

IPv6 Group  
Internet-Draft  
Expires: March 5, 2006

R. Droms  
Cisco Systems, Inc.  
D. Evans  
ARRIS International, Inc.  
September 2005

**Time Protocol Servers and Time Offset Options for IPv6 DHCP**  
**draft-droms-dhc-dhcpv6-rfc868-servers-02.txt**

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with [Section 6 of BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/1id-abstracts.txt>.

The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

This Internet-Draft will expire on March 5, 2006.

Copyright Notice

Copyright (C) The Internet Society (2005).

Abstract

The Time Protocol Servers option for IPv6 DHCP ([RFC 3315](#)) carries the IPv6 addresses of servers that a host should use for the Time Protocol ([RFC 868](#)). The Time Offset option carries the offset in seconds from Coordinated Universal Time (UTC) that a client may use to determine its local time.

## **1. Introduction**

The Time Protocol [[1](#)] can be used to obtain the current time from a server. The Time Protocol Servers option defined in this document provides an option to provide the IPv6 addresses of Time Protocol servers to a host through DHCP [[2](#)].

The Time Offset option defined in this document provides an option to provide an offset in seconds from UTC that a client can use to determine its local time. This option is only meaningful if the server has knowledge of the physical location of the client.

The options defined in this document are based on the IPv4 DHCP [[3](#)] Time Server and Time Offset options [[4](#)]. This document has no effect on IPv4 DHCP, which will continue to use the Time Server option to provide the IPv4 addresses of [RFC 868](#) Time Protocol servers and the Time Offset option to provide the offset between UTC and local time to clients.

## **2. Terminology**

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 [RFC2119](#) [[5](#)].

Throughout this document, unless indicated otherwise for clarity, the acronym "DHCP" refers to "Dynamic Host Configuration Protocol for IPv6" [[2](#)].

## **3. Format of the Time Protocol Servers option**

The Time Protocol Servers option defines a list of Time Protocol servers available to the DHCP client. The IPv6 address of each server is included in the option. The addresses SHOULD be listed in order of preference. The addresses MUST be unicast or anycast addresses.

The Time Protocol Servers option has the following format:





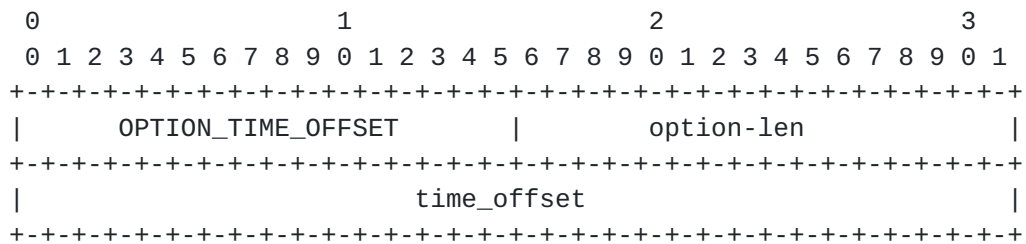
option-code           OPTION\_RFC868\_SERVERS (TBD).  
option-len            16 \* N.  
server-address1-N    The IPv6 addresses of the Time Protocol servers.

#### 4. Time Offset option

The Time Offset option specifies the offset in seconds from Coordinated Universal Time (UTC) that the client should use to determine its local time. The offset is expressed as a two's complement 32-bit integer. A positive offset indicates a location east of the zero meridian and a negative offset indicates a location west of the zero meridian. It is recommended that this option be used only when the concept of local time based on a 24-hour day is known to be meaningful.

The Time Offset option has the following format:





option-code	OPTION_TIME_OFFSET (TBD).
option-len	4.
server-address1-N	Offset in seconds from UTC.

## 5. Security Considerations

A server could use this option to return invalid or incorrect addresses or valid addresses of malicious Time Protocol servers to the client. A server could use this option to return incorrect or inappropriate time offset values to the client.

Authentication of DHCP messages [2] can be used to ensure that the contents of this option are not altered in transit between the DHCP server and client.

## 6. IANA Considerations

IANA is requested to assign an option code from the IPv6 DHCP options registry to `OPTION_RFC868_SERVER` and `OPTION_TIME_OFFSET`.

## 7. Normative References

- [1] Postel, J. and K. Harrenstien, "Time Protocol", STD 26, [RFC 868](#), May 1983.
- [2] Droms, R., Bound, J., Volz, B., Lemon, T., Perkins, C., and M. Carney, "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", [RFC 3315](#), July 2003.
- [3] Droms, R., "Dynamic Host Configuration Protocol", [RFC 2131](#), March 1997.
- [4] Alexander, S. and R. Droms, "DHCP Options and BOOTP Vendor Extensions", [RFC 2132](#), March 1997.
- [5] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.



#### Authors' Addresses

Ralph Droms  
Cisco Systems, Inc.  
1414 Massachusetts Avenue  
Boxborough, MA 01719  
USA

Phone: +1 978.936.1674  
Email: [rdroms@cisco.com](mailto:rdroms@cisco.com)

D. R. Evans  
ARRIS International, Inc.  
7912 Fairview Road  
Boulder, CO 80303  
USA

Phone: +1 303.494.0394  
Email: [N7DR@arrisi.com](mailto:N7DR@arrisi.com)

#### Full Copyright Statement

Copyright (C) The Internet Society (2005).

This document is subject to the rights, licenses and restrictions contained in [BCP 78](#), and except as set forth therein, the authors retain all their rights.

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

#### Intellectual Property

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be



found in [BCP 78](#) and [BCP 79](#).

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at <http://www.ietf.org/ipr>.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at [ietf-ipr@ietf.org](mailto:ietf-ipr@ietf.org).

#### Acknowledgment

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

