

TECHNICAL REPORT

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First edition
2004-07

Information technology – Customer premises cabling for wireless access points

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	4
1 Scope	5
2 Normative references	5
3 Definitions and abbreviations.....	5
3.1 Definitions	5
3.2 Abbreviations	7
4 Conformance.....	7
5 Configuration, structure and topology	8
5.1 General.....	8
5.2 Functional elements	8
5.3 Cabling subsystems	8
5.4 Topology	8
6 Media selection and performance	9
7 Telecommunications outlet coverage and location.....	9
7.1 General.....	9
7.2 Provisioning	9
7.3 Single user TO assembly.....	10
7.4 Multi-user TO assembly (MUTO).....	10
7.5 Consolidation point.....	11
7.6 Dimensioning and configuring.....	11
8 Interfaces.....	13
9 Power delivery over balanced cabling	13
Annex A (informative) Supported applications	14
A.1 General.....	14
A.2 Cabling applications	14
A.3 Wireless applications.....	14
A.4 Power provisioning	14
Bibliography	15
Figure 1 – Grid of telecommunications outlets for wireless coverage areas.....	12
Figure 2 – Channel and Permanent link.....	13
Table A.1 – Supported wireless applications	14

INFORMATION TECHNOLOGY – CUSTOMER PREMISES CABLING FOR WIRELESS ACCESS POINTS

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

The main task of IEC and ISO technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where, for any other reason, there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the technical committee has collected data of a different kind from that which is normally published as an International Standard, for example 'state of the art'.

Technical reports of types 1 and 2 are subject to review within three years of publication to decide whether they can be transformed into International Standards. Technical reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 24704, which is a technical report of type 2, was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

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

This document is issued in the type 2 technical report series of publications (according to 15.2.2 of the Procedures for the technical work of ISO/IEC JTC 1 (1998)) as a prospective standard for provisional application in the field of Customer Premises Cabling, because there is an urgent requirement for guidance on how standards in this field should be used.

This document is not to be regarded as an International Standard. It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to IEC Central Office.

A review of this type 2 technical report will be carried out not later than three years after its publication with the option of extension for a further three years, conversion into an International Standard or withdrawal.

INTRODUCTION

This document specifies the use of generic cabling for customer premises, as specified in international standard ISO/IEC 11801, for connection to wireless access points. It is intended to guide new installations and renovations. The customer premises may encompass one or more buildings or may be within a building that contains more than one enterprise.

This Technical Report specifies an ISO/IEC compliant implementation methodology that enables connection to information and communications technology (ICT) equipment that is specifically deployed to provide a grid of wireless coverage areas within buildings. The cabling may be installed prior to the selection of specific equipment or the wireless application to be used.

International standard ISO/IEC 11801 specifies a structure and performance requirements for cabling subsystems that support a wide range of applications. It provides appropriate equipment interfaces to the cabling infrastructure in equipment rooms, telecommunications rooms and work areas.

A growing number of enterprises employ equipment at the “edge” of the network that rely on both physical connections to the cabling infrastructure at the work area, while also having the ability to maintain untethered network access at other locations. This Technical Report was created because the infrastructure specified in cabling standard ISO/IEC 11801 does not specifically cover infrastructure for connections to wireless access points. Supplementary information is provided here on the number of outlets and outlet placement for wireless access points that may optionally receive both power and information transfer through the IT cabling.

This Technical Report specifies a cabling system infrastructure based upon balanced and optical fibre cabling that provides:

- users with requirements for a supplemental cabling infrastructure that enables reliable deployment of wireless ICT equipment without the costs associated with the installation of additional IT or mains power cabling;
- users with a flexible cabling scheme such that changes to the wireless access points are both easy and economical;
- building professionals (for example, architects) with guidance for accommodating cabling before specific requirements are known, i.e. in the initial planning either for construction or refurbishment;
- industry and applications standardization bodies (for example ITU-T, ISO/IEC JTC 1/SC 6, ISO/IEC JTC 1/SC 25/WG 1, IEC TC 100) with a cabling system that supports current products and provides a basis for future product development;
- users, designers, and manufacturers of wireless access points with advice on interfacing to the generic cabling;
- suppliers of cabling components and installers of cabling with relevant requirements.

A number of wireless applications have been analysed to determine the requirements specified herein. Propagation of microwave energy indoors is complex and the operating range of communications devices will depend on carrier frequency, transmission power, building geometry and materials. Consult the application standard and equipment manuals for guidance on factors that should be taken into account during design of the wireless grid and prior to deployment of wireless access points.

1 Scope

The cabling specified in this Technical Report is considered to be in addition to and not in place of the infrastructure specified in ISO/IEC 11801. This Technical Report specifies a customer premises cabling system infrastructure for an array of coverage areas that form a wireless network grid within a building. It is applicable to all of the balanced and optical fibre cabling classes specified in ISO/IEC 11801.

This Technical Report specifies design and configuration of an ISO/IEC 11801 compliant horizontal cabling subsystem. Requirements and guidelines are provided with respect to

- a) minimum configuration, structure and topology,
- b) performance requirements for permanent links and channels,
- c) coverage and location of telecommunications outlets,
- d) interfaces to wireless access points,
- e) power delivery over balanced cabling.

