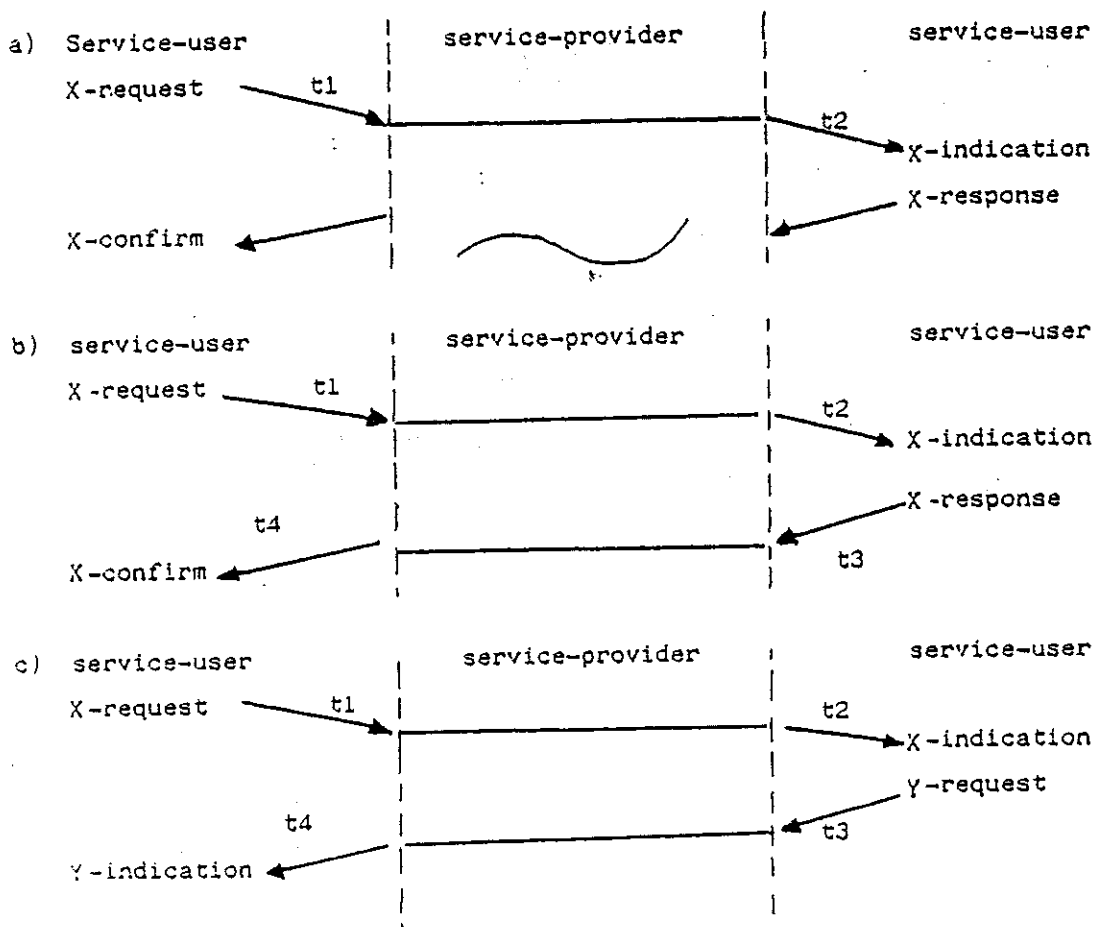


Figure 3

Annotated Time-Sequence Diagrams

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Sequences of events at each service-access-point are positioned along lines representing the passage of time, increasing downwards. Arrows, placed in the areas representing the service-user, indicate the direction of propagation of primitives (i.e., to or from the service-user) and may include implicate flow control between the service-user and service-provider.

Necessary sequence relations between the two interaction points are emphasized by an arrow between the time lines (e.g., in Figure 3a). The request primitive from one service-user to the service-provider at time t_1 is necessarily followed by the indication primitive to the peer service-user at time t_2 . In the absence of this arrow, there is no specific relationship between the delivery of confirmation and indication. The absence of relationship is indicated either by leaving the central field blank or, for clarity, by use of a tilde (~).

Figures 3b & c present alternative methods of indicating acknowledgements generated by the responding service-user. In Figure 3b, the same name (e.g., X) is used throughout the complete sequence, whereas in Figure 3c the responding service-user employs a request with a different name (e.g., Y).

REF

[ISO page 8]

CONVENTIONS FOR NAMING SERVICE PRIMITIVES

(This Annex is not an integral part of the body of the standard. It provides information for the authors of service standards but is not necessary for users of service Standards.)

