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INTERNATIONAL STANDARD

colour inside

Information technology – Home Electronic System (HES) interfaces – Part 4-2: Common user interface and cluster-to-cluster interface to support interworking among home cluster systems – Interfaces, services and objects



ISO/IEC 10192-4-2:2024-09(en)

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 8
2 Normative references 8
3 Terms, definitions, and abbreviated terms 9
3.1 Terms and definitions 9
3.2 Abbreviated terms 10
4 Conformance 11
5 HES components for common user interface 11
6 Common user interface 13
7 CUI operational information 13
7.1 Usage 13
7.2 CUI operational information composition 15
7.3 Delivery of CUI operational information 15
7.4 Interoperability of heterogeneous CUI operational information 16
7.5 CUI selection and resultant actions for handling devices 16
7.5.1 General 16
7.5.2 Acquisition of user's set of devices 17
7.5.3 Synchronization of user devices 17
7.5.4 Handling of request and response for user devices 17
8 Secure C2C connection 17
9 C2C authorization 18
9.1 General 18
9.2 User identity federation 18
9.3 C2C authorization procedure 21
10 C2C interface 22
11 CUI service 22
12 C2C interworking application ISEE group 22
12.1 General 22
12.2 C2C authorization controller service 23
12.3 C2C authorization processor service 23
12.4 C2C controller service 23
12.5 C2C processor service 24
12.6 Other services 24
12.7 HAN interface module 25
13 Privacy, security, and safety considerations 25
Bibliography 26

Figure 1 – Core interoperability and HES standards 7
Figure 2 – HES gateway applications standards 7
Figure 3 – CUI components of alternative #1: common user interface in a cluster 12
Figure 4 – CUI components of alternative #2: common user interface as a separate device 12
Figure 5 – CUI components of alternative #3: common user interface in a service module 12

Figure 6 – Translation between CUI operational information and interactive media 13
Figure 7 – Interactive visual and touch media 14
Figure 8 – Interactive speaker and voice media 14
Figure 9 – Interoperability of heterogenous CUI systems 16
Figure 10 – TLS based C2C secure connection 18
Figure 11 – Configuration of user identities and devices 19
Figure 12 – Configuration of user identity federation table 21
Figure 13 – C2C authorization procedure 22
Figure 14 – Structure of C2C interworking application ISEE group 23
Figure 15 – Address referencing of binding map service to a device in a cluster 24

Table 1 – Correlation between roles in OAuth 2.0 and CUI components 21

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) INTERFACES –

Part 4-2: Common user interface and cluster-to-cluster interface to support interworking among home cluster systems – Interfaces, services and objects

FOREWORD

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ISO/IEC 10192-4-2 has been prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
JTC1-SC25/3221/CDV	JTC1-SC25/3263/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, and the ISO/IEC Directives, JTC 1 Supplement available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

A list of all parts in the ISO/IEC 10192 series, published under the general title *Information technology – Home Electronic System (HES) interfaces*, can be found on the IEC website.

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INTRODUCTION

A home cluster system is implemented by interconnecting several devices to deliver one or more applications. A cluster can function independently of other clusters. Cluster devices include sensors, actuators, a controller, and user interfaces. Multiple home cluster systems can be installed and operated in a single home for the following reasons.

- There are various types of application domains in the home such as lighting, safety, air conditioning, telecommunications, audio and video, etc. One or more applications are implemented by the constituents of a cluster. Therefore, if a user purchases several applications, they will be implemented by one or more home cluster systems.
- Home application vendors usually provide systems implemented in clusters of required devices. Depending on the user's needs, several application systems, possibly from different manufacturers, can be installed in a home as separate clusters.

A customer can access the functions provided by a cluster via a user interface associated with that cluster. With multiple clusters it is important for a user to learn how to operate a range of different interfaces. This document provides the cluster-to-cluster interworking foundation necessary for a single common user interface to manage applications in multiple clusters.

Application-to-application and the resulting device-to-device collaboration are essential for providing integrated services in a multi-device Home Electronic System (HES) environment. For example, if a fire monitoring system detects a fire, it is important that the indoor lights are turned on and the fire announcement is broadcast through available speakers in the house for prompt evacuation of the residents, the ventilation blowers are stopped to avoid spreading the fire, and the public fire service is contacted. This needs collaboration among fire detectors, indoor lights, speakers, HVAC and telecommunication devices. If the devices are located in different clusters, cluster-to-cluster interworking is essential for collaboration among them.

In practice, a safety monitoring cluster can send out a fire-detected message and a lighting cluster can be ready to activate a lighting scene that alerts the occupant by turning on or flashing the appropriate lights. However, these two clusters usually do not have a way to communicate with each other especially if supplied by different manufacturers possibly using different protocols and messages. This document solves that problem by providing the necessary interworking and interoperability functionality to ensure that the clusters can work together.

