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Edition 1.0 2022-03

INTERNATIONAL STANDARD

colour inside

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



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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

FOREWORD

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ISO/IEC 10192-4-1 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-SC25/2990/CDV	JTC1-SC25/3032/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, 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.

IMPORTANT – The "colour inside" logo on the cover page of this document 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

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, and audio/video, etc. One or more applications are implemented by the constituents of a cluster. If a user purchases several applications, multiple home cluster systems can be installed in a home.

– 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 a device in a cluster via a user interface provided for that cluster. With multiple clusters a user needs 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 HES environment. For example, if a fire monitoring system detects a fire, the indoor lights should be turned on and the fire announcements should be broadcast through available speakers in the house for prompt evacuation of the residents, the ventilation blowers should be stopped to avoid spreading the fire, and the public fire service should be 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 needed for collaboration among them.

In practice, a safety monitoring cluster might send out a fire-detected message and a lighting cluster might be ready to activate a lighting scene that alerts the occupant by turning on or flashing the appropriate lights. However, the two clusters might 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, the interworking is accomplished using the HES gateway (ISO/IEC 15045 series) and related interoperability standards (ISO/IEC 18012 series). Additional standards needed for implementation of this document are under development. For interworking between cluster systems using the same protocols and belonging to the same HAN, HES gateway services may optionally be used if the cybersecurity, privacy and safety features of the HES gateway are desired. This document does 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

