Network Working Group
Request for Comments: 2855
Category: Standards Track

K. Fujisawa
Sony Corporation

June 2000

DHCP for IEEE 1394

Status of this Memo

Copyright Notice

Abstract

IEEE Std 1394-1995 is a standard for a High Performance Serial Bus. Since 1394 uses a different link-layer addressing method than conventional IEEE802/Ethernet, the usage of some fields must be clarified to achieve interoperability. This memo describes the 1394 specific usage of some fields of DHCP messages.

1. Introduction

IEEE Std 1394-1995 is a standard for a High Performance Serial Bus. IETF IP1394 Working Group specified the method to carry IPv4 datagrams and 1394 ARP packets over an IEEE1394 network [RFC2734].

The Dynamic Host Configuration Protocol (DHCP) [RFC2131] provides a framework for passing configuration information to hosts on a TCP/IP network.

Since 1394 uses a different link-layer addressing method than conventional IEEE802/Ethernet, the usage of some fields must be clarified to achieve interoperability. This memo describes the 1394 specific usage of some fields of DHCP. See [RFC2131] for the mechanism of DHCP and the explanations of each field.

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 RFC 2119 [RFC2119].

2. Issues related to 1394 link address

With conventional link-layer protocols, such as an Ethernet, the 'chaddr' (client hardware address) field may be used to return a reply message from a DHCP server (or relay-agent) to a client. Since a 1394 link address (node_ID) is transient and will not be consistent across the 1394 bridge, we have chosen not to put it in the 'chaddr' field. A DHCP client should request that the server sends a broadcast reply by setting the BROADCAST flag when 1394 ARP is not possible yet.

> Note: In general, the use of a broadcast reply is discouraged, but we consider the impact in a 1394 network as a non issue.

3. 1394 specific usage of DHCP message fields

Following rules should be used when a DHCP client is connected to an IEEE1394 network.

'htype' (hardware address type) MUST be 24 [ARPPARAM].

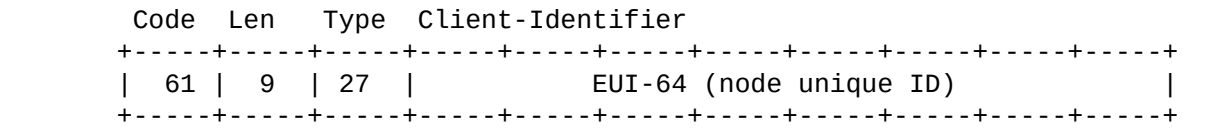
'hlen' (hardware address length) MUST be 0.

The 'chaddr' (client hardware address) field is reserved. The sender MUST set this field to zero, and the recipient and the relay agent MUST ignore its value on receipt.

A DHCP client on 1394 SHOULD set a BROADCAST flag in DHCPDISCOVER and DHCPREQUEST messages (and set 'ciaddr' to zero) to ensure that the server (or the relay agent) broadcasts its reply to the client.

> Note: As described in [RFC2131], 'ciaddr' MUST be filled in with client's IP address during BOUND, RENEWING or REBINDING state, therefore, the BROADCAST flag MUST NOT be set. In these cases, the DHCP server unicasts DHCPACK message to the address in 'ciaddr'. The link address will be resolved by 1394 ARP.

'client identifier' option MUST be used in DHCP messages from the client to the server due to the lack of the 'chaddr'. 'client identifier' option may consist of any data. Because every IP over 1394 node has an EUI-64 (node unique ID), the EUI-64 makes an obvious 'client identifier'. 1394 clients SHOULD include an EUI-64 identifier in the 'client identifier' option. The type value for the EUI-64 is 27 [ARPPARAM], and the format is illustrated as follows.



Note that the use of other 'client identifier' type, such as a fully qualified domain name (FQDN), is not precluded by this memo.

For more details, see "9.14. Client-identifier" in [RFC2132].

4. Security Considerations

DHCP currently provides no authentication or security mechanisms. Potential exposures to attack are discussed in section 7 of the DHCP protocol specification [RFC2131].

A malicious client can falsify its EUI-64 identifier, thus masquerading as another client.

Acknowledgments

The author appreciates the members of the Dynamic Host Configuration Working Group for their review and valuable comments.

References

[RFC2734] Johansson, P., "IPv4 over IEEE 1394", RFC 2734, December 1999.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, March 1997.

[RFC2131] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.

[RFC2132] Alexander, S. and R. Droms, "DHCP Options and BOOTP Vendor Extensions", RFC 2132, March 1997.

[ARPPARAM] http://www.iana.org/numbers.html

Author's Address

Kenji Fujisawa
Sony Corporation
6-7-35, Kitashinagawa,
Shinagawa-ku, Tokyo, 141-0001 Japan

Phone: +81-3-5448-8507
EMail: fujisawa@sm.sony.co.jp

Full Copyright Statement

Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.