



ISO/IEC 29341-5-10

Edition 1.0 2008-11

INTERNATIONAL STANDARD

Information technology – UPnP Device Architecture –
Part 5-10: Digital Security Camera Device Control Protocol –
Digital Security Camera Motion Image Service

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 29341-5-10:2008



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2008 ISO/IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about ISO/IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00



ISO/IEC 29341-5-10

Edition 1.0 2008-11

INTERNATIONAL STANDARD

**Information technology – UPnP Device Architecture –
Part 5-10: Digital Security Camera Device Control Protocol –
Digital Security Camera Motion Image Service**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

J

ICS 35.200

ISBN 2-8318-1007-1

CONTENTS

FOREWORD	4
ORIGINAL UPNP DOCUMENTS (informative)	6
1. Overview and Scope	8
2. Service Modeling Definitions	9
2.1. ServiceType	9
2.2. State Variables	9
2.2.1. AvailableEncodings	9
2.2.2. DefaultEncoding	9
2.2.3. AvailableCompressionLevels	9
2.2.4. DefaultCompressionLevel	10
2.2.5. AvailableResolutions	10
2.2.6. DefaultResolutions	10
2.2.7. VideoURL	10
2.2.8. VideoPresentationURL	10
2.2.9. MaxBandwidth	10
2.2.10. TargetFrameRate	10
2.3. Eventing and Moderation	11
2.4. Actions	12
2.4.1. GetAvailableEncodings	12
2.4.2. SetDefaultEncoding	12
2.4.3. GetDefaultEncoding	13
2.4.4. GetAvailableCompressionLevels	13
2.4.5. SetDefaultCompressionLevel	13
2.4.6. GetDefaultCompressionLevel	14
2.4.7. GetAvailableResolutions	14
2.4.8. SetDefaultResolution	14
2.4.9. GetDefaultResolution	14
2.4.10. GetVideoURL	15
2.4.11. GetDefaultVideoURL	15
2.4.12. GetVideoPresentationURL	16
2.4.13. GetDefaultVideoPresentationURL	17
2.4.14. SetMaxBandwidth	17
2.4.15. GetMaxBandwidth	17
2.4.16. SetTargetFrameRate	17
2.4.17. GetTargetFrameRate	18
2.4.18. Non-Standard Actions Implemented by a UPnP Vendor	18
2.4.19. Common Error Codes	18
2.5. Theory of Operation	19
3. XML Service Description	20
4. Test	25

LIST OF TABLES

Table 1: State Variables	9
Table 2: Event Moderation.....	11
Table 3: Actions	12
Table 4: Arguments for <u>GetAvailableEncodings</u>	12
Table 5: Arguments for <u>SetDefaultEncoding</u>	12
Table 6: Arguments for <u>GetDefaultEncoding</u>	13
Table 7: Arguments for <u>GetAvailableCompressionLevels</u>	13
Table 8: Arguments for <u>SetDefaultCompressionLevel</u>	13
Table 9: Arguments for <u>GetDefaultCompressionLevel</u>	14
Table 10: Arguments for <u>GetAvailableResolutions</u>	14
Table 11: Arguments for <u>SetDefaultResolution</u>	14
Table 12: Arguments for <u>GetDefaultResolution</u>	15
Table 13: Arguments for <u>GetVideoURL</u>	15
Table 13: Arguments for <u>GetDefaultVideoURL</u>	16
Table 14: Arguments for <u>GetVideoPresentationURL</u>	16
Table 15: Arguments for <u>GetDefaultVideoPresentationURL</u>	17
Table 16: Arguments for <u>SetMaxBandwidth</u>	17
Table 17: Arguments for <u>GetMaxBandwidth</u>	17
Table 18: Arguments for <u>SetTargetFrameRate</u>	17
Table 19: Arguments for <u>GetTargetFrameRate</u>	18
Table 20: Common Error Codes.....	18

INFORMATION TECHNOLOGY – UPNP DEVICE ARCHITECTURE –

Part 5-10: Digital Security Camera Device Control Protocol – Digital Security Camera Motion Image Service

FOREWORD

- 1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards. Their preparation is entrusted to technical committees; any ISO and IEC member body interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
- 3) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC and ISO member bodies.
- 4) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 5) In order to promote international uniformity, IEC and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 6) ISO and IEC provide no marking procedure to indicate their approval and cannot be rendered responsible for any equipment declared to be in conformity with an ISO/IEC publication.
- 7) All users should ensure that they have the latest edition of this publication.
- 8) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 9) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

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

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

Intel Corporation has informed IEC and ISO that it has patent applications or granted patents.

