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G. Harris, Ed.  
M. Richardson  
Sandelman  
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Link-Layer Types for PCAP-related Capture File Formats  
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## Abstract

This document describes a set of PCAP-related LinkType values and creates an IANA registry for those values.

## 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

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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## 1. Introduction

In the late 1980s, 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) file format used by tcpdump (PCAP, [I-D.ietf-opsawg-pcap]), as well as a revised file format [I-D.ietf-opsawg-pcapng], both of which are used by tcpdump and Wireshark [Wireshark].

Within those file formats each packet that is captured is indicated 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 LinkType values, establishing the IANA Considerations by which other uses of the PCAP-related formats may register new LinkType values.

## 2. IANA Considerations

### 2.1. PCAP Registry

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

### 2.2. LinkType Registry

IANA is also requested to create a registry entitled "PCAP-related LinkType List" under The PCAP registry group (Section 2.1).

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 16-bit unsigned integer assigned for this LinkType.
- \* Description: Provides a very short description.
- \* Reference: Indicates an authoritative document reference for the LinkType or a requester reference.

The policy allocation for the LinkType values is as follows:

- \* Values from 0 to 65000 are allocated following a First-Come First-Served policy (Section 4.4 of [RFC8126]). Values in the ranges 0-10, 50-51, and 98-301 are already assigned; values in the ranges 11-49 and 52-97 MUST not be assigned.
- \* Values from 65001 to 65535 are reserved for Experimental Use (Section 4.2 of [RFC8126]).

The initial version of the registry is provided in Section 2.2.1. In each case here, the reference should be set to [TCPDUMP] and the RFC number to be assigned to this document, which is not repeated each time.

The initial contents of the table are based upon the link-layer header type list maintained by libpcap, and published on [TCPDUMP].

Note that historically, values were assigned incrementally following First Come First Served (FCFS) policy. A preference was made to have a public specification, but with no mandate to enforce this. Some historical values may have less specification than desired.

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

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

There is often an associated Data Link Type (DLT) value which is often identical in value, but not universally so. DLT values are associated with specific operating systems, and the numerical values for some of them are operating system specific, and are thus not subject to standardization.

#### 2.2.1. Initial Values

This is the initial table for the registry:

Name LINKTYPE\_NULL  
Number 0  
Description BSD loopback encapsulation  
Reference [LINKTYPE\_NULL]

Name LINKTYPE\_ETHERNET  
Number 1  
Description IEEE 802.3 Ethernet

Name LINKTYPE\_EXP\_ETHERNET  
Number 2  
Description Xerox experimental 3Mb Ethernet  
Reference [PracConsEthDesign]

Name LINKTYPE\_AX25  
Number 3  
Description AX.25 layer 2 packets  
Reference [LINKTYPE\_AX25]

Name LINKTYPE\_PRONET  
Number 4  
Description Reserved for Proteon PRONet Token Ring

Name LINKTYPE\_CHAOS  
Number 5

Description Reserved for MIT Chaosnet  
Reference [AIM-628]

Name LINKTYPE\_IEEE802\_5  
Number 6  
Description IEEE 802.5 Token Ring

Name LINKTYPE\_ARCNET\_BSD  
Number 7  
Description Reserved for ARCNET Data Packets with BSD encapsulation

Name LINKTYPE\_SLIP  
Number 8  
Description SLIP, with a direction header  
Reference [LINKTYPE\_SLIP]

Name LINKTYPE\_PPP  
Number 9  
Description PPP  
Reference [LINKTYPE\_PPP]

Name LINKTYPE\_FDDI  
Number 10  
Description FDDI: per ANSI INCITS 239-1994

Name Not available for assignment  
Number 11-49  
Description Do not use these values

Name LINKTYPE\_PPP\_HDLC  
Number 50  
Description PPP in HDLC-like framing  
Reference [LINKTYPE\_PPP\_HDLC]

Name LINKTYPE\_PPP\_ETHER  
Number 51  
Description PPPoE session packets  
Reference [LINKTYPE\_PPP\_ETHER]

Name Not available for assignment  
Number 52-98  
Description Do not use these values

Name LINKTYPE\_SYMANTEC\_FIREWALL  
Number 99  
Description Reserved for Symantec Enterprise Firewall

Name LINKTYPE\_ATM\_RFC1483

Number 100  
Description LLC/SNAP-encapsulated ATM  
Reference [LINKTYPE\_ATM\_RFC1483]

Name LINKTYPE\_RAW  
Number 101  
Description Raw IP; begins with an IPv4 or IPv6 header

Name LINKTYPE\_SLIP\_BSDOS  
Number 102  
Description Reserved for BSD/OS SLIP BPF header

Name LINKTYPE\_PPP\_BSDOS  
Number 103  
Description Reserved for BSD/OS PPP BPF header

Name LINKTYPE\_C\_HDLC  
Number 104  
Description Cisco PPP with HDLC framing  
Reference [LINKTYPE\_C\_HDLC]

Name LINKTYPE\_IEEE802\_11  
Number 105  
Description IEEE 802.11 wireless LAN

Name LINKTYPE\_ATM\_CLIP  
Number 106  
Description ATM Classical IP, with no header preceding IP

Name LINKTYPE\_FRELAY  
Number 107  
Description Frame Relay LAPF  
Reference [LINKTYPE\_FRELAY]

Name LINKTYPE\_LOOP  
Number 108  
Description OpenBSD loopback encapsulation  
Reference [LINKTYPE\_LOOP]

Name LINKTYPE\_ENC  
Number 109  
Description Reserved for OpenBSD IPsec encapsulation

Name LINKTYPE\_LANE8023  
Number 110  
Description Reserved for ATM LANE + 802.3

Name LINKTYPE\_HIPPI

Number 111  
Description Reserved for NetBSD HIPPI

Name LINKTYPE\_HDLC  
Number 112  
Description Reserved for NetBSD HDLC framing

Name LINKTYPE\_LINUX\_SLL  
Number 113  
Description Linux "cooked" capture encapsulation  
Reference [LINKTYPE\_LINUX\_SLL]

