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**ISO/IEC JTC 1/SC 25
INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT
Secretariat: Germany (DIN)**

DOC TYPE: Officers contribution

TITLE: Request from ISO/IEC JTC 1/SC 25 to JTC 1 for clarification on consistency of standards versus competing specifications

SOURCE: ISO/IEC JTC 1/SC 25 Secretary

PROJECT: Many projects of SC 25 in the area of intelligent homes

STATUS: Up to now development of the residential market for intelligent homes has not met all expectations of industry in many parts of the world. Proposals to develop the world market with help of competing implementations of a coherent set of standards developed jointly by all interested parties compete with proposals to provide the user with a choice of deviating specifications. In this situation SC 25 asks for guidance from the parent body as how to best serve the **residential market**.

ACTION ID: FYI

DUE DATE: n/a

REQUESTED: For information to the Members of SC 25.

ACTION To JTC 1 with the request for guidance.

MEDIUM: Def

DISTRIBUTION: ITTF, JTC 1 Secretariat
P-, L-, O-Members of SC 25

No of Pages: 14 (including cover)

Request from ISO/IEC JTC 1/SC 25 to JTC 1 for clarification on consistency of standards versus competing specifications

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1 Question for guidance

The word "consistency of a set of standards" can be interpreted in multiple ways. The interpretation used and the degree of consistency needed in a specific case very likely depends on the market / customers a set of standards is provided to.

The world market for intelligent homes has developed much slower than expected. Since there are very different opinions with respect to the kind of international standards needed for the residential market ISO/IEC JTC 1/SC 25 seeks guidance from its parent body.

ISO/IEC JTC 1/SC 25 kindly requests clarification of JTC 1 Banff resolution 42 with respect to accommodation of competing protocols and the definition of conflict.

The following questions are provided to help illustrate the type of clarification being requested.

Question 1: Is it permissible to provide multiple international standards for the same application and function?

Question 2: In case Question 1 is answered with yes, shall the competing solutions apply different technologies, e. g. not just differ in coding but use different technical principles?

Question 3: In case Question 1 is answered with yes, what kind of relationship is required for entities meeting the competing specifications?

In case they belong to the same group of applications (HES Class 1, HES Class 2 or Class 3 only) the following is required as a minimum:

Interchangeability	Interworking	Interoperability	Co-existence
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In case they belong to different groups of applications (a mix of HES Class 1, HES Class 2 and Class 3) the following is required as a minimum:

Interchangeability	Interworking	Interoperability	Co-existence
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For the purpose of this document the following definitions apply

Co-existence: the use of the same network without affecting or disturbing the communication of other devices also hooked up to the same network;

Interoperability: the ability to send and receive datagrams and properly understand and react on them for all functions commonly supported, with the need for additional equipment (like translators or gateways) if different protocols are being used..

This includes the ability to interoperate together with the conformance to a described behavior. Interoperability includes the combination of data types for the realization of a specific functionality in "functional blocks".

NOTE Interoperability ensures that different application clusters (e.g. Home Controls [lighting, shading, HVAC, security] and Home Entertainment) can be connected for an integrated system user experience.

NOTE 2 If a protocol is used on different media, the devices are still considered as interoperable when they are separated by a media coupler ensuring the conversion of one physical encoding into another (e.g. PL to TP)

Interworking: the ability to send and receive datagrams and properly understand and react on them for a limited number of functions, without the need for additional equipment (like translators or gateways). If a protocol is used on different media, the devices are still

considered as interworking when they are separated by a media coupler ensuring the conversion of one physical encoding into another (e.g. PL to TP).

This includes the ability to understand the protocol and decode the actual payload of the message and the ability to interwork together with the conformance to a described behavior. In case of interworking, the standardization does not go beyond the definition of common data types for payload encoding.

NOTE Interworking ensures that products from different manufacturers for an application cluster (e.g. Home Controls or Home Entertainment) can be connected for an integrated application cluster user experience without any additional gateway.

