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Digital living network alliance (DLNA) home networked device interoperability guidelines – Part 6-2: Remote user interface – RVU

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DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME NETWORKED DEVICE INTEROPERABILITY GUIDELINES –

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FOREWORD

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International Standard IEC 62481-6-2 has been prepared under technical area 8: Multimedia home systems and applications for end-user network IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

CDV	Report on voting
100/2742/CDV	100/2888/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 62481 series, published under the general title *Digital Living Network Alliance (DLNA) home networked device interoperability guidelines,* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

INTRODUCTION

Consumers are acquiring, viewing, and managing an increasing number of digital media (photos, music, and video) on devices in the consumer electronics (CE), mobile, and personal computer (PC) domains. As such, they want to conveniently enjoy the content, regardless of the source, across different devices and locations in the home. The digital home vision integrates the Internet, mobile, and broadcast networks through a seamless, interoperable network, which will provide a unique opportunity for manufacturers and consumers alike. In order to deliver on this vision, a common set of industry design guidelines is needed that allows vendors to participate in a growing marketplace, leading to more innovation, simplicity, and value for consumers. This document serves that purpose and provides vendors with the information needed to build interoperable networked platforms and devices for the digital home.

DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME NETWORKED DEVICE INTEROPERABILITY GUIDELINES –

Part 6-2: Remote User Interface – RVU

1 Scope

This part of IEC 62481-6 specifies guidelines for RVU which is a remote user interface (RUI) protocol that allows clients to present a full-featured user interface by implementing minimal functionality, leaving most of the processing to the server. The RVU RUI delivers bitmapped and/or vector graphic user interface data for a robust, consistent UI experience throughout the home via thin clients.

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.

IEC 62481-1-1:2017, *Digital living network alliance (DLNA) home networked device interoperability guidelines - Part 1-1: Architecture and protocols*

IEC 62481-6-1:2017, *Digital living network alliance (DLNA) home networked device interoperability guidelines - Part 6-1: HTML 5 RUI*

ISO/IEC 29341-4-10, *Information technology – UPnP Device Architecture – Part 4-10: Audio Video Device Control Protocol – Level 2 – Audio Video Transport Service*

ISO/IEC 29341-4-11, *Information technology – UPnP Device Architecture – Part 4-11: Audio Video Device Control Protocol – Level 2 – Connection Manager Service*

ISO/IEC 29341-12-1, *Information Technology – UPnP Device Architecture – Part 12-1: Remote User Interface Device Control Protocol - Remote User Interface Client Device*

ISO/IEC 29341-12-2, *Information Technology – UPnP Device Architecture – Part 12-2: Remote User Interface Device Control Protocol – Remote User Interface Server Device*

ISO/IEC 29341-12-10:2015, *Information Technology - UPnP Device Architecture – Part 12-10: Remote User Interface Device Control Protocol – Remote User Interface Client Service Description*

ISO/IEC 29341-12-11:2015, *Information Technology – UPnP Device Architecture – Part 12-11: Remote User Interface Device Control Protocol – Remote User Interface Server Service Description*

RVU Protocol Specification: V1.0 2014, RVU Alliance
http://www.rvualliance.org

3 Terms, definitions and conventions

For the purposes of this document, the terms and definitions given in IEC 62481-1-1:2017 and the following 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 Terms and definitions

3.1.1
AVT
AVTransport Service
UPnP service that provides network-based control for common transport operations such as play, stop, pause, next, previous, and seek

Note 1 to entry: The AVTransport Service specification is a standard UPnP DCP.

3.1.2
CDS
ContentDirectory Service
UPnP service that provides network-based discovery of content

Note 1 to entry: The ContentDirectory Service specification is a standard UPnP Device Control Protocol.

3.1.3
DMR
Digital Media Renderer
DLNA Device Class having home network environmental characteristics, with the role of rendering content it receives after being setup by another network entity

3.1.4
DMS
Digital Media Server
DLNA Device Class having home network environmental characteristics, with the role of exposing and distributing content throughout the home

3.1.5
MSCP
MediaServer Control Point
UPnP AV control point that issues actions to a DMS

3.1.6
XDMR
eXtended DMR
device class defined to combine the functionality of a Digital Media Renderer (DMR) and a Media Server Control Point (MSCP)

Note 1 to entry: This device class is equivalent to combining previous device classes known as a DMR and a DMP.