Name LINKTYPE\_LTALK  
Number 114  
Description Apple LocalTalk  
Reference [LINKTYPE\_LTALK]

Name LINKTYPE\_ECONET  
Number 115  
Description Reserved for Acorn Econet

Name LINKTYPE\_IPFILTER  
Number 116  
Description Reserved for OpenBSD ipfilter

Name LINKTYPE\_PFLOG  
Number 117  
Description Reserved for PF packet filter logging

Name LINKTYPE\_CISCO\_IOS  
Number 118  
Description Reserved for Cisco-internal use

Name LINKTYPE\_IEEE802\_11\_PRISM  
Number 119  
Description IEEE 802.11 wireless LAN, preceded by a Prism monitor  
mode header  
Reference [LINKTYPE\_IEEE802\_11\_PRISM]

Name LINKTYPE\_IEEE802\_11\_AIRONET  
Number 120  
Description Reserved for 802.11 + FreeBSD Aironet radio metadata

Name LINKTYPE\_HHDLC  
Number 121  
Description Reserved for Siemens HiPath HDLC

Name LINKTYPE\_IP\_OVER\_FC

Number 122  
Description IP and ATM over Fibre Channel  
Reference [LINKTYPE\_IP\_OVER\_FC]

Name LINKTYPE\_SUNATM  
Number 123  
Description ATM traffic captured from a SunATM device  
Reference [LINKTYPE\_SUNATM]

Name LINKTYPE\_RIO  
Number 124  
Description Reserved for RapidIO

Name LINKTYPE\_PCI\_EXP  
Number 125  
Description Reserved for PCI Express

Name LINKTYPE\_AURORA  
Number 126  
Description Reserved for Xilinx Aurora link layer

Name LINKTYPE\_IEEE802\_11\_RADIOTAP  
Number 127  
Description IEEE 802.11 wireless LAN, preceded by a Radiotap header  
Reference [Radiotap]

Name LINKTYPE\_TZSP  
Number 128  
Description Reserved for Tazmen Sniffer Protocol

Name LINKTYPE\_ARCNET\_LINUX  
Number 129  
Description Reserved for ARCNET Data Packets with Linux encapsulation

Name LINKTYPE\_JUNIPER\_MLPPP  
Number 130  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_MLFR  
Number 131  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_ES  
Number 132  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_GGSN



Number 133  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_MFR  
Number 134  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_ATM2  
Number 135  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_SERVICES  
Number 136  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_ATM1  
Number 137  
Description Reserved for Juniper Networks

Name LINKTYPE\_APPLE\_IP\_OVER\_IEEE1394  
Number 138  
Description Apple IP-over-IEEE 1394 cooked header  
Reference [LINKTYPE\_APPLE\_IP\_OVER\_IEEE1394]

Name LINKTYPE\_MTP2\_WITH\_PHDR  
Number 139  
Description SS7 MTP2 frames, with a pseudo-header  
Reference [LINKTYPE\_MTP2\_WITH\_PHDR]

Name LINKTYPE\_MTP2  
Number 140  
Description SS7 MTP2 packets  
Reference [LINKTYPE\_MTP2]

Name LINKTYPE\_MTP3  
Number 141  
Description SS7 MTP3 packets  
Reference [LINKTYPE\_MTP3]

Name LINKTYPE\_SCCP  
Number 142  
Description SS7 SCCP packets  
Reference [LINKTYPE\_SCCP]

Name LINKTYPE\_DOCSIS  
Number 143  
Description DOCSIS MAC frames  
Reference [DOCSIS-4.0-MULP]

Name LINKTYPE\_LINUX\_IRDA  
Number 144  
Description Linux-IrDA packets  
Reference [LINKTYPE\_LINUX\_IRDA]

Name LINKTYPE\_IBM\_SP  
Number 145  
Description Reserved for IBM SP switch

Name LINKTYPE\_IBM\_SN  
Number 146  
Description Reserved for IBM Next Federation switch

Name LINKTYPE\_RESERVED\_01  
Number 147  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_02  
Number 148  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_03  
Number 149  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_04  
Number 150  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_05  
Number 151  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_06  
Number 152  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_07  
Number 153  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_08  
Number 154  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_09  
Number 155  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_10  
Number 156  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_11  
Number 157  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_12  
Number 158  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_13  
Number 159  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_14  
Number 160  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_15  
Number 161  
Description For private use (deprecated)

Name LINKTYPE\_RESERVED\_16  
Number 162  
Description For private use (deprecated)

Name LINKTYPE\_IEEE802\_11\_AVS  
Number 163  
Description IEEE 802.11 wireless LAN, preceded by an AVS header  
Reference [AVS]

Name LINKTYPE\_JUNIPER\_MONITOR  
Number 164  
Description Reserved for Juniper Networks

Name LINKTYPE\_BACNET\_MS\_TP  
Number 165  
Description BACnet MS/TP frames  
Reference [LINKTYPE\_BACNET\_MS\_TP]

Name LINKTYPE\_PPP\_PPPD  
Number 166  
Description PPP preceded by a direction octet and an HDLC-like control field  
Reference [LINKTYPE\_PPP\_PPPD]

Name LINKTYPE\_JUNIPER\_PPPOE  
Number 167  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_PPPOE\_ATM  
Number 168  
Description Reserved for Juniper Networks

Name LINKTYPE\_GPRS\_LLC  
Number 169  
Description General Packet Radio Service Logical Link Control, as  
per 3GPP TS 04.64  
Reference [\_3GPP-TS-04.64]

Name LINKTYPE\_GPF\_T  
Number 170  
Description Transparent-mapped generic framing procedure  
Reference [G.7041]

Name LINKTYPE\_GPF\_F  
Number 171  
Description Frame-mapped generic framing procedure  
Reference [G.7041]

Name LINKTYPE\_GCOM\_T1E1  
Number 172  
Description Reserved for Gcom T1/E1 line monitoring equipment

Name LINKTYPE\_GCOM\_SERIAL  
Number 173  
Description Reserved for Gcom T1/E1 line monitoring equipment

Name LINKTYPE\_JUNIPER\_PIC\_PEER  
Number 174  
Description Reserved for Juniper Networks

Name LINKTYPE\_ERF\_ETH  
Number 175  
Description Endace TYPE\_ETH ERF records  
Reference [LINKTYPE\_ERF]

Name LINKTYPE\_ERF\_POS  
Number 176  
Description Endace TYPE\_POS\_HDLC ERF records  
Reference [LINKTYPE\_ERF]

Name LINKTYPE\_LINUX\_LAPD  
Number 177

Description Linux vISDN LAPD frames  
Reference [LINKTYPE\_LINUX\_LAPD]

Name LINKTYPE\_JUNIPER\_ETHER  
Number 178  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_PPP  
Number 179  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_FRELAY  
Number 180  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_CHDLC  
Number 181  
Description Reserved for Juniper Networks

Name LINKTYPE\_MFR  
Number 182  
Description FRF.16.1 Multi-Link Frame Relay frames  
Reference [LINKTYPE\_MFR]

Name LINKTYPE\_JUNIPER\_VP  
Number 183  
Description Reserved for Juniper Networks

Name LINKTYPE\_A429  
Number 184  
Description Reserved for ARINC 429 frames

Name LINKTYPE\_A653\_ICM  
Number 185  
Description Reserved for Arinc 653 Interpartition Communication  
messages

Name LINKTYPE\_USB\_FREEBSD  
Number 186  
Description Reserved for USB traffic captured on FreeBSD

Name LINKTYPE\_BLUETOOTH\_HCI\_H4  
Number 187  
Description Bluetooth HCI UART Transport Layer packets  
Reference [LINKTYPE\_BLUETOOTH\_HCI\_H4]

Name LINKTYPE\_IEEE802\_16\_MAC\_CPS  
Number 188

Description Reserved for IEEE 802.16 MAC Common Part Sublayer

Name LINKTYPE\_USB\_LINUX

Number 189

Description USB packets, beginning with a Linux USB header

Reference [LINKTYPE\_USB\_LINUX]

Name LINKTYPE\_CAN20B

Number 190

Description Reserved for Controller Area Network (CAN) v. 2.0B packets

Name LINKTYPE\_IEEE802\_15\_4\_LINUX

Number 191

Description Reserved for IEEE 802.15.4 with address fields padded by Linux

Name LINKTYPE\_PPI

Number 192

Description Per-Packet Information header preceding packet data

Reference [LINKTYPE\_PPI]

Name LINKTYPE\_IEEE802\_16\_MAC\_CPS\_RADIO

Number 193

Description Reserved for 802.16 MAC Common Part Sublayer plus radio header

Name LINKTYPE\_JUNIPER\_ISM

Number 194

Description Reserved for Juniper Networks

Name LINKTYPE\_IEEE802\_15\_4\_WITHFCS

Number 195

Description IEEE 802.15.4 with FCS

Reference [LINKTYPE\_IEEE802\_15\_4\_WITHFCS]

Name LINKTYPE\_SITA

Number 196

Description Various link-layer types, with a pseudo-header

Reference [LINKTYPE\_SITA]

Name LINKTYPE\_ERF

Number 197

Description Endace ERF records

Reference [LINKTYPE\_ERF]

Name LINKTYPE\_RAIF1

Number 198

Description Reserved for Ethernet packets captured from a u10  
Networks board

Name LINKTYPE\_IPMB\_KONTRON

Number 199

Description Reserved for IPMB packet for IPMI, with a 2-octet header

Name LINKTYPE\_JUNIPER\_ST

Number 200

Description Reserved for Juniper Networks

Name LINKTYPE\_BLUETOOTH\_HCI\_H4\_WITH\_PHDR

Number 201

Description Bluetooth HCI UART Transport Layer packets with a  
direction pseudo-header

Reference [LINKTYPE\_BLUETOOTH\_HCI\_H4\_WITH\_PHDR]

Name LINKTYPE\_AX25\_KISS

Number 202

Description KISS frames between a host and an AX.25 TNC

Reference [LINKTYPE\_AX25\_KISS]

Name LINKTYPE\_LAPD

Number 203

Description Q.921 LAPD frames

Reference [LINKTYPE\_LAPD]

Name LINKTYPE\_PPP\_WITH\_DIR

Number 204

Description PPP, with a direction header

Reference [LINKTYPE\_PPP\_WITH\_DIR]

Name LINKTYPE\_C\_HDLC\_WITH\_DIR

Number 205

Description Cisco PPP with HDLC framing, with a direction header

Reference [LINKTYPE\_C\_HDLC\_WITH\_DIR]

Name LINKTYPE\_FRELAY\_WITH\_DIR

Number 206

Description Frame Relay LAPF, with a direction header

Reference [LINKTYPE\_FRELAY\_WITH\_DIR]

Name LINKTYPE\_LAPB\_WITH\_DIR

Number 207

Description X.25 LAPB, with a direction header

Reference [LINKTYPE\_LAPB\_WITH\_DIR]

Name Reserved

Number 208  
Description Reserved for an unspecified link-layer type

Name LINKTYPE\_I2C\_LINUX  
Number 209  
Description Linux I2C packets  
Reference [LINKTYPE\_I2C\_LINUX]

Name LINKTYPE\_FLEXRAY  
Number 210  
Description FlexRay frames or symbols, with a pseudo-header  
Reference [LINKTYPE\_FLEXRAY]

Name LINKTYPE\_MOST  
Number 211  
Description Reserved for Media Oriented Systems Transport (MOST) bus

Name LINKTYPE\_LIN  
Number 212  
Description Local Interconnect Network (LIN) automotive bus, with a metadata header  
Reference [LINKTYPE\_LIN]

Name LINKTYPE\_X2E\_SERIAL  
Number 213  
Description Reserved for X2E serial line captures

Name LINKTYPE\_X2E\_XORAYA  
Number 214  
Description Reserved for X2E Xoraya data loggers

Name LINKTYPE\_IEEE802\_15\_4\_NONASK\_PHY  
Number 215  
Description IEEE 802.15.4 with PHY header  
Reference [LINKTYPE\_IEEE802\_15\_4\_NONASK\_PHY]

Name LINKTYPE\_LINUX\_EVDEV  
Number 216  
Description Reserved for Linux evdev messages

Name LINKTYPE\_GSM\_TAP\_UM  
Number 217  
Description Reserved for GSM Um interface, with gsm\_tap header

Name LINKTYPE\_GSM\_TAP\_ABIS  
Number 218  
Description Reserved for GSM Abis interface, with gsm\_tap header



Name LINKTYPE\_MPLS  
Number 219  
Description MPLS packets with MPLS label as the header

Name LINKTYPE\_USB\_LINUX\_MMAPPED  
Number 220  
Description USB packets, beginning with an extended Linux USB header  
Reference [LINKTYPE\_USB\_LINUX\_MMAPPED]

Name LINKTYPE\_DECT  
Number 221  
Description Reserved for DECT packets, with a pseudo-header

Name LINKTYPE\_AOS  
Number 222  
Description Reserved for OS Space Data Link Protocol

Name LINKTYPE\_WIHART  
Number 223  
Description Reserved for Wireless HART (Highway Addressable Remote Transducer)

Name LINKTYPE\_FC\_2  
Number 224  
Description Fibre Channel FC-2 frames  
Reference [LINKTYPE\_FC\_2]

Name LINKTYPE\_FC\_2\_WITH\_FRAME\_DELIMS  
Number 225  
Description Fibre Channel FC-2 frames with SOF and EOF  
Reference [LINKTYPE\_FC\_2\_WITH\_FRAME\_DELIMS]

Name LINKTYPE\_IPNET  
Number 226  
Description Solaris ipnet  
Reference [LINKTYPE\_IPNET]

Name LINKTYPE\_CAN\_SOCKETCAN  
Number 227  
Description Controller Area Network (CAN) frames, with a metadata header  
Reference [LINKTYPE\_CAN\_SOCKETCAN]

Name LINKTYPE\_IPV4  
Number 228  
Description Raw IPv4; the packet begins with an IPv4 header

Name LINKTYPE\_IPV6

Number 229  
Description Raw IPv6; the packet begins with an IPv6 header

Name LINKTYPE\_IEEE802\_15\_4\_NOFCS  
Number 230  
Description IEEE 802.15.4 without FCS  
Reference [LINKTYPE\_IEEE802\_15\_4\_NOFCS]

Name LINKTYPE\_DBUS  
Number 231  
Description D-Bus messages  
Reference [LINKTYPE\_DBUS]

Name LINKTYPE\_JUNIPER\_VS  
Number 232  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_SRX\_E2E  
Number 233  
Description Reserved for Juniper Networks

Name LINKTYPE\_JUNIPER\_FIBRECHANNEL  
Number 234  
Description Reserved for Juniper Networks

Name LINKTYPE\_DVB\_CI  
Number 235  
Description DVB-CI messages, with a pseudo-header  
Reference [DVB-CI-PCAP]

Name LINKTYPE\_MUX27010  
Number 236  
Description Variant of 3GPP TS 27.010 multiplexing protocol  
Reference [LINKTYPE\_MUX27010]

Name LINKTYPE\_STANAG\_5066\_D\_PDU  
Number 237  
Description STANAG 5066 D\_PDUs  
Reference [LINKTYPE\_STANAG\_5066\_D\_PDU]

Name LINKTYPE\_JUNIPER\_ATM\_CEMIC  
Number 238  
Description Reserved for Juniper Networks

Name LINKTYPE\_NFLOG  
Number 239  
Description Linux netlink NETLINK NFLOG socket log messages  
Reference [LINKTYPE\_NFLOG]

Name LINKTYPE\_NETANALYZER  
Number 240  
Description Ethernet frames with netANALYZER pseudo-header  
Reference [LINKTYPE\_NETANALYZER]

Name LINKTYPE\_NETANALYZER\_TRANSPARENT  
Number 241  
Description Ethernet frames with netANALYZER pseudo-header,  
preamble, and SFD  
Reference [LINKTYPE\_NETANALYZER\_TRANSPARENT]

Name LINKTYPE\_IPOIB  
Number 242  
Description IP-over-InfiniBand  
Reference [LINKTYPE\_IPOIB]

Name LINKTYPE\_MPEG\_2\_TS  
Number 243  
Description MPEG-2 Transport Stream transport packets  
Reference [LINKTYPE\_MPEG\_2\_TS]

Name LINKTYPE\_NG40  
Number 244  
Description Frames from ng4T GmbH's ng40 protocol tester  
Reference [LINKTYPE\_NG40]

Name LINKTYPE\_NFC\_LLCP  
Number 245  
Description NFC Logical Link Control Protocol frames, with a pseudo-  
header  
Reference [LINKTYPE\_NFC\_LLCP]

Name LINKTYPE\_PFSYNC  
Number 246  
Description Reserved for pfsync output

Name LINKTYPE\_INFINIBAND  
Number 247  
Description InfiniBand data packets  
Reference [LINKTYPE\_INFINIBAND]

Name LINKTYPE\_SCTP  
Number 248  
Description SCTP packets, with no lower-level protocols such as IPv4  
or IPv6  
Reference [RFC9260]

Name LINKTYPE\_USBPCAP

Number 249  
Description USB packets, beginning with a USBPcap header  
Reference [USBPcap]

