

**Fixing EPD and LPD in IEEE Std 802-2014**

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**Source:**

Roger B. Marks                      Voice: +1 802 227 2253  
EthAirNet Associates              E-mail: [roger@ethair.net](mailto:roger@ethair.net)

Norm Finn  
Huawei                                  E-mail: [nfinn@nfinnconsulting.com](mailto:nfinn@nfinnconsulting.com)

**Venue: 802.1 Maintenance TG, related to IEEE Std 802-2014**

**Abstract:**

This document proposes maintenance corrections in the description of EtherType Protocol Discrimination (EPD) and LLC Protocol Discrimination (LPD) in IEEE Std 802-2014.

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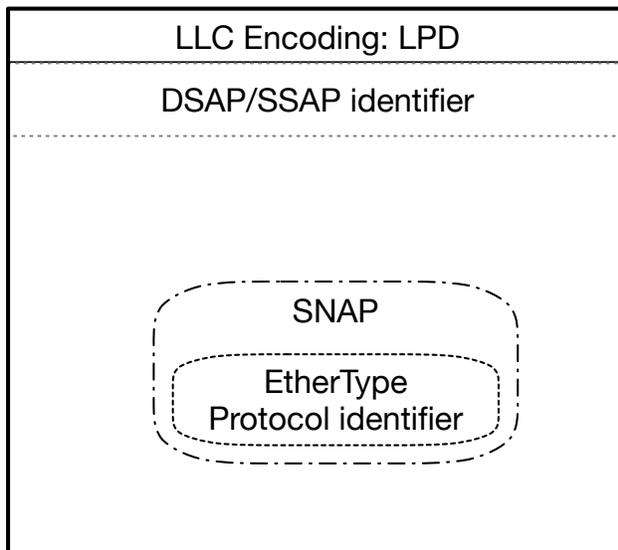
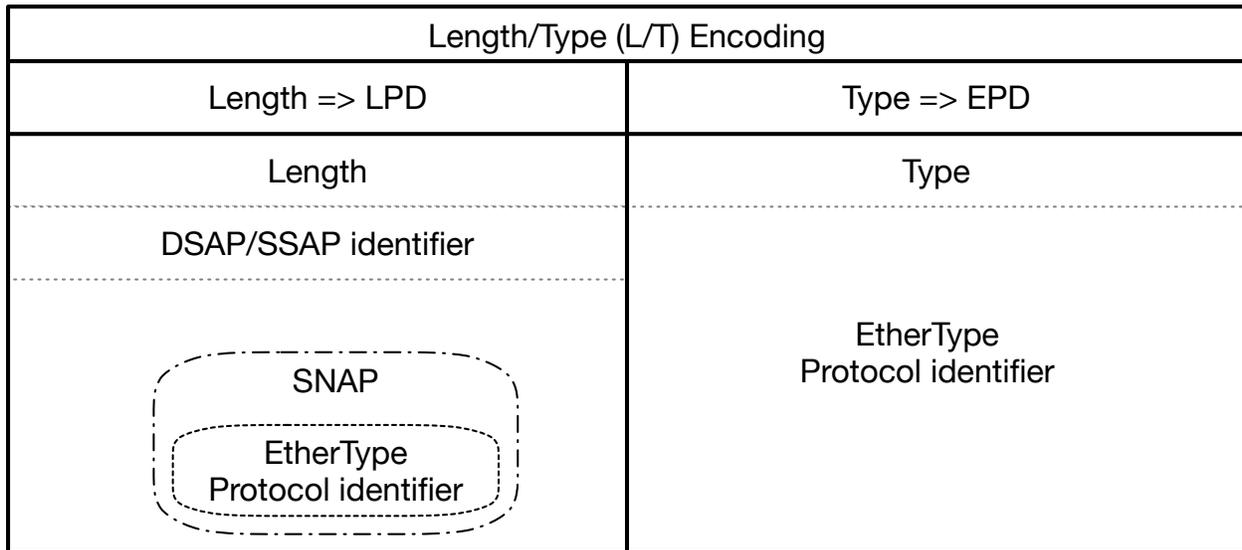
**Summary:**

- EtherType protocol discrimination (EPD) and LLC protocol discrimination (LPD) are discussed in IEEE Std 802, IEEE Std 802.1AC, and IEEE Std 802.1Q; IEEE Std 802.11 too.
- Overall, the descriptions are imprecise, inconsistent, and confusing.
- This contribution proposes, as a first step, making some changes to IEEE Std 802-2014 within an amendment (such as IEEE P802f). Efforts are being made to align IEEE 802.11.
- Larger updates to IEEE Std 802 could be addressed in a follow-up revision.
- IEEE Std 802.1Q and 802.1AC will be addressed next.