Interchangeability: the ability to exchange one product by another as both have the same functionality (both use the same medium and same protocol and have the same application functionality as regards used data points, data types and parameters)

home electronic system, HES

home control system that conforms to HES standards. There are three classes of HES corresponding to the classes for home control systems [2.26 of ISO/IEC TR 15044]

home control system

home network together with all the devices attached to it, including the rules for control, communication and management among application processes. Three classes of home control systems are defined. [2.22 of ISO/IEC TR 15044]

HES class 1: home control system with transport capabilities for Taylor control applications such as:

- control
- monitor or in
- measurement
- alarm
- low speed data transfer

NOTE these capabilities are typically provided by:

- single packet-mode low bandwidth channel
- digital transmission

HES class 2: home control system with class 1 transport capabilities plus:

- switched voice or other information transfer of similar bandwidth

NOTE these capabilities are typically provided by class 1 system enhanced with:

- multiple switched medium bandwidth channels
- analogue or digital transmission or both

In principle all class 2 capabilities can be supported on a single class 2 channel. For practical reasons however class 2 home control systems may contain a separate channel or use a separate medium to support class 1 capabilities.

HES class 3: home control system with class 2 transport capabilities plus:

- switched high-quality sound and media transfer and high-speed data transfer

NOTE these capabilities are typically provided by class 2 system enhanced with:

- multiple switched high bandwidth channels
- analogue or digital transmission or both

In principle all class 3 capabilities can be supported on a single class 3 channel. For practical reasons however class 3 home control systems may contain a separate channel or use a separate medium to support class 1 and class 2 capabilities.

2 Background

In the run-up of the SC 25 plenary the US had expressed concerns about the failure of one of its new work item proposals that was caused - to their understanding – by a too strict interpretation of the JTC 1 Banff resolution 42 provided in 2.1 and decided to ask JTC 1 for an interpretation of its resolution, see 2.2.

2.1 Excerpt from Resolutions Adopted at the 20th Meeting of ISO/IEC JTC 1, 10-16 November 2005 in Banff, Alberta, Canada

JTC 1 Resolution 42: SC 25 Work on Home-Networking

JTC 1 observes the increasing number of standardisation bodies active in the area of home-networking and sees a danger for the development of inconsistent and competing standards that would neither be in the interest of users nor the industry.

JTC 1 therefore instructs SC 25 to intensify its co-operation with the standardisation bodies involved in home networking (eg, via participation on IEC TC 100 Project Teams), to improve the gathering of requirements specifically from IEC TC 100, ITU-T and relevant consortia and to accelerate (within its scope) the development of a consistent set of standards for home-networking with the aim of responding to the requirements of all interested parties. SC 25 is instructed to respond to their requirements in a timely manner and to report on the actions taken at the 2006 JTC 1 plenary meeting in South Africa.

Unanimous

2.2 Excerpt from Approved Resolutions for 18th Plenary of SC 25, Jeju, Republic of Korea, 2007-09-07

Resolution SC 25: 18/ 6

SC 25 requests clarification from JTC 1 of Banff 42 with respect to accommodation of competing protocols and the definition of conflict.

approved with: 2 abstentions

3 Examples with (potential) inconsistencies

For detailed titles and status see Annex A

3.1 HES 1 network based control of HES Class 1

3.1.1 Solution 1: NW approved 2006-03, published 2006-09 to 2007-05

ISO/IEC 14543-3-1 to ISO/IEC 14543-3-7

3.1.2 Solution 2: NWIP not approved 2006-10

NWIP 14543-z-1 and NWIP 14543-z-2

3.2 Network enhanced control for HES Class 1

3.2.1 Solution 1: NW approved 2006-10

FDIS 14543-4-1 and FDIS 14543-4-2

3.2.2 Solution 2: NWIP not approved 2006-10, FDIS with new name distributed 2007-12

NWIP 14543-6-1 to NWIP 14543-6-3:
renamed as
DIS 14908-1 to DIS 14908-4

3.3 HES Classes 2 and 3

3.3.1 Solution 1: FDIS distributed 2006-12, approved 2007-05

ISO/IEC 29341-1 to ISO/IEC 29341-13-11

3.3.2 Solution 2: NW on parts 1 & 4 approved 2006-09

FCD 14543-5-1 to 14543-5-6

4 Definition of consistency

4.1 Requirements

JTC 1 Banff resolution 42 relates to home networking and intelligent homes. This area is characterised by:

- **network externalities:** this phenomena well known in economic theory is applicable to home networking: the attractivity of a specific product or solution is increased by the number of products and applications that are available in the same network,
- **mix and match of networking products and attached devices:** the user acquires products and solutions from different sources and at different points of time expecting that they will work together in his home and that new products can be added to his running system,
- **layman:** in general neither the buyer nor the user has system knowledge or would be interested to compare the pros and cons for different system architectures.
- **mix of media:** due to technical limitations, availability at a specific home user's disinclination a number of media (Powerline, balanced cable with lower bandwidth/higher current and with higher bandwidth/lower current, coaxial cable, infrared and wireless) need to be supported often even within the same home.
- **mix of applications and trades:** there is no killer application to boost the market for networked homes. The application that motivates one home owner to network his home will only be considered by another home owner only as an add-on for his home as soon as he has networked it for an application that is important to him to the point to cover the initial investment.
- **modularity:** the user must be able to acquire the system step-by-step, to upgrade the overall functionality and to replace subsystems over many years.
- **planning confidence:** the user needs to be sure he will be able to operate, maintain and upgrade his system over decades.
- **transparency:** the settings of the system need to be documented in a way that allows another person to maintain and upgrade the system, i.e. not necessarily the layman/tradesmen who installed it initially.

NOTE Some but not all of these requirements are also applicable to buildings run by commercial organisations.

4.2 Systems architecture

To meet the requirements listed above in an economic way, system architectures for intelligent homes provide multilayered structures that allow to replace and mix media and applications, that cover a multitude of applications, are supplied by different industries and often installed by different craftsmen from home entertainment to energy control from PC networking to lighting scenarios.

Figure 1 and 2 provide two examples that are complementary to each other insofar as entities of the HES Class 1 (see Figure 1) system can interoperate with entities of HES Class 2 and Class 3 with help of the tools provided in ISO/IEC 29341 (see Figure 2). Therefore Figure 1 and Figure 2 can be combined into an overall architecture without the need of showing the same function in multiple boxes.

