
**Information technology — UPnP
Device Architecture —**

**Part 20-14:
Audio video device control protocol —
Level 4 — Scheduled recording service**

Technologies de l'information — Architecture de dispositif UPnP —

*Partie 20-14: Protocole de contrôle de dispositif audio-vidéo —
Niveau 4 — Service d'enregistrement programmé*

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CONTENTS

1	Scope	1
2	Normative references	2
3	Terms, definitions, symbols and abbreviations	5
3.1	Provisioning terms	5
3.2	Terms specific to ScheduledRecording service	5
3.2.1	CDS	5
3.2.2	EPG	6
3.2.3	SRS	6
3.2.4	CDS object	6
3.2.5	User Channel	6
3.2.6	Channel Group	6
3.2.7	Channel Line-up	6
3.2.8	object	6
3.2.9	class	6
3.2.10	object Modification	6
3.2.11	<u>recordSchedule</u>	6
3.2.12	Conflicting <u>recordSchedule</u>	6
3.2.13	<u>recordTask</u>	7
3.2.14	Conflicting <u>recordTask</u>	7
3.2.15	<u>recordScheduleParts</u>	7
3.2.16	Property-set Data Types	7
3.2.17	Property	7
3.2.18	Member Property	8
3.2.19	Supported Member Property	8
3.2.20	Multi-valued property	8
3.2.21	Single-valued property	8
3.2.22	XML Document	8
3.2.23	XML Fragment	9
3.2.24	actualScheduledStartDateTime	9
3.2.25	actualStartDateTime	9
3.2.26	actualScheduledEndDateTime	9
3.2.27	actualEndDateTime	9
3.2.28	actualScheduledDuration	9
3.2.29	Lexical Sort Order	10
3.2.30	Lexical Matching	10
3.2.31	Simple Non-case-sensitive Sort Order	10
3.2.32	Simple Non-case-sensitive Matching	11
3.2.33	Numeric Sort Order	11
3.2.34	Boolean Sort Order	11
3.2.35	Sequenced Sort	11
3.2.36	Sequenced Lexical Sort	11
3.2.37	Sequenced Numeric Sort	11
3.2.38	Lexical Numeric Sort	11
3.2.39	<u>type</u> Relationship Sort	12
3.3	Symbols	12
4	Notations and Conventions	12

4.1	Notation	12
4.1.1	Data Types	12
4.1.2	Strings Embedded in Other Strings	12
4.1.3	Extended Backus-Naur Form	13
4.2	Derived Data Types	13
4.2.1	Summary	13
4.2.2	CSV Lists	14
4.3	Management of XML Namespaces in Standardized DCPs	15
4.3.1	Namespace Prefix Requirements	19
4.3.2	Namespace Names, Namespace Versioning and Schema Versioning	20
4.3.3	Namespace Usage Examples	22
4.4	Vendor-defined Extensions	22
4.4.1	Vendor-defined Action Names	22
4.4.2	Vendor-defined State Variable Names	23
4.4.3	Vendor-defined XML Elements and attributes	23
4.4.4	Vendor-defined Property Names	23
5	Service Modeling Definitions	23
5.1	ServiceType	23
5.2	ScheduledRecording Service Architecture	23
5.2.1	<u>recordSchedule</u>	23
5.2.2	<u>recordTask</u>	25
5.3	State Variables	26
5.3.1	State Variable Overview	26
5.3.2	<u>SortCapabilities</u>	28
5.3.3	<u>SortLevelCapability</u>	28
5.3.4	<u>StateUpdateID</u>	28
5.3.5	<u>LastChange</u>	29
5.3.6	<u>A ARG TYPE PropertyList</u>	32
5.3.7	<u>A ARG TYPE DataTypeID</u>	32
5.3.8	<u>A ARG TYPE ObjectID</u>	32
5.3.9	<u>A ARG TYPE ObjectIDList</u>	32
5.3.10	<u>A ARG TYPE PropertyInfo</u>	33
5.3.11	<u>A ARG TYPE Index</u>	33
5.3.12	<u>A ARG TYPE Count</u>	33
5.3.13	<u>A ARG TYPE SortCriteria</u>	33
5.3.14	<u>A ARG TYPE RecordSchedule</u>	33
5.3.15	<u>A ARG TYPE RecordTask</u>	34
5.3.16	<u>A ARG TYPE RecordScheduleParts</u>	34
5.4	Eventing and Moderation	35
5.5	Actions	35
5.5.1	Action Overview	35
5.5.2	<u>GetSortCapabilities()</u>	36
5.5.3	<u>GetPropertyList()</u>	37
5.5.4	<u>GetAllowedValues()</u>	38
5.5.5	<u>GetStateUpdateID()</u>	40
5.5.6	<u>BrowseRecordSchedules()</u>	40
5.5.7	<u>BrowseRecordTasks()</u>	45
5.5.8	<u>CreateRecordSchedule()</u>	47

