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Information technology – Fibre distributed data interface (FDDI) –

Part 26: Media Access Control Conformance Testing (MAC-ATS)

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**INFORMATION TECHNOLOGY –
FIBRE DISTRIBUTED DATA INTERFACE (FDDI) –
Part 26: Media Access Control Conformance Testing
(MAC-ATS)**

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 9314-26 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

International Standards are drafted in accordance with the ISO/IEC Directives, Part 3.

Annex A is for information only.

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

- *Part 1: Token Ring Physical Layer Protocol (PHY)*
- *Part 2: Token Ring Media Access Control (MAC)*
- *Part 3: Physical Layer Medium Dependent (PMD)*
- *Part 4: Single Mode Fibre Physical Layer Medium Dependent (SMF-PMD)¹⁾*
- *Part 5: Hybrid Ring Control (HRC)*
- *Part 6: Station Management (SMT)*
- *Part 7: Physical Layer Protocol (PHY-2)*
- *Part 8: Media Access Control-2 (MAC-2)*
- *Part 9: Low-cost Fibre Physical Layer Medium Dependent (LCF-PMD)¹⁾*
- *Part 13: Conformance Test Protocol Implementation – Conformance Statement (CT-PICS) Proforma*
- *Part 20: Abstract Test Suite for FDDI – Physical Medium Dependent Conformance Testing (PMD-ATS)¹⁾*
- *Part 21: Abstract Test Suite for FDDI – Physical Layer Protocol Conformance Testing (PHY-ATS)¹⁾*
- *Part 25: Abstract test suite for FDDI – Station Management Conformance Testing (SMT-ATS)*

¹⁾ To be published.

INTRODUCTION

The Fibre Distributed Data Interface (FDDI) is intended for use in a high performance general-purpose multi-station network and is designed for efficient operation with a peak data rate of 100 Mbit/s. It uses a Token Ring Architecture with optical fibre as the transmission medium. FDDI provides for hundreds of stations operating over an extent of tens of kilometers.

The FDDI Media Access Control (MAC) standard, ISO/IEC 9314-2, specifies the lower sub-layer of the Data Link Layer for FDDI. It specifies access to the medium, including addressing, data checking and data framing. ISO/IEC 9314-2 also specifies the receiver and transmitter state machines. This part of ISO/IEC 9314 is an abstract test suite (ATS) conformance test for FDDI MAC. Since MAC is a protocol that deals primarily with complete PDUs, the Tree and Tabular Combined Notation TTCN language specified in ISO/IEC 9646-3¹⁾ is used to specify MAC protocol tests.

Four other standards, along with this International Standard, provide a complete conformance test of an FDDI station:

- a) An ATS for FDDI Physical Medium Dependent (PMD) that provides a conformance test for FDDI PMD, ISO/IEC 9314-3. ISO/IEC 9314-3 specifies the optical interface of FDDI stations. ISO/IEC 9314-3 is not a protocol standard and this ATS requires the measurement of physical quantities such as optical power, wavelength and signal jitter. The PMD ATS differs from the methodology of higher level protocol conformance tests written using the TTCN, because the TTCN notation does not provide a suitable vehicle for Physical Layer testing, where there is no concept of a protocol data unit and where physical quantities must be measured.
- b) An ATS for the FDDI Physical Layer Protocol (PHY) that provides a conformance test for FDDI PHY, ISO/IEC 9314-1. ISO/IEC 9314-1 specifies the upper sublayer of the Physical Layer for the FDDI, including the data encode/decode, framing and clocking, as well as the elasticity buffer, smoothing and repeat filter functions. FDDI PHY, however, does contain several state machines and implements a protocol at the level of FDDI code symbols. The only physical quantity that must be measured in this conformance test is frequency. The PHY ATS cannot use the TTCN notation and a notation is developed in the PHY ATS for specifying test patterns and expected results in terms of FDDI code symbol strings.
- c) An ATS for FDDI Station Management (SMT), ISO/IEC 9314-6, that provides a conformance test for FDDI SMT. ISO/IEC 9314-6 specifies the local portion of the system management application process for FDDI, including the control required for proper operation of an FDDI station in an FDDI ring. ISO/IEC 9314-6 provides services such as connection management, station insertion and removal, station initialisation, configuration management and fault recovery, communications protocol for external authority, scheduling policies and the collection of statistics. SMT interacts with PMD, PHY and MAC. Therefore, an ATS for portions of SMT that use MAC PDUs can be specified in TTCN, while other portions require other approaches.
- d) A Protocol Implementation Conformance Statement (CT-PICS) proforma, ISO/IEC 9314-13, for FDDI that provides a statement of the mandatory and optional requirements of each of the four FDDI base standards. The PICS proforma is used to identify requirements for conformance testing and to specify optional functionality requirements, particularly by workshops for functional standards and profiles.

¹⁾ ISO/IEC 9646-3:1998, *Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 3: The tree and tabular combined notation (TTCN)*

**INFORMATION TECHNOLOGY –
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1 Scope

This part of ISO/IEC 9314 contains the abstract test suite for the Fibre Distributed Data Interface (FDDI) token ring Media Access Control (MAC) layer protocol. This test suite was developed based on the principles defined in OSI Conformance Testing Methodology and Framework (ISO/IEC 9646) and written in Tree and Tabular Combined Notation (TTCN), and intended for testing conformance to the MAC standard (ISO/IEC 9314-2:1989) of any FDDI stations.

The test methodology is the "remote single layer test" as described in ISO/IEC 9646. The abstract test scripts specify the MAC layer Protocol Data Units (PDU) to be exchanged between the two MAC entities, the MAC on the tester and the MAC on the Implementation Under Test (IUT). The tester is called the Lower Tester (LT).

The test suite does not require use of any higher layer protocols, nor does it assume existence of Logical Link Control (LLC) layer implementation on the IUT. It expects, however, that the Station Management (SMT) function is available on the IUT. Since MAC itself does not originate any data frames, the tester uses SMT to test the processing capability of MAC by sending frames to SMT and observing the SMT originated response frames.

The testing is expected to be conducted in a controlled environment with a minimum configuration (figure 1): a token ring with two stations, one being the LT and the other the IUT.

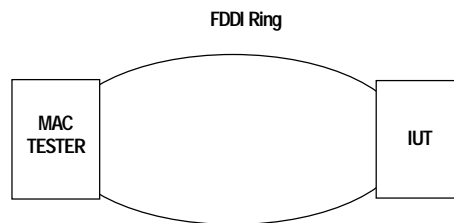


Figure 1 – MAC test configuration

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 9314. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 9314 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 9314-1:1989, *Information technology – Fibre Distributed Data Interface (FDDI) – Part 1: Token Ring Physical Layer Protocol (PHY)*

ISO/IEC 9314-2:1989, *Information technology – Fibre Distributed Data Interface (FDDI) – Part 2: Token Ring Media Access Control (MAC)*

ISO/IEC 9314-6:1998, *Information technology – Fibre Distributed Data Interface (FDDI) – Part 6: Station Management (SMT)*

ISO/IEC 9314-13:1998, *Information technology – Fibre Distributed Data Interface (FDDI) – Part 13: Protocol Implementation Conformance Statement (CT-PICS) Proforma*

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 9646-3:1998, *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 9646-6:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 6: Protocol profile test specification*

ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements*