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Partie 30-12: Protocole de contrôle de dispositif de gestion et de contrôle de l'Internet des objets — Service de transport générique de gestion et de contrôle de l'Internet des objets

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ISO/IEC 29341-30-12 was prepared by UPnP Forum 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 ISO/IEC 29341 series, under the general title *Information technology — UPnP Device Architecture*, can be found on the ISO web site.

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Original UPnP Document

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

UPnP Document Title	ISO/IEC 29341 Part
UPnP Device Architecture 1.0	ISO/IEC 29341-1:2008
UPnP Device Architecture Version 1.0	ISO/IEC 29341-1:2011
UPnP Device Architecture 1.1	ISO/IEC 29341-1-1:2011
UPnP Device Architecture 2.0	ISO/IEC 29341-1-2
UPnP Basic:1 Device	ISO/IEC 29341-2
UPnP AV Architecture:1	ISO/IEC 29341-3-1:2008
UPnP AV Architecture:1	ISO/IEC 29341-3-1:2011
UPnP AVTransport:1 Service	ISO/IEC 29341-3-10
UPnP ConnectionManager:1 Service	ISO/IEC 29341-3-11
UPnP ContentDirectory:1 Service	ISO/IEC 29341-3-12
UPnP RenderingControl:1 Service	ISO/IEC 29341-3-13
UPnP MediaRenderer:1 Device	ISO/IEC 29341-3-2
UPnP MediaRenderer:2 Device	ISO/IEC 29341-3-2:2011
UPnP MediaServer:1 Device	ISO/IEC 29341-3-3
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10:2008
UPnP AVTransport:2 Service	ISO/IEC 29341-4-10:2011
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11:2008
UPnP ConnectionManager:2 Service	ISO/IEC 29341-4-11:2011
UPnP ContentDirectory:2 Service	ISO/IEC 29341-4-12
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13:2008
UPnP RenderingControl:2 Service	ISO/IEC 29341-4-13:2011
UPnP ScheduledRecording:1	ISO/IEC 29341-4-14
UPnP ScheduledRecording:2	ISO/IEC 29341-4-14:2011
UPnP MediaRenderer:2 Device	ISO/IEC 29341-4-2
UPnP MediaServer:2 Device	ISO/IEC 29341-4-3
UPnP AV Datastructure Template:1	ISO/IEC 29341-4-4:2008
UPnP AV Datastructure Template:1	ISO/IEC 29341-4-4:2011
UPnP DigitalSecurityCamera:1 Device	ISO/IEC 29341-5-1
UPnP DigitalSecurityCameraMotionImage:1 Service	ISO/IEC 29341-5-10
UPnP DigitalSecurityCameraSettings:1 Service	ISO/IEC 29341-5-11
UPnP DigitalSecurityCameraStillImage:1 Service	ISO/IEC 29341-5-12
UPnP HVAC_System:1 Device	ISO/IEC 29341-6-1
UPnP ControlValve:1 Service	ISO/IEC 29341-6-10
UPnP HVAC_FanOperatingMode:1 Service	ISO/IEC 29341-6-11
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UPnP TemperatureSensor:1 Service	ISO/IEC 29341-6-15
UPnP TemperatureSetpoint:1 Service	ISO/IEC 29341-6-16
UPnP HVAC_UserOperatingMode:1 Service	ISO/IEC 29341-6-17
UPnP HVAC_ZoneThermostat:1 Device	ISO/IEC 29341-6-2

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UPnP BinaryLight:1 Device	ISO/IEC 29341-7-1
UPnP Dimming:1 Service	ISO/IEC 29341-7-10
UPnP SwitchPower:1 Service	ISO/IEC 29341-7-11
UPnP DimmableLight:1 Device	ISO/IEC 29341-7-2
UPnP InternetGatewayDevice:1 Device	ISO/IEC 29341-8-1
UPnP LANHostConfigManagement:1 Service	ISO/IEC 29341-8-10
UPnP Layer3Forwarding:1 Service	ISO/IEC 29341-8-11
UPnP LinkAuthentication:1 Service	ISO/IEC 29341-8-12
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UPnP QosPolicyHolder:1 Service	ISO/IEC 29341-10-12
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UPnP QosManager:2 Service	ISO/IEC 29341-11-11
UPnP QosPolicyHolder:2 Service	ISO/IEC 29341-11-12
UPnP QOS v2 Schema Files	ISO/IEC 29341-11-2
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UPnP RemoteUIClient:1 Service	ISO/IEC 29341-12-10
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UPnP RemoteUIServerDevice:1 Device	ISO/IEC 29341-12-2
UPnP DeviceSecurity:1 Service	ISO/IEC 29341-13-10
UPnP SecurityConsole:1 Service	ISO/IEC 29341-13-11
UPnP ContentDirectory:3 Service	ISO/IEC 29341-14-12:2011
UPnP MediaServer:3 Device	ISO/IEC 29341-14-3:2011
UPnP ContentSync:1	ISO/IEC 29341-15-10:2011
UPnP Low Power Architecture:1	ISO/IEC 29341-16-1:2011
UPnP LowPowerProxy:1 Service	ISO/IEC 29341-16-10:2011

