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Australian/New Zealand Standard

**Information technology—
Telecommunications and
information exchange between
systems—Network/transport
protocol interworking specification**

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STANDARDS NEW ZEALAND

AS/NZS 4104:1993

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PREFACE

This Standard was prepared by the Joint Standards Australia/New Zealand Committee on Information Systems—Interconnection. It is identical with, and has been reproduced from, ISO/IEC TR 10172:1991, *Information technology—Telecommunications and information exchange between systems—Network/transport protocol interworking specification*.

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Reference to International Standard or other Publication		Australian/New Zealand Standard	
ISO			
7498	Information processing systems— Open Systems Interconnection— Basic Reference Model	AS 2777	Information processing systems— Open Systems Interconnection— Basic reference model
7498-3	Part 3: Naming and Addressing	2777.3	Part 3: Naming and addressing
8072	Information processing systems— Open Systems Interconnection— Transport Service Definition	AS 2911	Information processing systems— Open Systems Interconnection— Transport service definition
8073	Information processing systems— Open Systems Interconnection— Connection oriented transport protocol specification	AS 2912	Information processing systems— Open Systems Interconnection— Connection oriented transport protocol specification
8073/Add.1	Addendum 1: Network connection management subprotocol	—	
8073/Add.2	Addendum 2: Class four operation over connectionless network service	—	
8348	Information processing systems— Data communications—Network service definition	AS 2994	Information processing systems— Data communications—Network service definition
8348/Add.2	Addendum 2: Network Layer addressing	2994	Supplement 1:Network layer addressing
8473	Information processing systems— Data communications—Protocol for providing the connectionless- mode network service	—	

8648	Information processing systems— Open Systems Interconnection— Internal Organization of the Network layer	AS 3622	Information processing systems Open Systems Interconnection— Internal organization of the network layer
8878	Information processing systems— Data communications—Use of X.25 to provide the OSI connection-mode network service	AS 3604	Information processing systems— Data communications—Use of X.25 to provide the OSI connection-mode network service
9542	Information processing systems— Telecommunications and infor- mation exchange between systems— End system to intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the con- nectionless-mode network service	—	
ISO/IEC 8208	Information processing systems— Data communications—X.25 Packet Layer Protocol for Data Terminal Equipment	AS 3621	Information processing systems— Data communications—X.25 packet level protocol for data terminal equipment
8881	Information processing systems— Data communications—Use of X.25 packet level protocol in local area network	—	
9574	Information technology— Telecommunications and infor- mation exchange between systems—Provision of the OSI connection-mode network service by packet mode terminal equip- ment connected to a Integrated Services Digital Network (ISDN)	—	
ISO/IEC TR 9577	Information technology— Telecommunications and information exchange between systems—Protocol identification in the network layer	—	
10029	Information technology— Telecommunications and information exchange between systems—Operation of an X.25 interworking unit	AS 4015	Information technology— Telecommunications and information exchange between systems—Operation of an X.25 interworking unit

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Information technology—Telecommunications and information exchange between systems—Network/transport protocol interworking specification

1 Scope

This Technical Report

- a) Specifies the circumstances in which Interworking Functional Units may be used to provide the OSI Connection-mode Transport Service end-to-end between two end systems, where
 - one of the end systems is accessed using the connection-mode transport protocol as defined in ISO 8073/Add.2¹ in combination with the protocol defined in ISO 8473;
 - the other end system is accessed using the connection-mode transport protocol as defined in ISO 8073 in combination with the procedures defined in ISO 8208/ISO 8878².
- b) Specifies various sets of procedures for the operation of such Interworking Functional Units.
- c) Specifies how IFUs which operate more than one of these sets of procedures may choose which set to use in a given instance, taking into account the possibility that some end systems may operate both types of Network Service.
- d) Specifies the requirements for IFUs to operate in series and/or in parallel.

NOTE - Only the Network Layer Relay (NLR) mode of operation is within the scope of OSI. The Active Transport Layer Relay (ATLR) and Passive Transport Layer Relay (PTLR) modes of operation are not considered to be OSI operations because ISO 7498 does not define relaying to be a Transport Layer function.

The field of application also covers the case where the two end systems operate the same Network Layer protocol but are interconnected via IFUs employing ATLR or PTLR operation.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this Technical Report. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Technical Report 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 7498:1984, *Information processing systems - Open Systems Interconnection - Basic Reference Model*.

¹ For purposes of conciseness and distinction, when ISO 8073/Add.2 is used throughout this Technical Report it shall be taken to mean ISO 8073 as modified by ISO 8073/Add.2, i.e. "use of Transport Class Four Operation over Connectionless Network Service".