5.5.9	<u>DeleteRecordSchedule()</u>	49
5.5.10	<u>GetRecordSchedule()</u>	50
5.5.11	<u>EnableRecordSchedule()</u>	51
5.5.12	<u>DisableRecordSchedule()</u>	52
5.5.13	<u>DeleteRecordTask()</u>	54
5.5.14	<u>GetRecordTask()</u>	54
5.5.15	<u>EnableRecordTask()</u>	55
5.5.16	<u>DisableRecordTask()</u>	57
5.5.17	<u>ResetRecordTask()</u>	58
5.5.18	<u>GetRecordScheduleConflicts()</u>	59
5.5.19	<u>GetRecordTaskConflicts()</u>	60
5.5.20	Common Error Codes	61
5.6	State Diagram of <u>recordTask</u>	62
5.6.1	A Full-Featured State Diagram	62
5.6.2	A Minimal-Implementation State Diagram	68
5.6.3	<u>recordTask</u> State Example	70
5.7	ScheduledRecording Service Priority Model	71
5.7.1	Introduction of the ScheduledRecording Service Priority Model	71
5.7.2	Ordered Priority within Each Priority Level	72
5.7.3	Setting the Initial Priority Level of a <u>recordSchedule</u>	73
5.7.4	Sorting <u>recordSchedule</u> Instances Based on their Current Priority Settings	75
5.8	Theory of Operation	76
5.8.1	Introduction	76
5.8.2	Checking the Capabilities of a ScheduledRecording Service	76
5.8.3	Adding a Scheduled Recording Entry to the List	88
5.8.4	Deleting a <u>recordSchedule</u>	106
5.8.5	Browsing <u>recordSchedule</u> and <u>recordTask</u> instances	106
5.8.6	Rating System	113
5.8.7	Conflict Detection and Resolution	113
6	XML Service Description	115
7	Test	125
Annex A	(normative) srs XML Document	126
A.1	<u>A_ARG_TYPE_RecordSchedule</u> AVDT XML Document	126
A.2	<u>A_ARG_TYPE_RecordTask</u> AVDT XML Document	127
A.3	<u>A_ARG_TYPE_RecordScheduleParts</u> AVDT XML Document	127
Annex B	(normative) AV Working Committee Extended Properties	129
B.1	Base Properties	129
B.1.1	<u>@id</u>	129
B.1.2	<u>title</u>	130
B.1.3	<u>class</u>	130
B.1.4	<u>additionalStatusInfo</u>	130
B.1.5	<u>cdsReference</u>	131
B.2	Priority Properties	132
B.2.1	<u>priority</u>	132
B.2.2	<u>desiredPriority</u>	133
B.3	Output Control Properties	135
B.3.1	<u>recordDestination</u>	135

