NSAI Standards

Standard Recommendation
S.R. CWA 50560:2010

Interoperability framework requirements specification for service to the home (IFRS)

S.R. CWA 50560:2010

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Údarás um Chaighdeáin Náisiúnta na hÉireann

CENELEC **CWA 50560**

WORKSHOP

AGREEMENT June 2010

ICS 97.120

English version

Interoperability framework requirements specification for service to the home (IFRS)

This CENELEC Workshop Agreement has been drafted by a Workshop of representatives of interested parties and was approved on 2010-06-01.

The formal process followed by the Workshop in the development of this Workshop Agreement has been endorsed by the national members of CENELEC but neither the national members of CENELEC nor the CENELEC Central Secretariat can be held accountable for the technical content of this CENELEC Workshop Agreement or possible conflicts with standards or legislation.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Preface

The objective of this CENELEC Workshop Agreement (CWA) for an Interoperability Framework Requirements Specification (IFRS) is to provide a methodology that will give consumers the confidence to install home and building automation products from different companies, both now and in the future, knowing that they will operate together and interact effectively with each other.

The work, sponsored by The Application Home Initiative (TAHI), has been prepared by a team of experts drawn from the TAHI membership and then reviewed and approved by experts drawn from industry and Standardisation Bodies following the procedures of a CENELEC Workshop. The secretariat of the Workshop was provided by the Netherlands Standardization Institute / Netherlands Electrotechnical Commitee. Overall, 27 registered members took part in the four open meetings and approved the CWA for publication.

This CWA states necessary requirements that devices, objects and systems must comply with in order for them to be capable of interoperability and introduces new concepts for measuring the level of interoperability in conformant systems. Four basic levels of interoperability have been identified that correspond to the current state-of-the-art, from none at all to the interoperability supported by present-day, largely custom designed and engineered, systems. The IFRS establishes three further levels of "open" interoperability that enable systems to be constructed and installed dynamically, by both professionals and consumers.

The CWA additionally provides an Interoperability Implementation Conformance Statement (IICS) proforma for the Conformance Clauses in the IFRS specification (Annex B). The IICS is based on ICS approaches established by ISO for protocols and services, and extends models used already by the home and building automated control industry. It details in tabular form the implementation options additional to those that are mandatory to implement.

Overall, this document will support interoperability for the stakeholders implementing systems in the Home Systems market. CWA 50560 will bring understanding of the issues and in particular allow the designer of interoperable applications for the Smart Home to work more effectively and with clear understanding of the wider issues.

As managing editor, I would like to thank the team of experts for the help and support they have given me in writing this CWA for Interoperability together. The experts were:

Dritan Kaleshi – University of Bristol

Xi Chen – DeMontfort University

Stephen Pattenden - Telemetry Associates Limited

The work would not have been possible without the vision of the TAHI Board and TAHI Working Groups, in particular the Interoperability Working Group, and the team thanks them for their support.

The Industry and Standards Body Experts attending the meetings of the CWA are listed in Annex C.

Alistair Munro – The Application Home Initiative Limited

11/06/2010

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Foreword

The production of this CWA (CENELEC Workshop Agreement) specifying Interoperability Framework Requirements for electronic systems in homes and buildings, was formally accepted at the Workshop's kick-off meeting on 2009-07-07.
The document has been developed through the collaboration of a number of contributing partners in the Workshop. This CWA has received the support of representatives of each of these contributing partners. Information on who have supported the document's contents may be obtained from the CENELEC Management Centre.
CWA approval was obtained at the Workshop’s meeting on 2009-07-07.
This CWA consists of a single part, this document, under the general title *Interoperability Framework Requirements Specification*.