A.1 Initials

The following initials are used to specify Application services and the layers of the OSI Model :

- a) P - Presentation Layer ;
- b) S - Session Layer ;
- c) T - Transport Layer ;
- d) N - Network Layer (see note) ;
- e) DL- Data-Link Layer ;
- f) Ph- Physical Layer.

Note : The use of 'N' to signify the Network Layer is not to be confused with the use of '(N)-' to signify a particular but unspecified layer of the Model.

A.2 Service Name

A single word consisting of the infinitive form of a verb is recommended for the service name (e.g., CONNECT, ABORT).

A.3 Name of Primitive Type

The name of the primitive type consists of one of the following (indicating the type of the primitive) :

- a) request ;
- b) indication ;
- c) response (positive or negative) ;
- d) confirm (positive or negative).

A.4 Representation

The initial(s) is represented in the form given in I.1. The service-element name is written in capital letters and the name of the primitive type is written in lower case letters.

The initial(s) and the service-element name are separated by a hyphen ; the service-element and primitive type are separated by a space.

[ISO page 9]

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A.5 Examples

The following are examples of primitive names which use these conventions :

- a) P-CONNECT request ;
- b) T-DATA indication ;
- c) S-DISCONNECT confirm.

National appendix A

British Standards and Drafts for Development for OSI, data communications and computer graphics

NOTE. Those publication dates listed which are subsequent to the publication of this Draft for Development are given for guidance only.

	Publication
A.1 OSI layer-independent standards	
<i>Reference model</i>	
BS 6568 Description of basic reference model for open systems interconnection (ISO 7498)	1984
DD 125 Basic reference model for open systems interconnection: connectionless-mode transmission (ISO 7498 DAD 1)	Sept 1985
<i>Service conventions</i>	
DD 108 Open Systems Interconnection: service conventions (ISO/DP 8509)	Oct 1985
<i>Formal description techniques</i>	
DD 123 Open Systems Interconnection: Estelle, a formal description technique based on an extended state transition model (ISO/DP 9074)	Nov 1985
DD 124 Open Systems Interconnection: LOTOS, a formal description technique based on the temporal ordering of observational behaviour (ISO/DP 8807)	Oct 1985
A.2 OSI Application layer	
<i>Common application service elements</i>	
DD 131 Open Systems Interconnection: definition of common application service elements: basic kernel subset (ISO/DP 8649/2)	March 1986
DD 132 Open Systems Interconnection: specification of protocols for common application service elements: basic kernel subset (ISO/DP 8650/2)	March 1986
DD 109 Open Systems Interconnection: definition of common application service elements: commitment, concurrency and recovery (ISO/DIS 8649/3)	July 1985
DD 110 Open Systems Interconnection: specification of protocols for common application service elements: commitment, concurrency and recovery (ISO/DIS 8650/3)	July 1985
<i>File transfer, access and management</i>	
DD 113 Open Systems Interconnection: file transfer, access and management (ISO/DP 8571/1-4)	
Part 1 General description	Aug 1985
Part 2 The virtual filestore	Aug 1985
Part 3 The file service definition	Aug 1985
Part 4 The file protocol specification	Aug 1985
<i>Job transfer and manipulation</i>	
DD 105 Open systems interconnection: job transfer and manipulation concepts and services (ISO/DP 8831)	May 1985
DD 106 Open systems interconnection: specification of the basic class protocol for job transfer and manipulation (ISO/DP 8832)	June 1985
<i>Virtual terminals</i>	
DD 129 Open Systems Interconnection: virtual terminal services: basic class	
Part 1 Initial facility set (ISO/DP 9040)	March 1986
DD 130 Open Systems Interconnection: virtual terminal protocols: basic class	
Part 1 Initial facility set (ISO/DP 9041)	March 1986
A.3 OSI Presentation layer	
DD 101 Open Systems Interconnection: connection-oriented presentation service definition (ISO/DP 8822)	Aug 1985

