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DHCP Options for Service Location Protocol

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

The Dynamic Host Configuration Protocol provides a framework for passing configuration information to hosts on a TCP/IP network. Entities using the Service Location Protocol need to find out the address of Directory Agents in order to transact messages. Another option provides an assignment of scope for configuration of SLP User and Service Agents.

1. Introduction

The Dynamic Host Configuration Protocol [2] provides a framework for passing configuration information to hosts on a TCP/IP network. Entities using the Service Location Protocol, Version 2 [3] and Service Location Protocol, Version 1 [4] need to obtain the address of Directory Agents and Scope configuration. The Service Location Protocol (SLP) provides a default configuration for Scopes and Directory Agents may be discovered using multicast or broadcast. It is useful in a larger deployment to be able to configure SLP Agents using DHCP, so as to centralize the administration and to deploy SLP in networks where multicast routing is not available.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [1].

2. Introduction

The DHCP options described below are used to configure Agents using the Service Location Protocol, Version 2 [3] and Version 1 [4].

The SLP Directory Agent option is used to configure User Agents and Service Agents with the location of Directory Agents in the network.

The SLP Scope Option takes precedence over both default and static scope configuration of SLP agents.

3. SLP Directory Agent Option

This option specifies the location of one or more SLP Directory Agents.

```

      0                               1                               2                               3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Code = 78 | Length | Mandatory | a1 |
+-----+-----+-----+-----+-----+-----+-----+-----+
| a2 | a3 | a4 | ...
+-----+-----+-----+-----+-----+-----+-----+-----+

```

The SLP Directory Agent Option specifies a list of IP addresses for Directory Agents. Directory Agents MUST be listed in order of preference, if there is an order of preference.

The Length value must include one for the 'Mandatory' byte and include four for each Directory Agent address which follows. Thus, the Length minus one of the option MUST always be divisible by 4 and has a minimum value of 5.

The address of the Directory Agent is given in network byte order.

The 'Mandatory' byte in the Directory Agent option may be set to either 0 or 1. If it is set to 1, the SLP User Agent or Service Agent so configured MUST NOT employ either active or passive multicast discovery of Directory Agents.

Note that for backward compatibility with some deployed software the Mandatory byte MUST NOT be set to any byte value for which the high order bit (0x80) is set.

The Directory Agents listed in this option MUST be configured with the a non-empty subset of the scope list that the Agent receiving the Directory Agent Option is configured with. See the notes below.

The SLPv2 specification [3] defines how to use this option.

4. SLP Service Scope Option

The scope list is a comma delimited list which indicates the scopes that a SLP Agent is configured to use.

```

0                               1                               2                               3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----+-----+-----+-----+-----+-----+-----+-----+
| Code = 79 | Length | Mandatory | <Scope List>...
+-----+-----+-----+-----+-----+-----+-----+-----+
    
```

The Length indicates the number of bytes which follow. Since the Scope-List String is encoded using UTF-8 [5] characters, it may be the cast that the Length is not the same as the number of characters in the Scope-List String. The Length value must include one for the 'Mandatory' byte.

The 'Mandatory' byte determines whether SLP Agents override their static configuration for scopes with the <Scope List> string provided by the option. This allows DHCP administrators to implement a policy of assigning a set of scopes to Agents for service provision. If the Mandatory byte is 0, static configuration takes precedence over the DHCP provided scope list. If the Mandatory byte is 1, the <Scope List> provided in this option MUST be used by the SLP Agent.

The Scope List String syntax and usage are defined in the SLPv2 specification [3].

4.1. Zero Length Scope-List String Configuration

A SLP Service Scope Option which indicates a Length of 1 (in other words, omitting the <Scope List> string entirely) validly configures the SLP User Agent to use "User Selectable Scopes."

The SLP Agent will use the aggregated list of scopes of all known DAs. If no DAs are known, the UA will use SA discovery to determine the list of scopes on the network, as defined in [3].

Note that this configuration is tantamount to removing all centralized control of the scope configuration of hosts on the network. This makes it possible for every User Agent to see every service. This may not be desirable as users may not be able to or desire to decide which services are appropriate for them.

5. Security Considerations

If a malicious host is able to insert fraudulent information in DHCPPOFFER packets sent to a prospective SLP Agent then the SLP Agent will be unable to obtain service, or may unwittingly be directed to use the incorrect services.

Many opportunities for denial of service exist. A service agent could find that it might rely on fraudulent or otherwise malicious directory agents to advertise its services. DHCPPOFFERS could prevent the regular SLP framework from functioning by directing clients to not use multicast, to use nonexistent directory agents and so on.

These difficulties are inherited from the much larger and more serious problem, viz. securing or authenticating any information whatsoever from a DHCP server (or client!) is not possible in common DHCP deployments.

References

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [2] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.
- [3] E. Guttman, C. Perkins, J. Veizades, and M. Day, "Service Location Protocol version 2", Work in Progress.
- [4] Veizades, J., Guttman, E., Perkins, C. and S. Kaplan, "Service Location Protocol", RFC 2165, July 1997.
- [5] Yergeau, F., "UTF-8, a transformation format of unicode and ISO 10646", RFC 2279, October 1998.

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