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Multimedia over IP in cable

Cable DHCP Registry

Recommendation ITU-T J.800.1

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Cable DHCP Registry

Summary

Recommendation ITU-T J.800.1 defines the Cable-specific DHCP option codes for DHCPv4 and DHCPv6 including the DHCPv6 Vendor-specific Information Options.

Source

Recommendation ITU-T J.800.1 was approved on 22 August 2008 by ITU-T Study Group 9 (2005-2008) under Recommendation ITU-T A.8 procedure.

FOREWORD

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Recommendation ITU-T J.800.1

Cable DHCP Registry

1 Scope

This Recommendation defines the Cable-specific DHCP option codes for DHCPv4 and DHCPv6 including the DHCPv6 Vendor-specific Information Options.

The scope of this version of this Recommendation includes:

- DHCPv4 protocol fields authoritatively assigned by CableLabs that are mandated for product implementation in eDOCSIS, DOCSIS, IPCable2Home, IPCablecom, and OpenCable specifications.
- DHCPv6 protocol fields authoritatively assigned by CableLabs that are mandated for product implementation in DOCSIS specifications and in other specifications under development for IPCablecom.

The Cable DHCPv6 options are carried in the DHCPv6 Vendor-specific Information option (option code OPTION_VENDOR_OPTS, Section 22.17 of [RFC 3315]). The enterprise number for Cable Television Laboratories, Inc. to be used in the DHCPv6 Vendor-specific option, is 4491.

The actual product requirements related to the implementation of these DHCP options can be found in relevant ITU-T Recommendations and CableLabs Project specifications.

NOTE – The structure and content of this Recommendation have been organized for ease of use by those familiar with the original source material; as such, the usual style of ITU-T recommendations has not been applied.

2 References

2.1 Normative References

- [RFC 1035] IETF RFC 1035, *Domain Names – Implementation and Specification*, November 1987.
- [RFC 3315] IETF RFC 3315, *Dynamic Host Configuration Protocol for IPv6 (DHCPv6)*, July 2003.
- [RFC 3495] IETF RFC 3495, *Dynamic Host Configuration Protocol (DHCP) Option for CableLabs Client Configuration*, March 2003.
- [RFC 3594] IETF RFC 3594, *PacketCable Security Ticket Control Sub-Option for the DHCP CableLabs Client Configuration (CCC) Option*, September 2003.

2.2 Informative References

This Recommendation uses the following informative references.

- [ANSI/SCTE 22-1] ANSI/SCTE 22-1, *Data-Over-Cable Service Interface Specification, DOCSIS 1.0 Part 1: Radio Frequency Interface (RFI)*, 2002.
- [ANSI/SCTE 23-1] ANSI/SCTE 23-1, *Data-Over-Cable Systems, Radio Frequency Interface Specification 1.1*.
- [CANN] Recommendation ITU-T J.800.0, *Cable Assigned Names and Numbers*.
- [CH 1.0] Recommendation ITU-T J.191, *IP feature package to enhance cable modems*.

[CH 1.1]	Recommendation ITU-T J.192, <i>A residential gateway to support the delivery of cable data services.</i>
[eDOCSIS]	Recommendation ITU-T J.126, <i>Embedded Cable Modem device specification.</i>
[eRouter]	Recommendation ITU-T J.218, <i>Cable modem IPv4 and IPv6 eRouter specification.</i>
[EUE-PROV]	Recommendation ITU-T J.369, <i>E-UE Provisioning Framework.</i>
[MIB-CLABDEF]	Recommendation ITU-T J.800.2, <i>Cable Definition MIB Specification.</i>
[MULPIv3.0]	Recommendation ITU-T J.222.2, <i>Third-generation transmission systems for interactive cable television services – IP cable modems: MAC and Upper Layer protocols.</i>
[OC-HOST 2.0]	<i>OpenCable Host Device 2.0 Core Functional Requirements, OC-SP-HOST2.0-CFR-C01-071113, November 13, 2007, Cable Television Laboratories, Inc.</i>
[PROV]	<i>PacketCable MTA Device Provisioning Specification, PKT-SP-PROV-C01-071129, November 29, 2007, Cable Television Laboratories, Inc.</i>
[PROV 1.5]	Recommendation ITU-T J.167, <i>Media terminal adapter (MTA) device provisioning requirements for the delivery of real-time services over cable television networks using cable modems.</i>
[RFC 868]	IETF RFC 868/STD0026, <i>Time Protocol</i> , May 1983.
[RFC 2131]	IETF RFC 2131, <i>Dynamic Host Configuration Protocol</i> , March 1997.
[RFC 2132]	IETF RFC 2132, <i>DHCP Options and BOOTP Vendor Extensions</i> , March 1997.
[RFC 3046]	IETF RFC 3046, <i>DHCP Relay Agent Information Option</i> , January 2001.
[RFC 3256]	IETF RFC 3256, <i>The DOCSIS (Data-Over-Cable Service Interface Specifications) Device Class DHCP (Dynamic Host Configuration Protocol) Relay Agent Information Sub-option</i> , April 2002.
[RFC 3634]	IETF RFC 3634, <i>Key Distribution Center (KDC) Server Address Sub-option for the Dynamic Host Configuration Protocol (DHCP) CableLabs Client Configuration (CCC) Option</i> , December 2003.
[RFC 3925]	IETF RFC 3925, <i>Vendor-Identifying Vendor Options for Dynamic Host Configuration Protocol version 4 (DHCPv4)</i> , October 2004.
[RFC 3993]	IETF RFC 3993, <i>Subscriber-ID Suboption for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Option</i> , March 2005.
[RFC 4014]	IETF RFC 4014, <i>Remote Authentication Dial-In User Service (RADIUS) Attributes Suboption for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Information Option</i> , February 2005.
[RFC 4243]	IETF RFC 4243, <i>Vendor-Specific Information Suboption for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Option</i> , December 2005.
[RFC 4361]	IETF RFC 4361, <i>Node-specific Client Identifiers for Dynamic Host Configuration Protocol Version Four (DHCPv4)</i> , February 2006.
[RFC 4580]	IETF RFC 4580, <i>Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay Agent Subscriber-ID Option</i> , June 2006.

2.3 Reference Acquisition

- Cable Television Laboratories, Inc., 858 Coal Creek Circle, Louisville, CO 80027, Phone +1-303-661-9100; Fax +1-303-661-9199; <http://www.cablelabs.com>.
- Internet Engineering Task Force (IETF) Secretariat, 46000 Center Oak Plaza, Sterling, VA 20166, Phone +1-571-434-3500, Fax +1-571-434-3535, <http://www.ietf.org>.
- Internet Assigned Numbers Authority (IANA), <http://www.iana.org>.

3 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms.

DHCP	Dynamic Host Configuration Protocol
eCM	Embedded Cable Modem
eSAFE	Embedded Service/Application Functional Entity
OUI	Organizationally Unique Identifier
TSP	Telephony Service Provider

4 DHCPv4 Protocol field values

4.1 Cable Values for DHCPv4 Option 43

Several Cable industry Recommendations and specifications mandate implementation of DHCPv4 option 43 by the DHCP client function of consumer premises equipment devices, to convey to the cable operator's provisioning system information about the product that can be used to make device and service configuration decisions during the provisioning process.

The DHCPv4 Option 43 sub-options code values for all Cable projects for DHCPv4 are listed in Table 1. Also see DHCPv4 Option 43 Syntax Requirements in [eDOCSIS].

The "used in" column includes the specifications where these values are used and they contain the normative requirements. This table is intended to define the values but the normative use of these values is not part of this Recommendation.

Table 1 – CableLabs DHCPv4 Option 43 Sub-options

DHCP Option 43	Value	Description	Used in
Sub-option 1		The request sub-option vector is a list of sub-options (within option 43) to be returned to client by the server upon reply to the request. None defined.	
Sub-option 2	<Device Type>	Device type of the component making the DHCP request. For a DOCSIS cable modem: "ECM" = embedded Cable Modem (as specified by DOCSIS 1.0, 1.1, or 2.0 Base Specifications) For an IPCablecom E-MTA: "EMTA" = embedded Multimedia Telephone Adapter (as specified in IPCablecom 1.0 and 1.5 MTA Device Provisioning Specifications) For IPCable2home PS: "EPS" = Embedded Portal Services or "SPS" = Stand-alone Portal Services For an OpenCable Host: "ESTB" For an OpenCable CableCARD: "CARD" For an eRouter: "EROUTER"	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0 eRouter
Sub-option 3	"ECM: <eSAFE ₁ : eSAFE ₂ ... SAFE _n >"	Colon-separated list of eCM and eSAFE(s) contained in the complete eDOCSIS device. First on the list shall be "ECM" for eCM. <eSAFE_x> can be "EMTA", "EPS", "ESTB" or "EROUTER" corresponding to embedded MTA, embedded Portal Service Element, and embedded STB, respectively. For example: "ECM:EMTA" = An IPCablecom Embedded MTA "ECM:EPS" = An IPCable2home Embedded Portal Services Element "ECM:ESTB" = An Embedded STB "ECM:EMTA:EPS" = An Embedded MTA and Embedded Portal Services Element "ECM:ESTB:CARD" – Indicates that a Cable Card is making a request via the eCM's DOCSIS return channel "ECM:EROUTER" = An embedded Router for DOCSIS	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0 eRouter