Information may be obtained from:

Intel Corporation
Standards Licensing Department
5200 NE Elam Young Parkway
MS: JFS-98
USA – Hillsboro, Oregon 97124

Microsoft Corporation has informed IEC and ISO that it has patent applications or granted patents as listed below:

6101499 / US; 6687755 / US; 6910068 / US; 7130895 / US; 6725281 / US; 7089307 / US; 7069312 / US;
10/783 524 / US

Information may be obtained from:

Microsoft Corporation
One Microsoft Way
USA – Redmond WA 98052

Philips International B.V. has informed IEC and ISO that it has patent applications or granted patents.

Information may be obtained from:

Philips International B.V. – IP&S
High Tech campus, building 44 3A21
NL – 5656 Eindhoven

NXP B.V. (NL) has informed IEC and ISO that it has patent applications or granted patents.

Information may be obtained from:

NXP B.V. (NL)
High Tech campus 60
NL – 5656 AG Eindhoven

Matsushita Electric Industrial Co. Ltd. has informed IEC and ISO that it has patent applications or granted patents.

Information may be obtained from:

Matsushita Electric Industrial Co. Ltd.
1-3-7 Shiromi, Chuoh-ku
JP – Osaka 540-6139

Hewlett Packard Company has informed IEC and ISO that it has patent applications or granted patents as listed below:

5 956 487 / US; 6 170 007 / US; 6 139 177 / US; 6 529 936 / US; 6 470 339 / US; 6 571 388 / US; 6 205 466 / US

Information may be obtained from:

Hewlett Packard Company
1501 Page Mill Road
USA – Palo Alto, CA 94304

Samsung Electronics Co. Ltd. has informed IEC and ISO that it has patent applications or granted patents.

Information may be obtained from:

Digital Media Business, Samsung Electronics Co. Ltd.
416 Maetan 3 Dong, Yeongtang-Gu,
KR – Suwon City 443-742

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC and ISO shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 29341-5-10 was prepared by UPnP Implementers Corporation and adopted, under the PAS procedure, by joint technical committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

The list of all currently available parts of the ISO/IEC 29341 series, under the general title *Universal plug and play (UPnP) architecture*, can be found on the IEC web site.

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

ORIGINAL UPnP DOCUMENTS (informative)