Figure 1 - Systems structure for network based control for HES Class 1

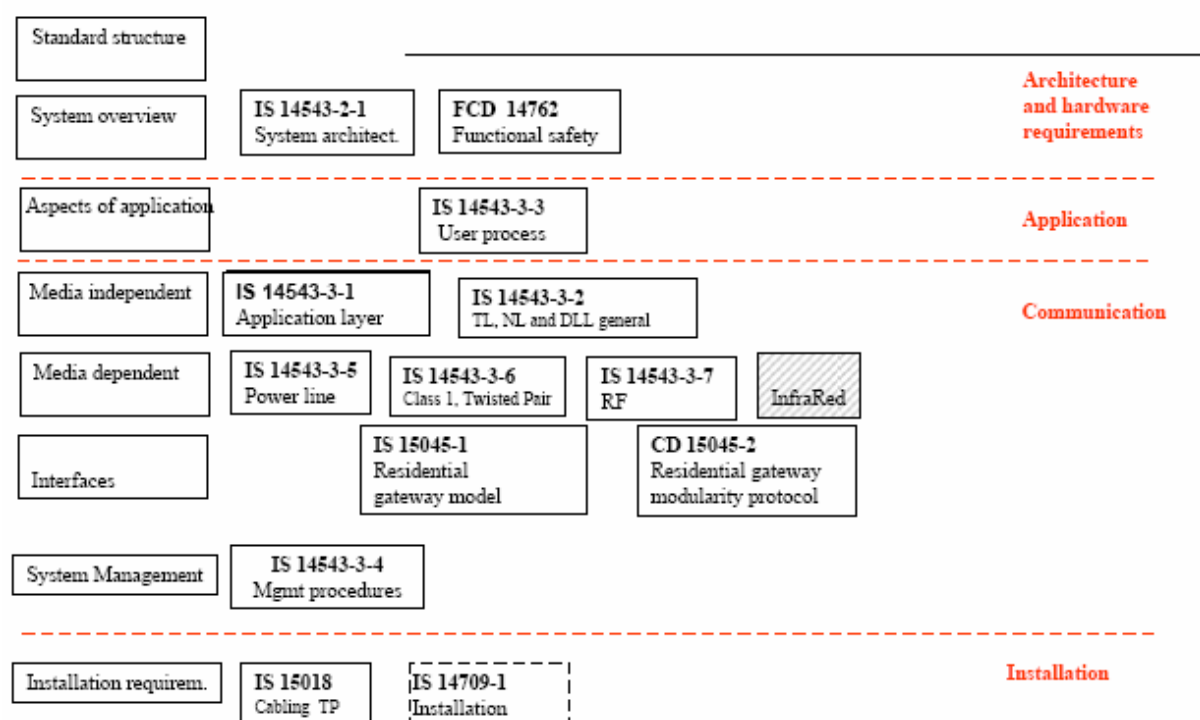
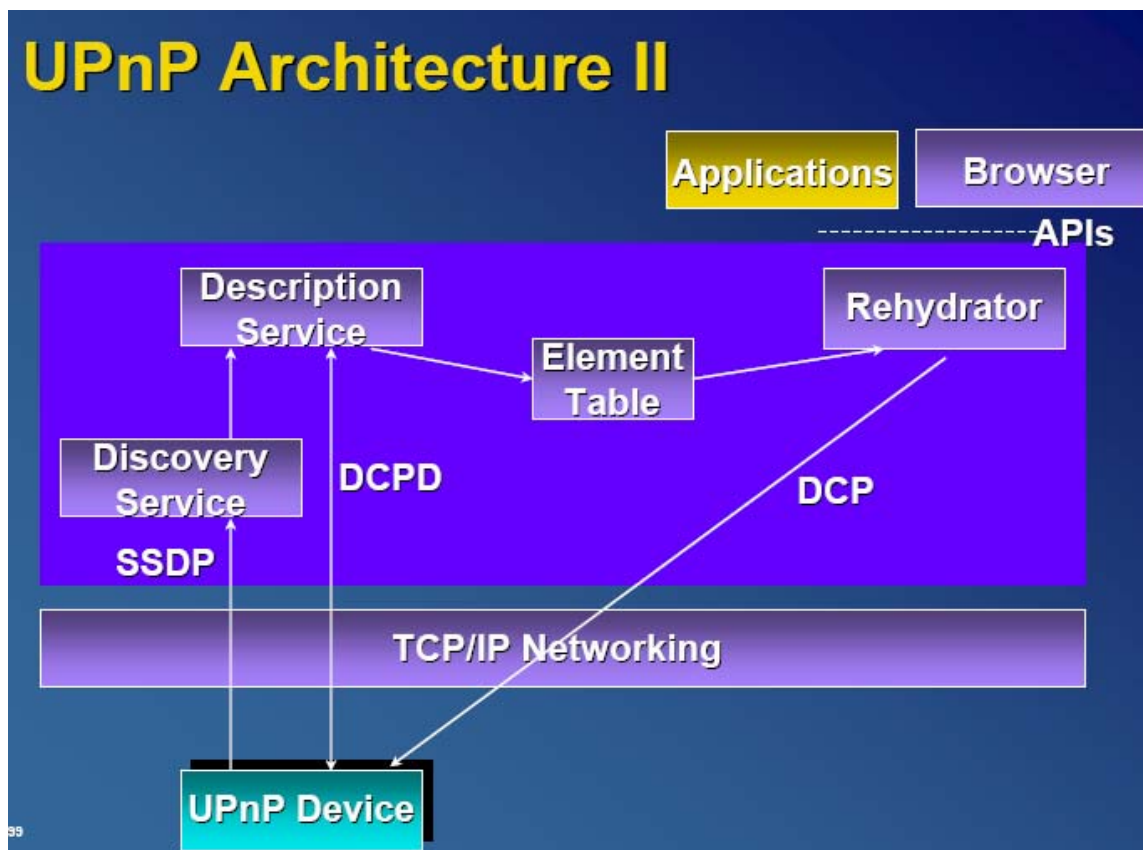
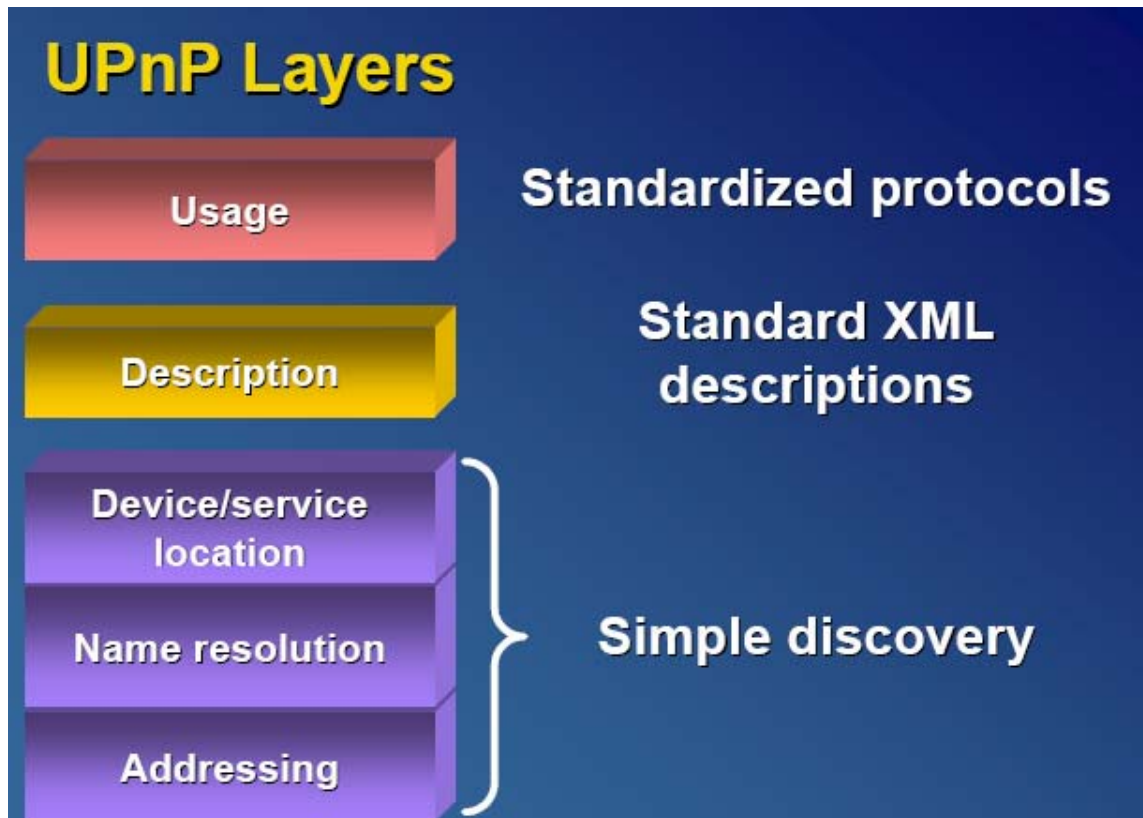


