ISO/IEC 14543-5-5

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# INTERNATIONAL STANDARD

**Information technology – Home electronic system (HES) architecture –**
**Part 5-5: Intelligent grouping and resource sharing for Class 2 and Class 3 –**
**Device type**

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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## FOREWORD

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International Standard ISO/IEC 14543-5-5 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

The list of all currently available parts of the ISO/IEC 14543 series, under the general title *Information technology – Home electronic system (HES) architecture*, can be found on the IEC web site.

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

ISO/IEC 14543-5, *Information technology – Home electronic system (HES) architecture – Part 5: Intelligent grouping and resource sharing for HES (IGRS)*, consists of the following parts:

➢ **IGRS Part 5-1: Core protocol**

- Specifies the TCP/IP protocol stack as the basis and the HTTP protocol as the message-exchanging framework among devices.

- Specifies a series of device and service interaction/invocation standards, including device and service discovery protocol, device and service description, service invocation, security mechanisms, etc.

- Specifies core protocols for a type of home network that supports streaming media and other high-speed data transport within a home.

➢ **IGRS Parts 5-2#: Application profile**

- Based on the IGRS Core Protocol.

- Specifies a device and service interaction mechanism, as well as application interfaces used in IGRS Basic Applications.

- Multiple application profiles are specified, including:
  - Part 5-21: AV profile
  - Part 5-22: File profile

- Additional application profiles are planned (part numbers to be assigned)
  - Part 5-2w: DVD profile
  - Part 5-2x: QoS profile
  - Part 5-2y: DMCP profile
  - Part 5-2z: Universal control profile

➢ **IGRS Part 5-3: Basic application**

- Includes an IGRS basic application list.

- Specifies a basic application framework.

- Specifies operation details (device grouping, service description template, etc.), function definitions and service invocation interfaces.

➢ **IGRS Part 5-4: Device validation**

- Specifies a standard method to validate an IGRS-compliant device.

➢ **IGRS Part 5-5: Device type**

- Specifies IGRS Device types used in IGRS applications.

➢ **IGRS Part 5-6: Service type**

- Specifies basic service types used in IGRS applications.

**INFORMATION TECHNOLOGY –
HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –**

**Part 5-5: Intelligent grouping and resource sharing
for HES Class 2 and Class 3 – Device type**

## 1 Scope

This part of the ISO/IEC 14543 specifies the device type of all devices that conform to ISO/IEC 14543-5-1: Core Protocol, and ISO/IEC 14543-5-2#: Application Profile.

This part of the ISO/IEC 14543 is applicable to all devices that are operating in an IGRS network.

## 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 14543-5-1, *Information technology – Home electronic system (HES) architecture – Part 5-1: Intelligent grouping and resource sharing for Class 2 and Class 3 – Core protocol*

ISO/IEC 14543-5-6, *Information technology – Home electronic system (HES) architecture – Part 5-6: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Service type*[1]

ISO/IEC 14543-5-21, *Information technology – Home electronic system (HES) architecture – Part 5-21: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Application profile – AV profile*

ISO/IEC 14543-5-22, *Information technology – Home electronic system (HES) architecture – Part 5-22: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Application profile – File profile*

ISO/IEC 29341-3-1:2008, *Information technology – UPnP Device Architecture – Part 3-1: Audio Video Device Control Protocol – Audio Video Architecture*

## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

For the purposes of this document the following terms and definitions apply. These terms are commonly used in other industry publications.

**3.1.1
centralised device group**
set of IGRS devices with one IGRS device acting as the master

NOTE   The master is responsible for managing the setup, for dismissing a Device Group and for processing a join request from other devices. The master device and other IGRS devices in such a Device Group form a centralised or master-slave relationship.

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**3.1.2**
**client identifier**
unique identifier associated with a client on an IGRS device to which that client belongs

**3.1.3**
**device group**
multiple IGRS devices that are organised in a logical group through the device group management mechanism in the IGRS specification

NOTE   Each IGRS device that joins in a Device Group follows common interaction rules. Two types of Device Groups are defined: peer-to-peer Device Group and centralised (master-slave) Device Group.