3.2 Conventions

In this document, a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Move). Any lowercase uses of these words have the normal technical English meaning.

4 Networking architecture, device models and guideline conventions

4.1 DLNA home networking architecture

This document extends the DLNA home networking architecture that is defined in Clause 4 of IEC 62481-1-1:2017.

4.2 Document conventions and conventions

See Clause 6 of IEC 62481-1-1:2017 for a full description of the DLNA document conventions.

4.3 Guideline structure and layout

See 7.1 of IEC 62481-1-1:2017 for guideline and attribute table layout descriptions.

5 RVU Device Model and Device Function

5.1 Device Model

Refer to Clause 5 of IEC 62481-1-1:2017 for detailed descriptions of existing DLNA Device Model. This document extends the existing DLNA devices and system usages.

5.2 Device Capabilities and roles

For the RVU guidelines, the following Device Function is defined.

An RVU Pull Controller (+RVUPL+), an RVU Source capability (+RVUSRC+), an RVU Sink capability (+RVUSINK+), and an RVU Controller (+RVUCTRL+) have the same roles as DLNA RUI-H capabilities. The system usages for RVU RUI capabilities are the same as DLNA RUI-H capabilities as specified in Clause 5.3 of IEC 62481-6-1:2017, but with DLNA RUI-H capabilities replaced by RVU RUI capabilities:

- an RVU Pull Controller (+RVUPL+) with the role of finding and loading remote UI content exposed by a +RVUSRC+ capability and rendering and interacting with the UI content;
- an RVU Source capability (+RVUSRC+) with the role of exposing and sourcing UI content;
- an RVU Sink capability (+RVUSINK+) with the role of exposing remote UI functionality and rendering UI content it receives from a +RVUSRC+ capability;
- an RVU Controller (+RVUCTRL+) with the role of finding +RVUSRC+ and +RVUSINK+ capabilities, finding matching UIs, and setting up the connection between the +RVUSINK+ and +RVUSRC+.

6 RVU guidelines

6.1 RVU Remote User Interfaces

6.1.1

DLNA devices adhere to the conditionally mandatory requirements in this section only when applying +RVUPL+, +RVUSRC+, +RVUSINK+, and +RVUCTRL+ device capabilities.

6.1.2

[GUIDELINE] An RVU Source capability (+RVUSRC+) shall implement a UPnP RemoteUIServerDevice and a UPnP RemoteUIServer with XML device description as defined in ISO/IEC 29341-12-2 and an XML service description as defined in ISO/IEC 29341-12-11:2015.

[ATTRIBUTES]

M	A	+RVUSRC+	n/a	n/a	ISO/IEC 29341-12-2 ISO/IEC 29341-12-11:2015	2KOQH	

6.1.3

[GUIDELINE] An RVU Pull Controller capability (+RVUPL+) shall implement a UPnP RemoteUIServerDevice control point that calls the required actions of the UPnP RemoteUIServer.

[ATTRIBUTES]

M	A	+RVUPL+	n/a	n/a	ISO/IEC 29341-12-11:2015	ANCNN	

6.1.4

[GUIDELINE] An RVU Sink capability (+RVUSINK+) shall implement a UPnP RemoteUIClientDevice and a UPnP RemoteUI Client with XML device description as defined in ISO/IEC 29341-12-1 and an XML service description as defined in ISO/IEC 29341-12-10:2015.

[ATTRIBUTES]

M	A	+RVUSINK+	n/a	n/a	ISO/IEC 29341-12-1 ISO/IEC 29341-12-10:2015	H3Q8Q	

6.1.5

[GUIDELINE] An RVU Controller capability (+RVUCTRL+) shall implement a UPnP RemoteUIServer control point that calls the required actions of the UPnP RemoteUIServer.

[ATTRIBUTES]

M	A	+RVUCTRL+	n/a	n/a	ISO/IEC 29341-12-11:2015	AVHLG	

6.1.6

[GUIDELINE] An RVU Controller capability (+RVUCTRL+) shall implement a UPnP RemoteUIClient control point that calls the required actions of the UPnP RemoteUIClient.

[ATTRIBUTES]

M	A	+RVUCTRL+	n/a	n/a	ISO/IEC 29341-12-10:2015	5DVST	