When the cluster systems are in different HANs or use different protocols, interworking is accomplished using the HES gateway (ISO/IEC 15045 series) and related interoperability standards (ISO/IEC 18012 series). For interworking between cluster systems using the same protocols and belonging to the same HAN, HES gateway services can optionally be used if the cybersecurity, privacy and safety features of the HES gateway are desired. The functions specified in this document do not require the Internet to operate but can connect to the Internet if the application requires.

This document specifies the architecture for interworking home cluster systems where

– the home cluster systems use different HANs or protocols, or
– the home cluster systems use the same HANs and protocols plus the services of the HES gateway.

Figure 1 shows the core interoperability and HES gateway standards. Figure 2 shows the common user interface series of standards designated ISO/IEC 10192-4, *Information technology – Home Electronic System (HES) interfaces – Common user interface and cluster-to-cluster interface to support interworking among home cluster systems*. ISO/IEC 10192-4 consists of three parts:

Part 4-1: Architecture

Part 4-2: Interfaces, services and objects

Part 4-3: Messaging

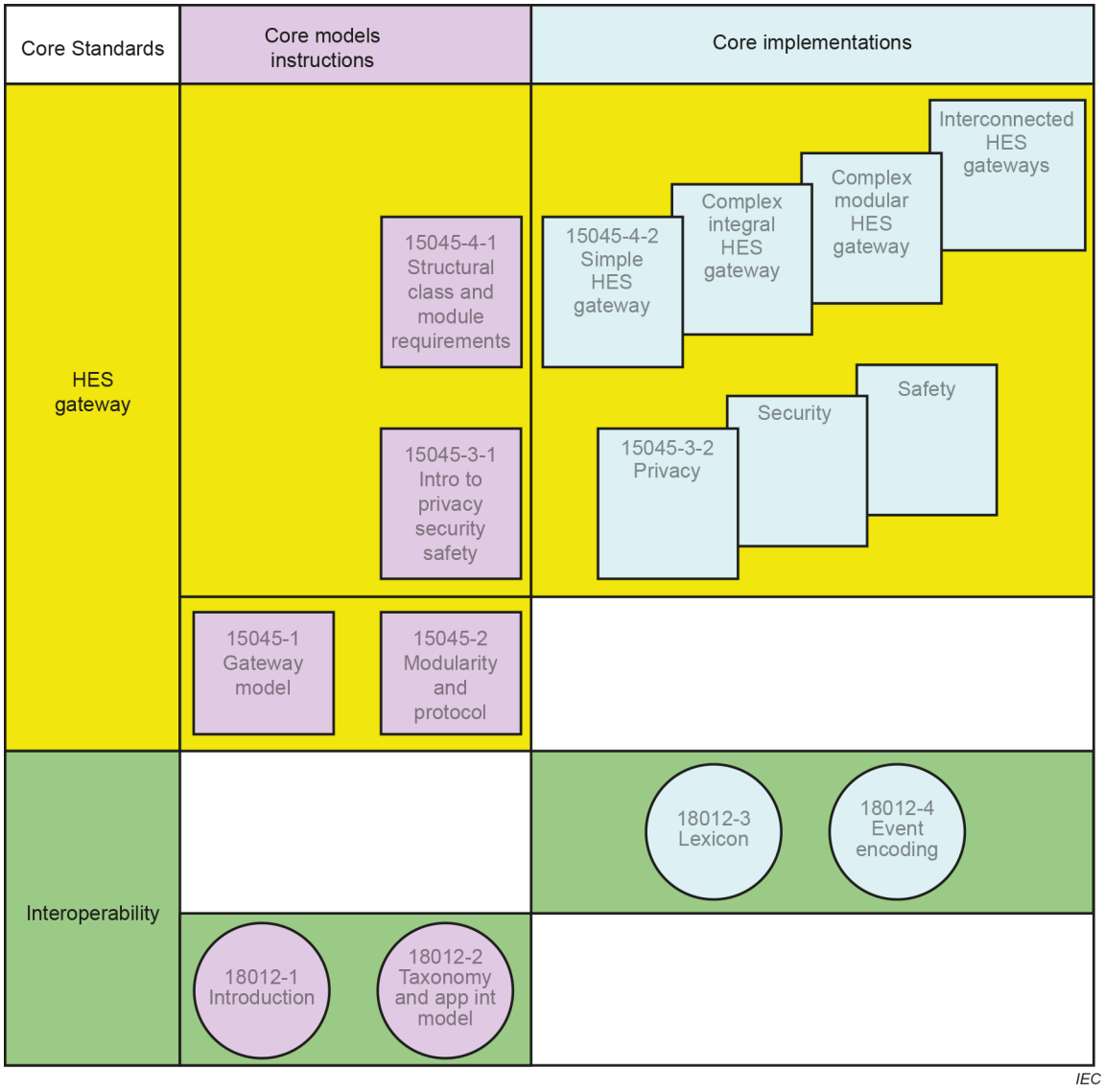


Figure 1 – Core interoperability and HES standards

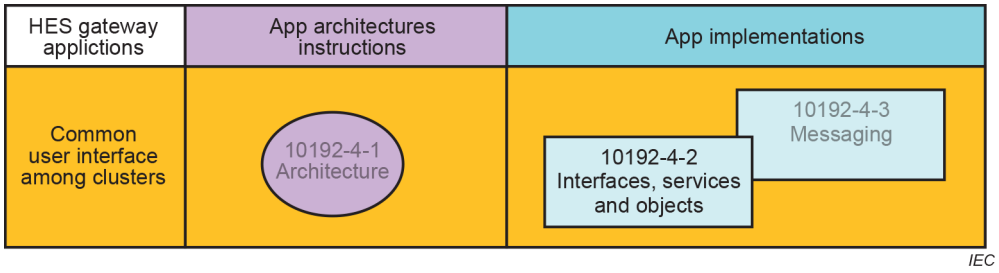


Figure 2 – HES gateway applications standards

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) INTERFACES –

Part 4-2: Common user interface and cluster-to-cluster interface to support interworking among home cluster systems – Interfaces, services and objects

1 Scope

This part of ISO/IEC 10192 specifies a control architecture, user interface, and service objects in the HES gateway to enable interworking among home cluster systems and interoperability among the applications supported by these cluster systems. The ISO/IEC 10192 series specifies a common user interface to these cluster-system applications. This common user interface provides input and output methods for user information exchange to access, monitor, control and coordinate applications running on home cluster systems.

This document specifies the application object, service and interface modules from the interoperability standard (ISO/IEC 18012 series) necessary for interworking and incorporation of these modules in the HES gateway (ISO/IEC 15045 series).

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 10192-4-1, *Information technology – Home Electronic System (HES) interfaces – Part 4-1: Common user interface and cluster-to-cluster interface to support interworking among home cluster systems – Architecture*