B.3.2	<u>desiredRecordQuality</u>	137
B.4	Content Identification Related Properties	140
B.4.1	<u>scheduledCDSObjectID</u>	140
B.4.2	<u>scheduledChannelID</u>	141
B.4.3	<u>scheduledStartDateTime</u>	143
B.4.4	<u>scheduledDuration</u>	144
B.4.5	<u>scheduledProgramCode</u>	144
B.5	Matching Content Criteria Properties	145
B.5.1	<u>matchingName</u>	145
B.5.2	<u>matchingID</u>	146
B.6	Matching Qualifying Criteria Properties	147
B.6.1	<u>matchingChannelID</u>	148
B.6.2	<u>matchingStartDateTimeRange</u>	149
B.6.3	<u>matchingDurationRange</u>	149
B.6.4	<u>matchingRatingLimit</u>	150
B.6.5	<u>matchingEpisodeType</u>	152
B.7	Content Control Properties	153
B.7.1	<u>totalDesiredRecordTasks</u>	153
B.7.2	<u>scheduledStartDateTimeAdjust</u>	154
B.7.3	<u>scheduledDurationAdjust</u>	154
B.7.4	<u>activePeriod</u>	155
B.7.5	<u>durationLimit</u>	155
B.7.6	<u>channelMigration</u>	156
B.7.7	<u>timeMigration</u>	157
B.7.8	<u>allowDuplicates</u>	157
B.8	Storage Related Properties	157
B.8.1	<u>persistedRecordings</u>	158
B.9	Schedule State Properties	159
B.9.1	<u>scheduleState</u>	159
B.9.2	<u>abnormalTasksExist</u>	161
B.10	Statistics Properties	161
B.10.1	<u>currentRecordTaskCount</u>	161
B.10.2	<u>totalCreatedRecordTasks</u>	161
B.10.3	<u>totalCompletedRecordTasks</u>	162
B.11	Task General Properties	162
B.11.1	<u>recordScheduleID</u>	162
B.11.2	<u>recordedCDSObjectID</u>	162
B.12	Task Content Identification Properties	163
B.12.1	<u>taskCDSObjectID</u>	164
B.12.2	<u>taskChannelID</u>	164
B.12.3	<u>taskStartDateTime</u>	165
B.12.4	<u>taskDuration</u>	166
B.12.5	<u>taskProgramCode</u>	166
B.12.6	<u>recordQuality</u>	166
B.13	Task Matched Content Criteria Properties	169
B.13.1	<u>matchedName</u>	169
B.13.2	<u>matchedID</u>	169
B.14	Task Matched Qualifying Criteria Properties	170
B.14.1	<u>matchedRating</u>	170

B.14.1.1	<u>matchedRating@type</u>	170
B.14.1.2	<u>matchedRating@equivalentAge</u>	171
B.14.2	<u>matchedEpisodeType</u>	171
B.15	Task Matched Content Control Properties	171
B.15.1	<u>taskStartDateTimeAdjust</u>	171
B.15.2	<u>taskDurationAdjust</u>	172
B.15.3	<u>taskDurationLimit</u>	172
B.15.3.1	<u>taskDurationLimit@effect</u>	172
B.15.4	<u>taskChannelMigration</u>	173
B.15.5	<u>taskTimeMigration</u>	173
B.16	Task State Properties	173
B.16.1	<u>taskState</u>	174
B.17	ContentDirectory Service Imported Properties	182
Annex C	(normative) AV Working Committee Class Definitions	186
C.1	Class Hierarchy	186
C.1.1	Relationships between Classes and Properties	188
C.1.2	<u>recordScheduleParts</u> Properties	189
C.1.3	<u>recordSchedule</u> Properties	193
C.1.4	<u>recordTask</u> Properties	197
C.2	Class Definitions	199
C.3	<u>object</u> Base Class	200
C.3.1	<u>object.recordSchedule</u> Class	201
C.3.2	<u>object.recordTask</u> Class	211
Annex D	(normative) EBNF Syntax Definitions	213
D.1	Priority Syntax	213
D.2	Date&time Syntax	213
D.3	Class Name Syntax	214
Annex E	(informative) ScheduledRecording Service Relationship to ContentDirectory Service	215
Annex F	(informative) ScheduledRecording Service Relationship to EPG	216
Annex G	(informative) AVDT Examples	217
G.1	<u>A ARG TYPE RecordSchedule</u> AVDT Example	217
G.2	<u>A ARG TYPE RecordTask</u> AVDT Example	234
G.3	<u>A ARG TYPE RecordScheduleParts</u> AVDT Example	253
Annex H	(informative) Bibliography	269