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	Publication
DD 102	Aug 1985
Open Systems Interconnection: connection-oriented presentation protocol specification (ISO/DP 8823)	
<i>Abstract Syntax Notation One</i>	
DD 103	July 1985
Open Systems Interconnection: specification of Abstract Syntax Notation One (ASN.1) (ISO/DIS 8824)	
DD 104	July 1985
Open Systems Interconnection: specification of basic encoding rules for Abstract Syntax Notation One (ASN.1) (ISO/DIS 8825)	
A.4 OSI Session Layer	
DD 111	July 1985
Open Systems Interconnection: basic connection-oriented session service definition (ISO/DIS 8326)	
DD 112	July 1985
Open Systems Interconnection: basic connection-oriented session protocol specification (ISO/DIS 8327)	
DD 126	Oct 1985
Open Systems Interconnection: session symmetric synchronization service (ISO 8326 DAD 1)	
DD 127	Oct 1985
Open Systems Interconnection: session symmetric synchronization protocol (ISO 8327 DAD 1)	
A.5 OSI Transport Layer	
DD 115	Aug 1985
Open Systems Interconnection: transport service definition (ISO/DIS 8072)	
DD 116	Aug 1985
Open Systems Interconnection: transport protocol specification (ISO/DIS 8073)	
DD 137	Aug 1985
Open Systems Interconnection: protocol to provide the connectionless-mode transport service utilizing either the connectionless-mode or the connection-oriented network service (ISO/DP 8602)	
A.6 OSI Network Layer	
DD 117	June 1985
Open Systems Interconnection: X.25 packet level protocol for data terminal equipment (ISO/DIS 8208)	
DD 118	Aug 1985
Open Systems Interconnection: protocol for providing the connectionless-mode network service (ISO/DIS 8473) incorporating the connectionless-mode service addendum (ISO/DIS 8348 DAD 1)	
DD 119	Aug 1985
Open Systems Interconnection: connection-mode network service definition (ISO/DIS 8348)	
DD 122	July 1985
Open Systems Interconnection: use of X.25 to provide the connection-oriented network service (ISO/DP 8878)	
DD 134	Aug 1985
Open Systems Interconnection: network layer addressing (ISO/DIS 8348 DAD 2)	
DD 135	Oct 1985
Open Systems Interconnection: internal organization of the network layer (ISO/DP 8648.2)	
A.7 OSI Data Link Layer	
<i>High-level Data Link Control</i>	
BS 5397	Oct 1985
High-level data link control (HDLC) procedures	
	Oct 1985
Part 1 Frame structure (ISO 3309-1984) (revision BS 5397 : Part 1 : 1981)	
Part 2 Consolidation of elements of procedures (ISO 4335-1984) (revision BS 5397 : Part 2 : 1982)	
	Oct 1985
Part 5 Consolidation of classes of procedures (ISO 7809) (revision BS 5397 : Part 3 : 1981 and Part 4 : 1982)	
	Oct 1985
Part 6 Multilink procedures (ISO/DIS 7478)	
	Oct 1985
Part 7 X.25 LAPB compatible DTE link layer procedures (ISO/DIS 7776)	
	Oct 1985
<i>Basic mode</i>	
BS 4505	1981
Digital data transmission	
	Nov 1985
Part 1 Specification for basic mode control procedures	
Part 2 Character structure for start/stop and synchronous transmission (ISO 1177) (revision BS 4505 : Part 2 : 1969)	

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	Publication
Part 3 Method for use of longitudinal parity to detect errors in information messages	1981
Part 4 Basic mode control procedures; code independent information transfer (ISO 2111) (revision BS 4505 : Part 4 : 1971)	Nov 1985
Part 6 Complements to the basic mode control procedures; recovery, abort and interrupt multiple station selection	1976
Part 7 Basic mode control procedures; conversational information message transfer	1976
 A.8 OSI Physical Layer	
BS 6623 DTE/DCE interface connectors and pin assignments	
Part 1 Specification for 25-pin connector (ISO/DIS 2110) (revision BS 4505 : Part 5 : 1981)	June 1985
Part 2 Specification for 37-pin connector (ISO/DIS 4902) (revision BS 4505 : Part 8 : 1981)	Nov 1985
Part 3 Specification for 15-pin connector (ISO/DIS 4903) (revision BS 4505 : Part 9 : 1981)	Nov 1985
Part 4 Specification for 34-pin connector (ISO 2593)	Nov 1985
BS 6638 Transmission signal quality at the DTE/DCE interface	
Part 1 Start-stop signal quality (ISO 7480)	Nov 1985
BS 6639 DTE/DCE back-up control using the 25-pin connector (ISO/DIS 8480)	Nov 1985
BS 6640 DTE-DTE physical connection	
Part 1 General arrangements for DTE-DTE physical connection using V.24 and X.24 interchange circuits (ISO/DTR 7477)	Nov 1985
Part 2 DTE-DTE physical connection using X.24 interchange circuits with DTE-provided timing (ISO/DIS 8481)	Nov 1985
DD 120 Twisted pair multipoint interconnection (ISO/DIS 8482)	Nov 1985
 A.9 Local area networks	
BS 6531 10 Mbps slotted ring local area network	
Part 1 Specification for the coding of bits and structure of slots and mini packets	1984
Part 2 Specification for configuration	1984
Part 3 Specification for free-standing repeaters	1984
Part 4 Specification for basic and enhanced class nodes with type 1 node/DTE interface	1984
Part 5 Specification for monitor	1984
Part 6 Specification for logging station	1984
Part 7 Specification for slave power supplies	1984
BS 6532 Data terminal equipment for attachment to 10 Mbps slotted ring local area network	
Part 1 Specification for media access control procedures for data terminal equipment	1984
Part 2 Specification for implementation requirements for media access control in general purpose data terminal equipment	1984
DD 98 CSMA/CD local area networks	
Part 1 Technical specification (ISO/DP 8802/3)	1984
Part 2 Guidance for implementors	1984
DD 99 Logical link control for local area networks	
Part 1 Technical specification (ISO/DP 8802/2)	May 1985
Part 2 Guidance for implementors	Nov 1985
DD 100 Token bus local area networks	
Part 1 Technical specification (ISO/DP 8802/4)	May 1985
DD 136 Token ring local area networks	
Part 1 Technical specification (ISO/DP 8802/5)	Nov 1985
Part 2 Guidance for implementors	Nov 1985
 A.10 Computer graphics	
BS 6390 Specification for a set of functions for computer graphics programming, the Graphical Kernel System (GKS) (ISO 7942-1985) (revision BS 6390 : 1983)	Feb 1986

