CableLabs® Specifications

CableLabs' Assigned Names and Numbers

CL-SP-CANN-I20-200715

ISSUED

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Key to Document Status Codes:

Work in Progress	An incomplete document, designed to guide discussion and generate feedback that may include several alternative requirements for consideration.
Draft	A document in specification format considered largely complete, but lacking review by Members and vendors. Drafts are susceptible to substantial change during the review process.
Issued	A generally public document that has undergone Member and Technology Supplier review, cross-vendor interoperability, and is for Certification testing if applicable. Issued Specifications are subject to the Engineering Change Process.
Closed	A static document, reviewed, tested, validated, and closed to further engineering change requests to the specification through CableLabs.

Trademarks

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1 SCOPE

This specification establishes a set of CableLabs registries and namespaces for Names and Numbers authoritatively assigned by CableLabs.

Numerous protocol fields make use of identifiers with well-known names or number values; for example, the IETF DHCP protocol and vendor-specific option values, the IETF RADIUS and DIAMETER protocols and associated CableLabs attributes, etc. To insure that such quantities have consistent values and interpretations in different implementations, their assignment must be administered by a central authority. For IETF protocols, that role is provided by the Internet Assigned Numbers Authority (IANA). For vendor-specific protocol fields that are defined by CableLabs specifications, or when the use of such protocol identifiers may be common to multiple CableLabs projects and specifications, this document defines a common repository to hold these values.

This document borrows some of the terminology and guidelines of IETF [RFC 2434].

The scope of this version of this specification includes:

- A DHCP registry for protocol fields authoritatively assigned by CableLabs that are in use in eDOCSIS™, DOCSIS®, CableHome®, PacketCable™, and OpenCable™ specifications, for both IPv4 and DHCPv6.
- An XML registry for XML (URN, URL) namespaces for DOCSIS, PacketCable and Stewardship and Fulfillment Interfaces.
- A DIAMETER registry for PacketCable.
- A Receive Channel Profile (RCP) registry for CableLabs-defined Standard RCPs and Vendor-defined Manufacturer RCPs that are used in DOCSIS 3.0 and beyond to communicate the receiver capabilities of a cable modem.
- An ASN.1 Codes registry for CableLabs assigned MIBs.

1.1 Requirements

Throughout this document, the words that are used to define the significance of particular requirements are capitalized. These words are:

"MUST"	This word or the adjective "REQUIRED" means that the item is an absolute requirement of this specification.
"MUST NOT"	This phrase means that the item is an absolute prohibition of this specification.
"SHOULD"	This word or the adjective "RECOMMENDED" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighed before choosing a different course.
"SHOULD NOT"	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
"MAY"	This word or the adjective "OPTIONAL" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.

2 REFERENCES

2.1 Normative References

None.

2.2 Informative References

This specification uses the following informative references.

[802.1ad] IEEE Std. 802.1ad-2005, IEEE Standard for Local and Metropolitan Area Networks – Virtual Bridged Local Area Networks Amendment 4: Provider Bridges, May 2006. Former amendment to 802.1Q, now part of 802.1Q-2011.

[802.1ah] IEEE Std. 802.1ah-2008, IEEE Standard for Local and Metropolitan Area Networks – Virtual Bridged Local Area Networks – Amendment 6: Provider Backbone Bridges, January 2008. Former amendment to 802.1Q, now part of 802.1Q-2011. [802.1Q].

[CANN DHCP] CableLabs' DHCP Options Registry, CL-SP-CANN-DHCP-Reg-I16-200715, July 15, 2020, Cable Television Laboratories, Inc.

[CCAP-OSSI] Data-Over-Cable Service Interface Specifications, Converged Cable Access Platform Operations Support System Interface Specification, CM-SP-CCAP-OSSI-I08-151210, December 10, 2015, Cable Television Laboratories, Inc.

[CCAP-OSSIv3.1] DOCSIS 3.1 CCAP Operations Support System Interface Specification, CM-SP-CCAP-OSSIv3.1-I18-200610, June 10, 2020, Cable Television Laboratories, Inc.

[CCAP-OSSIv4.0] DOCSIS 4.0 CCAP Operations Support System Interface Specification, CM-SP-CCAP-OSSIv4.0-I02-200311, March 11, 2020, Cable Television Laboratories, Inc.

[CH CAP-MIB] CableHome CAP MIB Specification, CH-SP-MIB-CAP-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CH CDP-MIB] CableHome CDP MIB Specification, CH-SP-MIB-CDP-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CH CTP-MIB] CableHome CTP MIB Specification, CH-SP-MIB-CTP-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CH PSDEV-MIB] CableHome PSDEV MIB Specification, CH-SP-MIB-PSDEV-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CH QOS-MIB] CableHome QOS MIB Specification, CH-SP-MIB-QOS-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CH SEC-MIB] CableHome Security MIB Specification, CH-SP-MIB-SEC-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[CM-OSSIv3.1] Cable Modem Operations Support System Interface Specification, CM-SP-CM-OSSIv3.1-I17-200610, June 10, 2020, Cable Television Laboratories, Inc.

[CM-OSSIv4.0] Cable Modem Operations Support System Interface Specification, CM-SP-CM-OSSIv4.0-I02-200311, March 11, 2020, Cable Television Laboratories, Inc.

[CO CSA-MIB] CableOffice Commercial Services Annex MIB Definition, CH-SP-CO-MIB-CSA-C01-060728, July 28, 2006, Cable Television Laboratories, Inc.

[DOCS TEST] DOCSIS Testing MIB Specification, CM-SP-TestMIB-D06-121219, December 19, 2012, Cable Television Laboratories, Inc.

[DPoE-MULPIv2.0] DOCSIS Provisioning of EPON Specifications, DPoE MAC and Upper Layer Protocols Specification, DPoE-SP-MULPIv2.0-I13-180228, February 28, 2018, Cable Television Laboratories, Inc.

[DPoE-OSSIv2.0]	DOCSIS Provisioning of EPON Specifications, DPoE Operations and Support System Interface Specification, DPoE-SP-OSSIv2.0-I12-180228, February 28, 2018, Cable Television Laboratories, Inc.
[DPoG-MULPI]	DOCSIS Provisioning of GPON Specifications, DPoG MAC and Upper Layer Protocols Specification, DPoG-SP-MULPIv1.0-C01-160830, August 30, 2016, Cable Television Laboratories, Inc.
[DPoG-OSSI]	DOCSIS Provisioning of GPON Specifications, DPoG Operations and Support System Interface Specification, DPoG-SP-OSSIv1.0-C01-160830, August 30, 2016, Cable Television Laboratories, Inc.
[DSG]	DOCSIS Set-top Gateway (DSG) Interface Specification, CM-SP-DSG-I25-170906-September 6, 2017, Cable Television Laboratories, Inc.
[eDOCSIS]	eDOCSIS Specification, CM-SP-eDOCSIS-I30-190213, February 13, 2019, Cable Television Laboratories, Inc.
[EQAM-PMI]	Edge QAM Provisioning and Management Interface Specification, CM-SP-EQAM-PMI-I02-111117, November 17, 2011, Cable Television Laboratories, Inc.
[eRouter]	IPv4 and IPv6 eRouter Specification, CM-SP-eRouter-I20-190515, May 15, 2019, Cable Television Laboratories, Inc.
[FMA-OSSI]	Flexible MAC Architecture Operations Support Systems Interface Specification, CM-SP-FMA-OSSI-D01-200529, May 29, 2020, Cable Television Laboratories, Inc.
[IANA AAA]	IANA's AAA parameters register: ftp://ftp.iana.org/assignments/aaa-parameters/
[IANA EN]	IANA's Enterprise-Numbers: http://www.iana.org/assignments/enterprise-numbers
[L2VPN]	Layer 2 Virtual Private Networks, CM-SP-L2VPN-I15-150528, May 28, 2015, Cable Television Laboratories, Inc.
[MIB-BB]	CableLabs Battery Backup MIB Specification, CL-SP-MIB-BB-I05-180209, February 9, 2018, Cable Television Laboratories, Inc.
[MIB-CLABDEF]	CableLabs Definition MIB Specification, CL-SP-MIB-CLABDEF-I12-160325, March 25, 2016, Cable Television Laboratories, Inc.
[M-OSSI]	Modular Operations Support System Interface Specification, CM-SP-M-OSSI-I08-081209, December 9, 2008, Cable Television Laboratories, Inc.
[MULPIv3.0]	DOCSIS 3.0 MAC and Upper Layer Protocols Interface Specification, CM-SP-MULPIv3.0-C01-171207, December 7, 2017, Cable Television Laboratories, Inc.
[OC MIB-HN]	OpenCable Home Networking MIB Specification, OC-SP-MIB-HN-I08-130530, May 30, 2013, Cable Television Laboratories, Inc.
[OC MIB-HOST2.X]	OpenCable Host Device 2.X MIB Specification, OC-SP-MIB-HOST2.X-I14-120531, May 31, 2012, Cable Television Laboratories, Inc.
[OC-DRI]	OpenCable Digital Receiver Interface Protocol, OC-SP-DRI-104-100910, September 10, 2010, Cable Television Laboratories, Inc.
[OLCA AUTH]	Online Content Access Authentication and Authorization Interface Specification, CL-SP-AUTH1.0-C01-160616, June 16, 2016, Cable Television Laboratories Inc.
[OPT-P2P-OSSI]	Coherent Optics Termination Device OSSI Specification, P2PCO-SP-CTD-OSSI-D01-190311, March 11, 2019, Cable Television Laboratories, Inc.
[OSSI]	Operations Support System Interface Specification, SP-OSSI-C01-011119, November 19, 2001, Cable Television Laboratories, Inc.
[OSSIv1.1]	Operations Support System Interface Specification, CM-SP-OSSIv1.1-C01-050907, September 7, 2005.
[OSSIv2.0]	Data-Over-Cable Service Interface Specifications, Operations Support System Interface Specification, CM-SP-OSSIv2.0-C01-081104, November 4, 2008, Cable Television Laboratories Inc.

[OSSIv3.0]	DOCSIS 3.0 Operations Support System Interface Specification, CM-SP-OSSIv3.0-C01-171207, December 7, 2017, Cable Television Laboratories, Inc.
[PKT 29.229]	PacketCable 2.0 IMS Delta Specifications Cx/Dx Interfaces based on the Diameter Protocol Specification 3GPP TS 29.229, PKT-SP-29.229-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT ESP]	PacketCable Electronic Surveillance Specification, PKT-SP-ESP1.5-C01-160824, August 24, 2016, Cable Television Laboratories, Inc.
[PKT EUE-DATA]	PacketCable Management E-UE Provisioning Data Model Specification, PKT-SP-EUE-DATA C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT EVE MIB1.5]	PacketCable Management Event MIB Specification, PKT-SP-EVEMIB1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT MIB EXMTA1.5]	PacketCable MTA Extension MIB Specification, PKT-SP-MIB-EXMTA1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT MIB EXSIG1.5]	PacketCable Signaling Extension MIB Specification, PKT-SP-MIB-EXSIG1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT MIB MTA1.5]	PacketCable MTA MIB Specification, PKT-SP-MIB-MTA1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT MIB SIG1.5]	PacketCable 1.5 Signaling MIB Specification, PKT-SP-MIB-SIG1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT RST-EUE-PROV]	RST E-UE Provisioning Specification, PKT-SP-RST-EUE-PROV-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT SMA-PROV]	PacketCable Security, Monitoring, and Automation Provisioning Specification, PKT-SP-SMA-PROV-C01-130930, September 30, 2013, Cable Television Laboratories, Inc.
[PKT SP-RSTF]	PacketCable Residential SIP Telephony Feature Specification, PKT-SP-RSTF-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT UE-DATA]	PacketCable 2.0 UE Provisioning Data Model, PKT-SP-UE-DATA-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT UE-PROV]	PacketCable 2.0 UE Provisioning Framework, PKT-SP-UE-PROV-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT ACCT]	PacketCable Accounting Specification, PKT-SP-ACCT-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT ES-INF]	PacketCable Electronic Surveillance - Intra-Network Functions Specification, PKT-SP-ES-INF-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT PROV]	PacketCable MTA Device Provisioning Specification, PKT-SP-PROV-C01-071129, November 29, 2007, Cable Television Laboratories, Inc.
[PKT PROV1.5]	PacketCable 1.5 MTA Device Provisioning Specification, PKT-SP-PROV1.5-C01-191120, November 20, 2019, Cable Television Laboratories, Inc.
[PKT RST-ACCT]	PacketCable Residential SIP Telephony Accounting Specification, PKT-SP-RST-ACCT-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[RFC 6289]	IETF RFC 6289, A Uniform Resource Name (URN) Namespace for CableLabs, June 2011.
[RFC 2141]	IETF RFC 2141, URN Syntax, May 1997.
[RFC 2434]	IETF RFC 2434/BCP0026, Guidelines for Writing an IANA Considerations Section in RFCs, October 1998.
[RFC 3261]	IETF RFC 3261, SIP: Session Initiation Protocol, June 2002.
[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 3588]	IETF RFC 3588, Diameter Base Protocol, September 2003.
[RFC 5226]	IETF RFC 5266, Guidelines for Writing an IANA Considerations Section in RFCs, May 2008.
[RFC 6733]	IETF RFC 6733 Diameter Base Protocol, October 2012.
[R-OSSI]	Remote PHY OSS Interface Specification, CM-SP-R-OSSI-I14-200421, April 21, 2020, Cable Television Laboratories, Inc.
[R-PHY]	Remote PHY Specification, CM-SP-R-PHY-I14-200324, March 24, 2020, Cable Television Laboratories, Inc.
[RST-UE-PROV]	PacketCable RST UE Provisioning Specification, PKT-SP-RST-UE-PROV-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[SAFI-CIP]	Campaign Information Package Specification, OC-SP-SaFI-CIPv3.0-I01-120307, March 7, 2012, Cable Television Laboratories, Inc.
[SAFI-COM]	Common Data Types Specification, OC-SP-SaFI-COMv3.0-I01-120307, March 7, 2012, Cable Television Laboratories, Inc.
[SAFI-IAF]	Interactive Application Fulfillment Summary Interface Specification, OC-SP-SaFI-IAFv3.0-I01-120307, March 7, 2012, Cable Television Laboratories, Inc.
[SAFI-IAM]	Interactive Application Messaging Specification, OC-SP-SaFI-IAMv3.0-I01-120307, March 7, 2012, Cable Television Laboratories, Inc.
[SAFI-SMS]	Service Measurement Summary Interface Specification, OC-SP-SaFI-SMSv3.0-I01-120307, March 7, 2012, Cable Television Laboratories, Inc.
[sRouter]	Standalone Router Specification, CL-SP-sRouter-I03-200715, July 15, 2020, Cable Television Laboratories, Inc.
[TEI]	TDM Emulation Interface Specification, CM-SP-TEI-I06-100611, June 11, 2010, Cable Television Laboratories, Inc.
[TR-069]	TR-069, CPE WAN Management Protocol v1.2, Issue 1 Amendment 4, July 2011, Broadband Forum Technical Report.
[TR-106]	TR-106, Data Model Template for TR-069-Enabled Devices, Issue 1, Amendment 6, July 2011, Broadband Forum Technical Report.
[WiFi MGMT]	WiFi Provisioning Framework Specification, WR-SP-WiFi-MGMT-I08-161213, December 13, 2016, Cable Television Laboratories, Inc.

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, 48377 Fremont Blvd., Suite 117, Fremont, California 94538, USA; Phone: +1-510-492-4080, Fax: +1-510-492-4001; http://www.ietf.org.
- Internet Assigned Numbers Authority (IANA); http://www.iana.org.

3 ABBREVIATIONS

This document uses the following abbreviations and acronyms.

ASN.1	Abstract Syntax Notation 1
AVP	Attribute-Value Pairs
CCAP	Converged Cable Access Platform
CTD	Coherent Optics Termination Device
DHCP	Dynamic Host Configuration Protocol
EPON	Ethernet Passive Optical Network
EQAM	Edge QAM
DOCSIS	Data-Over-Cable Service Interface Specifications
DPoE™	DOCSIS Provisioning of EPON
DPoG™	DOCSIS Provisioning of GPON
FMA	Flexible MAC Architecture
IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force
MIB	Management Information Base
NID	Namespace Identifier
PNM	Proactive Network Maintenance
RCC	Receive Channel Configurations
RCP	Receive Channel Profile
RFC	Request for Comments
RPD	Remote PHY Device
R-PHY	Remote PHY
SMA	Security, Monitoring, Automation
SNMP	Simple Network Management Protocol
URL	Uniform Resource Locator
URN	Uniform Resource Name
XML	Extensible Markup Language

4 CABLELABS DHCP PROTOCOL FIELD REGISTRY

4.1 Definition

This document establishes the CableLabs DHCP registry and defines new name spaces associated with CableLabs DHCPv4 and DHCPv6 options:

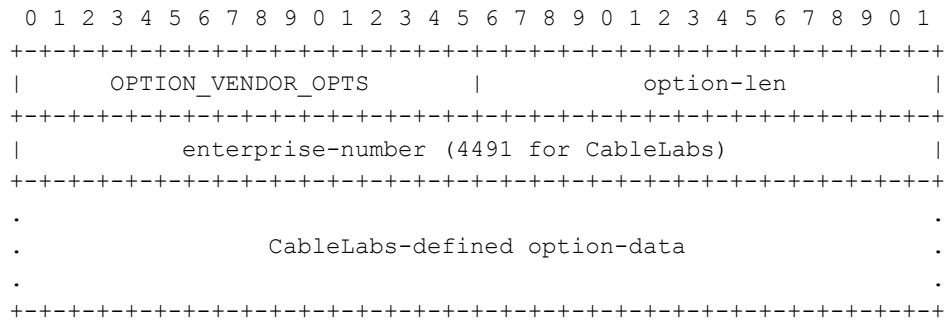
- CableLabs project codes,
- Sub-option codes for DHCPv4 options,
- CableLabs Vendor-specific Information Option codes for DHCPv6.

The CableLabs Assigned Name and Number authority has established a registry of values for each of these name spaces which are found in [CANN DHCP].

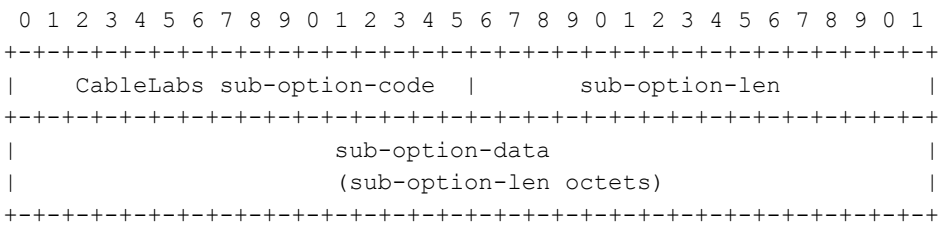
4.2 Format of the DHCPv6 CableLabs Vendor-specific Information Option

DHCPv6 defines a Vendor-specific Information Option (see the option code OPTION_VENDOR_OPTS in section 22.17 of [RFC 3315]). This section defines the structure or format of the option data for the CableLabs Vendor-specific Information Option.

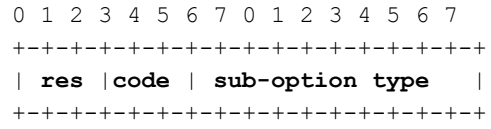
The format of the DHCPv6 CableLabs Vendor-specific Information option is:



option-code	OPTION_VENDOR_OPTS (17)
option-len	4 + length of option-data field
enterprise-number	The CableLabs' registered Enterprise Number: 4491, as registered with IANA in the Private Enterprise Numbers: http://www.iana.org/assignments/enterprise-numbers.html
CableLabs-defined option-data	An object containing one or more CableLabs sub-options The option-data field of the DHCPv6 CableLabs Vendor-specific Information option contains sub-option values. Each sub-option is structured as follows:



CableLabs sub-option-code:



res: reserved for CableLabs, do not use; bits must be zero value.
code: identifies the CableLabs project code for this sub-option. The null value for these 3 bits ('000') identifies a generic DHCPv6 option that may be common to multiple projects. See the Values for the CableLabs Project Codes section of the CableLabs DHCP registry specification for the values of the CableLabs Project Codes for DHCPv6 options.
sub-option type: defines the option type.

sub-option-len length of sub-option-data field

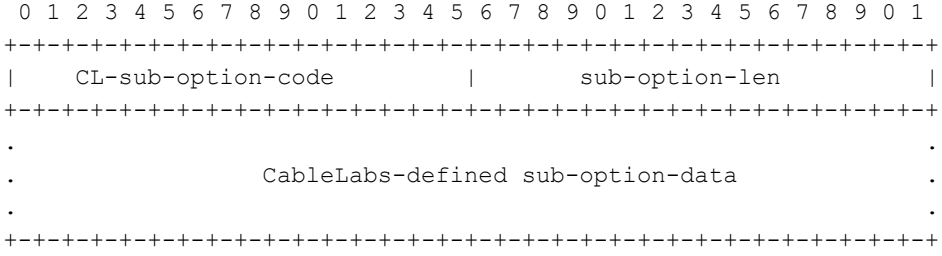
sub-option-data the value of the CableLabs sub-option

4.3 Template for defining new DHCPv6 CableLabs Vendor-specific Information Option codes

Each request for a new definition of a DHCPv6 CableLabs Vendor-specific Information Option must include:

- A definition of the sub-option compliant with the format specified in this section.
- An Engineering Change Request against the CableLabs DHCP registry requesting the addition of the new option.

New DHCPv6 CableLabs Vendor-specific Information Option code must be defined using the following format:



CL-sub-option-code CL_OPTION_xxxxxxxx where xxxxxxxx is descriptive name of the sub-option being defined.

Sub-option-len length of sub-option-data field

CableLabs-defined Sub-option-data	An object definition with normative requirements on how a DHCP client and server must use this information.
CableLabs Project	The requested CableLabs Project under which this new option should be assigned (a registered CableLabs Project code).

4.4 List of Relevant Specifications

The following list includes CableLabs and IETF specifications that contain definitions of DHCP option field values, or, references to the values defined in this document.

- CableLabs DHCP registry [CANN DHCP]
- DOCSIS OSSI specifications for DOCSIS 1.0 [OSSI], DOCSIS 1.1 [OSSIv1.1], DOCSIS 2.0 [OSSIv2.0]
- DOCSIS 3.0 MULPI [MULPIv3.0], OSSI [OSSIv3.0]
- DOCSIS 3.1 MULPI, OSSI [CM-OSSIv3.1], [CCAP-OSSIv3.1]
- PacketCable MTA Device Provisioning specifications version 1.0 [PKT PROV] and 1.5 [PKT PROV1.5]
- IETF [RFC 3495] and [RFC 6733]
- Remote PHY [R-PHY], R-OSSI [R-OSSI]

5 CABLELABS XML REGISTRY

5.1 Guidelines

[RFC 6289] reserves and specifies a Uniform Resource Name (URN) Namespace Identifier (NID) of 'cablelabs' for use in CableLabs projects.

It is RECOMMENDED to define CableLabs URN namespaces according to [RFC 6289].

The goal of this section is to provide guidelines for the definition of new XML namespaces under CableLabs management and some recommendations to align the target namespaces and to allow consistent versioning.

It is RECOMMENDED to define CableLabs XML (URL) namespaces as follows:

Organization Identifier	Identifier	CableLabs Project Name	Version	Type of Document	Identifier	XSD Identifier
For CableLabs: www.cablelabs.com	namespaces	PacketCable| DOCSIS| CableHome	2.03.0	'DTD'| 'XSD'	'smi'| 'reg'| 'ipdr'| 'netconf'	e.g., CLAB-PACM-MIB

5.2 Examples

A few examples include:

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/

http://www.cablelabs.com/namespaces/PacketCable/2.0/xsd/smi/

urn:cablelabs:packetcable-example:ue:rst-sample

5.3 Registered XML name spaces

The following name spaces are registered:

5.3.1 DOCSIS

5.3.1.1 DOCSIS IPDR Service Definition Namespaces

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-SAMIS-TYPE-1

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-SAMIS-TYPE-2

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-US-STATS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-REG-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-TOPOLOGY-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-SPECTRUM-MEASUREMENT-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CPE-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-DIAG-LOG-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-DIAG-LOG-EVENT-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-DIAG-LOG-DETAIL-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-US-UTIL-STATS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-DS-UTIL-STATS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-SERVICE-FLOW-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-IP-MULTICAST-STATS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-DS-OFDM-PROFILE-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-DS-OFDM-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-REG-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-SERVICE-FLOW-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-US-OFDMA-PROFILE-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-US-OFDMA-STATUS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-DS-OFDM-PROFILE-STATS-TYPE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-US-OFDMA-PROFILE-STATS-TYPE

5.3.1.2 DOCSIS Auxiliary Schema Namespaces

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CM

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CPE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-QOS

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-REC

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-US

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-NODE-CH

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-MD-NODE

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-SPECTRUM

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-DIAG-LOG

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-DIAG-LOG-DETAIL

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-US-UTIL

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-DS-UTIL

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-SERVICE-FLOW

http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-IP-MULTICAST

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-DS-OFDM

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-PARTIAL

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-CMTS-CM-US-OFDMA

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-OFDM-PROFILE

http://www.cablelabs.com/namespaces/DOCSIS/3.1/xsd/ipdr/DOCSIS-SERVICE-FLOW

5.3.1.3 DOCSIS CCAP YANG Namespaces

urn:cablelabs:params:xml:ns:yang:ccap

urn:cablelabs:params:xml:ns:yang:ccap:events

5.3.1.4 DOCSIS RPHY CCAP Core Namespaces

urn:cablelabs:params:xml:ns:yang:rphy

urn:cablelabs:params:xml:ns:yang:rphy:events

5.3.2 PacketCable

5.3.2.1 PacketCable 2.0 PACM Namespaces

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/SMI/v1/CL-PKTC-UE

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/SMI/v1/CL-PKTC-User

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/SMI/v1/CL-PKTC-TC

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/v1/CL-PKTC-ACL

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/v1/CL-PKTC-BASE-SVC

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/SMI/v1/CL-PKTC-RST

5.3.2.2 PacketCable 2.0 Auxiliary Namespaces

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/CLAB-DEF-MIB

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/SNMP-FRAMEWORK-MIB

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/SNMPv2-TC

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/SMI

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/SNMPv2-SMI

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/INET-ADDRESS-MIB

http://www.cablelabs.com/namespaces/PacketCable/R2/XSD/smi/SNMPv2-CONF

5.3.2.3 PacketCable SMA Namespaces

urn:cablelabs:packetcable:sma:xsd:v1:instruction

urn:cablelabs:packetcable:sma:xsd:v1:event

urn:cablelabs:packetcable:sma:xsd:v1:reg

urn:cablelabs:packetcable:sma:xsd:v1:dereg

urn:cablelabs:packetcable:sma:xsd:v1:devprofile:response

urn:cablelabs:packetcable:sma:xsd:v1:devlist

urn:cablelabs:packetcable:sma:xsd:v1:heartbeat

urn:cablelabs:packetcable:sma:xsd:v1:smalogic

urn:cablelabs:packetcable:sma:xsd:v1:deviceprofile

urn:cablelabs:packetcable:sma:xsd:v1:cfgenv

urn:cablelabs:packetcable:sma:xsd:v1:sig

urn:cablelabs:packetcable:sma:xsd:v1:ns

urn:cablelabs:packetcable:sma:xsd:v1:certs

urn:cablelabs:packetcable:sma:xsd:v1:base

urn:cablelabs:packetcable:sma:xsd:v1:op

urn:cablelabs:packetcable:sma:xsd:v1:ipv6cfg

urn:cablelabs:packetcable:sma:xsd:v1:ipv4cfg

urn:cablelabs:packetcable:sma:xsd:v1:mem

5.3.3 Stewardship and Fulfillment Interfaces

5.3.3.1 Stewardship and Fulfillment Interfaces Namespaces

http://www.cablelabs.com/namespaces/safi/xsd/com

http://www.cablelabs.com/namespaces/safi/xsd/cip

http://www.cablelabs.com/namespaces/safi/xsd/iaf

http://www.cablelabs.com/namespaces/safi/xsd/iam

http://www.cablelabs.com/namespaces/safi/xsd/sms

5.3.4 DPoE

5.3.4.1 DPoE 2.0 IPDR Service Definition Namespaces

http://www.cablelabs.com/namespaces/DPOE/2.0/xsd/ipdr/DPOE-MEF-USAGE-TYPE

5.3.4.2 DPoE 2.0 IPDR Auxiliary Schema Namespaces

http://www.cablelabs.com/namespaces/DPOE/2.0/xsd/ipdr/DPOE-MEF-SERVICE-FLOW

5.3.5 Wireless

5.3.5.1 Wireless TR-181 Data Model Extensions Namespace

http://www.cablelabs.com/namespaces/Wireless/TR181Ext

5.3.6 Coherent Optics

5.3.6.1 YANG Namespaces

urn:cablelabs:params:xml:ns:yang:coopt

urn:cablelabs:params:xml:ns:yang:coopt:events

6 CABLELABS DIAMETER AVP REGISTRY

This section lists any IANA assigned CableLabs-specific DIAMETER applications and Command Codes, as well as CableLabs assigned DIAMETER protocol codes, including the Attribute-Value Pairs (AVP) and Experimental result codes.

For assignment of DIAMETER applications, command codes, AVP and result codes, please see the procedures in Section 6.6.

6.1 Application Identifiers

The Diameter applications are identified with the application identifiers as specified in [RFC 3588]. There are two kinds of applications: IETF standards track applications and vendor-specific applications. All application identifiers are assigned by [IANA AAA]. This chapter lists the application identifiers assigned by IANA to all CableLabs Diameter applications.

The application identifiers are transferred in Diameter command's header in the Application-ID field.

6.1.1 CableLabs-specific Application Identifiers

There are no CableLabs-specific application identifiers at this time.

6.2 Command Codes

The command codes are used for communicating the command associated with the Diameter message. The command code is carried in the Diameter header's Command-Code field. The command codes can be divided into standard command codes allocated by IANA and experimental command codes for testing purposes only.

6.2.1 Command Codes Allocated for CableLabs

There are no CableLabs-specific command codes at this time.

6.3 Vendor Identifier

The vendor identifier (also known as Enterprise number) indicates the vendor-specific attributes, result codes and application identifiers in Diameter commands. The vendor identifier is used in the Vendor-ID field of the AVP header and in the Vendor-ID AVP. The Vendor-ID AVP is used to identify the vendor in the Vendor-Specific-Application-Id and Experimental-Result-Code grouped AVPs.

6.3.1 CableLabs' Vendor Identifier

The IANA has allocated a vendor identifier value 4491 for CableLabs [IANA EN].

6.4 Attribute-Value-Pair Codes

The AVP codes are used together with the vendor identifier to identify each attribute uniquely. There are multiple AVP namespaces. The IETF IANA namespace, that is, the AVPs with vendor identifier zero or without vendor identifier, is controlled by IANA. Each vendor controls the AVP codes within his AVP namespaces.

6.4.1 CableLabs-specific AVP Codes

The CableLabs-specific AVPs have the Vendor-Specific bit ('V' bit) set in the AVP header and they carry the CableLabs' vendor identifier in the Vendor-ID field of the AVP header. The CableLabs-specific AVP codes are presented in the following table. AVP Names of "Obsolete" indicate that the AVP Code was previously assigned but is no longer used, and re-assignment of the AVP Code should be avoided.

Table 1 - CableLabs-specific AVP Codes

AVP Name	AVP Code	Specification Reference	Data Type	AVP Flag rules				
				Must	May	Should not	Must not	May Encr.
BCID	200	[PKT ES-INF]	UTF8String	V, M	P			N
Call-Transfer	201	[PKT RST-ACCT]	Group	V, M	P			N
Correlate-Reason	202	[PKT ES-INF]	Enumerated	V, M	P			N
Dialog-Id	203	[PKT ES-INF]	UTF8String	V, M	P			N
Digest-Algorithm	204	[PKT 29.229]	UTF8String	V			M	N
Digest-Auth-Param	205	[PKT 29.229]	OctetString	V			M	N
Digest-Domain	206	[PKT 29.229]	UTF8String	V			M	N
Digest-HA1	207	[PKT 29.229]	OctetString	V			M	N
Digest-QoP	208	[PKT 29.229]	UTF8String	V			M	N
Digest-Realm	209	[PKT 29.229]	UTF8String	V			M	N
Direction	210	[PKT ES-INF]	Enumerated	V, M	P			N
Direct-Message	211	[PKT ES-INF]	Enumerated	V, M	P			N
Element-ID	212	[PKT ES-INF]	UTF8String	V, M	P			N
Element-Type	213	[PKT ES-INF]	Enumerated	V, M	P			N
Event-Message-Type	214	[PKT ES-INF]	Enumerated	V, M	P			N
Location-Routing- Number	215	[PKT ACCT]	UTF8String	V, M	P			N
LRN-Source-Indicator	216	[PKT ACCT]	Integer32	V, M	P			N
LRN-Query-Status	217	[PKT ACCT]	Integer32	V, M	P			N
LI-Information	218	[PKT ES-INF]	Grouped	V, M	P			N
New-Dialog-Id	219	[PKT ES-INF]	UTF8String	V, M	P			N
NP-Data	220	[PKT ACCT]	Grouped	V, M	P			N
Obsolete (previously PCMM™ BCID)	221	[PKT ACCT]						
PCMM-Information	222	[PKT ACCT]	Grouped	V, M	P			N
Refer-To	223	[PKT RST-ACCT], [PKT ACCT]	UTF8String	V, M	P			N
RST-Information	224	[PKT RST-ACCT]	Grouped	V, M	P			N
RST-Subscriber-ID	225	[PKT RST-ACCT]	UTF8String	V, M	P			N
Server-Role	226	[PKT RST-ACCT]	Enumerated	V, M	P			N
Session-Type	227	[PKT RST-ACCT]	Enumerated	V, M	P			N
SIP-Digest-Authenticate	228	[PKT 29.229]	Grouped	V			M	N
SIP-Message	229	[PKT ES-INF]	OctetString	V, M	P			N
Target	230	[PKT RST-ACCT], [PKT ACCT]	UTF8String	V, M	P			N
Tap-Id	231	[PKT ES-INF]	UTF8String	V, M	P			N
Transfer-Session-Call-ID	232	[PKT RST-ACCT]	UTF8String	V, M	P			N

6.5 Experimental Result Codes

The Diameter answer messages must carry either Result-Code AVP or Experimental-Result AVP. The values of Result-Code AVP are controlled by IANA. The Experimental-Result AVP is a grouped AVP containing the Vendor-ID AVP and Experimental-Result-Code AVP, thus the experimental result codes are controlled in a vendor-specific manner.

6.5.1 CableLabs-specific Experimental Result Codes

There are no CableLabs-specific result codes at this time.

6.6 Assignment of the Diameter Codes and Identifiers

6.6.1 Application Identifiers

If a specification determines it will require a new application identifier based on the rules defined in [RFC 3588], a request for an application identifier should be sent to IANA. When the application identifier is received, an Engineering Change Request needs to be submitted against this document adding the newly assigned application identifier.

6.6.2 Command Codes

If a specification determines there is a need for a new command code(s) and no CableLabs allocated command code values are available, the procedures defined in [RFC 3588] need to be followed.

It should be noted that the standard command codes allocated for 3GPP are scarce resources and getting new ones would require IETF specification work to be done. Therefore it is recommended to use the existing command codes whenever possible.

Once a new command code is assigned, an Engineering Change Request should be submitted against this document adding the newly assigned command codes.

6.6.3 AVP Codes

If a specification determines a Diameter application needs new CableLabs-specific AVP code(s), an Engineering Change Request needs to be submitted against this document adding the newly assigned AVP code value. AVP codes are available on a first-come-first-serve basis and are assigned in numerical order. Skipping AVP code values is discouraged as is reserving blocks of AVP codes for further assignment. Given the possibility for multiple Engineering Change Requests assigning AVP codes at the same time, conflicts may occur. As such, AVP code values are only guaranteed to be unique and allocated once the Engineering Change Request becomes an Engineering Change Notice. To ensure unique AVP code values, oversight of the allocation process is required and the responsibility of the CableLabs employee currently responsible for this specification.

Re-use of the existing AVPs is recommended, but special attention should be paid to the use of enumerated AVPs. Defining new values for an enumerated AVP should be agreed to case by case with the specification group responsible for the particular enumerated AVP.

6.6.4 Result Codes

If a specification determines that a Diameter application needs new CableLabs-specific result code(s), an Engineering Change Request needs to be submitted against this document adding the newly assigned result code value. Result codes are available on a first-come-first-serve basis and are assigned in numerical order. Skipping result code values is discouraged as is reserving blocks of result codes for further assignment. Given the possibility for multiple Engineering Change Requests assigning result codes at the same time, conflicts may occur. As such, result code values are only guaranteed to be unique and allocated once the Engineering Change Request becomes an Engineering Change Notice. To ensure unique result code values, oversight of the allocation process is required and the responsibility of the CableLabs employee currently responsible for this specification.

7 CABLELABS RCP REGISTRY

7.1 Definition

This document establishes a CableLabs Receive Channel Profile (RCP) registry. RCPs are used by DOCSIS 3.0 cable modems to advertise their receiver capabilities. RCPs can be "Standard RCPs" defined by CableLabs (and existing in the CableLabs RCP namespace) or "Manufacturer RCPs" defined by the Manufacturer of a cable modem or cable modem silicon (and existing in the Manufacturer's RCP namespace).

DOCSIS 3.0 Cable Modem Termination Systems (CMTSs) support the cable operator configuration of Receive Channel Configurations (RCCs) based on the deployed downstream channel lineup and the details of a CM's receiver capabilities as described in an RCP encoding. Each RCC in the CMTS is indexed by the RCP-ID of the RCP upon which it is based. The CM itself may only advertise the RCP-ID, which is then used by the CMTS to match the CM to an appropriate RCC at Registration time. This registry provides the detailed RCP encoding associated with each RCP-ID to allow proper configuration of RCCs by the cable operator.

7.2 Format

Two encoding formats are defined for an RCP. The first is an XML encoding defined in [OSSIv3.0], the second is a Type-Length-Value encoding defined in [MULPIv3.0]. The encoding format used for the CableLabs RCP registry is the XML format.

7.3 Defining New Receive Channel Profiles

Each request for a new entry in the CableLabs RCP registry must include the full XML encoding of the RCP, including an RCP-ID using either the CableLabs OUI (for a proposed new Standard RCP) or the Vendor's OUI (for a Manufacturer RCP), and an RCP Name.

8 CABLELABS ASN.1 CODES REGISTRY

8.1 Definition

This document establishes a CableLabs ASN.1 Codes registry. The purpose of this registry is to define a common repository for assignment of ASN.1 codes value of the type Object Identifier (OID) for CableLabs projects. Typically this registry contains the MIB Module Identities within the CableLabs enterprise branch for use within the Simple Network Management Protocol (SNMP), but can also contain any other ASN.1 definition used by other protocols or specifications.

8.2 SMI Network Management Codes

8.2.1 CableLabs Enterprise Number

```
Prefix:
iso.org.dod.internet.private.enterprises.cableLabs (1.3.6.1.4.1.4491)
```

Table 2 - CableLabs Enterprise Number Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	clabFunction	CableLabs	[MIB-CLABDEF]
2	clabProject	CableLabs Projects	[MIB-CLABDEF]
3	clabSecurity	CableLabs Security	[MIB-CLABDEF]
4	clabCommonMibs	CableLabs common SMI information	[MIB-CLABDEF]

8.2.2 CableLabs DOCSIS Project

```
Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjDocsis
(1.3.6.1.4.1.4491.2.1)
```

Table 3 - CableLabs DOCSIS Project Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	dsgMIB	DSG-MIB	
2	docsLoadBalanceMib	DOCS-LOADBAL-MIB	[OSSIv2.0]
3	dsgIfMIB	DSG-IF-MIB	[DSG]
4	dsgIfStdMib	DSG-IF-STD-MIB	[DSG]
5	docsIfExt2Mib	DOCS-IF-EXT2-MIB	[OSSIv2.0]
6	docsIfMCmtsMib	DOCS-IF-M-CMTS-MIB	[M-OSSI]
7	dtiMib	DTI-MIB	[M-OSSI]
8	docsL2vpnMIB	DOCS-L2VPN-MIB	[L2VPN]
9	docsDiagMib	DOCS-DIAG-MIB	[OSSIv3.0]
10	docsSubmgt3Mib	DOCS-SUBMGT3-MIB	[OSSIv3.0]
11	docsSecMib	DOCS-SEC-MIB	[OSSIv3.0]

Decimal	Name	Description	References
12	docsTestMIB	DOCS-TEST-MIB	[DOCS TEST]
13	sledMib	SLED-MIB	[eDOCSIS]
14	esafeMib	ESAFE-MIB	[eDOCSIS]
15	teaPwMIB	TEA-PW-MIB	[TEI]
16	teaPwTDMMIB	TEA-PW-TDM-MIB	[TEI]
17	teaPwTcMIB	TEA-PW-TC-MIB	[TEI]
18	docsMcastMib	DOCS-MCAST-MIB	[OSSIv3.0]
19	docsMcastAuthMib	DOCS-MCAST-AUTH-MIB	[OSSIv3.0]
20	docsIf3Mib	DOCS-IF3-MIB	[OSSIv3.0]
21	docsQos3Mib	DOCS-QOS3-MIB	[OSSIv3.0]
22	docsLoadbal3Mib	DOCS-LOADBAL3-MIB	[OSSIv3.0]
23	docsDrfMib	DOCS-DRF-MIB	[M-OSSI]
24	ccapMib	CCAP-MIB	[CCAP-OSSI]
25	dpoeMIB	DOCS-DPOE-MIB	[DPoE-OSSIv2.0]
26	dpogMIB	DOCS-DPOG-MIB	[DPoG-OSSI]
27	docsPnmMIB	DOCS-PNM-MIB	[CM-OSSIv3.1]
28	docsIf31Mib	DOCS-IF31-MIB	[CM-OSSIv3.1], [CCAP-OSSIv3.1]
29	docsBpi2Ext31Mib	DOCS-BPI2EXT-MIB	[CM-OSSIv3.1]
30	docsRphyMib	DOCS-RPHY-MIB	[R-OSSI]
31	docsRphyCtrlMib	DOCS-RPHY-CTRL-MIB	[R-OSSI]
32	docsRphyPtpMib	DOCS-RPHY-PTP-MIB	[R-OSSI]
33	docsRphyStatsMib	DOCS-RPHY-STATS-MIB	[R-OSSI]
34	docsRphySecMib	DOCS-RPHY-SEC-MIB	[R-OSSI]
35	docsFdxMib	DOCS-FDX-MIB	[CCAP-OSSIv4.0]

8.2.3 CableLabs PacketCable Project

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable (1.3.6.1.4.1.4491.2.2)

Table 4 - CableLabs PacketCable Project Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcMtaMib	PKTC-MTA-MIB	[PKT MIB MTA1.5]
2	pktcSigMib	PKTC-SIG-MIB	[PKT MIB SIG1.5]
3	pktcEventMib	PKTC-EVENT-MIB	[PKT EVE MIB1.5]
4	pktcSecurity	PacketCable Security Node	[MIB-CLABDEF]
5	pktcLawfulIntercept	PacketCable Lawful intercept node	[MIB-CLABDEF]

Decimal	Name	Description	References
6	pktcEnhancements	PacketCable Enhancements node	[MIB-CLABDEF]
7	pktcPACMMibs	PacketCable PACM node	[MIB-CLABDEF]
8	pktcApplicationMibs	PacketCable Service node	[MIB-CLABDEF]
9	pktcSupportMibs	PacketCable Support node	[MIB-CLABDEF]
10	pktcEUEMibs	PacketCable EUE node	[MIB-CLABDEF]
11	pktcSMAMibs	PacketCable SMA node	[MIB-CLABDEF]

8.2.3.1 CableLabs PacketCable Project Lawful Intercept Codes

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcLawfulIntercept (1.3.6.1.4.1.4491.2.2.5)

Table 5 - CableLabs PacketCable Project Electronic Surveillance Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pcesp	PCESP	[PKT ESP]

8.2.3.2 CableLabs PacketCable Project Enhancements

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcEnhancements (1.3.6.1.4.1.4491.2.2.6)

Table 6 - CableLabs PacketCable Project Enhancements Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcEnMtaMib	PKTC-EN-MTA-MIB	[PKT MIB EXMTA1.5]
2	pktcEnSigMib	PKTC-EN-SIG-MIB	[PKT MIB SIG1.5]
3	pktcEnEventMib	Reserved for future use	
4	pktcEnSecurityMib	Reserved for future use	
5	pktcEnEUEMib	Reserved for future use	

8.2.3.3 CableLabs PacketCable Project PACM

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcPACMMibs (1.3.6.1.4.1.4491.2.2.7)

Table 7 - CableLabs PacketCable Project PACM Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcPACMTC	Reserved - withdrawn	
2	pktcPACMUEMib	Reserved - withdrawn	

Decimal	Name	Description	References
3	pktcPACMUserMib	Reserved - withdrawn	
4		Reserved for future use	
5		Reserved for future use	
6	pktcPACMMgtMIB	Reserved - withdrawn	
7	pktcPACMEventMib	Reserved - withdrawn	

CableLabs PacketCable Project Application

Prefix:

iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcApplicationMibs (1.3.6.1.4.1.4491.2.2.8)

Table 8 - CableLabs PacketCable Project Application Codes

Decimal	Name	Description	References
0		Reserved for future use	
1		Reserved for future use	
2	pktcEUERSTMIB	CL-PKTC-EUE-RST-MIB	[PKT RST-EUE-PROV]

8.2.3.4 CableLabs PacketCable Project Support

Prefix:

iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcSupportMibs (1.3.6.1.4.1.4491.2.2.9)

Table 9 - CableLabs PacketCable Project Support Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcESSupportMibs	PacketCable ES node	[MIB-CLABDEF]

8.2.3.4.1 CableLabs PacketCable Project Support Electronic Surveillance

Prefix:

iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcSupportMibs.pktcESSupportMibs (1.3.6.1.4.1.4491.2.2.9.1)

Table 10 - CableLabs PacketCable Project Support Electronic Surveillance Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcESTapMib	PKTC-ES-TAP-MIB	[PKT ES-INF]
2	pktcESIpTapMIB	PKTC-ES-IPTAP-MIB	[PKT ES-INF]

8.2.3.5 CableLabs PacketCable Project EUE

Prefix:

iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcEUEMibs (1.3.6.1.4.1.4491.2.2.10)

Table 11 - CableLabs PacketCable Project EUE Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcEUEDeviceMibs	PacketCable EUE Device node	[MIB-CLABDEF]
2	pktcEUETCMIB	CL-PKTC-EUE-TC-MIB	[PKT EUE-DATA]
3	pktcEUEDevMIB	CL-PKTC-EUE-DEV-MIB	[PKT EUE-DATA]
4	pktcEUEUserMIB	CL-PKTC-EUE-USER-MIB	[PKT EUE-DATA]
5	pktcEUEProvMgmtMIB	CL-PKTC-EUE-PROV-MGMT-MIB	[PKT EUE-DATA]
6	pktcEUEEventMIB	CL-PKTC-EUE-EVENT-MIB	[PKT EUE-DATA]
7	pktcEUEPrsMIB	CL-PKTC-EUE-PRS-MIB	[PKT EUE-DATA]

8.2.3.5.1 CableLabs PacketCable Project EUE Specific

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjPacketCable.pktcEUEMibs.pktcEUEDeviceMibs (1.3.6.1.4.1.4491.2.2.10.1)

Table 12 - CableLabs PacketCable Project EUE Device Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	pktcEDVAMIB	CL-PKTC-EUE-EDVA-MIB	[PKT RST-EUE-PROV]

8.2.4 CableLabs OpenCable Project

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjOpenCable (1.3.6.1.4.1.4491.2.3)

Table 13 - CableLabs OpenCable Project Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	ocStbHostMibModule	OC-STB-HOST-MIB	[OC MIB-HOST2.X]
2	ocHnMibModule	OC-HOME-NETWORK-MIB	[OC MIB-HN]

8.2.5 CableLabs Wireless Project

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjWireless (1.3.6.1.4.1.4491.2.5)

Table 14 - CableLabs Wireless Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	clabWIFIMib	CLAB-WIFI-MIB	[WiFi MGMT]

8.2.6 CableLabs CableHome Project

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjCableHome (1.3.6.1.4.1.4491.2.4)

Table 15 - CableLabs CableHome Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	cabhPsDevMib	CABH-PS-DEV-MIB	[CH PSDEV-MIB]
2	cabhSecMib	CABH-SEC-MIB	[CH SEC-MIB]
3	cabhCapMib	CABH-CAP-MIB	[CH CAP-MIB]
4	cabhCdpMib	CABH-CDP-MIB	[CH CDP-MIB]
5	cabhCtpMib	CABH-CTP-MIB	[CH CTP-MIB]
6	cabhQosMib	CABH-QOS-MIB Reserved	
7	cabhCsaMib	CABH-CSA-MIB	[CO CSA-MIB]
8	cabhQos2Mib	CABH-QOS2-MIB	[CH QOS-MIB]

8.2.7 CableLabs Security

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabSecurity (1.3.6.1.4.1.4491.3)

Table 16 - CableLabs Security Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	clabSecCertObject	Security Certificates node	[MIB-CLABDEF]
2	clabSecOlcaObject	OLCA Object Class	[MIB-CLABDEF] [OLCA AUTH]

8.2.8 CableLabs Common SMI MIB Modules

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabCommonMibs (1.3.6.1.4.1.4491.4)

Table 17 - CableLabs Common Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	clabUpsMib	CLAB-UPS-MIB	[MIB-BB]
2	clabTopoMib	CLAB-TOPO-MIB	[OSSIv3.0]
3	clabGREMib	CLAB-GRE-MIB	[eRouter]
4	Reserved	Reserved	(formerly [eRouter], [sRouter])
5	Reserved	Reserved	(formerly [eRouter], [sRouter])
6	clabGWMib	CLAB-GW-MIB	[eRouter], [sRouter]
7	clabAniDevMib	CLAB-ANI-DEV-MIB	[sRouter]

8.2.9 CableLabs Coherent Optics Project

Prefix:
iso.org.dod.internet.private.enterprises.cableLabs.clabProject.clabProjCoOpt
(1.3.6.1.4.1.4491.2.6)

Table 18 - CableLabs Coherent Optics Project Codes

Decimal	Name	Description	References
0		Reserved for future use	
1	coOptCtdMIB	COOPT-CTD-MIB	[OPT-P2P-OSSI]

9 CABLELABS APPLICATIONS REGISTRY

This section contains CableLabs assigned application identifiers, represented as unique integer values, to identify applications specified for cable clients. Each application identifier is accompanied by the CableLabs project specifying the application, the name of the application, an integer value representing the application identifier, and a reference specification. The principal use for application identifiers is within data definitions, such as MIB modules.

As an example, the PacketCable application identifier "1" represents the PacketCable RST application. Within PacketCable MIBs, it is used within the user MIB to associate specific users with the CableLabs RST application. Using the MIBs specified in [PKT EUE-DATA], specifically the MIB table pktcEUEUsrAppMapTable, the following row entries are of relevance:

pktcEUEUsrAppMapAppOrgID.<user A>.<application index>=4491 (identifies CableLabs)

pktcEUEUsrAppMapAppIdentifier.<user A>.<application index>=1 (identifies RST)

The above example specifies that user A is associated with the CableLabs specified application, RST.

The registry is specified in Table 19.

Table 19 - PacketCable Application Identifiers

Project	Application	Identifier	Reference Specification
PacketCable	Residential SIP Telephony (RST)	1	[PKT SP-RSTF]

10 CABLELABS URN REGISTRY

This section contains a registry for CableLabs URN namespaces. Not all CableLabs URNs are listed in this document as many could be part of projects that do not produce specifications, or would be difficult to maintain an up-to-date record in this document. However, projects are encouraged to list the leading part of the NSS (Namespace Specific String) [RFC 2141] with references to project names, URLs, or other type of references.

CableLabs URNs use the NID Namespace Identifier [RFC 2141] 'cablelabs' per [RFC 6289]. Some URN formatted namespaces and URIs are already defined in some XML namespaces defined in Section 4.

Table 20 shows registered URNs, or parts of them. Based on the [RFC 2141] URN definition this registry URNs structure is refined as follows to provide flexibility on the registration of URNs in Table 20:

<URN> ::= "urn: " <NID> ": " <projectNSSpart> ": " <subjectNSSpart> ": " <trailingNSSpart>

<NID> ::= 'cablelabs'

<projectNSSpart> per [RFC 2141]with the exception of ": "

<subjectNSSpart> := <NSS> ; per [RFC 2141]; the subject of the URN

<trailingNSSpart> := <NSS> ; per [RFC 2141]

While the URN above is the RECOMMENDED URN structure, other formats might be already being used. In such case only relevant parts of the URN are shown in Table 20. <trailingNSSpart> might be omitted in Table 20, refers to the reference for the complete list of URNs.

Table 20 - CableLabs URN Registry

Project	<URN>	References
DOCSIS CCAP	urn:cablelabs:params:xml:ns:yang:ccap	[CCAP-OSSI]
DOCSIS CCAP	urn:cablelabs:params:xml:ns:yang:ccap:events	[CCAP-OSSI]
DOCSIS RPHY CCAP Core	urn:cablelabs:params:xml:ns:yang:rphy	[R-OSSI]
DOCSIS RPHY CCAP Core	urn:cablelabs:params:xml:ns:yang:rphy:events	[R-OSSI]
PacketCable	urn:cablelabs:packetcable:sma	[PKT SMA-PROV]
PacketCable	urn:cablelabs:packetcable:applications:rst	[PKT SP-RSTF]
PacketCable	urn:cablelabs:pktc2:oma	[PKT UE-PROV] [RST-UE-PROV]
OpenCable	urn:opencable-com:service:Tuner	[OC-DRI]
VoD Metadata		
Advertising and Interactive Services	urn:cablelabs:safi:xsd:cip:3.0	[SAFI-CIP]
Advertising and Interactive Services	urn:cablelabs:safi:xsd:com:3.0	[SAFI-COM]
Advertising and Interactive Services	urn:cablelabs:safi:xsd:iam:3.0	[SAFI-IAM]
Advertising and Interactive Services	urn:cablelabs:safi:xsd:iaf:3.0	[SAFI-IAF]
Advertising and Interactive Services	urn:cablelabs:safi:xsd:sms:3.0	[SAFI-SMS]
OLCA	urn:cablelabs:olca:1.0	[OLCA AUTH]
Coherent Optics CTD	urn:cablelabs:params:xml:ns:yang:coopt	[OPT-P2P-OSSI]
Coherent Optics CTD	urn:cablelabs:params:xml:ns:yang:coopt:events	[OPT-P2P-OSSI]

10.1 URLs and URN Namespaces Alignment

Section 4 listed a set of XML schema namespaces that may transition to URN as a future work revisions. The format of Section 4 is RECOMMENED to define the entire URN structure for future defined URNs if applicable. To this effect, slash characters "/ " of the format defined in Section 4.1 and shown in Section 4.2 are replaced with the character ": " with the exception of any trailing "/ " which must be ignored.

11 DOCSIS PROVISIONING TLV NUMBER ASSIGNMENT REGISTRY

This section contains the registry for all DOCSIS Provisioning TLV number assignments.

These TLVs are used in CM configuration files and in MAC Management messages. Currently these TLVs are used by one or more of the following specifications:

- DOCSIS specifications version 1.0, 1.1, 2.0, 3.0, 3.1
- DPoE specifications: v1.0, v2.0 (DPoE MULPI, DPoE MEF, DPoE SOAM)
- DPoG specifications: v1.0 (DPoG MULPI)
- DOCSIS family of specifications: L2VPN, TEI, DSG, eRouter, eDOCSIS

The way this chapter is organized is as follows: the first sections describe all the top level TLVs and the subsequent sections define the sub-TLV definitions for relevant top level TLVs.

11.1 Top Level DOCSIS TLVs

Type	Description	Sub-TLV section	Spec Defined
0	Pad		DOCSIS 1.0
1	Downstream Frequency		DOCSIS 1.0
2	Upstream Channel ID		DOCSIS 1.0
3	Network Access Control Object		DOCSIS 1.0
4	DOCSIS 1.0 Class of Service		DOCSIS 1.0
5	Modem Capabilities Encoding	11.2	DOCSIS 1.0
6	CM Message Integrity Check (MIC)		DOCSIS 1.0
7	CMTS Message Integrity Check (MIC)		DOCSIS 1.0
8	Vendor ID Encoding		DOCSIS 1.0
9	SW Upgrade Filename		DOCSIS 1.0
10	SNMP Write Access Control		DOCSIS 1.0
11	SNMP MIB Object		DOCSIS 1.0
12	Modem IP Address		DOCSIS 1.0
13	Service(s) Not Available Response		DOCSIS 1.0
14	CPE Ethernet MAC Address		DOCSIS 1.0
15	Telephone Settings Option (deprecated)		DOCSIS 1.0
17	Baseline Privacy (Security)		DOCSIS 1.0
18	Max Number of CPEs		DOCSIS 1.0
19	TFTP Server Timestamp		DOCSIS 1.0
20	TFTP Server Provisioned Modem IPv4 Address		DOCSIS 1.0
21	SW Upgrade IPv4 TFTP Server		DOCSIS 1.0
22	Upstream Packet Classification	11.5	DOCSIS 1.1
23	Downstream Packet Classification	11.5	DOCSIS 1.1
24	Upstream SF	11.4	DOCSIS 1.1
25	Downstream SF	11.4	DOCSIS 1.1
26	Payload Header Suppression		DOCSIS 1.1
27	HMAC-Digest		DOCSIS 3.1

Type	Description	Sub-TLV section	Spec Defined
28	Maximum Number of Classifiers		DOCSIS 1.1
29	Privacy Enable		DOCSIS 1.1
30	Authorization Block		DOCSIS 1.1
31	Key Sequence Number		DOCSIS 1.1
32	Manufacturer Code Verification Certificate		DOCSIS 1.1
33	Co-Signer Code Verification Certificate		DOCSIS 1.1
34	SNMPv3 Kickstart Value		DOCSIS 1.1
35	Subscriber Mgmt Control		DOCSIS 1.1
36	Subscriber Mgmt CPE IPv4 List		DOCSIS 1.1
37	Subscriber Mgmt Filter Groups		DOCSIS 1.1
38	SNMPv3 Notification Receiver		DOCSIS 1.1
39	Enable 2.0 Mode		DOCSIS 2.0
40	Enable Test Modes		DOCSIS 2.0
41	Downstream Channel List		DOCSIS 2.0
42	Static Multicast MAC Address		DOCSIS 2.0
43	DOCSIS Extension Field	11.3.1	DOCSIS 1.0
44	Vendor Specific Capabilities		DOCSIS 1.0
45	Downstream Unencrypted Traffic (DUT) Filtering	11.3.2	DOCSIS 2.0
46	Transmit Channel Configuration (TCC)		DOCSIS 3.0
47	Service Flow SID Cluster Assignment		DOCSIS 3.0
48	Receive Channel Profile		DOCSIS 3.0
49	Receive Channel Configuration		DOCSIS 3.0
50	DSID Encodings		DOCSIS 3.0
51	Security Association Encoding		DOCSIS 3.0
52	Initializing Channel Timeout		DOCSIS 3.0
53	SNMPv1v2c Coexistence		DOCSIS 3.0
54	SNMPv3 Access View Configuration		DOCSIS 3.0
55	SNMP CPE Access Control		DOCSIS 3.0
56	Channel Assignment Configuration Settings		DOCSIS 3.0
57	CM Initialization Reason		DOCSIS 3.0
58	SW Upgrade IPv6 TFTP Server		DOCSIS 3.0
59	TFTP Server Provisioned Modem IPv6 Address		DOCSIS 3.0
60	Upstream Drop Packet Classification	11.5	DOCSIS 3.0
61	Subscriber Mgmt CPE IPv6 Prefix List		DOCSIS 3.0
62	Upstream Drop Classifier Group ID		DOCSIS 3.0
63	Subscriber Mgmt Control Max CPE IPv6 Prefix		DOCSIS 3.0
64	CMTS Static Multicast Session Encoding		DOCSIS 3.0
65	L2VPN MAC Aging Encoding	11.3.3	DOCSIS 2.0
66	Management Event Control Encoding		DOCSIS 3.0
67	Subscriber Mgmt CPE IPv6 Prefix List		DOCSIS 3.0
68	Default Upstream Target Buffer Configuration		DOCSIS 3.0
69	MAC Address Learning Control Encoding		DOCSIS 3.0

Type	Description	Sub-TLV section	Spec Defined
70	Upstream Aggregate Service Flow Encodings	11.4	DOCSIS 3.1
71	Downstream Aggregate Service Flow Encodings	11.4	DOCSIS 3.1
72	Metro Ethernet Service Profile	11.8	DPoE 2.0
73	Network Timing Profile		DPoE 2.0
74	Energy Management Parameter Encoding		DOCSIS 3.0
75	Energy Mgt. Mode Indicator		DOCSIS 3.1
76	Energy Mgt. Identifier List for CM		DOCSIS 3.1
77	DOCSIS Time Protocol Enable		DOCSIS 3.1
78	AQM Disable		DOCSIS 3.1
79	UNI Control Encoding		DOCSIS 3.0
80	Energy Management – DOCSIS Light Sleep Encodings		DOCSIS 3.1
81	Manufacturer CVC Chain		DOCSIS 3.1
82	Co-signer CVC Chain		DOCSIS 3.1
83	L2CP Management		DPoE 2.0
84	Diplexer Band Edge		DOCSIS 3.1
201-231	eCM eSAFE Configuration File TLVs		
201	ePS		
202	eRouter	11.10	eRouter
203-215	Reserved		
216	eMTA		PacketCable 1.x
217	eSTB		DSG
218	Reserved		
219	eTEA	11.11	TEI
220	eDVA		PacketCable 2.0
221	eSG		SMA gateway
222-231	Reserved		
255	End-of-Data		DOCSIS 1.0

11.2 TLV 5 Modem Capabilities Encoding sub-TLVs

Type	Description	Spec Defined
5	**Modem Capabilities Encoding**	
5.1	Concatenation Support	DOCSIS 1.1
5.2	DOCSIS Version	DOCSIS 1.1
5.3	Fragmentation Support	DOCSIS 1.1
5.4	Payload Header Suppression Support	DOCSIS 1.1
5.5	IGMP Support	DOCSIS 1.1
5.6	Privacy Support	DOCSIS 1.1
5.7	Downstream SAID Support	DOCSIS 1.1
5.8	Upstream Service Flow Support	DOCSIS 1.1

Type	Description	Spec Defined
5	**Modem Capabilities Encoding**	
5.9	Optional Filtering Support	DOCSIS 1.1
5.10	Transmit Pre-Equalizer Taps	DOCSIS 1.1
5.11	Number of Transmit Pre-Equalizer Taps	DOCSIS 1.1
5.12	DCC Support	DOCSIS 1.1
5.13	IP Filters Support	DOCSIS 2.0
5.14	LLC Filters Support	DOCSIS 2.0
5.15	Expanded Unicast SID Space	DOCSIS 2.0
5.16	Ranging Hold-off Support	DOCSIS 2.0
5.17	L2VPN Capability	L2VPN
5.18	L2VPN eSAFE Host Capability	L2VPN
5.19	Downstream Unencrypted Traffic (DUT) Filtering	L2VPN
5.20	Upstream Frequency Range Support	DOCSIS 3.0
5.21	Upstream SC-QAM Symbol Rate Support	DOCSIS 3.0
5.22	Selectable Active Code Mode 2 Support	DOCSIS 3.0
5.23	Code Hopping Mode 2 Support	DOCSIS 3.0
5.24	Multiple Transmit SC-QAM Channel Support	DOCSIS 3.0
5.25	5.12 Msps UpstreamTransmit SC-QAM Channel Support	DOCSIS 3.0
5.26	2.56 Msps Upstream Transmit SC-QAM Channel Support	DOCSIS 3.0
5.27	Total SID Cluster Support	DOCSIS 3.0
5.28	SID Clusters per Service Flow Support	DOCSIS 3.0
5.29	Multiple Receive SC-QAM Channel Support	DOCSIS 3.0
5.30	Total Downstream Service ID (DSID) Support	DOCSIS 3.0
5.31	Resequencing Downstream Service ID (DSID) Support	DOCSIS 3.0
5.32	Multicast Downstream Service ID (DSID) Support	DOCSIS 3.0
5.33	Multicast DSID Forwarding	DOCSIS 3.0
5.34	Frame Control Type Forwarding Capability	DOCSIS 3.0
5.35	DPV Capability	DOCSIS 3.0
5.36	Unsolicited Grant Service/Upstream Service Flow Support	DOCSIS 3.0
5.37	MAP and UCD Receipt Support	DOCSIS 3.0
5.38	Upstream Drop Classifier Support	DOCSIS 3.0
5.39	IPv6 Support	DOCSIS 3.0
5.40	Extended Upstream Transmit Power Capability	DOCSIS 3.0
5.41	Optional 802.1ad, 802.1ah, MPLS Classification Support	DOCSIS 3.0
5.42	D-ONU Capabilities	DPoE 1.0
5.42.1	DpoE/G Version Number	DPoE 1.0
5.42.2	Number of Unicast LLIDs	DPoE 1.0
5.42.3	Number of Multicast LLIDs	DPoE 2.0
5.42.4	MESP Support	DPoE 2.0
5.42.5	Number of D-ONU Ports	DPoE 2.0
5.42.6	PON Data Rate Support	DPoE 2.0
5.42.7	Service OAM	DPoE 2.0
5.42.10	Number of T-CONTs Supported	DPoG 1.0

Type	Description	Spec Defined
5	**Modem Capabilities Encoding**	
5.42.11	Total Number of (X)GEM Ports Supported	DPoG 1.0
5.43	Reserved	-
5.44	Energy Management Capabilities	DOCSIS 3.0
5.45	C-DOCSIS Capability Encoding	DOCSIS 3.0
5.46	CM-STATUS-ACK	DOCSIS 3.0
5.47	Energy Management Preferences	DOCSIS 3.1
5.48	Extended Packet Length Support Capability	DOCSIS 3.1
5.49	Multiple Receive OFDM Channel Support	DOCSIS 3.1
5.50	Multiple Transmit OFDMA Channel Support	DOCSIS 3.1
5.51	Downstream OFDM Profile Support	DOCSIS 3.1
5.52	Downstream OFDM channel subcarrier QAM modulation support	DOCSIS 3.1
5.53	Upstream OFDM channel subcarrier QAM modulation support	DOCSIS 3.1
5.54	Downstream Lower Band Edge Support	DOCSIS 3.1
5.55	Downstream Upper Band Edge Support	DOCSIS 3.1
5.56	Upstream Upper Band Edge Support	DOCSIS 3.1
5.57	DOCSIS Time Protocol Support	DOCSIS 3.1
5.58	DOCSIS Time Protocol Performance Support	DOCSIS 3.1
5.59	P_{max}	DOCSIS 3.1
5.60	Diplexer Downstream Lower Band Edge	DOCSIS 3.1
5.61	Diplexer Downstream Upper Band Edge	DOCSIS 3.1
5.62	Diplexer Upstream Upper Band Edge	DOCSIS 3.1
5.63	Full Duplex Capability	DOCSIS 3.1
5.64	FDX DS State Lock	DOCSIS 3.1
5.65	FDX Switching Software Timing Uncertainty	DOCSIS 3.1
5.66	FDX DS to US Switching Time	DOCSIS 3.1
5.67	FDX US to DS Switching Time	DOCSIS 3.1
5.68		
5.69	CWT RxMER Measurement Convergence Time	DOCSIS 3.1
5.70		
5.71		
5.72	t-ds-reacquisition capability	DOCSIS 3.1
5.73	CWT Simultaneous Data Transmission Capability	DOCSIS 3.1
5.74	Extended Service Flow SID Cluster Assignments Support	DOCSIS 3.1
5.75	Echo Cancelling RBA Sub-band Direction Sets Supported	DOCSIS 3.1
5.76	Low Latency Support	DOCSIS 3.1

11.3 TLV 43.5, 45, 65 L2VPN sub-TLVs

11.3.1 TLV 43.5 L2VPN Encoding sub-TLVs

Type	Description	Spec Defined
43.5	L2VPN Encoding	DOCSIS 3.0

Type	Description	Spec Defined
43.5.1	VPN Identifier	L2VPN
43.5.2	NSI encapsulation format	DPoE 1.0
43.5.2.1	Other	DPoE 1.0
43.5.2.2	IEEE 802.1Q	DPoE 1.0
43.5.2.3	IEEE 802.1ad	DPoE 1.0
43.5.2.4	MPLS PW	DPoE 1.0
43.5.2.4.1	MPLS Pseudowire ID	DPoE 2.0
43.5.2.4.2	MPLS Peer IP address	DPoE 2.0
43.5.2.4.3	Pseudowire Type	DPoE 1.0
43.5.2.4.4	MPLS Backup Pseudowire ID	DPoE 2.0
43.5.2.4.5	MPLS Backup Peer IP address	DPoE 2.0
43.5.2.5	L2TPv3 Peer	DPoE 1.0
43.5.2.6	IEEE 802.1ah Encapsulation	DPoE 1.0
43.5.2.6.1	IEEE 802.1ah Backbone Service Instance Tag (I-Tag) TCI	DPoE 1.0
43.5.2.6.2	IEEE 802.1ah Destination Backbone Edge Bridge (BEB) MAC Address (B-DA)	DPoE 1.0
43.5.2.6.3	16-bit value of [802.1ah] B-Tag TCI	DPoE 2.0
43.5.2.6.4	16-bit value of [802.1ah] I-Tag TPID	DPoE 2.0
43.5.2.6.5	3 bit I-PCP	DPoE 2.0
43.5.2.6.6	1 bit I-DEI	DPoE 2.0
43.5.2.6.7	1 bit I-UCA	DPoE 2.0
43.5.2.6.8	24-bit value of [802.1ah] I-SID Backbone Service Instance Identifier	DPoE 2.0
43.5.2.6.9	16-bit value of [802.1ah] B-Tag TPID	DPoE 2.0
43.5.2.6.10	1 bit B-PCP	DPoE 2.0
43.5.2.6.11	1 bit B-DEI	DPoE 2.0
43.5.2.6.12	12-bit value of [802.1ah] B-VID	DPoE 2.0
43.5.2.8	16-bit value of [802.1ad] S-TPID	DPoE 2.0
43.5.3	eSafe DHCP snooping	DPoE 1.0
43.5.4	CM Interface Mask subtype	L2VPN
43.5.5	Attachment Group ID (AGI)	DPoE 1.0
43.5.6	source attachment individual id (SAII)	DPoE 1.0
43.5.7	target attachment individual id (TAII)	DPoE 1.0
43.5.8	Upstream User Priority subtype	DPoE 1.0
43.5.9	Downstream User Priority Range	DPoE 1.0
43.5.10	L2VPN SA-Descriptor Subtypes	DPoE 1.0
43.5.43	Vendor Specific L2VPN Subtype	L2VPN
43.5.12	Pseudowire Type	DPoE 2.0
43.5.13	L2VPN Mode	DPoE 1.0
43.5.14	Tag Protocol Identifier (TPID) Translation	DPoE 1.0
43.5.14.1	Upstream TPID Translation	DPoE 1.0
43.5.14.2	Downstream TPID Translation	DPoE 1.0
43.5.14.3	Upstream S-TPID Translation	DPoE 1.0
43.5.14.4	Downstream S-TPID Translation	DPoE 1.0
43.5.14.5	Upstream B-TPID Translation	DPoE 1.0

Type	Description	Spec Defined
43.5.14.6	Downstream B-TPID Translation	DPoE 1.0
43.5.14.7	Upstream I-TPID Translation	DPoE 1.0
43.5.14.8	Downstream I-TPID Translation	DPoE 1.0
43.5.15	L2CP Processing	DPoE 1.0/DPoE 2.0
43.5.15.1	L2CP Tunnel Mode	DPoE 1.0/DPoE 2.0
43.5.15.2	L2CP D-MAC Address	DPoE 1.0
43.5.15.3	L2CP L2PT D-MAC Address	DPoE 1.0/DPoE 2.0
43.5.15.4	L2CP Filter	DPoE 2.0
43.5.16	Reserved (formerly DAC)	DPoE 2.0
43.5.18	Pseudowire Class	DPoE 2.0
43.5.19	Service Delimiter	DPoE 2.0
43.5.19.1	C-VID	DPoE 2.0
43.5.19.2	S-VID	DPoE 2.0
43.5.19.3	I-SID	DPoE 2.0
43.5.19.4	B-VID	DPoE 2.0
43.5.20	VSI Encoding	DPoE 2.0
43.5.20.1	VPLS Class	DPoE 2.0
43.5.20.2	E-Tree Role	DPoE 2.0
43.5.20.3	E-Tree Root VID	DPoE 2.0
43.5.20.4	E-Tree Leaf VID	DPoE 2.0
43.5.21	BGP Attribute	DPoE 2.0
43.5.21.1	BGP VPNID	DPoE 2.0
43.5.21.2	Route Distinguisher	DPoE 2.0
43.5.21.3	Route Target (import)	DPoE 2.0
43.5.21.4	Route Target (export)	DPoE 2.0
43.5.21.5	CE-ID or VE-ID	DPoE 2.0
43.5.22	VPN-SG Attribute	DPoE 2.0
43.5.23	Pseudowire Signaling	DPoE 2.0
43.5.24	L2VPN SOAM Subtype	L2VPN
43.5.24.1	MEP Configuration	L2VPN
43.5.24.1.1	MD Level	L2VPN
43.5.24.1.2	MD Name	L2VPN
43.5.24.1.3	MA Name	L2VPN
43.5.24.1.4	MEP ID	L2VPN
43.5.24.2	Remote MEP Configuration	L2VPN
43.5.24.2.1	MD Level	L2VPN
43.5.24.2.2	MD Name	L2VPN
43.5.24.2.3	MA Name	L2VPN
43.5.24.2.4	MEP ID	L2VPN
43.5.24.3	Fault Management Configuration	L2VPN
43.5.24.3.1	Continuity Check Messages	L2VPN
43.5.24.3.2	Enable Loopback Reply Messages	L2VPN
43.5.24.3.3	Enable Linktrace Messages	L2VPN

Type	Description	Spec Defined
43.5.24.4	Performance Management Configuration	L2VPN
43.5.24.4.1	Frame Delay Measurement*	L2VPN
43.5.24.4.2	Frame Loss Measurement*	L2VPN
43.5.25	Network Timing Profile Reference	L2VPN
43.5.26	L2VPN DSID	L2VPN
43.5.27	Mutipoint Enable/Disable	DPoE 2.0
43.5.254	L2VPN Error Encoding	L2VPN
43.5.254.1	L2VPN Errored Parameter	L2VPN
43.5.254.2	L2VPN Confirmation Code	L2VPN
43.5.254.3	L2VPN Error Message Subtype	L2VPN

11.3.2 TLV 45 L2VPN DUT Filtering sub-TLVs

Type	Description	Spec Defined
45	**Encoding for DUT Filtering**	
45.1	Downstream Unencrypted Traffic (DUT) Control	DOCSIS 2.0
45.2	Downstream Unencrypted Traffic (DUT) CMIM	DOCSIS 2.0

11.3.3 TLV 65 L2VPN MAC Aging sub-TLVs

Type	Description	Spec Defined
65	**L2VPN MAC Aging Encoding**	
65.1	L2VPN MAC Aging Mode	DOCSIS 2.0

11.4 TLV 24/25/70/71 Service Flow sub-TLVs

Type	Description	Spec Defined
24 **25** **70** **71**	**Upstream Service Flow** **Downstream Service Flow** **Upstream Aggregate Service Flow** **Downstream Aggregate Service Flow**	
24.1 25.1 70.1 71.1	Service Flow Reference or ASF Reference	DOCSIS 3.0
24.2 25.2 70.2 71.2	Service Flow Identifier or ASF Identifier	DOCSIS 3.0
24.3 25.3	Service Identifier	DOCSIS 3.0
24.4 25.4	Service Class Name	DOCSIS 3.0
24.5 25.5	Service Flow Error Encoding	DOCSIS 3.0

Type	Description	Spec Defined
24.5.1 25.5.1	Errored Parameter	DOCSIS 3.0
24.5.2 25.5.2	Error Code	DOCSIS 3.0
24.5.3 25.5.3	Error Message	DOCSIS 3.0
24.6 25.6	Quality of Service Parameter Set Type	DOCSIS 3.0
24.7 25.7 70.7 71.7	Traffic Priority	DOCSIS 3.0
24.8 25.8 70.8 71.8	Maximum Sustained Traffic Rate	DOCSIS 3.0
24.9 25.9 70.9 71.9	Maximum Traffic Burst	DOCSIS 3.0
24.10 25.10 70.10 71.10	Minimum Reserved Traffic Rate	DOCSIS 3.0
24.11 25.11 70.11 71.11	Assumed Minimum Reserved Rate Packet Size	DOCSIS 3.0
24.12 25.12	Timeout for Active QoS Parameters	DOCSIS 3.0
24.13 25.13	Timeout for Admitted QoS Parameters	DOCSIS 3.0
24.23 25.23	IP Type Of Service (DSCP) Overwrite	DOCSIS 3.0
24.27 25.27 70.27 71.27	Peak Traffic Rate	DOCSIS 3.0
24.31 25.31	Service Flow Required Attribute Mask	DOCSIS 3.0
24.32 25.32	Service Flow Forbidden Attribute Mask	DOCSIS 3.0
24.33 25.33	Service Flow Attribute Aggregation Rule Mask	DOCSIS 3.0
24.34 25.34	Application Identifier	DOCSIS 3.0
24.35 25.35	Buffer Control	DOCSIS 3.0
24.35.1 25.35.1	Minimum Buffer	DOCSIS 3.0

Type	Description	Spec Defined
24.35.2 25.35.2	Target Buffer	DOCSIS 3.0
24.35.3 25.35.3	Maximum Buffer	DOCSIS 3.0
24.36 25.36 70.36 71.36	Aggregate Service Flow Reference	DOCSIS 3.0
24.37 25.37 70.37 71.37	Metro Ethernet Service Profile (MESP) Reference	DOCSIS 3.0
24.38 25.38	Serving Group Name	DOCSIS 3.0
70.38.1 71.38.1	Service Flow to ASF Matching by Application Id	DOCSIS 3.1
70.38.2 71.38.2	Service Flow to ASF Matching by Service Class Name	DOCSIS 3.1
70.38.3 71.38.3	Service Flow to ASF Matching by Traffic Priority Range	DOCSIS 3.1
24.40 25.40	AQM Encodings	DOCSIS 3.0
24.40.1 25.40.1	AQM Disable	DOCSIS 3.0
24.40.2 25.40.2	AQM Latency Target	DOCSIS 3.0
24.40.3 25.40.3	AQM Algorithm	DOCSIS 3.0
24.40.4 25.40.4	Immediate AQM Min Threshold	DOCSIS 3.1
24.40.5 25.40.5	Immediate AQM Range Exponent of Ramp Function	DOCSIS 3.1
24.40.6 25.40.6	Latency Histogram Encodings	DOCSIS 3.1
24.41 25.41	Data Rate Unit Setting	DOCSIS 3.0
70.42.1 71.42.1	Low Latency Service Flow Reference	DOCSIS 3.1
70.42.2 71.42.2	Low Latency Service Flow Identifier	DOCSIS 3.1
70.42.3 71.42.3	Classic SF SCN	DOCSIS 3.1
70.42.4 71.42.4	Low Latency SF SCN	DOCSIS 3.1
70.42.5 71.42.5	AQM Coupling Factor Exponent	DOCSIS 3.1
70.42.6 71.42.6	Scheduling Weight	DOCSIS 3.1
70.42.7 71.42.7	Queue Protection Enable	DOCSIS 3.1

Type	Description	Spec Defined
70.42.8 71.42.8	QPLatencyThreshold (CRITICALqL_us)	DOCSIS 3.1
70.42.9 71.42.9	QPQueuingScoreThreshold (CRITICALqLSCORE_us)	DOCSIS 3.1
70.42.10 71.42.10	QPDrainRateExponent(LG_AGING)	DOCSIS 3.1
24.43 25.43	Vendor Specific QoS Parameters	DOCSIS 3.0
24.44 25.44	Guaranteed Grant Interval (GGI)	DOCSIS 3.1
24.44 25.44	Service Flow Collection	DPoE 1.0

11.4.1 TLV 24 Service Flow sub-TLVs

Type	Description	Spec Defined
24	**Upstream Service Flow**	
24.14	Maximum Concatenated Burst	DOCSIS 3.0
24.15	Service Flow Scheduling Type	DOCSIS 3.0
24.16	Request/Transmission Policy	DOCSIS 3.0
24.17	Nominal Polling Interval	DPoE 1.0
24.18	Tolerated Poll Jitter	DOCSIS 3.0
24.19	Unsolicited Grant Size	DOCSIS 3.0
24.20	Nominal Grant Interval	DOCSIS 3.0
24.21	Tolerated Grant Jitter	DOCSIS 3.0
24.22	Grants per Interval	DOCSIS 3.0
24.24	Unsolicited Grant Time Reference	DOCSIS 3.0
24.25	Multiplier to Contention Request Backoff Window	DOCSIS 3.0
24.26	Multiplier to Number of Bytes Requested	DOCSIS 3.0

11.4.2 TLV 25 Service Flow sub-TLVs

Type	Description	Spec Defined
25	**Downstream Service Flow**	
25.14	Maximum Downstream Latency	DOCSIS 3.0
25.15	Reserved	-
25.17	Downstream Resequencing	DOCSIS 3.0

11.5 TLV 22/23/60 Classification sub-TLVs

Type	Description	Spec Defined
22 **23** **60**	**Upstream Classifier** **Downstream Classifier** **Upstream Drop Classifier (UDC)**	
22.1 23.1 60.1	Classifier Reference	DOCSIS 3.0
22.2 23.2 60.2	Classifier Identifier	DOCSIS 3.0
22.3 23.3	Service Flow Reference	DOCSIS 3.0
22.4 23.4	Service Flow Identifier	DOCSIS 3.0
22.5 23.5 60.5	Rule Priority	DOCSIS 3.0
22.6 23.6	Classifier Activation State	DOCSIS 3.0
22.7 23.7 60.7	Dynamic Service Change Action	DOCSIS 3.0
22.8 23.8 60.8	Classifier Error Encodings	DOCSIS 3.0
22.8.1 23.8.1 60.8.1	Errored Parameter	DOCSIS 3.0
22.8.2 23.8.2 60.8.2	Error Code	DOCSIS 3.0
22.8.3 23.8.3 60.8.3	Error Message	DOCSIS 3.0
22.9 23.9 60.9	IPv4 Packet Classification Encodings / TCP/UDP Packet Classification Encodings	DOCSIS 3.0
22.9.1 23.9.1 60.9.1	IPv4 Type of Service Range and Mask	DOCSIS 3.0
22.9.2 23.9.2 60.9.2	IP Protocol	DOCSIS 3.0
22.9.3 23.9.3 60.9.3	IPv4 Source Address	DOCSIS 3.0
22.9.4 23.9.4 60.9.4	IPv4 Source Mask	DOCSIS 3.0

Type	Description	Spec Defined
22 **23** **60**	**Upstream Classifier** **Downstream Classifier** **Upstream Drop Classifier (UDC)**	
22.9.5 23.9.5 60.9.5	IPv4 Destination Address	DOCSIS 3.0
22.9.6 23.9.6 60.9.6	IPv4 Destination Mask	DOCSIS 3.0
22.9.7 23.9.7 60.9.7	TCP/UDP Source Port Start	DOCSIS 3.0
22.9.8 23.9.8 60.9.8	TCP/UDP Source Port End	DOCSIS 3.0
22.9.9 23.9.9 60.9.9	TCP/UDP Destination Port Start	DOCSIS 3.0
22.9.10 23.9.10 60.9.10	TCP/UDP Destination Port End	DOCSIS 3.0
22.10 23.10 60.10	Ethernet LLC Packet Classification Encodings	DOCSIS 3.0
22.10.1 23.10.1 60.10.1	Destination MAC Address	DOCSIS 3.0
22.10.2 23.10.2 60.10.2	Source MAC Address	DOCSIS 3.0
22.10.3 23.10.3 60.10.3	Ethertype/DSAP/Mac Type	DOCSIS 3.0
22.10.4 23.10.4 60.10.4	Slow Protocol Subtype	DOCSIS 3.0
22.11 23.11 60.11	IEEE 802.1P/Q Packet Classification Encodings	DOCSIS 3.0
22.11.1 23.11.1 60.11.1	IEEE 802.1P User Priority	DOCSIS 3.0
22.11.2 23.11.2 60.11.2	IEEE 802.1Q VLAN_ID	DOCSIS 3.0
22.12 23.12 60.12	IPv6 Packet Classification Encodings	DOCSIS 3.0
22.12.1 23.12.1 60.12.1	IPv6 Traffic Class	DOCSIS 3.0

Type	Description	Spec Defined
22 23 60	**Upstream Classifier Downstream Classifier Upstream Drop Classifier (UDC)**	
22.12.2 23.12.2 60.12.2	IPv6 Flow Label	DOCSIS 3.0
22.12.3 23.12.3 60.12.3	IPv6 Next Header Type	DOCSIS 3.0
22.12.4 23.12.4 60.12.4	IPv6 Source Address	DOCSIS 3.0
22.12.5 23.12.5 60.12.5	IPv6 Source Prefix Length (bits)	DOCSIS 3.0
22.12.6 23.12.6 60.12.6	IPv6 Destination Address	DOCSIS 3.0
22.12.7 23.12.7 60.12.7	IPv6 Destination Prefix Length (bits)	DOCSIS 3.0
22.13 23.13	CM Interface Mask (CMIM) Encoding	L2VPN
22.14 23.14 60.14	[IEEE 802.1ad] S-VLAN Packet Classification Encodings	DOCSIS 3.0
22.14.1 23.14.1 60.14.1	[IEEE 802.1ad] S-TPID	DOCSIS 3.0
22.14.2 23.14.2 60.14.2	[IEEE 802.1ad] S-VID	DOCSIS 3.0
22.14.3 23.14.3 60.14.3	[IEEE 802.1ad] S-PCP	DOCSIS 3.0
22.14.4 23.14.4 60.14.4	[IEEE 802.1ad] S-DEI	DOCSIS 3.0
22.14.5 23.14.5 60.14.5	[IEEE 802.1ad] C-TPID	DOCSIS 3.0
22.14.6 23.14.6 60.14.6	[IEEE 802.1ad] C-VID	DOCSIS 3.0
22.14.7 23.14.7 60.14.7	[IEEE 802.1ad] C-PCP	DOCSIS 3.0
22.14.8 23.14.8 60.14.8	[IEEE 802.1ad] C-CFI	DOCSIS 3.0

Type	Description	Spec Defined
22 23 60	**Upstream Classifier Downstream Classifier Upstream Drop Classifier (UDC)**	
22.14.9 23.14.9 60.14.9	[IEEE 802.1ad] S-TCI	DOCSIS 3.0
22.14.10 23.14.10 60.14.10	[IEEE 802.1ad] C-TCI	DOCSIS 3.0
22.15 23.15 60.15	[IEEE 802.1ah] I-TAG Packet Classification Encodings	DOCSIS 3.0
22.15.1 23.15.1 60.15.1	[IEEE 802.1ah] I-TPID	DOCSIS 3.0
22.15.2 23.15.2 60.15.2	[IEEE 802.1ah] I-SID	DOCSIS 3.0
22.15.3 23.15.3 60.15.3	[IEEE 802.1ah] I-TCI	DOCSIS 3.0
22.15.4 23.15.4 60.15.4	[IEEE 802.1ah] I-PCP	DOCSIS 3.0
22.15.5 23.15.5 60.15.5	[IEEE 802.1ah] I-DEI	DOCSIS 3.0
22.15.6 23.15.6 60.15.6	[IEEE 802.1ah] I-UCA	DOCSIS 3.0
22.15.7 23.15.7 60.15.7	[IEEE 802.1ah] B-TPID	DOCSIS 3.0
22.15.8 23.15.8 60.15.8	[IEEE 802.1ah] B-TCI	DOCSIS 3.0
22.15.9 23.15.9 60.15.9	[IEEE 802.1ah] B-PCP	DOCSIS 3.0
22.15.10 23.15.10 60.15.10	[IEEE 802.1ah] B-DEI	DOCSIS 3.0
22.15.11 23.15.11 60.15.11	[IEEE 802.1ah] B-VID	DOCSIS 3.0
22.15.12 23.15.12 60.15.12	[IEEE 802.1ah] B-DA	DOCSIS 3.0
22.15.13 23.15.13 60.15.13	[IEEE 802.1ah] B-SA	DOCSIS 3.0

Type	Description	Spec Defined
22 23 60	**Upstream Classifier Downstream Classifier Upstream Drop Classifier (UDC)**	
22.16 23.16 60.16	ICMPv4/ICMPv6 Packet Classification Encodings	DOCSIS 3.0
22.16.1 23.16.1 60.16.1	ICMPv4/ICMPv6 Type Start	DOCSIS 3.0
22.16.2 23.16.2 60.16.2	ICMPv4/ICMPv6 Type End	DOCSIS 3.0
22.17 23.17 60.17	MPLS Classification Encodings	DOCSIS 3.0
22.17.1 23.17.1 60.17.1	MPLS TC bits	DOCSIS 3.0
22.17.2 23.17.2 60.17.2	MPLS Label	DOCSIS 3.0
22.43 23.43 60.43	Vendor-specific Classifier Parameters	DOCSIS 3.0
23.43.5.1 60.43.5.1	VPN Identifier	DOCSIS 3.0
23.43.8 60.43.8	General Extension Information	DOCSIS 3.0

11.6 TLV 26 sub-TLVs

Type	Description	Spec Defined
26	**Payload Header Suppression**	
26.1	Classifier Reference	DOCSIS 3.0
26.2	Classifier Identifier	DOCSIS 3.0
26.3	Service Flow Reference	DOCSIS 3.0
26.4	Service Flow Identifier	DOCSIS 3.0
26.5	Dynamic Service Change Action	DOCSIS 3.0
26.6	Payload Header Suppression Error Encodings	DOCSIS 3.0
26.6.1	Errored Parameter	DOCSIS 3.0
26.6.2	Error Code	DOCSIS 3.0
26.6.3	Error Message	DOCSIS 3.0
26.7	Payload Header Suppression Field (PHSF)	DOCSIS 3.0
26.8	Payload Header Suppression Index (PHSI)	DOCSIS 3.0
26.9	Payload Header Suppression Mask (PHSM)	DOCSIS 3.0
26.10	Payload Header Suppression Size (PHSS)	DOCSIS 3.0
26.11	Payload Header Suppression Verification (PHSV)	DOCSIS 3.0

Type	Description	Spec Defined
26	**Payload Header Suppression**	
26.13	Dynamic Bonding Change Action	DOCSIS 3.0
26.43	Vendor Specific PHS Parameters	DOCSIS 3.0

11.7 TLV 53, 54 DOCSIS sub-TLVs

Type	Description	Spec Defined
53	**SNMPv1v2c Coexistence Configuration**	
53.1	SNMPv1v2c Community Name	DOCSIS 2.0
53.2	SNMPv1v2c Transport Address Access	DOCSIS 2.0
53.2.1	SNMPv1v2c Transport Address	DOCSIS 2.0
53.2.2	SNMPv1v2c Transport Address Mask	DOCSIS 2.0
53.3	SNMPv1v2c Access View Type	DOCSIS 2.0
53.4	SNMPv1v2c Access View Name	DOCSIS 2.0
54	**SNMPv3 Access View Configuration**	DOCSIS 2.0
54.1	SNMPv3 Access View Name	DOCSIS 2.0
54.2	SNMPv3 Access View Subtree	DOCSIS 2.0
54.3	SNMPv3 Access View Mask	DOCSIS 2.0
54.4	SNMPv3 Access View Type	DOCSIS 2.0

11.8 TLV 72 MESP sub-TLVs

Type	Description	Spec Defined
72	**Metro Ethernet Service Profile Encoding**	
72.1	MESP Reference	DPoE 2.0
72.2	MESP Bandwidth Profile (MESP-BP)	DPoE 2.0
72.2.1	MESP-BP Committed Information Rate	DPoE 2.0
72.2.2	MESP-BP Committed Burst Size	DPoE 2.0
72.2.3	MESP-BP Excess Information Rate	DPoE 2.0
72.2.4	MESP-BP Excess Burst Size	DPoE 2.0
72.2.5	MESP-BP Coupling Flag	DPoE 2.0
72.2.6	MESP-BP Color Mode	DPoE 2.0
72.2.6.1	MESP-BP-CM Color Identification Field	DPoE 2.0
72.2.6.2	MESP-BP-CM Color Identification Field Value	DPoE 2.0
72.2.7	MESP-BP Color Marking	DPoE 2.0
72.2.7.1	MESP-BP-CR Color Marking Field	DPoE 2.0
72.2.7.2	MESP-BP-CR Color Marking Field Value	DPoE 2.0
72.3	MESP Name	DPoE 2.0

11.9 TLV 83 L2CP sub-TLVs

Type	Description	Spec Defined
83	**L2CP Management**	
83.1	CMIM	DPoE 2.0
83.2	L2CP Mode	DPoE 2.0
83.3	L2CP L2PT D-MAC Address	DPoE 2.0
83.4	L2CP Filter	DPoE 2.0

11.10 TLV 202 eRouter sub-TLVs

Type	Description	Spec Defined
202	**eRouter Operation Mode encoding**	
202.1	eRouter Initialization Mode Encoding	eRouter 1.0
202.2	TR-069 Management Server	eRouter 1.0
202.2.1	EnableCWMP	eRouter 1.0
202.2.2	URL parameter	eRouter 1.0
202.2.3	Username parameter	eRouter 1.0
202.2.4	Password parameter	eRouter 1.0
202.2.5	Connection Request Username	eRouter 1.0
202.2.6	Connection Request Password	eRouter 1.0
202.2.7	ACSOverride	eRouter 1.0
202.3	eRouter Initialization Mode Override	eRouter 1.0
202.10	Router Advertisement (RA) Transmission Interval	eRouter 1.0
202.11	SNMP MIB Object	eRouter 1.0
202.12	IP Multicast Configuration Server	eRouter 1.0
202.13	Link-ID Control	eRouter 1.0
202.42	Topology Mode Encoding	eRouter 1.0
202.43	Vendor Specific Information	eRouter 1.0
202.43.8	Vendor ID Encoding	eRouter 1.0
202.53	SNMPv1v2c Coexistence Configuration	eRouter 1.0
202.53.1	SNMPv1v2c Community Name	eRouter 1.0
202.53.2	SNMPv1v2c Community Name	eRouter 1.0
202.53.2.1	SNMPv1v2c Transport Address	eRouter 1.0
202.53.2.2	SNMPv1v2c Transport Address Mask	eRouter 1.0
202.53.2.3	SNMPv1v2c Access View Type	eRouter 1.0
202.53.2.4	SNMPv1v2c Access View Name	eRouter 1.0
202.54	SNMPv3 Access View Configuration	eRouter 1.0
202.54.1	SNMPv3 Access View Name	eRouter 1.0
202.54.2	SNMPv3 Access View Subtree	eRouter 1.0
202.54.3	SNMPv3 Access View Mask	eRouter 1.0
202.54.4	SNMPv3 Access View Type	eRouter 1.0

11.11 TLV 219 eTEA sub-TLVs

Type	Description	Spec Defined
219.8	eTEA Symbol Clock	CM-SP-TEI
219.9	eTEA IWF cfg-encoding	CM-SP-TEI
219.9.1	eTEA PW Index Setting	CM-SP-TEI
219.9.2	eTEA Emullation Type	CM-SP-TEI
219.9.3	eTEA PW Peer Address	CM-SP-TEI
219.9.4	eTEA PW Peer Address IPv6	CM-SP-TEI
219.9.5	eTEA PW Destination Port	CM-SP-TEI
219.9.6	eTEA PW Peer Destination Port	CM-SP-TEI
219.9.7	eTEA PW Name	CM-SP-TEI
219.9.8	eTEA PW Description	CM-SP-TEI
219.9.9	eTEA PW Admin Status	CM-SP-TEI
219.9.10	eTEA Status Change Notification Enable	CM-SP-TEI
219.9.11	eTEA PW TDM Type	CM-SP-TEI
219.9.12	eTEA PW TDM Configuration Table Index	CM-SP-TEI
219.9.13	eTEA PW CESoPSNConfiguration Index	CM-SP-TEI
219.9.14	eTEA PW RTP SSRC	CM-SP-TEI
219.9.15	eTEA PW Peer SSRC	CM-SP-TEI
219.9.16	eTEA PW TDM Circulation Map	CM-SP-TEI
219.9.16.1	eTEA PW TDM Port #	CM-SP-TEI
219.9.16.2	eTEA PW TDM Timeslot Map	CM-SP-TEI
219.10	eTEA PW TDM configuration Table	CM-SP-TEI
219.10.1	eTEA PW TDM Configuration Table Index	CM-SP-TEI
219.10.2	eTEA PW TDM Payload Size	CM-SP-TEI
219.10.3	eTEA PW RTP header Used	CM-SP-TEI
219.10.5	eTEA jitter buffer setting	CM-SP-TEI
219.10.6	eTEA PW Payload Suppression	CM-SP-TEI
219.10.7	eTEA PW LOPS Exit Criteria	CM-SP-TEI
219.10.8	eTEA PW LOPS Entrance Criteria	CM-SP-TEI
219.10.10	eTEA PW Packet Replace Policy	CM-SP-TEI
219.10.11	eTEA PW Packet Loss Window	CM-SP-TEI
219.10.12	eTEA PW Excessive Loss Threshold	CM-SP-TEI
219.10.15	eTEA PW Severe Loss Threshold	CM-SP-TEI
219.10.16	eTEA PW RTP Timestamp Mode	CM-SP-TEI
219.10.17	eTEA PW Default Fill Pattern	CM-SP-TEI
219.10.18	eTEA PW L Flag Payload Policy	CM-SP-TEI
219.10.19	eTEA PW TOS	CM-SP-TEI
219.10.20	eTEA PW RTP Payload Type	CM-SP-TEI
219.10.21	eTEA PW RTP Peer Payload Type	CM-SP-TEI
219.10.22	eTEA PW RTP Timestamp Reference	CM-SP-TEI
219.10.23	eTEA PW RTP Peer Timestamp Reference	CM-SP-TEI
219.10.24	eTEA PW SRTP Enable	CM-SP-TEI

Type	Description	Spec Defined
219.11	eTEA SNMP MIB Object	CM-SP-TEI
219.12	eTEA SNMP Write-Access Control	CM-SP-TEI
219.13	CESoPSN Configuration Table	CM-SP-TEI
219.13.1	PW CESoPSN Config Table Index	CM-SP-TEI
219.13.2	Default Idle Pattern	CM-SP-TEI
219.13.3	LFlag Policy	CM-SP-TEI
219.13.4	RFlag Policy	CM-SP-TEI
219.13.5	Remote Defect Policy	CM-SP-TEI
219.13.6	LOPS Policy	CM-SP-TEI
219.13.7	App Sig TOS	CM-SP-TEI
219.13.8	RTP CAS PT	CM-SP-TEI
219.13.9	RTP CAS Peer PT	CM-SP-TEI
219.13.10	App Sig Idle	CM-SP-TEI
219.13.11	App Sig Interval	CM-SP-TEI
219.13.12	App Sig Max Interval	CM-SP-TEI
219.14	dsx1 Configuration Table	CM-SP-TEI
219.14.1	dsx1 port ID	CM-SP-TEI
219.14.2	dsx1 Line type	CM-SP-TEI
219.14.3	dsx1 Line Coding	CM-SP-TEI
219.14.4	dsx1 Circuit ID	CM-SP-TEI
219.14.5	dsx1 Loopback Configuration	CM-SP-TEI
219.14.6	dsx1 Signal Mode	CM-SP-TEI
219.14.7	dsx1 Transmit Clock Source	CM-SP-TEI
219.14.8	dsx1 Fdl	CM-SP-TEI
219.14.9	dsx1 Line Length	CM-SP-TEI
219.14.10	dsx1 Line Status Trap Enable	CM-SP-TEI
219.14.11	dsx1 Channelization	CM-SP-TEI
219.14.12	dsx1 Line Mode	CM-SP-TEI
219.14.13	dsx1 Line Build Out	CM-SP-TEI
219.43	eTEA Vendor Specific Extensions	CM-SP-TEI
219.255	eTEA End of Text	CM-SP-TEI

12 CABLELABS EXTENDED NETWORK TEST AND MONITORING REGISTRY

This section defines a File Type Registry for Proactive Network Maintenance (PNM) and Low Latency Reporting.

12.1 DOCSIS PNM Registry

12.1.1 Definition

This document establishes a CableLabs DOCSIS Proactive Network Maintenance (PNM) File Type Registry. PNM File Types are associated with PNM tests implemented in the CM or CCAP. PNM tests generate files to report measurements or test results. Refer to the Proactive Network Maintenance Object Model section of [CCAP-OSSIv3.1] and the Proactive Network Maintenance Requirements section of [CM-OSSIv3.1] for further details.

12.1.2 Format

The PNM File Type format is a four-byte hexadecimal identifier specific to the type of CCAP or CM PNM test that generated the data file. The first three bytes (0x504E4D or 0x504E4E) of the file type are encoded as the ASCII Hex values for the ASCII string “PNM” or “PNN”. The “PNN” File Identifier indicates the file header contains version information. The fourth byte is encoded as a unique file type identifier, e.g., 0x01, 0x02, …, 0xFF.

12.1.3 CM PNM File Types

The CM PNM File Type identifiers are defined in the number range 0x01 to 0x64.

Table 21 - CableLabs DOCSIS CM PNM File Type Codes

CM PNM Test	File Identifier
Symbol Capture	504E4D01
Symbol Capture	504E4E01
OFDM Channel Estimate Coefficient	504E4D02
OFDM Channel Estimate Coefficient	504E4E02
Downstream Constellation Display	504E4D03
Downstream Constellation Display	504E4E03
Receive Modulation Error Ratio (RxMER)	504E4D04
Receive Modulation Error Ratio (RxMER)	504E4E04
Downstream Histogram	504E4D05
Downstream Histogram	504E4E05
Upstream Pre-equalizer Coefficients	504E4D06
Upstream Pre-equalizer Coefficients	504E4E06
Upstream Pre-equalizer Coefficients Last Update	504E4D07
Upstream Pre-equalizer Coefficients Last Update	504E4E07
OFDM FEC Summary	504E4D08
OFDM FEC Summary	504E4E8
Spectrum Analysis	504E4D09
Spectrum Analysis	504E4E09
OFDM Modulation Profile	504E4D0A

12.1.4 CCAP PNM File Types

The CCAP PNM File Type identifiers are defined in the number range 0x65 to 0xFF.

Table 22 - CableLabs DOCSIS CCAP PNM File Type Codes

CCAP PNM Test	File Identifier
Symbol Capture	504E4D65
Symbol Capture	504E4E65
Active and Quiet Probe	504E4D66
Active and Quiet Probe	504E4E66
Impulse Noise	504E4D67
Impulse Noise	504E4E67
Histogram	504E4D68
Histogram	504E4E68
Receive Modulation Error Ratio (RxMER)	504E4D69
Receive Modulation Error Ratio (RxMER)	504E4E69
Triggered Spectrum Capture	504E4D6A
Triggered Spectrum Capture	504E4E6A

12.2 DOCSIS Latency Report Registry

12.2.1 Definition

This section is analogous to the PNM registry. Types are associated with Latency reports implemented in the CM or CCAP. Reports generate files to report Latency. Refer to the Latency Report section of [CCAP-OSSIv3.1] and the Latency Report Requirements section of [CM-OSSIv3.1] for further details.