List of Tables

Table 1 — Properties in XML.....	8
Table 2 — EBNF Operators.....	13
Table 3 — CSV Examples	15
Table 4 — Namespace Definitions.....	16
Table 5 — Schema-related Information.....	18
Table 6 — Default Namespaces for the AV Specifications	20
Table 7 — State Variables	26
Table 8 — Allowed values for the <u>DataTypeID</u> argument.....	28
Table 9 — Allowed Elements in <StateEvent> Element	29
Table 10 — Eventing and Moderation	35
Table 11 — Actions.....	35
Table 12 — Arguments for <u>GetSortCapabilities()</u>	36
Table 13 — Error Codes for <u>GetSortCapabilities()</u>	37
Table 14 — Arguments for <u>GetPropertyList()</u>	37
Table 15 — Error Codes for <u>GetPropertyList()</u>	38
Table 16 — Arguments for <u>GetAllowedValues()</u>	38
Table 17 — Error Codes for <u>GetAllowedValues()</u>	39
Table 18 — Arguments for <u>GetStateUpdateID()</u>	40
Table 19 — Error Codes for <u>GetStateUpdateID()</u>	40
Table 20 — Arguments for <u>BrowseRecordSchedules()</u>	40
Table 21 — Error Codes for <u>BrowseRecordSchedules()</u>	45
Table 22 — Arguments for <u>BrowseRecordTasks()</u>	45
Table 23 — Error Codes for <u>BrowseRecordTasks()</u>	47
Table 24 — Arguments for <u>CreateRecordSchedule()</u>	47
Table 25 — Error Codes for <u>CreateRecordSchedule()</u>	49
Table 26 — Arguments for <u>DeleteRecordSchedule()</u>	50
Table 27 — Error Codes for <u>DeleteRecordSchedule()</u>	50
Table 28 — Arguments for <u>GetRecordSchedule()</u>	50
Table 29 — Error Codes for <u>GetRecordSchedule()</u>	51
Table 30 — Arguments for <u>EnableRecordSchedule()</u>	52
Table 31 — Error Codes for <u>EnableRecordSchedule()</u>	52
Table 32 — Arguments for <u>DisableRecordSchedule()</u>	53
Table 33 — Error Codes for <u>DisableRecordSchedule()</u>	53
Table 34 — Arguments for <u>DeleteRecordTask()</u>	54
Table 35 — Error Codes for <u>DeleteRecordTask()</u>	54
Table 36 — Arguments for <u>GetRecordTask()</u>	55
Table 37 — Error Codes for <u>GetRecordTask()</u>	55
Table 38 — Arguments for <u>EnableRecordTask()</u>	56
Table 39 — Error Codes for <u>EnableRecordTask()</u>	56
Table 40 — Arguments for <u>DisableRecordTask()</u>	57
Table 41 — Error Codes for <u>DisableRecordTask()</u>	58

