

# INTERNATIONAL STANDARD

Information technology – **IT- STANDARD PREVIEW**  
Automated infrastructure management (AIM) systems – Requirements, data  
exchange and applications **(standards.iteh.ai)**

[ISO/IEC 18598:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/ef6a655c-e435-4b5b-996b-7594c53d7fbf/iso-iec-18598-2016>



**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2016 ISO/IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about ISO/IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### **About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### **About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### **IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)**

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### **Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### **IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### **IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)**

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### **IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### **IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

INTERNATIONAL STANDARDS PREVIEW  
(standards.iteh.ai)  
ISO/IEC 18598:2016  
https://standards.iteh.ai/catalog/standards/iso-iec-18598-2016  
7594c53d7bf/iso-iec-18598-2016

# INTERNATIONAL STANDARD

---

Information technology – **STANDARD PREVIEW**  
Automated infrastructure management (AIM) systems – Requirements, data  
exchange and applications  
(standards.iteh.ai)

[ISO/IEC 18598:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/ef6a655c-e435-4b5b-996b-7594c53d7fbf/iso-iec-18598-2016>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 35.200

ISBN 978-2-8322-3665-9

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms, definitions and abbreviations .....	6
3.1 Terms and definitions .....	6
3.2 Abbreviations .....	9
4 Conformance.....	10
5 Automated infrastructure management (AIM) systems .....	10
5.1 Functional elements .....	10
5.2 System requirements.....	10
5.3 Functional requirements .....	10
5.3.1 Documentation and maintenance of information within AIM software .....	10
5.3.2 Management and usage of information within AIM software.....	11
5.3.3 Integrity of information within AIM software.....	11
5.4 Functional recommendations .....	12
6 AIM solutions: business benefits .....	12
6.1 General.....	12
6.2 Intrinsic benefits of stand-alone AIM systems.....	12
6.2.1 Accurate documentation.....	12
6.2.2 Asset management .....	12
6.2.3 Capacity management.....	13
6.2.4 Change management.....	13
6.2.5 Incident management.....	13
6.3 Extrinsic benefits of AIM when linked with other business information and network management systems.....	14
6.3.1 General .....	14
6.3.2 IT-related systems .....	14
6.3.3 Building management systems .....	16
6.3.4 Data centre infrastructure management (DCIM) .....	17
6.3.5 Configuration management database (CMDB) applications .....	18
7 AIM solutions: Data exchange framework .....	19
7.1 General.....	19
7.2 Data exchange format and protocols.....	19
7.3 Commands.....	19
7.4 Common data model definition .....	21
7.4.1 General .....	21
7.4.2 Element reference ID .....	21
7.4.3 Element and attribute definitions .....	21
7.4.4 Containment rules and hierarchy .....	27
Annex A (informative) Hierarchy and containment rules .....	28
Annex B (informative) Field descriptions.....	30
Annex C (normative) Implementation requirements and recommendations .....	31
C.1 General.....	31
C.2 Design.....	31

C.3	Specification .....	31
C.3.1	Business, operational and system requirements.....	31
C.3.2	Integration requirements for data exchange with other applications .....	32
C.3.3	System test plan .....	32
C.4	Installation .....	32
C.5	Operation.....	32
Annex D (informative)	Optional lower level data exchange framework .....	33
Bibliography	.....	34
Figure 1	– Example of a helpdesk work flow integrated with an AIM system .....	15
Figure 2	–Relationship between AIM systems and CMDB applications .....	19
Figure A.1	– Spaces .....	28
Figure A.2	– Telecommunications equipment.....	28
Figure A.3	– Work orders .....	29
Table 1	– Work order management commands .....	20
Table 2	– Asset management.....	20
Table 3	– Alarms and events.....	20
Table 4	– Circuit tracing.....	20
Table 5	– Attribute key.....	21
Table 6	– Connectivity .....	22
Table 7	– Premises/space.....	22
Table 8	– Furniture.....	22
Table 9	–Telecommunications equipment.....	23
Table 10	– Organizational Element.....	25
Table 11	– Work Order.....	25
Table 12	– Work Order Task .....	26
Table 13	– Event .....	26
Table 14	– Alarm .....	26
Table B.1	– AIM software fields.....	30
Table D.1	– Port level .....	33
Table D.2	– Port level work actions .....	33

ITeH STANDARD PREVIEW

(standards.iteh.ai)

ISO/IEC 18598:2016

<https://standards.iteh.ai/catalog/standards/sist/cf6a655e-e435-4b5b-996b-7594c53d7fbf/iso-iec-18598-2016>

7594c53d7fbf/iso-iec-18598-2016

## INFORMATION TECHNOLOGY –

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

#### 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.
- 2) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees and ISO member bodies.
- 3) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC National Committees and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO, IEC or ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 5) ISO and IEC do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. ISO or IEC are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.  
<https://standards.iteh.ai/catalog/standards/sist/ef6a655c-e435-4b5b-996b-405367000000/iso-iec-18598-2016>
- 7) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC National Committees or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC publication 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 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.

## 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.

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

[ISO/IEC 18598:2016](https://standards.iteh.ai/catalog/standards/sist/ef6a655c-e435-4b5b-996b-7594c53d7fbf/iso-iec-18598-2016)

<https://standards.iteh.ai/catalog/standards/sist/ef6a655c-e435-4b5b-996b-7594c53d7fbf/iso-iec-18598-2016>

## 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.

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

(standards.iteh.ai)

#### 2 Normative references

ISO/IEC 18598:2016

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 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

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

ISO/IEC 18598:2016

https://standards.iteh.ai/catalog/standards/iso-iec-18598-2016/7594c53d7fbf/iso-iec-18598-2016

**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

**3.2 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

## 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.

## 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.

### 5.2 System requirements

An AIM system shall be able to

- a) automatically detect connectivity between AIM-enabled panel ports,
- b) automatically detect connectivity between AIM-enabled panel ports and other equipment (with AIM-enabled ports) or document and/or infer connectivity between AIM-enabled panel ports and other equipment (without AIM-enabled ports),
- c) monitor the connections and disconnections of a) and b).

### 5.3 Functional requirements

#### 5.3.1 Documentation and maintenance of information within AIM software

Once configured, an AIM system shall be able to

- a) accommodate the chosen identification scheme for the items to be documented within the AIM software (including identification schemes in accordance with IEC 81346-1 and ISO/IEC 14763-2 – an implementation of which is described in ISO/IEC TR 14763-2-1),
- b) record the connections between elements within the cabling infrastructure,