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UPnP LowPowerDevice:1 Service	ISO/IEC 29341-16-11:2011
UPnP QoS Architecture:3	ISO/IEC 29341-17-1:2011
UPnP QosDevice:3 Service	ISO/IEC 29341-17-10:2011
UPnP QosManager:3 Service	ISO/IEC 29341-17-11:2011
UPnP QosPolicyHolder:3 Service	ISO/IEC 29341-17-12:2011
UPnP QosDevice:3 Addendum	ISO/IEC 29341-17-13:2011
UPnP RemoteAccessArchitecture:1	ISO/IEC 29341-18-1:2011
UPnP InboundConnectionConfig:1 Service	ISO/IEC 29341-18-10:2011
UPnP RADAConfig:1 Service	ISO/IEC 29341-18-11:2011
UPnP RADASync:1 Service	ISO/IEC 29341-18-12:2011
UPnP RATAConfig:1 Service	ISO/IEC 29341-18-13:2011
UPnP RAClient:1 Device	ISO/IEC 29341-18-2:2011
UPnP RAServer:1 Device	ISO/IEC 29341-18-3:2011
UPnP RADiscoveryAgent:1 Device	ISO/IEC 29341-18-4:2011
UPnP SolarProtectionBlind:1 Device	ISO/IEC 29341-19-1:2011
UPnP TwoWayMotionMotor:1 Service	ISO/IEC 29341-19-10:2011
UPnP AV Architecture:2	ISO/IEC 29341-20-1
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UPnP ContentDirectory:4 Device	ISO/IEC 29341-20-12
UPnP RenderingControl:3 Service	ISO/IEC 29341-20-13
UPnP ScheduledRecording:2 Service	ISO/IEC 29341-20-14
UPnP MediaRenderer:3 Service	ISO/IEC 29341-20-2
UPnP MediaServer:4 Device	ISO/IEC 29341-20-3
UPnP AV Datastructure Template:1	ISO/IEC 29341-20-4
UPnP InternetGatewayDevice:2 Device	ISO/IEC 29341-24-1
UPnP WANIPConnection:2 Service	ISO/IEC 29341-24-10
UPnP WANIPv6FirewallControl:1 Service	ISO/IEC 29341-24-11
UPnP WANConnectionDevice:2 Service	ISO/IEC 29341-24-2
UPnP WANDevice:2 Device	ISO/IEC 29341-24-3
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UPnP MultiScreen Application Management:1 Service	ISO/IEC 29341-28-10
UPnP MultiScreen Screen:1 Device	ISO/IEC 29341-28-2
UPnP MultiScreen Application Management:2 Service	ISO/IEC 29341-29-10
UPnP MultiScreen Screen:2 Device	ISO/IEC 29341-29-2
UPnP IoT Management and Control Architecture Overview:1	ISO/IEC 29341-30-1

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

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1 Scope

This part of Publicly Available Specification ISO/IEC 29341 specifies the characteristics of a networked service that offers *sensor* and/or *actuator* data transport capabilities to an independent networked entity known as a control point.

This document defines the service SensorTransportGeneric:1 (in short TransportGeneric), which identifies Level *1* of the UPnP IoT Management and Control TransportGeneric:1 Service [10]. This Publicly Available Specification is applicable to Standardized DCPs of the UPnP Forum which include this service.

This service enables UPnP clients to access sensors and/or actuators without needing a detailed knowledge of the target sensor or actuator or its connectivity to the UPnP network. *Sensors* and *Actuators* are instead treated a generic data sources or sinks.

This service definition is compliant with the UPnP Device Architecture version 1.0 [1]. It defines a service type referred to herein as TransportGeneric service.

2 Normative References

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

[1] UPnP Device Architecture, version 1.0, UPnP Forum, June 13, 2000. Available at: http://upnp.org/specs/arch/UPnPDA10_20000613.pdf. Latest version available at: http://upnp.org/specs/arch/UPnP-arch-DeviceArchitecture-v1.0.pdf.

[2] ISO 8601 Data elements and interchange formats – Information interchange -- Representation of dates and times, International Standards Organization, December 21, 2000. Available at: ISO 8601:2000.

[3] IETF RFC 2119, Key words for use in RFCs to Indicate Requirement Levels, S. Bradner, 1997. Available at: http://www.faqs.org/rfcs/rfc2119.html.

[4] HyperText Transport Protocol – HTTP/1.1, R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, June 1999. Available at: http://www.ietf.org/rfc/rfc2616.txt.

