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**Addition of Device Class to Agent Options**  
**<[draft-ietf-dhc-agentoptions-device-class-03.txt](#)>**

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Abstract

This document proposes a new sub-option to the DHCP Relay Information Agent Option. This new sub-option is for use with DOCSIS cable modems and describes a "device class" to which the cable modem belongs. The cable modem signals its device class information to the Relay Agent using DOCSIS signalling, and the Relay Agent forwards the device class information to the DHCP Server which can then make a policy decision based on it.

## **1. Introduction**

DHCP Agent Options is described in [1] and includes several Relay Agent Information sub-options. This I-D proposes an additional sub-option for use with DOCSIS cable modems. This sub-option is added by DHCP relay agents which terminate cable modems. The sub-option encodes an identifier of the device class to which the cable modem belongs. It is intended for use by DHCP servers to make policy decisions based on the device class of the host.

The motivation for using a Relay Agent Information sub-option, rather than a new or existing DHCP option, is the introduction of CPE Controlled Cable Modems (CCCMs) [2]. In an implementation of a CCCM, the modem firmware controls DOCSIS signalling, but the attached computer (CPE) manages other protocol activities -- particularly DHCP client message handling. The assumption of this document is that it is better to trust the operation of the CCCM firmware, than to trust the operation of CCCM software running on the attached computer (e.g. a standard PC).

The key words "MUST", "MUST NOT", "SHOULD", "SHOULD NOT" and "MAY" in this document are to be interpreted as described in [RFC 2119](#) [4].

## **2. Device Class Sub-option**

The DOCSIS RFI specification [3] specifies the Device Class encoding within the payload of the Device Class Identification Request (DCI-REQ) message. The relay agent MUST pass the Device Class value unchanged to the DHCP server. Possible uses of this field include:

- o host endpoint information
- o host hardware capabilities
- o host software capabilities
- o host options information

DOCSIS defines the Device Class to be a 32-bit field where individual bits represent individual attributes of the CM. Bit #0 is the least significant bit of the field. Bits are set to 1 to select the attributes defined below.

bit #0 - CPE Controlled Cable Modem (CCCM)

bits #1-31 - Reserved and set to zero

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The device class sub-option is coded as follows:

SubOpt	Len	Device Class			
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
TBD	4	d1	d2	d3	d4
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+

The DHCP server needs to understand the meaning of this sub-option in order to offer different policy options in its reply to the host. DHCP servers MAY use the device class for IP and other parameter assignment policies for cable modems.

### 3. Security Considerations

Operation of the DHCP Relay Agent Information Option relies on an implied trusted relationship between the DHCP relay agent and the DHCP server.

Operation of the device class sub-option also relies on an implied trusted relationship between the DHCP client (i.e. the cable modem) and the DHCP relay agent, through DOCSIS signalling. According to DOCSIS specifications, the cable modem firmware always controls DOCSIS signalling, but cannot control DHCP client message handling (e.g. CCCMs). This document assumes that the cable modem firmware is trustworthy for DOCSIS signalling information.

This document introduces a new identifier, the device class sub-option, that is provided by the relay agent device and is assumed to be trusted. Cryptographic or other techniques to authenticate the device class are beyond the scope of this document.

### 4. IANA Considerations

IANA has assigned a value of TBD from the DHCP Relay Agent Sub-options space [[RFC 3046](#)] for the device class sub-option defined in [section 2](#).

### 5. References

- [1] Patrick, M., "DHCP Relay Agent Information Option", [RFC 3046](#), January 2001.
- [2] "Data-Over-Cable Service Interface Specifications: Cable Modem to Customer Premise Equipment Interface Specification SP-CMCI-I06-

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010829", DOCSIS, August 2001, <http://www.cablemodem.com>.

- [3] "Data-Over-Cable Service Interface Specifications: Cable Modem Radio Frequency Interface Specification SP-RFIV1.1-I07-010829", DOCSIS, August 2001, <http://www.cablemodem.com>.
- [4] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

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