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

UPnP Document Title	ISO/IEC 29341 Part
UPnP Device Architecture 1.0	ISO/IEC 29341-1
UPnP Basic:1 Device	ISO/IEC 29341-2
UPnP AV Architecture:1	ISO/IEC 29341-3-1
UPnP MediaRenderer:1 Device	ISO/IEC 29341-3-2
UPnP MediaServer:1 Device	ISO/IEC 29341-3-3
UPnP AVTransport:1 Service	ISO/IEC 29341-3-10
UPnP ConnectionManager:1 Service	ISO/IEC 29341-3-11
UPnP ContentDirectory:1 Service	ISO/IEC 29341-3-12
UPnP RenderingControl:1 Service	ISO/IEC 29341-3-13
UPnP MediaRenderer:2 Device	ISO/IEC 29341-4-2
UPnP MediaServer:2 Device	ISO/IEC 29341-4-3
UPnP AV Datastructure Template:1	ISO/IEC 29341-4-4
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11
UPnP ContentDirectory:2 Service	ISO/IEC 29341-4-12
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13
UPnP ScheduledRecording:1	ISO/IEC 29341-4-14
UPnP DigitalSecurityCamera:1 Device	ISO/IEC 29341-5-1
UPnP DigitalSecurityCameraMotionImage:1 Service	ISO/IEC 29341-5-10
UPnP DigitalSecurityCameraSettings:1 Service	ISO/IEC 29341-5-11
UPnP DigitalSecurityCameraStillImage:1 Service	ISO/IEC 29341-5-12
UPnP HVAC_System:1 Device	ISO/IEC 29341-6-1
UPnP HVAC_ZoneThermostat:1 Device	ISO/IEC 29341-6-2
UPnP ControlValve:1 Service	ISO/IEC 29341-6-10
UPnP HVAC_FanOperatingMode:1 Service	ISO/IEC 29341-6-11
UPnP FanSpeed:1 Service	ISO/IEC 29341-6-12
UPnP HouseStatus:1 Service	ISO/IEC 29341-6-13
UPnP HVAC_SetpointSchedule:1 Service	ISO/IEC 29341-6-14
UPnP TemperatureSensor:1 Service	ISO/IEC 29341-6-15
UPnP TemperatureSetpoint:1 Service	ISO/IEC 29341-6-16
UPnP HVAC_UserOperatingMode:1 Service	ISO/IEC 29341-6-17
UPnP BinaryLight:1 Device	ISO/IEC 29341-7-1
UPnP DimmableLight:1 Device	ISO/IEC 29341-7-2
UPnP Dimming:1 Service	ISO/IEC 29341-7-10
UPnP SwitchPower:1 Service	ISO/IEC 29341-7-11
UPnP InternetGatewayDevice:1 Device	ISO/IEC 29341-8-1
UPnP LANDevice:1 Device	ISO/IEC 29341-8-2
UPnP WANDevice:1 Device	ISO/IEC 29341-8-3
UPnP WANConnectionDevice:1 Device	ISO/IEC 29341-8-4
UPnP WLANAccessPointDevice:1 Device	ISO/IEC 29341-8-5
UPnP LANHostConfigManagement:1 Service	ISO/IEC 29341-8-10
UPnP Layer3Forwarding:1 Service	ISO/IEC 29341-8-11
UPnP LinkAuthentication:1 Service	ISO/IEC 29341-8-12
UPnP RadiusClient:1 Service	ISO/IEC 29341-8-13
UPnP WANCableLinkConfig:1 Service	ISO/IEC 29341-8-14
UPnP WANCommonInterfaceConfig:1 Service	ISO/IEC 29341-8-15
UPnP WANDSLLinkConfig:1 Service	ISO/IEC 29341-8-16
UPnP WANEthernetLinkConfig:1 Service	ISO/IEC 29341-8-17
UPnP WANIPConnection:1 Service	ISO/IEC 29341-8-18
UPnP WANPOTSLinkConfig:1 Service	ISO/IEC 29341-8-19
UPnP WANPPPPConnection:1 Service	ISO/IEC 29341-8-20
UPnP WLANConfiguration:1 Service	ISO/IEC 29341-8-21
UPnP Printer:1 Device	ISO/IEC 29341-9-1
UPnP Scanner:1.0 Device	ISO/IEC 29341-9-2
UPnP ExternalActivity:1 Service	ISO/IEC 29341-9-10
UPnP Feeder:1.0 Service	ISO/IEC 29341-9-11
UPnP PrintBasic:1 Service	ISO/IEC 29341-9-12
UPnP Scan:1 Service	ISO/IEC 29341-9-13
UPnP QoS Architecture:1.0	ISO/IEC 29341-10-1
UPnP QoSDevice:1 Service	ISO/IEC 29341-10-10
UPnP QoSManager:1 Service	ISO/IEC 29341-10-11
UPnP QoSPolicyHolder:1 Service	ISO/IEC 29341-10-12
UPnP QoS Architecture:2	ISO/IEC 29341-11-1
UPnP QOS v2 Schema Files	ISO/IEC 29341-11-2

UPnP Document Title	ISO/IEC 29341 Part
UPnP QosDevice:2 Service	ISO/IEC 29341-11-10
UPnP QosManager:2 Service	ISO/IEC 29341-11-11
UPnP QosPolicyHolder:2 Service	ISO/IEC 29341-11-12
UPnP RemoteUIClientDevice:1 Device	ISO/IEC 29341-12-1
UPnP RemoteUIServerDevice:1 Device	ISO/IEC 29341-12-2
UPnP RemoteUIClient:1 Service	ISO/IEC 29341-12-10
UPnP RemoteUIServer:1 Service	ISO/IEC 29341-12-11
UPnP DeviceSecurity:1 Service	ISO/IEC 29341-13-10
UPnP SecurityConsole:1 Service	ISO/IEC 29341-13-11

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 29341-5-10:2008

1. Overview and Scope

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

The service enables delivery and control of live snapshot images from a digital security camera.

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 29341-5-10:2008

2. Service Modeling Definitions

2.1. ServiceType

A service that is compliant with this template is identified with the following service type: **urn:schemas-upnp-org:service:** DigitalSecurityCameraMotionImage:1.

