DOCSIS Provisioning of EPON (DPoE™)
Architecture, Specifications, Qualification
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Agenda

What is DOCSIS Provisioning of EPON?

DPoE and IEEE P1904.1 (SIEPON)

DPoE Interoperability and Qualification
DOCSIS Networks for Internet Access

- More than 118 million DOCSIS cable modems (CMs) are deployed worldwide.
- Every CM, regardless of manufacturer or cable operator, is provisioned according to DOCSIS specifications.
- Cable operators want to use the same Operations and Support Systems (OSS) with other access network technologies (i.e., EPON).
What is DOCSIS Provisioning of EPON?
• Brings the mature systems and business processes of the DOCSIS OSS to EPON access networks
• Enables full vendor/equipment interoperability – similar to CMTS and Cable Modems
• Leverages existing technical and customer care knowledge base, systems, and processes
• Developed by MSOs, CableLabs, and vendors
DPoE Architecture

IP Management

DOCSIS Network

CMTS

HFC

CM

IP/Transport Network

DNS

DHCP

SNMP

TFTP

SYSLOG

Time Srvr

DPoE System

OLT

vCM

vCM

Cable Modem

ONU

PON

Cable Modem

ONU

eOAM

IP Management
Provisioning DPoE ONUs

Topology Resolution and Physical Layer Initialization
- Initial MAC layer initialization using EPON Multipoint Control Protocol (MPCP)
- Single LLID is registered for subsequent stages

Authentication and Encryption Initialization
- Downstream encryption using AES-128
- Device authentication

IP Initialization
- IP stack configuration using Dynamic Host Configuration Protocol (DHCP)
- TFTP download of configuration file

Registration
- Registration of additional LLIDs depends on services
- Classifier, service flow, and QoS configuration using extended OAM (eOAM)
DPoE and IEEE P1904.1 (SIEPON)
SIEPON “Packages”

- SIEPON is standardizing three “packages”:
  - North America (Package A)
  - Japan (Package B)
  - China (Package C)

- External specifications provide additional requirements for operating EPON in specific environments:
  - DPoE specs for DOCSIS environments
  - Broadband Forum for DSL environments
SIEPON / DPoE v1.0 Relationship

- DPoE specs essentially build on SIEPON standard
DPoE Interoperability and Qualification
DPoE Interoperability

DOCSIS OSS Servers

- DNS
- DHCP
- SNMP
- TFTP
- SYSLOG
- Time Srvr

IP/Transport Network

CMTS

PON Network

DPoE System Vendor A

DPoE ONU Vendor B

DPoE System Vendor C

DPoE ONU Vendor D

HFC Network

Vendor A

Vendor B

Vendor C

Vendor D
Service Interoperability
DPoE, EPoC and DOCSIS

DPoE + EPoC + DOCSIS = Converged Access Network Solution
Thank you!

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## DPoE Specifications

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<td><strong>MULPI</strong></td>
<td>Specifications for support of a subset of DOCSIS 3.0 MULPI functionality plus EPON requirements</td>
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<td><strong>MEF</strong></td>
<td>Specifications for MEF services added to DOCSIS static configuration provisioning model</td>
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<td><strong>DEMARC</strong></td>
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<td><strong>Service OAM</strong></td>
<td>Defines DPoE Network element requirements for the support of IEEE 802.1ag and ITU Y.1731</td>
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<td><strong>SEC</strong></td>
<td>Provide transparent support of DOCSIS device authentication, code verification, and additional security</td>
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<td>Best practices and requirements for IP network element management and operations</td>
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<td><strong>OAM</strong></td>
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**DPoE Specifications**

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