² For purposes of conciseness ISO 8208/ISO 8878 shall be taken to mean ISO 8208 operated in accordance with ISO 8878.

ISO 7498-3:1986, *Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 3: Naming and Addressing.*

ISO 8072:1986, *Information processing systems - Open Systems Interconnection - Transport Service Definition.*

ISO 8073:1988, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification.*

ISO 8073/Add.1:1988, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification - Addendum 1: Network connection management subprotocol.*

ISO 8073/Add.2:1989, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification - Addendum 2: Class four operation over connectionless network service.*

ISO/IEC 8208:1990, *Information processing systems - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment.*

ISO 8348/Add.2:1988, *Information processing systems - Data communications - Network service definition - Addendum 2: Network Layer addressing.*

ISO 8473:1988, *Information processing systems - Data communications - Protocol for providing the connectionless-mode network service.*

ISO 8648:1988, *Information processing systems - Open Systems Interconnection - Internal Organization of the Network layer.*

ISO 8878:1987, *Information processing systems - Data communications - Use of X.25 to provide the OSI connection-mode network service.*

ISO/IEC 8881:1989, *Information processing systems - Data communications - Use of X.25 packet level protocol in local area network.*

ISO 9542:1988, *Information processing systems - Telecommunications and information exchange between systems - End system to Intermediate system routing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473).*

ISO/IEC 9574:1989, *Information technology - Telecommunications and information exchange between systems - Provision of the OSI connection-mode network service by packet mode terminal equipment connected to an Integrated Services Digital Network (ISDN).*

ISO/IEC TR 9577:1990, *Information technology - Telecommunications and information exchange between systems - Protocol Identification in the network layer.*

ISO/IEC 10028:³, *Information processing systems - Data Communications - Definition of the relaying functions of a Network Layer intermediate system.*

ISO/IEC TR 10029:1989, *Information technology - Telecommunications and information exchange between systems - Operation of an X.25 interworking unit.*

³ To be published.

ISO/IEC 10177:-⁴, *Information technology - Telecommunications and Information Exchange between Systems - Intermediate system support of the OSI connection-mode Network Service using ISO 8208 in accordance with ISO /IEC10028.*

3 Definitions

3.1 Reference Model definitions

This Technical Report makes use of the following concepts defined in ISO 7498:

- 3.1.1 (N)-layer
- 3.1.2 (N)-service access point
- 3.1.3 (N)-address
- 3.1.4 Routing
- 3.1.5 (N)-relay
- 3.1.6 (N)-protocol data unit
- 3.1.7 Title
- 3.1.8 (N)-interface-data-unit

3.2 Network Layer Architecture definitions

This Technical Report makes use of the following concepts from ISO 8648:

- 3.2.1 Intermediate system
- 3.2.2 Subnetwork independent convergence protocol

3.3 Additional definitions

For the purposes of this Technical Report, the following definitions apply:

3.3.1 end system: a system in which there is a transport entity providing service to a session entity in an instance of communication.

NOTE - The term end system in ISO 7498 is interpreted to mean a system in which there is a transport entity in an instance of communication. Since ISO 7498 does not permit relaying above the Network layer, this is equivalent to the definition given above. However, this Technical Report discusses relaying at the transport layer; consequently the definition given above is used in order to distinguish end systems from systems relaying at the transport layer.

3.3.2 (N)-SAP Address: (N)-Address

NOTE -The terms (N)-SAP Address and (N)-Address are used synonymously, as in most Network and Transport layer standards.

4 Symbols and abbreviations

- ATLR Active Transport Layer Relay
- CL Connectionless-mode

⁴ To be published.

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CLNP	Connectionless-mode Network Protocol (ISO 8473)
CLNS	Connectionless-mode Network Service
CO	Connection-mode
CONP	Connection-mode Network Protocol (ISO 8208/ISO 8878)
CONS	Connection-mode Network Service
COTS	Connection-mode Transport Service
ES	End system
IFU	Interworking Functional Unit
IS	Intermediate system
NCMS	Network Connection Management Subprotocol
NLI	Network Layer Interworking
NLR	Network Layer Relay
NPDU	Network Protocol Data Unit
NSDU	Network Service Data Unit
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PTLR	Passive Transport Layer Relay
QOS	Quality of Service
TC	Transport Connection
TCLP	Transport Connectionless- mode Part
TCOP	Transport Connection-mode Part
TLR	Transport Layer Relay
TPDU	Transport Protocol Data Unit
TSDU	Transport Service Data Unit

5 Overview of IFU

5.1 Applicability of IFU

An IFU is applicable only in certain restricted circumstances where CO/CL interworking is necessary to achieve interconnection of two otherwise incompatible end systems. Any other use