

# INTERNATIONAL STANDARD

iTeh STANDARD PREVIEW

Information technology – UPnP Device Architecture –  
Part 8-12: Internet Gateway Device Control Protocol – Link Authentication  
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
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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 WANPPPConnection: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 QoSDevice:2 Service	ISO/IEC 29341-11-10



<b>UPnP Document Title</b>	<b>ISO/IEC 29341 Part</b>
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
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## 1. Overview and Scope

This device template is compliant with the UPnP Device Architecture, Version 1.0.

This service-type enables a UPnP control point to configure and control the parameters pertaining to authentication by an authentication server. The service specifies variables and actions that are used by control points to add, update and delete records used for authentication. This would typically be used for maintaining per-client authentication parameters on a device. This service would support a user/client list with the credentials (password, public key) and the specific access rights on a per-user basis. The service is mainly designed for authentication on a wireless access point (AP) that implements link layer security such as 802.1x. It may be used for other purposes - e.g., to securely store client credentials such as certificates and asymmetric keys for network-layer security protocols.

The working committee has however looked at this service only from the perspective of 802.1x usage and therefore this document makes several references to the 802.1x protocol. This service may be co-located with the access point device that requires the authentication service or located on a different device on the network such as an Internet Gateway Device (IGD). The service was defined to associate WLAN clients and their credentials to bootstrap a secure WLAN in a UPnP technology compliant *WLANAccessPointDevice*<sup>\*</sup>.

This service is defined as a standalone service and will remain at the component level. Any product that implements a standard device specification will have the option to implement this standard service specification. The product will be tested at certification testing time for this service in addition to being tested to the product's original device type (e.g., *WLANAccessPointDevice*, *InternetGatewayDevice*).

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\* Refer to companion documents defined by the UPnP Internet Gateway working committee for more details on specific devices and services referenced in this document.

## 2. Service Modeling Definitions

### 2.1. ServiceType

The following service type identifies a service that is compliant with this template:

**urn:schemas-upnp-org:service:LinkAuthentication:1**

### 2.2. State Variables

**Table 1: State Variables**

Variable Name	Req. or Opt. <sup>1</sup>	Data Type	Allowed Value	Default Value <sup>2</sup>	Eng. Units
NumberOfEntries	R	ui2	>=0	0	N/A
Identifier	R	String	<= 64 char	Empty string	N/A
Secret	R	String	Encoded in BASE64, <= 1024 char	Empty string	N/A
SecretType	R	String	See Table 1.1, <= 32 char	Not specified	N/A
AuthType	R	String	See Table 1.2, <= 32 char	Not specified	N/A
AuthState	R	String	See Table 1.3, <= 32 char	"Unconfigured"	N/A
CredentialState	R	String	See Table 1.4, <= 32 char	"Unconfigured"	N/A
Description	R	String	<= 256 char	Empty string	N/A
MACAddress	R	String	MAC address, "xx:xx:xx:xx:xx:x", case-independent, 17 char	Empty string	N/A
CredentialDuration	R	ui4	>= 0	0	Seconds
LinkedIdentifier	R	String	<= 64 char	Empty string	N/A
LastChange	R	String	<= 1024 char	Empty string	N/A
LastError	R	String	<= 1024 char	Empty string	N/A
<i>Non-standard state variables implemented by an UPnP device vendor go here.</i>	<i>X</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>

<sup>1</sup> R = Required, O = Optional, X = Non-standard.

<sup>2</sup> 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 from the appropriate table below.

#### 2.2.1. NumberOfEntries

This variable indicates the number of entries in the authentication database.

#### 2.2.2. Identifier

This variable is similar to a username or userID field. This field is matched when a client supplies an EAP-Identity string. This service expects Identifier to uniquely identify each record in the

authentication database, that is, there are no records with duplicate Identifier fields. Note, EAP uses the term Identifier to refer to a single octet used to match EAP request and responses, in this specification Identifier refers to the EAP Identity string. See RFC 2716 Section 3.1. The Identifier may contain the characters < > & which will “break” the surrounding XML, therefore the Identifier string must be ‘escaped’. Refer to DeviceSecurity section “XML Strings as UPnP Parameters”.

### 2.2.3. Secret

This variable contains the secret as per the type specified in *SecretType*. It is encoded as a canonical BASE64 string (as used by the *DeviceSecurity* service).

### 2.2.4. SecretType

This variable specifies the type of secret contained in the *Secret* field. Possible string values are specified in table 1.1.

**Table 1.1: allowedValueList for SecretType**

Value	Req. or Opt. <sup>1</sup>	Description
<b>TextPassword</b>	R	This value indicates that Secret field contains a text password
<b>X509Certificate</b>	R	This value indicates the Secret field contains an X.509 certificate
<b>PublicKey</b>	R	This value indicates the Secret field contains a public key
<b>PubKeyHash160</b>	R	This value indicates the Secret field contains a 160-bit hash of a public key
<i>Vendor-defined</i>	<u>R</u>	<u>R</u> ISO/IEC 29341-8-12:2008
<i>Vendor-defined</i>	<u>O</u>	<u>O</u> <a href="http://standards.iteh.ai/catalog/standards/sist/c4c9afcf-1683-419f-9a0e-16603a2f394f/iso-iec-29341-8-12-2008">http://standards.iteh.ai/catalog/standards/sist/c4c9afcf-1683-419f-9a0e-16603a2f394f/iso-iec-29341-8-12-2008</a>

<sup>1</sup> R = Required, O = Optional.