Name LINKTYPE\_RTAC\_SERIAL  
Number 250  
Description Serial-line packet from the Schweitzer Engineering  
Laboratories RTAC product  
Reference [LINKTYPE\_RTAC\_SERIAL]

Name LINKTYPE\_BLUETOOTH\_LE\_LL  
Number 251  
Description Bluetooth Low Energy link-layer packets  
Reference [LINKTYPE\_BLUETOOTH\_LE\_LL]

Name LINKTYPE\_WIRESHARK\_UPPER\_PDU  
Number 252  
Description Reserved for Wireshark

Name LINKTYPE\_NETLINK  
Number 253  
Description Linux Netlink capture encapsulation  
Reference [LINKTYPE\_NETLINK]

Name LINKTYPE\_BLUETOOTH\_LINUX\_MONITOR  
Number 254  
Description Bluetooth Linux Monitor  
Reference [LINKTYPE\_BLUETOOTH\_LINUX\_MONITOR]

Name LINKTYPE\_BLUETOOTH\_BREDR\_BB  
Number 255  
Description Bluetooth Basic Rate and Enhanced Data Rate baseband  
packets  
Reference [LINKTYPE\_BLUETOOTH\_BREDR\_BB]

Name LINKTYPE\_BLUETOOTH\_LE\_LL\_WITH\_PHDR  
Number 256  
Description Bluetooth Low Energy link-layer packets  
Reference [LINKTYPE\_BLUETOOTH\_LE\_LL\_WITH\_PHDR]

Name LINKTYPE\_PROFIBUS\_DL  
Number 257  
Description PROFIBUS data link layer packets  
Reference [LINKTYPE\_PROFIBUS\_DL]

Name LINKTYPE\_PKTAP  
Number 258  
Description Apple PKTAP capture encapsulation

Reference [LINKTYPE\_PKTAP]

Name LINKTYPE\_EPON

Number 259

Description Ethernet-over-passive-optical-network packets, including preamble octets

Reference [LINKTYPE\_EPON]

Name LINKTYPE\_IPMI\_HPM\_2

Number 260

Description IPMI HPM.2 trace packets

Reference [LINKTYPE\_IPMI\_HPM\_2]

Name LINKTYPE\_ZWAVE\_R1\_R2

Number 261

Description Z-Wave RF profile R1 and R2 packets

Reference [LINKTYPE\_ZWAVE\_R1\_R2]

Name LINKTYPE\_ZWAVE\_R3

Number 262

Description Z-Wave RF profile R3 packets

Reference [LINKTYPE\_ZWAVE\_R3]

Name LINKTYPE\_WATTSTOPPER\_DLM

Number 263

Description WattStopper Digital Lighting Management (DLM) and Legrand Nitoo Open protocol packets

Reference [LINKTYPE\_WATTSTOPPER\_DLM]

Name LINKTYPE\_ISO\_14443

Number 264

Description ISO 14443 contactless smartcard messages

Reference [ISO-14443-PCAP]

Name LINKTYPE\_RDS

Number 265

Description IEC 62106 Radio data system (RDS) groups

Reference [LINKTYPE\_RDS]

Name LINKTYPE\_USB\_DARWIN

Number 266

Description USB packets captured on a Darwin-based operating system (macOS, etc.)

Reference [LINKTYPE\_USB\_DARWIN]

Name LINKTYPE\_OPENFLOW

Number 267

Description Reserved for OpenBSD DLT\_OPENFLOW

Name LINKTYPE\_SDLC  
Number 268  
Description SNA SDLC packets  
Reference [LINKTYPE\_SDLC]

Name LINKTYPE\_TI\_LLN\_SNIFFER  
Number 269  
Description Reserved for Texas Instruments protocol sniffer

Name LINKTYPE\_LORATAP  
Number 270  
Description LoRaWan packets with a LoRaTap pseudo-header  
Reference [LINKTYPE\_LORATAP]

Name LINKTYPE\_VSOCK  
Number 271  
Description Protocol for communication between host and guest  
machines in VMware and KVM hypervisors  
Reference [LINKTYPE\_VSOCK]

Name LINKTYPE\_NORDIC\_BLE  
Number 272  
Description Messages to and from a Nordic Semiconductor nRF Sniffer  
for Bluetooth LE packets  
Reference [LINKTYPE\_NORDIC\_BLE]

Name LINKTYPE\_DOCSIS31\_XRA31  
Number 273  
Description DOCSIS packets and bursts, preceded by a pseudo-header  
Reference [DOCSIS-XRA] [DOCSIS-4.0-MULP]

Name LINKTYPE\_ETHERNET\_MPACKET  
Number 274  
Description IEEE 802.3 mPackets  
Reference [LINKTYPE\_ETHERNET\_MPACKET]

Name LINKTYPE\_DISPLAYPORT\_AUX  
Number 275  
Description DisplayPort AUX channel monitoring messages  
Reference [LINKTYPE\_DISPLAYPORT\_AUX]

Name LINKTYPE\_LINUX\_SLL2  
Number 276  
Description Linux cooked capture encapsulation v2  
Reference [LINKTYPE\_LINUX\_SLL2]

Name LINKTYPE\_SERCOS\_MONITOR  
Number 277

Description Reserved for Sercos Monitor

Name LINKTYPE\_OPENVIZSLA

Number 278

Description OpenVizsla FPGA-based USB sniffer

Reference [OpenVizsla]

Name LINKTYPE\_EBHSCR

Number 279

Description Elektrobit High Speed Capture and Replay (EBHSCR) format

Reference [EBHSCR]

Name LINKTYPE\_VPP\_DISPATCH

Number 280

Description fd.io VPP graph dispatcher trace records

Reference [FD.io-VPP]

Name LINKTYPE\_DSA\_TAG\_BRCM

Number 281

Description Ethernet frames, with a Broadcom switch tag inserted

Reference [LINKTYPE\_DSA\_TAG\_BRCM]