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		Publication
DD 107	Computer graphics: Metafile for transfer and storage of picture description information (ISO/DP 8632/1-4)	
	Part 1 Functional description	Feb 1986
	Part 2 Character encoding	Feb 1986
	Part 3 Binary encoding	Feb 1986
	Part 4 Clear text encoding	Feb 1986
DD 114	Computer graphics: Graphical Kernel System (GKS) language bindings (ISO/DP 8651/1-3)	
	Part 1 FORTRAN	Oct 1985
	Part 2 Pascal	Oct 1985
	Part 3 Ada	Oct 1985
DD 128	Computer graphics: Graphical Kernel System for three dimensions (GKS 3-D) functional description (ISO/DP 8805)	Feb 1986

A.11 Other standards

Database languages

DD 000	Network database language (ISO/DP 8907)	April 1986
DD 000	Database language SQL (ISO/DP 9075)	April 1986

Data descriptive file

BS 0000	Specification for a data descriptive file for information interchange (ISO 8211)	April 1986
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A.12 Correspondence between ISO and BSI publications

ISO	BSI	ISO	BSI
ISO 1177	BS 4505: Part 2	DP 8571/1	DD 113: Part 1
DIS 2110	BS 6623: Part 1	DP 8571/2	DD 113: Part 2
ISO 2111	BS 4505: Part 4	DP 8571/3	DD 113: Part 3
ISO 2593	BS 6623: Part 4	DP 8571/4	DD 113: Part 4
ISO 3309	BS 5397: Part 1	DP 8602	DD 137
ISO 4335	BS 5397: Part 2	DP 8632/1	DD 107: Part 1
ISO 4902	BS 6623: Part 2	DP 8632/2	DD 107: Part 2
ISO 4903	BS 6623: Part 3	DP 8632/3	DD 107: Part 3
DTR 7477	BS 6640: Part 1	DP 8632/4	DD 107: Part 4
DIS 7478	BS 5397: Part 6	DP 8648.2	DD 135
ISO 7480	BS 6638	DP 8649/2	DD 131
ISO 7498	BS 6568	DIS 8649/3	DD 109
ISO 7498 DAD 1	DD 125	DP 8650/2	DD 132
DIS 7776	BS 5397: Part 7	DIS 8650/3	DD 110
ISO 7809	BS 5397: Part 5	DP 8651/1	DD 114: Part 1
DIS 7942	BS 6390	DP 8651/2	DD 114: Part 2
DIS 8072	DD 115	DP 8651/3	DD 114: Part 3
DIS 8073	DD 116	DP 8802/2	DD 99: Part 1
DIS 8208	DD 117	DP 8802/3	DD 98: Part 1
ISO 8211	BS 0000	DP 8802/4	DD 100: Part 1
DIS 8326	DD 111	DP 8802/5	DD 136: Part 1
DIS 8326 DAD 1	DD 126	DP 8805	DD 128
DIS 8327	DD 112	DP 8807	DD 124
DIS 8327 DAD 1	DD 127	DP 8822	DD 101
DIS 8348	DD 119	DP 8823	DD 102
DIS 8348 DAD 1	Appendix to DD 118	DIS 8824	DD 103
DIS 8348 DAD 2	DD 134	DIS 8825	DD 104
DIS 8473	DD 118	DP 8831	DD 105
DIS 8480	BS 6639	DP 8832	DD 106
DIS 8481	BS 6640: Part 2	DP 8878	DD 122
DIS 8482	DD 120	DP 8907	DD 000
DP 8509	DD 108	DP 9040	DD 129: Part 1
		DP 9041	DD 130: Part 1
		DP 9074	DD 123
		DP 9075	DD 000

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