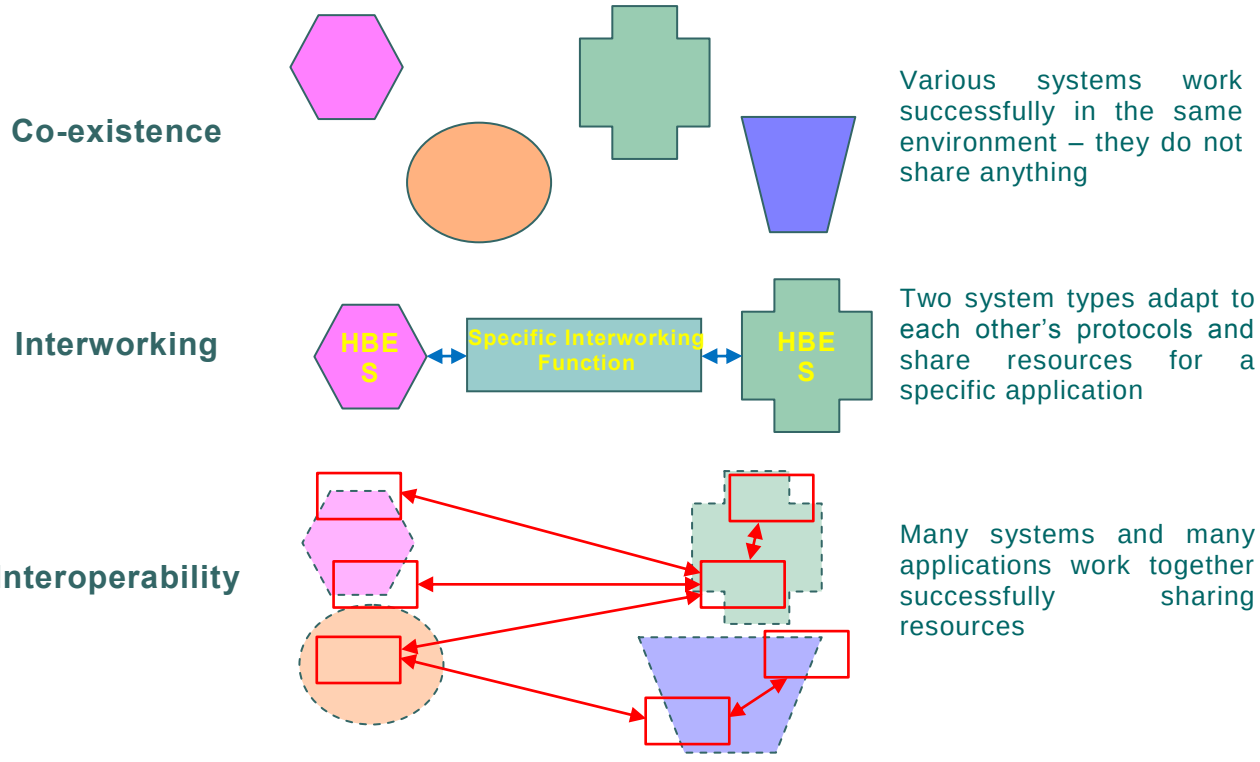
Introduction

1.1 General

The objective of this Framework, the IFRS, is to propose a methodology that will give consumers the confidence to buy products from different companies both now and in the future, knowing that they will operate together.

Achieving this requires several phases of standardisation to ensure integration from the physical connectors to the way systems function. There are three phases of integration:

- **Co-existence** - where different systems can operate in the same environment without hindering each others' operation;
- **Interworking** - where different technologies are connected together to transfer data end-to-end. It is primarily a technical solution encompassing connectors, protocols, bridges, etc. ;
- I**nteroperability** - where different application functions are able use the shared information in a consistent way. This requires interworking as a building block as well as coexistence, and adds business rules, processes, and security provisions that enable applications to be joined together.



The Interoperability Framework Requirements Specification, IFRS, addresses the third of these terms. It provides a common set of rules to enable products that use different standards to interoperate when they are present in an installation..

The Framework covers four high level functional activities: discovery, configuration, operations and system management. It puts forward a common set of requirements that if complied with, and if coexistence and interworking are assured, will enable interoperability. It does not address co-existence or interworking on the basis that this is achieved by technology standards.

Interoperability is provided by alliances of commercial businesses (and there are several such alliances), but to ensure interoperability customers are limited to purchasing products from members of the alliance. The IFRS acknowledges the work and the value of such alliances but specifically addresses the ability for customers to purchase products and services from competing alliances and still achieve interoperability. In doing so it expects to increase the market for those alliances that conform to the IFRS as customers will purchase their products with greater freedom of choice and confidence that they will work.

1.2 How to use this specification

This specification is composed of a number of sections, some of which are normative and some informative.

Sections 2 to 6 are **normative** and cover clauses that should be complied with in order to conform to this specification.

Annex A is **informative** and is designed to help the understanding of sections 2 to 6.

Annex B is **normative** and contains methods and instructions for documenting compliance to the specification.

Of importance are:

- Section 5 which covers the steps required of objects and systems conforming to the Framework.
- Section 6 the Conformance Clauses and their accompanying sub-clauses.