Name LINKTYPE\_DSA\_TAG\_BRCM\_PREPEND

Number 282

Description Ethernet frames, with a Broadcom switch tag prepended

Reference [LINKTYPE\_DSA\_TAG\_BRCM\_PREPEND]

Name LINKTYPE\_IEEE802\_15\_4\_TAP

Number 283

Description IEEE 802.15.4 with a tap header preceding it

Reference [Exegin-802.15.4-TAP]

Name LINKTYPE\_DSA\_TAG\_DSA

Number 284

Description Ethernet frames, with a Marvell DSA switch tag inserted

Reference [LINKTYPE\_DSA\_TAG\_DSA]

Name LINKTYPE\_DSA\_TAG\_EDSA

Number 285

Description Ethernet frames, with a Marvell EDSA switch tag inserted

Reference [LINKTYPE\_DSA\_TAG\_EDSA]

Name LINKTYPE\_ELEE

Number 286

Description Reserved for ELEE lawful intercept protocol

Name LINKTYPE\_Z\_WAVE\_SERIAL

Number 287

Description Serial frames transmitted between a host and a Z-Wave chip over an RS-232 or USB serial connection  
Reference [Z\_WAVE\_SERIAL] section 5

Name LINKTYPE\_USB\_2\_0  
Number 288  
Description USB 2.0, 1.1, or 1.0 packets  
Reference [LINKTYPE\_USB\_2\_0]

Name LINKTYPE\_ATSC\_ALP  
Number 289  
Description ATSC Link-Layer Protocol frames  
Reference [LINKTYPE\_ATSC\_ALP]

Name LINKTYPE\_ETW  
Number 290  
Description Event Tracing for Windows messages  
Reference [LINKTYPE\_ETW]

Name LINKTYPE\_NETANALYZER\_NG  
Number 291  
Description Reserved for Hilscher Gesellschaft fuer Systemautomation mbH netANALYZER NG hardware and software

Name LINKTYPE\_ZBOSS\_NCP  
Number 292  
Description ZBOSS NCP Serial Protocol, with a pseudo-header  
Reference [LINKTYPE\_ZBOSS\_NCP]

Name LINKTYPE\_USB\_2\_0\_LOW\_SPEED  
Number 293  
Description Low-Speed USB 2.0, 1.1, or 1.0 packets  
Reference [LINKTYPE\_USB\_2\_0\_LOW\_SPEED]

Name LINKTYPE\_USB\_2\_0\_FULL\_SPEED  
Number 294  
Description Full-Speed USB 2.0, 1.1, or 1.0 packets  
Reference [LINKTYPE\_USB\_2\_0\_FULL\_SPEED]

Name LINKTYPE\_USB\_2\_0\_HIGH\_SPEED  
Number 295  
Description High-Speed USB 2.0 packets  
Reference [LINKTYPE\_USB\_2\_0\_HIGH\_SPEED]

Name LINKTYPE\_AUERSWALD\_LOG  
Number 296  
Description Auerswald Logger Protocol  
Reference [Auerswald-Logger]



Name LINKTYPE\_ZWAVE\_TAP  
Number 297  
Description Z-Wave packets, with a metadata header  
Reference [LINKTYPE\_ZWAVE\_TAP]

Name LINKTYPE\_SILABS\_DEBUG\_CHANNEL  
Number 298  
Description Silicon Labs debug channel protocol  
Reference [Silabs-Debug-Channel]

Name LINKTYPE\_FIRA\_UCI  
Number 299  
Description Ultra-wideband (UWB) controller interface protocol (UCI)  
Reference [LINKTYPE\_FIRA\_UCI]

Name LINKTYPE\_MDB  
Number 300  
Description MDB (Multi-Drop Bus) protocol  
Reference [MDB-PCAP]

Name LINKTYPE\_DECT\_NR  
Number 301  
Description DECT-2020 New Radio (NR) MAC layer  
Reference [LINKTYPE\_DECT\_NR]

#### 2.2.2. Guidance for Designated Experts

When processing a request for an allocation, the Designated Experts will encourage the requester to provide a specification at a stable URL. There is no requirement for a specification, but often review of the specification allows the Designated Expert to determine if the allocation actually is a duplicate of another specification.

When the contents of the link type can contain an IPv4 or IPv6 header, then the octets between the beginning of the link type and the IP header needs to be clear.

Specifications that are not publicly available, but which may be obtained via liaison agreements (such as to ITU-T, 3GPP, IEEE, etc.) are acceptable particularly if the specification document will be public eventually, but are discouraged. For other documents, the Designated Expert will need use their judgement, or consult the OPSAWG or an Area Director.

LinkTypes may be allocated for specifications not publicly available may be made within the FCFS range. This includes specifications that might be subject to a security classification. The minimal requirement is to provide a contact person for that link type.

### 3. Security Considerations

This document describes the IANA registration rules for the LinkType encapsulations. PCAP-related packet file formats use this value to determine what kind of headers precede network packet captures. Many of these formats can contain IPv4 and IPv6 packets. A system reading PCAP-related format captures can be subject to arbitrary inputs that may be controlled by malicious entities, so utmost caution is required.

Many LinkType formats include a "snapshot" length, which may be smaller than the actual packet. It is therefore very likely that trailing parts of a packet capture may be omitted, yet internal length fields in the packets will claim the packet is bigger than the capture. This leads to trivial buffer overreads, and systems interpreting the packets need to carefully scrutinize all attempts to read data from a capture.

### 4. Contributors

PCAP has been developed over three and half decades by a variety of developers, including: Bill Fenner, Denis Ovsienko, Francois-Xavier Le Bail, Fulvio Rizzo, Gerald Combs, Gianluca Varenni, Gisle Vanem, Hannes Gredler, Joerg Mayer, Michal Sekletar, Stephen Donnelly, Torsten Landschoff, and Jun-ichiro itojun Hagino.

