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INTERNATIONAL STANDARD

Information technology – Generic cabling systems for data centres

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INFORMATION TECHNOLOGY – GENERIC CABLING SYSTEMS FOR DATA CENTRES

FOREWORD

1) ISO (International Organization for Standardization) and IEC (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. Their preparation is entrusted to technical committees; any ISO and IEC member body interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.

2) 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.

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10) 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 24764 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

ISO/IEC 24764 is to be read in conjunction with International Standard ISO/IEC 11801:2002, its Amendment 1 (2008) and Amendment 2 (2010).

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

INTRODUCTION

Within premises, the importance of the information technology cabling infrastructure is similar to that of other fundamental building utilities such as heating, lighting and mains power. As with other utilities, interruptions to service can have serious impact. Poor quality of service due to lack of design foresight, use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten an organisation's effectiveness.

Cabling within data centres comprises both application-specific and multipurpose networks that are mission-critical. Generic cabling designs in accordance with ISO/IEC 11801 have supported the development of high data rate applications based upon a defined cabling model. This International standard recognizes the benefit of generic cabling to provision multiple services and to connect large quantities of equipment within the limited space of data centre premises, and is to be used in conjunction with ISO/IEC 11801.

This International Standard provides:

a) data centre users with an application independent generic cabling system capable of supporting a wide range of applications;

b) data centre users with a flexible cabling scheme such that modifications are both easy and economical;

c) data centre professionals (for example, data centre architects) with guidance allowing the accommodation of cabling before specific requirements are known; that is, in the initial planning either for construction or refurbishment;

d) industry and applications standardization bodies with a cabling system which supports current products and provides a basis for future product development.

This International Standard specifies multi-vendor cabling, and is related to:

- the associated standard covering general requirements for generic cabling within premises (ISO/IEC 11801);
- standards for cabling components developed by technical committees of the IEC;
- standards for the quality assurance, installation and administration of information technology cabling (ISO/IEC 14763-2[1]) and testing of installed cabling (IEC 61935-1 and ISO/IEC 14763-3);
- applications developed by the technical committees of IEC, subcommittees of ISO/IEC JTC 1 and study groups of ITU-T[2].

It is anticipated that the generic cabling system meeting the requirements of this International Standard will have a life expectancy of up to ten years.

This International Standard has taken into account requirements specified in application standards listed in Annex F of ISO/IEC 11801:2002 and Amendment 2 (2010). It refers to International Standards for components and test methods whenever appropriate International Standards are available.

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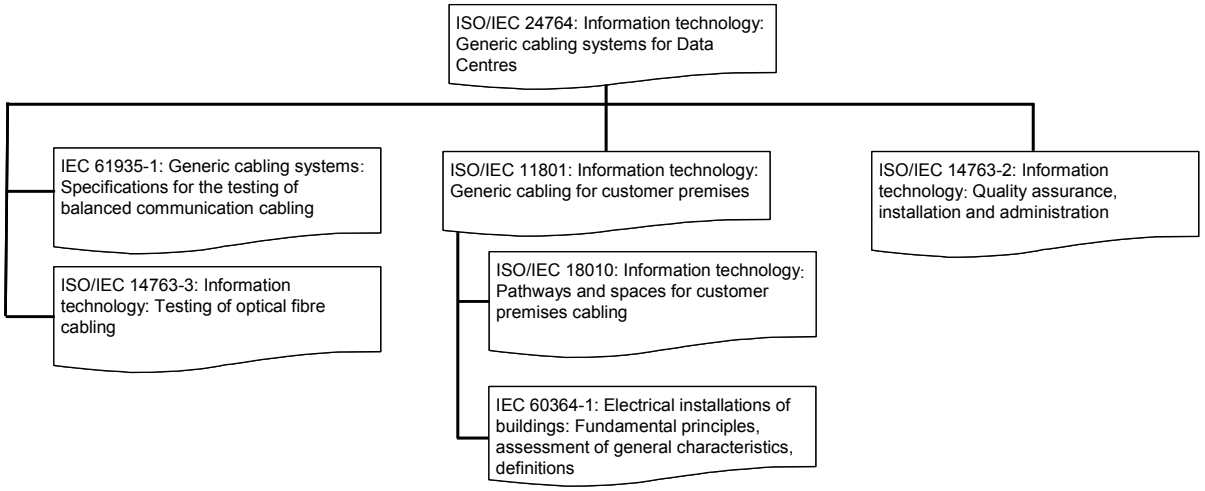
1 Until ISO/IEC 14763-2 is published, relevant information may be found in ISO/IEC 18010.