2 Scope

This CWA contains a specification of an Interoperability Requirements Framework, specifying seven levels of interoperability, based on four groups of interoperability steps specified by five types of interaction, plus a methodology based on conformance clauses for satisfying requirements related to the claimed level of interoperability of devices installed in a Home and Building Electronic System (HBES, HES).

It is applicable to installations of a single type of HBES, or that interconnect two or more dissimilar HBESs. Within a HBES of a single type any of its capabilities for service, applications and connectivity topology can be used. Interconnection technologies used to interconnect dissimilar HBES are similarly unconstrained.

For applicable installations, the scope of its provisions applies to: the connection of devices to the various communications services to enable them to communicate end-to-end across internetworked media; the processes of discovery by which devices find out about each other and configuration to associate them with each other; and the generic aspects of application operation; and management.

This CWA is not applicable to the interoperability required between devices to implement specific applications, such as heating or lighting control, energy management, or entertainment. The interoperability requirements defined in this CWA are necessary for such application interoperability but not sufficient. This CWA does not define how measurements are made; nor the algorithms that receive, process and respond to them; nor the interaction between users, service providers, and the HBES application(s). This is the responsibility of experts and organisations that specialise in particular application domains.

The users of the CWA will be installers, system integrators, application designers and service providers of HBES applications and services. It will allow them to select devices and their functionality, including end-points and gateways and software applications hosted in them, that may be deployed in customer premises. Given specific application functional requirements, which are, as noted above, themselves a separate, vertical, collection of interoperability rules, the CWA will allow its users to select specific products consistent with their application objectives. Products can be substituted for each other with expectations that the system and its applications will continue to perform their specified function being set by the level of interoperability that is claimed.

The CWA is applied by completion by its implementer of PICS proformas and related PIXIT proformas for a device. The PICS/PIXIT method was standardized by ISO/JTC1/SC21 as part of the means by which conformance was claimed to the protocols and services of the Open Systems Interconnection (OSI) family of standards, and has been refined by ETSI subsequently.

Consistent with the CWA, the proformas represent a voluntary disclosure of information. Their status and acceptability will be enhanced by a certification issued by a test house that has verified the interoperability claims that the PICS contains. The PIXIT provides information to the test house to instruct testers on test configuration and any extra information required to place the device in the correct state for individual claims to be verified.

Devices and services interacting to form new applications across application and system domains may result in multiple applications or services requiring access and control of individual devices and objects in the premises. Clusters of applications will intersect and will have to coexist. Therefore this CWA will address the requirements for safety, security and priority of access and control.

By complying with the provisions of this CWA devices in the home should be able to respond to service requests originating from devices implementing a multiplicity of technologies, in particular sharing:

- identity of any object or device within the system boundary; alongside
- methods for discovering devices and objects together with their specifications to establish the necessary link, (inter)network and end-to-end transport associations; accompanied by
- the methods of configuring and managing the objects; and
- the application, or service, specific interactions between objects.

It is implicit that the CWA does not undermine the status of the resident owner of the home or building, who is the first in the hierarchy of access and control management.

The future of the CWA during its three year lifetime will be progressed as follows:

- Completion of the PICS/PIXIT proformas for HBES products across a wide range of specifications;
- Development of the CWA and its PICS and PIXIT proformas into a TS, or other official standard subject to agreement;
- Establishing a demonstration site for interoperability “plug-fests”;
- Establishing a test and certification laboratory and authority;
- Getting the interoperability certificate accepted.

3 Normative References

The following standards make provision for interoperability within systems composed from devices that comply with them. They may be cited as normative references by systems and devices claiming compliance with this CWA.

Standard	Responsible body (input from)	Status
ISO/IEC 18012-1:2004 Information technology -- Home Electronic System -- Guidelines for product interoperability -- Part 1: Introduction	ISO/IEC JTC 1/SC 25	IS
ISO/IEC 18012-2:xxxx Information technology – Home Electronic System – Guidelines for product interoperability – Part 2: Taxonomy and Lexicon	ISO/IEC JTC 1/SC 25 WG1	Work in progress (FCD)
ISO/IEC 14543-2-1 Part 2-1: Introduction and device modularity	ISO/IEC JTC 1 SC25	IS
ISO/IEC 14543-3-x (7 parts) Home Electronic Systems (HES) Architecture	ISO/IEC JTC 1 SC25	IS