Figure 2 - Systems structure of ISO/IEC 29341



4.3 Possible definitions of a "consistent set of standards for home-networking"

4.3.1 Introduction

The meaning of the following figures is purely schematic and neither complete nor reflecting a specific system. They just have been drawn to ease the understanding of the descriptive words.

4.3.2 Single option

An overall system structure that provides a single option per medium capable to meet the needs of a specific application (group) that provides seamless communication. There are no competing or alternative specifications for the same problem yet the structure provides the means to replace one solution by the other, e.g. following technical progress. There are no gateways or translator with the exception of bridges between different media.

4.3.3 System structure with HES class-specific solutions and with common functional structuring, interfaces and protocols

An overall system structure that provides seamless communication between application clusters HES Class 1 and HES Class 2/3. Competing solutions can replace each other based on common protocols and interfaces.

4.3.4 System structure with competing solutions and with common functional structuring, interfaces and protocols

An overall system structure that provides seamless communication that allows competing solutions from medium support to applications. Competing solutions can replace each other based on common protocols and interfaces.

4.3.5 System structure with competing solutions and common API

An overall system structure with a common application layer representation that provides seamless communication that allows competing solutions from medium support to applications. Competing solutions can communicate with each other with help of gateways below the API (application program interface) based on common API.

4.3.6 System structure with competing solutions and translation on the application layer

An overall system structure that provides communication that allows competing solutions from medium support to applications. Competing solutions can communicate with each other with help of gateways/translators on the application layer.

4.3.7 System structure with competing solutions that coexist

Two system structures that not support interaction yet avoid interference with each other.

