

BS ISO/IEC 29341-12-10:2015



BSI Standards Publication

Information technology — UPnP Device Architecture

Part 12-10: Remote User Interface Device
Control Protocol — Remote User Interface
Client Service

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This British Standard is the UK implementation of ISO/IEC 29341-12-10:2015.

The UK participation in its preparation was entrusted to Technical Committee IST/6, Data communications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2015.
Published by BSI Standards Limited 2015

ISBN 978 0 580 88292 0
ICS 35.200

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2015.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

**Information technology — UPnP
Device Architecture —**

**Part 12-10:
Remote User Interface Device Control
Protocol — Remote User Interface
Client Service**

Technologies de l'information — Architecture de dispositif UPnP —

*Partie 12-10: Protocole de contrôle de dispositif d'interface utilisateur
à distance — Service client d'interface utilisateur à distance*





COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

CONTENTS

Foreword	v
Introduction.....	vi
1. Scope.....	1
2. Normative References	1
3. Service Modeling Definitions	2
3.1. ServiceType	2
3.2. State Variables	2
3.2.1. CompatibleUlsUpdateIDEvent	2
3.2.2. CurrentConnections	2
3.2.3. CurrentConnectionsEvent	3
3.2.4. DeviceProfile	3
3.2.5. A_ARG_TYPE_CompatibleUls	3
3.2.6. A_ARG_TYPE_DisplayMessageType	3
3.2.7. A_ARG_TYPE_InputDataType	3
3.2.8. A_ARG_TYPE_Int	4
3.2.9. A_ARG_TYPE_String	4
3.3. Eventing and Moderation	4
3.3.1. Relationships Between State Variables	4
3.4. Actions.....	5
3.4.1. Connect.....	5
3.4.2. Disconnect	6
3.4.3. GetCurrentConnections	7
3.4.4. GetDeviceProfile	8
3.4.5. GetUICollection	9
3.4.6. AddUICollection.....	9
3.4.7. RemoveUICollection.....	10
3.4.8. DisplayMessage.....	11
3.4.9. ProcessInput	12
3.4.10. Non-Standard Actions Implemented by a UPnP Vendor.....	13
3.4.11. Relationships Between Actions	13
3.4.12. Common Error Codes	14
4. Theory of Operation.....	15
4.1. Example Values of State Variables.....	15
4.1.1. A_ARG_TYPE_URI	15
4.1.2. CurrentConnections	16
4.1.3. A_ARG_TYPE_CompatibleUls	16
4.1.4. DeviceProfile	17
4.2. Remote UI Scenarios for the Basic DCP	18
4.2.1. Connect, Disconnect and GetCurrentConnections	18
4.2.2. Add, Get and Remove UI Listings.....	18
4.2.3. Display Message.....	18
4.2.4. Process Input.....	18
4.3. Remote UI Scenarios for the Advanced DCP	19
4.3.1. Mirror.....	19
4.3.2. Move	19
4.3.3. Reconnect.....	19
4.4. Types of Client Devices.....	20

4.4.1. Autonomous Remote UI Clients	20
4.4.2. Fully Remoted Remote UI Clients.....	20
5. DeviceProfile XSD Schema	21
6. A_ARG_TYPE_CompatibleUis XSD Schema	22
7. XML Service Description	23

LIST OF TABLES

Table 1: Service State Variables	2
Table 2: Allowed value list for state variable A_ARG_TYPE_DisplayMessageType.....	3
Table 3: Allowed value list for state variable A_ARG_TYPE_InputDataType	3
Table 4: Event moderation.....	4
Table 5: Actions	5
Table 6: Arguments for Connect()	5
Table 7: Arguments for Disconnect()	6
Table 8: Arguments for GetCurrentConnections()	7
Table 9: Arguments for GetDeviceProfile()	8
Table 10: Arguments for GetUIListing()	9
Table 11: Arguments for AddUIListing()	9
Table 12: Arguments for RemoveUIListing()	10
Table 13: Arguments for DisplayMessage()	11
Table 14: Arguments for ProcessInput()	12
Table 15: Common Error Codes.....	14

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see <http://www.iso.org/directives>).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of the ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword – Supplementary information](#)

ISO/IEC 29341-12-10 was prepared by UPnP Implementers Corporation and adopted, under the PAS procedure, by joint technical committee ISO/IEC JTC 1. Information technology, in parallel with its approval by national bodies of ISO and IEC.

This second edition replaces the first edition (ISO/IEC 29341-12-10:2008), which has been technically revised.

The list of all currently available parts of ISO/IEC 29341 series, under the general title *Information technology — UPnP Device Architecture*, can be found on the [ISO web site](#).

Introduction

ISO and IEC draw attention to the fact that it is claimed that compliance with this document may involve the use of patents as indicated below.