Table 42 — Arguments for <u>ResetRecordTask()</u>	58
Table 43 — Error Codes for <u>ResetRecordTask()</u>	59
Table 44 — Arguments for <u>GetRecordScheduleConflicts()</u>	59
Table 45 — Error Codes for <u>GetRecordScheduleConflicts()</u>	60
Table 46 — Arguments for <u>GetRecordTaskConflicts()</u>	60
Table 47 — Error Codes for <u>GetRecordTaskConflicts()</u>	61
Table 48 — Common Error Codes	61
Table 49 — <u>recordTask</u> State Timeline	71
Table 50 — Example 1: Fewer <u>recordSchedule</u> instances than the Number of Supported Priority Levels	72
Table 51 — Example 2: More <u>recordSchedule</u> instances than the Number of Supported Priority Levels	73
Table 52 — Existing <u>recordSchedule</u> Priorities	74
Table 53 — <u>desiredPriority</u> Property Set to “RS-C”	74
Table 54 — <u>desiredPriority</u> Property Set to “HIGHEST”, “L1 HI”, or “RS-A”	75
Table 55 — <u>desiredPriority</u> Property Set to “LOWEST”, “L3 LOW”, or “RS-B”	75
Table 56 — <u>desiredPriority</u> Property Set to “RS-C”	75
Table B.1 — Base Properties Overview	129
Table B.2 — Allowed values for the <u>class</u> Property	130
Table B.3 — Priority Properties	132
Table B.4 — Allowed values for the <u>priority</u> Property	132
Table B.5 — Primary allowed values for the <u>desiredPriority</u> Property	133
Table B.6 — Additional allowed values for the <u>desiredPriority</u> Property	134
Table B.7 — Allowed values for the <u>desiredPriority@type</u> Property	135
Table B.8 — Output Control Properties	135
Table B.9 — <u>desiredRecordQuality</u> Example	138
Table B.10 — Allowed values for the <u>desiredRecordQuality</u> Property	139
Table B.11 — Allowed values for the <u>desiredRecordQuality@type</u> Property	140
Table B.12 — Content Identification Related Properties	140
Table B.13 — Allowed values for the <u>scheduledChannelID@type</u> Property	142
Table B.14 — Matching Content Criteria Properties	145
Table B.15 — Allowed values for the <u>matchingName@type</u> Property	146
Table B.16 — Allowed values for the <u>matchingID@type</u> Property	147
Table B.17 — Matching Qualifying Criteria Properties	147
Table B.18 — Allowed values for the <u>matchingRatingLimit</u> Property Using the MPAA Rating System (<u>matchingRatingLimit@type</u> = “MPAA.ORG”)	150
Table B.19 — Allowed values for the <u>matchingRatingLimit</u> Property Using the RIAA Rating System (<u>matchingRatingLimit@type</u> = “RIAA.ORG”)	150
Table B.20 — Allowed values for the <u>matchingRatingLimit</u> Property Using the ESRB Rating System (<u>matchingRatingLimit@type</u> = “ESRB.ORG”)	151
Table B.21 — Allowed values for the <u>matchingRatingLimit</u> Property Using the TVGUIDELINES Rating System (<u>matchingRatingLimit@type</u> = “TVGUIDELINES.ORG”)	151
Table B.22 — Allowed values for the <u>matchingRatingLimit@type</u> Property	152
Table B.23 — Allowed values for the <u>matchingEpisodeType</u> Property	153
Table B.24 — Content Control Properties	153

ISO/IEC 29341-20-14:2017(E)

Table B.25 — Allowed values for the durationLimit@effect Property	156
Table B.26 — Storage Related Properties	157
Table B.27 — Schedule State Properties	159
Table B.28 — Allowed values for the scheduleState Property	160
Table B.29 — Allowed values for the scheduleState@currentErrors Property	160
Table B.30 — Statistics Properties	161
Table B.31 — Task General Properties	162
Table B.32 — Task Content Identification Properties	163
Table B.33 — recordQuality Example	167
Table B.34 — Allowed values for the recordQuality Property	168
Table B.35 — Task Matched Content Criteria Properties	169
Table B.36 — Task Matched Qualifying Criteria Properties	170
Table B.37 — Task Matched Content Control Properties	171
Table B.38 — State Related Properties	173
Table B.39 — Allowed values for the attributes of the taskState Property	174
Table B.40 — Allowed values for the taskState Property	175
Table B.41 — Allowed values for the taskState@phase Property	176
Table B.42 — Allowed values for the taskState@xxx Properties	179
Table C.1 — Class Properties Overview for recordScheduleParts usage	189
Table C.2 — Class Properties Overview for recordSchedule usage	193
Table C.3 — Class Properties Overview for recordTask usage	197
Table C.4 — object Base Class Properties	200
Table C.5 — object.recordSchedule Base Class Properties	201
Table C.6 — object.recordSchedule.direct Class Properties	202
Table C.7 — object.recordSchedule.direct.manual Class Properties	203
Table C.8 — object.recordSchedule.direct.cdsEPG Class Properties	204
Table C.9 — object.recordSchedule.direct.cdsNonEPG Class Properties	206
Table C.10 — object.recordSchedule.direct.programCode Class Properties	207
Table C.11 — object.recordSchedule.query Class Properties	208
Table C.12 — object.recordSchedule.query.contentName Class Properties	209
Table C.13 — object.recordSchedule.query.contentID Class Properties	210
Table C.14 — object.recordTask Base Class Properties	212

