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Information processing systems — Fibre Distributed Data Interface (FDDI) —

Part 1 : Token Ring Physical Layer Protocol (PHY)

*Systèmes de traitement de l'information — Interface de données distribuées sur
fibre (FDDI) —*

Partie 1 : Protocole de la couche physique de l'anneau à jeton



Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9314-1 was prepared by Technical Committee ISO/TC 97, *Information processing systems*.

ISO 9314 consists of the following parts, under the general title *Information processing systems – Fibre Distributed Data Interface (FDDI)*:

- *Part 1: Token Ring Physical Layer Protocol (PHY)*
- *Part 2: Token Ring Media Access Control (MAC)*
- *Part 3: Token Ring Physical Layer, Medium Dependent (PMD)*

Introduction

This part of ISO 9314 on the FDDI physical layer protocol is intended for use in a high-performance multistation network. This protocol is designed to be effective at 100 Mbit/s using a Token ring architecture and fibre optics as the transmission medium over distances of several kilometers in extent.

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Information processing systems — Fibre Distributed Data Interface (FDDI) —

Part 1 : Token Ring Physical Layer Protocol (PHY)

1 Scope

This part of ISO 9314 specifies the Physical Layer Protocol (PHY), the upper sublayer of the Physical Layer, for Fibre Distributed Data Interface (FDDI).

FDDI provides a high-bandwidth (100 Mbit/s), general-purpose interconnection among computers and peripheral equipment using fibre optics as the transmission medium. FDDI can be configured to support a sustained transfer rate of approximately 80 Mbit/s (10 Mbyte/s). It may not meet the response time requirements of all unbuffered high-speed devices. FDDI establishes connections among many stations distributed over distances of several kilometers in extent. Default values for FDDI were calculated on the basis of 1 000 physical links and a total fibre path length of 200 km (typically corresponding to 500 stations and 100 km of dual fibre cable).

FDDI consists of:

- (a) A Physical Layer (PL), which is divided into two sublayers:
 - (1) A Physical Medium Dependent (PMD), which provides the digital baseband point-to-point communication between stations in the FDDI network. The PMD provides all services necessary to transport a suitably coded digital bit stream from station to station. The PMD defines and characterizes the fibre-optic drivers and receivers, medium-dependent code requirements, cables, connectors, power budgets, optical bypass provisions, and physical-hardware-related characteristics. It specifies the point of interconnectability for conforming FDDI attachments.
 - (2) A Physical Layer Protocol (PHY), which provides connection between the PMD and the Data Link Layer. PHY establishes clock synchronization with the upstream code-bit data stream and decodes this incoming code-bit stream into an equivalent symbol stream for use by the higher layers. PHY provides encoding and decoding between data and control indicator symbols and code bits, medium conditioning and initializing, the synchronization of incoming and outgoing code-bit clocks, and the delineation of octet boundaries as required for the transmission of information to or from higher layers. Information to be transmitted on the interface medium is encoded by the PHY into a grouped transmission code. The definition of PHY is contained in this part of ISO 9314.
- (b) A Data Link Layer (DLL), which controls the accessing of the medium and the generation and verification of frame check sequences to ensure the proper delivery of valid data to the higher layers. DLL also concerns itself with the generation and recognition of device addresses and the peer-to-peer associations within the FDDI network. For the purpose of the PHY definition contained in this part of ISO 9314,

references to DLL are made in terms of the Media Access Control (MAC) entity, which is the lowest sublayer of DLL.

(c) A Station Management (SMT)¹⁾, which provides the control necessary at the station level to manage the processes under way in the various FDDI layers such that a station may work cooperatively on a ring. SMT provides services such as control of configuration management, fault isolation and recovery, and scheduling procedures.

The definition of PHY as contained in this part of ISO 9314 is designed to be as independent as possible from the actual physical medium.

ISO 9314 specifies the interfaces, functions, and operations necessary to ensure interoperability between conforming FDDI implementations. This part of ISO 9314 is a functional description. Conforming implementations may employ any design technique that does not violate interoperability.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9314. 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 9314 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 9314-2: 1989, *Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 2: Token Ring Media Access Control (MAC)*.

ISO 9314-3: ----²⁾, *Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 3: Token Ring Physical Layer, Medium Dependent (PMD)*.

¹⁾ SMT will form the subject of a future part of ISO 9314.

²⁾ To be published.