**Background Contributions:**

- R. Marks, “What are EPD and LPD?”  
[maint-Marks-epd-lpd-0719-v02.pdf](#)
- N Finn, “Why the EPD/LPD information in IEEE 802, IEEE 802.1AC, and 802.1Q must be fixed”  
[maint-finn-epd-lpd-errors-0919-v02.pdf](#)
- R. Marks and N. Finn, “Clarifying EPD and LPD”  
[maint-Marks-Finn-hlpde-1119-copyright](#)
- R. Marks, “EPD and LPD Terminology Misalignment in IEEE Std 802.1 and 802.11,” 2020-01-15 ([IEEE 802.11-20-0174-01-0arc](#))

Summary understanding of the EPD, LPD, LLC Encoding, and L/T Encoding



## Proposed changes to IEEE Std 802-2014

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### 5.2.2 LLC sublayer

*Modify the last two paragraphs on p. 13 as follows:*

The higher layer protocol discrimination entity (HLPDE) is used by the LLC sublayer to determine the higher layer protocol to which to deliver an LLC sublayer protocol data unit (PDU). Two methods may be used in the HLPDE. The two methods are:

- 1) EtherType protocol discrimination (EPD), which uses the EtherType value made available to the LLC sublayer through the MSAP
- 2) LLC protocol discrimination (LPD), which uses the SSAP/DSAP addresses defined-specified in ISO/IEC 8802-2, including and can support EtherTypes using the Subnetwork Access Protocol (SNAP) format

~~IEEE Std 802.3™ is capable of natively representing the EtherType within its MAC frame format, which is used to support EPD. IEEE Std 802.3 also natively supports ISO/IEC 8802-2 LPD (over a limited range of frame sizes). In other IEEE 802 networks, such as for IEEE Std 802.11™, LPD is also achieved using SNAP, as described in Clause 9. In either of these techniques, the EtherType is effectively being used as a means of identifying an LSAP that provides LLC sublayer service to the protocol concerned. New IEEE 802 standards shall support protocol discrimination in the LLC sublayer using EPD.~~

The protocol discrimination may be encoded using LLC encoding or Length/Type (L/T) encoding. Each of these encodings supports both EtherTypes and SSAP/DSAP addresses as protocol discriminators. LLC encoding uses only LPD. L/T encoding uses the value of a Length/Type field to distinguish between EPD and LPD. New IEEE 802 standards shall support both EPD and LPD, using either L/T encoding or some other means of distinguishing EPD from LPD.

### 9.2.1 Format, function, and administration

Delete the first paragraph of 9.2.1 as follows:

~~Protocol discrimination performed by the EPD method is based on EtherTypes. For example, the value of the Type/Length field in the IEEE 802.3 MAC frame format directs the protocol parser into the LPD HLPDE if the value is less than 1536. This allows frames of both formats to be freely intermixed on a given IEEE 802 network and at a given station.~~

Modify 9.4 as follows:

### 9.4 Encapsulation of ~~Ethernet-EPD~~ frames with LPD

This subclause specifies the standard method for conveying ~~Ethernet-EPD~~ frames across IEEE 802 networks that ~~offer only the LPD function and not the EPD function in the LLC sublayer~~ use LLC encoding.

An ~~Ethernet-EPD~~ frame conveyed on an ~~LPD-only~~ IEEE 802 network using LLC encoding shall be encapsulated in a SNAP data unit contained in an LPD PDU of type UI, as follows:

- a) The Protocol Identification field of the SNAP data unit shall contain a SNAP identifier in which
  - 1) The three OUI octets each take the value zero.
  - 2) The two remaining octets take the values, in the same order, of the 2 octets of the ~~Ethernet-EPD~~ frame's EtherType.
- b) The Protocol Data field of the SNAP data unit shall contain the user data octets, in order, of the ~~Ethernet-EPD~~ frame.
- c) The values of the Destination MAC Address field and Source MAC Address field of the ~~Ethernet-EPD~~ frame shall be used in the Destination MAC Address field and Source MAC Address field, respectively, of the MAC frame in which the SNAP data unit is conveyed.

NOTE—This encapsulation was originally specified in IETF RFC 1042 [B1], which contains recommendations relating to its use. Further recommendations are contained in IETF RFC 1390 [B2].