List of Figures

Figure 1 — Creating a new recordSchedule	24
Figure 2 — Capability check	25
Figure 3 — Browse recordSchedule	25
Figure 4 — Delete a recordSchedule	25
Figure 5 — A Full-Featured State Diagram	63
Figure 6 — A Minimal-Implementation State Diagram	69
Figure C.1 — Class hierarchy for the ScheduledRecording service.	187

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>).

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For an explanation on the voluntary nature of Standard, 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](#)

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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](#).

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Original UPnP Document

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 and later by UPnP Forum. 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 29341-1:2008
UPnP Device Architecture Version 1.0	ISO/IEC 29341-1:2011
UPnP Device Architecture 1.1	ISO/IEC 29341-1-1:2011
UPnP Device Architecture 2.0	ISO/IEC 29341-1-2
UPnP Basic:1 Device	ISO/IEC 29341-2
UPnP AV Architecture:1	ISO/IEC 29341-3-1:2008
UPnP AV Architecture:1	ISO/IEC 29341-3-1:2011
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:1 Device	ISO/IEC 29341-3-2
UPnP MediaRenderer:2 Device	ISO/IEC 29341-3-2:2011
UPnP MediaServer:1 Device	ISO/IEC 29341-3-3
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10:2008
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10:2011
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11:2008
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11:2011
UPnP ContentDirectory:2 Service	ISO/IEC 29341-4-12
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13:2008
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13:2011
UPnP ScheduledRecording:1	ISO/IEC 29341-4-14
UPnP ScheduledRecording:2	ISO/IEC 29341-4-14:2011
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 29341-4-4:2008
UPnP AV Datastructure Template:1	ISO/IEC 29341-4-4:2011
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 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 HVAC_ZoneThermostat:1 Device	ISO/IEC 29341-6-2

UPnP BinaryLight:1 Device	ISO/IEC 29341-7-1
UPnP Dimming:1 Service	ISO/IEC 29341-7-10
UPnP SwitchPower:1 Service	ISO/IEC 29341-7-11
UPnP DimmableLight:1 Device	ISO/IEC 29341-7-2
UPnP InternetGatewayDevice:1 Device	ISO/IEC 29341-8-1
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 LANDevice:1 Device	ISO/IEC 29341-8-2
UPnP WANPPPConnection:1 Service	ISO/IEC 29341-8-20
UPnP WLANConfiguration:1 Service	ISO/IEC 29341-8-21
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 Printer:1 Device	ISO/IEC 29341-9-1
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 Scanner:1.0 Device	ISO/IEC 29341-9-2
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 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 QOS v2 Schema Files	ISO/IEC 29341-11-2
UPnP RemoteUIClientDevice:1 Device	ISO/IEC 29341-12-1
UPnP RemoteUIClient:1 Service	ISO/IEC 29341-12-10
UPnP RemoteUIServer:1 Service	ISO/IEC 29341-12-11
UPnP RemoteUIServerDevice:1 Device	ISO/IEC 29341-12-2
UPnP DeviceSecurity:1 Service	ISO/IEC 29341-13-10
UPnP SecurityConsole:1 Service	ISO/IEC 29341-13-11
UPnP ContentDirectory:3 Service	ISO/IEC 29341-14-12:2011
UPnP MediaServer:3 Device	ISO/IEC 29341-14-3:2011
UPnP ContentSync:1	ISO/IEC 29341-15-10:2011
UPnP Low Power Architecture:1	ISO/IEC 29341-16-1:2011
UPnP LowPowerProxy:1 Service	ISO/IEC 29341-16-10:2011

ISO/IEC 29341-20-14:2017(E)

