



**PUCC Metadata Specification -
Home Appliance Part 2 UPnP Devices
(Version 2.0 - March 31, 2009)**

Peer-to-Peer Universal Computing Consortium (PUCC)

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1. Introduction

This document is a template for Technical documents.

This document defines the PUCC metadata specification for the devices which have a UPnP interface.

The specification targets the devices of the following categories, in which UPnP-certified products (*) exist.

※ The products listed on <http://www.upnp-ic.org/certification/default.asp>

- (1) Media Server Devices
- (2) Media Renderer Devices

2. Terminology

2.1. Definitions

The following terms are defined in the PUCC Device Discovery and Service Invocation Protocol Specification.

- Service;
- Device;

The template for devices and services are defined by the "PUCC Device and Service Metadata Template".

2.2. Abbreviations

PUCC Peer-to-Peer Universal Computing Consortium

3. Reference

[PUCC] “Peer-to-Peer Universal Computing Consortium”,

URL: <http://www.pucc.jp/>

[XML] “Extensible Markup Language (XML) 1.0 (Second Edition)”, W3C Recommendation 6 October 2000, T.

Bray et al. URL: <http://www.w3.org/TR/2000/REC-xml-20001006>

[HTTP] “Hypertext Transfer Protocol -- HTTP/1.1”, RFC2616, R. Fielding et al., June 1999.

URL:<http://www.ietf.org/rfc/rfc2616.txt>

[TCP] “Transmission Control Protocol” RFC793, J. Postel. September 1981.

URL: <http://www.ietf.org/rfc/rfc793.txt>

[UDP] “User Datagram Protocol”, RFC768, J. Postel. August 28 1980.

URL: <http://www.ietf.org/rfc/rfc768.txt>

[IP] “Internet Protocol” RFC791, J. Postel. September 1981.

URL: <http://www.ietf.org/rfc/rfc791.txt>

[URI] “Universal Resource Identifier”

URL: <http://www.w3.org/Addressing/>

[UPnP] “Universal Plug and Play”

URL: <http://www.upnp.org/resources/upnpresources.zip>

4. Goal and Requirements

4.1. Goal

The goal of this document is:

- ◆ To define the PUCC metadata for the devices which have an UPnP-compliant interface
- ◆

4.2. Requirements

1. Clearness

Technical documents should be easy to understand.

2. Accuracy

Technical specifications should be defined precisely.

3. Language

Technical specifications must be in English

5. Summary

The metadata of devices with a UPnP interface is created by mapping the UPnP metadata model into the PUCC metadata model. The following are the differences between those two models and the specification for the mapping of the UPnP metadata into the PUCC metadata.

5.1. UPnP Device Architecture 1.0 Model

- UPnP devices consist of multiple devices or services. The UPnP device architecture model allows a multiple layers of UPnP devices to form a nested structure.
 (E.g.) A video cassette recorder device consists of the tape feed service, the tuner service and the clock service.
- A UPnP service is the minimum unit of a function. A service has state variables, each of which indicates the status of a device, and actions which correspond to the services.
 (E.g.) The clock service has a state variable called the time as well as the actions of setting the time (`set_time`) and of checking the time (`get_time`).

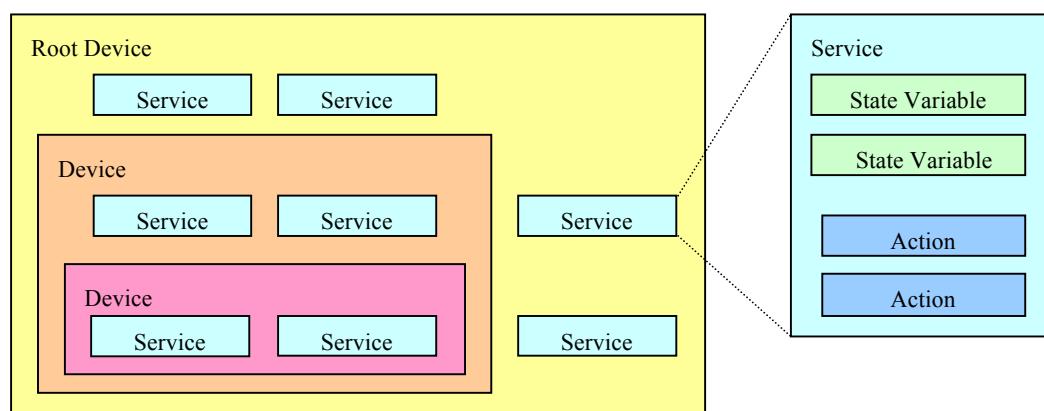


Figure 5.1-1 A device and service model of UPnP Device Architecture 1.0

- A device on a UPnP network can be divided into what controls (the Control Point) and what is controlled (the Device).

5.2. PUCC Device Search/Service Execution Architecture Model

- A PUCC device consists of a multiple of primitive devices, services and state variables, exclusive of the device itself.
 (E.g.) A D-VHS device has the power control service, the power status inquiry service and the state variable to indicate the power status.
- A PUCC primitive device consists of a multiple of services and state variables, exclusive of the primitive device itself.

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(E.g.) The video cassette recorder primitive device has the Play service, the Record service, the FastForward service, the Rewind service, the Stop service, the Pause service, the GetStatus service and the state variable to indicate the tape running status.

- A PUCC service is an equivalent of an action, but it does not have any state variables. Service parameters can be correlated with state variables of devices and primitive devices.

(E.g.) Both of the services to set the time (setTime) and to check the time (getTime) are services.

- There is a concept of composite service, which encompasses multiple devices. A composite service does not have to be coordinated by a device or a primitive device.

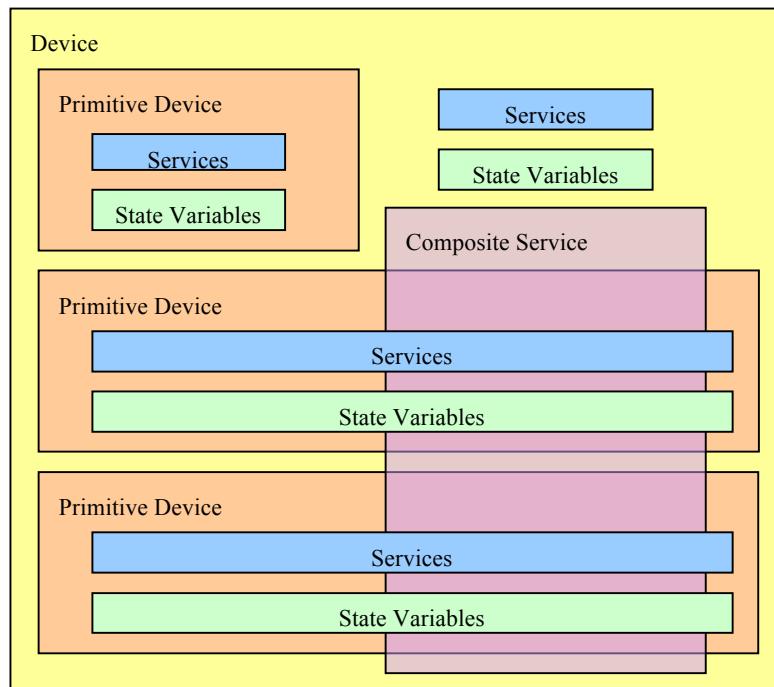


Figure 5.2-1.A device and service model of PUCC device search/service execution architecture

- A device on a PUCC network does not clearly differentiate what controls (the Control Point) and what is controlled (the Device) due to its peer-to-peer nature.

UPnP-PUCC Metadata Specification - Home Appliance Part 2 UPnP Devices

UPnP-PUCC Metadata Mapping Specification

- Figure 5.3-1 shows an image of mapping from the UPnP metadata to the PUCC metadata.

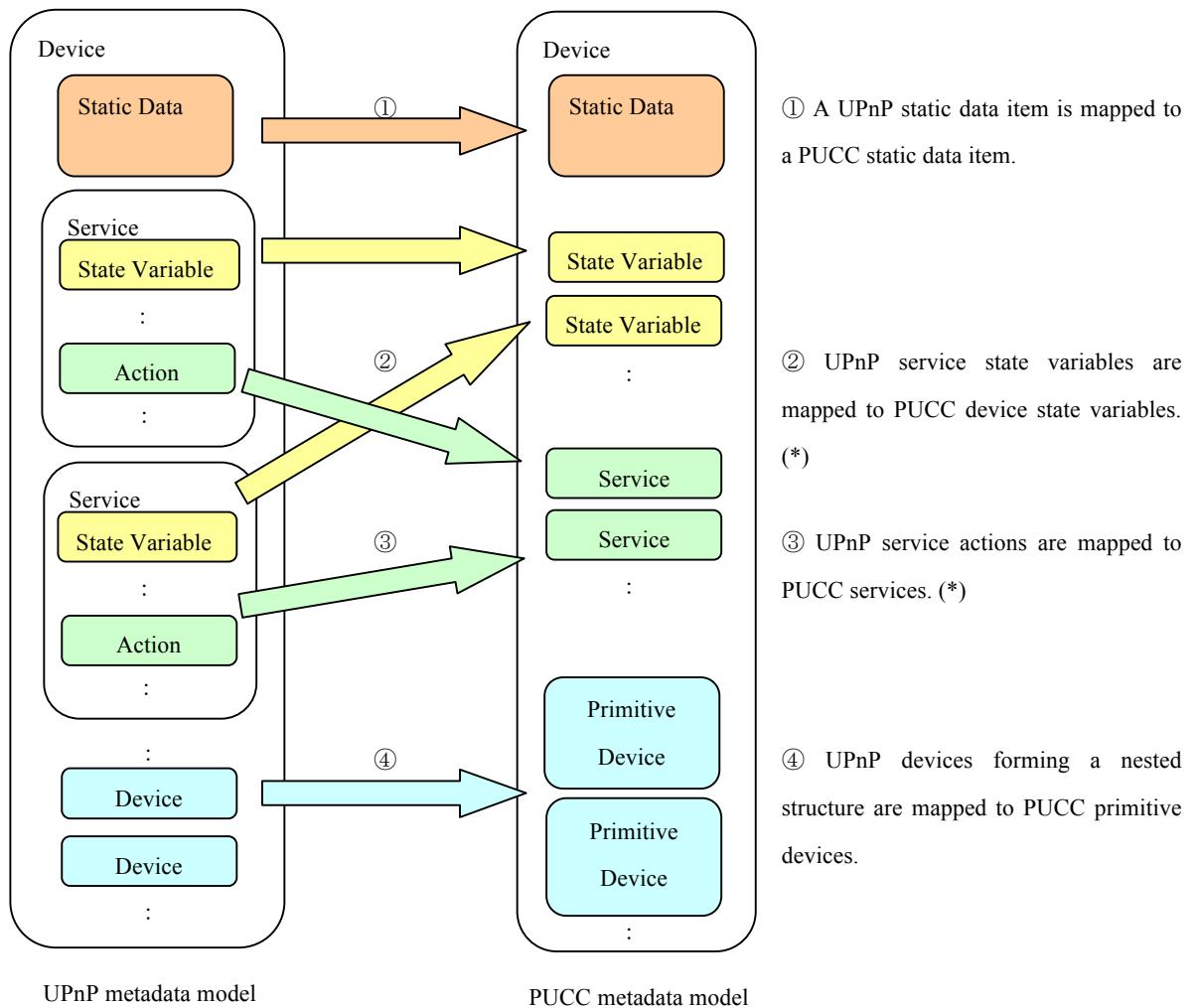


Figure 5.3-1 An image of mapping from the UPnP metadata to the PUCC metadata.

6. Media Server Devices

This chapter defines the PUCC metadata specification for media server devices.

6.1. Device Model

Media server devices adopt the device model shown below.

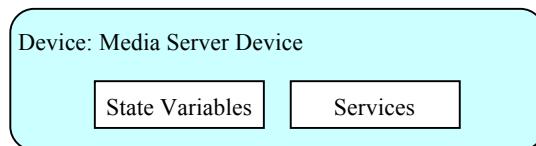


Figure 6.1-1 Media server device model

6.2. Device Type

The device type identifier of media server devices is shown below.

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer>

6.3. State Variables

The state variables of media server devices are shown below.

Table 6.3-1 Media server device state variables

	State Variable Name	Description	Data Type	Event Generation (Yes/No)
1	TransferIDs	<p>TransferIDs is a CSV list of type A_ARG_TYPE_TransferID. It is evented to notify clients when file transfers initiated by ImportResource or ExportResource started or finished. When a file transfer starts, its transfer id is added to the TransferIDs list. When the transfer ends, its id is removed from TransferIDs.</p> <p>This state variable is used for eventing only.</p>	string	Yes
2	A_ARG_TYPE_ObjectID	This variable is used in conjunction with those actions that include an ObjectId parameter. ObjectId parameters uniquely identify individual objects within the Content Directory Service.	string	No
3	A_ARG_TYPE_Result	<p>This variable is used in conjunction with those actions that include a Result parameter. The structure of the result is a DIDL-Lite XML fragment:</p> <ul style="list-style-type: none"> •Optional XML header e.g. <?xml version="1.0" ?> •<DIDL-Lite>is the root tag. •<container>is the tag representing container objects. •<item>is the tag representing item objects. •Tags in the Dublin Core (dc) and UPnP (upnp) namespaces represent object metadata. 	string	No
4	A_ARG_TYPE_SearchCriteria	A_ARG_TYPE_SearchCriteria is the related state variable for the SearchCriteria parameter used in search actions. The SearchCriteria parameter gives one or more search criteria to be used for querying the Content Directory.	string	No
5	A_ARG_TYPE_BrowseFlag	This variable is used in conjunction with the browse actions. A BrowseFlag parameter specifies a browse option to be used for browsing the Content Directory.	string	No
6	A_ARG_TYPE_Filter	This variable is used in conjunction with those actions that include a Filter parameter. The comma-separated list of property specifiers (including namespaces) indicates which metadata properties are to be returned in the results from browsing or searching.	string	No

7	A_ARG_TYPE_SortCriteria	This variable is used in conjunction with those actions that include a SortCriteria parameter. A_ARG_TYPE_SortCriteria is CSV list of signed property names, where signed means preceded by '+' or '-' sign. The '+' and '-' indicate the sort is in ascending or descending order, respectively, with regard to the value of its associated property. Properties appear in the list in order of descending sort priority.	string	No
8	A_ARG_TYPE_Index	This variable is used in conjunction with those actions that include an Index parameter. Index parameters specify an offset into an arbitrary list of objects. A value of 0 represents the first object in the list.	unsignedInt	No
9	A_ARG_TYPE_Count	This variable is used in conjunction with those actions that include a Count parameter. Count parameters specify an ordinal number of arbitrary objects.	unsignedInt	No
10	A_ARG_TYPE_UpdateID	This variable is used in conjunction with any action that includes an UpdateID parameter. A_ARG_TYPE_UpdateID is the related state variable for the return parameter UpdateID used in Browse() and Search() actions. The return value will either be the SystemUpdateID or a ContainerUpdateID.	unsignedInt	No
11	A_ARG_TYPE_TransferID	This variable is used in conjunction with those actions that include a TransferID parameter. TransferID parameters uniquely identify individual file transfers initiated by the ImportResource() or the ExportResource() action of the Content Directory Service. TransferID is a unique value assigned by the device.	unsignedInt	No
12	A_ARG_TYPE_TransferStatus	This variable is used in conjunction with those actions that include a TransferStatus parameter. This variable may assume one of the enumerated values: IN_PROGRESS, STOPPED, ERROR, or COMPLETED, indicating the status of a file transfer.	string	No
13	A_ARG_TYPE_TransferLength	This variable is used in conjunction with those actions that include a TransferLength parameter. It has the string type of data representing a numerical value that may exceed 32 bits in size.	string	No
14	A_ARG_TYPE_TransferTotal	This variable is used in conjunction with those actions that include a TransferTotal parameter. It has the string type of data representing a numerical value that may exceed 32 bits in size.	string	No
15	A_ARG_TYPE_TagValueList	A_ARG_TYPE_TagValueList is a CSV list of pairs of XML fragments. Each fragment is either an empty placeholder or a well-formed XML element. Note that commas (',') that appear within XML CDATA in the fragments must be escaped (as \$\,).	string	No

16	A_ARG_TYPE_URI	This variable is used in conjunction with any action that includes a URI parameter. A_ARG_TYPE_URI variables utilized as IN or OUT parameters in CDS actions must be properly escaped URIs as described in [RFC 2396].	anyURI	No
17	SearchCapabilities	SearchCapabilities is a CSV list of property names that can be used in search queries. An empty string indicates that the CDS does not support any kind of searching. A wildcard ('*') indicates that the device supports search queries using all tags present in the CDS.	string	No
18	SortCapabilities	SortCapabilities is a CSV list of tags that the CDS can use to sort Search() or Browse() results. An empty string indicates that the device does not support any kind of sorting. A wildcard ('*') indicates that the device supports sorting using all tags present in the Content Directory.	string	No
19	SystemUpdateID	This required variable changes whenever anything in the Content Directory changes. A change could be a new or removed object, or a change in the metadata of an object. This variable is evented and the event is moderated at a maximum rate of 0.5 Hz. The actual value of SystemUpdateID is unspecified. Clients should only check for equality with previous values of SystemUpdateID.	unsignedInt	Yes
20	ContainerUpdateIDs	This optional state variable is an unordered CSV list of ordered pairs. Each pair consists of a ContainerID and a ContainerUpdateID, in that order. There can be at most one occurrence in ContainerUpdateIDs of an ordered pair with any specific ContainerID. The initial value of ContainerUpdateIDs is the empty string.	string	Yes
21	SourceProtocolInfo	This variable contains a comma-separated list of information protocols this ConnectionManager supports for sending data, in its current state. Besides the traditional notion of the term ‘protocol’, the protocol-related information provided by the connection also contains other information such as supported content formats.	string	Yes
22	SinkProtocolInfo	This variable contains a comma-separated list of information protocols this ConnectionManager supports for “sinking” (receiving) data, in its current state. The format and allowed value list are the same as for the SourceProtocolInfo state variable.	string	Yes
23	CurrentConnectionIDs	Comma-separated list of references to current active Connections. This list may change without explicit actions invoked by Control points, for example, by out-of-band cleanup or termination of finished connections.	string	Yes

24	A_ARG_TYPE_ConnectionStatus	The current status of the Connection referred to by variable A_ARG_TYPE_ConnectionID. This status may change dynamically due to changes in the network.	string	No
25	A_ARG_TYPE_ConnectionManager	This state variable is introduced to provide type information for the “PeerConnectionManager” parameter in actions PrepareForConnection and GetCurrentConnectionInfo. A ConnectionManager reference takes the form of a UDN/Service-Id pair (the slash is the delimiter). A control point can use UPnP discovery (SSDP) to obtain a ConnectionManager’s description document from the UDN. Subsequently, the ConnectionManager’s service description can be obtained by using the serviceId part of the reference.	string	No
26	A_ARG_TYPE_Direction	This state variable is introduced to provide type information for the “Direction” parameter in action PrepareForConnection.	string	No
27	A_ARG_TYPE_ProtocolInfo	This state variable is introduced to provide type information for the “Protocol” parameter in actions PrepareForConnection and GetCurrentConnectionInfo.	string	No
28	A_ARG_TYPE_ConnectionID	This state variable is introduced to provide type information for the “ConnectionID” parameter in actions: PrepareForConnection, ConnectionComplete and GetCurrentConnectionInfo.	integer	No
29	A_ARG_TYPE_AVTransportID	This state variable is introduced to provide type information for the “AVTransportID” parameter in actions: PrepareForConnection and GetCurrentConnectionInfo. It identifies a logical instance of the AVTransport service associated with a Connection.	integer	No
30	A_ARG_TYPE_RcsID	This state variable is introduced to provide type information for the “RcsID” parameter in actions: PrepareForConnection and GetCurrentConnectionInfo. It identifies a logical instance of the Rendering Control service associated with a Connection.	integer	No
31	TransportState	This state variable forms the ‘core’ of the AVTransport service. It defines the conceptually ‘top-level’ state of the transport, e.g., whether it is playing, recording, etc. Device vendors do not need to implement all allowed values of this variable, e.g., No-recordable media will not implement the RECORDING state.	string	No
32	TransportStatus	The TransportState after an error has occurred is implementation-dependent; some implementations may go to “STOPPED” while other implementations may be able to continue playing after an error. The time at which this state variable returns to “OK” after an error situation is also implementation dependent.	string	No

33	Playback StorageMedium	Indicates the storage medium of the resource specified by AVTransportURI.	string	No
34	Record StorageMedium	Indicates the storage medium where the resource specified by AVTransportURI will be recorded when a Record action is issued. If no resource is specified, then the state variable is set to "NOE". Device vendors may extend the allowed value list of this variable.	string	No
35	PossiblePlayback StorageMedia	Contains a static, comma-separated list of storage media that the device can play. Recommended values are defined in the allowed value list for variable PlaybackStorageMedium.	string	No
36	PossibleRecord StorageMedia	Contains a static, comma-separated list of storage media onto which the device can record. Recommended values are defined in the allowed value list for variable RecordStorageMedium. If the service implementation doesn't support recording then this state variable must be set to value "NOT_IMPLEMENTED".	string	No
37	CurrentPlayMode	Indicates the current play mode. This notion is typical for CD-based audio media, but is generally not supported by tape-based media.	string	No
38	TransportPlaySpeed	String representation of a rational fraction, indicates the speed relative to normal speed. Example values are '1', '1/2', '2', '-1', '1/10', etc. Actually supported speeds can be retrieved from the AllowedValueList of this state variable in the AVTransport service description. Value '1' is required, value '0' is not allowed.	string	No
39	RecordMedium WriteStatus	Write protection status of currently loaded media.	string	No
40	CurrentRecord QualityMode	Indicates the currently set record quality mode. Such a setting takes the form of "Quality Ordinal:label". The Quality Ordinal indicates a particular relative quality level available in the device, from 0 (lowest quality) to n (highest quality). The label associated with the ordinal provides a human-readable indication of the ordinal's meaning.	string	No
41	PossibleRecord QualityModes	Contains a static, comma-separated list of recording quality modes that the device supports. For example, for an analog VHS recorder, the string would be "0:EP,1:LP,2:SP", while for a PVR the string would be "0:BASIC,1:MEDIUM,2:HIGH". The string specifics depend on the type of device containing the AVTransport. If the service implementation doesn't support recording then this state variable must be set to value "NOT_IMPLEMENTED".	string	No

42	NumberOfTracks	Number of tracks controlled by the AVTransport instance. If no resource is associated with the AVTransport instance (via SetAVTransportURI), and there is no ‘default’ resource (for example, a loaded disc) then NumberOfTracks shall be 0. Otherwise, it shall be 1 or higher.	unsignedInt	No
43	CurrentTrack	If NumberOfTracks is 0, then CurrentTrack will be 0. Otherwise, this state variable will contain the sequence number of the currently selected track, starting at value ‘1’, up to and including NumberOfTracks.	unsignedInt	No
44	CurrentTrackDuration	Duration of the current track, specified as a string of the following form: H+:MM:SS[F+] or H+:MM:SS[.F0/F1] where : <ul style="list-style-type: none"> • H+ means one or more digits to indicate elapsed hours • MM means exactly 2 digits to indicate minutes (00 to 59) • SS means exactly 2 digits to indicate seconds (00 to 59) • [F+] means optionally a dot followed by one or more digits to indicate fractions of seconds • [.F0/F1] means optionally a dot followed by a fraction, with F0 and F1 at least one digit long, and F0 < F1 <p>If the service implementation doesn’t support track duration information then this state variable must be set to value “NOT_IMPLEMENTED”.</p>	string	No
45	CurrentMediaDuration	Duration of the media, as identified by state variable AVTransportURI. The format of this variable is the same as the format for CurrentTrackDuration, described above. If no content is associated with the AVTransport instance, and there is no ‘default’ content then CurrentMediaDuration shall be “00:00:00”. If the service implementation doesn’t support media duration information then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
46	CurrentTrackMetaData	Metadata, in the form of a valid DIDL-Lite XML fragment , associated with the resource pointed to by state variable CurrentTrackURI. The meta data may have been extracted from state variable AVTransportURIMetaData, or extracted from the resource binary itself. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No

47	CurrentTrackURI	Reference, in the form of a URI, to the current track. The URI enables a control point to retrieve any meta data associated with current track, such as, for example, title and author information, via the ContentDirectory service.	string	No
48	AVTransportURI	Reference, in the form of a URI of the resource controlled by the AVTransport instance. This URI may refer to a ‘single’ item or to a collection of items. In the single item case, the AVTransport will have 1 ‘track’ and AVTransportURI is equal to CurrentTrackURI. In the ‘collection of items’ case, the AVTransport will have multiple tracks, and AVTransportURI will remain constant during track changes.	string	No
49	AVTransportURI MetaData	Metadata, in the form of a DIDL-Lite XML fragment, associated with the resource pointed to by state variable AVTransportURI. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
50	NextAVTransportURI	AVTransportURI value to be played when the playback of the current AVTransportURI finishes. Setting this variable ahead of time enables a device to provide seamless transitions between resources for certain streaming protocols that need buffering. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
51	NextAVTransportURI MetaData	Metadata, in the form of a DIDL-Lite XML fragment, associated with the resource pointed to by state variable NextAVTransportURI. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
52	RelativeTimePosition	This state variable contains the current position, in terms of time, from the beginning of the current track. The time format is the same as for state variable CurrentTrackDuration. If the service implementation doesn’t support relative time-based position information then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
53	AbsoluteTimePosition	This state variable contains the current position, in terms of a time, from the beginning of the media. The time format is the same as for state variable CurrentTrackDuration. If the service implementation doesn’t support any kind of position information then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No

54	Relative CounterPosition	This state variable contains the current position, in terms of a dimensionless counter, from the beginning of the current track. If the service implementation doesn't support relative count-based position information then this state variable must be set to the maximum value of the i4 data type.	integer	No
55	Absolute CounterPosition	This state variable contains the current position, in terms of a dimensionless counter, from the beginning of the loaded media. If the service implementation doesn't support absolute count-based position information then this state variable must be set to the maximum value of the i4 data type.	integer	No
56	Current TransportActions	This state variable contains a comma-separated list of transport-controlling actions that can be successfully invoked for the current resource at this specific point in time. The list will contain a subset of the following actions: Play, Stop, Pause, Seek, Next, Previous and Record.	string	No
57	LastChange	This variable is used for eventing purposes to allow clients to receive meaningful event notifications whenever the state of the AVTransport changes. Logically, it contains a list of pairs, one element being an AVTransport instance ID and the second element the name and new value of the state variable for that instance.	string	Yes
58	A_ARG_TYPE_SeekMode	This state variable is introduced to provide type information for the “seek mode” parameter in action “Seek”. It indicates the allowed units in which the amount of seeking to be performed is specified. A device vendor is allowed to implement a subset of the allowed value list of this state variable. Only value ‘TRACK_NR’ is required.	string	No
59	A_ARG_TYPE_SeekTarget	This state variable is introduced to provide type information for the “target” parameter in action “Seek”. It indicates the target position of the seek action, in terms of units defined by state variable A_ARG_TYPE_SeekMode.	string	No
60	A_ARG_TYPE_InstanceID	This state variable is introduced to provide type information for the “InstanceID” input parameter present in all AVTransport actions. It identifies the virtual instance of the AVTransport service to which the action applies.	unsignedInt	No

Table 6.3-2 Values indicating A_ARG_TYPE_BrowseFlag

	Value	Meaning
1	BrowseMetadata	This indicates that the properties of the object specified by the ObjectID parameter will be returned in the result.
2	BrowseDirectChildren	This indicates that first level objects under the object specified by ObjectID parameter will be returned in the result, as well as the metadata of all objects specified.

Table 6.3-3 Values indicating A_ARG_TYPE_TransferStatus

	Value	Meaning
1	IN_PROGRESS	In progress.
2	STOPPED	Stopped.
3	ERROR	Error.
4	COMPLETED	Completed.

Table 6.3-4 Values indicating A_ARG_TYPE_ConnectionStatus

	Value	Meaning
1	OK	OK
2	ContentFormatMismatch	Content format mismatch.
3	InsufficientBandwidth	Insufficient bandwidth.
4	UnreliableChannel	Unreliable channel.
5	Unknown	Unknown.

Table 6.3-5 Values indicating A_ARG_TYPE_Direction

	Value	Meaning
1	Input	Input.
2	Output	Output.