While placement and security of wireless access points are outside the scope of this Technical Report, placement of telecommunications outlets (TOs) is specified to enable flexible deployment of wireless services.

Safety (electrical, fire, etc.) and electromagnetic compatibility (EMC) requirements are outside the scope of this Technical Report.

2 Normative references

The following referenced documents are indispensable for the application of this document. The latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

ISO/IEC 14763-1, *Information technology – Implementation and operation of customer premises cabling – Part 1: Administration*

ISO/IEC 18010, *Information technology – Pathways and spaces for customer premises cabling*

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11801, ISO/IEC 18010 and the following apply.

3.1.1

channel

end-to-end transmission path connecting any two pieces of application-specific equipment [3.1.15 of ISO/IEC 11801:2002]

NOTE A transmission path may use one or more pairs, may share a pair with another path, for example power feeding and information may run over the same pair.

3.1.2

coverage area

area served by terminal equipment connected to a telecommunications outlet

3.1.3

coverage area cord

cord connecting the telecommunications outlet to terminal equipment that serves a coverage area (for example, wireless access point)

3.1.4

grid

arrangement of multiple contiguous coverage areas

3.1.5

information and communications technologies (ICT)

group of applications using information and communications (telecommunications) technologies

3.1.6

link

transmission path between two cabling system interfaces

3.1.7

permanent link

transmission path between the telecommunications outlet and the floor distributor [3.1.52 of ISO/IEC 11801:2002]

NOTE The permanent link does not include work area cords, coverage area cords, equipment cords, patch cords and jumpers, but includes the connection at each end. It can include a CP link.

3.1.8

remote power feeding

supply of power different from mains power to application-specific equipment via balanced cabling

3.1.9

space (telecommunications)

area used for housing the installation and termination of telecommunications equipment (IT) and cabling [3.1.25 of ISO/IEC 18010:2002]

NOTE Examples of spaces are equipment rooms, telecommunications rooms, work areas, coverage areas and maintenance holes/handholes.

3.1.10

terminal equipment

equipment that provides access to an application / service at a telecommunications outlet

3.1.11

wireless access point

terminal equipment that provides service to wireless end point devices

3.2 Abbreviations

C	Connection
CP	Consolidation Point
DTE	Data Terminal Equipment
EMC	Electromagnetic Compatibility
EQP	Transmission Equipment
ffs	for further study
FD	Floor Distributor
ICT	Information and Communications Technology
IT	Information Technology
MUTO	Multi-user telecommunications outlet
TE	Terminal Equipment
TO	Telecommunications Outlet

4 Conformance

For a cabling installation intended for use with wireless applications to conform to this Technical Report, the following shall apply.

- a) The configuration, structure and topology of cabling shall conform to Clause 5.
- b) The entire system shall be composed of channels and links that meet the necessary level of performance specified in Clause 6.
- c) The coverage and location of the telecommunications outlet shall conform to Clause 7.
- d) The cabling interfaces to the wireless access points shall conform to Clause 8.
- e) When used, power delivery over balanced cabling shall conform to Clause 9.
- f) System administration shall meet the requirements of ISO/IEC 14763-1.
- g) System pathways and spaces shall meet the requirements of ISO/IEC 18010.
- h) Regulations concerning safety and EMC shall be met as applicable to the location of the installation.

In all other respects, the cabling infrastructure shall be in full compliance with ISO/IEC 11801. No portion of this Technical Report shall be used to negate or replace the minimum requirements of ISO/IEC 11801.

5 Configuration, structure and topology

5.1 General

This clause identifies the functional elements, configuration and topology of a horizontal system to support wireless access points.

5.2 Functional elements

The functional elements of the horizontal cabling system are as follows:

- floor distributor (FD);
- horizontal cable;
- consolidation point (CP) - optional;
- telecommunications outlet (TO).

The type and number of functional elements used depends upon the type of premises and the applications served. It is possible for the functions of multiple elements to be combined into a single element. Equipment and coverage area cords used to connect the transmission equipment to the cabling subsystem are considered to be part of the cabling channel and shall meet the applicable requirements of ISO/IEC 11801.

Equipment is connected with coverage area cords to the telecommunications outlets and with equipment cords to the distributors. During planning, consideration of a logical boundary between coverage areas served from different floor distributors should be considered. For example, such a boundary may be at a fixed structural boundary within the building or at areas that do not require coverage.

5.3 Cabling subsystems

A horizontal subsystem shall be used to connect the wireless access point serving a coverage area to equipment at a distributor. The horizontal cabling subsystem ends at the telecommunications outlet. TOs that support wireless access points serving coverage areas should connect to equipment at distributors on the same floor. Active equipment shall not be connected between the floor distributor and the telecommunications outlet.

Functional elements and requirements for campus backbone subsystems, building backbone subsystems and connections between subsystems shall comply with ISO/IEC 11801.

5.4 Topology

The horizontal cabling used to serve wireless coverage areas shall be configured in a star topology.

Passive connections between the horizontal cabling subsystem and other subsystems shall be achieved using cross-connections.