

INTERNATIONAL STANDARD

Information technology – Home electronic system (HES) architecture –
Part 5-3: Intelligent grouping and resource sharing for Class 2 and Class 3 –
Basic application
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INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 5-3: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Basic application

FOREWORD

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International Standard ISO/IEC 14543-5-3 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 [ISO/IEC 14543-5-3:2012](https://standards.iteh.ai/catalog/standards/sist/8e0fb088-8fa1-4a87-ba26-948d4dce2f2b/iso-iec-14543-5-3-2012)
 - Part 5-2x: QoS profile <https://standards.iteh.ai/catalog/standards/sist/8e0fb088-8fa1-4a87-ba26-948d4dce2f2b/iso-iec-14543-5-3-2012>
 - 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 5-3: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Basic application

1 Scope

This part of ISO/IEC 14543 defines design criteria and application requirements enabled by the relevant application profiles. It also defines required or optional interaction processes, interaction interfaces, software and hardware interfaces and the software framework that may or may not be specified by the existing application profiles related to the IGRS basic applications.

This part of the ISO/IEC 14543 is applicable to computers, household appliances and communication devices that implement media data streaming 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.

[ISO/IEC 14543-5-3:2012](#)

ISO/IEC 8802-3:2000, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

ISO/IEC 13818-11:2004, *Information technology – Generic coding of moving pictures and associated audio information – Part 11: IPMP on MPEG-2 systems*

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 type¹*

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 15444-4:2004, *Information technology – JPEG 2000 image coding system: Conformance testing*

ISO/IEC 23000-2:2008, *Information technology – Multimedia application format (MPEG-A) – Part 2: MPEG music player application format*

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.

3.1.1

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 the device group involved and to coordinate the service invocation sequence between the media server and the media client

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

3.1.2

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.

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3.1.3

media client

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

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

3.1.4

media server

audio/video device in an IGRS network that possesses storage and computing capabilities

NOTE Examples of a media server device include a PC, a 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.

3.2 Abbreviations

The following acronyms and abbreviations are used in this standard.

| | |
|----------|---|
| BCM | Back Channel Message |
| CIS | Content Index Service |
| CMS | Connection Management Service |
| IGRS | Intelligent Grouping and Resource Sharing |
| IGRSDSIM | IGRS Dynamic Service Invocation Module |
| MC | Media Client |
| MCTMS | Media Client Transport Management Service |
| MS | Media Server |
| MSTMS | Media Server Transport Management Service |
| RMS | Rendering Management Service |

4 Conformance

This International Standard is intended to be used primarily as an implementation guideline for developers to ensure interoperability at the application level.

For conformance to this International Standard the following applies.

- The interaction model used in an IGRS media AV basic application shall meet the system design criteria specified in Clause 5.
- The specific interaction flow process used in an IGRS basic application for digital media forwarding, storage and playback system shall meet Clause 6.
- Media clients, media recorders and media servers shall be compliant with the relevant protocols, function descriptions, software profiles, software interfaces (including media format supported) and hardware interfaces (including physical and networking interfaces) that enable IGRS digital media forwarding, storage and playback system as specified in 6.3, 6.4, 6.5 and 6.6.

5 Overview

5.1 Summary

An IGRS application, based on the IGRS core protocol and IGRS application profiles, is classified in two types: IGRS basic application and IGRS extended application. As defined in ISO/IEC 14543-5-5, IGRS devices can be divided into many different device types according to usage scenarios. An IGRS basic application, which is directly related to a specific device type, is a standardized application defined by the IGRS specification that corresponds to a particular IGRS device function. It is expected that a specific device type on an IGRS device would result in a standardized IGRS basic application implementation. An IGRS extended application may be developed by a third party supplier based on the IGRS core protocol and IGRS application profile. An IGRS extended application conforms to the IGRS standard and is intended to diversify and to enhance the current IGRS device functionalities.

The IGRS basic application defines application requirements enabled by the relevant application profiles. It also defines the interaction process and interaction interfaces that may or may not be specified by the existing application profiles related to these basic applications. Application manufacturers are allowed to develop their own basic applications independently based on this standard guideline. However, interoperability shall be achieved among these various application implementations. Moreover, application manufacturers can also choose to develop their own extended applications independently, as necessary.

The guidelines of this standard include the following basic applications based on the IGRS core protocol and application profile:

- digital media forwarding,
- storage,
- a playback system.

This standard defines the application requirement, specific functional description, basic service description, basic device description, software profile, software interface and hardware interface for digital media forwarding, storage and a playback system.

5.2 Design criteria

5.2.1 Relationship between basic application and IGRS

The basic application includes two parts: one part specifies the application profile and the interaction process of the IGRS basic application; the other specifies the functional definition, interface invocation and service invocation message format of other software tools needed to ensure interoperability and ease of use. An IGRS application is triggered through the interactions between one or more IGRS services and one or more IGRS clients invoking IGRS services. The basic application shall guide users to design integrated applications based on IGRS protocols.

