

# INTERNATIONAL STANDARD

iTeh STANDARD PREVIEW

Information technology – UPnP Device Architecture –  
Part 8-13: Internet Gateway Device Control Protocol – Radius Client Service

[ISO/IEC 29341-8-13:2008](https://standards.iso.org/standards/catalog/standards/sist/3d5fd51e-6a71-4cdf-b20f-b1d3d99fbd0/iso-iec-29341-8-13-2008)

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# CONTENTS

FOREWORD ..... 3

ORIGINAL UPNP DOCUMENTS (informative) ..... 5

**1. Overview and Scope ..... 7**

**2. Service Modeling Definitions ..... 7**

    2.1. ServiceType ..... 7

    2.2. State Variables ..... 7

        2.2.1. NumberOfAuthServerEntries ..... 7

        2.2.2. AuthServerIPAddress ..... 8

        2.2.3. AuthServerPortNumber ..... 8

        2.2.4. AuthServerSharedSecret ..... 8

    2.3. Eventing and Moderation ..... 8

        2.3.1. Event Model ..... 8

    2.4. Actions ..... 8

        2.4.1. GetGenericAuthServerEntry ..... 9

        2.4.2. GetSpecificAuthServerEntry ..... 9

        2.4.3. AddAuthServerEntry ..... 10

        2.4.4. DeleteAuthServerEntry ..... 11

        2.4.5. FactoryDefaultReset ..... 11

        2.4.6. ResetAuthentication ..... 11

        2.4.7. Non-Standard Actions Implemented by a UPnP Device Vendor ..... 12

        2.4.8. Common Error Codes ..... 12

    2.5. Theory of Operation ..... 12

        2.5.1. Operation of the RADIUS Client ..... 12

**3. XML Service Description ..... 13**

**4. Test ..... 15**

# LIST OF TABLES

Table 1: State Variables ..... 7

Table 2: Event Moderation ..... 8

Table 3: Actions ..... 8

Table 4: Arguments for GetGenericAuthServerEntry ..... 9

Table 5: Arguments for GetSpecificAuthServerEntry ..... 9

Table 6: Arguments for AddAuthServerEntry ..... 10

Table 7: Arguments for DeleteAuthServerEntry ..... 11

Table 8: Common Error Codes ..... 12

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### Part 8-13: Internet Gateway Device Control Protocol – Radius Client 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
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 WANPPPoEConnection: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

<b>UPnP Document Title</b>	<b>ISO/IEC 29341 Part</b>
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

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## 1. Overview and Scope

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

This service enables the **control and configuration of radius component of IEEE 802.11 Wireless Access Points for the unmanaged network space, namely residential and small office LANs.**

Its intent is to simplify the setup experience, secure wireless networks and provide the framework for diagnosing and monitoring problems on wireless networks.

- This service-type enables remote setup and configuration of the **RADIUS related parameters of a wireless access point**

## 2. Service Modeling Definitions

### 2.1. ServiceType

The service is OPTIONAL as specified in **urn:schemas-upnp-org:device:WLANAccessPointDevice:1**

The following service type identifies a service that is compliant with this template:  
**urn:schemas-upnp-org:service:RadiusClient:1**

This service does not support the QueryStateVariable action.

### 2.2. State Variables

Table 1 shows all the state variables of RadiusClient service. <https://standards.iteh.ai/catalog/standards/sist/3d5fd51e-6a71-4cdf-b20f-9341-8-13-2008>

**Table 1: State Variables**

Variable Name	Req. or Opt. <sup>1</sup>	Data Type	Allowed Value	Default Value <sup>2</sup>	Eng. Units
<b>NumberOfAuthServerEntries</b>	R	ui2	>=0	0	N/A
<b>AuthServerIPAddress</b>	R	String	IP Address, <= 32 char	Empty String	N/A
<b>AuthServerPortNumber</b>	R	ui2	Between 1 and 65535 inclusive	0	N/A
<b>AuthServerSharedSecret</b>	R	String	Shared Secret, <= 128 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. NumberOfAuthServerEntries

This variable indicates the number of Authentication Server entries (number of elements in the array) configured for this access point. The access point will attempt authentication with the authentication servers listed in the array in order. This variable is read/write and is evented.