UPnP LowPowerDevice:1 Service	ISO/IEC 29341-16-11:2011
UPnP QoS Architecture:3	ISO/IEC 29341-17-1:2011
UPnP QoSDevice:3 Service	ISO/IEC 29341-17-10:2011
UPnP QoSManager:3 Service	ISO/IEC 29341-17-11:2011
UPnP QoSPolicyHolder:3 Service	ISO/IEC 29341-17-12:2011
UPnP QoSDevice:3 Addendum	ISO/IEC 29341-17-13:2011
UPnP RemoteAccessArchitecture:1	ISO/IEC 29341-18-1:2011
UPnP InboundConnectionConfig:1 Service	ISO/IEC 29341-18-10:2011
UPnP RADAConfig:1 Service	ISO/IEC 29341-18-11:2011
UPnP RADASync:1 Service	ISO/IEC 29341-18-12:2011
UPnP RATAConfig:1 Service	ISO/IEC 29341-18-13:2011
UPnP RAClient:1 Device	ISO/IEC 29341-18-2:2011
UPnP RAServer:1 Device	ISO/IEC 29341-18-3:2011
UPnP RADiscoveryAgent:1 Device	ISO/IEC 29341-18-4:2011
UPnP SolarProtectionBlind:1 Device	ISO/IEC 29341-19-1:2011
UPnP TwoWayMotionMotor:1 Service	ISO/IEC 29341-19-10:2011
UPnP AV Architecture:2	ISO/IEC 29341-20-1
UPnP AVTransport:3 Service	ISO/IEC 29341-20-10
UPnP ConnectionManager:3 Service	ISO/IEC 29341-20-11
UPnP ContentDirectory:4 Device	ISO/IEC 29341-20-12
UPnP RenderingControl:3 Service	ISO/IEC 29341-20-13
UPnP ScheduledRecording:2 Service	ISO/IEC 29341-20-14
UPnP MediaRenderer:3 Service	ISO/IEC 29341-20-2
UPnP MediaServer:4 Device	ISO/IEC 29341-20-3
UPnP AV Datastructure Template:1	ISO/IEC 29341-20-4
UPnP InternetGatewayDevice:2 Device	ISO/IEC 29341-24-1
UPnP WANIPConnection:2 Service	ISO/IEC 29341-24-10
UPnP WANIPv6FirewallControl:1 Service	ISO/IEC 29341-24-11
UPnP WANConnectionDevice:2 Service	ISO/IEC 29341-24-2
UPnP WANDevice:2 Device	ISO/IEC 29341-24-3
UPnP Telephony Architecture:2	ISO/IEC 29341-26-1
UPnP CallManagement:2 Service	ISO/IEC 29341-26-10
UPnP MediaManagement:2 Service	ISO/IEC 29341-26-11
UPnP Messaging:2 Service	ISO/IEC 29341-26-12
UPnP PhoneManagement:2 Service	ISO/IEC 29341-26-13
UPnP AddressBook:1 Service	ISO/IEC 29341-26-14
UPnP Calendar:1 Service	ISO/IEC 29341-26-15
UPnP Presense:1 Service	ISO/IEC 29341-26-16
UPnP TelephonyClient:2 Device	ISO/IEC 29341-26-2
UPnP TelephonyServer:2 Device	ISO/IEC 29341-26-3
UPnP Friendly Info Update:1 Service	ISO/IEC 29341-27-1
UPnP MultiScreen MultiScreen Architecture:1	ISO/IEC 29341-28-1
UPnP MultiScreen Application Management:1 Service	ISO/IEC 29341-28-10
UPnP MultiScreen Screen:1 Device	ISO/IEC 29341-28-2
UPnP MultiScreen Application Management:2 Service	ISO/IEC 29341-29-10
UPnP MultiScreen Screen:2 Device	ISO/IEC 29341-29-2
UPnP IoT Management and Control Architecture Overview:1	ISO/IEC 29341-30-1

ISO/IEC 29341-20-14:2017(E)

UPnP DataStore:1 Service	ISO/IEC 29341-30-10
UPnP IoT Management and Control Data Model:1 Service	ISO/IEC 29341-30-11
UPnP IoT Management and Control Transport Generic:1 Service	ISO/IEC 29341-30-12
UPnP IoT Management and Control:1 Device	ISO/IEC 29341-30-2
UPnP Energy Management:1 Service	ISO/IEC 29341-31-1

1 Scope

This service definition is compliant with the UPnP Device Architecture version 1.0 [14]. It defines a service type referred to herein as ScheduledRecording service.