Table 6.3-6 Values indicating TransportState

Value	Meaning
1 STOPPED	Stopped.
2 PLAYING	Playing.
3 TRANSITIONING	Transitioning.
4 PAUSED_PLAYBACK	In case the media contains video, it indicates output of a still image.
5 PAUSED_RECORDING	The transport is already prepared for recording and may respond faster or more accurate.
6 RECORDING	Recording.
7 NO_MEDIA_PRESENT	No media present.

Table 6.3-7 Values indicating TransportStatus

Value	Meaning
1 OK	OK.
2 ERROR_OCCURRED	During operation of the AVTransport service, asynchronous errors may occur that cannot be returned by a normal action. This situation can be signalled to control points by setting this state variable to value “ERROR_OCCURRED”.

Table 6.3-8 Values indicating PlaybackStorageMedium / RecordStorageMedium

	Value	Meaning
1	UNKNOWN	Unknown.
2	DV	DV.
3	MINI-DV	MiniDV.
4	VHS	VHS.
5	W-VHS	W-VHS.
6	S-VHS	S-VHS.
7	D-VHS	D-VHS.
8	VHSC	VHS-C.
9	VIDEO8	Video8.
10	HI8	Hi8.
11	CD-ROM	CD-ROM.
12	CD-DA	CD-DA.
13	CD-R	CD-R.
14	CD-RW	CD-RW.
15	VIDEO-CD	Video-CD.
16	SACD	SACD.
17	MD-AUDIO	MD Audio.
18	MD-PICTURE	MD Picture.
19	DVD-ROM	DVD-ROM.
20	DVD-VIDEO	DVD-Video.
21	DVD-R	DVD-R.
22	DVD+RW	DVD+RW.
23	DVD-RW	DVD-RW.
24	DVD-RAM	DVD-RAM.
25	DVD-AUDIO	DVD-Audio.
26	DAT	DAT.
27	LD	LD.
28	HDD	HDD.
29	MICRO-MV	MICRO-MV.
30	NETWORK	If AVTransportURI refers to a resource received from the UPnP network the state variable is set to "NETWORK".
31	NOE	If no resource is specified, then the state variable is set to "NOE".
32	NOT_IMPLEMENTED	If the service implementation is not supported then this state variable must be set to value "NOT_IMPLEMENTED".

Table 6.3-9 Values indicating CurrentPlayMode

Value	Meaning
1 NORMAL	Normal.
2 SHUFFLE	Shuffle.
3 REPEAT_ONE	Repeat one.
4 REPEAT_ALL	Repeat all.
5 RANDOM	Random.
6 DIRECT_1	Indicates playing a single track and then stop (don't play the next track).
7 INTRO	Indicates playing a short sample (typically 10 seconds or so) of each track on the media.

Table 6.3-10 Values indicating RecordMediumWriteStatus

Value	Meaning
1 WRITABLE	Writable.
2 PROTECTED	Indicates a writable media that is currently write-protected (e.g., a protected VHS tape).
3 NOT_WRITABLE	Indicates an inherent ‘read-only’ media (e.g., a DVD-ROM disc) or the device doesn’t support recording on the current media.
4 UNKNOWN	If no media is loaded, the write status will be “UNKNOWN”.
5 NOT_IMPLEMENTED	If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.

Table 6.3-11 Values indicating CurrentRecordQualityMode

Value	Meaning
1 0:EP	Level 0 (EP).
2 1:LP	Level 1 (LP).
3 2:SP	Level 2 (SP).
4 0:BASIC	Level 0 (Basic).
5 1:MEDIUM	Level 1 (Medium)
6 2:HIGH	Level 2 (High).
7 NOT_IMPLEMENTED	If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.

Table 6.3-12 Values indicating A_ARG_TYPE_SeekMode

Value	Meaning
1 TRACK_NR	Indicates seeking to a particular track number.
2 ABS_TIME	Absolute time.
3 REL_TIME	Relative time.
4 ABS_COUNT	Absolute count.
5 REL_COUNT	Relative count.
6 CHANNEL_FREQ	Channel frequency.
7 TAPE-INDEX	Tape index.
8 FRAME	Frame.

6.4. Services

Media server device services are shown below.

Table 6.4-1 Services offered by media server devices

	Service Name	Description
1	GetSearchCapabilities	This action returns the searching capabilities that are supported by the device.
2	GetSortCapabilities	This action returns the CSV list of meta-data tags that can be used in sortCriteria.
3	GetSystemUpdateID	This action returns the current value of state variable SystemUpdateID.
4	Browse	This action allows the caller to incrementally browse the native hierarchy of the Content Directory objects exposed by the Content Directory Service.
5	Search	This action allows the caller to search the content directory for objects that match some search criteria.
6	CreateObject	This action creates a new object in the container identified by ContainerID.
7	DestroyObject	This action destroys the specified object when permitted.
8	UpdateObject	This action modifies, deletes or inserts object metadata.
9	ImportResource	This action transfers a file from a remote source resource, specified by SourceURI, to a local destination resource, specified by DestinationURI, in the Content Directory Service.
10	ExportResource	This action transfers a file from a local source resource, specified by SourceURI, to a remote destination resource, specified by DestinationURI.
11	StopTransferResource	This action stops the file transfer initiated by the ImportResource() or ExportResource() action.
12	GetTransferProgress	This action is used to query the progress of the file transfer initiated by the ImportResource() or the ExportResource() action.
13	DeleteResource	This action uses the specified ResourceURI to locate and delete all of the corresponding <res> elements in the CDS.
14	CreateReference	This action creates a reference to an existing item, specified by the ObjectID argument, in the parent container, specified by the ContainerID argument.
15	GetProtocolInfo	This action returns the protocol-related info that this ConnectionManager supports in its current state, as a comma-separate list of strings.
16	PrepareForConnection	This action is used to allow the device to prepare itself to connect to the network for the purposes of sending or receiving media content (e.g. a video stream).
17	ConnectionComplete	A control point should call the ConnectionComplete action for all connections that it created via PrepareForConnection to ensure that all resources associated with the connection are freed up.
18	GetCurrent ConnectionIDs	This action returns a comma-separated list of ConnectionIDs of currently ongoing Connections.
19	GetCurrent ConnectionInfo	This action returns associated information of the connection referred to by the 'ConnectionID' parameter.

20	SetAVTransportURI	This action specifies the URI of the resource to be controlled by the specified AVTransport instance.
21	SetNextAVTransportURI	This action specifies the URI of the resource to be controlled when the playback of the current resource (set earlier via SetAVTransportURI) finishes.
22	GetMediaInfo	This action returns information associated with the current media of the specified instance.
23	GetTransportInfo	This action returns information associated with the current transport state of the specified instance.
24	GetPositionInfo	This action returns information associated with the current position of the transport of the specified instance.
25	GetDeviceCapabilities	This action returns informationNo device capabilities of the specified instance.
26	GetTransportSettings	This action returns informationNo various settings of the specified instance, such as the current play mode and the current recording quality mode.
27	Stop	This action stops the progression of the current resource that is associated with the specified instance.
28	Play	This action start playing the resource of the specified instance, at the specified speed, starting at the current position, according to the current play mode.
29	Pause	While the device is in a playing state, this action halts the progression of the resource that is associated with the specified instance Id.
30	Record	This action start recording on the specified transport instance, at the current positionNo the media, according to the currently specified recording quality, and return immediately.
31	Seek	This action start seeking through the resource controlled by the specified instance - as fast as possible - to the specified target position.
32	Next	This action advance to the next track.
33	Previous	This action advance to the previous track.
34	SetPlayMode	This action sets the play mode of the specified AVTransport instance.
35	SetRecordQualityMode	This action sets the record quality mode of the specified AVTransport instance.
36	GetCurrentTransportActions	This action returns the CurrentTransportActions state variable for the specified instance.
37	ContentDownload	MediaServer デバイスに存在するコンテンツをダウンロードする。
38	ContentUpload	MediaServer デバイスにコンテンツをアップロードする。
39	QueryStateVariable	This action is used to query some state variables.
40	GetIcon	This action is used to query the data of the icon.

The details of the services are shown below.

6.4.1. GetSearchCapabilities

(1)Description

This action returns the searching capabilities that are supported by the device.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSearchCapabilities>

(3)Input parameter

No

(4)Output parameter

Table 6.4.1-1 GetSearchCapabilities service output parameter

	Parameter	Related State Variable	Remarks
1	SearchCaps	SearchCapabilities	See also Table 6.3-1

6.4.2. GetSortCapabilities

(1)Description

This action returns the CSV list of meta-data tags that can be used in sortCriteria.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSortCapabilities>

(3)Input parameter

No

(4)Output parameter

Table 6.4.2-1 GetSortCapabilities service output parameter

	Parameter	Related State Variable	Remarks
1	SortCaps	SortCapabilities	See also Table 6.3-1

6.4.3. GetSystemUpdateID

(1)Description

This action returns the current value of state variable SystemUpdateID. It can be used by clients that want to ‘poll’ for any changes in the Content Directory (as opposed to subscribing to events).

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSystemUpdateID>

(3)Input parameter

No

(4)Output parameter

Table 6.4.3-1 GetSystemUpdateID service output parameter

	Parameter	Related State Variable	Remarks
1	Id	SystemUpdateID	See also Table 6.3-1

6.4.4. Browse

(1)Description

This action allows the caller to incrementally browse the native hierarchy of the Content Directory objects exposed by the Content Directory Service, including information listing the classes of objects available in any particular object container.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Browse>

(3)Input parameter

Table 6.4.4-1 Browse service input parameters

	Parameter	Related State Variable	Remarks
1	ObjectID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2	BrowseFlag	A_ARG_TYPE_BrowseFlag	
3	Filter	A_ARG_TYPE_Filter	
4	StartingIndex	A_ARG_TYPE_Index	
5	RequestedCount	A_ARG_TYPE_Count	
6	SortCriteria	A_ARG_TYPE_SortCriteria	

(4)Output parameter

Table 6.4.4-2 Browse service output parameters

	Parameter	Related State Variable	Remarks
1	Result	A_ARG_TYPE_Result	See also Table 6.3-1
2	NumberReturned	A_ARG_TYPE_Count	
3	TotalMatches	A_ARG_TYPE_Count	
4	UpdateID	A_ARG_TYPE_UpdateID	

6.4.5. Search

(1)Description

This action allows the caller to search the content directory for objects that match some search criteria. The search criteria are specified as a query string operating on properties with comparison and logical operators.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Search>

(3)Input parameter

Table 6.4.5-1 Search service input parameters

	Parameter	Related State Variable	Remarks
1	ContainerID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2	SearchCriteria	A_ARG_TYPE_SearchCriteria	
3	Filter	A_ARG_TYPE_Filter	
4	StartingIndex	A_ARG_TYPE_Index	
5	RequestedCount	A_ARG_TYPE_Count	
6	SortCriteria	A_ARG_TYPE_SortCriteria	

(4)Output parameter

Table 6.4.5-2 Search service output parameters

	Parameter	Related State Variable	Remarks
1	Result	A_ARG_TYPE_Result	See also Table 6.3-1
2	NumberReturned	A_ARG_TYPE_Count	
3	TotalMatches	A_ARG_TYPE_Count	
4	UpdateID	A_ARG_TYPE_UpdateID	

6.4.6. CreateObject

(1)Description

This action creates a new object in the container identified by ContainerID. The new object is created with the required id attribute set to "" and the required restricted attribute set to false. The actual value of the id attribute is supplied by the Content Directory Service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateObject>

(3)Input parameter

Table 6.4.6-1 CreateObject service input parameters

	Parameter	Related State Variable	Remarks
1	ContainerID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2	Elements	A_ARG_TYPE_Result	

(4)Output parameter

Table 6.4.6-2 CreateObject service output parameters

	Parameter	Related State Variable	Remarks
1	ObjectID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2	Result	A_ARG_TYPE_Result	

6.4.7. DestroyObject

(1)Description

This action destroys the specified object when permitted. If the object is a container, all of its child objects are also deleted, recursively. Each deleted object becomes invalid and all references to it are also deleted.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DestroyObject>

(3)Input parameter

Table 6.4.7-1 DestroyObject service input parameter

	Parameter	Related State Variable	Remarks
1	ObjectID	A_ARG_TYPE_ObjectID	See also Table 6.3-1

(4)Output parameter

No

6.4.8. UpdateObject

(1)Description

This action modifies, deletes or inserts object metadata. The object to be updated is specified by ObjectID. CurrentTagValue is a CSV list of XML fragments. Each fragment is either the complete, exact, current text of an existing metadata element of the object or an empty placeholder. NewTagValue is also a CSV list of XML fragments, each of which is the complete new text of a metadata element for the object or an empty placeholder. The two tag/value lists must have the same number of entries. Each entry in CurrentTagValue represents metadata to be modified. The corresponding entry in NewTagValue represents the new, replacement metadata for the element identified by CurrentTagValue.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/UpdateObject>

(3)Input parameter

Table 6.4.8-1 UpdateObject service input parameters

Parameter	Related State Variable	Remarks
1 ObjectID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2 CurrentTagValue	A_ARG_TYPE_TagValueList	
3 NewTagValue	A_ARG_TYPE_TagValueList	

(4)Output parameter

No

6.4.9. ImportResource

(1)Description

This action transfers a file from a remote source resource, specified by SourceURI, to a local destination resource, specified by DestinationURI, in the Content Directory Service. When the Content Directory Service identifies the destination resource in CDS, the action will return a unique TransferID in the response and start HTTP GET. A client can monitor the progress of file transfer by using GetTransferProgress().

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ImportResource>

(3)Input parameter

Table 6.4.9-1 ImportResource service input parameters

	Parameter	Related State Variable	Remarks
1	SourceURI	A_ARG_TYPE_URI	See also Table 6.3-1
2	DestinationURI	A_ARG_TYPE_URI	

(4)Output parameter

Table 6.4.9-2 ImportResource service output parameter

	Parameter	Related State Variable	Remarks
1	TransferID	A_ARG_TYPE_TransferID	See also Table 6.3-1

6.4.10. ExportResource

(1)Description

This action transfers a file from a local source resource, specified by SourceURI, to a remote destination resource, specified by DestinationURI. When the CDS identifies the source resource, the action will return a unique TransferID in the response and start the HTTP POST. A client can monitor the progress of file transfer by using the GetTransferProgress() action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ExportResource>

(3)Input parameter

Table 6.4.10-1 ExportResource service input parameters

	Parameter	Related State Variable	Remarks
1	SourceURI	A_ARG_TYPE_URI	See also Table 6.3-1
2	DestinationURI	A_ARG_TYPE_URI	

(4)Output parameter

Table 6.4.10-2 ExportResource service output parameter

	Parameter	Related State Variable	Remarks
1	TransferID	A_ARG_TYPE_TransferID	See also Table 6.3-1

6.4.11. StopTransferResource

(1)Description

This action stops the file transfer initiated by the ImportResource() or ExportResource() action. The file transfer, identified by TransferID, is halted immediately.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/StopTransferResource>

(3)Input parameter

Table 6.4.11-1 StopTransferResource service input parameter

	Parameter	Related State Variable	Remarks
1	TransferID	A_ARG_TYPE_TransferID	See also Table 6.3-1

(4)Output parameter

No

6.4.12. GetTransferProgress

(1)Description

This action is used to query the progress of the file transfer initiated by the ImportResource() or the ExportResource() action. Progress of the file transfer, specified by TransferID, will be returned in the response. TransferStatus indicates the status of the file transfer, it can be either IN_PROGRESS, STOPPED, ERROR, or COMPLETED. TransferLength specifies the length in bytes that has been transferred. TransferTotal specifies the total length of file in bytes that should be transferred in this file transfer.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransferProgress>

(3)Input parameter

Table 6.4.12-1 GetTransferProgress service input parameter

	Parameter	Related State Variable	Remarks
1	TransferID	A_ARG_TYPE_TransferID	See also Table 6.3-1

(4)Output parameter

Table 6.4.12-2 GetTransferProgress service output parameters

	Parameter	Related State Variable	Remarks
1	TransferStatus	A_ARG_TYPE_TransferStatus	See also Table 6.3-1
2	TransferLength	A_ARG_TYPE_TransferLength	
3	TransferTotal	A_ARG_TYPE_TransferTotal	

6.4.13. DeleteResource

(1)Description

This action uses the specified ResourceURI to locate and delete all of the corresponding <res> elements in the CDS. Whether or not the resource identified by ResourceURI is actually deleted is implementation dependent.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DeleteResource>

(3)Input parameter

Table 6.4.13-1 DeleteResource service input parameter

	Parameter	Related State Variable	Remarks
1	ResourceURI	A_ARG_TYPE_URI	See also Table 6.3-1

(4)Output parameter

No

6.4.14. CreateReference

(1)Description

This action creates a reference to an existing item, specified by the ObjectID argument, in the parent container, specified by the ContainerID argument. Both the ContainerID and ObjectID must already exist in the CDS. A unique, new object id is assigned to the newly created reference item and returned in the NewID output parameter.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateReference>

(3)Input parameter

Table 6.4.14-1 CreateReference service input parameters

	Parameter	Related State Variable	Remarks
1	ContainerID	A_ARG_TYPE_ObjectID	See also Table 6.3-1
2	ObjectID	A_ARG_TYPE_ObjectID	

(4)Output parameter

Table 6.4.14-2 CreateReference service output parameter

	Parameter	Related State Variable	Remarks
1	NewID	A_ARG_TYPE_ObjectID	See also See also Table 6.3-1

6.4.15. GetProtocolInfo

(1) Description

This action returns the protocol-related info that this ConnectionManager supports in its current state, as a comma-separate list of strings.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetProtocolInfo>

(3) Input parameter

No

(4) Output parameter

Table 6.4.15-1 GetProtocolInfo service output parameters

Parameter	Related State Variable	Remarks
1 Source	SourceProtocolInfo	See also See also
2 Sink	SinkProtocolInfo	Table 6.3-1

6.4.16. PrepareForConnection

(1)Description

This action is used to allow the device to prepare itself to connect to the network for the purposes of sending or receiving media content (e.g. a video stream). The RemoteProtocolInfo parameter identifies the protocol, network, and format that should be used to transfer the content. Its value corresponds to one of the ProtocolInfo entries returned by the GetProtocolInfo() action from the remote device. If the remote device does not implement GetProtocolInfo(), then the RemoteProtocolInfo parameter should be set to one of the ProtocolInfo entries returned by the GetProtocolInfo() action of the local device.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/PrepareForConnection>

(3)Input parameter

Table 6.4.16-1 PrepareForConnection service input parameters

	Parameter	Related State Variable	Remarks
1	RemoteProtocolInfo	A_ARG_TYPE_ProtocolInfo	See also Table 6.3-1
2	PeerConnectionManager	A_ARG_TYPE_ConnectionManager	
3	PeerConnectionID	A_ARG_TYPE_ConnectionID	
4	Direction	A_ARG_TYPE_Direction	

(4)Output parameter

Table 6.4.16-2 PrepareForConnection service output parameters

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 6.3-1
2	AVTransportID	A_ARG_TYPE_AVTransportID	
3	ResID	A_ARG_TYPE_RcsID	

6.4.17. ConnectionComplete

(1) Description

A control point should call the ConnectionComplete action for all connections that it created via PrepareForConnection to ensure that all resources associated with the connection are freed up. In addition, a ConnectionManager may implement ‘automatic’ or ‘autonomous’ closing of connections, in a protocol and vendor-specific way.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ConnectionComplete>

(3) Input parameter

Table 6.4.17-1 ConnectionComplete service input parameter

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 6.3-1

(4) Output parameter

No

6.4.18. GetCurrentConnectionIDs

(1)Description

This action returns a comma-separated list of ConnectionIDs of currently ongoing Connections. A ConnectionID can be used to manually terminate a Connection via action ConnectionComplete, or to retrieve additional information about the ongoing Connection via action GetCurrentConnectionInfo.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionIDs>

(3)Input parameter

No

(4)Output parameter

Table 6.4.18-1 GetCurrentConnectionIDs service output parameter

	Parameter	Related State Variable	Remarks
1	ConnectionIDs	CurrentConnectionIDs	See also Table 6.3-1

6.4.19. GetCurrentConnectionInfo

(1)Description

This action returns associated information of the connection referred to by the ‘ConnectionID’ parameter. The ‘AVTransportID’ and ‘PeerConnectionManager’ parameters may be NULL (empty string) in cases where the connection has been setup completely out of band, e.g., not involving a PrepareForConnection action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionInfo>

(3)Input parameter

Table 6.4.19-1 GetCurrentConnectionInfo service input parameter

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 6.3-1

(4)Output parameter

Table 6.4.19-2 GetCurrentConnectionInfo service output parameters

	Parameter	Related State Variable	Remarks
1	RcsID	A_ARG_TYPE_RcsID	See also Table 6.3-1
2	AVTransportID	A_ARG_TYPE_AVTransportID	
3	ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
4	PeerConnectionManager	A_ARG_TYPE_ConnectionManager	
5	PeerConnectionID	A_ARG_TYPE_ConnectionID	
6	Direction	A_ARG_TYPE_Direction	
7	Status	A_ARG_TYPE_ConnectionStatus	

6.4.20. SetAVTransportURI

(1)Description

This action specifies the URI of the resource to be controlled by the specified AVTransport instance. It is recommended that the AVTransport service checks the MIME-type of the specified resource when executing this action. A control point can supply metadata associated with the specified resource, using a DIDL-Lite XML fragment, in parameter CurrentURIMetaData. If supported by the AVTransport, this metadata is stored in a state variable, and returned as output parameter as part of action GetMediaInfo. If a control point does not want to use this feature it can supply NULL (empty string) for the CurrentURIMetaData parameter.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetAVTransportURI>

(3)Input parameter

Table 6.4.20-1 SetAVTransportURI service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2	CurrentURI	AVTransportURI	
3	CurrentURIMetaData	AVTransportURIMetaData	

(4)Output parameter

No

6.4.21. SetNextAVTransportURI

(1) Description

This action specifies the URI of the resource to be controlled when the playback of the current resource (set earlier via SetAVTransportURI) finishes. This action allows a device to ‘prefetch’ the data to be played next, in order to provide a seamless transition between resources. This type of prefetching or buffering is particularly useful for protocol such as HTTP GET, where the data is usually buffered before playback. It is recommended that the AVTransport service checks the MIME-type of the specified resource when executing this action.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetNextAVTransportURI>

(3) Input parameter

Table 6.4.21-1 SetNextAVTransportURI service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2	NextURI	AVTransportURI	
3	NextURIMetaData	AVTransportURIMetaData	

(4) Output parameter

No

6.4.22. GetMediaInfo

(1)Description

This action returns information associated with the current media of the specified instance; it has no effect on state.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetMediaInfo>

(3)Input parameter

Table 6.4.22-1 GetMediaInfo service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

Table 6.4.22-2 GetMediaInfo service output parameters

	Parameter	Related State Variable	Remarks
1	NrTracks	NumberOfTracks	See also Table 6.3-1
2	MediaDuration	CurrentMediaDuration	
3	CurrentURI	AVTransportURI	
4	CurrentURIMetaData	AVTransportURIMetaData	
5	NextURI	NextAVTransportURI	
6	NextURIMetaData	NextAVTransportURIMetaData	
7	PlayMedium	PlaybackStorageMedium	
8	RecordMedium	RecordStorageMedium	
9	WriteStatus	RecordMediumWriteStatus	

6.4.23. GetTransportInfo

(1)Description

This action returns information associated with the current transport state of the specified instance; it has no effect on state.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportInfo>

(3)Input parameter

Table 6.4.23-1 GetTransportInfo service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

Table 6.4.23-2 GetTransportInfo service output parameters

	Parameter	Related State Variable	Remarks
1	CurrentTransportState	TransportState	See also Table 6.3-1
2	CurrentTransportStatus	TransportStatus	
3	CurrentSpeed	TransportPlaySpeed	

6.4.24. GetPositionInfo

(1) Description

This action returns information associated with the current position of the transport of the specified instance; it has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetPositionInfo>

(3) Input parameter

Table 6.4.24-1 GetPositionInfo service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4) Output parameter

Table 6.4.24-2 GetPositionInfo service output parameters

	Parameter	Related State Variable	Remarks
1	Track	CurrentTrack	See also Table 6.3-1
2	TrackDuration	CurrentTrackDuration	
3	TrackMetaData	CurrentTrackMetaData	
4	TrackURI	CurrentTrackURI	
5	RelTime	RelativeTimePosition	
6	AbsTime	AbsoluteTimePosition	
7	RelCount	RelativeCounterPosition	
8	AbsCount	AbsoluteCounterPosition	

6.4.25. GetDeviceCapabilities

(1)Description

This action returns information about device capabilities of the specified instance, such as the supported playback and recording formats, and the supported quality levels for recording. This action has no effect on state.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetDeviceCapabilities>

(3)Input parameter

Table 6.4.25-1 GetDeviceCapabilities service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

Table 6.4.25-2 GetDeviceCapabilities service output parameters

	Parameter	Related State Variable	Remarks
1	PlayMedia	PossiblePlaybackStorageMedia	See also Table 6.3-1
2	RecMedia	PossibleRecordStorageMedia	
3	RecQualityModes	PossibleRecordQualityModes	

6.4.26. GetTransportSettings

(1) Description

This action returns information various settings of the specified instance, such as the current play mode and the current recording quality mode. This action has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportSettings>

(3) Input parameter

Table 6.4.26-1 GetTransportSettings service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4) Output parameter

Table 6.4.26-2 GetTransportSettings service output parameters

	Parameter	Related State Variable	Remarks
1	PlayMode	CurrentPlayMode	See also Table 6.3-1
2	RecQualityMode	CurrentRecordQualityMode	

6.4.27. Stop

(1)Description

This action stops the progression of the current resource that is associated with the specified instance. Additionally, it is recommended that the “output of the device” should change to something other than the current snippet of resource. Although the exact nature of this change varies from device to device, a common behavior is to immediately cease all “output” from the device. Nevertheless, the exact behavior is defined by the manufacturer of the device.

On some devices, the current positionNo the transport changes as a result of the Stop action. This can be detected by control points via event notification of CurrentTrack. Alternatively, a control point can poll using the GetPositionInfo action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Stop>

(3)Input parameter

Table 6.4.27-1 Stop service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

No

6.4.28. Play

(1)Description

Start playing the resource of the specified instance, at the specified speed, starting at the current position, according to the current play mode. Keep playing until the resource ends or the transport state is changed via actions Stop or Pause. The device should do a ‘best effort’ to match the specified play speed. Actually supported speeds can be retrieved from the AllowedValueList of the TransportPlaySpeed state variable in the AVTransport service description.

If no AVTransportURI is set, the resource being played is device-dependent.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Play>

(3)Input parameter

Table 6.4.28-1 Play service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2	Speed	TransportPlaySpeed	

(4)Output parameter

No

6.4.29. Pause

(1)Description

While the device is in a playing state, e.g. TransportState is “PLAYING”, this action halts the progression of the resource that is associated with the specified instance Id. Any visual representation of the resource should remain displayed in a static manner (e.g. the last frame of video should remain displayed). Any audio representation of the resource should be muted. The difference between Pause() and Stop() is that Pause() MUST remain at the current position within the resource and the current resource must persist as described above.