### 2.2.2. AuthServerIPAddress

This variable is an IPv4 or IPv6 address of the Authentication Server, such as a RADIUS Server, for 802.1x-based Authentication.

### 2.2.3. AuthServerPortNumber

This variable is the port number (such as 1645 or 1812 for RADIUS) of the Authentication Server, such as a RADIUS Server, for EAP-based Authentication. This variable is read/write.

### 2.2.4. AuthServerSharedSecret

This variable is a string that represents the password in plain text for the access point to authenticate into the Authentication Server, such as a Radius Server, for EAP-based Authentication. This variable is read/write.

## 2.3. Eventing and Moderation

Table 2: Event Moderation

Variable Name	Evented	Moderated Event	Max Event Rate <sup>1</sup>	Logical Combination	Min Delta per Event <sup>2</sup>
NumberOfAuthServerEntries	Yes	No	N/A	N/A	N/A
<i>Non-standard state variables implemented by an UPnP device vendor go here.</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>

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

<sup>2</sup> (N) \* (allowedValueRange Step).

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### 2.3.1. Event Model

Only one state variable of the *RadiusClient* service is evented:

**NumberOfAuthServerEntries:** This state variable event helps keep the client's authentication server list synchronized with the authentication server list maintained at the AP device.

None of the events are moderated.

## 2.4. Actions

Table 3 lists the required and optional actions for the UPnP AP device. This is followed by 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.

Securing UPnP actions in this service is optional but strongly recommended, using UPnP security protocols as defined by UPnP Security working group. If the AP implements security for UPnP actions, Table 3 indicates the actions that MUST be secure. The others may be implemented as secure or open. Secure actions MUST be protected for both confidentiality and integrity.

Access permissions will be inherited from the containing device (e.g., *WLANAccessPointDevice*).

Table 3: Actions

Name	Secure or Open*	Req. or Opt.
GetGenericAuthServerEntry	S	R
GetSpecificAuthServerEntry	S	R

Name	Secure or Open*	Req. or Opt.
AddAuthServerEntry	S	R
DeleteAuthServerEntry	S	R
FactoryDefaultReset	S	R
ResetAuthentication	S	R

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

\* This column is relevant if DeviceSecurity service is present in the container device

### 2.4.1. GetGenericAuthServerEntry

This action retrieves Authentication Server Entries one entry at a time. Control points can call this action with an incrementing array index until no more entries are found on the gateway. If NumberOfAuthServerEntries is updated during a call, the process may have to start over. Entries in the array are contiguous. As entries are deleted, the array is compacted, and the evented variable NumberOfAuthServerEntries is decremented. Authentication Server Entries are logically stored as an array on the AP and retrieved using an array index ranging from 0 to NumberOfAuthServerEntries – 1.

#### 2.4.1.1. Arguments

Table 4: Arguments for GetGenericAuthServerEntry

Argument	Direction	relatedStateVariable
NewAuthServerIndex	IN	NumberOfAuthServerEntries
NewAuthServerIPAddress	OUT	AuthServerIPAddress
NewAuthServerPortNumber	OUT	AuthServerPortNumber
NewAuthServerSharedSecret	OUT	AuthServerSharedSecret

#### 2.4.1.2. Dependency on State (if any)

#### 2.4.1.3. Effect on State (if any)

#### 2.4.1.4. Errors

errorCode	errorDescription	Description
402	Invalid Args	See UPnP Device Architecture section on Control
713	InvalidIndex	The specified array index is out of bounds

### 2.4.2. GetSpecificAuthServerEntry

This action retrieves the Authentication Server Entry for a specified {address, port} combination.

#### 2.4.2.1. Arguments

Table 5: Arguments for GetSpecificAuthServerEntry