ISO and IEC take no position concerning the evidence, validity and scope of these patent rights. The holders of - these patent rights have assured ISO and IEC that they are willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with ISO and IEC.

Original UPnP Documents

Reference may be made in this document to original UPnP documents. These references are retained in order to maintain consistency between the specifications as published by ISO/IEC and by UPnP Implementers Corporation. The following table indicates the original UPnP document titles and the corresponding part of ISO/IEC 29341:

UPnP Document Title	ISO/IEC 29341 Part
UPnP Device Architecture 1.0	ISO/IEC 29341-1
UPnP Basic:1 Device	ISO/IEC 29341-2
UPnP AV Architecture:1	ISO/IEC 29341-3-1
UPnP MediaRenderer:1 Device	ISO/IEC 29341-3-2
UPnP MediaServer:1 Device	ISO/IEC 29341-3-3
UPnP AVTransport:1 Service	ISO/IEC 29341-3-10
UPnP ConnectionManager:1 Service	ISO/IEC 29341-3-11
UPnP ContentDirectory:1 Service	ISO/IEC 29341-3-12
UPnP RenderingControl:1 Service	ISO/IEC 29341-3-13
UPnP MediaRenderer:2 Device	ISO/IEC 29341-4-2
UPnP MediaServer:2 Device	ISO/IEC 29341-4-3
UPnP AV Datastructure Template:1	ISO/IEC 29341-4-4
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11
UPnP ContentDirectory:2 Service	ISO/IEC 29341-4-12
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13
UPnP ScheduledRecording:1	ISO/IEC 29341-4-14
UPnP DigitalSecurityCamera:1 Device	ISO/IEC 29341-5-1
UPnP DigitalSecurityCameraMotionImage:1 Service	ISO/IEC 29341-5-10
UPnP DigitalSecurityCameraSettings:1 Service	ISO/IEC 29341-5-11
UPnP DigitalSecurityCameraStillImage:1 Service	ISO/IEC 29341-5-12
UPnP HVAC_System:1 Device	ISO/IEC 29341-6-1
UPnP HVAC_ZoneThermostat:1 Device	ISO/IEC 29341-6-2
UPnP ControlValve:1 Service	ISO/IEC 29341-6-10
UPnP HVAC_FanOperatingMode:1 Service	ISO/IEC 29341-6-11
UPnP FanSpeed:1 Service	ISO/IEC 29341-6-12
UPnP HouseStatus:1 Service	ISO/IEC 29341-6-13
UPnP HVAC_SetpointSchedule:1 Service	ISO/IEC 29341-6-14
UPnP TemperatureSensor:1 Service	ISO/IEC 29341-6-15
UPnP TemperatureSetpoint:1 Service	ISO/IEC 29341-6-16
UPnP HVAC_UserOperatingMode:1 Service	ISO/IEC 29341-6-17
UPnP BinaryLight:1 Device	ISO/IEC 29341-7-1
UPnP DimmableLight:1 Device	ISO/IEC 29341-7-2
UPnP Dimming:1 Service	ISO/IEC 29341-7-10
UPnP SwitchPower:1 Service	ISO/IEC 29341-7-11
UPnP InternetGatewayDevice:1 Device	ISO/IEC 29341-8-1
UPnP LANDevice:1 Device	ISO/IEC 29341-8-2
UPnP WANDevice:1 Device	ISO/IEC 29341-8-3
UPnP WANConnectionDevice:1 Device	ISO/IEC 29341-8-4
UPnP WLANAccessPointDevice:1 Device	ISO/IEC 29341-8-5
UPnP LANHostConfigManagement:1 Service	ISO/IEC 29341-8-10
UPnP Layer3Forwarding:1 Service	ISO/IEC 29341-8-11
UPnP LinkAuthentication:1 Service	ISO/IEC 29341-8-12
UPnP RadiusClient:1 Service	ISO/IEC 29341-8-13
UPnP WANCableLinkConfig:1 Service	ISO/IEC 29341-8-14
UPnP WANCommonInterfaceConfig:1 Service	ISO/IEC 29341-8-15
UPnP WANDSLLinkConfig:1 Service	ISO/IEC 29341-8-16
UPnP WANEthernetLinkConfig:1 Service	ISO/IEC 29341-8-17
UPnP WANIPConnection:1 Service	ISO/IEC 29341-8-18
UPnP WANPOTSLinkConfig:1 Service	ISO/IEC 29341-8-19
UPnP WANPPPConnection:1 Service	ISO/IEC 29341-8-20
UPnP WLANConfiguration:1 Service	ISO/IEC 29341-8-21
UPnP Printer:1 Device	ISO/IEC 29341-9-1