Annex A – Full titles of examples with (potential) inconsistencies

A.1 HES 1 network based control of HES Class 1

A.1.1 Solution 1: NW approved 2006-03, published 2006-09 to 2007-05

ISO/IEC 14543-3-1: *Information Technology - Home Electronic Systems (HES) architecture - Part 3-1: Communication layers- Application layer for network based control of HES Class 1*

ISO/IEC 14543-3-2: *Information Technology - Home Electronic Systems (HES) architecture - Part 3-2: Communication layers - Transport, network and general parts of data link layer for network based control of HES Class 1*

ISO/IEC 14543-3-3: *Information Technology - Home Electronic Systems (HES) Architecture - Part 3-3: User process for network based control of HES Class 1*

ISO/IEC 14543-3-4: *Information Technology - Home Electronic Systems (HES) Architecture - Part 3-4: System Management – Management procedures for network based control of HES Class 1*

ISO/IEC 14543-3-5: *Information Technology - Home Electronic Systems (HES) Architecture - Part 3-5: Media and media dependent layers – Power line for network based control of HES Class 1*

ISO/IEC 14543-3-6: *Information Technology - Home Electronic Systems (HES) Architecture - Part 3-6: Media and media dependent layers – Twisted pair for network based control of HES Class 1*

ISO/IEC 14543-3-7: *Information Technology - Home Electronic Systems (HES) Architecture - Part 3-7: Media and media dependent layers – Radio frequency for network based control of HES Class 1*

4.3.8 Solution 2: NWIP not approved 2006-10

NWIP 14543-z-1: IT - Home Electronic System (HES) Architecture – Part z-1: core protocol

NWIP 14543-z-2: IT - Home Electronic System (HES) Architecture – Part z-2: Device description file

A.2 Network enhanced control for HES Class 1

A.2.1 Solution 1: NW approved 2006-10

FDIS 14543-4-1: IT - Home Electronic System (HES) Architecture – Part 4-1: Communications layers - application layer for the network enhanced control devices of HES Class 1

FDIS 14543-4-2: IT - Home Electronic System (HES) Architecture – Part 4-2: Communication layers – Transport, network and general parts of data link layer for network enhanced control devices of HES Class 1

A.2.2 Solution 2: NWIP not approved 2006-10, FDIS with new title distributed 2007-12

NWIP 14543-6-1: IT - Home Electronic System (HES) Architecture – Part 6-1: Communication layers – ISO layers 2 through 6 for network-enhanced control devices of HES Class 1
renamed as
DIS 14908-1: Open Data Communication in Building Automation, Controls and Building Management -- Control Network Protocol -- Part 1: Protocol Stack

NWIP 14543-6-2: IT - Home Electronic System (HES) Architecture – Part 6-2: Media and Media-Dependent Layers – Power line for worldwide use
renamed as
DIS 14908-3: Open Data Communication in Building Automation, Controls and Building Management -- Control Network Protocol -- Part 3: Power Line Channel Specification

NWIP 14543-6-3: IT – Home Electronic System (HES) Architecture – Part 6-3: Media and Media-Dependent Layers – Dual-stranded, polarity-insensitive, low-voltage twisted-pair wiring
renamed as
DIS 14908-2: Open Data Communication in Building Automation, Controls and Building Management --
Control Network Protocol -- Part 2: Twisted Pair Communication

A.3 HES Classes 2 and 3

A.3.1 Solution 1: FDIS distributed 2006-12, approved 2007-05

ISO/IEC 29341-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 1-1: UPnP Device Architecture Version 1.0*

ISO/IEC 29341-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 2: Basic Device Control Protocol - Basic Device*

ISO/IEC 29341-3-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-1: Audio Video Device Control Protocol - Audio Video Architecture*

ISO/IEC 29341-3-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-2: Audio Video Device Control Protocol - Media Renderer Device*

ISO/IEC 29341-3-3 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-3: Audio Video Device Control Protocol - Media Server Device*

ISO/IEC 29341-3-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-10: Audio Video Device Control Protocol - Audio Video Transport Service*

ISO/IEC 29341-3-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-11: Audio Video Device Control Protocol - Connection Manager Service*

ISO/IEC 29341-3-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-12: Audio Video Device Control Protocol - Content Directory Service*

ISO/IEC 29341-3-13 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 3-13: Audio Video Device Control Protocol - Rendering Control Service*

ISO/IEC 29341-4-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-1: Audio Video Device Control Protocol - Level 2 - Audio Video Architecture*