Table 1 – CableLabs DHCPv4 Option 43 Sub-options

DHCP Option 43	Value	Description	Used in
Sub-option 4	"<device serial number>"	Device serial number as in the MIB object docsDevSerialNumber, e.g., "123456" For OpenCable CableCARD, the serial number of the card. If Serial Number is not available, then other unique identifier (other than MAC Address) may be utilized.	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 5	"<Hardware version>"	Hardware version number. Identical to value as reported in the <Hardware version> field in the MIB object sysDescr. e.g., "v.3.2.1"	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 6	"<Software version>"	Software version number. Identical to value as reported in the <Software version> field in the MIB object sysDescr. e.g., "v.1.0.2"	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 7	"<Boot ROM version>"	Boot ROM version. Identical to value as reported in the <Boot ROM version> field in the MIB object sysDescr. e.g., "Bv4.5.6"	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 8	"<OUI>"	A 6-octet, hexadecimal-encoded, vendor-specific Organizationally Unique Identifier (OUI)	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 9	"<Model number>"	Device model number. Identical to value as reported in the <Model number> field in the MIB object sysDescr. e.g., "T3000"	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0 CableCARD 2.0
Sub-option 10	"<Vendor name>"	Vendor name or ID. Identical to value as reported in the <Vendor name> field in the MIB object sysDescr. e.g., "XYZ Corp" Not used for OpenCable CableCARD. Sub-option 51 is used instead.	DOCSIS 1.1/2.0/3.0* IPCablecom 1.0/1.5 IPCable2home 1.0/1.1 OpenCable Host 2.0

Table 1 – CableLabs DHCPv4 Option 43 Sub-options

DHCP Option 43	Value	Description	Used in
Sub-options 11 to 127			
Reserved for CableLabs			
<i>Sub-options 11..14</i>			
<i>IPCable2home</i>			
Sub-option 11	PS WAN-Man (0x01) PS WAN-Data (0x02)	Identifies that an address is being requested in the IPCable2home Portal Services WAN Management realm. Identifies that an address is being requested in the IPCable2home Portal Services WAN-Data realm	IPCable2home 1.0/1.1
Sub-option 12	"<CM/PS System Description>"	CM/PS System Description from sysDescr	IPCable2home 1.0/1.1
Sub-option 13	"<CM/PS Firmware Rev>"	CM/PS Firmware Revision from docsDevSwCurrentVers	IPCable2home 1.0/1.1
Sub-option 14	"<Firewall Policy File Version>"	Firewall Policy File Version from cabhSec2FirewallPolicyCurrentVersion	IPCable2home 1.0/1.1
Sub-option 15		Unassigned	
<i>Sub-options 16..17</i>			
<i>OpenCable</i>			
Sub-option 16	<Device TPID>	OpenCable DCAS Host Transport Processor Identifier	OpenCable DCAS™ specification
Sub-option 17	<Device SMID>	OpenCable DCAS Host Secure Micro Identifier	OpenCable DCAS™ specification
Sub-options 18..30		Unassigned	
<i>Sub-options 31..32</i>			
<i>IPCablecom</i>			
Sub-option 31	<MTA MAC Address>	Sub-option 31 contains the IPCablecom MTA MAC Address encoded as a 6-byte octet string.	IPCablecom 1.0/1.5
Sub-option 32	<MTA correlation ID>	Sub-option 32 contains the IPCablecom Provisioning correlation ID encoded as a 4-byte integer in network order	IPCablecom 1.0/1.5
Sub-options 33..50		Unassigned	