[5] IETF RFC 3339, Date and Time on the Internet: Timestamps, G. Klyne, Clearswift Corporation, C. Newman, Sun Microsystems, July 2002. Available at: http://www.ietf.org/rfc/rfc3339.txt.

[6] Extensible Markup Language (XML) 1.0 (Third Edition), François Yergeau, Tim Bray, Jean Paoli, C. M. Sperberg-McQueen, Eve Maler, eds., W3C Recommendation, February 4, 2004. Available at: http://www.w3.org/TR/2004/REC-xml-20040204.

[7] XML Schema Part 2: Data Types, Second Edition, Paul V. Biron, Ashok Malhotra, W3C Recommendation, 28 October 2004. Available at: http://www.w3.org/TR/2004/REC-xmlschema-2-20041028.

[8] UPnP IoT Management and Control Architecture Overview, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/specs/iotmc/UPnP-iotmc-IoTManagementAndControl-Architecture-Overview-v1-20130701.pdf. Latest version available at: http://www.upnp.org/specs/iotmc/UPnP-iotmc-IoTManagementAndControl-Architecture-Overview-v1.pdf.

[9] UPnP IoT Management and Control Device, UPnP Forum July 1, 2013. Available at: http://www.upnp.org/specs/iotm/UPnP-iotmc-IoTManagementAndControl-v1-Device-20130701.pdf. Latest version available at: http://www.upnp.org/specs/iotmc/UPnP-iotmc-UPnP IoT Management and Control Device-v1-Device.pdf.

[10] UPnP UPnP IoT Management and Control Device TransportGeneric:1 Service, UPnP Forum July 1, 2013. Available at: http://www.upnp.org/specs/iotmc/UPnP-iotmc-UPnP

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IoTManagementandControl-TransportGeneric-v1-Service-20130701.pdf. Latest version available at: http://www.upnp.org/specs/iotmc/UPnP-iotm-IoTManagementandControl-TransportGeneric-v1-Service.pdf.

[11] UPnP DataStore:1 Service, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/specs/smgt/UPnP-ds-DataStore-v1-Service-20130701.pdf. Latest version available at: http://www.upnp.org/specs/smgt/UPnP-ds-DataStore-v1-Service.pdf.

[12] UPnP IoT Management And Control DataModel Service, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/specs/smgt/UPnP-iotmc-IoTManagementAndControl-DataModel-v1-Service-20130701.pdf. Latest version available at: http://www.upnp.org/specs/smgt/UPnP-iotmc-IoTManagementAndControl-DataModel-v1-Service.pdf.

[13] UPnP DeviceProtection:1 Service, UPnP Forum, February 24, 2011. Available at: http://www.upnp.org/specs/gw/UPnP-gw-DeviceProtection-v1-Service-20110224.pdf.
Latest version available at: http://www.upnp.org/specs/gw/UPnP-gw-DeviceProtection-v1-Service.pdf.

[14] UPnP ConfigurationManagement:2 Service, UPnP Forum, February 16, 2012. Available at: http://www.upnp.org/specs/dm/UPnP-dm-ConfigurationManagement-v2-Service-20120216.pdf. Latest version available at: http://www.upnp.org/specs/dm/UPnP-dm-ConfigurationManagement-v2-Service.pdf.

[15] XML Schema UPnP DataStore DataRecord Status, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/schemas/ds/drecstatus-v1-20130701.xsd. Latest version available at: http://www.upnp.org/schemas/ds/drecstatus.xsd.

[16] XML Schema UPnP DataStore DataRecord, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/schemas/ds/drecs-v1-20130701.xsd. Latest version available at: http://www.upnp.org/schemas/ds/drecs.xsd.

[17] XML Schema for Sensor DataRecord Information, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/schemas/smgt/srecinfo-v1-20130701.xsd.
Latest version available at: http://www.upnp.org/schemas/smgt/srecinfo.xsd.

[18] XML Schema for Sensor TransportConnections Information, UPnP Forum, July 1, 2013. Available at: http://www.upnp.org/schemas/smgt/tspc-v1-20130701.xsd.
Latest version available at: http://www.upnp.org/schemas/smgt/tspc.xsd.

3 Terms, Definitions and Abbreviations

For the purposes of this document, the terms and definitions given in [1] and [8] apply.

4 Notations and conventions

4.1 Notation

- Strings that are to be taken literally are enclosed in “double quotes”.
- Words that are emphasized are printed in *italic*.
- Keywords that are defined by the UPnP Working Committee are printed using the *forum* character style.
- Keywords that are defined by the UPnP Device Architecture are printed using the **arch** character style.
- A double colon delimiter, “::”, signifies a hierarchical parent-child (parent::child) relationship between the two objects separated by the double colon. This delimiter is used in multiple contexts, for example: Service::Action(), Action()::Argument, parentProperty::childProperty.

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