ISO/IEC 29341-4-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-2: Audio Video Device Control Protocol - Level 2 - Media Renderer Device*

ISO/IEC 29341-4-3 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-3: Audio Video Device Control Protocol - Level 2 - Media Server Device*

ISO/IEC 29341-4-4 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-4: Audio Video Device Control Protocol - Level 2 - Audio Video Data Structures*

ISO/IEC 29341-4-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-10: Audio Video Device Control Protocol - Level 2 - Audio Video Transport Service*

ISO/IEC 29341-4-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-11: Audio Video Device Control Protocol - Level 2 - Connection Manager Service*

ISO/IEC 29341-4-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-12: Audio Video Device Control Protocol - Level 2 - Content Directory Service*

ISO/IEC 29341-4-13 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-13: Audio Video Device Control Protocol - Level 2 - Rendering Control Service*

ISO/IEC 29341-4-14 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 4-14: Audio Video Device Control Protocol - Level 2 - Scheduled Recording Service*

ISO/IEC 29341-5-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 5-1: Digital Security Camera Device Control Protocol - Digital Security Camera Device*

ISO/IEC 29341-5-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 5-10: Digital Security Camera Device Control Protocol - Digital Security Camera Motion Image Service*

ISO/IEC 29341-5-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 5-11: Digital Security Camera Device Control Protocol - Digital Security Camera Settings Service*

ISO/IEC 29341-5-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 5-12: Digital Security Camera Device Control Protocol - Digital Security Camera Still Image Service*

ISO/IEC 29341-6-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-1: Heating, Ventilation, and Air Conditioning Device Control Protocol - System Device*

ISO/IEC 29341-6-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-2: Heating, Ventilation, and Air Conditioning Device Control Protocol - Zone Thermostat Device*

ISO/IEC 29341-6-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-10: Heating, Ventilation, and Air Conditioning Device Control Protocol - Control Valve Service*

ISO/IEC 29341-6-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-11: Heating, Ventilation, and Air Conditioning Device Control Protocol - Fan Operating Mode Service*

ISO/IEC 29341-6-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-12: Heating, Ventilation, and Air Conditioning Device Control Protocol - Fan Speed Service*

ISO/IEC 29341-6-13 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-13: Heating, Ventilation, and Air Conditioning Device Control Protocol - House Status Service*

ISO/IEC 29341-6-14 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-14: Heating, Ventilation, and Air Conditioning Device Control Protocol - Setpoint Schedule Service*

ISO/IEC 29341-6-15 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-15: Heating, Ventilation, and Air Conditioning Device Control Protocol - Temperature Sensor Service*

ISO/IEC 29341-6-16 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-16: Heating, Ventilation, and Air Conditioning Device Control Protocol - Temperature Setpoint Service*

ISO/IEC 29341-6-17 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 6-17: Heating, Ventilation, and Air Conditioning Device Control Protocol - User Operating Mode Service*

ISO/IEC 29341-7-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 7-1: Lighting Device Control Protocol - Binary Light Device*

ISO/IEC 29341-7-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 7-2: Lighting Device Control Protocol - Dimmable Light Device*

ISO/IEC 29341-7-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 7-10: Lighting Device Control Protocol - Dimming Service*

ISO/IEC 29341-7-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 7-11: Lighting Device Control Protocol - Switch Power Service*

ISO/IEC 29341-8-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-1: Internet Gateway Device Control Protocol - Internet Gateway Device*

ISO/IEC 29341-8-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-2: Internet Gateway Device Control Protocol - Local Area Network Device*

ISO/IEC 29341-8-3 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-3: Internet Gateway Device Control Protocol - Wide Area Network Device*

ISO/IEC 29341-8-4 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-4: Internet Gateway Device Control Protocol - Wide Area Network Connection Device*

ISO/IEC 29341-8-5 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-5: Internet Gateway Device Control Protocol - Wireless Local Area Network Access Point Device*

ISO/IEC 29341-8-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-10: Internet Gateway Device Control Protocol - Local Area Network Host Configuration Management Service*

ISO/IEC 29341-8-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-12: Internet Gateway Device Control Protocol - Link Authentication Service*

ISO/IEC 29341-8-13 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-13: Internet Gateway Device Control Protocol - Radius Client Service*

