



ISO/IEC 14543-5-9

Edition 1.0 2017-08

# INTERNATIONAL STANDARD



---

**Information technology – Home electronic system (HES) architecture –  
Part 5-9: Intelligent grouping and resource sharing for HES Class 2 and  
Class 3 – Remote access service platform**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 35.240.67

ISBN 978-2-8322-4681-8

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

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references .....	8
3 Terms, definitions and abbreviated terms .....	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	10
4 Conformance .....	10
5 IRSP overview .....	10
6 IRSP architecture .....	11
7 Server types.....	12
7.1 Account server.....	12
7.2 Message server .....	13
7.3 Application server .....	13
7.4 IRSP external application server .....	14
8 Messages exchanged between servers.....	14
8.1 Overview.....	14
8.2 Messages exchanged between account server and message server .....	15
8.2.1 Register on account server .....	15
8.2.2 Modify the user or device information .....	16
8.2.3 Delete account on the IRSP.....	17
8.2.4 Reset device verification code on IRSP .....	18
8.3 Messages exchanged between message server and application server in same AS .....	19
8.3.1 User or device uploads message to application server through message server .....	19
8.3.2 Device uploads online/offline notification to application server through message server .....	19
8.3.3 Application server pushes message to user or device through message server .....	19
8.3.4 Response status code for message exchange between message server and application server in same AS.....	20
8.4 Messages exchanged between application servers in same AS.....	21
8.4.1 Overview .....	21
8.4.2 Response status code for message exchange between application servers in same AS.....	21
8.5 Messages exchanged between message servers in different ASs .....	22
8.6 Messages exchanged between application servers in different ASs .....	22
8.7 Messages exchanged between message server and application server in different ASs .....	22
8.8 Messages exchanged between IRSP internal application server and IRSP external application server .....	22
8.8.1 Overview .....	22
8.8.2 IRSP internal application server sends message to third party IRSP external application server.....	22
8.8.3 Third party IRSP external application server sends message to IRSP internal application server.....	23
9 Security of IRSP .....	24

Bibliography.....	25
Figure 1 – Interfaces and working scope of IGRS RA core protocol and IRSP protocol .....	11
Figure 2 – IRSP architecture .....	12
Figure 3 – Message exchange models in IGRS RA system .....	14
Table 1 – Registration response status code and contents in registration response message .....	16
Table 2 – Information modification response status code and contents in information modification response message .....	17
Table 3 – Deletion response status code and contents in deletion response message .....	18
Table 4 – Device verification code reset response status code and contents in the device verification code reset response message .....	18
Table 5 – Response status code for message request from message server to application server .....	20
Table 6 – Response status code for message request from application server to message server .....	21
Table 7 – Response status code for message request from one application server to another application server in same AS .....	22
Table 8 – Requested parameters in message sent from the third party IRSP external application server to the IRSP internal application server.....	23

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

### Part 5-9: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Remote access service platform

#### 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.
- 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 14543-5-9 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 and ISO websites.

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.

A bilingual version of this publication may be issued at a later date.

**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

The ISO/IEC 14543-5 series of standards specifies the services and protocol of the application layer for Intelligent Grouping and Resource Sharing (IGRS) devices and services in the Home Electronic System. Some parts reference Classes 1, 2 and 3, which are HES designations specified in the HES architecture standard, ISO/IEC 14543-2-1.

The ISO/IEC 14543-5 series includes the following parts.

- Part 5-1: Core protocol
  - Specifies the TCP/IP protocol stack as the basis and the HTTP protocol as the message-exchange 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 transports within a home.
- 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
- 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.
- Part 5-4: Device validation
  - Defines a standard method to validate an IGRS-compliant device.
- Part 5-5: Device type
  - Specifies IGRS device types used in IGRS applications.
- Part 5-6: Service type
  - Specifies basic service types used in IGRS applications.
- Part 5-7: Remote access system architecture
  - Specifies the architecture and framework for the remote access of IGRS devices and services in the Home Electronic System. The remote access communications protocol and application profiles are specified in the following parts of ISO/IEC 14543-5:
    - ISO/IEC 14543-5-8: Remote access core protocol
    - ISO/IEC 14543-5-9: Remote access service platform
    - ISO/IEC 14543-5-101: Remote AV access profile
    - ISO/IEC 14543-5-102: Remote universal management profile
    - ISO/IEC 14543-5-11: Remote user interface
    - ISO/IEC 14543-5-12: Remote access test and verification
  - The relationships among these parts are specified in part 5-7.
- Part 5-8: Remote access core protocol

- Provides detailed system components, system function modules, basic concepts of IGRS remote access elements and their relationships, message exchange mechanisms and security related specifications.
- Specifies interfaces between IGRS Remote Access (RA) client and service platforms. Defines co-operative procedures among IGRS RA clients.
- Part 5-9: Remote access service platform
  - Specifies the IGRS RA service platform (IRSP) architectures and interfaces among servers in the service platforms.
  - Based on Part 5-8: Remote access core protocol
- Parts 5-10#: Remote access application profiles
  - Defines a device and service interaction mechanism for various applications
  - Based on Part 5-8: Remote access core protocol
  - Two profiles are under development:
    - Part 5-101: Remote AV access profile.<sup>1</sup> This part defines the common requirements for IGRS RA AV users or devices in IGRS networks.
    - Part 5-102: Remote universal management profile.<sup>2</sup> This part specifies a mechanism for integrating devices with both relatively high and low processing capabilities into IGRS networks. It also specifies universal remote device discovery and a management framework.
  - Additional application profiles will be specified in the future.
- Part 5-11: Remote user interface<sup>3</sup>
  - Specifies adaptive user interface generation and remote device control mechanisms suitable for different remote access applications and devices.
- Part 5-12: Remote access test and verification<sup>4</sup>
  - Defines a standard method to test and verify IGRS-RA compliant devices and service interfaces.

---

<sup>1</sup> Under preparation. Stage at the time of publication: ISO/IEC DIS 14543-5-101:2017.

<sup>2</sup> Under preparation. Stage at the time of publication: ISO/IEC CD 14543-5-102:2016.

<sup>3</sup> Under preparation. Stage at the time of publication: ISO/IEC DIS 14543-5-11:2017.

<sup>4</sup> Under preparation. Stage at the time of publication: ISO/IEC DIS 14543-5-12:2017.

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

### Part 5-9: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Remote access service platform

#### 1 Scope

This part of ISO/IEC 14543-5 specifies the basic functionalities, module structures and interfaces in an IGRS RA service platform (IRSP). The service interaction flow and the request/response message formats are also specified.

This document is applicable to remote access of an IGRS sub-network (called an IGRS subnet) for resource sharing and service collaboration among home and/or remote computers, consumer electronics and communication devices.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 14543-5-8, *Information technology – Home electronic system (HES) architecture – Part 5-8: Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Remote access core protocol*

IETF RFC 2818, *HTTP over TLS*

IETF RFC 4422, *Simple Authentication and Security Layer (SASL)*

IETF RFC 5246, *The Transport Layer Security (TLS) Protocol – Version 1.2*

IETF RFC 6121, *Extensible Messaging and Presence Protocol (XMPP): Instant Messaging and Presence*