2.2. State Variables

Table 1: State Variables

Variable Name	Req. or Opt. ¹	Data Type	Allowed Value	Default Value	Eng. Units
<u>AvailableEncodings</u>	<u>R</u>	<u>string</u>			
<u>DefaultEncoding</u>	<u>R</u>	<u>string</u>			
<u>AvailableCompressionLevels</u>	<u>R</u>	<u>string</u>			
<u>DefaultCompressionLevel</u>	<u>R</u>	<u>string</u>			
<u>AvailableResolutions</u>	<u>R</u>	<u>string</u>			
<u>DefaultResolutions</u>	<u>R</u>	<u>string</u>			
<u>VideoURL</u>	<u>R</u>	<u>string</u>			
<u>VideoPresentationURL</u>	<u>R</u>	<u>string</u>			
<u>MaxBandwidth</u>	<u>R</u>	<u>ui4</u>	<u>0..</u>	<u>(Maximum)</u>	
<u>TargetFrameRate</u>	<u>R</u>	<u>ui4</u>	<u>0..</u>	<u>(Maximum)</u>	
<i>Non-standard state variables implemented by an UPnP vendor go here.</i>	X	TBD	TBD	TBD	TBD

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

2.2.1. AvailableEncodings

The value of this string should be a list of all by the vendor specific service supported MIME-type still image types. The types in the list should be separated by a “,”.

Example: image/jpeg, image/gif, image/bmp

This is a read only property.

2.2.2. DefaultEncoding

The value of this string must be a MIME-type still image type. Any MIME still image type listed in AvailableEncodings may be used as an allowed value.

2.2.3. AvailableCompressionLevels

Compression level describes how much an image should be compressed. Since a wide variety of compression methods and algorithms are available compression levels become subjective values that are hard to quantify. The value of this string should be a list of all supported compression levels separated by a “,”. The list order should be the lowest compression level first.

Example1: 0, 1, 2, 3, 4, 5

Example2: Lowest, Highest

This is a read only property.

2.2.4. DefaultCompressionLevel

The value of this string must be one of the supported compression levels specified in AvailableCompressionLevels.

AvailableEncodings may be used as an allowed value.

2.2.5. AvailableResolutions

Resolution is the actual number of horizontal and vertical pixels an image contains. It does not tell anything of the image quality apart from the size in pixels. There must be at least one resolution available. Presented in ascending order based on first the value of X multiplied by Y and as second order the value of X. Always formatted as "XxY". Where X is the horizontal number of pixels and Y the vertical number of pixels.

Example: 320x240, 640x480

This is a read only property.

Resolution is always based on Rotation = 0.

(See: Security Camera Settings Service for more information)

2.2.6. DefaultResolutions

The value of this string must be one of the supported resolutions specified in AvailableResolutions.

2.2.7. VideoURL

The VideoURL is the URL for the video stream itself.

This is a read only property.

2.2.8. VideoPresentationURL

This is the URL for an html presentation page of the current video stream. The typical implementation would be an html page that includes the VideoURL. This field must exist but may contain the empty string.

2.2.9. MaxBandwidth

This is the maximum bandwidth allowed for this service to use for *each* video connection. Unit used is Kbit/s. If set to 0 this service would be disabled. MaxBandwidth has priority over TargetFrameRate frame rate.

2.2.10. TargetFrameRate

Frame rate in frames/minute. Target frame rate should never be exceeded by the device. If an attempt to set outside scope of device the nearest supported legal value will be set.

2.3. Eventing and Moderation

Table 2: Event Moderation

Variable Name	Evented	Moderated Event	Max Event Rate ¹	Logical Combination	Min Delta per Event ²
<u>AvailableEncodings</u>	<u>No</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>DefaultEncoding</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>AvailableCompressionLevels</u>	<u>No</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>DefaultCompressionLevel</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>AvailableResolutions</u>	<u>No</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>DefaultResolution</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>VideoURL</u>	<u>No</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>VideoPresentationURL</u>	<u>No</u>	<u>No</u>	<u>N/A</u>		<u>N/A</u>
<u>MaxBandwidth</u>	<u>Yes</u>	<u>Yes</u>	<u>1</u>		<u>N/A</u>
<u>TargetFrameRate</u>	<u>Yes</u>	<u>Yes</u>	<u>1</u>		<u>N/A</u>
<i>Non-standard state variables implemented by an UPnP vendor go here.</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>

¹ Determined by N, where Rate = (Event)/(N secs).

² (N) * (allowedValueRange Step).

2.4. Actions

Immediately following this table is detailed information about these actions, including short descriptions of the actions, the effects of the actions on state variables, and error codes defined by the actions.