**3.1.4**
**device identifier**
globally unique device identifier associated with one IGRS device

**3.1.5**
**device pipe**
channel used to transfer device interaction messages

NOTE   This channel is set up through the pipe setup mechanism in the IGRS specification.

**3.1.6**
**device type**
identifier that indicates the physical and functional characteristic shown by an IGRS device

**3.1.7**
**entity device type**
identifier that indicates the physical form of a device

**3.1.8**
**functional device type**
identifier that indicates the functional characteristic of a device

**3.1.9**
**IGRS client**
application that draws upon the services of one or more connected IGRS devices

NOTE   Multiple client instances can exist on a network at the same time.

**3.1.10**
**IGRS device**
information device that conforms to the IGRS specification

**3.1.11**
**IGRS dynamic service invocation module**
part of the AV application logic to orchestrate the interaction of application services with respect to the capability of the device or device group involved and to coordinate the service invocation sequence between the media server and media client

NOTE   The IGRS dynamic service invocation module should be implemented on a media server, a media client or a separate other device.

**3.1.12**
**IGRS service**
shareable resource encapsulated in an IGRS device by implementing application interfaces and providing services for other IGRS devices

NOTE   An IGRS service has an invocation interface that meets the requirements of the IGRS specification. These invocation interfaces are described and announced on the network through the IGRS service description specification.

**3.1.13**
**IGRS user**
owner of an IGRS device and client

**3.1.14**
**mandatory interface**
service interface that is implemented by an IGRS device of some functional device type

**3.1.15**

**peer-to-peer device group**
set of IGRS devices where each IGRS device within a set has a peer-to-peer relationship to one another

**3.1.16**
**service identifier**
unique identifier assigned to a service provided by a specific IGRS device

NOTE   The same type of service may be provided by multiple IGRS devices within the same network. Each instance of a service has a unique service identifier on the IGRS device providing that service.

**3.1.17**
**service type**
category of IGRS service defined according to the set of encapsulated resources

NOTE   The service type enables service applications in the same category to have common invocation interfaces.

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**3.1.18**
**subservice**
specific set of services that is a part of some functional device type

**3.1.19**
**user identifier**
identifier of an IGRS user

**3.2    Abbreviations**

| | |
|---|---|
| BCM | Back Channel Message |
| CIS | Content Index Service |
| CMS | Connection Management Service |
| FAMS | File Access Management Service |
| FC | File Client |
| FCMS | File Connection Management Service |
| FS | File Server |
| IGRS | Intelligent Grouping and Resource Sharing |
| MC | Media Client |
| MCTMS | Media Client Transport Management Service |
| MP | Media Player |
| MR | Media Recorder |
| MS | Media Server |
| MSTMS | Media Server Transport Management Service |
| RMS | Rendering Management Service |

## 4   Conformance

For IGRS devices to claim conformance to this International Standard the following applies.

- The IGRS device type classification identifier definitions shall meet the specification described in Clause 5.
- An entity device type shall meet the basic device type specifications described in Clause 6.
- A functional device type including subservice and mandatory interface definitions shall meet the specification defined in Clause 7.

## 5   Device type overview

IGRS device type can be divided into two conceptual types. One type is the Entity Device Type; the other is Functional Device Type. The Entity Device Type is used to indicate the physical form of a device, such as a PC, TV, etc. The Functional Device Type is used to indicate the common functional characteristic of devices, for example, Media Server, Media Player, etc.

The identifiers of the Entity Device Type and Functional Device Type of IGRS devices shall conform to the definition of the device type identifier in 8.1.4 of ISO/IEC 14543-5-1.