ISO/IEC 15045-1, *Information technology – Home Electronic System (HES) gateway – Part 1: A residential gateway model for HES*

ISO/IEC 15045-2, *Information technology – Home Electronic System (HES) gateway – Part 2: Modularity and protocol*

ISO/IEC 15045-3-1, *Information technology – Home Electronic System (HES) gateway – Part 3-1: Privacy, security, and safety – Introduction*

ISO/IEC 15045-3-2, *Information technology – Home Electronic System (HES) gateway – Part 3-2: Privacy, security, and safety – Privacy framework*

ISO/IEC 15045-4-1, *Information technology – Home Electronic System (HES) gateway – Part 4-1: Structure – Structural class and module requirements*

ISO/IEC 15045-4-2, *Information technology – Home Electronic System (HES) gateway – Part 4-2: Structure – Simple gateway*

ISO/IEC 18012-1, *Information technology – Home Electronic System (HES) – Guidelines for product interoperability – Part 1: Introduction*

ISO/IEC 18012-2, *Information technology – Home Electronic System (HES) – Guidelines for product interoperability – Part 2: Taxonomy and application interoperability model*

ISO/IEC 18012-3, *Information technology – Home Electronic System (HES) – Guidelines for product interoperability – Part 3: Lexicon*[1]

ISO/IEC 18012-4, *Information technology – Home Electronic System (HES) – Guidelines for product interoperability – Part 4: Event encoding*[2]

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
access token
trusted object encapsulating the authority for a subject to access a resource

[SOURCE: ISO/IEC 29146:2016]

3.1.2
cluster controller
functional unit that manages the operation of a home cluster system

3.1.3
C2C interface
interface in a cluster that supports HAN communication for C2C interworking with an HES gateway by a cluster controller in a home cluster system

[SOURCE: ISO/IEC 10192-4-1:2022, 3.1.1]

3.1.4
C2C interworking
communications among home cluster systems to support coordination among them

3.1.5
common user interface
interface that provides input and output methods for user information exchange to access, monitor and control applications running on home cluster systems

3.1.6
CUI operational information
local user object and service that enable users to access, monitor, and control applications running on their home cluster system and to schedule coordination among them

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[1] First edition under preparation. Stage at the time of publication: ISO/IEC CDV 18012-3:2024.

[2] First edition under preparation. Stage at the time of publication: ISO/IEC CDV 18012-4:2024.