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INTERNATIONAL STANDARD

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inside

**Information technology – UPnP device architecture –
Part 18-4: Remote Access Device Control Protocol – Remote Access Discovery
Agent Device**

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**INFORMATION TECHNOLOGY –
UPNP DEVICE ARCHITECTURE –**

**Part 18-4: Remote Access Device Control Protocol –
Remote Access Discovery Agent Device**

FOREWORD

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International Standard ISO/IEC 29341-18-4 was prepared by UPnP Forum Steering committee[1], was adopted, under the fast track procedure, by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

The list of all currently available parts of the ISO/IEC 29341 series, under the general title *Information technology – UPnP device 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.

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[1] UPnP Forum Steering committee, UPnP Forum, 3855 SW 153rd Drive, Beaverton, Oregon 97006 USA. See also "Introduction".

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1 Overview and Scope

This device definition is compliant with the UPnP Device Architecture version 1.0. It defines a device type referred to herein as *RADiscoveryAgent* device.

1.1 Introduction

The *RADiscoveryAgent* device is a UPnP device that provides the functionality capability for synchronizing the UPnP discovery information between two remote networks.

The Remote Access Discovery Agent functionality is a combination of a RADASync service and a control point functionality that interacts with a remote RADASync service running on the remote network. Each control point is pushing discovery information about devices available in its local area network to its corresponding RADASync peer. This device provides control points with the following functionality:

- Ability to push discovery information from a remote network that will be used to recreate and propagate the original information into the local network.

- Ability to propagate multicast events from a remote network into the local network.

This device does not address:

- Control level and content level Access Control for local devices which are exposed to remote networks.

1.2 Notation

- In this document, features are described as Required, Recommended, or Optional as follows:

    The key words "MUST," "MUST NOT," "REQUIRED," "SHALL," "SHALL NOT," "SHOULD," "SHOULD NOT," "RECOMMENDED," "MAY," and "OPTIONAL" in this specification are to be interpreted as described in [RFC 2119].

    In addition, the following keywords are used in this specification:

    PROHIBITED – The definition or behavior is an absolute prohibition of this specification. Opposite of REQUIRED.

    CONDITIONALLY REQUIRED – The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is REQUIRED, otherwise it is PROHIBITED.

    CONDITIONALLY OPTIONAL – The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is OPTIONAL, otherwise it is PROHIBITED.

    These keywords are thus capitalized when used to unambiguously specify requirements over protocol and application features and behavior that affect the interoperability and security of implementations. When these words are not capitalized, they are meant in their natural-language sense.

- Strings that are to be taken literally are enclosed in "double quotes".

- Placeholder values that need to be replaced are enclosed in the curly brackets "{" and "}".

- 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.

1.3 Vendor-defined Extensions

Whenever vendors create additional vendor-defined state variables, actions or properties, their assigned names and XML representation MUST follow the naming conventions and XML rules as specified in [DEVICE], Clause 2.5, "Description: Non-standard vendor extensions".

1.4 References

1.4.1 Normative References

This clause lists the normative references used in this specification and includes the tag inside square brackets that is used for each such reference:

[DEVICE] – UPnP Device Architecture, version 1.0.
Available at: http://www.upnp.org/specs/arch/UPnP-arch-DeviceArchitecture-v1.0-20080424.pdf.
Latest version available at: http://www.upnp.org/specs/arch/UPnP-arch-DeviceArchitecture-v1.0.pdf.

[RADASync] – RADASync:1, UPnP Forum,
Available at: http://www.upnp.org/specs/ra/UPnP-ra-RADASync-v1-Service-20090930.pdf.
Latest version available at: http://www.upnp.org/specs/ra/UPnP-ra-RADASync-v1-Service.pdf.

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

[XML] – "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/.

1.4.2 Informative References

This clause lists the informative references that are provided as information in helping understand this specification:

[RAARCH] – RAArchitecture:1, UPnP Forum,
Available at: http://www.upnp.org/specs/ra/UPnP-ra-RAArchitecture-v1-20090930.pdf.
Latest version available at: http://www.upnp.org/specs/ra/UPnP-ra-RAArchitecture-v1.pdf.

[RAServer] – RAServer:1, UPnP Forum,
Available at: http://www.upnp.org/specs/ra/UPnP-ra-RAServer-v1-Device-20090930.pdf.
Latest version available at: http://www.upnp.org/specs/ra/UPnP-ra-RAServer-v1-Device.pdf.

2 Device Definitions

2.1 Device Type

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

urn:**schemas-upnp-org:device**:*RADiscoveryAgent:1*

RADiscoveryAgent device is used herein to refer to this device type.

2.2 Terms and Abbreviations

2.2.1 Abbreviations

Table 2-1 — Abbreviations

Definition	Description
RADA	Remote Access Discovery Agent

2.2.2 Terms

2.2.2.1 Remote Access Client

The Remote Access Client (RAC) is the peer physical device that is not part of the physical home network. The RAC is exposing only the UPnP devices and services that are embedded in the physical device.

2.2.2.2 Remote Access Server

The Remote Access Server (RAS) is the peer physical device located in the home network. RAS is exposing to the RAC the UPnP devices and services available in the physical home network as well as any embedded in the physical RAS device.

2.2.2.3 Remote Access Network Interface

The RA network interface is the network interface that is created by the Remote Access Transport Agent. The settings for this interface are contained in a RATA profile.