PCAP was originally created at LBL by Steve McCanne, Craig Leres, and Van Jacobson.

### 5. Acknowledgments

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### 6. References

#### 6.1. Normative References

- [RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <<https://www.rfc-editor.org/rfc/rfc8126>>.

#### 6.2. Informative References

- [TCPDUMP] "LINK-LAYER HEADER TYPES", <<https://www.tcpdump.org/linktypes.html>>.

[LIBPCAP] "libpcap", <<https://github.com/the-tcpdump-group/libpcap>>.

[Wireshark]  
"Homepage of Wireshark", <<https://www.wireshark.org>>.

[\_3GPP-TS-04.64]  
"Digital cellular telecommunications system (Phase 2+);  
General Packet Radio Service (GPRS); Mobile Station -  
Serving GPRS Support Node (MS-SGSN) Logical Link Control  
(LLC) layer specification", 3GPP TS 04.64.

[AIM-628] Moon, D. A., "Chaosnet", MIT A.I. Memo No. 628, June 1981,  
<[http://www.bitsavers.org/pdf/mit/ai/AIM-628\\_chaosnet.pdf](http://www.bitsavers.org/pdf/mit/ai/AIM-628_chaosnet.pdf)>.

[Auerswald-Logger]  
"Packet structure", n.d., <<https://github.com/Auerswald-GmbH/auerlog/blob/master/auerlog.txt>>.

[AVS] Peachy, S., "AVS Capture Frame Format Version 2",  
<<http://web.archive.org/web/20040803232023/http://www.shaftnet.org/~pizza/software/capturefrm.txt>>.

[DOCSIS-4.0-MULP]  
"DOCSIS 4.0 MAC and Upper Layer Protocols Interface  
Specification", <<https://www.cablelabs.com/specifications/CM-SP-MULPIv4.0>>.

[DOCSIS-XRA]  
"Excentis XRA Header Definition",  
<<https://support.excentis.com/knowledge/article/45>>.

[DVB-CI-PCAP]  
Kaiser, M., "PCAP format for DVB-CI", January 2021,  
<<https://www.kaiser.cx/posts/pcap-dvbci/>>.

[EBHSCR] "Documentation EBHSCR",  
<<http://www.elektrobit.com/ebhscr>>.

[Exegin-802.15.4-TAP]  
"IEEE 802.15.4 TAP Link Type Specification",  
<<https://gitlab.com/exegin/ieee802-15-4-tap>>.

[FD.io-VPP]  
"VNET (VPP Network Stack)", <<https://fdio-vpp.readthedocs.io/en/latest/gettingstarted/developers/vnet.html>>.

[G.7041] "Generic Framing Procedure", ITU-T Recommendation G.7041/Y.1303, <<https://www.itu.int/rec/T-REC-G.7041/en>>.

[ISO-14443-PCAP]  
Kaiser, M., "PCAP format for ISO14443", January 2021,  
<<https://www.kaiser.cx/posts/pcap-iso14443/>>.

[LINKTYPE\_APPLE\_IP\_OVER\_IEEE1394]  
"LINKTYPE\_APPLE\_IP\_OVER\_IEEE1394",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_APPLE\\_IP\\_OVER\\_IEEE1394.html](https://www.tcpdump.org/linktypes/LINKTYPE_APPLE_IP_OVER_IEEE1394.html)>.

[LINKTYPE\_ATM\_RFC1483]  
"LINKTYPE\_ATM\_RFC1483",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_ATM\\_RFC1483.html](https://www.tcpdump.org/linktypes/LINKTYPE_ATM_RFC1483.html)>.

[LINKTYPE\_ATSC\_ALP]  
"LINKTYPE\_ATSC\_ALP", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_ATSC\\_ALP.html](https://www.tcpdump.org/linktypes/LINKTYPE_ATSC_ALP.html)>.

[LINKTYPE\_AX25]  
"LINKTYPE\_AX25",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_AX25.html](https://www.tcpdump.org/linktypes/LINKTYPE_AX25.html)>.

[LINKTYPE\_AX25\_KISS]  
"LINKTYPE\_AX25\_KISS", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_AX25\\_KISS.html](https://www.tcpdump.org/linktypes/LINKTYPE_AX25_KISS.html)>.

[LINKTYPE\_BACNET\_MS\_TP]  
"LINKTYPE\_BACNET\_MS\_TP",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_BACNET\\_MS\\_TP.html](https://www.tcpdump.org/linktypes/LINKTYPE_BACNET_MS_TP.html)>.

[LINKTYPE\_BLUETOOTH\_BREDR\_BB]  
"LINKTYPE\_BLUETOOTH\_BREDR\_BB",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_BLUETOOTH\\_BREDR\\_BB.html](https://www.tcpdump.org/linktypes/LINKTYPE_BLUETOOTH_BREDR_BB.html)>.

[LINKTYPE\_BLUETOOTH\_HCI\_H4]  
"LINKTYPE\_BLUETOOTH\_HCI\_H4",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_BLUETOOTH\\_HCI\\_H4.html](https://www.tcpdump.org/linktypes/LINKTYPE_BLUETOOTH_HCI_H4.html)>.