Table 3: Actions

Name	Req. or Opt. ¹
<u>GetAvailableEncodings</u>	<u>R</u>
<u>SetDefaultEncoding</u>	<u>R</u>
<u>GetDefaultEncoding</u>	<u>R</u>
<u>GetAvailableCompressionLevels</u>	<u>R</u>
<u>SetDefaultCompressionLevel</u>	<u>R</u>
<u>GetDefaultCompressionLevel</u>	<u>R</u>
<u>GetAvailableResolutions</u>	<u>R</u>
<u>SetDefaultResolution</u>	<u>R</u>
<u>GetDefaultResolution</u>	<u>R</u>
<u>GetVideoURL</u>	<u>R</u>
<u>GetDefaultVideoURL</u>	<u>R</u>
<u>GetVideoPresentationURL</u>	<u>R</u>
<u>GetDefaultVideoPresentationURL</u>	<u>R</u>
<u>SetMaxBandwidth</u>	<u>R</u>
<u>GetMaxBandwidth</u>	<u>R</u>
<u>SetTargetFrameRate</u>	<u>R</u>
<u>GetTargetFrameRate</u>	<u>R</u>
<i>Non-standard actions implemented by an URP vendor go here.</i>	X

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

2.4.1. GetAvailableEncodings

Get the list of supported MIME-type still image types.

2.4.1.1. Arguments

Table 4: Arguments for [GetAvailableEncodings](#)

Argument	Direction	relatedStateVariable
<u>GetAvailableEncodings</u>	<u>OUT</u>	<u>AvailableEncodings</u>

2.4.2. SetDefaultEncoding

Set the DefaultEncoding.

2.4.2.1. Arguments

Table 5: Arguments for [SetDefaultEncoding](#)

Argument	Direction	relatedStateVariable
<u>ReqEncoding</u>	<u>IN</u>	<u>DefaultEncoding</u>

2.4.2.2. Effect on State

Changes the value of DefaultEncoding to ReqEncoding.

2.4.2.3. Errors

errorCode	errorDescription	Description
<u>700</u>	<u>ReqEncoding not supported</u>	ReqEncoding is not one of the supported encodings specified in AvailableEncodings.

2.4.3. GetDefaultEncoding

Get the DefaultEncoding.

2.4.3.1. Arguments

Table 6: Arguments for GetDefaultEncoding

Argument	Direction	relatedStateVariable
<u>RetEncoding</u>	<u>OUT</u>	<u>DefaultEncoding</u>

2.4.4. _GetAvailableCompressionLevels

Get the list of supported compression levels.

2.4.4.1. Arguments

Table 7: Arguments for GetAvailableCompressionLevels

Argument	Direction	relatedStateVariable
<u>RetAvailableCompressionLevels</u>	<u>OUT</u>	<u>AvailableCompressionLevels</u>

2.4.5. _SetDefaultCompressionLevel

Set the DefaultCompressionLevel.

2.4.5.1. Arguments

Table 8: Arguments for SetDefaultCompressionLevel

Argument	Direction	relatedStateVariable
<u>ReqCompressionLevel</u>	<u>IN</u>	<u>DefaultCompressionLevel</u>

2.4.5.2. Effect on State

Changes the value of DefaultCompressionLevel to ReqCompressionLevel.

2.4.5.3. Errors

errorCode	errorDescription	Description
<u>701</u>	<u>ReqCompressionLevel not supported</u>	ReqCompressionLevel is not one of the supported compression levels specified in AvailableCompressionLevels.

2.4.6. GetDefaultCompressionLevel

Get the DefaultCompressionLevel.

2.4.6.1. Arguments

Table 9: Arguments for GetDefaultCompressionLevel

Argument	Direction	relatedStateVariable
<u>ReqCompressionLevel</u>	<u>OUT</u>	<u>DefaultCompressionLevel</u>

2.4.7. GetAvailableResolutions

Get the list of supported resolutions.

2.4.7.1. Arguments

Table 10: Arguments for GetAvailableResolutions

Argument	Direction	relatedStateVariable
<u>ReqAvailableResolutions</u>	<u>OUT</u>	<u>AvailableResolutions</u>

2.4.8. SetDefaultResolution

Set the DefaultResolution.

2.4.8.1. Arguments

Table 11: Arguments for SetDefaultResolution

Argument	Direction	relatedStateVariable
<u>ReqResolution</u>	<u>IN</u>	<u>DefaultResolution</u>

2.4.8.2. Effect on State

Changes the value of DefaultResolution to ReqResolution.

2.4.8.3. Errors

errorCode	errorDescription	Description
<u>702</u>	<u>ReqResolution not supported</u>	ReqResolution is not one of the supported resolutions specified in AvailableResolutions.