2.3 *RADiscoveryAgent* Device Architecture

This device is hosted by the Remote Access Client or Remote Access Server and is active on the RA network interface. The device embeds the RADASync Service and a RADASync Control Point.
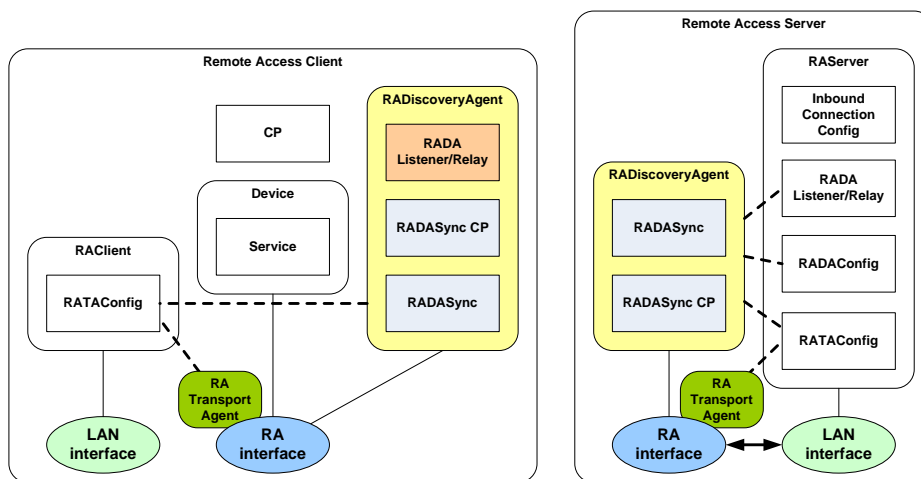

Figure 2-1 — RADiscoveryAgent Device Architecture.

Additionally, the *RADiscoveryAgent* Device in the Remote Access Client is hosting the RADA Listener and Relay functionality that is a support function of the Remote Access Discovery Agent (RADA). RADA Listener and Relay are described in detail in the RADASync Service document.

2.4 Device Model

RADiscoveryAgent products MUST implement minimum version numbers of all REQUIRED embedded devices and services specified in the table below. A *RADiscoveryAgent* device can be either a *Root* device or can be *Embedded* in another UPnP device (*RADiscoveryAgent* or other). A *RADiscoveryAgent* device (*Root* or *Embedded*) can in turn contain other standard or non-standard *Embedded* UPnP devices.

Table 2-2 — Device Requirements

DeviceType	Root	R/O [a]	ServiceType	R/O [a]	Service ID [b]
RADiscoveryAgent:1	*Root* or *Embedded*	*R*	*RADASync:1*	*R*	RADASync
			Standard non-RA services defined by UPnP (QoS, Security, etc.) go here.	*X*	*TBD*
			Non-standard services embedded by a UPnP vendor go here.	*X*	*TBD*
Standard devices embedded by a UPnP vendor go here.	*Embedded*	*O*	*Services as defined by the corresponding standard UPnP Device Definition go here.*		
Non-standard devices embedded by a UPnP vendor go here.	*Embedded*	*X*	*TBD*	*TBD*	*TBD*

a   *R* = REQUIRED, *O* = OPTIONAL, *X* = Non-standard

b   Prefixed by urn:**upnp-org**:**serviceId**:

2.4.1 Description of Device Requirements

Any instance of a *RADiscoveryAgent* MUST have a *RADASync* service.

RADiscoveryAgent MUST be visible only on the Remote Access network interface of the physical device that host the device. *RADiscoveryAgent* MUST not be visible on the LAN interface of the host physical device.

2.5 Theory of Operation

Refer to the Clause 4.3 and Clause 4.4 of the Remote Access Architecture document.

3 XML Device Description

```xml
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
    <specVersion>
        <major>1</major>
        <minor>0</minor>
    </specVersion>
    <URLBase>base URL for all relative URLs</URLBase>

    <device>
        <deviceType>
            urn:schemas-upnp-org:device:RADiscoveryAgent:1
        </deviceType>
        <friendlyName>short user-friendly title</friendlyName>
        <manufacturer>manufacturer name</manufacturer>
        <manufacturerURL>URL to manufacturer site</manufacturerURL>
        <modelDescription>long user-friendly title</modelDescription>
        <modelName>model name</modelName>
        <modelNumber>model number</modelNumber>
```

```xml
        <modelURL>URL to model site</modelURL>
        <serialNumber>manufacturer's serial number</serialNumber>
        <UDN>uuid:UUID</UDN>
        <UPC>Universal Product Code</UPC>
        <iconList>
            <icon>
                <mimetype>image/format</mimetype>
                <width>horizontal pixels</width>
                <height>vertical pixels</height>
                <depth>color depth</depth>
                <url>URL to icon</url>
            </icon>
            <!-- XML to declare other icons, if any, go here -->
        </iconList>
        <serviceList>
            <service>
                <serviceType>
                    urn:schemas-upnp-org:service:RADASync:1
                </serviceType>
                <serviceId>
                    urn:upnp-org:serviceId:RADASync
                </serviceId>
                <SCPDURL>URL to service description</SCPDURL>
                <controlURL>URL for control</controlURL>
                <eventSubURL>URL for eventing</eventSubURL>
            </service>

    <!-- Declarations for standard non-RA services defined by
        UPnP (if any)go here. -->

    <!-- Declarations for other services defined by UPnP vendor
        (if any)go here. -->

        </serviceList>
        <deviceList>

    <!-- Declarations for standard non-RA devices defined by UPnP
        (if any)go here. -->

    <!-- Declarations for other devices defined by UPnP vendor
        (if any)go here. -->

        </deviceList>
        <presentationURL>URL for presentation</presentationURL>
    </device>
</root>
```

4 Test

No semantic tests have been specified for this device.