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Information technology – UPnP Device Architecture – Part 9-13: Imaging Device Control Protocol – Scan Service

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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
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UPnP Document Title	ISO/IEC 29341 Part
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UPnP SecurityConsole:1 Service	ISO/IEC 29341-13-11

1 Overview and Scope

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

The Scan service represents the scan functionality of a scanner device. A control point may use this service to initiate a scan operation and receive images that represent the document in the scanner. The control point may pull the images using HTTP/GETs from the Destination URL or the service map push the images using HTTP/POSTs. The service has the following basic functional areas:

Operation Functionality

The *StartScan, Start, Stop, Abort* and *SetConfiguration* actions are used to control the action of the scan service.

Status Functionality

The *GetConfiguration, GetSideInformation, GetDestination* and *GetState* actions are used to query the current state of the scan service.

This service template does not address:

- *Faxing or Copying*

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:***Scan:1*

2.2 State Variables

Table 1: State Variables

Variable Name	Req. or Opt.[1]	Data Type	Allowed Value[2]	Default Value[2]	Eng. Units
JobName	R	string	[device-setting | …]	“”	
FailureCode	R	string	[No Error | Jammed | Timeout Reached | ErredTimeout Reached | Destination Not Reachable]	No Error	
State	R	string	[Idle | Reserved | NotReady | Pending | Scanning | Finishing | Erred]	Idle	
StateReason	R	string			
ImageFormat	R	string	[device-setting | image/jpeg]	image/jpeg	
CompressionFactor	R	i4	-1-100	100	n/a
ImageType	R	string	[device-setting | Mixed]	Mixed	
ColorType	R	string	[device-setting | Color | Mono]	Color	
BitDepth	R	string	[device-setting | 8]	8	bits
ColorSpace	R	string	[device-setting | sRGB]	sRGB	n/a
UseFeeder	R	string	[device-setting]	0 (false)	n/a
BaseName	R	string	[device-setting | buffer]	buffer	
AppendSideNumber	R	string	[device-setting|0]	0 (false)	n/a
SideCount	R	i4	[-1-1]	0	n/a
SideNumber	R	i4		1	n/a
Destination	R	string			
Timeout	R	i4	[-1 | 0]		seconds
ErrorTimeout	R	i4		vendor unique	seconds
Resolution	R	string	[device-setting]		Pixels

Variable Name	Req. or Opt.[1]	Data Type	Allowed Value[2]	Default Value[2]	Eng. Units
					Per Inch
ScanLength	R	i4	0 – vendor-defined	0	milli-inches
DeviceID	R	string			n/a
HeightLimit	R	i4			milli-inches
WidthLimit	R	i4			milli-inches
XValueLimit	R	i4	-1-vendor-defined	vendor-defined	milli-inches
YValueLimit	R	i4	-1-vendor-defined	vendor-defined	milli-inches
RegistrationID	R	ui4			
JobID	R	ui4	1 – vendor-defined		
DestinationID	R	ui4		0	

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

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

2.2.1 JobName

This string allows the client to give the job a unique name. This is informational only. It can be used to identify the client or the purpose of the job. If the value is set to *device-setting* in the SetConfiguration or StartScan actions, then the value should not be changed.

2.2.2 FailureCode

A Failure Code indicates a failure, or error, that does not occur as an immediate result of an action and cannot be reported as part of the action response. Error Codes that occur during the execution of an action are not listed as allowed values of the FailureCode unless they can occur outside of the boundary of the action.

Table 1.1: allowedValueList for FailureCode

Value	Req. or Opt.
No Error	R
Jammed	R
Timeout Reached	R
ErredTimeout Reached	R
Destination not Reachable	R
… (Vendor specific error codes)	O

2.2.3 State

The current state of the scanner. The states are defined as follows:

- *Idle* – The scanner is not active
- *Reserved* – The scanner is reserved for use by a specific control point that has the correct RegistrationID. The RegistrationID value came from the ExternalActivity service.
- *NotReady* – The scanning is getting ready to scan.
- *Pending* - The scanner is currently processing a Scan job. It is waiting for client interaction (start action) or feeder interaction (loaded state) to complete
- *Scanning* – The scanner is currently scanning an image to the destination
- *Finishing* – The scanner has completed scanning all available sides and is waiting for the transfer of images to complete
- *Erred* – An error occurred during a scan operation. The scan service is waiting for the client to acknowledge the error by sending an Abort action.

2.2.4 StateReason

The StateReason string is used to augment the information given by the current state. This is especially helpful when in the NotReady state. In this case, the vendor should put information in this variable that tells the client what is going on (i.e. Calibrating, Warming Up, etc.).

2.2.5 ImageFormat

The format of the image to be returned. The list of allowed values may be a subset or superset of the given values. To send images to a printer, the application/vnd.pwg-xhtml-print format MUST be used with JPEG images embedded in an application/vnd.pwg-multiplexed document. See Using XHTML-Print To Send An Image Directly To A Printer on page 37 for more information about using the XHTML image type. If the value is set to *device-setting* in the SetConfiguration or StartScan actions, then the value should not be changed.

NOTE: the ImageFormat value "application/vnd.pwg-xhtml-print+xml" exceeds the recommended maximum length of 31 characters for elements of an allowedValueList. A truncated version (application/vnd.pwg-xhtml-print) is used so that it will fit within that length.

Table 1.2: allowedValueList for ImageFormat

Value	Req. or Opt.	Filename Suffix
device-setting	R	
image/jpeg	R	jpg
application/vnd.pwg-xhtml-print (Scan-to-Print)	O	xml
… (vendor defined)	O	

2.2.6 CompressionFactor

The measure of compression for compressed image formats. If the value is set to –1 (*device-setting)* in the SetConfiguration or StartScan actions, then the value should not be changed.

2.2.7 ImageType

The type of image to be scanned. If the value is set to *device-setting* in the SetConfiguration or StartScan actions, then the value should not be changed.

Table 1.3: allowedValueList for ImageType

Value	Req. or Opt.
device-setting	R
Mixed	R
Photo	O
Text	O
Graphics	O

2.2.8 Color Type and BitDepth

The type of the pixel used to represent the image is very dependent upon the ImageFormat. ColorType and BitDepth are used to describe the basic shape of the pixels. ColorType is used to describe whether the image is monochrome, color, or some sort of extended multi-plane pixel. The BitDepth value is used to describe the size of each part of a pixel. Since JPEG is the only required image format, the values for JPEG are given here. If vendors support additional image formats, then they should extend the allowed values to describe their formats (i.e. PNG-RGB-ALPHA, etc.).

Table 1.4: allowedValueList for ColorType

Value	Req. or Opt.
device-setting	R
Color	O
Mono	O

Note: Either *Color* or *Mono* should be given as an allowed value. Both are allowed, but at least one of them is required. The allowed value list can be extended or a subset of the list given here.

Table 1.5: allowedValueList for BitDepth

Value	Req. or Opt.
device-setting	R
8	R
12	O

The allowed value list may be extended as required.

2.2.8.1 Common Pixel Description Values

The following examples show how to describe most JPEG variations:

Table 1.6: Common Pixel Description Values

Description	ColorType	BitDepth
8-bit Color JPEG	Color	8
8-bit Gray	Mono	8
12-bit Color	Color	12
PNG RGB with Alpha	PNG-RGB-ALPHA	8