When the device is recording, e.g., the TransportState is “RECORDING”, the device MUST maintain its current recording position, but does not accept any more data to record. Any data received after the Pause() action and before the next Record() action will be lost.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Pause>

(3)Input parameter

Table 6.4.29-1 Pause service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

No

6.4.30. Record

(1)Description

Start recording on the specified transport instance, at the current positioNo the media, according to the currently specified recording quality, and return immediately. If AVTransportURI is set (differs from the empty string) then that resource will be recorded. If no AVTransportURI is set (equals the empty string), then the source of the content being recording is device dependent. In both cases, whether the device outputs the resource to a screen or speakers while recording is device dependent. If the device implementing the Record action also has a ContentDirectory service, then recorded content will be added to this ContentDirectory in a device-dependent way. Specifically, there is no UPnP mechanism to specify the location of the recorded content in the ContentDirectory hierarchy.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Record>

(3)Input parameter

Table 6.4.30-1 Record service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

No

6.4.31. Seek

(1)Description

Start seeking through the resource controlled by the specified instance - as fast as possible - to the specified target position. Unit value “TRACK_NR” indicates seeking to a particular track number. For tape-based media that do not support the notion of track (such as VCRs), Seek(“TRACK_NR”,”1”) is equivalent to the common “FastReverse” VCR functionality. Special track number ‘0’ is used to indicate the end of the media, hence, Seek(“TRACK_NR”,”0”) is equivalent to the common “FastForward” VCR functionality.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Seek>

(3)Input parameter

Table 6.4.31-1 Seek service input parameters

Parameter	Related State Variable	Remarks
1 InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2 Unit	A_ARG_TYPE_SeekMode	
3 Target	A_ARG_TYPE_SeekTarget	

(4)Output parameter

No

6.4.32. Next

(1)Description

Convenient action to advance to the next track. This action is functionally equivalent to Seek(TRACK_NR,CurrentTrackNr+1). This action does not ‘cycle’ back to the first track.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Next>

(3)Input parameter

Table 6.4.32-1 Next service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

No

6.4.33. Previous

(1)Description

Convenient action to advance to the previous track. This action is functionally equivalent to Seek(TRACK_NR,CurrentTrackNr-1). This action does not ‘cycle’ back to the last track.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Previous>

(3)Input parameter

Table 6.4.33-1 Previous service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4)Output parameter

No

6.4.34. SetPlayMode

(1)Description

Sets the play mode of the specified AVTransport instance.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetPlayMode>

(3)Input parameter

Table 6.4.34-1 SetPlayMode service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2	NewPlayMode	CurrentPlayMode	

(4)Output parameter

No

6.4.35. SetRecordQualityMode

(1)Description

Sets the record quality mode of the specified AVTransport instance.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetRecordQualityMode>

(3)Input parameter

Table 6.4.35-1 SetRecordQualityMode service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1
2	NewRecordQualityMode	CurrentRecordQualityMode	

(4)Output parameter

No

6.4.36. GetCurrentTransportActions

(1) Description

Returns the CurrentTransportActions state variable for the specified instance.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentTransportActions>

(3) Input parameter

Table 6.4.36-1 GetCurrentTransportActions service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	A_ARG_TYPE_InstanceID	See also Table 6.3-1

(4) Output parameter

Table 6.4.36-2 GetCurrentTransportActions service output parameter

	Parameter	Related State Variable	Remarks
1	Actions	CurrentTransportActions	See also Table 6.3-1

6.4.37. ContentDownload

(1) Description

MediaServer デバイスに存在するコンテンツをダウンロードする。.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentDownload>

(3) Input parameter

Table 6.4.37-1 ContentDownload service input parameter

	Parameter	Data Type	Remarks
1	exportUri	anyURI	Content URI

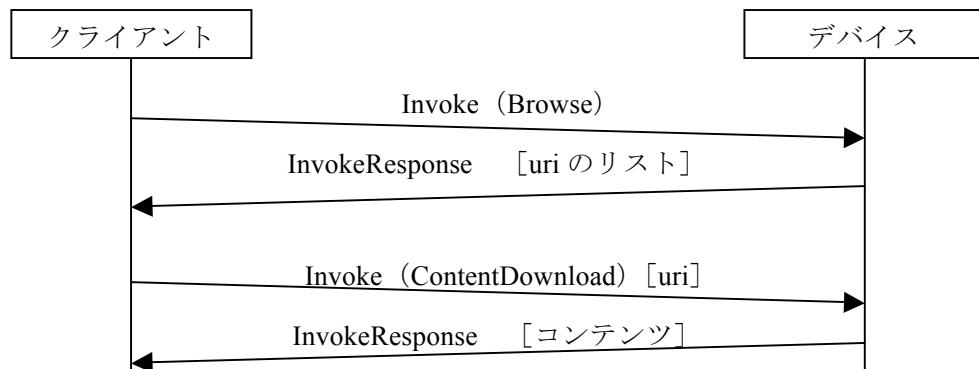
(4) Output parameter

Table 6.4.37-2 ContentDownload service output parameter

	Parameter	Data Type	Remarks
1	mimeType	string	MIME type
2	length	integer	content length
3	content	base64Binary	the content

※ダウンロード結果が失敗（指定されたコンテンツが無い等）の場合は、InvokeResponse をエラーとして返却する。

(5) Sequence



6.4.38. ContentUpload

(1)Description

MediaServer デバイスにコンテンツをアップロードする。.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentUpload>

(3)Input parameter

Table 6.4.38-1 ContentUpload service input parameter

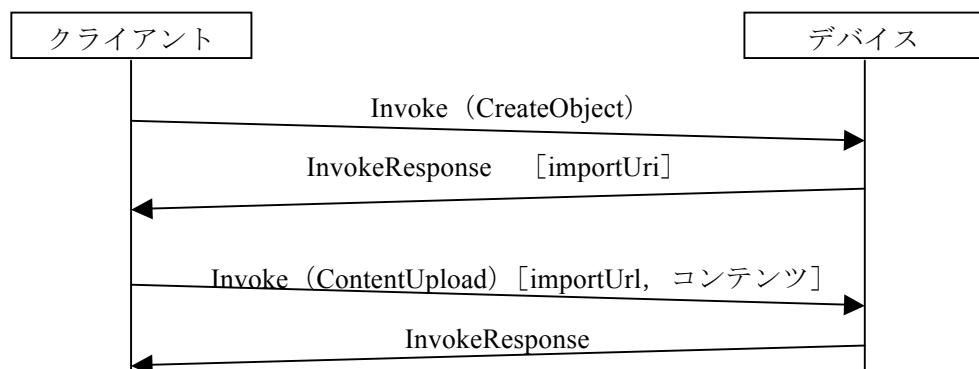
	Parameter	Related State Variable	Remarks
1	importUri	anyURI	content URI
2	contentType	string	MIME type
3	length	integer	content length
4	content	base64Binary	the content

(4)Output parameter

No.

※ダウンロード結果が失敗（指定されたコンテンツが無い等）の場合は、InvokeResponse をエラーとして返却する。

(5)Sequence



6.4.39. QueryStateVariable

(1)Description

This action is used to query some state variables.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/QueryStateVariable>

(3)Input parameter

Table 6.4.39-1 QueryStateVariable service input parameters

Parameter	Related State Variable	Remarks
1 TransferIDs	TransferIDs	No value is set.
2 A_ARG_TYPE_ObjectID	A_ARG_TYPE_ObjectID	
3 A_ARG_TYPE_Result	A_ARG_TYPE_Result	
4 A_ARG_TYPE_SearchCriteria	A_ARG_TYPE_SearchCriteria	
5 A_ARG_TYPE_BrowseFlag	A_ARG_TYPE_BrowseFlag	
6 A_ARG_TYPE_Filter	A_ARG_TYPE_Filter	
7 A_ARG_TYPE_SortCriteria	A_ARG_TYPE_SortCriteria	
8 A_ARG_TYPE_Index	A_ARG_TYPE_Index	
9 A_ARG_TYPE_Count	A_ARG_TYPE_Count	
10 A_ARG_TYPE_UpdateID	A_ARG_TYPE_UpdateID	
11 A_ARG_TYPE_TransferID	A_ARG_TYPE_TransferID	
12 A_ARG_TYPE_TransferStatus	A_ARG_TYPE_TransferStatus	
13 A_ARG_TYPE_TransferLength	A_ARG_TYPE_TransferLength	
14 A_ARG_TYPE_TransferTotal	A_ARG_TYPE_TransferTotal	
15 A_ARG_TYPE_TagValueList	A_ARG_TYPE_TagValueList	
16 A_ARG_TYPE_URI	A_ARG_TYPE_URI	
17 SearchCapabilities	SearchCapabilities	
18 SortCapabilities	SortCapabilities	
19 SystemUpdateID	SystemUpdateID	
20 ContainerUpdateIDs	ContainerUpdateIDs	
21 SourceProtocolInfo	SourceProtocolInfo	
22 SinkProtocolInfo	SinkProtocolInfo	
23 CurrentConnectionIDs	CurrentConnectionIDs	
24 A_ARG_TYPE_ConnectionStatus	A_ARG_TYPE_ConnectionStatus	
25 A_ARG_TYPE_ConnectionManager	A_ARG_TYPE_ConnectionManager	
26 A_ARG_TYPE_Direction	A_ARG_TYPE_Direction	
27 A_ARG_TYPE_ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
28 A_ARG_TYPE_ConnectionID	A_ARG_TYPE_ConnectionID	
29 A_ARG_TYPE_AVTransportID	A_ARG_TYPE_AVTransportID	

30	A_ARG_TYPE_RcsID	A_ARG_TYPE_RcsID
31	TransportState	TransportState
32	TransportStatus	TransportStatus
33	PlaybackStorageMedium	PlaybackStorageMedium
34	RecordStorageMedium	RecordStorageMedium
35	PossiblePlaybackStorageMedia	PossiblePlaybackStorageMedia
36	PossibleRecordStorageMedia	PossibleRecordStorageMedia
37	CurrentPlayMode	CurrentPlayMode
38	TransportPlaySpeed	TransportPlaySpeed
39	RecordMediumWriteStatus	RecordMediumWriteStatus
40	CurrentRecordQualityMode	CurrentRecordQualityMode
41	PossibleRecordQualityModes	PossibleRecordQualityModes
42	NumberOfTracks	NumberOfTracks
43	CurrentTrack	CurrentTrack
44	CurrentTrackDuration	CurrentTrackDuration
45	CurrentMediaDuration	CurrentMediaDuration
46	CurrentTrackMetaData	CurrentTrackMetaData
47	CurrentTrackURI	CurrentTrackURI
48	AVTransportURI	AVTransportURI
49	AVTransportURIMetaData	AVTransportURIMetaData
50	NextAVTransportURI	NextAVTransportURI
51	NextAVTransportURIMetaData	NextAVTransportURIMetaData
52	RelativeTimePosition	RelativeTimePosition
53	AbsoluteTimePosition	AbsoluteTimePosition
54	RelativeCounterPosition	RelativeCounterPosition
55	AbsoluteCounterPosition	AbsoluteCounterPosition
56	CurrentTransportActions	CurrentTransportActions
57	LastChange	LastChange
58	A_ARG_TYPE_SeekMode	A_ARG_TYPE_SeekMode
59	A_ARG_TYPE_SeekTarget	A_ARG_TYPE_SeekTarget
60	A_ARG_TYPE_InstanceID	A_ARG_TYPE_InstanceID

(4)Output parameter

See also Table 6.4.39-2 QueryStateVariable service output parameters

	Parameter	Related State Variable	Remarks
1	TransferIDs	TransferIDs	See also Table 6.3-1
2	A_ARG_TYPE_ObjectID	A_ARG_TYPE_ObjectID	
3	A_ARG_TYPE_Result	A_ARG_TYPE_Result	
4	A_ARG_TYPE_SearchCriteria	A_ARG_TYPE_SearchCriteria	
5	A_ARG_TYPE_BrowseFlag	A_ARG_TYPE_BrowseFlag	
6	A_ARG_TYPE_Filter	A_ARG_TYPE_Filter	
7	A_ARG_TYPE_SortCriteria	A_ARG_TYPE_SortCriteria	
8	A_ARG_TYPE_Index	A_ARG_TYPE_Index	
9	A_ARG_TYPE_Count	A_ARG_TYPE_Count	
10	A_ARG_TYPE_UpdateID	A_ARG_TYPE_UpdateID	
11	A_ARG_TYPE_TransferID	A_ARG_TYPE_TransferID	
12	A_ARG_TYPE_TransferStatus	A_ARG_TYPE_TransferStatus	
13	A_ARG_TYPE_TransferLength	A_ARG_TYPE_TransferLength	
14	A_ARG_TYPE_TransferTotal	A_ARG_TYPE_TransferTotal	
15	A_ARG_TYPE_TagValueList	A_ARG_TYPE_TagValueList	
16	A_ARG_TYPE_URI	A_ARG_TYPE_URI	
17	SearchCapabilities	SearchCapabilities	
18	SortCapabilities	SortCapabilities	
19	SystemUpdateID	SystemUpdateID	
20	ContainerUpdateIDs	ContainerUpdateIDs	
21	SourceProtocolInfo	SourceProtocolInfo	
22	SinkProtocolInfo	SinkProtocolInfo	
23	CurrentConnectionIDs	CurrentConnectionIDs	
24	A_ARG_TYPE_ConnectionStatus	A_ARG_TYPE_ConnectionStatus	
25	A_ARG_TYPE_ConnectionManager	A_ARG_TYPE_ConnectionManager	
26	A_ARG_TYPE_Direction	A_ARG_TYPE_Direction	
27	A_ARG_TYPE_ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
28	A_ARG_TYPE_ConnectionID	A_ARG_TYPE_ConnectionID	
29	A_ARG_TYPE_AVTransportID	A_ARG_TYPE_AVTransportID	
30	A_ARG_TYPE_RcsID	A_ARG_TYPE_RcsID	
31	TransportState	TransportState	
32	TransportStatus	TransportStatus	
33	PlaybackStorageMedium	PlaybackStorageMedium	
34	RecordStorageMedium	RecordStorageMedium	
35	PossiblePlaybackStorageMedia	PossiblePlaybackStorageMedia	
36	PossibleRecordStorageMedia	PossibleRecordStorageMedia	
37	CurrentPlayMode	CurrentPlayMode	
38	TransportPlaySpeed	TransportPlaySpeed	

39	RecordMediumWriteStatus	RecordMediumWriteStatus	
40	CurrentRecordQualityMode	CurrentRecordQualityMode	
41	PossibleRecordQualityModes	PossibleRecordQualityModes	
42	NumberOfTracks	NumberOfTracks	
43	CurrentTrack	CurrentTrack	
44	CurrentTrackDuration	CurrentTrackDuration	
45	CurrentMediaDuration	CurrentMediaDuration	
46	CurrentTrackMetaData	CurrentTrackMetaData	
47	CurrentTrackURI	CurrentTrackURI	
48	AVTransportURI	AVTransportURI	
49	AVTransportURIMetaData	AVTransportURIMetaData	
50	NextAVTransportURI	NextAVTransportURI	
51	NextAVTransportURIMetaData	NextAVTransportURIMetaData	
52	RelativeTimePosition	RelativeTimePosition	
53	AbsoluteTimePosition	AbsoluteTimePosition	
54	RelativeCounterPosition	RelativeCounterPosition	
55	AbsoluteCounterPosition	AbsoluteCounterPosition	
56	CurrentTransportActions	CurrentTransportActions	
57	LastChange	LastChange	
58	A_ARG_TYPE_SeekMode	A_ARG_TYPE_SeekMode	
59	A_ARG_TYPE_SeekTarget	A_ARG_TYPE_SeekTarget	
60	A_ARG_TYPE_InstanceID	A_ARG_TYPE_InstanceID	

6.4.40. GetIcon

(1)Description

This action is used to query the data of the icon.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetIcon>

(3)Input parameter

Table 6.4.40-1 GetIcon service input parameter

	Parameter	Related State Variable	Data Type	Remarks
1	uri	-	string	Sets the URL of an icon image.

(4)Output parameter

Table 6.4.40-2 GetIcon service output parameters

	Parameter	Related State Variable	Data Type	Remarks
1	mimeType	-	string	Sets the MIME type of an icon image.
2	base64Data	-	base64Binary	Sets the BASE 64-encoded data of an icon image.

6.5. Metadata

6.5.1. Device Metadata

The metadata template of media server devices is shown below.

Italic letters in red: differ by the entity of each media server device

```

<?xml version="1.0"?>
<Device type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer" id="global unique ID for this device">
  name="short user-friendly title">
  <Specification>
    <URLBase>base URL for all relative URLs</URLBase>
    <Manufacturer>manufacturer name</Manufacturer>
    <ManufacturerURL>URL to manufacturer site</ManufacturerURL>
    <ManufactureDate>date of manufacture</ManufactureDate>
    <ModelDescription>long user-friendly title</ModelDescription>
    <ModelName>model name</ModelName>
    <ModelNumber>model number</ModelNumber>
    <ModelURL>URL to model site</ModelURL>
    <SerialNumber>manufacturer's serial number</SerialNumber>
    <UDN>uuid:UUID</UDN>
    <UPC>Universal Product Code</UPC>
    <IconList>
      <Icon>
        <Mimetype>image/format</Mimetype>
        <Width>horizontal pixels</width>
        <Height>vertical pixels</height>
        <Depth>color depth</depth>
        <Url>URL to icon</Url>
      </Icon>
      XML to declare other icons, if any, go here
    </IconList>
  </Specification>
  <StateVariableList>
    <StateVariable> name="TransferIDs" datatype="string" sendEvents="yes"/>
    <StateVariable> name="A_ARG_TYPE_ObjectID" datatype="string" sendEvents="no"/>
    <StateVariable> name="A_ARG_TYPE_Result" datatype="string" sendEvents="no"/>
    <StateVariable> name="A_ARG_TYPE_SearchCriteria" datatype="string" sendEvents="no"/>
    <StateVariable> name="A_ARG_TYPE_BrowseFlag" datatype="string" sendEvents="no">
      <AllowedValueList>
        <AllowedValue>BrowseMetadata</AllowedValue>
        <AllowedValue>BrowseDirectChildren</AllowedValue>
      </AllowedValueList>
    </StateVariable>
    <StateVariable> name="A_ARG_TYPE_Filter" datatype="string" sendEvents="no"/>
  </StateVariableList>

```

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```

<StateVariable name="A_ARG_TYPE_SortCriteria" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_Index" datatype="unsignedInt" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_Count" datatype="unsignedInt" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_UpdateID" datatype="unsignedInt" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_TransferID" datatype="unsignedInt" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_TransferStatus" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>COMPLETED</AllowedValue>
    <AllowedValue>ERROR</AllowedValue>
    <AllowedValue>IN_PROGRESS</AllowedValue>
    <AllowedValue>STOPPED</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_TransferLength" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_TransferTotal" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_TagValueList" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_URI" datatype="anyURI" sendEvents="no"/>
<StateVariable name="SearchCapabilities" datatype="string" sendEvents="no"/>
<StateVariable name="SortCapabilities" datatype="string" sendEvents="no"/>
<StateVariable name="SystemUpdateID" datatype="unsignedInt" sendEvents="yes"/>
<StateVariable name="ContainerUpdateIDs" datatype="string" sendEvents="yes"/>
<StateVariable name="SourceProtocolInfo" datatype="string" sendEvents="yes"/>
<StateVariable name="SinkProtocolInfo" datatype="string" sendEvents="yes"/>
<StateVariable name="CurrentConnectionIDs" datatype="string" sendEvents="yes"/>
<StateVariable name="A_ARG_TYPE_ConnectionStatus" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>OK</AllowedValue>
    <AllowedValue>ContentFormatMismatch</AllowedValue>
    <AllowedValue>InsufficientBandwidth</AllowedValue>
    <AllowedValue>UnreliableChannel</AllowedValue>
    <AllowedValue>Unknown</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_ConnectionManager" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_Direction" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>Input</AllowedValue>
    <AllowedValue>Output</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_ProtocolInfo" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_ConnectionID" datatype="integer" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_AVTransportID" datatype="integer" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_RcsID" datatype="int" sendEvents="no"/>
<StateVariable name="TransportState" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>STOPPED</AllowedValue>
  </AllowedValueList>
</StateVariable>

```

```
<AllowedValue>PAUSED_PLAYBACK</AllowedValue>
<AllowedValue>PAUSED_RECORDING</AllowedValue>
<AllowedValue>PLAYING</AllowedValue>
<AllowedValue>RECORDING</AllowedValue>
<AllowedValue>TRANSITIONING</AllowedValue>
<AllowedValue>NO_MEDIA_PRESENT</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="TransportStatus" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>OK</AllowedValue>
<AllowedValue>ERROR_OCCURRED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="PlaybackStorageMedium" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>UNKNOWN</AllowedValue>
<AllowedValue>DV</AllowedValue>
<AllowedValue>MINI-DV</AllowedValue>
<AllowedValue>VHS</AllowedValue>
<AllowedValue>W-VHS</AllowedValue>
<AllowedValue>S-VHS</AllowedValue>
<AllowedValue>D-VHS</AllowedValue>
<AllowedValue>VHSC</AllowedValue>
<AllowedValue>VIDEO8</AllowedValue>
<AllowedValue>HI8</AllowedValue>
<AllowedValue>CD-ROM</AllowedValue>
<AllowedValue>CD-DA</AllowedValue>
<AllowedValue>CD-R</AllowedValue>
<AllowedValue>CD-RW</AllowedValue>
<AllowedValue>VIDEO-CD</AllowedValue>
<AllowedValue>SACD</AllowedValue>
<AllowedValue>MD-AUDIO</AllowedValue>
<AllowedValue>MD-PICTURE</AllowedValue>
<AllowedValue>DVD-ROM</AllowedValue>
<AllowedValue>DVD-VIDEO</AllowedValue>
<AllowedValue>DVD-R</AllowedValue>
<AllowedValue>DVD+RW</AllowedValue>
<AllowedValue>DVD-RW</AllowedValue>
<AllowedValue>DVD-RAM</AllowedValue>
<AllowedValue>DVD-AUDIO</AllowedValue>
<AllowedValue>DAT</AllowedValue>
<AllowedValue>LD</AllowedValue>
<AllowedValue>HDD</AllowedValue>
<AllowedValue>MICRO-MV</AllowedValue>
<AllowedValue>NETWORK</AllowedValue>
<AllowedValue>NOE</AllowedValue>
```

```
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="RecordStorageMedium" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>UNKNOWN</AllowedValue>
<AllowedValue>DV</AllowedValue>
<AllowedValue>MINI-DV</AllowedValue>
<AllowedValue>VHS</AllowedValue>
<AllowedValue>W-VHS</AllowedValue>
<AllowedValue>S-VHS</AllowedValue>
<AllowedValue>D-VHS</AllowedValue>
<AllowedValue>VHSC</AllowedValue>
<AllowedValue>VIDEO8</AllowedValue>
<AllowedValue>HI8</AllowedValue>
<AllowedValue>CD-ROM</AllowedValue>
<AllowedValue>CD-DA</AllowedValue>
<AllowedValue>CD-R</AllowedValue>
<AllowedValue>CD-RW</AllowedValue>
<AllowedValue>VIDEO-CD</AllowedValue>
<AllowedValue>SACD</AllowedValue>
<AllowedValue>MD-AUDIO</AllowedValue>
<AllowedValue>MD-PICTURE</AllowedValue>
<AllowedValue>DVD-ROM</AllowedValue>
<AllowedValue>DVD-VIDEO</AllowedValue>
<AllowedValue>DVD-R</AllowedValue>
<AllowedValue>DVD+RW</AllowedValue>
<AllowedValue>DVD-RW</AllowedValue>
<AllowedValue>DVD-RAM</AllowedValue>
<AllowedValue>DVD-AUDIO</AllowedValue>
<AllowedValue>DAT</AllowedValue>
<AllowedValue>LD</AllowedValue>
<AllowedValue>HDD</AllowedValue>
<AllowedValue>MICRO-MV</AllowedValue>
<AllowedValue>NETWORK</AllowedValue>
<AllowedValue>NOE</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="PossiblePlaybackStorageMedia" datatype="string" sendEvents="no"/>
<StateVariable name="PossibleRecordStorageMedia" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentPlayMode" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>NORMAL</AllowedValue>
<AllowedValue>SHUFFLE</AllowedValue>
<AllowedValue>REPEAT_ONE</AllowedValue>
<AllowedValue>REPEAT_ALL</AllowedValue>
```

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```

<AllowedValue>RANDOM</AllowedValue>
<AllowedValue>DIRECT_1</AllowedValue>
<AllowedValue>INTRO</AllowedValue>
</AllowedValueList>
<DefaultValue>NORMAL</DefaultValue>
</StateVariable>
<StateVariable name="TransportPlaySpeed" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>1</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="RecordMediumWriteStatus" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>WRITABLE</AllowedValue>
<AllowedValue>PROTECTED</AllowedValue>
<AllowedValue>NOT_WRITABLE</AllowedValue>
<AllowedValue>UNKNOWN</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="CurrentRecordQualityMode" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>0:EP</AllowedValue>
<AllowedValue>1:LP</AllowedValue>
<AllowedValue>2:SP</AllowedValue>
<AllowedValue>0:BASIC</AllowedValue>
<AllowedValue>1:MEDIUM</AllowedValue>
<AllowedValue>2:HIGH</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="PossibleRecordQualityModes" datatype="string" sendEvents="no"/>
<StateVariable name="NumberOfTracks" datatype="unsignedInt" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Maximum> vendor-defined </Maximum>
</AllowedValueRange>
</StateVariable>
<StateVariable name="CurrentTrack" datatype="unsignedInt" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Maximum> vendor-defined </Maximum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="CurrentTrackDuration" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentMediaDuration" datatype="string" sendEvents="no"/>

```

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```

<StateVariable name="CurrentTrackMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentTrackURI" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransportURI" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransportURIMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="NextAVTransportURI" datatype="string" sendEvents="no"/>
<StateVariable name="NextAVTransportURIMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="RelativeTimePosition" datatype="string" sendEvents="no"/>
<StateVariable name="AbsoluteTimePosition" datatype="string" sendEvents="no"/>
<StateVariable name="RelativeCounterPosition" datatype="integer" sendEvents="no"/>
<StateVariable name="AbsoluteCounterPosition" datatype="integer" sendEvents="no"/>
<StateVariable name="CurrentTransportActions" datatype="string" sendEvents="no"/>
<StateVariable name="LastChange" datatype="string" sendEvents="yes"/>
<StateVariable name="A_ARG_TYPE_SeekMode" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>ABS_TIME</AllowedValue>
    <AllowedValue>REL_TIME</AllowedValue>
    <AllowedValue>ABS_COUNT</AllowedValue>
    <AllowedValue>REL_COUNT</AllowedValue>
    <AllowedValue>TRACK_NR</AllowedValue>
    <AllowedValue>CHANNEL_FREQ</AllowedValue>
    <AllowedValue>TAPE-INDEX</AllowedValue>
    <AllowedValue>FRAME</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_SeekTarget" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_InstanceID" datatype="unsignedInt" sendEvents="no"/>
</StateVariableList>
<ServiceList>
  <Service name="GetSearchCapabilities"
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSearchCapabilities"/>
  <Service name="GetSortCapabilities"
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSortCapabilities"/>
  <Service name="GetSystemUpdateID"
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSystemUpdateID"/>
  <Service name="Browse"
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Browse"/>
    <Service name="Search"
      type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Search"/>
    <Service name="CreateObject"
      type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateObject"/>
    <Service name="DestroyObject"
      type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DestroyObject"/>
    <Service name="UpdateObject"
      type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/UpdateObject"/>
    <Service name="ImportResource"
      type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ImportResource"/>
    <Service name="ExportResource"
  
```

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```

type= "http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ExportResource"/>
<Service name="StopTransferResource"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/StopTransferResource"/>
<Service name="GetTransferProgress"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransferProgress"/>
<Service name="DeleteResource"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DeleteResource"/>
<Service name="CreateReference"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateReference"/>
<Service name="GetProtocolInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetProtocolInfo"/>
<Service name="PrepareForConnection"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/PrepareForConnection"/>
<Service name="ConnectionComplete"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ConnectionComplete"/>
<Service name="GetCurrentConnectionIDs"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionIDs"/>
<Service name="GetCurrentConnectionInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionInfo"/>
<Service name="SetAVTransportURI"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetAVTransportURI"/>
<Service name="SetNextAVTransportURI"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetNextAVTransportURI"/>
<Service name="GetMediaInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetMediaInfo"/>
<Service name="GetTransportInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportInfo"/>
<Service name="GetPositionInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetPositionInfo"/>
<Service name="GetDeviceCapabilities"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetDeviceCapabilities"/>
<Service name="GetTransportSettings"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportSettings"/>
<Service name="Stop" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Stop"/>
<Service name="Play" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Play"/>
<Service name="Pause"
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Pause"/>
<Service name="Record"
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Record"/>
<Service name="Seek" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Seek"/>
<Service name="Next" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Next"/>
<Service name="Previous"
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Previous"/>
<Service name="SetPlayMode"
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetPlayMode"/>
<Service name="SetRecordQualityMode"
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetRecordQualityMode"/>

```

```
<Service name="GetCurrentTransportActions"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentTransportActions"/>
<Service name="ContentDownload"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentDownload"/>
<Service name="ContentUpload"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentUpload"/>
<Service name="QueryStateVariable"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/QueryStateVariable"/>
<Service name="GetIcon"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetIcon"/>
</ServiceList>
<PrimitiveDeviceList/>
</Device>
```

6.5.2. Service Metadata

The metadata templates of the services that media server devices have are shown below.