The ScheduledRecording service is a UPnP service that allows control points to schedule the recording of content. Generally, this content is broadcast content, but this specification does not limit itself to broadcast content. This service type enables the following functions:

- Create a recordSchedule so that it is added to the list of recordSchedule instances. Each recordSchedule describes user-level recording instructions for the ScheduledRecording service.
- Browse a list of recordSchedule instances stored by the ScheduledRecording service.
- Delete a recordSchedule so that it is removed from the list of recordSchedule instances.
- Browse a list of recordTask instances, stored by the ScheduledRecording service. The ScheduledRecording service may create zero or more recordTask instances for each recordSchedule. A recordTask represents a discrete recording operation of a recordSchedule.
- Enable or disable individual recordTask instances.
- Enable or disable a recordSchedule.
- Receive notifications indicating change of recordSchedule or recordTask list.

The ScheduledRecording service does not require a dependency on any UPnP services other than a co-located ContentDirectory service, which provides the following functions:

- A ContentDirectory service provides channel line-up to allow users to find recordable channels. A control point may use this metadata when creating a recordSchedule on a ScheduledRecording service.
- A ContentDirectory service may provide Electronic Program Guide (EPG) features to allow users to find recordable content. A control point may use this metadata when creating a recordSchedule on a ScheduledRecording service.
- Contents recorded by the ScheduledRecording service may be exposed by a ContentDirectory service.

The architectural relationship among the different concepts, defined by the ScheduledRecording service can be summarized as follows: A ScheduledRecording service owns a flat (that is: non-nested) list of recordSchedule instances, meaning that the ScheduledRecording service may create, destroy, or change recordSchedule instances. A recordSchedule represents user-level instructions to perform recording operations. Generally, a user constructs his instructions to a ScheduledRecording service via a control point that invokes UPnP actions that affect the list of recordSchedule instances. In all cases, the ScheduledRecording service shall be able to describe discrete recording operations for a recordSchedule through a list of associated recordTask instances. A recordTask can only exist with a recordSchedule (that is: never orphaned). Thus when a recordTask is created by the ScheduledRecording service, its lifetime depends on its parent recordSchedule. An individual recordTask can be selectively enabled or disabled.

This service template does not address:

- Implementations where the ScheduledRecording service and its associated ContentDirectory service are not co-located in the same device.

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.

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Latest version available

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Latest version available at: <http://www.upnp.org/specs/av/UPnP-av-AVDataStructureTemplate-v1.pdf>.

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[8] – *XML Schema for ContentDirectory LastChange Eventing*, UPnP Forum, September 30, 2008.

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3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms and definitions given in [14] and the following apply.

3.1 Provisioning terms

3.1.1 allowed

A
The definition or behavior is allowed.

3.1.2 conditionally allowed

CA
The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is allowed, otherwise it is not allowed.

3.1.3 conditionally required

CR
The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is required. Otherwise the definition or behavior is allowed as default unless specifically defined as not allowed.

3.1.4 required

R
The definition or behavior is required.

3.1.5 R/A

Used in a table column heading to indicate that each abbreviated entry in the column declares the provisioning status of the item named in the entry's row.

3.1.6 X

Vendor-defined, non-standard.

3.1.7 -D

Declares that the item referred to is deprecated, when it is appended to any of the other abbreviated provisioning terms.

3.1.8 CSV list (or CSV)

Comma separated value list. List—or one-dimensional array—of values contained in a string and separated by commas

3.2 Terms specific to ScheduledRecording service

3.2.1 CDS

ContentDirectory service