2.4.9. GetDefaultResolution

Get the DefaultResolution.

2.4.9.1. Arguments

Table 12: Arguments for GetDefaultResolution

Argument	Direction	relatedStateVariable
<u>RetResolution</u>	<u>OUT</u>	<u>DefaultResolution</u>

2.4.10. GetVideoURL

Get a URL to the video stream itself. The RetVideoURL is being built depending on how the different parameters has been set.

ReqEncoding should be one of the supported encodings.

ReqCompression should be one of the supported compressions.

ReqResolution should be one of the supported resolutions.

ReqMaxBandwidth should be the maximum bandwidth allowed.

ReqTargetFrameRate should be the maximum frame rate in frames/minute.

2.4.10.1. Arguments

Table 13: Arguments for GetVideoURL

Argument	Direction	relatedStateVariable
<u>ReqEncoding</u>	<u>IN</u>	<u>DefaultEncoding</u>
<u>ReqCompression</u>	<u>IN</u>	<u>DefaultCompression</u>
<u>ReqResolution</u>	<u>IN</u>	<u>DefaultResolution</u>
<u>ReqMaxBandwidth</u>	<u>IN</u>	<u>MaxBandwidth</u>
<u>ReqTargetFrameRate</u>	<u>IN</u>	<u>TargetFrameRate</u>
<u>RetVideoURL</u>	<u>OUT</u>	<u>VideoURL</u>

2.4.10.2. Errors

errorCode	errorDescription	Description
<u>700</u>	<u>ReqEncoding not supported</u>	ReqEncoding is not one of the supported encodings specified in AvailableEncodings.
<u>701</u>	<u>ReqCompressionLevel not supported</u>	ReqCompressionLevel is not one of the supported compression levels specified in AvailableCompressionLevels.
<u>702</u>	<u>ReqResolution not supported</u>	ReqResolution is not one of the supported resolutions specified in AvailableResolutions.

2.4.11. GetDefaultVideoURL

Get a URL to the video stream itself. The RetVideoURL is being built depending on how the different default parameters DefaultEncoding, DefaultCompressionLevel and DefaultResolution has been set.

2.4.11.1.Arguments

Table 13: Arguments for GetDefaultVideoURL

Argument	Direction	relatedStateVariable
<u>RetVideoURL</u>	<u>OUT</u>	<u>VideoURL</u>

2.4.12.GetVideoPresentationURL

Get a URL to an html presentation page of the current video stream.

The ReqVideoPresentationURL is being built depending on how the different parameters has been set.

ReqEncoding should be one of the supported encodings.

ReqCompression should be one of the supported compressions.

ReqResolution should be one of the supported resolutions.

ReqMaxBandwidth should be the maximum bandwidth allowed.

ReqTargetFrameRate should be the maximum frame rate in frames/minute.

2.4.12.1.Arguments

Table 14: Arguments for GetVideoPresentationURL

Argument	Direction	relatedStateVariable
<u>ReqEncoding</u>	<u>IN</u>	<u>DefaultEncoding</u>
<u>ReqCompression</u>	<u>IN</u>	<u>DefaultCompression</u>
<u>ReqResolution</u>	<u>IN</u>	<u>DefaultResolution</u>
<u>ReqMaxBandwidth</u>	<u>IN</u>	<u>MaxBandwidth</u>
<u>ReqTargetFrameRate</u>	<u>IN</u>	<u>TargetFrameRate</u>
<u>RetVideoPresentationURL</u>	<u>OUT</u>	<u>VideoPresentationURL</u>

2.4.12.2.Errors

errorCode	errorDescription	Description
<u>700</u>	<u>ReqEncoding not supported</u>	ReqEncoding is not one of the supported encodings specified in AvailableEncodings.
<u>701</u>	<u>ReqCompressionLevel not supported</u>	ReqCompressionLevel is not one of the supported compression levels specified in AvailableCompressionLevels.
<u>702</u>	<u>ReqResolution not supported</u>	ReqResolution is not one of the supported resolutions specified in AvailableResolutions.

2.4.13. GetDefaultVideoPresentationURL

Get a URL to an html presentation page of the current video stream. The RetVideoPresentationURL is being built depending on how the different default parameters DefaultEncoding, DefaultCompressionLevel and DefaultResolution has been set.