(1)GetSearchCapabilities service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSearchCapabilities"
    name="GetSearchCapabilities">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="SearchCaps" relatedStateVariable="SearchCapabilities"/>
  </OutputParameterList>
</Service>
```

(2)GetSortCapabilities service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSortCapabilities"
    name="GetSortCapabilities">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="SortCaps" relatedStateVariable="SortCapabilities"/>
  </OutputParameterList>
</Service>
```

(3)GetSystemUpdateID service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetSystemUpdateID"
    name="GetSystemUpdateID">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="Id" relatedStateVariable="SystemUpdateID"/>
  </OutputParameterList>
</Service>
```

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(4)Browse service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Browse"
    name="Browse">
    <InputParameterList>
        <Parameter name="ObjectID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="BrowseFlag" relatedStateVariable="A_ARG_TYPE_BrowseFlag"/>
        <Parameter name="Filter" relatedStateVariable="A_ARG_TYPE_Filter"/>
        <Parameter name="StartingIndex" relatedStateVariable="A_ARG_TYPE_Index"/>
        <Parameter name="RequestedCount" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="SortCriteria" relatedStateVariable="A_ARG_TYPE_SortCriteria"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="Result" relatedStateVariable="A_ARG_TYPE_Result"/>
        <Parameter name="NumberReturned" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="TotalMatches" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="UpdateID" relatedStateVariable="A_ARG_TYPE_UpdateID"/>
    </OutputParameterList>
</Service>
```

(5)Search service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Search"
    name="Search">
    <InputParameterList>
        <Parameter name="ContainerID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="SearchCriteria" relatedStateVariable="A_ARG_TYPE_SearchCriteria"/>
        <Parameter name="Filter" relatedStateVariable="A_ARG_TYPE_Filter"/>
        <Parameter name="StartingIndex" relatedStateVariable="A_ARG_TYPE_Index"/>
        <Parameter name="RequestedCount" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="SortCriteria" relatedStateVariable="A_ARG_TYPE_SortCriteria"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="Result" relatedStateVariable="A_ARG_TYPE_Result"/>
        <Parameter name="NumberReturned" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="TotalMatches" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="UpdateID" relatedStateVariable="A_ARG_TYPE_UpdateID"/>
    </OutputParameterList>
</Service>
```

(6)CreateObject service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateObject"
    name="CreateObject">
    <InputParameterList>
        <Parameter name="ContainerID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="Elements" relatedStateVariable="A_ARG_TYPE_Result"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="ObjectID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="Result" relatedStateVariable="A_ARG_TYPE_Result"/>
    </OutputParameterList>
</Service>
```

(7)DestroyObject service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DestroyObject"
    name="DestroyObject">
    <InputParameterList>
        <Parameter name="ObjectID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(8)UpdateObject service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/UpdateObject"
    name="UpdateObject">
    <InputParameterList>
        <Parameter name="ObjectID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="CurrentTagValue"
            relatedStateVariable="A_ARG_TYPE_TagValueList"/>
        <Parameter name="NewTagValue" relatedStateVariable="A_ARG_TYPE_TagValueList"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(9)ImportResource service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ImportResource"
    name="ImportResource">
    <InputParameterList>
        <Parameter name="SourceURI" relatedStateVariable="A_ARG_TYPE_URI"/>
        <Parameter name="DestinationURI" relatedStateVariable="A_ARG_TYPE_URI"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="TransferID" relatedStateVariable="A_ARG_TYPE_TransferID"/>
    </OutputParameterList>
</Service>
```

(10)ExportResource service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ExportResource"
    name="ExportResource">
    <InputParameterList>
        <Parameter name="SourceURI" relatedStateVariable="A_ARG_TYPE_URI"/>
        <Parameter name="DestinationURI" relatedStateVariable="A_ARG_TYPE_URI"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="TransferID" relatedStateVariable="A_ARG_TYPE_TransferID"/>
    </OutputParameterList>
</Service>
```

(11)StopTransferResource service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/StopTransferResource"
    name="StopTransferResource">
    <InputParameterList>
        <Parameter name="TransferID" relatedStateVariable="A_ARG_TYPE_TransferID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(12)GetTransferProgress service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransferProgress"
    name="GetTransferProgress">
  <InputParameterList>
    <Parameter name="TransferID" relatedStateVariable="A_ARG_TYPE_TransferID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="TransferStatus" relatedStateVariable="A_ARG_TYPE_TransferStatus"/>
    <Parameter name="TransferLength"
      relatedStateVariable="A_ARG_TYPE_TransferLength"/>
    <Parameter name="TransferTotal" relatedStateVariable="A_ARG_TYPE_TransferTotal"/>
  </OutputParameterList>
</Service>
```

(13)DeleteResource service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/DeleteResource"
  name="DeleteResource">
  <InputParameterList>
    <Parameter name="ResourceURI" relatedStateVariable="A_ARG_TYPE_URI"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(14)CreateReference service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/CreateReference"
  name="CreateReference">
  <InputParameterList>
    <Parameter name="ContainerID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
    <Parameter name="ObjectID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="NewID" relatedStateVariable="A_ARG_TYPE_ObjectID"/>
  </OutputParameterList>
</Service>
```

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(15)GetProtocolInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetProtocolInfo"
    name="GetProtocolInfo">
    <InputParameterList/>
    <OutputParameterList>
        <Parameter name="Source" relatedStateVariable="SourceProtocolInfo"/>
        <Parameter name="Sink" relatedStateVariable="SinkProtocolInfo"/>
    </OutputParameterList>
</Service>
```

(16)PrepareForConnection service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/PrepareForConnection"
    name="PrepareForConnection">
    <InputParameterList>
        <Parameter name="RemoteProtocolInfo"
            relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
        <Parameter name="PeerConnectionManager"
            relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
        <Parameter name="PeerConnectionID"
            relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
        <Parameter name="Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
        <Parameter name="AVTransportID"
            relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
        <Parameter name="RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
    </OutputParameterList>
</Service>
```

(17)ConnectionComplete service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ConnectionComplete"
    name="ConnectionComplete">
    <InputParameterList>
        <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
    </InputParameterList>
    <OutputParameterList/>
```

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```
</Service>
```

(18)GetCurrentConnectionIDs service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionIDs"
    name="GetCurrentConnectionIDs">
  <InputParameterList>
  <OutputParameterList>
    <Parameter name="ConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
  </OutputParameterList>
</Service>
```

(19)GetCurrentConnectionInfo service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionInfo"
    name="GetCurrentConnectionInfo">
  <InputParameterList>
    <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
    <Parameter name="AVTransportID"
      relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
    <Parameter name="ProtocolInfo" relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
    <Parameter name="PeerConnectionManager"
      relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
    <Parameter name="PeerConnectionID"
      relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
    <Parameter name="Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
    <Parameter name="Status" relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
  </OutputParameterList>
</Service>
```

(20)SetAVTransportURI service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetAVTransportURI"
  name="SetAVTransportURI">
  <InputParameterList>
    <Parameter name="InstanceId" relatedStateVariable="A_ARG_TYPE_InstanceId"/>
    <Parameter name="CurrentURI" relatedStateVariable="AVTransportURI"/>
    <Parameter name="CurrentURIMetaData"
```

```
relatedStateVariable="AVTransportURIMetaData"/>
</InputParameterList>
<OutputParameterList/>
</Service>
```

(21)SetNextAVTransportURI service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetNextAVTransportURI"
    name="SetNextAVTransportURI">
  <InputParameterList>
    <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    <Parameter name="NextURI" relatedStateVariable="NextAVTransportURI"/>
    <Parameter name="NextURIMetaData"
      relatedStateVariable="NextAVTransportURIMetaData"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(22)GetMediaInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetMediaInfo"
  name="GetMediaInfo">
  <InputParameterList>
    <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="NrTracks" relatedStateVariable="NumberOfTracks"/>
    <Parameter name="MediaDuration" relatedStateVariable="CurrentMediaDuration"/>
    <Parameter name="CurrentURI" relatedStateVariable="AVTransportURI"/>
    <Parameter name="CurrentURIMetaData"
      relatedStateVariable="AVTransportURIMetaData"/>
    <Parameter name="NextURI" relatedStateVariable="NextAVTransportURI"/>
    <Parameter name="NextURIMetaData"
      relatedStateVariable="NextAVTransportURIMetaData"/>
    <Parameter name="PlayMedium" relatedStateVariable="PlaybackStorageMedium"/>
    <Parameter name="RecordMedium" relatedStateVariable="RecordStorageMedium"/>
    <Parameter name="WriteStatus" relatedStateVariable="RecordMediumWriteStatus"/>
  </OutputParameterList>
</Service>
```

(23)GetTransportInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportInfo"
         name="GetTransportInfo">
  <InputParameterList>
    <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentTransportState" relatedStateVariable="TransportState"/>
    <Parameter name="CurrentTransportStatus" relatedStateVariable="TransportStatus"/>
    <Parameter name="CurrentSpeed" relatedStateVariable="TransportPlaySpeed"/>
  </OutputParameterList>
</Service>
```

(24)GetPositionInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetPositionInfo"
         name="GetPositionInfo">
  <InputParameterList>
    <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="Track" relatedStateVariable="CurrentTrack"/>
    <Parameter name="TrackDuration" relatedStateVariable="CurrentTrackDuration"/>
    <Parameter name="TrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
    <Parameter name="TrackURI" relatedStateVariable="CurrentTrackURI"/>
    <Parameter name="RelTime" relatedStateVariable="RelativeTimePosition"/>
    <Parameter name="AbsTime" relatedStateVariable="AbsoluteTimePosition"/>
    <Parameter name="RelCount" relatedStateVariable="RelativeCounterPosition"/>
    <Parameter name="AbsCount" relatedStateVariable="AbsoluteCounterPosition"/>
  </OutputParameterList>
</Service>
```

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(25)GetDeviceCapabilities service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetDeviceCapabilities"
    name="GetDeviceCapabilities">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="PlayMedia" relatedStateVariable="PossiblePlaybackStorageMedia"/>
        <Parameter name="RecMedia" relatedStateVariable="PossibleRecordStorageMedia"/>
        <Parameter name="RecQualityModes"
relatedStateVariable="PossibleRecordQualityModes"/>
    </OutputParameterList>
</Service>
```

(26)GetTransportSettings service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportSettings"
    name="GetTransportSettings">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="PlayMode" relatedStateVariable="CurrentPlayMode"/>
        <Parameter name="RecQualityMode" relatedStateVariable="CurrentRecordQualityMode"/>
    </OutputParameterList>
</Service>
```

(27)Stop service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Stop"
name="Stop">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(28)Play service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Play"
name="Play">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
        <Parameter name="Speed" relatedStateVariable="TransportPlaySpeed"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(29)Pause service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Pause"
name="Pause">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(30)Record service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Record"
name="Record">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(31)Seek service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Seek"
name="Seek">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
        <Parameter name="Unit" relatedStateVariable="A_ARG_TYPE_SeekMode"/>
        <Parameter name="Target" relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(32)Next service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Next"
name="Next">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(33)Previous service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Previous"
name="Previous">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(34)SetPlayMode service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetPlayMode"
name="SetPlayMode">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
        <Parameter name="NewPlayMode" relatedStateVariable="CurrentPlayMode"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(35)SetRecordQualityMode service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetRecordQualityMode"
name="SetRecordQualityMode">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
        <Parameter name="NewRecordQualityMode"
relatedStateVariable="CurrentRecordQualityMode"/>
    </InputParameterList>
```

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```
<OutputParameterList/>
</Service>
```

(36)GetCurrentTransportActions service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentTransportActions
"
    name="GetCurrentTransportActions">
    <InputParameterList>
        <Parameter name="InstanceID" relatedStateVariable="A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="Actions" relatedStateVariable="CurrentTransportActions"/>
    </OutputParameterList>
</Service>
```

(37)ContentDownload service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentDownload"
    name="ContentDownload">
    <InputParameterList>
        <Parameter name="exportUri" datatype="anyURI"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="mimeType" datatype="string"/>
        <Parameter name="length" datatype="integer"/>
        <Parameter name="content" datatype="base64Binary"/>
    </OutputParameterList>
</Service>
```

(38)ContentUpload service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ContentUpload"
    name="ContentUpload">
    <InputParameterList>
        <Parameter name="importUri" datatype="anyURI"/>
        <Parameter name="mimeType" datatype="string"/>
        <Parameter name="length" datatype="integer"/>
        <Parameter name="content" datatype="base64Binary"/>
    </InputParameterList>
```

```
</InputParameterList>
<OutputParameterList/>
</Service>
```

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(39)QueryStateVariable service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/QueryStateVariable"
    name="QueryStateVariable">
    <InputParameterList>
        <Parameter name="TransferIDs" relatedStateVariable="TransferIDs"/>
        <Parameter name="A_ARG_TYPE_ObjectID"
            relatedStateVariable="A_ARG_TYPE_ObjectID"/>
        <Parameter name="A_ARG_TYPE_Result" relatedStateVariable="A_ARG_TYPE_Result"/>
        <Parameter name="A_ARG_TYPE_SearchCriteria"
            relatedStateVariable="A_ARG_TYPE_SearchCriteria"/>
        <Parameter name="A_ARG_TYPE_BrowseFlag"
            relatedStateVariable="A_ARG_TYPE_BrowseFlag"/>
        <Parameter name="A_ARG_TYPE_Filter" relatedStateVariable="A_ARG_TYPE_Filter"/>
        <Parameter name="A_ARG_TYPE_SortCriteria"
            relatedStateVariable="A_ARG_TYPE_SortCriteria"/>
        <Parameter name="A_ARG_TYPE_Index" relatedStateVariable="A_ARG_TYPE_Index"/>
        <Parameter name="A_ARG_TYPE_Count" relatedStateVariable="A_ARG_TYPE_Count"/>
        <Parameter name="A_ARG_TYPE_UpdateID"
            relatedStateVariable="A_ARG_TYPE_UpdateID"/>
        <Parameter name="A_ARG_TYPE_TransferID"
            relatedStateVariable="A_ARG_TYPE_TransferID"/>
        <Parameter name="A_ARG_TYPE_TransferStatus"
            relatedStateVariable="A_ARG_TYPE_TransferStatus"/>
        <Parameter name="A_ARG_TYPE_TransferLength"
            relatedStateVariable="A_ARG_TYPE_TransferLength"/>
        <Parameter name="A_ARG_TYPE_TransferTotal"
            relatedStateVariable="A_ARG_TYPE_TransferTotal"/>
        <Parameter name="A_ARG_TYPE_TagValueList"
            relatedStateVariable="A_ARG_TYPE_TagValueList"/>
        <Parameter name="A_ARG_TYPE_URI" relatedStateVariable="A_ARG_TYPE_URI"/>
        <Parameter name="SearchCapabilities" relatedStateVariable="SearchCapabilities"/>
        <Parameter name="SortCapabilities" relatedStateVariable="SortCapabilities"/>
        <Parameter name="SystemUpdateID" relatedStateVariable="SystemUpdateID"/>
        <Parameter name="ContainerUpdateIDs" relatedStateVariable="ContainerUpdateIDs"/>
        <Parameter name="SourceProtocolInfo" relatedStateVariable="SourceProtocolInfo"/>
        <Parameter name="SinkProtocolInfo" relatedStateVariable="SinkProtocolInfo"/>
        <Parameter name="CurrentConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
        <Parameter name="A_ARG_TYPE_ConnectionStatus"
            relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
        <Parameter name="A_ARG_TYPE_ConnectionManager"
            relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
        <Parameter name="A_ARG_TYPE_Direction"
            relatedStateVariable="A_ARG_TYPE_Direction"/>
        <Parameter name="A_ARG_TYPE_ProtocolInfo"
            relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
```

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```

<Parameter name="A_ARG_TYPE_ConnectionID"
    relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
<Parameter name="A_ARG_TYPE_AVTransportID"
    relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
<Parameter name="A_ARG_TYPE_RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
<Parameter name="TransportState" relatedStateVariable="TransportState"/>
<Parameter name="TransportStatus" relatedStateVariable="TransportStatus"/>
<Parameter name="PlaybackStorageMedium" relatedStateVariable="PlaybackStorageMedium"/>
<Parameter name="RecordStorageMedium" relatedStateVariable="RecordStorageMedium"/>
<Parameter name="PossiblePlaybackStorageMedia"
    relatedStateVariable="PossiblePlaybackStorageMedia"/>
<Parameter name="PossibleRecordStorageMedia"
    relatedStateVariable="PossibleRecordStorageMedia"/>
<Parameter name="CurrentPlayMode" relatedStateVariable="CurrentPlayMode"/>
<Parameter name="TransportPlaySpeed" relatedStateVariable="TransportPlaySpeed"/>
<Parameter name="RecordMediumWriteStatus"
    relatedStateVariable="RecordMediumWriteStatus"/>
<Parameter name="CurrentRecordQualityMode"
    relatedStateVariable="CurrentRecordQualityMode"/>
<Parameter name="PossibleRecordQualityModes"
    relatedStateVariable="PossibleRecordQualityModes"/>
<Parameter name="NumberOfTracks" relatedStateVariable="NumberOfTracks"/>
<Parameter name="CurrentTrack" relatedStateVariable="CurrentTrack"/>
<Parameter name="CurrentTrackDuration" relatedStateVariable="CurrentTrackDuration"/>
<Parameter name="CurrentMediaDuration" relatedStateVariable="CurrentMediaDuration"/>
<Parameter name="CurrentTrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
<Parameter name="CurrentTrackURI" relatedStateVariable="CurrentTrackURI"/>
<Parameter name="AVTransportURI" relatedStateVariable="AVTransportURI"/>
<Parameter name="AVTransportURIMetaData"
    relatedStateVariable="AVTransportURIMetaData"/>
<Parameter name="NextAVTransportURI" relatedStateVariable="NextAVTransportURI"/>
<Parameter name="NextAVTransportURIMetaData"
    relatedStateVariable="NextAVTransportURIMetaData"/>
<Parameter name="RelativeTimePosition" relatedStateVariable="RelativeTimePosition"/>
<Parameter name="AbsoluteTimePosition" relatedStateVariable="AbsoluteTimePosition"/>
<Parameter name="RelativeCounterPosition" relatedStateVariable="RelativeCounterPosition"/>
<Parameter name="AbsoluteCounterPosition" relatedStateVariable="AbsoluteCounterPosition"/>
<Parameter name="CurrentTransportActions" relatedStateVariable="CurrentTransportActions"/>
<Parameter name="LastChange" relatedStateVariable="LastChange"/>
<Parameter name="A_ARG_TYPE_SeekMode"
    relatedStateVariable="A_ARG_TYPE_SeekMode"/>
<Parameter name="A_ARG_TYPE_SeekTarget"
    relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
<Parameter name="A_ARG_TYPE_InstanceID"
    relatedStateVariable="A_ARG_TYPE_InstanceID"/>
</InputParameterList>
<OutputParameterList>

```

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```

<Parameter name="TransferIDs" relatedStateVariable="TransferIDs"/>
<Parameter name="A_ARG_TYPE_ObjectID"
    relatedStateVariable="A_ARG_TYPE_ObjectID"/>
<Parameter name="A_ARG_TYPE_Result" relatedStateVariable="A_ARG_TYPE_Result"/>
<Parameter name="A_ARG_TYPE_SearchCriteria"
    relatedStateVariable="A_ARG_TYPE_SearchCriteria"/>
<Parameter name="A_ARG_TYPE_BrowseFlag"
    relatedStateVariable="A_ARG_TYPE_BrowseFlag"/>
<Parameter name="A_ARG_TYPE_Filter" relatedStateVariable="A_ARG_TYPE_Filter"/>
<Parameter name="A_ARG_TYPE_SortCriteria"
    relatedStateVariable="A_ARG_TYPE_SortCriteria"/>
<Parameter name="A_ARG_TYPE_Index" relatedStateVariable="A_ARG_TYPE_Index"/>
<Parameter name="A_ARG_TYPE_Count" relatedStateVariable="A_ARG_TYPE_Count"/>
<Parameter name="A_ARG_TYPE_UpdateID"
    relatedStateVariable="A_ARG_TYPE_UpdateID"/>
<Parameter name="A_ARG_TYPE_TransferID"
    relatedStateVariable="A_ARG_TYPE_TransferID"/>
<Parameter name="A_ARG_TYPE_TransferStatus"
    relatedStateVariable="A_ARG_TYPE_TransferStatus"/>
<Parameter name="A_ARG_TYPE_TransferLength"
    relatedStateVariable="A_ARG_TYPE_TransferLength"/>
<Parameter name="A_ARG_TYPE_TransferTotal"
    relatedStateVariable="A_ARG_TYPE_TransferTotal"/>
<Parameter name="A_ARG_TYPE_TagValueList"
    relatedStateVariable="A_ARG_TYPE_TagValueList"/>
<Parameter name="A_ARG_TYPE_URI" relatedStateVariable="A_ARG_TYPE_URI"/>
<Parameter name="SearchCapabilities" relatedStateVariable="SearchCapabilities"/>
<Parameter name="SortCapabilities" relatedStateVariable="SortCapabilities"/>
<Parameter name="SystemUpdateID" relatedStateVariable="SystemUpdateID"/>
<Parameter name="ContainerUpdateIDs" relatedStateVariable="ContainerUpdateIDs"/>
<Parameter name="SourceProtocolInfo" relatedStateVariable="SourceProtocolInfo"/>
<Parameter name="SinkProtocolInfo" relatedStateVariable="SinkProtocolInfo"/>
<Parameter name="CurrentConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
<Parameter name="A_ARG_TYPE_ConnectionStatus"
    relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
<Parameter name="A_ARG_TYPE_ConnectionManager"
    relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
<Parameter name="A_ARG_TYPE_Direction"
    relatedStateVariable="A_ARG_TYPE_Direction"/>
<Parameter name="A_ARG_TYPE_ProtocolInfo"
    relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
<Parameter name="A_ARG_TYPE_ConnectionID"
    relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
<Parameter name="A_ARG_TYPE_AVTransportID"
    relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
<Parameter name="A_ARG_TYPE_RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
<Parameter name="TransportState" relatedStateVariable="TransportState"/>

```

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```

<Parameter name="TransportStatus" relatedStateVariable="TransportStatus"/>
<Parameter name="PlaybackStorageMedium" relatedStateVariable="PlaybackStorageMedium"/>
<Parameter name="RecordStorageMedium" relatedStateVariable="RecordStorageMedium"/>
<Parameter name="PossiblePlaybackStorageMedia"
           relatedStateVariable="PossiblePlaybackStorageMedia"/>
<Parameter name="PossibleRecordStorageMedia"
           relatedStateVariable="PossibleRecordStorageMedia"/>
<Parameter name="CurrentPlayMode" relatedStateVariable="CurrentPlayMode"/>
<Parameter name="TransportPlaySpeed" relatedStateVariable="TransportPlaySpeed"/>
<Parameter name="RecordMediumWriteStatus"
           relatedStateVariable="RecordMediumWriteStatus"/>
<Parameter name="CurrentRecordQualityMode"
           relatedStateVariable="CurrentRecordQualityMode"/>
<Parameter name="PossibleRecordQualityModes"
           relatedStateVariable="PossibleRecordQualityModes"/>
<Parameter name="NumberOfTracks" relatedStateVariable="NumberOfTracks"/>
<Parameter name="CurrentTrack" relatedStateVariable="CurrentTrack"/>
<Parameter name="CurrentTrackDuration" relatedStateVariable="CurrentTrackDuration"/>
<Parameter name="CurrentMediaDuration" relatedStateVariable="CurrentMediaDuration"/>
<Parameter name="CurrentTrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
<Parameter name="CurrentTrackURI" relatedStateVariable="CurrentTrackURI"/>
<Parameter name="AVTransportURI" relatedStateVariable="AVTransportURI"/>
<Parameter name="AVTransportURIMetaData"
           relatedStateVariable="AVTransportURIMetaData"/>
<Parameter name="NextAVTransportURI" relatedStateVariable="NextAVTransportURI"/>
<Parameter name="NextAVTransportURIMetaData"
           relatedStateVariable="NextAVTransportURIMetaData"/>
<Parameter name="RelativeTimePosition" relatedStateVariable="RelativeTimePosition"/>
<Parameter name="AbsoluteTimePosition" relatedStateVariable="AbsoluteTimePosition"/>
<Parameter name="RelativeCounterPosition" relatedStateVariable="RelativeCounterPosition"/>
<Parameter name="AbsoluteCounterPosition" relatedStateVariable="AbsoluteCounterPosition"/>
<Parameter name="CurrentTransportActions" relatedStateVariable="CurrentTransportActions"/>
<Parameter name="LastChange" relatedStateVariable="LastChange"/>
<Parameter name="A_ARG_TYPE_SeekMode"
           relatedStateVariable="A_ARG_TYPE_SeekMode"/>
<Parameter name="A_ARG_TYPE_SeekTarget"
           relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
<Parameter name="A_ARG_TYPE_InstanceID"
           relatedStateVariable="A_ARG_TYPE_InstanceID"/>
</OutputParameterList>
</Service>

```

(40)GetIcon service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetIcon"
name="GetIcon">
    <InputParameterList>
        <Parameter name="url" datatype="string"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="mimeType" datatype="string"/>
        <Parameter name="base64Data" datatype="base64Binary"/>
    </OutputParameterList>
</Service>
```

7. Media Renderer Devices

This chapter defines the PUCC metadata for media renderer devices.

7.1. Device Model

Media renderer devices adopt the device model as shown below.

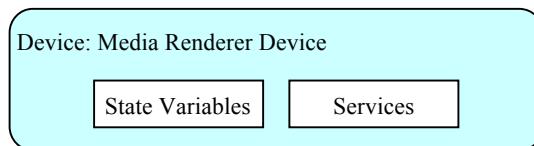


Figure 7.1-1 Media renderer device model

7.2. Device Type

The device type identifier of media renderer devices is shown below.

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer>

7.3. State Variables

A list of media renderer device state variables is shown below.