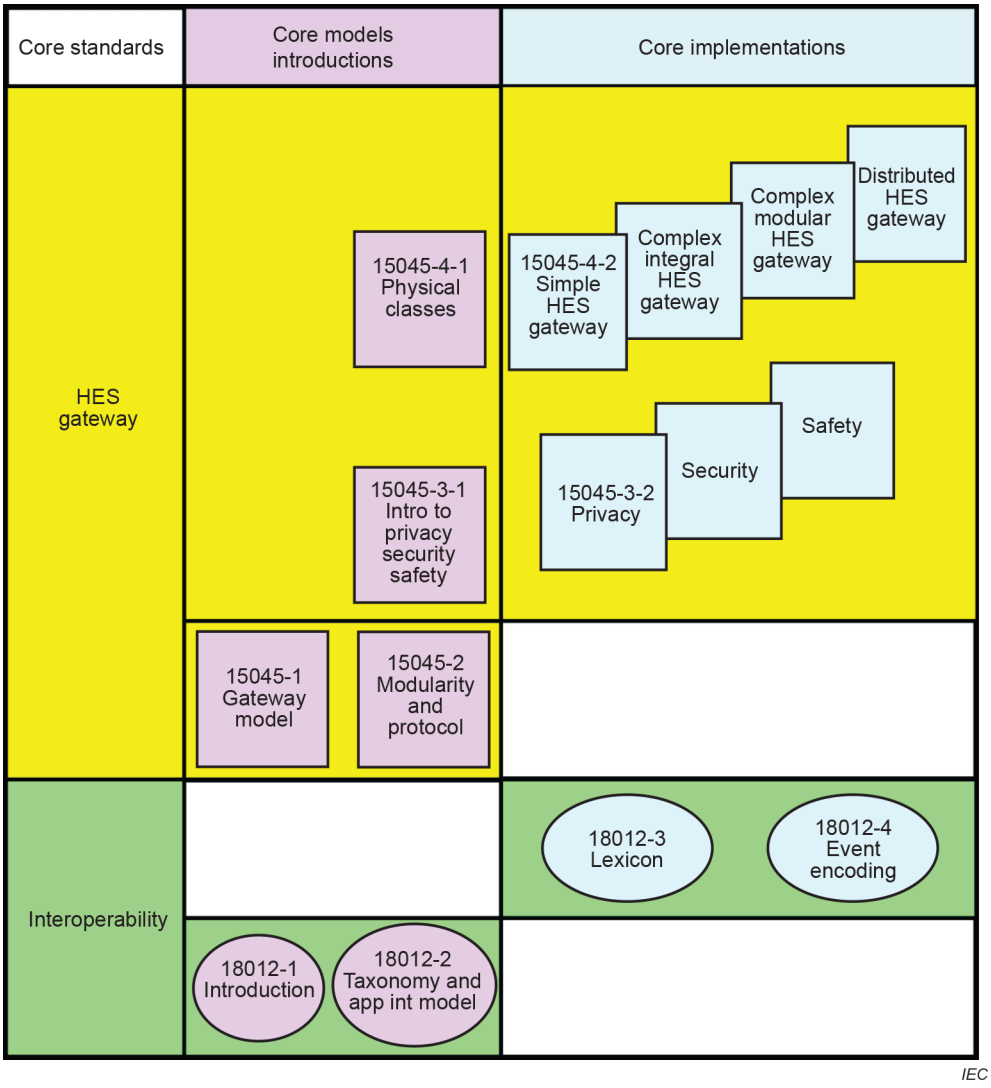


Figure 1 – Core interoperability and HES standards

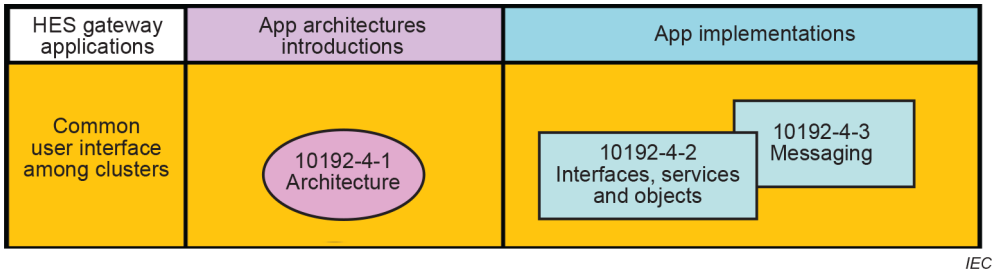


Figure 2 – HES gateway applications standards

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) INTERFACES –

Part 4-1: Common user interface and cluster-to-cluster interface to support interworking among home cluster systems – Architecture

1 Scope

This part of ISO/IEC 10192 specifies an architecture for a common user interface and cluster-to-cluster interface to support interworking among home cluster systems. It specifies a cluster-to-cluster interface to enable interworking among home cluster systems and interoperability among the applications supported by these cluster systems as well as 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 and control applications running on home cluster systems.

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 15045 (all parts), *Information technology – Home Electronic System (HES) gateway*

ISO/IEC 18012 (all parts), *Information technology – Home Electronic System (HES) – Guidelines for product interoperability*

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 terminological databases for use in standardization at the following addresses:

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

3.1.1
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

3.1.2
CUI user object
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

3.1.3
home cluster system
set of functional units under common control in a home environment that includes sensors, actuators, user interfaces, and a cluster controller

3.1.4
master CUI C2C interface
C2C interface of a home cluster system that includes CUI user objects that initiate actions on remote systems

3.1.5
NSEE group
group of HAN and WAN network interface modules, service modules and HES-CLME event encoding to support a particular application or operation

3.1.6
receptive CUI C2C interface
C2C interface of a home cluster system that manipulates the local cluster based upon receipt of CUI user objects from a remote master CUI

3.1.7
user interface
functional system used specifically to interface the computer-based control system to the operator, maintenance personnel, or engineer

[SOURCE: IEC 62270:2013]

3.2 Abbreviated terms

C2C	cluster to cluster
CLME	common language messaging exchange
CUI	common user interface
HAN	home area network
HES	home electronic system
HVAC	heating, ventilation, and air conditioning
NSEE	network (e.g. HAN and WAN network modules), service (e.g. service modules), and event encoding (e.g. HES-CLME)
WAN	wide area network

4 Conformance

Home cluster systems that claim conformance to this document shall:

– support the configuration as specified in Clause 5;
– support the C2C interface as specified in Clause 6.

An HES gateway that claims conformance to this document shall include service modules and features that:

– support the cluster interworking as specified in Clause 6;
– support the common user interface as specified in Clause 7;
– support the C2C interworking application NSEE group as specified in Clause 8.