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Information technology – Automated infrastructure management (AIM) systems – Requirements, data exchange and applications

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FOREWORD

1) 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.

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ISO/IEC 18598 edition 1.1 contains the first edition (2016-09) and its amendment 1 (2021-03) [documents JTC1-SC25/2996/FDIS and JTC1-SC25/3011/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard ISO/IEC 18598 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This International Standard is intended for

- premises owners and facility managers,
- suppliers of AIM solutions,
- planners of network infrastructures,
- network operation managers,
- data centre operation managers,
- IT process managers,
- suppliers of management system software,
- software integrators.

This International Standard is one of a number of documents prepared in support of International Standards and Technical Reports produced by ISO/IEC JTC 1/SC 25.

INTRODUCTION to Amendment 1

This amendment adds the following content to ISO/IEC 18598:2016:

- updates to the data exchange model;
- an Annex E which addresses the optional application of AIM systems to cabling supporting remote powering in accordance with IEEE 802.3bt-2018;
- an Annex F which addresses formatting of data from field test equipment.

INFORMATION TECHNOLOGY –

Automated infrastructure management (AIM) systems – Requirements, data exchange and applications

1 Scope

This International Standard specifies the requirements and recommendations for the attributes of automated infrastructure management (AIM) systems.

This International Standard explains how AIM systems can contribute to operational efficiency and deliver benefits to

a) cabling infrastructure and connected device administration,

b) facilities and IT management processes and systems,

c) other networked management processes and systems (e.g. intelligent building systems),

d) business information systems covering asset tracking and asset management together with event notifications and alerts that assist with physical network security.

For AIM systems providing support functionality for remote powering as an option, this International Standard addresses additional administration requirements and recommendations.

This International Standard specifies a framework of requirements and recommendations for data exchange with other systems

2 Normative references

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

There are no normative references in this document.

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
AIM-enabled port
port which is able to automatically detect the insertion and removal of a cord and process that event as part of an automated infrastructure management system

3.1.2
AIM hardware
combination of patch panels and controllers that are designed to automatically detect the insertion or removal of cords, to record connectivity information, and to exchange connectivity information with AIM software

3.1.3
AIM system
integrated hardware and software system that automatically detects the insertion or removal of cords, documents the cabling infrastructure including connected equipment enabling management of the infrastructure and data exchange with other systems

3.1.4
alarm
event of sufficient importance to be highlighted within the AIM system

3.1.5
application programming interface
API
set of commands, functions and protocols that specify how software components should interact

3.1.6
basic connectivity configuration
list of information including, but not restricted to, number and type of ports, number of slots, expansion cards, MAC and IP address

3.1.7
business information system
system that is used to analyse and facilitate strategic and operational activities for an organization

3.1.8
building management system
BMS
computer-based control system installed in a building that controls and monitors mechanical and electrical equipment such as heating, ventilation and air-conditioning (HVAC), power systems and access control systems

3.1.9
cabling connectivity information
combination of connection information automatically detected by AIM and additional cabling infrastructure information from various sources

3.1.10
cabling infrastructure
cables, connecting hardware, panels and other closures, cabinets, frames, racks together with pathways and spaces providing their accommodation

3.1.11
circuit
series of electromagnetically connected components or devices

3.1.12
closure
fixture or fitting of either open or closed construction intended to contain connecting hardware

[SOURCE: ISO/IEC 14763-2:2012, 3.1.11]

3.1.13
command
defined method which either provides data or performs an internal operation within an AIM system based on a request

Note 1 to entry: A command may contain zero or more parameters.

3.1.14
configuration management database
repository of information related to all the components of an information system

3.1.15
connecting hardware
device or combination of devices used to connect cables or cable elements

[SOURCE: ISO/IEC 11801:2002, 3.1.17, modified]

3.1.16
connection information
record of an event generated by the insertion or removal of a ~~connector~~ cord at an AIM-enabled port

3.1.17
cord
cable, cable unit or cable element with a minimum of one termination

[SOURCE: ISO/IEC 11801:2002, 3.1.20]

3.1.18
data
value or set of values that describes information within an AIM system

3.1.19
data exchange
ability of an AIM system and other systems to work together reliably

3.1.20
discoverable equipment
equipment with a network address

Note 1 to entry: Discoverable equipment could be treated as non-discoverable equipment according to end user choice.

3.1.21
end device
equipment that is either the source or the destination of a message on a networked system

3.1.22
event
change in state of an element within the AIM system

3.1.23
information security management system
part of the overall management system, based on a business risk approach, that establishes, implements, operates, monitors, reviews, maintains and improves information security

Note 1 to entry: The management system includes organizational structure, policies, planning activities, responsibilities, practices, procedures, processes and resources.

3.1.24
interoperability
ability for two or more independent systems to exchange data or information

3.1.25
managed network distribution equipment
discoverable network distribution equipment that uses communications protocols such as the simple network management protocol (SNMP) to exchange management information

3.1.26
network distribution equipment
electronic equipment that provides connectivity and supports data exchange between end devices

3.1.27
non-discoverable equipment
equipment without a network address

3.1.28
patch panel
closure designed to be mounted in a cabinet, frame or rack

3.1.29
permissions
set of rules which describe what a user or group of users may access or control within an AIM system

3.1.30
telecommunications infrastructure
cabling infrastructure together with the network distribution equipment, end devices and their accommodation

3.1.31
work order
set of one or more actions that should be performed by a technician or user of the system

3.1.32
Power over Ethernet
PoE
remote powering in accordance with ISO/IEC/IEEE 8802-3

3.1.33
remote powering
power delivery from power sources to terminal equipment or powered devices over telecommunications cabling

EXAMPLE Power over Ethernet in accordance with ISO/IEC/IEEE 8802-3

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

AIM automated infrastructure management
API application programming interface
BMS building management system
CMDB configuration management database
DCIM data centre infrastructure management
HVAC heating, ventilation and air-conditioning
HTTP hypertext transfer protocol
IP internet protocol

IT information technology
ITIL Information Technology Infrastructure Library
JSON JavaScript object notation
MAC media access control
PC personal computer
PoE power over Ethernet
REST representational state transfer
SNMP simple network management protocol
SOAP simple object access protocol
WAP wireless access point
XML extensible markup language
PD powered device
PSE power supply equipment

4 Conformance

For an AIM system to conform to this International Standard, it shall

a) comprise hardware and software components which together meet the requirements of Clause 5,
b) meet the requirements of Clause 7,
c) be implemented in accordance with the requirements of Annex C.

AIM systems that provide support functionality for remote powering to conform to this International Standard shall conform with the requirements of Annex E in addition to the conformance requirements above.

5 Automated infrastructure management (AIM) systems

5.1 Functional elements

An AIM system shall include the following two functional elements:

a) hardware that automatically detects the insertion and removal of cords;
b) software that
   - collects and stores the resulting connection information,
   - relates the connection information to cabling connectivity information,
   - relates the cabling connectivity information to information from other sources,
   - makes the connection information accessible to either an authorized user or to other systems.

It is important to note that although the initial detection of connectivity is generally accomplished through electrical, electronic, electro-mechanical or optical means, the different functions and features using this data are implemented in software.

The software used for AIM systems shall include either application programming interfaces (APIs) or data exchange formats as described in Clause 7 to allow data from the AIM system to be shared with other systems used by the organization. This is an important aspect for enhancing and automating the management and operational functions in the building and data centres.