Table 7.3-1 Media renderer device state variables

	State Variable Name	Description	Data Type	Event Generation (Yes/No)
1	RenderingControl _LastChange	This variable is used exclusively for eventing purposes to allow clients to receive meaningful event notifications whenever the state of the device changes. The LastChange state variable identifies all of the state variables that have changed since the last time the LastChange state variable was evented.	string	Yes
2	PresetNameList	This variable contains a comma-separated list of valid preset names currently supported by this device. Its value changes if/when the device changes the set of presets that it supports. This may occur in conjunction with a vendor-defined action or some other No-UPnP event. This state variable will include any of the predefined presets that are supported by the device.	string	No
3	Brightness	This unsigned integer variable represents the current brightness setting of the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the brightness of the display's output.	unsigned Short	No
4	Contrast	This unsigned integer variable represents the current contrast setting of the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the contrast of the display's output.	unsigned Short	No
5	Sharpness	This unsigned integer variable represents the current sharpness setting of the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values accentuate fine detail.	unsigned Short	No

6	RedVideoGain	This unsigned integer variable represents the current setting of the red “gain” control for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the intensity of red in the display’s output.	unsigned Short	No
7	GreenVideoGain	This unsigned integer variable represents the current setting of the green “gain” control for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the intensity of green in the display’s output.	unsigned Short	No
8	BlueVideoGain	This unsigned integer variable represents the current setting of the blue “gain” control for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the intensity of blue in the display’s output.	unsigned Short	No
9	RedVideoBlackLevel	This unsigned integer variable represents the current setting for the minimum output intensity of red for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the minimum output intensity of red in the display’s output.	unsigned Short	No
10	GreenVideoBlackLevel	This unsigned integer variable represents the current setting for the minimum output intensity of green for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the minimum output intensity of green in the display’s output.	unsigned Short	No

11	BlueVideoBlackLevel	This unsigned integer variable represents the current setting for the minimum output intensity of blue for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Higher values increase the minimum output intensity of blue in the display's output.	unsigned Short	No
12	ColorTemperature	This unsigned integer variable represents the current setting for the “color quality” of white for the associated display device. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device Lower values produce “warmer” shades of white (e.g. biased towards yellow/orange) and higher values produce “cooler” shades of white (e.g. biased towards blue).	unsigned Short	No
13	HorizontalKeystone	This signed integer variable represents the current level of compensation for horizontal distortion of the associated display device. Its value ranges from device-specific negative number to a device specific positive number. Zero does not need to be in the middle of this range, although it will be for most devices. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device.	short	No
14	VerticalKeystone	This signed integer variable represents the current level of compensation for vertical distortion of the associated display device. Its value ranges from device-specific negative number to a device specific positive number. Zero does not need to be in the middle of this range, although it will be for most devices. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device.	short	No
15	Mute	This boolean variable represents the current “mute” setting of the associated audio channel. A value of TRUE (e.g. a numerical value of 1) indicates that the output of the associated audio channel is currently muted (i.e. that channel is not producing any sound).	boolean	No

16	Volume	This unsigned integer variable represents the current volume setting of the associated audio channel. Its value ranges from a minimum of 0 to some device specific maximum. A numerical change of 1 corresponds to the smallest incremental change that is supported by the device. Lower values produce a quieter sound and higher values produce a louder sound. A value of 0 represents complete silence and a value of 1 represents the quietest level of sound supported by the device for that channel.	unsigned Short	No
17	VolumeDB	This signed integer variable represents the current volume setting of the associated audio channel. Its value represents the current setting in units of 1/256 dB. This means that a numeric change of 1 corresponds to a volume change of 1/256 dB. The value range for this variable is a minimum value of -32,767 (which equals -127.9961dB) and a maximum value of +32,767 (which equals +127.9961dB). Lower values (including negative values) produce a quieter sound and larger values produce a louder sound. Setting the volume to the minimum value supported by the device produces complete silence on that channel.	short	No
18	Loudness	This boolean variable represents the current "loudness" setting of the associated audio channel. A value of TRUE (e.g. a numerical value of 1) indicates that the loudness effect is active.	boolean	No
19	A_ARG_TYPE_Channel	This variable is used to identify a particular channel of an audio output stream. A channel, except the Master channel, is associated with the location of the speaker where the audio data stream is to be presented.	string	No
20	RenderingControl_A_ARG_TYPE_InstanceID	This signed integer parameter is used to specify the logical instance of the Rendering Control Service to which the associated action should be applied. A value of '0' indicates that the action should be applied to the global stream.	unsigned Int	No
21	A_ARG_TYPE_PresetName	This string parameter is used to specify the name of a device preset. This may include any of the names listed in the PresetNameList state variable or any of the predefined presets that are supported by the device.	string	No

22	SourceProtocolInfo	This variable contains a comma-separated list of information protocols this ConnectionManager supports for sending data, in its current state. Besides the traditional notion of the term ‘protocol’, the protocol-related information provided by the connection also contains other information such as supported content formats.	string	Yes
23	SinkProtocolInfo	This variable contains a comma-separated list of information protocols this ConnectionManager supports for “sinking” (receiving) data, in its current state. The format and allowed value list are the same as for the SourceProtocolInfo state variable.	string	Yes
24	CurrentConnectionIDs	Comma-separated list of references to current active Connections. This list may change without explicit actions invoked by Control points, for example, by out-of-band cleanup or termination of finished connections.	string	Yes
25	A_ARG_TYPE_ConnectionStatus	The current status of the Connection referred to by variable A_ARG_TYPE_ConnectionID. This status may change dynamically due to changes in the network.	string	No
26	A_ARG_TYPE_ConnectionManager	This state variable is introduced to provide type information for the “PeerConnectionManager” parameter in actions PrepareForConnection and GetCurrentConnectionInfo. A ConnectionManager reference takes the form of a UDN/Service-Id pair (the slash is the delimiter). A control point can use UPnP discovery (SSDP) to obtain a ConnectionManager’s description document from the UDN. Subsequently, the ConnectionManager’s service description can be obtained by using the serviceId part of the reference.	string	No
27	A_ARG_TYPE_Direction	This state variable is introduced to provide type information for the “Direction” parameter in action PrepareForConnection.	string	No
28	A_ARG_TYPE_ProtocolInfo	This state variable is introduced to provide type information for the “Protocol” parameter in actions PrepareForConnection and GetCurrentConnectionInfo.	string	No
29	A_ARG_TYPE_ConnectionID	This state variable is introduced to provide type information for the “ConnectionID” parameter in actions: PrepareForConnection, ConnectionComplete and GetCurrentConnectionInfo.	integer	No

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30	A_ARG_TYPE _AVTransportID	This state variable is introduced to provide type information for the “AVTransportID” parameter in actions: PrepareForConnection and GetCurrentConnectionInfo. It identifies a logical instance of the AVTransport service associated with a Connection.	integer	No
31	A_ARG_TYPE _RcsID	This state variable is introduced to provide type information for the “RcsID” parameter in actions: PrepareForConnection and GetCurrentConnectionInfo. It identifies a logical instance of the Rendering Control service associated with a Connection.	integer	No
32	TransportState	This state variable forms the ‘core’ of the AVTransport service. It defines the conceptually ‘top-level’ state of the transport, e.g., whether it is playing, recording, etc. Device vendors do not need to implement all allowed values of this variable, e.g., No-recordable media will not implement the RECORDING state.	string	No
33	TransportStatus	The TransportState after an error has occurred is implementation-dependent; some implementations may go to “STOPPED” while other implementations may be able to continue playing after an error. The time at which this state variable returns to “OK” after an error situation is also implementation dependent.	string	No
34	Playback StorageMedium	Indicates the storage medium of the resource specified by AVTransportURI.	string	No
35	Record StorageMedium	Indicates the storage medium where the resource specified by AVTransportURI will be recorded when a Record action is issued. If no resource is specified, then the state variable is set to “NOE”. Device vendors may extend the allowed value list of this variable.	string	No
36	PossiblePlayback StorageMedia	Contains a static, comma-separated list of storage media that the device can play. Recommended values are defined in the allowed value list for variable PlaybackStorageMedium.	string	No
37	PossibleRecord StorageMedia	Contains a static, comma-separated list of storage media onto which the device can record. Recommended values are defined in the allowed value list for variable RecordStorageMedium. If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No

38	CurrentPlayMode	Indicates the current play mode. This notion is typical for CD-based audio media, but is generally not supported by tape-based media.	string	No
39	TransportPlaySpeed	String representation of a rational fraction, indicates the speed relative to normal speed. Example values are ‘1’, ‘1/2’, ‘2’, ‘-1’, ‘1/10’, etc. Actually supported speeds can be retrieved from the AllowedValueList of this state variable in the AVTransport service description. Value ‘1’ is required, value ‘0’ is not allowed.	string	No
40	RecordMedium WriteStatus	Write protection status of currently loaded media.	string	No
41	CurrentRecord QualityMode	Indicates the currently set record quality mode. Such a setting takes the form of “Quality Ordinal:label”. The Quality Ordinal indicates a particular relative quality level available in the device, from 0 (lowest quality) to n (highest quality). The label associated with the ordinal provides a human-readable indication of the ordinal’s meaning.	string	No
42	PossibleRecord QualityModes	Contains a static, comma-separated list of recording quality modes that the device supports. For example, for an analog VHS recorder, the string would be “0:EP,1:LP,2:SP”, while for a PVR the string would be “0:BASIC,1:MEDIUM,2:HIGH”. The string specifics depend on the type of device containing the AVTransport. If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
43	NumberOfTracks	Number of tracks controlled by the AVTransport instance. If no resource is associated with the AVTransport instance (via SetAVTransportURI), and there is no ‘default’ resource (for example, a loaded disc) then NumberOfTracks shall be 0. Otherwise, it shall be 1 or higher.	unsigned Int	No
44	CurrentTrack	If NumberOfTracks is 0, then CurrentTrack will be 0. Otherwise, this state variable will contain the sequence number of the currently selected track, starting at value ‘1’, up to and including NumberOfTracks.	unsigned Int	No

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45	CurrentTrackDuration	<p>Duration of the current track, specified as a string of the following form: H+:MM:SS[.F+] or H+:MM:SS[.F0/F1]</p> <p>where :</p> <ul style="list-style-type: none"> • H+ means one or more digits to indicate elapsed hours • MM means exactly 2 digits to indicate minutes (00 to 59) • SS means exactly 2 digits to indicate seconds (00 to 59) • [.F+] means optionally a dot followed by one or more digits to indicate fractions of seconds • [.F0/F1] means optionally a dot followed by a fraction, with F0 and F1 at least one digit long, and F0 < F1 <p>If the service implementation doesn't support track duration information then this state variable must be set to value "NOT_IMPLEMENTED".</p>	string	No
46	CurrentMediaDuration	<p>Duration of the media, as identified by state variable AVTransportURI. The format of this variable is the same as the format for CurrentTrackDuration, described above. If no content is associated with the AVTransport instance, and there is no 'default' content then CurrentMediaDuration shall be "00:00:00". If the service implementation doesn't support media duration information then this state variable must be set to value "NOT_IMPLEMENTED".</p>	string	No
47	CurrentTrackMetaData	<p>Metadata, in the form of a valid DIDL-Lite XML fragment , associated with the resource pointed to by state variable CurrentTrackURI. The meta data may have been extracted from state variable AVTransportURIMetaData, or extracted from the resource binary itself. If the service implementation doesn't support this feature then this state variable must be set to value "NOT_IMPLEMENTED".</p>	string	No
48	CurrentTrackURI	<p>Reference, in the form of a URI, to the current track. The URI enables a control point to retrieve any meta data associated with current track, such as, for example, title and author information, via the ContentDirectory service.</p>	string	No

49	AVTransportURI	Reference, in the form of a URI of the resource controlled by the AVTransport instance. This URI may refer to a ‘single’ item or to a collection of items. In the single item case, the AVTransport will have 1 ‘track’ and AVTransportURI is equal to CurrentTrackURI. In the ‘collection of items’ case, the AVTransport will have multiple tracks, and AVTransportURI will remain constant during track changes.	string	No
50	AVTransportURI MetaData	Metadata, in the form of a DIDL-Lite XML fragment, associated with the resource pointed to by state variable AVTransportURI. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
51	NextAVTransportURI	AVTransportURI value to be played when the playback of the current AVTransportURI finishes. Setting this variable ahead of time enables a device to provide seamless transitions between resources for certain streaming protocols that need buffering. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
52	NextAVTransportURI MetaData	Metadata, in the form of a DIDL-Lite XML fragment, associated with the resource pointed to by state variable NextAVTransportURI. If the service implementation doesn’t support this feature then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
53	RelativeTimePosition	This state variable contains the current position, in terms of time, from the beginning of the current track. The time format is the same as for state variable CurrentTrackDuration. If the service implementation doesn’t support relative time-based position information then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No
54	AbsoluteTimePosition	This state variable contains the current position, in terms of a time, from the beginning of the media. The time format is the same as for state variable CurrentTrackDuration. If the service implementation doesn’t support any kind of position information then this state variable must be set to value “NOT_IMPLEMENTED”.	string	No

55	Relative CounterPosition	This state variable contains the current position, in terms of a dimensionless counter, from the beginning of the current track. If the service implementation doesn't support relative count-based position information then this state variable must be set to the maximum value of the i4 data type.	integer	No
56	Absolute CounterPosition	This state variable contains the current position, in terms of a dimensionless counter, from the beginning of the loaded media. If the service implementation doesn't support absolute count-based position information then this state variable must be set to the maximum value of the i4 data type.	integer	No
57	Current TransportActions	This state variable contains a comma-separated list of transport-controlling actions that can be successfully invoked for the current resource at this specific point in time. The list will contain a subset of the following actions: Play, Stop, Pause, Seek, Next, Previous and Record.	string	No
58	AVTransport _LastChange	This variable is used for eventing purposes to allow clients to receive meaningful event notifications whenever the state of the AVTransport changes. Logically, it contains a list of pairs, one element being an AVTransport instance ID and the second element the name and new value of the state variable for that instance.	string	Yes
59	A_ARG_TYPE _SeekMode	This state variable is introduced to provide type information for the "seek mode" parameter in action "Seek". It indicates the allowed units in which the amount of seeking to be performed is specified. A device vendor is allowed to implement a subset of the allowed value list of this state variable. Only value 'TRACK_NR' is required.	string	No
60	A_ARG_TYPE _SeekTarget	This state variable is introduced to provide type information for the "target" parameter in action "Seek". It indicates the target position of the seek action, in terms of units defined by state variable A_ARG_TYPE_SeekMode.	string	No
61	AVTransport _A_ARG_TYPE _InstanceID	This state variable is introduced to provide type information for the "InstanceId" input parameter present in all AVTransport actions. It identifies the virtual instance of the AVTransport service to which the action applies.	unsigned Int	No

Table 7.3-2 Values indicating A_ARG_TYPE_Channel

	Value	Meaning
1	Master	Master.
2	LF	Left Front.
3	RF	Right Front.
4	CF	Center Front.
5	LFE	Low Frequency Enhancement. [Super woofer]
6	LS	Left Surround.
7	RS	Right Surround.
8	LFC	Left of Center. [in front]
9	RFC	Right of Center. [in front]
10	SD	Surround. [rear]
11	SL	Side Left. [left wall]
12	SR	Side Right. [right wall]
13	T	Top. [overhead]
14	B	Bottom. [bottom]

Table 7.3-3 Values indicating A_ARG_TYPE_PresetName

	Value	Meaning
1	FactoryDefaults	The factory settings defined by the device's manufacturer.
2	InstallationDefaults	The installation settings defined by the installer of the device. This may or may not be the same as the Factory defaults.

Table 7.3-4 Values indicating A_ARG_TYPE_ConnectionStatus

	Value	Meaning
1	OK	OK
2	ContentFormatMismatch	Content format mismatch.
3	InsufficientBandwidth	Insufficient bandwidth.
4	UnreliableChannel	Unreliable channel.
5	Unknown	Unknown.

Table 7.3-5 Values indicating A_ARG_TYPE_Direction

	Value	Meaning
1	Input	Input.
2	Output	Output.

Table 7.3-6 Values indicating TransportState

Value	Meaning
1 STOPPED	Stopped.
2 PLAYING	Playing.
3 TRANSITIONING	Transitioning.
4 PAUSED_PLAYBACK	In case the media contains video, it indicates output of a still image.
5 PAUSED_RECORDING	The transport is already prepared for recording and may respond faster or more accurate.
6 RECORDING	Recording.
7 NO_MEDIA_PRESENT	No media present.

Table 7.3-7 Values indicating TransportStatus

Value	Meaning
1 OK	OK.
2 ERROR_OCCURRED	During operation of the AVTransport service, asynchronous errors may occur that cannot be returned by a normal action. This situation can be signalled to control points by setting this state variable to value “ERROR_OCCURRED”.

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Table 7.3-8 Values indicating PlaybackStorageMedium / RecordStorageMedium

Value	Meaning
1 UNKNOWN	Unknown.
2 DV	DV.
3 MINI-DV	MiniDV.
4 VHS	VHS.
5 W-VHS	W-VHS.
6 S-VHS	S-VHS.
7 D-VHS	D-VHS.
8 VHSC	VHS-C.
9 VIDEO8	Video8.
10 HI8	Hi8.
11 CD-ROM	CD-ROM.
12 CD-DA	CD-DA.
13 CD-R	CD-R.
14 CD-RW	CD-RW.
15 VIDEO-CD	Video-CD.
16 SACD	SACD.
17 MD-AUDIO	MD Audio.
18 MD-PICTURE	MD Picture.
19 DVD-ROM	DVD-ROM.
20 DVD-VIDEO	DVD-Video.
21 DVD-R	DVD-R.
22 DVD+RW	DVD+RW.
23 DVD-RW	DVD-RW.
24 DVD-RAM	DVD-RAM.
25 DVD-AUDIO	DVD-Audio.
26 DAT	DAT.
27 LD	LD.
28 HDD	HDD.
29 MICRO-MV	MICRO-MV.
30 NETWORK	If AVTransportURI refers to a resource received from the UPnP network the state variable is set to "NETWORK".
31 NOE	If no resource is specified, then the state variable is set to "NOE".
32 NOT_IMPLEMENTED	If the service implementation is not supported then this state variable must be set to value "NOT_IMPLEMENTED".

Table 7.3-9 Values indicating CurrentPlayMode

Value	Meaning
1 NORMAL	Normal.
2 SHUFFLE	Shuffle.
3 REPEAT_ONE	Repeat one.
4 REPEAT_ALL	Repeat all.
5 RANDOM	Random.
6 DIRECT_1	Indicates playing a single track and then stop (don't play the next track).
7 INTRO	Indicates playing a short sample (typically 10 seconds or so) of each track on the media.

Table 7.3-10 Values indicating RecordMediumWriteStatus

Value	Meaning
1 WRITABLE	Writable.
2 PROTECTED	Indicates a writable media that is currently write-protected (e.g., a protected VHS tape).
3 NOT_WRITABLE	Indicates an inherent ‘read-only’ media (e.g., a DVD-ROM disc) or the device doesn’t support recording on the current media.
4 UNKNOWN	If no media is loaded, the write status will be “UNKNOWN”.
5 NOT_IMPLEMENTED	If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.

Table 7.3-11 Values indicating CurrentRecordQualityMode

Value	Meaning
1 0:EP	Level 0 (EP).
2 1:LP	Level 1 (LP).
3 2:SP	Level 2 (SP).
4 0:BASIC	Level 0 (Basic).
5 1:MEDIUM	Level 1 (Medium)
6 2:HIGH	Level 2 (High).
7 NOT_IMPLEMENTED	If the service implementation doesn’t support recording then this state variable must be set to value “NOT_IMPLEMENTED”.

Table 7.3-12 Values indicating A_ARG_TYPE_SeekMode

Value	Meaning
1 TRACK_NR	Indicates seeking to a particular track number.
2 ABS_TIME	Absolute time.
3 REL_TIME	Relative time.
4 ABS_COUNT	Absolute count.
5 REL_COUNT	Relative count.
6 CHANNEL_FREQ	Channel frequency.
7 TAPE-INDEX	Tape index.
8 FRAME	Frame.

7.4. Services

The services of media renderer devices are shown below.

Table 7.4-1 Services offered by media renderer services

	Service Name	Description
1	ListPresets	This action returns a list of the currently defined presets.
2	SelectPreset	This action restores (a subset) of the state variables to the values associated with the specified preset.
3	GetBrightness	This action retrieves the current value of the Brightness state variable of the specified instance of this service.
4	SetBrightness	This action sets the Brightness state variable of the specified instance of this service to the specified value.
5	GetContrast	This action retrieves the current value of the Contrast state variable of the specified instance of this service.
6	SetContrast	This action sets the Contrast state variable of the specified instance of this service to the specified value.
7	GetSharpness	This action retrieves the current value of the Sharpness state variable of the specified instance of this service.
8	SetSharpness	This action sets the Sharpness state variable of the specified instance of this service to the specified value.
9	GetRedVideoGain	This action retrieves the current value of the RedVideoGain state variable of the specified instance of this service.
10	SetRedVideoGain	This action sets the RedVideoGain state variable of the specified instance of this service to the specified value.
11	GetGreenVideoGain	This action retrieves the current value of the GreenVideoGain state variable of the specified instance of this service.
12	SetGreenVideoGain	This action sets the GreenVideoGain state variable of the specified instance of this service to the specified value.
13	GetBlueVideoGain	This action retrieves the current value of the BlueVideoGain state variable of the specified instance of this service.
14	SetBlueVideoGain	This action sets the BlueVideoGain state variable of the specified instance of this service to the specified value.
15	GetRedVideoBlackLevel	This action retrieves the current value of the RedVideoBlackLevel state variable of the specified instance of this service.
16	SetRedVideoBlackLevel	This action sets the RedVideoBlackLevel state variable of the specified instance of this service to the specified value.
17	GetGreenVideoBlackLevel	This action retrieves the current value of the GreenVideoBlackLevel state variable of the specified instance of this service.
18	SetGreenVideoBlackLevel	This action sets the GreenVideoBlackLevel state variable of the specified instance of this service to the specified value.
19	GetBlueVideoBlackLevel	This action retrieves the current value of the BlueVideoBlackLevel state variable of the specified instance of this service.

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20	SetBlueVideoBlackLevel	This action sets the BlueVideoBlackLevel state variable of the specified instance of this service to the specified value.
21	GetColorTemperature	This action retrieves the current value of the ColorTemperature state variable of the specified instance of this service.
22	SetColorTemperature	This action sets the ColorTemperature state variable of the specified instance of this service to the specified value.
23	GetHorizontalKeystone	This action retrieves the current value of the HorizontalKeystone state variable of the specified instance of this service.
24	SetHorizontalKeystone	This action sets the HorizontalKeystone state variable of the specified instance of this service to the specified value.
25	GetVerticalKeystone	This action retrieves the current value of the VerticalKeystone state variable of the specified instance of this service.
26	SetVerticalKeystone	This action sets the VerticalKeystone state variable of the specified instance of this service to the specified value.
27	GetMute	This action retrieves the current value of the Mute setting of the channel for the specified instance of this service.
28	SetMute	This action sets the Mute state variable of the specified instance of this service to the specified value.
29	GetVolume	This action retrieves the current value of the Volume state variable of the specified channel for the specified instance of this service.
30	SetVolume	This action sets the Volume state variable of the specified Instance and Channel to the specified value.
31	GetVolumeDB	This action retrieves the current value of the VolumeDB state variable of the channel for the specified instance of this service.
32	SetVolumeDB	This action sets the VolumeDB state variable of the specified Instance and Channel to the specified value.
33	GetVolumeDBRange	This action retrieves the valid range for the VolumeDB state variable of the channel for the specified instance of this service.
34	GetLoudness	This action retrieves the current value of the Loudness setting of the channel for the specified instance of this service.
35	SetLoudness	This action sets the specified value of the Loudness state variable of the channel for the specified instance of this service to the specified value.
36	GetProtocolInfo	This action returns the protocol-related info that this ConnectionManager supports in its current state, as a comma-separate list of strings.
37	PrepareForConnection	This action is used to allow the device to prepare itself to connect to the network for the purposes of sending or receiving media content (e.g. a video stream).
38	ConnectionComplete	A control point should call the ConnectionComplete action for all connections that it created via PrepareForConnection to ensure that all resources associated with the connection are freed up.
39	GetCurrentConnectionIDs	This action returns a comma-separated list of ConnectionIDs of currently ongoing Connections.
40	GetCurrentConnectionInfo	This action returns associated information of the connection referred to by the 'ConnectionID' parameter.
41	SetAVTransportURI	This action specifies the URI of the resource to be controlled by the specified AVTransport instance.

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42	SetNextAVTransportURI	This action specifies the URI of the resource to be controlled when the playback of the current resource (set earlier via SetAVTransportURI) finishes.
43	GetMediaInfo	This action returns information associated with the current media of the specified instance.
44	GetTransportInfo	This action returns information associated with the current transport state of the specified instance.
45	GetPositionInfo	This action returns information associated with the current position of the transport of the specified instance.
46	GetDeviceCapabilities	This action returns information device capabilities of the specified instance.
47	GetTransportSettings	This action returns various settings of the specified instance, such as the current play mode and the current recording quality mode.
48	Stop	This action stops the progression of the current resource that is associated with the specified instance.
49	Play	This action starts playing the resource of the specified instance, at the specified speed, starting at the current position, according to the current play mode.
50	Pause	While the device is in a playing state, this action halts the progression of the resource that is associated with the specified instance Id.
51	Record	This action starts recording on the specified transport instance, at the current position of the media, according to the currently specified recording quality, and return immediately.
52	Seek	This action starts seeking through the resource controlled by the specified instance - as fast as possible - to the specified target position.
53	Next	This action advances to the next track.
54	Previous	This action advances to the previous track.
55	SetPlayMode	This action sets the play mode of the specified AVTransport instance.
56	SetRecordQualityMode	This action sets the record quality mode of the specified AVTransport instance.
57	GetCurrentTransportActions	This action returns the CurrentTransportActions state variable for the specified instance.
58	QueryStateVariable	This action is used to query some state variables.
59	GetIcon	This action is used to query the data of the icon.

The details of the services are shown below.

7.4.1. ListPresets

(1)Description

This action returns a list of the currently defined presets. The CurrentPresetNameList “out” parameter contains a comma-separated list of preset names that include both predefined (static) presets and user-defined (dynamically created) presets that may be created via a private vendor-defined action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service>ListPresets>

(3)Input parameter

Table 7.4.1-1 ListPresets service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.1-2 ListPresets service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentPresetNameList	PresetNameList	See also Table 7.3-1

7.4.2. SelectPreset

(1)Description

This action restores (a subset) of the state variables to the values associated with the specified preset. The specified preset name may be one of the predefined presets or one of the user-defined presets that may have been created via a private vendor-defined action. The selected preset determines which state variables will be affected.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service>SelectPreset>

(3)Input parameter

Table 7.4.2-1 SelectPreset service output parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	PresetName	A_ARG_TYPE_PresetName	

(4)Output parameter

No

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7.4.3. GetBrightness

(1) Description

This action retrieves the current value of the Brightness state variable of the specified instance of this service.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBrightness>

(3) Input parameter

Table 7.4.3-1 GetBrightness service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.3-2 GetBrightness service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentBrightness	Brightness	See also Table 7.3-1

7.4.4. SetBrightness

(1) Description

This action sets the Brightness state variable of the specified instance of this service to the specified value.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBrightness>

(3) Input parameter

Table 7.4.4-1 SetBrightness service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredBrightness	Brightness	

(4) Output parameter

No

7.4.5. GetContrast

(1)Description

This action retrieves the current value of the Contrast state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetContrast>

(3)Input parameter

Table 7.4.5-1 GetContrast service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.5-2 GetContrast service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentContrast	Contrast	See also Table 7.3-1

7.4.6. SetContrast

(1)Description

This action sets the Contrast state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetContrast>

(3)Input parameter

Table 7.4.6-1 SetContrast service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredContrast	Contrast	

(4)Output parameter

No

7.4.7. GetSharpness

(1)Description

This action retrieves the current value of the Sharpness state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetSharpness>

(3)Input parameter

Table 7.4.7-1 GetSharpness service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.7-2 GetSharpness service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentSharpness	Sharpness	See also Table 7.3-1

7.4.8. SetSharpness

(1)Description

This action sets the Sharpness state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetSharpness>

(3)Input parameter

Table 7.4.8-1 SetSharpness service output parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredSharpness	Sharpness	

(4)Output parameter

No

7.4.9. GetRedVideoGain

(1)Description

This action retrieves the current value of the RedVideoGain state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoGain>

(3)Input parameter

Table 7.4.9-1 GetRedVideoGain service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.9-2 GetRedVideoGain service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentRedVideoGain	RedVideoGain	See also Table 7.3-1

7.4.10. SetRedVideoGain

(1)Description

This action sets the RedVideoGain state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoGain>

(3)Input parameter

Table 7.4.10-1 SetRedVideoGain service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredRedVideoGain	RedVideoGain	

(4)Output parameter

No

7.4.11. GetGreenVideoGain

(1)Description

This action retrieves the current value of the GreenVideoGain state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoGain>

(3)Input parameter

Table 7.4.11-1 GetGreenVideoGain service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.11-2 GetGreenVideoGain service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentGreenVideoGain	GreenVideoGain	See also Table 7.3-1

7.4.12. SetGreenVideoGain

(1)Description

This action sets the GreenVideoGain state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoGain>

(3)Input parameter

Table 7.4.12-1 SetGreenVideoGain service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredGreenVideoGain	GreenVideoGain	

(4)Output parameter

No

7.4.13. GetBlueVideoGain

(1)Description

This action retrieves the current value of the BlueVideoGain state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoGain>

(3)Input parameter

Table 7.4.13-1 GetBlueVideoGain service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.13-2 GetBlueVideoGain service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentBlueVideoGain	BlueVideoGain	See also Table 7.3-1

7.4.14. SetBlueVideoGain

(1)Description

This action sets the BlueVideoGain state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoGain>

(3)Input parameter

Table 7.4.14-1 SetBlueVideoGain service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredBlueVideoGain	BlueVideoGain	

(4)Output parameter

No

7.4.15. GetRedVideoBlackLevel

(1)Description

This action retrieves the current value of the RedVideoBlackLevel state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoBlackLevel>

(3)Input parameter

Table 7.4.15-1 GetRedVideoBlackLevel service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.15-2 GetRedVideoBlackLevel service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentRedVideoBlackLevel	RedVideoBlackLevel	See also Table 7.3-1

7.4.16. SetRedVideoBlackLevel

(1)Description

This action sets the RedVideoBlackLevel state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoBlackLevel>

(3)Input parameter

Table 7.4.16-1 SetRedVideoBlackLevel service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredRedVideoBlackLevel	RedVideoBlackLevel	