2 International Telecommunication Union – Telecommunications Standardization Sector.

Figure 1 shows the schematic and contextual relationships between the standards produced by ISO/IEC JTC 1/SC 25 for information technology cabling, namely this and other generic cabling design standards (ISO/IEC 11801), cabling installation standards (ISO/IEC 14763-2[3]), testing of installed cabling (IEC 61935-1 and ISO/IEC 14763-3).



Scheme of the relationship between cabling standards such as ISO/IEC 11801 and other standards relevant for information technology cabling systems.

Figure 1 – Relationship between generic cabling standards

3 Until ISO/IEC 14763-2 is published, relevant information may be found in ISO/IEC 18010.

INFORMATION TECHNOLOGY – GENERIC CABLING SYSTEMS FOR DATA CENTRES

1 Scope

This International Standard specifies generic cabling that supports a wide range of communications services for use within a data centre. It covers balanced cabling and optical fibre cabling.

This International Standard is based upon and references the requirements of ISO/IEC 11801.

This International Standard contains additional requirements that are appropriate to data centres in which the maximum distance over which communications services have to be distributed is 2 000 m. The principles of this International Standard may also be applied to data centre installations that do not fall within this range.

In addition to the requirements of ISO/IEC 11801, this International Standard specifies:

a) a modified structure and configuration for generic cabling within data centres used to support existing and emerging applications;
b) a reference implementation specific to data centre infrastructures.

Data centres have specific pathway and space requirements that are specified in ISO/IEC 14763-2. Until ISO/IEC 14763-2 is published, relevant information may be found in ISO/IEC 18010 (see Bibliography).

Safety (electrical safety and protection, fire, optical power etc.) and electromagnetic compatibility (EMC) requirements are outside the scope of this International Standard and are covered by other standards and regulations. However, information given in this International Standard and those identified in Figure 1 can be of assistance in meeting these other standards and regulations.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11801 2002, Information technology – Generic cabling for customer premises
Amendment 1(2008)
Amendment 2(2010).

ISO/IEC 14763-3, *Information technology – Implementation and operation of customer premises cabling – Part 3: Testing of optical fibre cabling*

IEC 60603-7 (all parts), *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

IEC 60603-7-2:, *Connectors for electronic equipment – Part 7-2: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*[4]

IEC 60603-7-3:, *Connectors for electronic equipment – Part 7-3: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*[5]

IEC 60603-7-4:, *Connectors for electronic equipment – Part 7-4: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*[6]

IEC 60603-7-5:, *Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*[7]

IEC 60603-7-7:, *Connectors for electronic equipment – Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 600 MHz*[8]

IEC 60603-7-41:, *Connectors for electronic equipment – Part 7-41: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*[9]

IEC 60603-7-51:, *Connectors for electronic equipment – Part 7-51: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*[10]

IEC 60603-7-71:, *Connectors for electronic equipment – Part 7-71: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 1 000 MHz*[11]

IEC 60794-2-11, *Optical fibre cables – Part 2-11: Indoor cables – Detailed specification for simplex and duplex cables for use in premises cabling*

IEC 60874-19-1, *Fibre optic interconnecting devices and passive components Connectors for optical fibres and cables – Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b – Detail specification*

IEC 61076-3-104, *Connectors for electronic equipment – Product requirements – Part 3-104: Detail specification for 8-way, shielded free and fixed connectors for data transmissions with frequencies up to 1 000 MHz*

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4 Second edition in preparation.