The device type identifier shall meet the following syntactic definition:

<IGRSDeviceTypeURN>::=urn:<IGRSNS>:<IGRSSingleType>|<IGRSTypeList>

<IGRSNS>::=IGRS:Device:DeviceType

When describing a single device type, the syntactic definition is:

<IGRSDeviceTypeURN>::=urn:<IGRSNS>:<IGRSSingleType>

<IGRSSingleType>::= <NAME>

When describing a multi-device type, the syntax shall be:

<IGRSDeviceTypeURN>::=urn:<IGRSNS>:<IGRSTypeList>

<IGRSTypeList>::=<IGRSSingleType>*<IGRSTypeVal>

<IGRSTypeVal>::=<ConnectionSign><IGRSSingleType>

<NAME>::=1*16<URN chars>

<URN chars>::=<trans>

<trans>::=<upper>|<lower>|<number>|<other>

<upper>::= "A" | "B" | "C" | "D" | "E" | "F" | "G" | "H" |"I" | "J" | "K" | "L" | "M" | "N" | "O" | "P" |"Q" | "R" | "S" | "T" | "U" | "V" | "W" | "X" |"Y" | "Z"

<lower>::= "a" | "b" | "c" | "d" | "e" | "f" | "g" | "h" |"i" | "j" | "k" | "l" | "m" | "n" | "o" | "p" |"q" | "r" | "s" | "t" | "u" | "v" | "w" | "x" |"y" | "z"

<number>::= "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" |"8" | "9"

<other>::= - | . | _

<ConnectionSign>::=;

<URN chars> is case insensitive.

Every IGRS device shall have one Entity Device Type and at least one Functional Device Type.

All device types related to the IGRS device shall be listed in the device type field of the device online advertisement message. However, only relevant types shall be listed in the device type field of device search and subscription messages.

When both types are listed at the same time, the Entity Device Type shall be listed in front of the Functional Device Type.

## 6   Entity device type

The Entity Device Type is used to indicate the physical form of IGRS devices. Every IGRS device shall have a unique Entity Device Type. To identify the common Entity Device Types, the corresponding device type identifiers specified in Table 1 shall be used.

**Table 1 – Basic entity device type list**

| Entity Device Type Identifier | Field Explanation |
|---|---|
| urn:IGRS:Device:DeviceType:PC | IGRS PC |
| urn:IGRS:Device:DeviceType:NoteBook | IGRS Notebook |
| urn:IGRS:Device:DeviceType:PDA | IGRS PDA |
| urn:IGRS:Device:DeviceType:DC | IGRS Digital Camera |
| urn:IGRS:Device:DeviceType:DV | IGRS Digital Video Camera |
| urn:IGRS:Device:DeviceType:MP3 | IGRS MP3 Player |
| urn:IGRS:Device:DeviceType:MP4 | IGRS MP4 Player |
| urn:IGRS:Device:DeviceType:Mobilephone | IGRS Mobile Phone |
| urn:IGRS:Device:DeviceType:SetTopBox | IGRS Set-Top-Box |
| urn:IGRS:Device:DeviceType:TV | IGRS TV |
| urn:IGRS:Device:DeviceType:VCR | IGRS VCR |
| urn:IGRS:Device:DeviceType:DVDPlayer | IGRS CD/DVD Player |
| urn:IGRS:Device:DeviceType:DMA | IGRS Digital Media Adaptor |
| urn:IGRS:Device:DeviceType:NAS | IGRS Network Attached Storage (NAS) |
| urn:IGRS:Device:DeviceType:UnknownType | IGRS unknown device type |

## 7   Functional device type

### 7.1   Summary on functional device type

The Functional Device Type identifies the functional form of IGRS devices. Every device can have multiple Functional Device Types at the same time.

The Functional Device Type is defined by the subservices and the mandatory interface set of each subservice.

This standard details a series of basic Functional Device Types in the following subclauses. The descriptions include the related device type identifier, the subservice set, the mandatory interface set of each subservice and the commonly used service invocation procedure of the device type.

Table 2 defines a series of basic Functional Device Types.