(4)Output parameter

No

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7.4.17. GetGreenVideoBlackLevel
(1)Description

This action retrieves the current value of the GreenVideoBlackLevel state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoBlackLevel>

(3)Input parameter

Table 7.4.17-1 GetGreenVideoBlackLevel service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.17-2 GetGreenVideoBlackLevel service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentGreenVideoBlackLevel	GreenVideoBlackLevel	See also Table 7.3-1

7.4.18. SetGreenVideoBlackLevel
(1)Description

This action sets the GreenVideoBlackLevel state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoBlackLevel>

(3)Input parameter

Table 7.4.18-1 SetGreenVideoBlackLevel service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredGreendVideoBlackLevel	GreenVideoBlackLevel	

(4)Output parameter

No

7.4.19. GetBlueVideoBlackLevel

(1)Description

This action retrieves the current value of the BlueVideoBlackLevel state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoBlackLevel>

(3)Input parameter

Table 7.4.19-1 GetBlueVideoBlackLevel service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.19-2 GetBlueVideoBlackLevel service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentBlueVideoBlackLevel	BlueVideoBlackLevel	See also Table 7.3-1

7.4.20. SetBlueVideoBlackLevel

(1)Description

This action sets the BlueVideoBlackLevel state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoBlackLevel>

(3)Input parameter

Table 7.4.20-1 SetBlueVideoBlackLevel service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

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(4)Output parameter

No

7.4.21. GetColorTemperature

(1)Description

This action retrieves the current value of the ColorTemperature state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetColorTemperature>

(3)Input parameter

Table 7.4.21-1 GetColorTemperature service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.21-2 GetColorTemperature service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentColorTemperature	ColorTemperature	See also Table 7.3-1

7.4.22. SetColorTemperature

(1)Description

This action sets the ColorTemperature state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetColorTemperature>

(3)Input parameter

Table 7.4.22-1 SetColorTemperature service input parameters

	Parameter	Related State Variable	Remarks

1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredColorTemperature	ColorTemperature	

(4) Output parameter

No

7.4.23. GetHorizontalKeystone

(1) Description

This action retrieves the current value of the HorizontalKeystone state variable of the specified instance of this service.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetHorizontalKeystone>

(3) Input parameter

Table 7.4.23-1 GetHorizontalKeystone service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.23-2 GetHorizontalKeystone service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentHorizontalKeystone	HorizontalKeystone	See also Table 7.3-1

7.4.24. SetHorizontalKeystone

(1) Description

This action sets the HorizontalKeystone state variable of the specified instance of this service to the specified value.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetHorizontalKeystone>

(3) Input parameter

Table 7.4.24-1 SetHorizontalKeystone service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl <u>_A_ARG_TYPE_InstanceID</u>	See also Table 7.3-1
2	DesiredHorizontalKeystone	HorizontalKeystone	

(4)Output parameter

No

7.4.25. GetVerticalKeystone

(1)Description

This action retrieves the current value of the VerticalKeystone state variable of the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVerticalKeystone>

(3)Input parameter

Table 7.4.25-1 GetVerticalKeystone service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl <u>_A_ARG_TYPE_InstanceID</u>	See also Table 7.3-1

(4)Output parameter

Table 7.4.25-2 GetVerticalKeystone service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentVerticalKeystone	VerticalKeystone	See also Table 7.3-1

7.4.26. SetVerticalKeystone

(1)Description

This action sets the VerticalKeystone state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVerticalKeystone>

(3)Input parameter

Table 7.4.26-1 SetVerticalKeystone service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	DesiredVerticalKeystone	VerticalKeystone	

(4)Output parameter

No

7.4.27. GetMute

(1)Description

This action retrieves the current value of the Mute setting of the channel for the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetMute>

(3)Input parameter

Table 7.4.27-1 GetMute service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	

(4)Output parameter

Table 3.4.27-2 GetMute service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentMute	Mute	See also Table 7.3-1

7.4.28. SetMute

(1)Description

This action sets the Mute state variable of the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetMute>

(3)Input parameter

Table 7.4.28-1 SetMute service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	
3	DesiredMute	Mute	

(4)Output parameter

No

7.4.29. GetVolume

(1)Description

This action retrieves the current value of the Volume state variable of the specified channel for the specified instance of this service. The CurrentVolume (OUT) parameter contains a value ranging from 0 to a device-specific maximum.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolume>

(3)Input parameter

Table 7.4.29-1 GetVolume service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	

(4)Output parameter

Table 7.4.29-2 GetVolume service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentVolume	Volume	See also Table 7.3-1

7.4.30. SetVolume

(1)Description

This action sets the Volume state variable of the specified Instance and Channel to the specified value. The DesiredVolume input parameter contains a value ranging from 0 to a device-specific maximum.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolume>

(3)Input parameter

Table 7.4.30-1 SetVolume service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	
3	DesiredVolume	Volume	

(4)Output parameter

No

7.4.31. GetVolumeDB

(1)Description

This action retrieves the current value of the VolumeDB state variable of the channel for the specified instance of this service. The CurrentVolume (OUT) parameter represents the current volume setting in units of 1/256 decibels (dB).

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDB>

(3)Input parameter

Table 7.4.31-1 GetVolumeDB service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	

(4)Output parameter

Table 7.4.31-2 GetVolumeDB service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentVolume	VolumeDB	See also Table 7.3-1

7.4.32. SetVolumeDB

(1)Description

This action sets the VolumeDB state variable of the specified Instance and Channel to the specified value.

The DesiredVolume parameter represents the desired volume setting in unit of 1/256 decibels (dB).

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolumeDB>

(3)Input parameter

Table 7.4.32-1 SetVolumeDB service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	
3	DesiredVolume	VolumeDB	

(4)Output parameter

No

7.4.33. GetVolumeDBRange

(1)Description

This action retrieves the valid range for the VolumeDB state variable of the channel for the specified instance of this service. The MinValue and MaxValue (OUT) parameter identify the range of valid values for the VolumeDB state variable in units of 1/256 decibels (dB).

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDBRange>

(3)Input parameter

Table 7.4.33-1 GetVolumeDBRange service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	

(4)Output parameter

Table 7.4.33-2 GetVolumeDBRange service output parameters

	Parameter	Related State Variable	Remarks
1	MinValue	VolumeDB	See also Table 7.3-1
2	MaxValue	VolumeDB	

7.4.34. GetLoudness

(1)Description

This action retrieves the current value of the Loudness setting of the channel for the specified instance of this service.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetLoudness>

(3)Input parameter

Table 7.4.34-1 GetLoudness service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	RenderingControl A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Channel	A_ARG_TYPE_Channel	

(4)Output parameter

Table 7.4.34-2 GetLoudness service output parameter

	Parameter	Related State Variable	Remarks
1	CurrentLoudness	Loudness	See also Table 7.3-1

7.4.35. SetLoudness

(1)Description

This action sets the specified value of the Loudness state variable of the channel for the specified instance of this service to the specified value.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetLoudness>

(3)Input parameter

Table 7.4.35-1 SetLoudness service input parameters

Parameter	Related State Variable	Remarks
1 InstanceID	RenderingControl _A_ARG_TYPE_InstanceID	See also Table 7.3-1
2 Channel	A_ARG_TYPE_Channel	
3 DesiredLoudness	Loudness	

(4)Output parameter

No

7.4.36. GetProtocolInfo

(1)Description

This action returns the protocol-related info that this ConnectionManager supports in its current state, as a comma-separate list of strings.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetProtocolInfo>

(3)Input parameter

No

(4)Output parameter

Table 7.4.36-1 GetProtocolInfo service output parameters

Parameter	Related State Variable	Remarks
1 Source	SourceProtocolInfo	See also Table 7.3-1
2 Sink	SinkProtocolInfo	

7.4.37. PrepareForConnection

(1)Description

This action is used to allow the device to prepare itself to connect to the network for the purposes of sending or receiving media content (e.g. a video stream). The RemoteProtocolInfo parameter identifies the protocol, network, and format that should be used to transfer the content. Its value corresponds to one of the ProtocolInfo entries returned by the GetProtocolInfo() action from the remote device. If the remote device does not implement GetProtocolInfo(), then the RemoteProtocolInfo parameter should be set to one of the ProtocolInfo entries returned by the GetProtocolInfo() action of the local device.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/PrepareForConnection>

(3)Input parameter

Table 7.4.37-1 PrepareForConnection service input parameters

	Parameter	Related State Variable	Remarks
1	RemoteProtocolInfo	A_ARG_TYPE_ProtocolInfo	See also Table 7.3-1
2	PeerConnectionManager	A_ARG_TYPE_ConnectionManager	
3	PeerConnectionID	A_ARG_TYPE_ConnectionID	
4	Direction	A_ARG_TYPE_Direction	

(4)Output parameter

Table 7.4.37-2 PrepareForConnection service output parameters

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 7.3-1
2	AVTransportID	A_ARG_TYPE_AVTransportID	
3	ResID	A_ARG_TYPE_RcsID	

7.4.38. ConnectionComplete

(1) Description

A control point should call the ConnectionComplete action for all connections that it created via PrepareForConnection to ensure that all resources associated with the connection are freed up. In addition, a ConnectionManager may implement ‘automatic’ or ‘autonomous’ closing of connections, in a protocol and vendor-specific way.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/ConnectionComplete>

(3) Input parameter

Table 7.4.38-1 ConnectionComplete service input parameter

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 7.3-1

(4) Output parameter

No

7.4.39. GetCurrentConnectionIDs

(1)Description

This action returns a comma-separated list of ConnectionIDs of currently ongoing Connections. A ConnectionID can be used to manually terminate a Connection via action ConnectionComplete, or to retrieve additional information about the ongoing Connection via action GetCurrentConnectionInfo.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentConnectionIDs>

(3)Input parameter

No

(4)Output parameter

Table 7.4.39-1 GetCurrentConnectionIDs service output parameter

	Parameter	Related State Variable	Remarks
1	ConnectionIDs	CurrentConnectionIDs	See also Table 7.3-1

7.4.40. GetCurrentConnectionInfo

(1)Description

This action returns associated information of the connection referred to by the ‘ConnectionID’ parameter.

The ‘AVTransportID’ and ‘PeerConnectionManager’ parameters may be NULL (empty string) in cases where the connection has been setup completely out of band, e.g., not involving a PrepareForConnection action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentConnectionInfo>

(3)Input parameter

Table 7.4.40-1 GetCurrentConnectionInfo service input parameter

	Parameter	Related State Variable	Remarks
1	ConnectionID	A_ARG_TYPE_ConnectionID	See also Table 7.3-1

(4)Output parameter

Table 7.4.40-2 GetCurrentConnectionInfo service output parameters

	Parameter	Related State Variable	Remarks
1	RcsID	A_ARG_TYPE_RcsID	See also Table 7.3-1
2	AVTransportID	A_ARG_TYPE_AVTransportID	
3	ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
4	PeerConnectionManager	A_ARG_TYPE_ConnectionManager	
5	PeerConnectionID	A_ARG_TYPE_ConnectionID	
6	Direction	A_ARG_TYPE_Direction	
7	Status	A_ARG_TYPE_ConnectionStatus	

7.4.41. SetAVTransportURI

(1)Description

This action specifies the URI of the resource to be controlled by the specified AVTransport instance. It is recommended that the AVTransport service checks the MIME-type of the specified resource when executing this action. A control point can supply meta data associated with the specified resource, using a DIDL-Lite XML fragment, in parameter CurrentURIMetaData. If supported by the AVTransport, this meta data is stored in a state variable, and returned as output parameter as part of action GetMediaInfo. If a control point does not want to use this feature it can supply NULL (empty string) for the CurrentURIMetaData parameter.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetAVTransportURI>

(3)Input parameter

Table 7.4.41-1 SetAVTransportURI service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	CurrentURI	AVTransportURI	
3	CurrentURIMetaData	AVTransportURIMetaData	

(4)Output parameter

No

7.4.42. SetNextAVTransportURI

(1) Description

This action specifies the URI of the resource to be controlled when the playback of the current resource (set earlier via SetAVTransportURI) finishes. This action allows a device to ‘prefetch’ the data to be played next, in order to provide a seamless transition between resources. This type of prefetching or buffering is particularly useful for protocol such as HTTP GET, where the data is usually buffered before playback. It is recommended that the AVTransport service checks the MIME-type of the specified resource when executing this action.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetNextAVTransportURI>

(3) Input parameter

Table 7.4.42-1 SetNextAVTransportURI service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	NextURI	AVTransportURI	
3	NextURIMetaData	AVTransportURIMetaData	

(4) Output parameter

No

7.4.43. GetMediaInfo

(1) Description

This action returns information associated with the current media of the specified instance; it has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetMediaInfo>

(3) Input parameter

Table 7.4.43-1 GetMediaInfo service input parameter

Parameter	Related State Variable	Remarks
1 InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.43-2 GetMediaInfo service output parameters

Parameter	Related State Variable	Remarks
1 NrTracks	NumberOfTracks	See also Table 7.3-1
2 MediaDuration	CurrentMediaDuration	
3 CurrentURI	AVTransportURI	
4 CurrentURIMetaData	AVTransportURIMetaData	
5 NextURI	NextAVTransportURI	
6 NextURIMetaData	NextAVTransportURIMetaData	
7 PlayMedium	PlaybackStorageMedium	
8 RecordMedium	RecordStorageMedium	
9 WriteStatus	RecordMediumWriteStatus	

7.4.44. GetTransportInfo

(1) Description

This action returns information associated with the current transport state of the specified instance; it has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetTransportInfo>

(3) Input parameter

Table 7.4.44-1 GetTransportInfo service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.44-2 GetTransportInfo service output parameters

	Parameter	Related State Variable	Remarks
1	CurrentTransportState	TransportState	See also Table 7.3-1
2	CurrentTransportStatus	TransportStatus	
3	CurrentSpeed	TransportPlaySpeed	

7.4.45. GetPositionInfo

(1) Description

This action returns information associated with the current position of the transport of the specified instance; it has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetPositionInfo>

(3) Input parameter

Table 7.4.45-1 GetPositionInfo service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.45-2 GetPositionInfo service output parameters

	Parameter	Related State Variable	Remarks
1	Track	CurrentTrack	See also Table 7.3-1
2	TrackDuration	CurrentTrackDuration	
3	TrackMetaData	CurrentTrackMetaData	
4	TrackURI	CurrentTrackURI	
5	RelTime	RelativeTimePosition	
6	AbsTime	AbsoluteTimePosition	
7	RelCount	RelativeCounterPosition	
8	AbsCount	AbsoluteCounterPosition	

7.4.46. GetDeviceCapabilities

(1)Description

This action returns information about device capabilities of the specified instance, such as the supported playback and recording formats, and the supported quality levels for recording. This action has no effect on state.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetDeviceCapabilities>

(3)Input parameter

Table 7.4.46-1 GetDeviceCapabilities service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.46-2 GetDeviceCapabilities service output parameters

	Parameter	Related State Variable	Remarks
1	PlayMedia	PossiblePlaybackStorageMedia	See also Table 7.3-1
2	RecMedia	PossibleRecordStorageMedia	
3	RecQualityModes	PossibleRecordQualityModes	

7.4.47. GetTransportSettings

(1) Description

This action returns information various settings of the specified instance, such as the current play mode and the current recording quality mode. This action has no effect on state.

(2) Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetTransportSettings>

(3) Input parameter

Table 7.4.47-1 GetTransportSettings service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4) Output parameter

Table 7.4.47-2 GetTransportSettings service output parameters

	Parameter	Related State Variable	Remarks
1	PlayMode	CurrentPlayMode	See also Table 7.3-1
2	RecQualityMode	CurrentRecordQualityMode	

7.4.48. Stop

(1)Description

This action stops the progression of the current resource that is associated with the specified instance. Additionally, it is recommended that the “output of the device” should change to something other than the current snippet of resource. Although the exact nature of this change varies from device to device, a common behavior is to immediately cease all “output” from the device. Nevertheless, the exact behavior is defined by the manufacturer of the device.

On some devices, the current position or transport changes as a result of the Stop action. This can be detected by control points via event notification of CurrentTrack. Alternatively, a control point can poll using the GetPositionInfo action.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Stop>

(3)Input parameter

Table 7.4.48-1 Stop service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

No

7.4.49. Play

(1)Description

Start playing the resource of the specified instance, at the specified speed, starting at the current position, according to the current play mode. Keep playing until the resource ends or the transport state is changed via actions Stop or Pause. The device should do a ‘best effort’ to match the specified play speed. Actually supported speeds can be retrieved from the AllowedValueList of the TransportPlaySpeed state variable in the AVTransport service description.

If no AVTransportURI is set, the resource being played is device-dependent.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Play>

(3)Input parameter

Table 7.4.49-1 Play service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	Speed	TransportPlaySpeed	

(4)Output parameter

No

7.4.50. Pause

(1)Description

While the device is in a playing state, e.g. TransportState is “PLAYING”, this action halts the progression of the resource that is associated with the specified instance Id. Any visual representation of the resource should remain displayed in a static manner (e.g. the last frame of video should remain displayed). Any audio representation of the resource should be muted. The difference between Pause() and Stop() is that Pause() MUST remain at the current position within the resource and the current resource must persist as described above.

When the device is recording, e.g., the TransportState is “RECORDING”, the device MUST maintain its current recording position, but does not accept any more data to record. Any data received after the Pause() action and before the next Record() action will be lost.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Pause>

(3)Input parameter

Table 7.4.50-1 Pause service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

No

7.4.51. Record

(1)Description

Start recording on the specified transport instance, at the current positioNo the media, according to the currently specified recording quality, and return immediately. If AVTransportURI is set (differs from the empty string) then that resource will be recorded. If no AVTransportURI is set (equals the empty string), then the source of the content being recording is device dependent. In both cases, whether the device outputs the resource to a screen or speakers while recording is device dependent. If the device implementing the Record action also has a ContentDirectory service, then recorded content will be added to this ContentDirectory in a device-dependent way. Specifically, there is no UPnP mechanism to specify the location of the recorded content in the ContentDirectory hierarchy.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Record>

(3)Input parameter

Table 7.4.51-1 Record service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

No

7.4.52. Seek

(1)Description

Start seeking through the resource controlled by the specified instance - as fast as possible - to the specified target position. Unit value “TRACK_NR” indicates seeking to a particular track number. For tape-based media that do not support the notion of track (such as VCRs), Seek(“TRACK_NR”,”1”) is equivalent to the common “FastReverse” VCR functionality. Special track number ‘0’ is used to indicate the end of the media, hence, Seek(“TRACK_NR”,”0”) is equivalent to the common “FastForward” VCR functionality.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Seek>

(3)Input parameter

Table 7.4.52-1 Seek service input parameters

Parameter	Related State Variable	Remarks
1 InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2 Unit	A_ARG_TYPE_SeekMode	
3 Target	A_ARG_TYPE_SeekTarget	

(4)Output parameter

No

7.4.53. Next

(1)Description

A convenient action to advance to the next track. This action is functionally equivalent to Seek (TRACK_NR,CurrentTrackNr+1). This action does not ‘cycle’ back to the first track.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Next>

(3)Input parameter

Table 7.4.53-1 Next service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

No

7.4.54. Previous

(1)Description

A convenient action to advance to the previous track. This action is functionally equivalent to Seek (TRACK_NR,CurrentTrackNr-1) . This action does not ‘cycle’ back to the last track.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Previous>

(3)Input parameter

Table 7.4.54-1 Previous service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

No

7.4.55. SetPlayMode

(1)Description

Sets the play mode of the specified AVTransport instance.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetPlayMode>

(3)Input parameter

Table 7.4.55-1 SetPlayMode service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	NewPlayMode	CurrentPlayMode	

(4)Output parameter

No

7.4.56. SetRecordQualityMode

(1)Description

Sets the record quality mode of the specified AVTransport instance.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRecordQualityMode>

(3)Input parameter

Table 7.4.56-1 SetRecordQualityMode service input parameters

	Parameter	Related State Variable	Remarks
1	InstanceID	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1
2	NewRecordQualityMode	CurrentRecordQualityMode	

(4)Output parameter

No

7.4.57. GetCurrentTransportActions

(1)Description

Returns the CurrentTransportActions state variable for the specified instance.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentTransportActions>

(3)Input parameter

Table 7.4.57-1 GetCurrentTransportActions service input parameter

	Parameter	Related State Variable	Remarks
1	InstanceId	AVTransport_A_ARG_TYPE_InstanceID	See also Table 7.3-1

(4)Output parameter

Table 7.4.57-2 GetCurrentTransportActions service output parameter

	Parameter	Related State Variable	Remarks
1	Actions	CurrentTransportActions	See also Table 7.3-1

7.4.58. QueryStateVariable

(1)Description

This action is used to query some state variables.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/QueryStateVariable>

(3)Input parameter

Table 7.4.58-1 QueryStateVariable service input parameters

Parameter	Related State Variable	Remarks
1 RenderingControl_LastChange	RenderingControl_LastChange	No value is set.
2 PresetNameList	PresetNameList	
3 Brightness	Brightness	
4 Contrast	Contrast	
5 Sharpness	Sharpness	
6 RedVideoGain	RedVideoGain	
7 GreenVideoGain	GreenVideoGain	
8 BlueVideoGain	BlueVideoGain	
9 RedVideoBlackLevel	RedVideoBlackLevel	
10 GreenVideoBlackLevel	GreenVideoBlackLevel	
11 BlueVideoBlackLevel	BlueVideoBlackLevel	
12 ColorTemperature	ColorTemperature	
13 HorizontalKeystone	HorizontalKeystone	
14 VerticalKeystone	VerticalKeystone	
15 Mute	Mute	
16 Volume	Volume	
17 VolumeDB	VolumeDB	
18 Loudness	Loudness	
19 A_ARG_TYPE_Channel	A_ARG_TYPE_Channel	
20 RenderingControl A_ARG_TYPE_InstanceID	RenderingControl A_ARG_TYPE_InstanceID	
21 A_ARG_TYPE_PresetName	A_ARG_TYPE_PresetName	
22 SourceProtocolInfo	SourceProtocolInfo	
23 SinkProtocolInfo	SinkProtocolInfo	
24 CurrentConnectionIDs	CurrentConnectionIDs	
25 A_ARG_TYPE_ConnectionStatus	A_ARG_TYPE_ConnectionStatus	
26 A_ARG_TYPE_ConnectionManager	A_ARG_TYPE_ConnectionManager	
27 A_ARG_TYPE_Direction	A_ARG_TYPE_Direction	
28 A_ARG_TYPE_ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
29 A_ARG_TYPE_ConnectionID	A_ARG_TYPE_ConnectionID	

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30	A_ARG_TYPE_AVTransportID	A_ARG_TYPE_AVTransportID
31	A_ARG_TYPE_RcsID	A_ARG_TYPE_RcsID
32	TransportState	TransportState
33	TransportStatus	TransportStatus
34	PlaybackStorageMedium	PlaybackStorageMedium
35	RecordStorageMedium	RecordStorageMedium
36	PossiblePlaybackStorageMedia	PossiblePlaybackStorageMedia
37	PossibleRecordStorageMedia	PossibleRecordStorageMedia
38	CurrentPlayMode	CurrentPlayMode
39	TransportPlaySpeed	TransportPlaySpeed
40	RecordMediumWriteStatus	RecordMediumWriteStatus
41	CurrentRecordQualityMode	CurrentRecordQualityMode
42	PossibleRecordQualityModes	PossibleRecordQualityModes
43	NumberOfTracks	NumberOfTracks
44	CurrentTrack	CurrentTrack
45	CurrentTrackDuration	CurrentTrackDuration
46	CurrentMediaDuration	CurrentMediaDuration
47	CurrentTrackMetaData	CurrentTrackMetaData
48	CurrentTrackURI	CurrentTrackURI
49	AVTransportURI	AVTransportURI
50	AVTransportURIMetaData	AVTransportURIMetaData
51	NextAVTransportURI	NextAVTransportURI
52	NextAVTransportURIMetaData	NextAVTransportURIMetaData
53	RelativeTimePosition	RelativeTimePosition
54	AbsoluteTimePosition	AbsoluteTimePosition
55	RelativeCounterPosition	RelativeCounterPosition
56	AbsoluteCounterPosition	AbsoluteCounterPosition
57	CurrentTransportActions	CurrentTransportActions
58	AVTransport_LastChange	AVTransport_LastChange
59	A_ARG_TYPE_SeekMode	A_ARG_TYPE_SeekMode
60	A_ARG_TYPE_SeekTarget	A_ARG_TYPE_SeekTarget
61	AVTransport_A_ARG_TYPE_InstanceID	AVTransport_A_ARG_TYPE_InstanceID

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(4)Output parameter

Table 7.4.58-2 QueryStateVariable service output parameters

	Parameter	Related State Variable	Remarks
1	RenderingControl_LastChange	RenderingControl_LastChange	See also Table 7.3-1
2	PresetNameList	PresetNameList	
3	Brightness	Brightness	
4	Contrast	Contrast	
5	Sharpness	Sharpness	
6	RedVideoGain	RedVideoGain	
7	GreenVideoGain	GreenVideoGain	
8	BlueVideoGain	BlueVideoGain	
9	RedVideoBlackLevel	RedVideoBlackLevel	
10	GreenVideoBlackLevel	GreenVideoBlackLevel	
11	BlueVideoBlackLevel	BlueVideoBlackLevel	
12	ColorTemperature	ColorTemperature	
13	HorizontalKeystone	HorizontalKeystone	
14	VerticalKeystone	VerticalKeystone	
15	Mute	Mute	
16	Volume	Volume	
17	VolumeDB	VolumeDB	
18	Loudness	Loudness	
19	A_ARG_TYPE_Channel	A_ARG_TYPE_Channel	
20	RenderingControl A_ARG_TYPE_InstanceID	RenderingControl A_ARG_TYPE_InstanceID	
21	A_ARG_TYPE_PresetName	A_ARG_TYPE_PresetName	
22	SourceProtocolInfo	SourceProtocolInfo	
23	SinkProtocolInfo	SinkProtocolInfo	
24	CurrentConnectionIDs	CurrentConnectionIDs	
25	A_ARG_TYPE_ConnectionStatus	A_ARG_TYPE_ConnectionStatus	
26	A_ARG_TYPE_ConnectionManager	A_ARG_TYPE_ConnectionManager	
27	A_ARG_TYPE_Direction	A_ARG_TYPE_Direction	
28	A_ARG_TYPE_ProtocolInfo	A_ARG_TYPE_ProtocolInfo	
29	A_ARG_TYPE_ConnectionID	A_ARG_TYPE_ConnectionID	
30	A_ARG_TYPE_AVTransportID	A_ARG_TYPE_AVTransportID	
31	A_ARG_TYPE_RcsID	A_ARG_TYPE_RcsID	
32	TransportState	TransportState	
33	TransportStatus	TransportStatus	
34	PlaybackStorageMedium	PlaybackStorageMedium	
35	RecordStorageMedium	RecordStorageMedium	
36	PossiblePlaybackStorageMedia	PossiblePlaybackStorageMedia	
37	PossibleRecordStorageMedia	PossibleRecordStorageMedia	

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38	CurrentPlayMode	CurrentPlayMode	
39	TransportPlaySpeed	TransportPlaySpeed	
40	RecordMediumWriteStatus	RecordMediumWriteStatus	
41	CurrentRecordQualityMode	CurrentRecordQualityMode	
42	PossibleRecordQualityModes	PossibleRecordQualityModes	
43	NumberOfTracks	NumberOfTracks	
44	CurrentTrack	CurrentTrack	
45	CurrentTrackDuration	CurrentTrackDuration	
46	CurrentMediaDuration	CurrentMediaDuration	
47	CurrentTrackMetaData	CurrentTrackMetaData	
48	CurrentTrackURI	CurrentTrackURI	
49	AVTransportURI	AVTransportURI	
50	AVTransportURIMetaData	AVTransportURIMetaData	
51	NextAVTransportURI	NextAVTransportURI	
52	NextAVTransportURIMetaData	NextAVTransportURIMetaData	
53	RelativeTimePosition	RelativeTimePosition	
54	AbsoluteTimePosition	AbsoluteTimePosition	
55	RelativeCounterPosition	RelativeCounterPosition	
56	AbsoluteCounterPosition	AbsoluteCounterPosition	
57	CurrentTransportActions	CurrentTransportActions	
58	AVTransport_LastChange	AVTransport_LastChange	
59	A_ARG_TYPE_SeekMode	A_ARG_TYPE_SeekMode	
60	A_ARG_TYPE_SeekTarget	A_ARG_TYPE_SeekTarget	
61	AVTransport_A_ARG_TYPE_InstanceID	AVTransport_A_ARG_TYPE_InstanceID	

7.4.59. GetIcon

(1)Description

This action is used to query the data of the icon.