5 Second edition in preparation.

6 Second edition in preparation.

7 Second edition in preparation.

8 Third edition in preparation.

9 In preparation.

10 In preparation.

11 In preparation.

IEC 61156-5:2009, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Horizontal floor wiring – Sectional specification*

IEC 61754-7, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 7: Type MPO connector family*

IEC 61754-20, *Fibre optic connector interfaces – Part 20: Type LC connector family*

IEC 61755-3-2, *Fibre optic connector optical interfaces – Part 3-2: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical full zirconia ferrules for 8 degrees angled-PC single mode fibres*

IEC 61935-1, *Specification for the testing of balanced and coaxial infirmation technology cabling – Part 1: Installed balanced cabling as specified in ISO/IEC 11801 and related standards*

3 Terms and definitions and abbreviations

3.1 Terms and definitions

For the purposes of this International Standard the following terms and definitions apply in addition to those of ISO/IEC 11801.

3.1.1
cabled optical fibre Category
system of defining requirements for the cabled optical fibre performance within optical fibre channels and links.

3.1.2
equipment outlet
fixed connecting device for terminating the zone distribution cabling and providing the interface to the equipment cabling

3.1.3
fixed zone distribution cable
cable connecting the zone distributor to either the equipment outlet or, if present, the local distribution point

3.1.4
local distribution point
connection point in the zone distribution cabling subsystem between a zone distributor and an equipment outlet

3.1.5
local distribution point cable
cable connecting a local distribution point to an equipment outlet

3.1.6
local distribution point link
transmission path between a local distribution point and the interface at the other end of the fixed zone distribution cable including the connecting hardware at each end

3.1.7
main distribution cable
cable connecting the main distributor to the zone distributor

3.1.8
main distributor
distributor used to make connections between the main distribution cabling subsystem, network access cabling subsystem and cabling subsystems as specified in ISO/IEC 11801 and active equipment

3.1.9
network access cable
cable connecting the external network interface to the main distributor or zone distributor

3.1.10
transition assembly
assembly of cabled optical fibres and connectors, with an array connector on one end and simplex or duplex connectors on the other end

3.1.11
zone distribution cable
cable connecting the zone distributor to the equipment outlet(s) or local distribution point(s)

3.1.12
zone distributor
distributor used to make connections between the main distribution cabling subsystem, zone distribution cabling subsystem, network access cabling subsystem and cabling subsystems specified in ISO/IEC 11801 and active equipment

3.2 Abbreviations

For the purposes of this International Standard the following abbreviations apply in addition to those of ISO/IEC 11801.

BEF	Building Entrance Facility
ENI	External Network Interface
EO	Equipment Outlet
LDP	Local Distribution Point
MD	Main Distributor
OE EQP	Opto-Electronic EQuiPment
ZD	Zone Distributor

4 Conformance

For a cabling system to conform to this International Standard the following applies.

a) The configuration and structure shall conform to the requirements of Clause 5.

b) The performance of balanced channels shall conform to the transmission performance and environmental requirements of Clause 6. This shall be achieved by one of the following:

   1) a channel design and implementation ensuring that the prescribed channel performance is met;

   2) attachment of appropriate components to a link design meeting the prescribed performance class of Clause 6 and Annex A. Channel performance shall be ensured where a channel is created by adding more than one cord to either end of a link meeting the requirements of Clause 6 and Annex A;

   3) using the reference implementations of Clause 7 and compatible cabling components conforming to the requirements of Clauses 8, 9 and 10, based upon a statistical approach of performance modelling.

c) The implementation and performance of optical fibre cabling channels shall meet the requirements specified in Clause 6.

d) The interfaces to the cabling shall conform to the requirements of Clause 9 with respect to mating interfaces and performance.