5.2.2 Relationship between basic application and transport protocol

The basic application does not rely on any specific transport protocols. Therefore, it shall support any transport protocols such as FTP, HTTP, etc.

5.2.3 Relationship between basic application and existing file sharing system

The basic application defines a set of standard interfaces used in an IGRS network. It does not pose any restriction on the back-end implementation method. Therefore, the file sharing system associated with the IGRS basic application cannot only support a proprietary system developed by users, but also any existing sharing system.

5.2.4 Relationship between basic application and file format

The basic application profile is independent of any specific file format, which means that it shall support interactions with files of any arbitrary format.

5.2.5 Basic application interaction model

An IGRS application is achieved through interactions between one or more IGRS services and one or more IGRS clients. Typically, the interaction of an IGRS application is as shown in Figure 1.

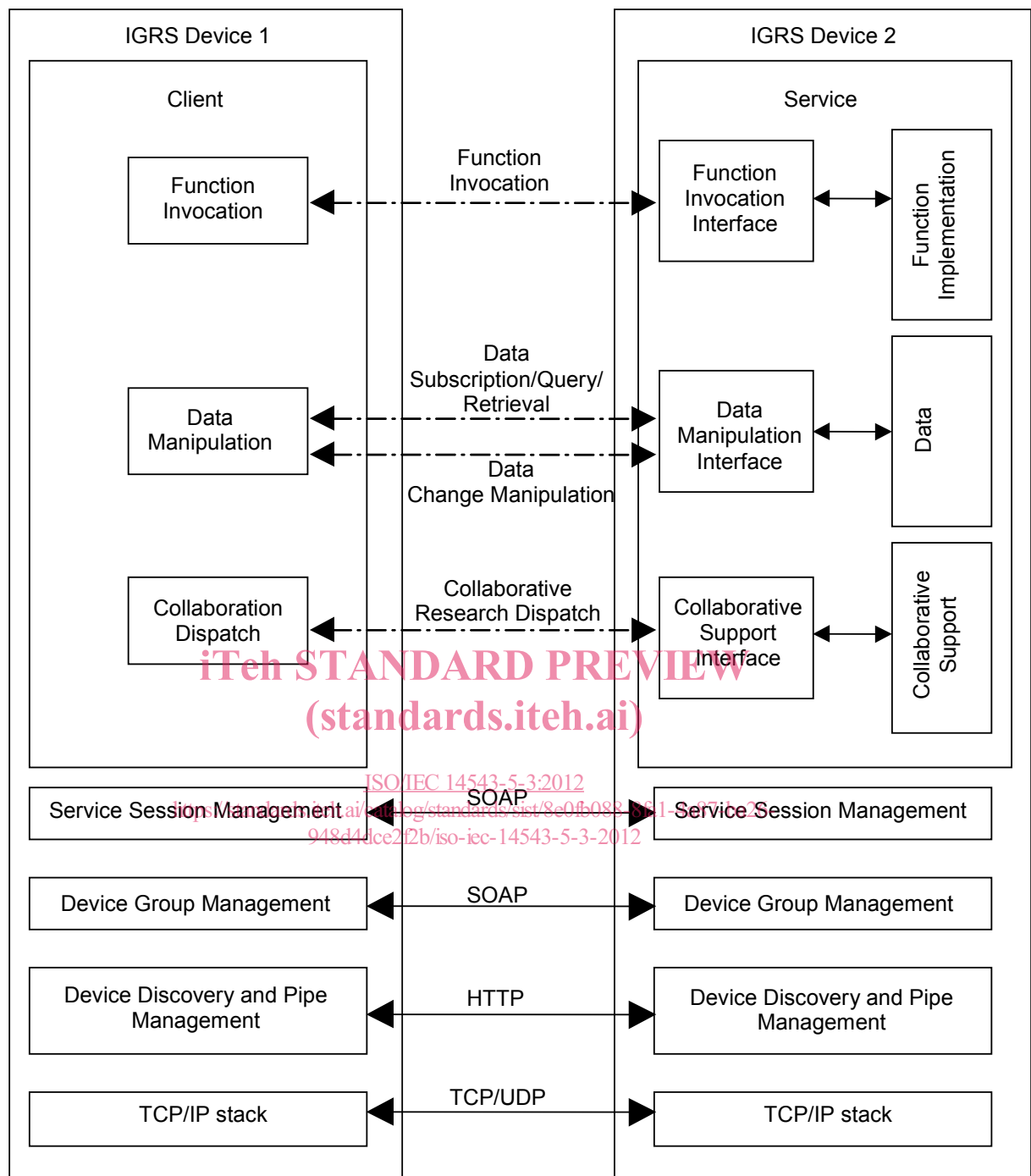


Figure 1 – IGRS application interaction model

5.2.6 Design principle

The following guidelines shall apply.

- The application scenario shall be clearly described. Through a description of application scenarios, the users shall obtain valuable user experience information and learn about reusable operational procedures.
- Description of specific functions shall be accurate. By describing specific functions, users shall know which IGRS device is used and what IGRS services and corresponding interfaces have been invoked.