

# [MS-SSDP]: Simple Service Discovery Protocol (SSDP) Extensions

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## Revision Summary

Date	Revision History	Revision Class	Comments
07/20/2007	0.1	Major	MCPPE Milestone 5 Initial Availability
09/28/2007	1.0	Major	Updated and revised the technical content.
10/23/2007	1.0.1	Editorial	Revised and edited the technical content.
11/30/2007	1.0.2	Editorial	Revised and edited the technical content.
01/25/2008	1.0.3	Editorial	Revised and edited the technical content.

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# 1 Introduction

Simple Service Discovery Protocol Extensions are a set of extensions to the Simple Service Discovery Protocol (SSDP), as specified in [\[UPNPARCH1\]](#), and are used to detect devices on a home network.

## 1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

### URI

The following terms are specific to this document:

**Universal Plug and Play (UPnP):** A set of computer network protocols promulgated by the UPnP Forum [\[UPnP\]](#). The goals of UPnP are to allow devices to connect seamlessly and to simplify the implementation of networks in home (data sharing, communications, and entertainment) and corporate environments. UPnP achieves this by defining and publishing UPnP device control protocols built upon open, Internet-based communication standards.

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.ietf.org/rfc/rfc2119.txt>

[RFC3986] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifier (URI): Generic Syntax", RFC 3986, January 2005, <http://www.ietf.org/rfc/rfc3986.txt>

[SSDP1] Goland, Yaron Y., Cai, T., Leach, P., Gu, Y., and Albright, S., "Simple Service Discovery Protocol (SSDP)", 1999, <http://tools.ietf.org/html/draft-cai-ssdp-v1-03>

If you have any trouble finding [SSDP1], please check [here](#).

[UPnP] UPnP Forum, "Standards", <http://www.upnp.org/standardizeddcps/default.asp>

[UPNPARCH1] UPnP Forum, "UPnP Device Architecture 1.0", July 2006, <http://www.upnp.org/specs/arch/UPnP-DeviceArchitecture-v1.0-20060720.pdf>

### 1.2.2 Informative References

There are no informative references for this protocol.

### 1.3 Protocol Overview (Synopsis)

The Simple Service Discovery Protocol (as specified in [\[UPNPARCH1\]](#)) is used to detect **Universal Plug and Play** (as specified in [\[UPnP\]](#)) devices on a network. The Simple Service Discovery Protocol is maintained by the UPnP Forum and published by the UPnP Implementers Corporation.

Simple Service Discovery Protocol Extensions provide a mechanism for a control point to discover a device on the network without requiring the device to implement a complete Simple Service Discovery Protocol stack. The Simple Service Discovery Protocol is simplified by removing the requirement for a description document (substituted with a name/value list in each announcement), and by removing the need for a multicast listener (substituted with frequent periodic announcements).

### 1.4 Relationship to Other Protocols

Simple Service Discovery Protocol Extensions depend upon protocols described in section 1.1 of [\[UPNPARCH1\]](#), specifically:

- HTTPMU
- UDP
- IP

### 1.5 Prerequisites/Preconditions

Simple Service Discovery Protocol Extensions have no additional prerequisites/preconditions beyond what is required for the Simple Service Discovery Protocol, as specified in [\[UPNPARCH1\]](#).

### 1.6 Applicability Statement

Simple Service Discovery Protocol Extensions provide a mechanism for a control point to discover a device on the network without requiring the device to implement a complete Simple Service Discovery Protocol stack.

### 1.7 Versioning and Capability Negotiation

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### 1.8 Vendor-Extensible Fields

The AL header (as specified in [\[SSDP1\]](#)) in the ssdp:alive message contains a bracketed list of **URIs** (as specified in [\[RFC3986\]](#)). The vendor may extend that list with any URIs that are compliant with the rules specified in [\[RFC3986\]](#).

### 1.9 Standards Assignments

There are no standards assignments other than what is specified in [\[UPNPARCH1\]](#).

## 2 Messages

The following sections specify how Simple Service Discovery Protocol Extensions messages are transported and message syntax.

### 2.1 Transport

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### 2.2 Message Syntax

Simple Service Discovery Protocol Extensions MUST follow the Simple Service Discovery Protocol discovery advertisement messages syntax, as specified in [\[UPNPARCH1\]](#) section 1.1, with the following exceptions:

- The LOCATION header MUST contain the single character "\*".
- The AL (Alternate Location) header (as specified by [\[SSDP1\]](#)) is required and MUST contain a list of URIs ([\[RFC3986\]](#)), with each URI framed by the characters "<" and ">".

Simple Service Discovery Protocol Extensions SHOULD NOT implement the Simple Service Discovery Protocol discovery search messages syntax as specified in [\[UPNPARCH1\]](#) section 1.2.

## 3 Protocol Details

The following sections specify details of Simple Service Discovery Protocol Extensions, including abstract data models and message processing rules.

### 3.1 Device Details

The Simple Service Discovery Protocol (as specified in [\[UPNPARCH1\]](#)) is used for device discovery between control points and devices. On the device, specific messages are multicast.

#### 3.1.1 Abstract Data Model

No abstract data model is required.

#### 3.1.2 Timers

Because Simple Service Discovery Protocol Extensions are implemented such that the traditional Simple Service Discovery Protocol search does not exist on the device, the device **SHOULD** send ssdp:alive messages on a periodic basis that is more frequent than the Simple Service Discovery Protocol default.

#### 3.1.3 Initialization

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

#### 3.1.4 Higher-Layer Triggered Events

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

#### 3.1.5 Message Processing Events and Sequencing Rules

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

#### 3.1.6 Timer Events

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

#### 3.1.7 Other Local Events

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### 3.2 Control Point Details

The Simple Service Discovery Protocol is used for device discovery between control points (as specified in [\[UPNPARCH1\]](#)) and devices (as specified in [\[UPNPARCH1\]](#)). The control point listens for multicast messages from the device.

### **3.2.1 Abstract Data Model**

No abstract data model is required.

### **3.2.2 Timers**

No timers are required.

### **3.2.3 Initialization**

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### **3.2.4 Higher-Layer Triggered Events**

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### **3.2.5 Message Processing Events and Sequencing Rules**

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### **3.2.6 Timer Events**

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### **3.2.7 Other Local Events**

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

## 4 Protocol Examples

New device A is set up and plugged in to the home network for the first time. When it is turned on, the device first sends a UDP multicast message over port 1900 of ssdp:byebye, and then immediately after, ssdp:alive:

```
NOTIFY * HTTP/1.1
HOST: 239.255.255.250:1900
NT: search target
NTS: ssdp:byebye
LOCATION: *
USN: advertisement UUID
```

```
NOTIFY * HTTP/1.1
HOST: 239.255.255.250:1900
NT: search target
NTS: ssdp:alive
LOCATION: *
CACHE-CONTROL: max-age=4
AL:<http://contoso.com><urn:schemas-contoso-com:placeholder>
USN: advertisement UUID
SERVER: UPnP/1.0
```

The device continues to resend these messages every 5 seconds until a control point on the network that is listening for this message responds with the appropriate behavior.



## 5 Security

The following sections specify security considerations for implementers of Simple Service Discovery Protocol Extensions.

### 5.1 Security Considerations for Implementers

Simple Service Discovery Protocol Extensions do not specify anything beyond what is specified by [\[UPNPARCH1\]](#).

### 5.2 Index of Security Parameters

There are no security parameters for Simple Service Discovery Protocol Extensions.

## 6 Appendix A: Windows Behavior

The information in this specification is applicable to the following versions of Windows:

- Windows Vista

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Windows behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that Windows does not follow the prescription.

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