(2)Service type identifier

<http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetIcon>

(3)Input parameter

Table 7.4.59-1 GetIcon service input parameter

	Parameter	Related State Variable	Data Type	Remarks
1	uri	-	string	Sets the URL of an icon image.

(4)Output parameter

Table 7.4.59-2 GetIcon service output parameters

	Parameter	Related State Variable	Data Type	Remarks
1	mimeType	-	string	Sets the MIME type of an icon image.
2	base64Data	-	base64Binary	Sets the BASE64-encoded data of an icon image.

7.5. Metadata

7.5.1. Device Metadata

The metadata template of media renderer devices is shown below.

Italic letters in red: differ by the entity of each media renderer device

```

<?xml version="1.0"?>
<Device type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer"
         id="global unique ID for this device" name="short user-friendly title">
  <Specification>
    <URLBase>base URL for all relative URLs</URLBase>
    <Manufacturer>manufacturer name</Manufacturer>
    <ManufacturerURL>URL to manufacturer site</ManufacturerURL>
    <ManufactureDate>date of manufacture</ManufactureDate>
    <ModelDescription>long user-friendly title</ModelDescription>
    <ModelName>model name</ModelName>
    <ModelNumber>model number</ModelNumber>
    <ModelURL>URL to model site</ModelURL>
    <SerialNumber>manufacturer's serial number</SerialNumber>
    <UDN>uuid:UUID</UDN>
    <UPC>Universal Product Code</UPC>
    <IconList>
      <Icon>
        <Mimetype>image/format</Mimetype>
        <Width>horizontal pixels</width>
        <Height>vertical pixels</height>
        <Depth>color depth</depth>
        <Url>URL to icon</Url>
      </Icon>
      XML to declare other icons, if any, go here
    </IconList>
  </Specification>
  <StateVariableList>
    <StateVariable name="RenderingControl_LastChange" datatype="string" sendEvents="yes"/>
    <StateVariable name="PresetNameList" datatype="string" sendEvents="no"/>
    <StateVariable name="Brightness" datatype="unsignedShort" sendEvents="no">
      <AllowedValueRange>
        <Minimum>0</Minimum>
        <Maximum> vendor-defined </Maximum>
        <Step>1</Step>
      </AllowedValueRange>
    </StateVariable>
    <StateVariable name="Contrast" datatype="unsignedShort" sendEvents="no">
      <AllowedValueRange>
    
```

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```
<Minimum>0</Minimum>
<Maximum> vendor-defined </Maximum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="Sharpness" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="RedVideoGain" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="GreenVideoGain" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="BlueVideoGain" datatype="unsignedShort" sendEvents="no">
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</AllowedValueRange>
</StateVariable>
<StateVariable name="RedVideoBlackLevel" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="GreenVideoBlackLevel" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="BlueVideoBlackLevel" datatype="unsignedShort" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
```

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```

<StateVariable name="ColorTemperature" datatype="unsignedShort" sendEvents="no">
  <AllowedValueRange>
    <Minimum>0</Minimum>
    <Step>1</Step>
  </AllowedValueRange>
</StateVariable>
<StateVariable name="HorizontalKeystone" datatype="short" sendEvents="no">
  <AllowedValueRange>
    <Step>1</Step>
  </AllowedValueRange>
</StateVariable>
<StateVariable name="VerticalKeystone" datatype="short" sendEvents="no">
  <AllowedValueRange>
    <Step>1</Step>
  </AllowedValueRange>
</StateVariable>
<StateVariable name="Mute" datatype="boolean" sendEvents="no"/>
<StateVariable name="Volume" datatype="unsignedShort" sendEvents="no">
  <AllowedValueRange>
    <Minimum>0</Minimum>
    <Step>1</Step>
  </AllowedValueRange>
</StateVariable>
<StateVariable name="VolumeDB" datatype="short" sendEvents="no"/>
<StateVariable name="Loudness" datatype="boolean" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_Channel" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>Master</AllowedValue>
    <AllowedValue>LF</AllowedValue>
    <AllowedValue>RF</AllowedValue>
    <AllowedValue>CF</AllowedValue>
    <AllowedValue>LFE</AllowedValue>
    <AllowedValue>LS</AllowedValue>
    <AllowedValue>RS</AllowedValue>
    <AllowedValue>LFC</AllowedValue>
    <AllowedValue>RFC</AllowedValue>
    <AllowedValue>SD</AllowedValue>
    <AllowedValue>SL</AllowedValue>
    <AllowedValue>SR</AllowedValue>
    <AllowedValue>T</AllowedValue>
    <AllowedValue>B</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="RenderingControl_A_ARG_TYPE_InstanceID" datatype="unsignedInt"
sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_PresetName" datatype="string" sendEvents="no">
  <AllowedValueList>

```

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```

<AllowedValue>FactoryDefaults</AllowedValue>
<AllowedValue>InstallationDefaults</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="SourceProtocolInfo" datatype="string" sendEvents="yes"/>
<StateVariable name="SinkProtocolInfo" datatype="string" sendEvents="yes"/>
<StateVariable name="CurrentConnectionIDs" datatype="string" sendEvents="yes"/>
<StateVariable name="A_ARG_TYPE_ConnectionStatus" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>OK</AllowedValue>
    <AllowedValue>ContentFormatMismatch</AllowedValue>
    <AllowedValue>InsufficientBandwidth</AllowedValue>
    <AllowedValue>UnreliableChannel</AllowedValue>
    <AllowedValue>Unknown</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_ConnectionManager" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_Direction" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>Input</AllowedValue>
    <AllowedValue>Output</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_ProtocolInfo" datatype="string" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_ConnectionID" datatype="integer" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_AVTransportID" datatype="integer" sendEvents="no"/>
<StateVariable name="A_ARG_TYPE_RcsID" datatype="integer" sendEvents="no"/>
<StateVariable name="TransportState" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>STOPPED</AllowedValue>
    <AllowedValue>PAUSED_PLAYBACK</AllowedValue>
    <AllowedValue>PAUSED_RECORDING</AllowedValue>
    <AllowedValue>PLAYING</AllowedValue>
    <AllowedValue>RECORDING</AllowedValue>
    <AllowedValue>TRANSITIONING</AllowedValue>
    <AllowedValue>NO_MEDIA_PRESENT</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="TransportStatus" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>OK</AllowedValue>
    <AllowedValue>ERROR_OCCURRED</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="PlaybackStorageMedium" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>UNKNOWN</AllowedValue>
  </AllowedValueList>

```

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```
<AllowedValue>DV</AllowedValue>
<AllowedValue>MINI-DV</AllowedValue>
<AllowedValue>VHS</AllowedValue>
<AllowedValue>W-VHS</AllowedValue>
<AllowedValue>S-VHS</AllowedValue>
<AllowedValue>D-VHS</AllowedValue>
<AllowedValue>VHSC</AllowedValue>
<AllowedValue>VIDEO8</AllowedValue>
<AllowedValue>HI8</AllowedValue>
<AllowedValue>CD-ROM</AllowedValue>
<AllowedValue>CD-DA</AllowedValue>
<AllowedValue>CD-R</AllowedValue>
<AllowedValue>CD-RW</AllowedValue>
<AllowedValue>VIDEO-CD</AllowedValue>
<AllowedValue>SACD</AllowedValue>
<AllowedValue>MD-AUDIO</AllowedValue>
<AllowedValue>MD-PICTURE</AllowedValue>
<AllowedValue>DVD-ROM</AllowedValue>
<AllowedValue>DVD-VIDEO</AllowedValue>
<AllowedValue>DVD-R</AllowedValue>
<AllowedValue>DVD+RW</AllowedValue>
<AllowedValue>DVD-RW</AllowedValue>
<AllowedValue>DVD-RAM</AllowedValue>
<AllowedValue>DVD-AUDIO</AllowedValue>
<AllowedValue>DAT</AllowedValue>
<AllowedValue>LD</AllowedValue>
<AllowedValue>HDD</AllowedValue>
<AllowedValue>MICRO-MV</AllowedValue>
<AllowedValue>NETWORK</AllowedValue>
<AllowedValue>NOE</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="RecordStorageMedium" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>UNKNOWN</AllowedValue>
<AllowedValue>DV</AllowedValue>
<AllowedValue>MINI-DV</AllowedValue>
<AllowedValue>VHS</AllowedValue>
<AllowedValue>W-VHS</AllowedValue>
<AllowedValue>S-VHS</AllowedValue>
<AllowedValue>D-VHS</AllowedValue>
<AllowedValue>VHSC</AllowedValue>
<AllowedValue>VIDEO8</AllowedValue>
<AllowedValue>HI8</AllowedValue>
<AllowedValue>CD-ROM</AllowedValue>
<AllowedValue>CD-DA</AllowedValue>
```

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```

<AllowedValue>CD-R</AllowedValue>
<AllowedValue>CD-RW</AllowedValue>
<AllowedValue>VIDEO-CD</AllowedValue>
<AllowedValue>SACD</AllowedValue>
<AllowedValue>MD-AUDIO</AllowedValue>
<AllowedValue>MD-PICTURE</AllowedValue>
<AllowedValue>DVD-ROM</AllowedValue>
<AllowedValue>DVD-VIDEO</AllowedValue>
<AllowedValue>DVD-R</AllowedValue>
<AllowedValue>DVD+RW</AllowedValue>
<AllowedValue>DVD-RW</AllowedValue>
<AllowedValue>DVD-RAM</AllowedValue>
<AllowedValue>DVD-AUDIO</AllowedValue>
<AllowedValue>DAT</AllowedValue>
<AllowedValue>LD</AllowedValue>
<AllowedValue>HDD</AllowedValue>
<AllowedValue>MICRO-MV</AllowedValue>
<AllowedValue>NETWORK</AllowedValue>
<AllowedValue>NOE</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="PossiblePlaybackStorageMedia" datatype="string" sendEvents="no"/>
<StateVariable name="PossibleRecordStorageMedia" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentPlayMode" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>NORMAL</AllowedValue>
    <AllowedValue>SHUFFLE</AllowedValue>
    <AllowedValue>REPEAT_ONE</AllowedValue>
    <AllowedValue>REPEAT_ALL</AllowedValue>
    <AllowedValue>RANDOM</AllowedValue>
    <AllowedValue>DIRECT_1</AllowedValue>
    <AllowedValue>INTRO</AllowedValue>
  </AllowedValueList>
  <DefaultValue>NORMAL</DefaultValue>
</StateVariable>
<StateVariable name="TransportPlaySpeed" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>1</AllowedValue>
  </AllowedValueList>
</StateVariable>
<StateVariable name="RecordMediumWriteStatus" datatype="string" sendEvents="no">
  <AllowedValueList>
    <AllowedValue>WRITABLE</AllowedValue>
    <AllowedValue>PROTECTED</AllowedValue>
    <AllowedValue>NOT_WRITABLE</AllowedValue>
    <AllowedValue>UNKNOWN</AllowedValue>
  </AllowedValueList>
</StateVariable>

```

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```

<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="CurrentRecordQualityMode" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>0:EP</AllowedValue>
<AllowedValue>1:LP</AllowedValue>
<AllowedValue>2:SP</AllowedValue>
<AllowedValue>0:BASIC</AllowedValue>
<AllowedValue>1:MEDIUM</AllowedValue>
<AllowedValue>2:HIGH</AllowedValue>
<AllowedValue>NOT_IMPLEMENTED</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="PossibleRecordQualityModes" datatype="string" sendEvents="no"/>
<StateVariable name="NumberOfTracks" datatype="unsignedInt" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
</AllowedValueRange>
</StateVariable>
<StateVariable name="CurrentTrack" datatype="unsignedInt" sendEvents="no">
<AllowedValueRange>
<Minimum>0</Minimum>
<Maximum> vendor-defined </Maximum>
<Step>1</Step>
</AllowedValueRange>
</StateVariable>
<StateVariable name="CurrentTrackDuration" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentMediaDuration" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentTrackMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="CurrentTrackURI" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransportURI" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransportURIMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="NextAVTransportURI" datatype="string" sendEvents="no"/>
<StateVariable name="NextAVTransportURIMetaData" datatype="string" sendEvents="no"/>
<StateVariable name="RelativeTimePosition" datatype="string" sendEvents="no"/>
<StateVariable name="AbsoluteTimePosition" datatype="string" sendEvents="no"/>
<StateVariable name="RelativeCounterPosition" datatype="int" sendEvents="no"/>
<StateVariable name="AbsoluteCounterPosition" datatype="int" sendEvents="no"/>
<StateVariable name="CurrentTransportActions" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransport_LastChange" datatype="string" sendEvents="yes"/>
<StateVariable name="A_ARG_TYPE_SeekMode" datatype="string" sendEvents="no">
<AllowedValueList>
<AllowedValue>ABS_TIME</AllowedValue>
<AllowedValue>REL_TIME</AllowedValue>
<AllowedValue>ABS_COUNT</AllowedValue>
<AllowedValue>REL_COUNT</AllowedValue>

```

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```

<AllowedValue>TRACK_NR</AllowedValue>
<AllowedValue>CHANNEL_FREQ</AllowedValue>
<AllowedValue>TAPE-INDEX</AllowedValue>
<AllowedValue>FRAME</AllowedValue>
</AllowedValueList>
</StateVariable>
<StateVariable name="A_ARG_TYPE_SeekTarget" datatype="string" sendEvents="no"/>
<StateVariable name="AVTransport_A_ARG_TYPE_InstanceID" datatype="unsignedInt" sendEvents="no"/>
</StateVariableList>
<ServiceList>
<Service name="ListPresets"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/ListPresets"/>
<Service name="SelectPreset"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SelectPreset"/>
<Service name="GetBrightness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBrightness"/>
<Service name="SetBrightness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBrightness"/>
<Service name="GetContrast"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetContrast"/>
<Service name="SetContrast"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetContrast"/>
<Service name="GetSharpness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetSharpness"/>
<Service name="SetSharpness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetSharpness"/>
<Service name="GetRedVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoGain"/>
<Service name="SetRedVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoGain"/>
<Service name="GetGreenVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoGain"/>
<Service name="SetGreenVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoGain"/>
<Service name="GetBlueVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoGain"/>
<Service name="SetBlueVideoGain"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoGain"/>
<Service name="GetRedVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoBlackLevel"/>
<Service name="SetRedVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoBlackLevel"/>
<Service name="GetGreenVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoBlackLevel"/>
<Service name="SetGreenVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoBlackLevel"/>

```

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```

<Service name="GetBlueVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoBlackLevel"/>
<Service name="SetBlueVideoBlackLevel"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoBlackLevel"/>
<Service name="GetColorTemperature"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetColorTemperature"/>
<Service name="SetColorTemperature"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetColorTemperature"/>
<Service name="GetHorizontalKeystone"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetHorizontalKeystone"/>
<Service name="SetHorizontalKeystone"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetHorizontalKeystone"/>
<Service name="GetVerticalKeystone"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVerticalKeystone"/>
<Service name="SetVerticalKeystone"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVerticalKeystone"/>
<Service name="GetMute"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetMute"/>
<Service name="SetMute"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetMute"/>
<Service name="GetVolume"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolume"/>
<Service name="SetVolume"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolume"/>
<Service name="GetVolumeDB"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDB"/>
<Service name="SetVolumeDB"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolumeDB"/>
<Service name="GetVolumeDBRange"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDBRange"/>
<Service name="GetLoudness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetLoudness"/>
<Service name="SetLoudness"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetLoudness"/>
<Service name="GetProtocolInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetProtocolInfo"/>
<Service name="PrepareForConnection"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/PrepareForConnection"/>
<Service name="ConnectionComplete"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/ConnectionComplete"/>
<Service name="GetCurrentConnectionIDs"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionIDs"/>
<Service name="GetCurrentConnectionInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentConnectionInfo"/>
<Service name="SetAVTransportURI"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetAVTransportURI"/>
<Service name="SetNextAVTransportURI"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetNextAVTransportURI"/>

```

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```

  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetNextAVTransportURI"/>
<Service name="GetMediaInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetMediaInfo"/>
<Service name="GetTransportInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportInfo"/>
<Service name="GetPositionInfo"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetPositionInfo"/>
<Service name="GetDeviceCapabilities"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetDeviceCapabilities"/>
<Service name="GetTransportSettings"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetTransportSettings"/>
<Service name="Stop" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Stop"/>
<Service name="Play" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Play"/>
<Service name="Pause"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Pause"/>
<Service name="Record"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Record"/>
<Service name="Seek" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Seek"/>
<Service name="Next" type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Next"/>
<Service name="Previous"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/Previous"/>
<Service name="SetPlayMode"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetPlayMode"/>
<Service name="SetRecordQualityMode"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/SetRecordQualityMode"/>
<Service name="GetCurrentTransportActions"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetCurrentTransportActions"/>
<Service name="QueryStateVariable"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/QueryStateVariable"/>
<Service name="GetIcon"
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/Service/GetIcon"/>
</ServiceList>
<PrimitiveDeviceList/>
</Device>
```

7.5.2. Service Metadata

The metadata templates of the services that media renderer devices have are shown below.

(1) ListPresets service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/ListPresets"
    name="ListPresets">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentPresetNameList" relatedStateVariable="PresetNameList"/>
    </OutputParameterList>
</Service>
```

(2) SelectPreset service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SelectPreset"
    name="SelectPreset">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="PresetName" relatedStateVariable="A_ARG_TYPE_PresetName"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(3) GetBrightness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBrightness"
    name="GetBrightness">
    <InputParameterList>
        <Parameter name="InstanceID"

relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <InputParameterList/>
        <OutputParameterList>
            <Parameter name="CurrentBrightness" relatedStateVariable="Brightness"/>
        </OutputParameterList>
    </Service>
```

(4) SetBrightness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBrightness"
    name="SetBrightness">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
            <Parameter name="DesiredBrightness" relatedStateVariable="Brightness"/>
        </InputParameterList>
        <OutputParameterList/>
    </Service>
```

(5) GetContrast service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetContrast"
    name="GetContrast">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentContrast" relatedStateVariable="Contrast"/>
    </OutputParameterList>
</Service>
```

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(6)SetContrast service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetContrast"
    name="SetContrast">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredContrast" relatedStateVariable="Contrast"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(7)GetSharpness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetSharpness"
    name="GetSharpness">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentSharpness" relatedStateVariable="Sharpness"/>
    </OutputParameterList>
</Service>
```

(8)SetSharpness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetSharpness"
    name="SetSharpness">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredSharpness" relatedStateVariable="Sharpness"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(9) GetRedVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoGain"
    name="GetRedVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentRedVideoGain" relatedStateVariable="RedVideoGain"/>
  </OutputParameterList>
</Service>
```

(10) SetRedVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoGain"
    name="SetRedVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="DesiredRedVideoGain" relatedStateVariable="RedVideoGain"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(11) GetGreenVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoGain"
    name="GetGreenVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentGreenVideoGain" relatedStateVariable="GreenVideoGain"/>
  </OutputParameterList>
</Service>
```

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(12) SetGreenVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoGain"
    name="SetGreenVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="DesiredGreendVideoGain" relatedStateVariable="GreenVideoGain"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(13) GetBlueVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoGain"
    name="GetBlueVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentBlueVideoGain" relatedStateVariable="BlueVideoGain"/>
  </OutputParameterList>
</Service>
```

(14) SetBlueVideoGain service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoGain"
    name="SetBlueVideoGain">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="DesiredBlueVideoGain" relatedStateVariable="BlueVideoGain"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

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(15) GetRedVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetRedVideoBlackLevel"
    name="GetRedVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentRedVideoBlackLevel"
            relatedStateVariable="RedVideoBlackLevel"/>
    </OutputParameterList>
</Service>
```

(16) SetRedVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRedVideoBlackLevel"
    name="SetRedVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredRedVideoBlackLevel"
            relatedStateVariable="RedVideoBlackLevel"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(17) GetGreenVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetGreenVideoBlackLeve
l"
    name="GetGreenVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentGreenVideoBlackLevel"
            relatedStateVariable="GreenVideoBlackLevel"/>
    </OutputParameterList>
</Service>
```

(18) SetGreenVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetGreenVideoBlackLevel
"
    name="SetGreenVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredGreenVideoBlackLevel"
            relatedStateVariable="GreenVideoBlackLevel"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(19)GetBlueVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetBlueVideoBlackLevel"
    name="GetBlueVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentBlueVideoBlackLevel"
            relatedStateVariable="BlueVideoBlackLevel"/>
    </OutputParameterList>
</Service>
```

(20)SetBlueVideoBlackLevel service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetBlueVideoBlackLevel"
    name="SetBlueVideoBlackLevel">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredBlueVideoBlackLevel"
            relatedStateVariable="BlueVideoBlackLevel"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(21)GetColorTemperature service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetColorTemperature"
    name="GetColorTemperature">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentColorTemperature" relatedStateVariable="ColorTemperature"/>
    </OutputParameterList>
</Service>
```

(22)SetColorTemperature service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetColorTemperature"
    name="SetColorTemperature">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredColorTemperature" relatedStateVariable="ColorTemperature"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(23)GetHorizontalKeystone service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetHorizontalKeystone"
    name="GetHorizontalKeystone">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentHorizontalKeystone"
            relatedStateVariable="HorizontalKeystone"/>
    </OutputParameterList>
</Service>
```

(24)SetHorizontalKeystone service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetHorizontalKeystone"
    name="SetHorizontalKeystone">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="DesiredHorizontalKeystone"
            relatedStateVariable="HorizontalKeystone"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(25)GetVerticalKeystone service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVerticalKeystone"
    name="GetVerticalKeystone">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentVerticalKeystone" relatedStateVariable="VerticalKeystone"/>
  </OutputParameterList>
</Service>
```

(26)SetVerticalKeystone service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVerticalKeystone"
    name="SetVerticalKeystone">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="DesiredVerticalKeystone" relatedStateVariable="VerticalKeystone"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(27)GetMute service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetMute"
  name="GetMute">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentMute" relatedStateVariable="Mute"/>
  </OutputParameterList>
</Service>
```

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(28)SetMute service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetMute"
         name="SetMute">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
    <Parameter name="DesiredMute" relatedStateVariable="Mute"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(29)GetVolume service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolume"
         name="GetVolume">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentVolume" relatedStateVariable="Volume"/>
  </OutputParameterList>
</Service>
```

(30)SetVolume service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolume"
         name="SetVolume">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
    <Parameter name="DesiredVolume" relatedStateVariable="Volume"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

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(31)GetVolumeDB service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDB"
         name="GetVolumeDB">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentVolume" relatedStateVariable="VolumeDB"/>
  </OutputParameterList>
</Service>
```

(32)SetVolumeDB service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetVolumeDB"
         name="SetVolumeDB">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
    <Parameter name="DesiredVolume" relatedStateVariable="VolumeDB"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(33)GetVolumeDBRange service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetVolumeDBRange"
         name="GetVolumeDBRange">
  <InputParameterList>
    <Parameter name="InstanceID"
              relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="MinValue" relatedStateVariable="VolumeDB"/>
    <Parameter name="MaxValue" relatedStateVariable="VolumeDB"/>
  </OutputParameterList>
</Service>
```

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(34)GetLoudness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetLoudness"
    name="GetLoudness">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="CurrentLoudness" relatedStateVariable="Loudness"/>
    </OutputParameterList>
</Service>
```

(35)SetLoudness service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetLoudness"
    name="SetLoudness">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
        <Parameter name="Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
        <Parameter name="DesiredLoudness" relatedStateVariable="Loudness"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(36)GetProtocolInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetProtocolInfo"
    name="GetProtocolInfo">
    <InputParameterList/>
    <OutputParameterList>
        <Parameter name="Source" relatedStateVariable="SourceProtocolInfo"/>
        <Parameter name="Sink" relatedStateVariable="SinkProtocolInfo"/>
    </OutputParameterList>
</Service>
```

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(37)PrepareForConnection service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/PrepareForConnection"
    name="PrepareForConnection">
    <InputParameterList>
        <Parameter name="RemoteProtocolInfo" relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
        <Parameter name="PeerConnectionManager"
            relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
        <Parameter name="PeerConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
        <Parameter name="Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
        <Parameter name="AVTransportID" relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
        <Parameter name="RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
    </OutputParameterList>
</Service>
```

(38)ConnectionComplete service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/ConnectionComplete"
    name="ConnectionComplete">
    <InputParameterList>
        <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(39)GetCurrentConnectionIDs service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentConnectionIDs"
    name="GetCurrentConnectionIDs">
    <InputParameterList/>
    <OutputParameterList>
        <Parameter name="ConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
    </OutputParameterList>
</Service>
```

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(40)GetCurrentConnectionInfo service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentConnectionInfo"
name="GetCurrentConnectionInfo">
<InputParameterList>
    <Parameter name="ConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
</InputParameterList>
<OutputParameterList>
    <Parameter name="RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
    <Parameter name="AVTransportID" relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
    <Parameter name="ProtocolInfo" relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
    <Parameter name="PeerConnectionManager"
relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
    <Parameter name="PeerConnectionID" relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
    <Parameter name="Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
    <Parameter name="Status" relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
</OutputParameterList>
</Service>
```

(41)SetAVTransportURI service metadata

```
<?xml version="1.0" ?>
<Service
type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetAVTransportURI"
name="SetAVTransportURI">
<InputParameterList>
    <Parameter name="InstanceID"
relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    <Parameter name="CurrentURI" relatedStateVariable="AVTransportURI"/>
    <Parameter name="CurrentURIMetaData"
relatedStateVariable="AVTransportURIMetaData"/>
</InputParameterList>
<OutputParameterList/>
</Service>
```

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(42)SetNextAVTransportURI service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetNextAVTransportURI"
    name="SetNextAVTransportURI">
<InputParameterList>
    <Parameter name="InstanceID"
        relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    <Parameter name="NextURI" relatedStateVariable="NextAVTransportURI"/>
    <Parameter name="NextURIMetaData"
        relatedStateVariable="NextAVTransportURIMetaData"/>
</InputParameterList>
<OutputParameterList/>
</Service>
```

(43)GetMediaInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetMediaInfo"
    name="GetMediaInfo">
<InputParameterList>
    <Parameter name="InstanceID"
        relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
</InputParameterList>
<OutputParameterList>
    <Parameter name="NrTracks" relatedStateVariable="NumberOfTracks"/>
    <Parameter name="MediaDuration" relatedStateVariable="CurrentMediaDuration"/>
    <Parameter name="CurrentURI" relatedStateVariable="AVTransportURI"/>
    <Parameter name="CurrentURIMetaData"
        relatedStateVariable="AVTransportURIMetaData"/>
    <Parameter name="NextURI" relatedStateVariable="NextAVTransportURI"/>
    <Parameter name="NextURIMetaData"
        relatedStateVariable="NextAVTransportURIMetaData"/>
    <Parameter name="PlayMedium" relatedStateVariable="PlaybackStorageMedium"/>
    <Parameter name="RecordMedium" relatedStateVariable="RecordStorageMedium"/>
    <Parameter name="WriteStatus" relatedStateVariable="RecordMediumWriteStatus"/>
</OutputParameterList>
</Service>
```

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(44)GetTransportInfo service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetTransportInfo"
    name="GetTransportInfo">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="CurrentTransportState" relatedStateVariable="TransportState"/>
    <Parameter name="CurrentTransportStatus" relatedStateVariable="TransportStatus"/>
    <Parameter name="CurrentSpeed" relatedStateVariable="TransportPlaySpeed"/>
  </OutputParameterList>
</Service>
```

(45)GetPositionInfo service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetPositionInfo"
  name="GetPositionInfo">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="Track" relatedStateVariable="CurrentTrack"/>
    <Parameter name="TrackDuration" relatedStateVariable="CurrentTrackDuration"/>
    <Parameter name="TrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
    <Parameter name="TrackURI" relatedStateVariable="CurrentTrackURI"/>
    <Parameter name="RelTime" relatedStateVariable="RelativeTimePosition"/>
    <Parameter name="AbsTime" relatedStateVariable="AbsoluteTimePosition"/>
    <Parameter name="RelCount" relatedStateVariable="RelativeCounterPosition"/>
    <Parameter name="AbsCount" relatedStateVariable="AbsoluteCounterPosition"/>
  </OutputParameterList>
</Service>
```