2.4.13.1. Arguments

Table 15: Arguments for GetDefaultVideoPresentationURL

Argument	Direction	relatedStateVariable
<u>RetVideoPresentationURL</u>	<u>OUT</u>	<u>VideoPresentationURL</u>

2.4.14. SetMaxBandwidth

Change Maximum bandwidth allowed for each connection to this Motion Image service.
The response to an attempt to set an unsupported but legal value shall result in the nearest *supported* legal value.

2.4.14.1. Arguments

Table 16: Arguments for SetMaxBandwidth

Argument	Direction	relatedStateVariable
<u>ReqMaxBandwidth</u>	<u>IN</u>	<u>MaxBandwidth</u>

2.4.14.2. Effect on State

Changes the value of MaxBandwidth to ReqMaxBandwidth.

2.4.15. GetMaxBandwidth

Get the Maximum bandwidth allowed for each connection to this Motion Image service.

2.4.15.1. Arguments

Table 17: Arguments for GetMaxBandwidth

Argument	Direction	relatedStateVariable
<u>RetMaxBandwidth</u>	<u>OUT</u>	<u>MaxBandwidth</u>

2.4.16. SetTargetFrameRate

Change Target Frame rate. The response to an attempt to set an unsupported but legal value shall result in the nearest *supported* legal value.

2.4.16.1. Arguments

Table 18: Arguments for SetTargetFrameRate

Argument	Direction	relatedStateVariable
<u>ReqTargetFrameRate</u>	<u>IN</u>	<u>TargetFrameRate</u>

2.4.16.2. Effect on State

Changes the value of TargetFrameRate to ReqTargetFrameRate.

2.4.17. GetTargetFrameRate

Get the Target Frame Rate allowed for each connection to this Motion Image service.

2.4.17.1. Arguments

Table 19: Arguments for GetTargetFrameRate

Argument	Direction	relatedStateVariable
<u>ReqTargetFrameRate</u>	<u>OUT</u>	<u>TargetFrameRate</u>

2.4.18. Non-Standard Actions Implemented by a UPnP Vendor

To facilitate certification, non-standard actions implemented by UPnP vendors should be included in this service template. The UPnP Device Architecture lists naming requirements for non-standard actions (see the section on Description).

2.4.19. Common Error Codes

The following table lists error codes common to actions for this service type. If an action results in multiple errors, the most specific error should be returned.

Table 20: Common Error Codes

errorCode	errorDescription	Description
401	Invalid Action	See UPnP Device Architecture section on Control.
402	Invalid Args	See UPnP Device Architecture section on Control.
404	Invalid Var	See UPnP Device Architecture section on Control.
501	Action Failed	See UPnP Device Architecture section on Control.
600-699	TBD	Common action errors. Defined by UPnP Forum Technical Committee.
<u>700</u>	<u>ReqEncoding not supported</u>	ReqEncoding is not one of the supported encodings specified in AvailableEncodings.
<u>701</u>	<u>ReqCompressionLevel not supported</u>	ReqCompressionLevel is not one of the supported compression levels specified in AvailableCompressionLevels.
<u>702</u>	<u>ReqResolution not supported</u>	ReqResolution is not one of the supported resolutions specified in AvailableResolutions.
800-899	TBD	(Specified by UPnP vendor.)

2.5. Theory of Operation

An instance of Digital Security Camera Motion Image Service may be embedded into a Digital Security Camera Device or other devices requiring this service.

This service will enable access to live motion images (video) by providing the retrieval address of the desired video stream. The retrieval address will be in the form of a complete URL.

Method of video data transfer is in no way restricted by this specification, implementers are free to use any available transport protocols that can be described in the form of a URL.

The operation of this service is “stateless”. The action of fetching a VideoURL or VideoPresentationURL does not affect the properties of previous, simultaneous or later fetched video streams and VideoPresentation URLs. This allows for multiple User Control Points to receive images with different properties without potential interference.

The properties AvailableResolutions, AvailableCompressionLevels and AvailableEncodings are vendor specific descriptions of the complete set of available options of the matching property.

The VideoURL property is the URL where the video stream itself can be fetched.

The VideoPresentationURL is a container document needed for *display* of the video by a user control point. This does for instance allow for display of video that require special viewers such as ActiveX components or Java applets.

