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# Link-Layer Types for PCAP and PCAPNG Capture File Formats

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## Abstract

This document creates an IANA registry for the PCAP and PCAPNG LINKTYPE values. The PCAP and PCAPNG formats are used to save network captures from programs such as tcpdump and wireshark, when using libraries such as libpcap.

The RFC Editor will remove this note

## About This Document

This note is to be removed before publishing as an RFC.

Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-ietf-opsawg-pcaplinktype/>.

Discussion of this document takes place on the opsawg Working Group mailing list (<mailto:opsawg@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/opsawg/>. Subscribe at <https://www.ietf.org/mailman/listinfo/opsawg/>.

Source for this draft and an issue tracker can be found at <https://github.com/IETF-OPSAWG-WG/pcapng>.

## Status of This Memo

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## 1. Introduction

In the late 1980's, Van Jacobson, Steve McCanne, and others at the Network Research Group at Lawrence Berkeley National Laboratory developed the tcpdump program to capture and dissect network traces. The code to capture traffic, using low-level mechanisms in various operating systems, and to read and write network traces to a file was later put into a library named libpcap [LIBPCAP].

Other documents describe the original (legacy) format used by tcpdump (pcap), as well as the revised format (pcapng) which is used by tcpdump and Wireshark [Wireshark].

Within those formats each packet that is captured is described by a LINKTYPE value. The LINKTYPE value selects one of many hundred formats for metadata and Layer 2 encapsulation of the packet.

This document creates an IANA registry for the LINKTYPE format, establishing the IANA Considerations by which other uses of the pcap and pcapng formats may register new LINKTYPE values.

## 2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

## 3. IANA Considerations

### 3.1. PCAP Registry

IANA is requested to create a new registry group entitled "The PCAP Registry".

### 3.2. LinkType Registry

IANA is also requested to create a registry entitled "PCAP LinkType List" under The PCAP registry group ([Section 3.1](#)).

The registry has the following structure:

- **LINKTYPE Name:** Indicates the symbolic name for this LinkType. The name is prefixed with "LINKTYPE\_" (i.e., LINKTYPE\_something).
- **LINKTYPE Value:** Indicates the integer value assigned for this LinkType.
- **Description:** Provides a very short description.
- **Reference:** Indicates an authoritative the document reference for the LinkType or a requester reference.

The LinkType value is a 16-bit number. The policy allocation for the LinkType values is as follows:

- Values from 0 to 32767 must be allocated via Specification Required ([Section 4.6](#) of [[RFC8126](#)]). Guidance for Designated Experts is provided in Section X.
- Values from 32768 to 65000 are allocated following a First-Come First-Served policy ([Section 4.4](#) of [[RFC8126](#)]).
- Values from 65001 to 65535 are reserved for Private Use ([Section 4.1](#) of [[RFC8126](#)]).

The initial version of the registry is provided in [Section 3.2.1](#). In each case here, the reference should be to [\[TCPDUMP\]](#) and the RFC number to be assigned to this document, which is not repeated each time.

The initial values table is based upon the Link type list maintained by libpcap, and published on [\[TCPDUMP\]](#).

Note that historically, values were assigned incrementally following First Come First Served policy, with a preference for a public specification, but with no mandate. Some historical values may have less specification than desired.

LinkType values 147 to 162 named LINKTYPE\_RESERVED\_xx were originally reserved for Private Use. Their use is Deprecated in favour of the values in the 65001-65535 range.

In general, Private Use values should never leak out of the entity that uses it. As the First Come First Served range is large and easily obtained, official values are recommended.

There is often an associated DLT value which is often identical in value, but not universally so. DLT values are associated with specific operation system captures, and are operating system specific, and are thus not subject to standardization.

### 3.2.1. Initial Values

Option A: Initial Values of "PCAP LinkType List" Registry

Value: 0

Name: LINKTYPE\_NULL

Description: BSD loopback encapsulation

Reference: [\[LINKTYPE\\_NULL\]](#)

Value: 1

Name: LINKTYPE\_ETHERNET

Description: IEEE 802.3 Ethernet

Reference: -

Value: 189

Name: LINKTYPE\_USB\_LINUX

Description: USB packets, beginning with a Linux USB header, as specified by the struct `usbmon_packet` in the `Documentation/usb/usbmon.txt` file in the Linux source tree. Only the first 48 octets of that header are present. All fields in the header are in host byte order. When performing a live capture, the host byte order is the byte order of the machine on which the packets are captured. When reading a pcap file, the byte order is the byte order for the file, as specified by the file's magic number; when reading a pcapng file, the byte order is the byte order for the section of the pcapng file, as specified by the Section Header Block

Reference: -

Value: 237

Name: LINKTYPE\_STANAG\_5066\_D\_PDU

Description: D\_PDUs as described by NATO standard STANAG 5066, starting with the synchronization sequence, and including both header and data CRCs. The current version of STANAG 5066 is backwards-compatible with the 1.0.2 version , although newer versions are classified

Reference: [[STANAG-5066](#)]

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Option B: Initial Values of "PCAP LinkType List" Registry

Value	Name Description	Reference
0	LINKTYPE_NULL BSD loopback encapsulation	[ <a href="#">LINKTYPE_NULL</a> ]
1	LINKTYPE_ETHERNET IEEE 802.3 Ethernet	
189	LINKTYPE_USB_LINUX USB packets, beginning with a Linux USB header, as specified by the struct usbmon_packet in the Documentation/usb/usbmon.txt file in the Linux source tree. Only the first 48 octets of that header are present. All fields in the header are in host byte order. When performing a live capture, the host byte order is the byte order of the machine on which the packets are captured. When reading a pcap file, the byte order is the byte order for the file, as specified by the file's magic number; when reading a pcapng file, the byte order is the byte order for the section of the pcapng file, as specified by the Section Header Block	

Value	Name Description	Reference
237	LINKTYPE_STANAG_5066_D_PDU D_PDUs as described by NATO standard STANAG 5066, starting with the synchronization sequence, and including both header and data CRCs. The current version of STANAG 5066 is backwards-compatible with the 1.0.2 version , although newer versions are classified	[STANAG-5066]

Table 1: Initial Values of the "PCAP LinkType List" Registry

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