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(46)GetDeviceCapabilities service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetDeviceCapabilities"
    name="GetDeviceCapabilities">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="PlayMedia" relatedStateVariable="PossiblePlaybackStorageMedia"/>
    <Parameter name="RecMedia" relatedStateVariable="PossibleRecordStorageMedia"/>
    <Parameter name="RecQualityModes"
      relatedStateVariable="PossibleRecordQualityModes"/>
  </OutputParameterList>
</Service>
```

(47)GetTransportSettings service metadata

```
<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetTransportSettings"
    name="GetTransportSettings">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="PlayMode" relatedStateVariable="CurrentPlayMode"/>
    <Parameter name="RecQualityMode" relatedStateVariable="CurrentRecordQualityMode"/>
  </OutputParameterList>
</Service>
```

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(48)Stop service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Stop"
name="Stop">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(49)Play service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Play"
name="Play">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    <Parameter name="Speed" relatedStateVariable="TransportPlaySpeed"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(50)Pause service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Pause"
name="Pause">
  <InputParameterList>
    <Parameter name="InstanceID"
      relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(51)Record service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Record"
    name="Record">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(52)Seek service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Seek"
    name="Seek">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
        <Parameter name="Unit" relatedStateVariable="A_ARG_TYPE_SeekMode"/>
        <Parameter name="Target" relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(53)Next service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Next"
    name="Next">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

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(54)Previous service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/Previous"
    name="Previous">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(55)SetPlayMode service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetPlayMode"
    name="SetPlayMode">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
        <Parameter name="NewPlayMode" relatedStateVariable="CurrentPlayMode"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(56)SetRecordQualityMode service metadata

```
<?xml version="1.0" ?>
<Service
    type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/SetRecordQualityMode"
    name="SetRecordQualityMode">
    <InputParameterList>
        <Parameter name="InstanceID"
            relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
        <Parameter name="NewRecordQualityMode"
            relatedStateVariable="CurrentRecordQualityMode"/>
    </InputParameterList>
    <OutputParameterList/>
</Service>
```

(57)GetCurrentTransportActions service metadata

```
<?xml version="1.0" ?>
<Service

type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetCurrentTransportAction
ns"

name="GetCurrentTransportActions">
<InputParameterList>
<Parameter name="InstanceID"
relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
</InputParameterList>
<OutputParameterList>
<Parameter name="Actions" relatedStateVariable="CurrentTransportActions"/>
</OutputParameterList>
</Service>
```

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(58)QueryStateVariable service metadata

```

<?xml version="1.0" ?>
<Service
  type="http://www.pucc.jp/2009/03/Device/UPnP/MediaServer/MediaRenderer/QueryStateVariable"
  name="QueryStateVariable">
  <InputParameterList>
    <Parameter name="RenderingControl_LastChange"
      relatedStateVariable="RenderingControl_LastChange"/>
    <Parameter name="PresetNameList" relatedStateVariable="PresetNameList"/>
    <Parameter name="Brightness" relatedStateVariable="Brightness"/>
    <Parameter name="Contrast" relatedStateVariable="Contrast"/>
    <Parameter name="Sharpness" relatedStateVariable="Sharpness"/>
    <Parameter name="RedVideoGain" relatedStateVariable="RedVideoGain"/>
    <Parameter name="GreenVideoGain" relatedStateVariable="GreenVideoGain"/>
    <Parameter name="BlueVideoGain" relatedStateVariable="BlueVideoGain"/>
    <Parameter name="RedVideoBlackLevel" relatedStateVariable="RedVideoBlackLevel"/>
    <Parameter name="GreenVideoBlackLevel" relatedStateVariable="GreenVideoBlackLevel"/>
    <Parameter name="BlueVideoBlackLevel" relatedStateVariable="BlueVideoBlackLevel"/>
    <Parameter name="ColorTemperature" relatedStateVariable="ColorTemperature"/>
    <Parameter name="HorizontalKeystone" relatedStateVariable="HorizontalKeystone"/>
    <Parameter name="VerticalKeystone" relatedStateVariable="VerticalKeystone"/>
    <Parameter name="Mute" relatedStateVariable="Mute"/>
    <Parameter name="Volume" relatedStateVariable="Volume"/>
    <Parameter name="VolumeDB" relatedStateVariable="VolumeDB"/>
    <Parameter name="Loudness" relatedStateVariable="Loudness"/>
    <Parameter name="A_ARG_TYPE_Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
    <Parameter name="RenderingControl_A_ARG_TYPE_InstanceID"
      relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
    <Parameter name="A_ARG_TYPE_PresetName" relatedStateVariable="A_ARG_TYPE_PresetName"/>
    <Parameter name="SourceProtocolInfo" relatedStateVariable="SourceProtocolInfo"/>
    <Parameter name="SinkProtocolInfo" relatedStateVariable="SinkProtocolInfo"/>
    <Parameter name="CurrentConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
    <Parameter name="A_ARG_TYPE_ConnectionStatus"
      relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
    <Parameter name="A_ARG_TYPE_ConnectionManager"
      relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
    <Parameter name="A_ARG_TYPE_Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
    <Parameter name="A_ARG_TYPE_ProtocolInfo" relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
    <Parameter name="A_ARG_TYPE_ConnectionID"
      relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
    <Parameter name="A_ARG_TYPE_AVTransportID"
      relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
    <Parameter name="A_ARG_TYPE_RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
    <Parameter name="TransportState" relatedStateVariable="TransportState"/>
    <Parameter name="TransportStatus" relatedStateVariable="TransportStatus"/>
  </InputParameterList>
</Service>

```

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```

<Parameter name="PlaybackStorageMedium" relatedStateVariable="PlaybackStorageMedium"/>
<Parameter name="RecordStorageMedium" relatedStateVariable="RecordStorageMedium"/>
<Parameter name="PossiblePlaybackStorageMedia"
           relatedStateVariable="PossiblePlaybackStorageMedia"/>
<Parameter name="PossibleRecordStorageMedia" relatedStateVariable="PossibleRecordStorageMedia"/>
<Parameter name="CurrentPlayMode" relatedStateVariable="CurrentPlayMode"/>
<Parameter name="TransportPlaySpeed" relatedStateVariable="TransportPlaySpeed"/>
<Parameter name="RecordMediumWriteStatus" relatedStateVariable="RecordMediumWriteStatus"/>
<Parameter name="CurrentRecordQualityMode" relatedStateVariable="CurrentRecordQualityMode"/>
<Parameter name="PossibleRecordQualityModes" relatedStateVariable="PossibleRecordQualityModes"/>
<Parameter name="NumberOfTracks" relatedStateVariable="NumberOfTracks"/>
<Parameter name="CurrentTrack" relatedStateVariable="CurrentTrack"/>
<Parameter name="CurrentTrackDuration" relatedStateVariable="CurrentTrackDuration"/>
<Parameter name="CurrentMediaDuration" relatedStateVariable="CurrentMediaDuration"/>
<Parameter name="CurrentTrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
<Parameter name="CurrentTrackURI" relatedStateVariable="CurrentTrackURI"/>
<Parameter name="AVTransportURI" relatedStateVariable="AVTransportURI"/>
<Parameter name="AVTransportURIMetaData" relatedStateVariable="AVTransportURIMetaData"/>
<Parameter name="NextAVTransportURI" relatedStateVariable="NextAVTransportURI"/>
<Parameter name="NextAVTransportURIMetaData"
           relatedStateVariable="NextAVTransportURIMetaData"/>
<Parameter name="RelativeTimePosition" relatedStateVariable="RelativeTimePosition"/>
<Parameter name="AbsoluteTimePosition" relatedStateVariable="AbsoluteTimePosition"/>
<Parameter name="RelativeCounterPosition" relatedStateVariable="RelativeCounterPosition"/>
<Parameter name="AbsoluteCounterPosition" relatedStateVariable="AbsoluteCounterPosition"/>
<Parameter name="CurrentTransportActions" relatedStateVariable="CurrentTransportActions"/>
<Parameter name="AVTransport_LastChange" relatedStateVariable="AVTransport_LastChange"/>
<Parameter name="A_ARG_TYPE_SeekMode" relatedStateVariable="A_ARG_TYPE_SeekMode"/>
<Parameter name="A_ARG_TYPE_SeekTarget" relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
<Parameter name="AVTransport_A_ARG_TYPE_InstanceID"
           relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
</InputParameterList>
<OutputParameterList>
  <Parameter name="RenderingControl_LastChange"
            relatedStateVariable="RenderingControl_LastChange"/>
  <Parameter name="PresetNameList" relatedStateVariable="PresetNameList"/>
  <Parameter name="Brightness" relatedStateVariable="Brightness"/>
  <Parameter name="Contrast" relatedStateVariable="Contrast"/>
  <Parameter name="Sharpness" relatedStateVariable="Sharpness"/>
  <Parameter name="RedVideoGain" relatedStateVariable="RedVideoGain"/>
  <Parameter name="GreenVideoGain" relatedStateVariable="GreenVideoGain"/>
  <Parameter name="BlueVideoGain" relatedStateVariable="BlueVideoGain"/>
  <Parameter name="RedVideoBlackLevel" relatedStateVariable="RedVideoBlackLevel"/>
  <Parameter name="GreenVideoBlackLevel" relatedStateVariable="GreenVideoBlackLevel"/>
  <Parameter name="BlueVideoBlackLevel" relatedStateVariable="BlueVideoBlackLevel"/>
  <Parameter name="ColorTemperature" relatedStateVariable="ColorTemperature"/>
  <Parameter name="HorizontalKeystone" relatedStateVariable="HorizontalKeystone"/>

```

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```

<Parameter name="VerticalKeystone" relatedStateVariable="VerticalKeystone"/>
<Parameter name="Mute" relatedStateVariable="Mute"/>
<Parameter name="Volume" relatedStateVariable="Volume"/>
<Parameter name="VolumeDB" relatedStateVariable="VolumeDB"/>
<Parameter name="Loudness" relatedStateVariable="Loudness"/>
<Parameter name="A_ARG_TYPE_Channel" relatedStateVariable="A_ARG_TYPE_Channel"/>
<Parameter name="RenderingControl_A_ARG_TYPE_InstanceID"
           relatedStateVariable="RenderingControl_A_ARG_TYPE_InstanceID"/>
<Parameter name="A_ARG_TYPE_PresetName" relatedStateVariable="A_ARG_TYPE_PresetName"/>
<Parameter name="SourceProtocolInfo" relatedStateVariable="SourceProtocolInfo"/>
<Parameter name="SinkProtocolInfo" relatedStateVariable="SinkProtocolInfo"/>
<Parameter name="CurrentConnectionIDs" relatedStateVariable="CurrentConnectionIDs"/>
<Parameter name="A_ARG_TYPE_ConnectionStatus"
           relatedStateVariable="A_ARG_TYPE_ConnectionStatus"/>
<Parameter name="A_ARG_TYPE_ConnectionManager"
           relatedStateVariable="A_ARG_TYPE_ConnectionManager"/>
<Parameter name="A_ARG_TYPE_Direction" relatedStateVariable="A_ARG_TYPE_Direction"/>
<Parameter name="A_ARG_TYPE_ProtocolInfo" relatedStateVariable="A_ARG_TYPE_ProtocolInfo"/>
<Parameter name="A_ARG_TYPE_ConnectionID"
           relatedStateVariable="A_ARG_TYPE_ConnectionID"/>
<Parameter name="A_ARG_TYPE_AVTransportID"
           relatedStateVariable="A_ARG_TYPE_AVTransportID"/>
<Parameter name="A_ARG_TYPE_RcsID" relatedStateVariable="A_ARG_TYPE_RcsID"/>
<Parameter name="TransportState" relatedStateVariable="TransportState"/>
<Parameter name="TransportStatus" relatedStateVariable="TransportStatus"/>
<Parameter name="PlaybackStorageMedium" relatedStateVariable="PlaybackStorageMedium"/>
<Parameter name="RecordStorageMedium" relatedStateVariable="RecordStorageMedium"/>
<Parameter name="PossiblePlaybackStorageMedia"
           relatedStateVariable="PossiblePlaybackStorageMedia"/>
<Parameter name="PossibleRecordStorageMedia" relatedStateVariable="PossibleRecordStorageMedia"/>
<Parameter name="CurrentPlayMode" relatedStateVariable="CurrentPlayMode"/>
<Parameter name="TransportPlaySpeed" relatedStateVariable="TransportPlaySpeed"/>
<Parameter name="RecordMediumWriteStatus" relatedStateVariable="RecordMediumWriteStatus"/>
<Parameter name="CurrentRecordQualityMode" relatedStateVariable="CurrentRecordQualityMode"/>
<Parameter name="PossibleRecordQualityModes" relatedStateVariable="PossibleRecordQualityModes"/>
<Parameter name="NumberOfTracks" relatedStateVariable="NumberOfTracks"/>
<Parameter name="CurrentTrack" relatedStateVariable="CurrentTrack"/>
<Parameter name="CurrentTrackDuration" relatedStateVariable="CurrentTrackDuration"/>
<Parameter name="CurrentMediaDuration" relatedStateVariable="CurrentMediaDuration"/>
<Parameter name="CurrentTrackMetaData" relatedStateVariable="CurrentTrackMetaData"/>
<Parameter name="CurrentTrackURI" relatedStateVariable="CurrentTrackURI"/>
<Parameter name="AVTransportURI" relatedStateVariable="AVTransportURI"/>
<Parameter name="AVTransportURIMetaData" relatedStateVariable="AVTransportURIMetaData"/>
<Parameter name="NextAVTransportURI" relatedStateVariable="NextAVTransportURI"/>
<Parameter name="NextAVTransportURIMetaData"
           relatedStateVariable="NextAVTransportURIMetaData"/>
<Parameter name="RelativeTimePosition" relatedStateVariable="RelativeTimePosition"/>

```

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```
<Parameter name="AbsoluteTimePosition" relatedStateVariable="AbsoluteTimePosition"/>
<Parameter name="RelativeCounterPosition" relatedStateVariable="RelativeCounterPosition"/>
<Parameter name="AbsoluteCounterPosition" relatedStateVariable="AbsoluteCounterPosition"/>
<Parameter name="CurrentTransportActions" relatedStateVariable="CurrentTransportActions"/>
<Parameter name="AVTransport_LastChange" relatedStateVariable="AVTransport_LastChange"/>
<Parameter name="A_ARG_TYPE_SeekMode" relatedStateVariable="A_ARG_TYPE_SeekMode"/>
<Parameter name="A_ARG_TYPE_SeekTarget" relatedStateVariable="A_ARG_TYPE_SeekTarget"/>
<Parameter name="AVTransport_A_ARG_TYPE_InstanceID"
    relatedStateVariable="AVTransport_A_ARG_TYPE_InstanceID"/>
</OutputParameterList>
</Service>
```

(59)GetIcon service metadata

```
<?xml version="1.0" ?>
<Service type="http://www.pucc.jp/2009/03/Device/UPnP/MediaRenderer/Service/GetIcon"
    name="GetIcon">
    <InputParameterList>
        <Parameter name="url" datatype="string"/>
    </InputParameterList>
    <OutputParameterList>
        <Parameter name="mimeType" datatype="string"/>
        <Parameter name="base64Data" datatype="base64Binary"/>
    </OutputParameterList>
</Service>
```

Appendix A. Version History

Document number	Date	Note
PUCC Metadata Specification – Home Appliance Part 2 UPnP Devices	30 Sep, 2007	Version 1.0
PUCC Metadata Specification – Home Appliance Part 2 UPnP Devices	31 Mar, 2009	Version 2.0

Appendix B. UPnP—PUCC Metadata Mapping Specification

B.1. UPnP-PUCC Device Metadata Mapping

The mapping of device metadata from UPnP to PUCC is performed in accordance with the mapping tables shown below.

Table B.1-1.UPnP→PUCC device metadata mapping table (1/6)

UPnP Device Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
1	root	XML fragment (specVersion element,URLBase element,device element)	—	—	Not required (The Device is the root element)
2	@xmlns	anyURI	—	—	Not required (No ID set for the metadata specification)
3	specVersion	XML fragment (major element,minor element)	—	—	Not required (The version of the specification is not necessary.)
4	major	int	—	—	Not required (The version of the specification is not necessary)
5	minor	int	—	—	Not required (The version of the specification is not necessary)
6	URLBase	anyURI	URLBase	anyURI	Converted to the URL Base element of the Specification element of the Device element

Table B.1-1.UPnP→PUCC device metadata mapping table (2/6)

UPnP Device Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
7	device	XML fragment (deviceType element,friendlyName element,manufacturer element,manufacturerU RL element,modelDescripti on element,modelName element,modelNumber element,modelURL element,serialNumber element,UDN element,UPC element,iconList element)	Device	XML fragment (Specification element,StataVariable element,ServiceList element,PrimitiveDeviceL ist element)	Change subelements
8	—	—	@xmlns	anyURI	Added
9	—	—	@id	ID	Identify the instance of additional elements to make them globally unique
10	deviceType	anyURI	@type	anyURI	No value change
11	friendlyName	string	@name	string	No value change

Table B.1-1.UPnP→PUCC device metadata mapping table (3/6)

UPnP Document	Device	Descriptive	PUCC Device Metadata		
			Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)
12	—	—	Specification	XML fragment (URLBase element,Manufacturer element,ManufacturerURL element,ManufactureDate element,ModelDescription element,ModelName element,ModelNumber element,ModelURL element,SerialNumber element,UDN element,UPC element,IconList element)	Added
13	manufacturer	string	Manufacturer	string	No value change
14	manufacturerURL	anyURI	ManufacturerURL	anyURI	No value change
15	—	—	ManufactureDate	date	Added
16	modelDescription	string	ModelDescription	string	No value change
17	modelName	string	ModelName	string	No value change
18	modelNumber	string	ModelNumber	string	No value change
19	modeURL	anyURI	ModeURL	anyURI	No value change
20	serialNumber	string	SerialNumber	string	No value change
21	UDN	anyURI	UDN	anyURI	No value change
22	UPC	string	UPC	string	No value change

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Table B.1-1.UPnP→PUCC device metadata mapping table (4/6)

UPnP Device Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
23	iconList	XML fragment (icon element)	iconList	XML fragment (Icon element)	Convert the first letter of the name of subelements from a lower case to an upper case.
24	icon	XML fragment (mimetype element,width element,height element,depth element,url element)	Icon	XML fragment (Mimetype element,Width element,Height element,Depth element,Url element)	Convert the first letter of the name of subelements from a lower case to an upper case.
25	mimetype	string	Mimetype	string	No value change
26	width	int	Width	int	No value change
27	height	int	Height	int	No value change
28	depth	int	Depth	int	No value change
29	url	anyURI	Url	anyURI	No value change
30	serviceList	XML fragment (service element)	—	—	Not required (No UPnP service equivalent for PUCC. PUCC services correspond to UPnP actions.)

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Table B.1-1.UPnP→PUCC device metadata mapping table (5/6)

UPnP Device Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	
31	service	XML fragment (serviceType element,serviceId element,SCPDURL element,controlURL element,eventSubUR L element,)	—	—	Same as above
32	serviceType	anyURI	—	—	Same as above
33	serviceId	anyURI	—	—	Same as above
34	SCPDURL	anyURI	—	—	Not required (The service metadata is not obtained by the URL.)
35	controlURL	anyURI	—	—	Not required (The point of service execution is not specified by the URL.)
36	eventSubURL	anyURI	—	—	Not required (The party notified of events is not specified by the URL.)
37	—	—	ServiceList	XML fragment (Service element)	The conversion of elements under the ServiceList elements is described in the service metadata conversion specification.
38	deviceList	XML fragment (presentationURL element)	PrimitiveDeviceList	XML fragment (PrimitiveDev ice element)	The subelements are named Primitive Device, not Device.

Table B.1-1.UPnP→PUCC device metadata mapping table (6/6)

UPnP Device Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
39	presentationURL	anyURI	—	—	Not required (The presentation function is not supported in the PUCC device search/ service execution architecture.)
40	—	—	StateVariableList	XML fragment (StateVariable element)	The conversion of elements under the StateVariableList elements is described in the service metadata conversion specification.

B.2. UPnP-PUCC Service Metadata Mapping

The mapping of service metadata from UPnP to PUCC is performed in accordance with the conversion tables shown below.

Table B.2-1.UPnP→PUCC service metadata mapping table (1/3)

UPnP Service Descriptive Document		PUCC Service Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
1	sepd	XMLfragment (specVersion element)	—	—	Not required (The service is the root element.)
2	@xmlns	anyURI	—	—	Not required (No ID set for the metadata specification)
3	specVersion	XMLfragment (major element,minor element)	—	—	Not required (The version of the specification is not necessary.)
4	major	int	—	—	Not required (The version of the specification is not necessary.)
5	minor	int	—	—	Not required (The version of the specification is not necessary.)
6	actionList	XMLfragment (action element)	—	—	Not required (More than two action are not defined.)
7	action	XMLfragment (name element,argumen tList element)	Service	XMLfragment (InputParamterList element,OutputPara meterList element)	Change subelements or add the attribute to them.
8	name	string	@name	string	No value change
9	—	—	@type	anyURI	Set the name domain identifier that identifies

					additional PUCC service types.
10	argumentList	XMLfragment (argument element)	—	—	Deleted

Table B.2-1.UPnP→PUCC service metadata mapping table (2/3)

	UPnP Service Descriptive Document		PUCC Service Metadata		
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
11	—	—	InputParameterList	XMLfragment (Paramter element)	Added
12	—	—	OutputParameterList	XMLfragment (Paramter element)	Added
13	argument	XMLfragment (name element,direction element,retval element,relatedStateVariable element,default Value element,allowed ValueList element,allowed ValueRange element)	Parameter	XMLfragment (DefaultValue element,Allowed ValueList element,Allowed ValueRange element,Allowed XmlData element)	Set the parameter elemenet in the InputParameterList element when the subelement direction element value is “in.” Set the parameter elemenet in the OutputParameterList element when the subelement direction element value is “out.”
14	name	string	@name	string	No value change
15	direction	string	—	—	Not required (The InputParameterList and the

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					OutputParameterList are separated.)
16	retval	empty	—	—	Not required (The PUCC device search/service execution architecture does not have the concept of return code.)
17	—	—	@datatype	string	Set the data type element value of the corresponding state variable elements.

Table B.2-1.UPnP→PUCC service metadata mapping table (3/3)

	UPnP Service Descriptive Document		PUCC Service Metadata		
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Description
18	relatedStateVariable	string	relatedStateVariable	string	No value change
19	defaultValue	No rules	DefaultValue	No rules	No value change
20	allowedValueList	XML fragment (allowedValue element)	AllowedValueList	XML fragment (AllowedValue element)	Convert the first letter of the name of subelements from a lower case to an upper case.
21	allowedValue	No rules	AllowedValue	No rules	No value change
22	allowedValueRange	XML fragment	AllowedValueRange	XML fragment (Minimum element,Maximum element,Step element)	Convert the first letter of the name of subelements from a lower case to an upper case.
23	minimum	int	Minimum	int	No value change
24	maximum	int	Maximum	int	No value change
25	step	int	Step	int	No value change

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Table B.2-2.UPnP service metadata→PUCC device metadata mapping

UPnP Service Descriptive Document		PUCC Device Metadata			
	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	Element Name/ Attribute Name (Prefix @ to Attribute Name)	Data Type of Element Value/ Attribute Value	
1	serviceStateTable	XML fragment (stateVariable element)	StateVariableList	XML fragment (StateVariable element)	Convert the first letter of the name of subelements from a lower case to an upper case.
2	stateVariable	XML fragment (name element,dataT ype element,default Value element,allow edValueList element,allow edValueRange element)	StateVariable	XML fragment (DefaultValue element,Allowed ValueList element,Allowed ValueRange element)	Change subelements and attributes.
3	name	string	@name	string	No value change
4	dataType	string	@datatype	string	No value change
5	@sendEvents	string	@sendEvents	string	No value change
6	defaultValue	No rules	DefaultValue	No rules	No value change
7	allowedValueList	XML fragment (allowedValue element)	AllowedValueList	XML fragment (AllowedValue element)	Convert the first letter of the name of subelements from a lower case to an upper case.
8	allowedValue	No rules	AllowedValue	No rules	No value change
9	allowedValueRang e	XML fragment	AllowedValueRang e	XML fragment (Minimum	Convert the first letter of the name of subelements

		(minimum element,maximum element,step element)		element,Maximum element,Step element)	from a lower case to an upper case.
10	minimum	int	Minimum	int	No value change
11	maximum	int	Maximum	int	No value change
12	step	int	Step	int	No value change

The value of state variables and service parameter data types change when converted from UPnP to PUCC.

The mapping is performed in accordance with the Table shown below.

Table B.2-3.Data type mapping

	UPnP	PUCC
1	ui1	unsignedByte
2	ui2	unsignedShort
3	ui4	unsignedInt
4	i1	byte
5	i2	short
6	i4	int
7	int	integer
8	r4	float
9	r8	double
10	number	double
11	fixed.14.4	double
12	float	float
13	char	string
14	string	string
15	date	date
16	dateTime	dateTime
17	dateTime.tz	dateTime
18	time	time
19	time.tz	time
20	boolean	boolean
21	bin.base64	base64Binary
22	bin.hex	hexBinary
23	url	anyURI
24	uuid	hexBinary

Appendix C. content download and content upload

DLNA 1.5 でシステムの利用方法として追加されたコンテンツアップロードとコンテンツダウンロードを、PUCC プロトコルで利用することができるよう、MediaServer デバイスの PUCC サービスとしてメタデータ仕様に定義する。

1. 方式

- コンテンツアップロードとコンテンツダウンロードはどちらも PUCC Device Discovery and Service Invocation Protocol による PUCC サービスとして実現する。
- 両サービスを提供するデバイスは、UPnP デバイスの MediaServer デバイスとする。
- それぞれのサービスの内容は以下とする。
 - ① コンテンツダウンロードサービス
 - ・ PUCC サービスのクライアントが、あるコンテンツを、ある MediaServer デバイスからダウンロードする。
 - ・ ダウンロードするコンテンツの識別は URL とする。URL をコンテンツダウンロードサービスの入力パラメータとする。
 - ・ ダウンロードするコンテンツの URL は、MediaServer デバイスの Browse サービスにより、取得する。
 - ・ コンテンツはマルチホップでダウンロードすることができるよう、BASE64 エンコードして、コンテンツダウンロードサービスの出力パラメータとして設定する。
 - ・ コンテンツダウンロードは、DLNA1.5 で規定するバックグラウンド転送を行う。
 - ② コンテンツアップロードサービス
 - ・ PUCC サービスのクライアントが、あるコンテンツを、ある MediaServer デバイスにアップロードする。
 - ・ コンテンツのアップロード先の識別は URL とする。アップロード先 URL をコンテンツアップロードサービスの入力パラメータとする。
 - ・ アップロード先の URL は、MediaServer デバイスの CreateObject サービスにより取得する (importUri)
 - ・ コンテンツはマルチホップでアップロードすることができるよう、BASE64 エンコードする。
 - ・ コンテンツアップロードは、DLNA1.5 で規定するバックグラウンド転送を行う。

<参考>コンテンツ転送モード

DLNA1.5 では以下の 3 種類のコンテンツ転送モードが規定されている。

	コンテンツ転送モード	転送レート	使用例	デフォルトの DLNAQOS レベル
1	ストリーミング転送	コンテンツの送信元と受信者が、コンテンツのビットレート等のタイミング情報に基づいて転送レートを一定に保つ。	動画・音楽のリアルタイム再生	2
2	インタラクティブ転送	コンテンツの送信者は、受信者が処理できる最大のレートで転送する。	静止画・プリントイングコンテンツ	1
3	バックグラウンド転送	コンテンツの送信者は、自分が決めたレートでコンテンツを転送する。ただし、そのレートで受信者が処理できる必要がある。	ファイルコンテンツ	0

コンテンツ転送モードは、メディアクラスに依存する。

	メディアクラス	転送モード
1	XHTML プリンティング	バックグラウンド／インタラクティブ
2	メディアコレクションファイル (プレイリスト／スライドショー)	バックグラウンド／インタラクティブ
3	静止画	バックグラウンド／インタラクティブ
4	音楽	バックグラウンド／ストリーミング

5 動画

バックグラウンド／ストリーミング

コンテンツダウンロードは、バックグラウンドモードあるいはストリーミングモードを使用する。

コンテンツアップロードは、HTTP を使う場合はバックグラウンドモードを使用する。