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INTERNATIONAL STANDARD

Information technology – Home electronic system (HES) architecture – Part 5-6: Intelligent grouping and resource sharing for Class 2 and Class 3 – Service type

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INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 5-6: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Service type

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International Standard ISO/IEC 14543-5-6 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) architecure – Part 5: Intelligent Grouping and Resource Sharing for HES (IGRS), consists of six 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**
  - Defines 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.

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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 Scope

This part of ISO/IEC 14543-5 specifies the service types that conform to ISO/IEC 14543-5-1.

This part of the ISO/IEC 14543 is applicable to computers, household appliances and communication devices that implement media or data streaming in a local area network (LAN) or personal area network (PAN) environment by wired or wireless means.

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.

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ISO/IEC 14543-5-1:2010, *Information technology – Home electronic system (HES) architecture – Part 5-1: Intelligent grouping and resource sharing for Class 2 and Class 3 – Core protocol*

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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 14543-5-22:2010, *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*

IETF RFC 2046, *Multipurpose Internet Mail Extensions (MIME) – Part 2: Media Types*

3 Terms, definitions, abbreviations and conventions

3.1 Terms and definitions

For the purposes of this document the following terms and defintions apply.

3.1.1
audio/video multicast device group
type of media device group consisting of a media server and media client with multicast capability for an AV multicast playback application

3.1.2
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.

3.1.3
client identifier
unique identifier associated with a Client on an IGRS Device to which that Client belongs

3.1.4
content index service device group
type of media device group consisting of multiple media servers for managing content across multiple media servers in a distributed, collaborative and load-balancing manner

3.1.5
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 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.

3.1.6
device identifier
globally unique device identifier associated with one IGRS Device

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3.1.7
device pipe
channel used to transfer device interaction messages

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

3.1.8
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.

3.1.9
IGRS device
information device that conforms to the IGRS specification

3.1.10
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 another separate device.

3.1.11
IGRS service
sharable 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.

3.1.12
IGRS user
owner of an IGRS Device and Client

3.1.13
media client
audio/video device in an IGRS network that possesses multimedia decoding capability

NOTE Examples of a media client device include a TV, set top box, etc. The media client may access content on the media server as the destination device in an audio/video application.

3.1.14
media device group
embodiment of device group in an audio/video system and a type of centralised device group defined in ISO/IEC 14543-5-1

NOTE A media device group consists of two classes: content index service device group and audio video multicast device group.

3.1.15
media server
audio/video device in IGRS network that possesses storage and computing capability

NOTE Examples of a media server device include a PC, network storage server, etc. The media server may provide a network interface to other audio/video devices to access content managed by the media server as the source device in an audio/video application.

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3.1.16
peer-to-peer device group
set of IGRS Devices where each IGRS Device in this set has a peer-to-peer relationship with one another

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3.1.17
service attribute
variable associated with each service type to record the service status

3.1.18
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.

3.1.19
service interface
method provided by IGRS service for the IGRS clients to share resources

NOTE The service interface is composed of interface name, parameters provide by IGRS clients, etc.

3.1.20
service type
category of IGRS Service defined according to the set of resources encapsulated

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

3.1.21
service type identifier
global unique identifier to differentiate IGRS services and identify the operation methods and eventing mechanism of certain services

3.1.22
user identifier
identifier of an IGRS user

3.2 Abbreviations

BCM	Back Channel Message
CIS	Content Index Service
CMS	Connection Management Service
EPG	Electronic Program Guide
FAMS	File Access Management Service
FC	File Client
FCMS	File Connection Management Service
FS	File Server
IGRS	Intelligent Grouping and Resource Sharing
MAN	Mandatory, also refer to message definitions in ISO/IEC 14543-5-1
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

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3.3 Conventions

For the convenience of the implementer, a number of XML schemas specified in this standard can also be found on the World Wide Web. In case of any differences, the definitions within this standard shall prevail.

4 Conformance

For conformity to this International Standard the following applies.

- The IGRS generic service model shall meet the general description specification described in Clause 5.
- The IGRS service type identifier requirements shall meet the specifications described in Clause 6.
- The list of all standard IGRS service types and their detailed service-related functional requirements shall conform to meet the specification defined in Clauses 7 and 8 respectively.
- The Back Channel Message TCP Service definitions shall meet the specification defined in Clause 9.
- The content representation framework requirements for an IGRS AV application shall meet the specifications described in Annex A.
- The description requirements for metadata used in an IGRS AV application shall meet the specifications described in Annex B.

- The data type generation requirements for all IGRS services shall meet the specifications described in Annex C.
- The specific service type message formats for all IGRS services shall meet the specifications described in Annex D.
- The XML schema files used in the IGRS services shall meet the specifications described in Annex E.
- The service description wsdl files used in the IGRS services shall meet the specifications described in Annex F, Annex G, Annex H, Annex I and Annex J, respectively.

5 IGRS service overview

An IGRS service conforms to the Core Protocol and indicates the shared resource provided by IGRS devices. An IGRS service is published based on the service description template and mechanism specified by the the Core Protocol and can be invoked by IGRS clients through the operation mechanism specified by the Core Protocol.

An IGRS service is classified into many types. The service instances implementing the same service type should provide the same invocation interface and eventing mechanism. The service type is uniquely defined by the relevant service attribute and interface set.

This standard defines in detail a series of basic service types in the next few clauses. The description includes the relevant service type identifier, service attribute, service interface set and service implementation flow.

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6 Definition of service type identifier

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An IGRS service type can be classified into standard service type and non-standard service type.

Standard service type identifiers shall conform to the service type identifier definition in the Core Protocol, see 8.2.3 of ISO/IEC 14543-5-1:2010. According to the service type identifier definition in the Core Protocol, the syntax of the standard service type identifier shall be as follows:

<IGRSServiceTypeURN>::=“urn:”<IGRSNS>“:”<IGRSIDVAL>
<IGRSNS>::=“IGRS:Service:ServiceType”
<IGRSIDVAL>::=1*<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>::=“-” | “.” | “_”
The value <URN chars> is case insensitive.

A non-standard service type is a service type not defined by this standard but by the developer of the product. Non-standard service type identifiers shall conform to the servicetype identifier syntax definition in the Core Protocol, see 8.2.3 of ISO/IEC 14543-5-1. According to the service type identifier definition in the Core Protocol, the syntax of the non-standard service type identifier shall be as follows:

<IGRSSelfDefineServiceTypeURN>::=“urn:” <IGRSNS> “:” <IGRSIDVAL>
<IGRSNS>::=“IGRS:service:servicetype-p”
<IGRSIDVAL>::=1*<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>::= “-” | “.” | “_”
The value <URN chars> is case insensitive.

Unless specified in the document, the word “service type” shall have the meaning of “standard service type”.

7 Standard service type list

A standard service type includes the following services: Content Index Service, Connection Management Service, Media Server Transport Management Service, Media Client Transport Management Service, Rendering Management Service, File Access Management Service and File Connection Management Service.

Table 1 defines a series of the current basic service types. Clause 8 specifies the details of the service types listed in Table 1.

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