12.2.2 Format

The Report File Type format is a four-byte hexadecimal identifier specific to the type of CCAP or CM report that generated the data file. The first three bytes (0x4C4C44) of the file type are encoded as the ASCII Hex values for the ASCII string “LLD”. The fourth byte is encoded as a unique file type identifier, e.g., 0x01, 0x02, …, 0xFF.

12.2.3 CCAP Latency Report File Types

The CCAP Report File Type identifiers are defined in the number range 0x10 to 0x19.

Table 23 - CableLabs DOCSIS CMTS Latency Report File Type Codes

CMTS Latency Report	File Identifier
Latency Report	4C4C4410

12.2.4 CM Latency Report File Types

The CM Report File Type identifiers are defined in the number range 0x01 to 0x09.

Table 24 - CableLabs DOCSIS CM Latency Report File Type Codes

CM Latency Report	File Identifier
Latency Report	4C4C4401

13 CABLELABS ERROR CODE REGISTRY

This section defines an Error Code Registry.

13.1 DOCSIS Error Code Registry

13.1.1 Definition

This document establishes a CableLabs DOCSIS Error Code Registry for events that are to be reported by DOCSIS devices through local event logging, and may be accompanied by syslog, SNMP notification or NETCONF notification.

13.1.2 Format

The format for the DOCSIS error code is as follows:

<Process><Error Number>.<Sub Error Number>

Where:

- Process is an ASCII upper case letter representing the process associated with the error.
- Error Number is composed of three numerical digits representing the specific error for the associated Process.
- Sub Error Number is composed of two numerical digits and is used as a refinement of the Error Number.

For example:

- I114.01
- D004.02

In order to use the error code in notifications to be logged or emitted via standard mechanisms such as SNMP notifications and Syslog logging, the error code is converted to an Event ID. The Event IDs are used to uniquely identify the type of event in the notifications or logs.

An Event ID is an INTEGER representation of the error code in decimal format. For the standard DOCSIS events, this number is derived from the error code using the following rules:

- The Event ID is an eight-digit decimal number.
- The first two digits (left-most) are the ASCII code for the letter in the first character of the error code, which represents the Process associated with the error.
- The next four digits are filled by the Error Number, the 3 digits between the letter and the dot in the error code and padded by a zero on the left.
- The last two digits are filled by the Sub Error Number, the two digits after the dot in the error code and padded by a zero on the left.

For example, Error Code I114.01 is converted into Event ID 73011401, and Error Code D004.02 is converted into Event ID 68000402. This convention only uses a small portion of available number space reserved for DOCSIS (0 to 2^{31}-1).

13.1.3 DOCSIS Reserved Error Code Ranges

Table 25 - CableLabs DOCSIS Reserved Error Codes

Error Code Range	Specification Category	Event Group[1]	References
Bxxx.xx	CM, CCAP, RPHY	Refer to following sections	[CCAP-OSSI] [CCAP-OSSIv3.1] [OSSIv3.0] [CM-OSSIv3.1] [R-OSSI] [CCAP-OSSIv4.0] [CM-OSSIv4.0]
Cxxx.xx	CM, CCAP		[CCAP-OSSI] [CCAP-OSSIv3.1] [OSSIv3.0] [CM-OSSIv3.1] [CCAP-OSSIv4.0] [CM-OSSIv4.0]
Dxxx.xx	CM	DHCP, TOD and TFTP	[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]
Exxx.xx	CM	Secure Software Download	[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]
Fxxx.xx	CCAP, FMA	Refer to follosing sections	[CCAP-OSSI] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0] [FMA-OSSI]
Gxxx.xx	DSG		[DSG]
Hxxx.xx	eDOCSIS		[eDOCSIS]
Ixxx.xx	CMTS, CCAP	Registration and TLV-11	[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
Jxxx.xx	CMTS, CCAP	CM-STATUS	[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
Kxxx.xx	CMTS, CCAP	QoS	[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
Lxxx.xx	CMTS, CCAP, CM		[OSSIv3.0] [CCAP-OSSIv3.1] [CM-OSSIv3.1] [CCAP-OSSIv4.0] [CM-OSSIv4.0]
Mxxx.xx	M-CMTS		[M-OSSI]
Nxxx.xx	CM		[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]
Pxxx.xx	TEI, DPoE		[TEI] [DPoE-OSSIv2.0]
Qxxx.xx	EQAM		[EQAM-PMI]
Rxxx.xx	CM	Ranging	[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]
Sxxx.xx	CMTS, CCAP, CM	Dynamic Services	[OSSIv3.0] [CCAP-OSSIv3.1] [CM-OSSIv3.1] [CCAP-OSSIv4.0] [CM-OSSIv4.0]
Txxx.xx	CM	Downstream Acquisition	[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]
Uxxx.xx	CM	Downstream Acquisition	[OSSIv3.0] [CM-OSSIv3.1] [CM-OSSIv4.0]

Vxxx.xx	CMTS, CCAP	IPDR	[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
Wxxx.xx	CMTS, CCAP	Multicast	[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
Yxxxx.xx	CMTS, CCAP		[OSSIv3.0] [CCAP-OSSIv3.1] [CCAP-OSSIv4.0]
[1] Indicates the range is limited to a specific Event Group for the Specification Category			

13.1.3.1 Remote PHY Reserved Error Code Ranges

The following table represents the reserved Error Code ranges for Remote PHY as specified in [R-OSSI].

Table 26 - Remote PHY Reserved Error Codes

Error Code Range	Description
B70x.xx	RPD Error Code Range
B80x.xx	CCAP Core Error Code Range

13.1.3.2 Flexible MAC Architecture Reserved Error Code Ranges

The following table represents the reserved Error Code ranges for FMA as specified in [FMA-OSSI].

Table 27 - FMA Reserved Error Codes

Error Code Range	Description
F7xx.xx	MAC NE Error Code Range
F8xx.xx	MAC Manager Error Code Range
F9xx.xx	PacketCable Aggregator Error Code Range

13.1.4 Coherent Optics Reserved Error Code Ranges

Table 28 - CableLabs Coherent Optics Reserved Error Codes

Error Code Range	Specification Category	Event Group	References
C90x.xx	CTD		[OPT-P2P-OSSI]

Appendix I Acknowledgements

On behalf of CableLabs and its participating member companies, we would like to extend our thanks to all member and vendor participants who contributed to the development of the protocol fields registered in this specification. Key contributors to this document are recognized individually in each of the CableLabs project-specific specifications.

Steve Burroughs - CableLabs

Appendix II Revision History (Informative)

II.1 Engineering Changes for CL-SP-CANN-I02-080306

The following engineering changes are incorporated into CL-SP-CANN-I02-080306:

ECN	Date Accepted	Summary
CANN-N-07.0028-3	7/25/2007	Registration of additional Diameter AVPs for PacketCable 2.0
CANN-N-07.0029-2	7/18/2007	Update to DIAMETER Registrations
CANN-N-07.0033-2	11/28/2007	New Section CableLabs ASN.1 Codes Registry
CANN-N-07.0036-3	2/20/2008	Addition of application registry

II.2 Engineering Change for CL-SP-CANN-I03-090811

The following engineering change is incorporated into CL-SP-CANN-I03-090811:

ECN	Date Accepted	Summary
CANN-N-08.0038-2	1/28/2009	Modifications to support SMA devices

II.3 Engineering Changes for CL-SP-CANN-I04-100212

The following engineering changes are incorporated into CL-SP-CANN-I04-100212:

ECN	Date Accepted	Summary
CANN-N-09.0045-1	11/11/2009	SAFI namespace update
CANN-N-09.0046-1	12/16/2009	Home Networking Addition

II.4 Engineering Change for CL-SP-CANN-I05-110210

The following engineering change is incorporated into CL-SP-CANN-I05-110210:

ECN	Date Accepted	Summary
CANN-N-10.0091-1	1/5/2011	New OID for Online Content Access Project

II.5 Engineering Change for CL-SP-CANN-I06-111117

The following engineering change is incorporated into CL-SP-CANN-I06-111117:

ECN	Date Accepted	Summary
CANN-N-11.0099-2	10/05/2011	Addition of cmapMib to CableLabs DOCSIS Project Codes

II.6 Engineering Changes for CL-SP-CANN-I07-120809

The following engineering changes are incorporated into CL-SP-CANN-I07-120809:

ECN	Date Accepted	Summary
CANN-N-12.0110-4	7/11/2012	Add support for RFC6289 and reserve CCAP YANG namespace
CANN-N-12.0112-1	6/13/2012	Definition of Wireless project in and TR-069 registry in the CANN spec

II.7 Engineering Change for CL-SP-CANN-I08-121113

The following engineering change is incorporated into CL-SP-CANN-I08-121113:

ECN	Date Accepted	Summary
CANN-N-12.0111-2	10/17/12	URN namespace registry for CANN spec

II.8 Engineering Change for CL-SP-CANN-I09-130404

The following engineering change is incorporated into CL-SP-CANN-I09-130404:

ECN	Date Accepted	Summary	Author
CANN-N-12.0115-1	12/12/12	Correction to CANN-N-12.0111-2	Sundaresan

II.9 Engineering Change for CL-SP-CANN-I10-140729

The following engineering change is incorporated into CL-SP-CANN-I10-140729:

ECN	Date Accepted	Summary	Author
CANN-N-14.0118-4	5/14/14	New Chapter for DOCSIS TLV reservation	Sundaresan

II.10 Engineering Changes for CL-SP-CANN-I11-141218

The followings engineering changes are incorporated into CL-SP-CANN-I11-141218

ECN	Date Accepted	Summary	Author
CANN-N-14.0120-1	8/13/2014	Add new DOCSIS schema namespaces	Barringer
CANN-N-14.0121-1	10/15/2014	Security CVC Chain TLV Numbers for CANN	Lopez
CANN-N-14.0122-2	10/15/2014	New project code for DOCSIS PNM MIB	Alvarez
CANN-N-14.0123-1	10/1/2014	Updates for DPoX	Burroughs
CANN-N-14.0124-1	11/26/2014	Add reference for 3.1 DOCSIS CM OSSI specification	Alvarez
CANN-N-14.0125-1	12/03/2014	Reserve DPoE SF Collection TLVs	Burroughs

II.11 Engineering Changes for CL-SP-CANN-I12-150319

The followings engineering changes are incorporated into CL-SP-CANN-I12-150319

ECN	Date Accepted	Summary	Author
CANN-N-14.0126-2	2/11/2015	Update CANN spec to add OID prefix for eRouter Tunneling MIBs	Berg
CANN-N-15.0127-1	2/11/2015	Adding eRouter TLVs 53 & 54 to CANN	Kloberdans

II.12 Engineering Changes for CL-SP-CANN-I13-150515

The followings engineering changes are incorporated into CL-SP-CANN-I13-150515.

ECN	Date Accepted	Summary	Author
CANN-N-15.0128-1	4/15/2015	Add DOCSIS project code for IF31 MIB	Sundelin
CANN-N-15.0131-1	4/15/2015	DPoE Multipoint sub-TLV Assignment	Burroughs
CANN-N-15.0132-1	4/29/2015	Add newly defined TLV 202 sub-types to CANN specification	Berg

II.13 Engineering Changes for CL-SP-CANN-I14-160317

The followings engineering changes are incorporated into CL-SP-CANN-I14-160317.

ECN	Date Accepted	Summary	Author
CANN-N-15.0136-1	12/9/2015	Create new namespaces for DOCSIS 3.1 schemas	Barringer
CANN-N-15.0137-1	12/16/2015	Add GRE and MAP MIBs to SMI Network Management Codes in CANN	Berg
CANN-N-15.0139-3	2/24/2016	Retire and reserve the DAC TLV	Burroughs
CANN-N-16.0141-1	2/24/2016	Update MIB Module Names	Hedstrom

II.14 Engineering Changes for CL-SP-CANN-I15-170111

The followings engineering changes are incorporated into CL-SP-CANN-I15-170111.

ECN	Date Accepted	Summary	Author
CANN-N-16.0143-1	4/6/2016	Update TLV Registry for L2CP Processing	Burroughs
CANN-N-16.0144-1	4/20/2016	Reservation of RPHY YANG namespace	Hedstrom
CANN-N-16.0145-2	4/27/2016	Addition of DOCS-RPHY-MIB OID	Hedstrom
CANN-N-16.0148-2	6/30/2016	Update Wireless TR-069 Data Model Registry	Burroughs
CANN-N-16.0151-1	7/21/2016	Reserve Deprecated SMI Numbers	Burroughs
CANN-N-16.0154-1	8/25/2016	Add Top Level L2CP TLV	Burroughs

II.15 Engineering Changes for CL-SP-CANN-I16-170510

The followings engineering changes are incorporated into CL-SP-CANN-I16-170510.

ECN	Date Accepted	Summary	Author
CANN-N-17.0156-1	3/9/2017	Addition of PNM Test Types	Hedstrom
CANN-R-17.0158-1	4/13/2017	CANN EC to accompany MULPI diplexer configuration EC	Dolas

II.16 Engineering Changes for CL-SP-CANN-I17-171220

The followings engineering changes are incorporated into CL-SP-CANN-I17-171220.

ECN	Date Accepted	Summary	Author
CANN-N-17.0164-2	11/16/2017	Register new PNM FileTypes for Versioning	Burroughs

II.17 Engineering Changes for CL-SP-CANN-I18-180509

The followings engineering changes are incorporated into CL-SP-CANN-I18-180509.

ECN	Date Accepted	Summary	Author
CANN-N-18.0167-2	4/12/2018	New Error Code Set Registry Section	Hedstrom

II.18 Engineering Changes for CL-SP-CANN-I19-190422

The followings engineering changes are incorporated into CL-SP-CANN-I19-190422.

ECN	Date Accepted	Summary	Author
CANN-N-18.0168-1	11/8/2018	Add new DOCS-RPHY-SEC-MIB MIB Module OID	Hedstrom
CANN-N-18.0170-3	2/7/2019	Add Latency Report to Registry	Burroughs
CANN-N-19.0171-1	4/18/2019	Add Coherent Optics reserved namespaces to CANN	Hedstrom

II.19 Engineering Changes for CL-SP-CANN-I20-200715

The followings engineering changes are incorporated into CL-SP-CANN-I20-200715.

ECN	Date Accepted	Summary	Author
CANN-N-19.0174-1	11/21/2019	Add new CableLabs DOCSIS Project Code for DOCS-FDX-MIB	Hedstrom
CANN-N-19.0175-1	12/12/2019	Reserve Event number space for FMA	Hedstrom
CANN-N-20.0177-1	7/2/2020	Reserve Event number space for FMA PacketCable Aggregator Events	Hedstrom

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