UPnP Document Title	ISO/IEC 29341 Part
UPnP Scanner:1.0 Device	ISO/IEC 29341-9-2
UPnP ExternalActivity:1 Service	ISO/IEC 29341-9-10
UPnP Feeder:1.0 Service	ISO/IEC 29341-9-11
UPnP PrintBasic:1 Service	ISO/IEC 29341-9-12
UPnP Scan:1 Service	ISO/IEC 29341-9-13
UPnP QoS Architecture:1.0	ISO/IEC 29341-10-1
UPnP QosDevice:1 Service	ISO/IEC 29341-10-10
UPnP QosManager:1 Service	ISO/IEC 29341-10-11
UPnP QosPolicyHolder:1 Service	ISO/IEC 29341-10-12
UPnP QoS Architecture:2	ISO/IEC 29341-11-1
UPnP QOS v2 Schema Files	ISO/IEC 29341-11-2
UPnP QosDevice:2 Service	ISO/IEC 29341-11-10
UPnP QosManager:2 Service	ISO/IEC 29341-11-11
UPnP QosPolicyHolder:2 Service	ISO/IEC 29341-11-12
UPnP RemoteUIClientDevice:1 Device	ISO/IEC 29341-12-1
UPnP RemoteUIServerDevice:1 Device	ISO/IEC 29341-12-2
UPnP RemoteUIClient:1 Service	ISO/IEC 29341-12-10
UPnP RemoteUIServer:1 Service	ISO/IEC 29341-12-11
UPnP DeviceSecurity:1 Service	ISO/IEC 29341-13-10
UPnP SecurityConsole:1 Service	ISO/IEC 29341-13-11

INFORMATION TECHNOLOGY – UPNP DEVICE ARCHITECTURE –

Part 12-10: Remote User Interface Device Control Protocol – Remote User Interface Client Service

1. Scope

This service definition is compliant with the UPnP Device Architecture version 1.0.

This service-type encapsulates the management of an out-of-band remoting protocol connection to a device capable of user interaction. This service is required for all Remote UI clients.

It is specified in: **urn:schemas-upnp-org:device:RemoteUIClientDevice**

2. Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 29341-4-12, *Information Technology – UPnP Device Architecture – Part 4-12: Audio video Device Control Protocol – Level 2 – Content Directory Service*

IETF RFC 1738, *Uniform Resource Locators (URL)*, Tim Berners-Lee, et. Al., December 1994.
Available at: <http://www.ietf.org/rfc/rfc1738.txt>.

IETF RFC 3986, *Uniform Resource Identifiers (URI): Generic Syntax*, Tim Berners-Lee, et al, 2005.
Available at: <http://www.ietf.org/rfc/rfc3986.txt>.

3. Service Modeling Definitions

3.1. ServiceType

The following service type identifies a service that is compliant with this template:

urn:schemas-upnp-org:service:[*RemoteUIClient:1*](#).

3.2. State Variables

Table 1: Service State Variables

Variable Name	Req. or Opt. ¹	Data Type	Allowed Value	Default Value ²	Eng. Units
DeviceProfile	R	string	Undefined	Empty string	N/A
CurrentConnections	R	string	Undefined	Empty string	N/A
CurrentConnectionsEvent	O	string	Undefined	Empty string	N/A
CompatibleUIsUpdateIDEvent	O	i4	Undefined	Undefined	N/A
A_ARG_TYPE_String	O	string	Undefined	Empty string	N/A
A_ARG_TYPE_CompatibleUIs	O	string	Undefined	Empty string	N/A
A_ARG_TYPE_DisplayMessageType	O	string	Undefined	Empty string	N/A
A_ARG_TYPE_InputDataType	O	string	Undefined	Empty string	N/A
A_ARG_TYPE_Int	O	i4	Undefined	Undefined	N/A
<i>Non-standard state variables implemented by a UPnP vendor go here.</i>	<i>X</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>

¹ R = Required, O = Optional, X = Non-standard.

² Default values listed in this column are required. To specify standard optional values or to delegate assignment of values to the vendor, you must reference a specific instance of an appropriate table below.

3.2.1. CompatibleUIsUpdateIDEvent

CompatibleUIsUpdateIDEvent is an optional, evented integer state variable used to indicate a change in the state of the *A_ARG_TYPE_CompatibleUIs* listing optionally stored on the client device.

CompatibleUIsUpdateIDEvent is incremented and evented every time a change in *A_ARG_TYPE_CompatibleUIs* occurs. The value rolls over to one once it reaches the maximum value. The maximum value is 2147483647.

3.2.2. CurrentConnections

This required variable is a comma-separated value list representing all current Remote UI client sessions. See 1.3.1 in ISO/IEC 29341-4-12 for detailed definition of comma-separated value list (CSV). The values of