ISO/IEC 29341-8-14 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-14: Internet Gateway Device Control Protocol - Wide Area Network Cable Link Configuration Service*

ISO/IEC 29341-8-15 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-15: Internet Gateway Device Control Protocol - Wide Area Network Common Interface Configuration Service*

ISO/IEC 29341-8-16 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-16: Internet Gateway Device Control Protocol - Wide Area Network Digital Subscriber Line Configuration Service*

ISO/IEC 29341-8-17 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-17: Internet Gateway Device Control Protocol - Wide Area Network Ethernet Link Configuration Service*

ISO/IEC 29341-8-18 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-18: Internet Gateway Device Control Protocol - Wide Area Network Internet Protocol Connection Service*

ISO/IEC 29341-8-19 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-19: Internet Gateway Device Control Protocol - Wide Area Network Plain Old Telephone Service Link Configuration Service*

ISO/IEC 29341-8-20 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-20: Internet Gateway Device Control Protocol - Wide Area Network Point-to-Point Protocol Connection Service*

ISO/IEC 29341-8-21 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 8-21: Internet Gateway Device Control Protocol - Wireless Local Area Network Configuration Service*

ISO/IEC 29341-9-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-1: Imaging Device Control Protocol - Printer Device*

ISO/IEC 29341-9-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-2: Imaging Device Control Protocol - Scanner Device*

ISO/IEC 29341-9-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-10: Imaging Device Control Protocol - External Activity Service*

ISO/IEC 29341-9-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-11: Imaging Device Control Protocol - Feeder Service*

ISO/IEC 29341-9-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-12: Imaging Device Control Protocol - Print Basic Service*

ISO/IEC 29341-9-13 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 9-13: Imaging Device Control Protocol - Scan Service*

ISO/IEC 29341-10-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 10-1: Quality of Service Device Control Protocol - Quality of Service Architecture*

ISO/IEC 29341-10-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 10-10: Quality of Service Device Control Protocol - Quality of Service Device Service*

ISO/IEC 29341-10-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 10-11: Quality of Service Device Control Protocol - Quality of Service Manager Service*

ISO/IEC 29341-10-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 10-12: Quality of Service Device Control Protocol - Quality of Service Policy Holder Service*

ISO/IEC 29341-11-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 11-1: Quality of Service Device Control Protocol - Level 2 - Quality of Service Architecture*

ISO/IEC 29341-11-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 11-2: Quality of Service Device Control Protocol - Level 2 - Quality of Service Schemas*

ISO/IEC 29341-11-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 11-10: Quality of Service Device Control Protocol - Level 2 - Quality of Service Device Service*

ISO/IEC 29341-11-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 11-11: Quality of Service Device Control Protocol - Level 2 - Quality of Service Manager Service*

ISO/IEC 29341-11-12 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 11-12: Quality of Service Device Control Protocol - Level 2 - Quality of Service Policy Holder Service*

ISO/IEC 29341-12-1 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 12-1: Remote User Interface Device Control Protocol - Remote User Interface Client Device*

ISO/IEC 29341-12-2 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 12-2: Remote User Interface Device Control Protocol - Remote User Interface Server Device*

ISO/IEC 29341-12-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 12-10: Remote User Interface Device Control Protocol - Remote User Interface Client Service*

ISO/IEC 29341-12-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 12-11: Remote User Interface Device Control Protocol - Remote User Interface Server Service*

ISO/IEC 29341-13-10 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 13-10: Device Security Device Control Protocol - Device Security Service*

ISO/IEC 29341-13-11 Ed.1 (being published): *Information Technology - UPnP Device Architecture - Part 13-11: Device Security Device Control Protocol - Security Console Service*

A.3.2 Solution 2: NW on parts 1 & 4 approved 2006-09

FCD 14543-5-1, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-1: Core protocol

NWIP and CD 14543-5-21, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-21: Application Profile - AV profile

NWIP and CD 14543-5-22, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-22: Application Profile - Application profile

FCD 14543-5-4, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-4: Device Certification

NWIP & CD 14543-5-5, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-5: Device Type

NWIP & CD 14543-5-6, IT - Home Electronic Systems (HES) Architecture - Intelligent grouping and resource sharing for HES Class 2 & Class 3 (IGRS) - Part 5-6: Service Type