3. XML Service Description

```
<?xml version="1.0"?>
<scpd xmlns="urn:schemas-upnp-org:service-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <actionList>
    <action>
      <name>GetAvailableEncodings</name>
      <argumentList>
        <argument>
          <name>RetAvailableEncodings</name>
          <relatedStateVariable>AvailableEncodings</relatedStateVariable>
          <direction>out</direction>
        </argument>
      </argumentList>
    </action>
    <action>
      <name>GetDefaultEncoding</name>
      <argumentList>
        <argument>
          <name>RetEncoding</name>
          <relatedStateVariable>DefaultEncoding</relatedStateVariable>
          <direction>out</direction>
        </argument>
      </argumentList>
    </action>
    <action>
      <name>SetDefaultEncoding</name>
      <argumentList>
        <argument>
          <name>ReqEncoding</name>
          <relatedStateVariable>DefaultEncoding</relatedStateVariable>
          <direction>in</direction>
        </argument>
      </argumentList>
    </action>
    <action>
      <name>GetAvailableCompressionLevels</name>
      <argumentList>
        <argument>
          <name>RetAvailableCompressionLevels</name>
          <relatedStateVariable>AvailableCompressionLevels</relatedStateVariable>
          <direction>out</direction>
        </argument>
      </argumentList>
    </action>
    <action>
      <name>GetDefaultCompressionLevel</name>
      <argumentList>
        <argument>
          <name>RetCompressionLevel</name>
          <relatedStateVariable>DefaultCompressionLevel</relatedStateVariable>
          <direction>out</direction>
        </argument>
      </argumentList>
    </action>
  </actionList>
</scpd>
```

```

<name>SetDefaultCompressionLevel</name>
  <argumentList>
    <argument>
      <name>ReqCompressionLevel</name>
      <relatedStateVariable>DefaultCompressionLevel
      </relatedStateVariable>
      <direction>in</direction>
    </argument>
  </argumentList>
</action>
<action>
<name>GetAvailableResolutions</name>
  <argumentList>
    <argument>
      <name>RetAvailableResolutions</name>
      <relatedStateVariable>AvailableResolutions
      </relatedStateVariable>
      <direction>out</direction>
    </argument>
  </argumentList>
</action>
<action>
<name>GetDefaultResolution</name>
  <argumentList>
    <argument>
      <name>RetResolution</name>
      <relatedStateVariable>DefaultResolution
      </relatedStateVariable>
      <direction>out</direction>
    </argument>
  </argumentList>
</action>
<action>
<name>SetDefaultResolution</name>
  <argumentList>
    <argument>
      <name>ReqResolution</name>
      <relatedStateVariable>DefaultResolution
      </relatedStateVariable>
      <direction>in</direction>
    </argument>
  </argumentList>
</action>
<action>
<name>GetVideoURL</name>
  <argumentList>
    <argument>
      <name>ReqEncoding</name>
      <relatedStateVariable>DefaultEncoding</relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqCompression</name>
      <relatedStateVariable>DefaultCompressionLevel
      </relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqResolution</name>
      <relatedStateVariable>DefaultResolution
      </relatedStateVariable>
      <direction>in</direction>
    </argument>
  </argumentList>
</action>

```

```

    <name>ReqMaxBandwidth</name>
    <relatedStateVariable>MaxBandwidth</relatedStateVariable>
    <direction>in</direction>
  </argument>
  <argument>
    <name>ReqTargetFrameRate</name>
    <relatedStateVariable>TargetFrameRate</relatedStateVariable>
    <direction>in</direction>
  </argument>
  <argument>
    <name>RetVideoURL</name>
    <relatedStateVariable>VideoURL
  </relatedStateVariable>
    <direction>out</direction>
  </argument>
</argumentList>
</action>
<action>
  <name>GetDefaultVideoURL</name>
  <argumentList>
    <argument>
      <name>RetVideoURL</name>
      <relatedStateVariable>VideoURL
    </relatedStateVariable>
      <direction>out</direction>
    </argument>
  </argumentList>
</action>
<action>
  <name>GetVideoPresentationURL</name>
  <argumentList>
    <argument>
      <name>ReqEncoding</name>
      <relatedStateVariable>DefaultEncoding</relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqCompression</name>
      <relatedStateVariable>DefaultCompressionLevel
    </relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqResolution</name>
      <relatedStateVariable>DefaultResolution
    </relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqMaxBandwidth</name>
      <relatedStateVariable>MaxBandwidth</relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>ReqTargetFrameRate</name>
      <relatedStateVariable>TargetFrameRate</relatedStateVariable>
      <direction>in</direction>
    </argument>
    <argument>
      <name>RetVideoPresentationURL</name>
      <relatedStateVariable>VideoPresentationURL
    </relatedStateVariable>
      <direction>out</direction>
    </argument>
  </argumentList>
</action>

```