[LINKTYPE\_BLUETOOTH\_HCI\_H4\_WITH\_PHDR]  
"LINKTYPE\_BLUETOOTH\_HCI\_H4\_WITH\_PHDR",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_BLUETOOTH\\_HCI\\_H4\\_WITH\\_PHDR.html](https://www.tcpdump.org/linktypes/LINKTYPE_BLUETOOTH_HCI_H4_WITH_PHDR.html)>.

```
[LINKTYPE_BLUETOOTH_LE_LL]
    "LINKTYPE_BLUETOOTH_LE_LL",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_BLUETOOTH_LE_LL.html>.

[LINKTYPE_BLUETOOTH_LE_LL_WITH_PHDR]
    "LINKTYPE_BLUETOOTH_LE_LL_WITH_PHDR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_BLUETOOTH_LE_LL_WITH_PHDR.html>.

[LINKTYPE_BLUETOOTH_LINUX_MONITOR]
    "LINKTYPE_BLUETOOTH_LINUX_MONITOR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_BLUETOOTH_LINUX_MONITOR.html>.

[LINKTYPE_C_HDLC]
    "LINKTYPE_C_HDLC",
    <https://www.tcpdump.org/linktypes/LINKTYPE_C_HDLC.html>.

[LINKTYPE_C_HDLC_WITH_DIR]
    "LINKTYPE_C_HDLC_WITH_DIR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_C_HDLC_WITH_DIR.html>.

[LINKTYPE_CAN_SOCKETCAN]
    "LINKTYPE_CAN_SOCKETCAN",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_CAN_SOCKETCAN.html>.

[LINKTYPE_DBUS]
    "LINKTYPE_DBUS",
    <https://www.tcpdump.org/linktypes/LINKTYPE_DBUS.html>.

[LINKTYPE_DECT_NR]
    "LINKTYPE_DECT_NR",
    <https://www.tcpdump.org/linktypes/LINKTYPE_DECT_NR.html>.

[LINKTYPE_DISPLAYPORT_AUX]
    "LINKTYPE_DISPLAYPORT_AUX",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_DISPLAYPORT_AUX.html>.

[LINKTYPE_DSA_TAG_BRCM]
    "LINKTYPE_DSA_TAG_BRCM",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_DSA_TAG_BRCM.html>.
```

```
[LINKTYPE_DSA_TAG_BRCM_PREPEND]
    "LINKTYPE_DSA_TAG_BRCM_PREPEND",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_DSA_TAG_BRCM_PREPEND.html>.

[LINKTYPE_DSA_TAG_DSA]
    "LINKTYPE_DSA_TAG_DSA",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_DSA_TAG_DSA.html>.

[LINKTYPE_DSA_TAG_EDSA]
    "LINKTYPE_DSA_TAG_EDSA",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_DSA_TAG_EDSA.html>.

[LINKTYPE_EPON]
    "LINKTYPE_EPON",
    <https://www.tcpdump.org/linktypes/LINKTYPE_EPON.html>.

[LINKTYPE_ERF]
    "LINKTYPE_ERF",
    <https://www.tcpdump.org/linktypes/LINKTYPE_ERF.html>.

[LINKTYPE_ETW]
    "LINKTYPE_ETW",
    <https://www.tcpdump.org/linktypes/LINKTYPE_ETW.html>.

[LINKTYPE_ETHERNET_MPACKE]
    "LINKTYPE_ETHERNET_MPACKE",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_ETHERNET_MPACKE.html>.

[LINKTYPE_FC_2]
    "LINKTYPE_FC_2",
    <https://www.tcpdump.org/linktypes/LINKTYPE_FC_2.html>.

[LINKTYPE_FC_2_WITH_FRAME_DELIMS]
    "LINKTYPE_FC_2_WITH_FRAME_DELIMS",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_FC_2_WITH_FRAME_DELIMSa.html>.

[LINKTYPE_FIRA_UCI]
    "LINKTYPE_FIRA_UCI", <https://www.tcpdump.org/linktypes/
    LINKTYPE_FIRA_UCI.html>.

[LINKTYPE_FLEXRAY]
    "LINKTYPE_FLEXRAY",
    <https://www.tcpdump.org/linktypes/LINKTYPE_FLEXRAY.html>.
```

```
[LINKTYPE_FRELAY]
    "LINKTYPE_FRELAY",
    <https://www.tcpdump.org/linktypes/LINKTYPE_FRELAY.html>.

[LINKTYPE_FRELAY_WITH_DIR]
    "LINKTYPE_FRELAY_WITH_DIR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_FRELAY_WITH_DIR.html>.

[LINKTYPE_I2C_LINUX]
    "LINKTYPE_I2C_LINUX", <https://www.tcpdump.org/linktypes/
    LINKTYPE_I2C_LINUX.html>.

[LINKTYPE_IEEE802_11_PRISM]
    "LINKTYPE_IEEE802_11_PRISM",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_IEEE802_11_PRISM.html>.

[LINKTYPE_IEEE802_15_4_NOFCS]
    "LINKTYPE_IEEE802_15_4_NOFCS",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_IEEE802_15_4_NOFCS.html>.

[LINKTYPE_IEEE802_15_4_NONASK_PHY]
    "LINKTYPE_IEEE802_15_4_NONASK_PHY",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_IEEE802_15_4_NONASK_PHY.html>.

[LINKTYPE_IEEE802_15_4_WITHFCS]
    "LINKTYPE_IEEE802_15_4_WITHFCS",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_IEEE802_15_4_WITHFCS.html>.

[LINKTYPE_IPOIB]
    "LINKTYPE_IPOIB",
    <https://www.tcpdump.org/linktypes/LINKTYPE_IPOIB.html>.

[LINKTYPE_IP_OVER_FC]
    "LINKTYPE_IP_OVER_FC", <https://www.tcpdump.org/linktypes/
    LINKTYPE_IP_OVER_FC.html>.

[LINKTYPE_INFINIBAND]
    "LINKTYPE_INFINIBAND", <https://www.tcpdump.org/linktypes/
    LINKTYPE_INFINIBAND.html>.

[LINKTYPE_IPMI_HPM_2]
    "LINKTYPE_IPMI_HPM_2", <https://www.tcpdump.org/linktypes/
    LINKTYPE_IPMI_HPM_2.html>.
```

```
[LINKTYPE_IPNET]
    "LINKTYPE_IPNET",
    <https://www.tcpdump.org/linktypes/LINKTYPE_IPNET.html>.

[LINKTYPE_LAPB_WITH_DIR]
    "LINKTYPE_LAPB_WITH_DIR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_LAPB_WITH_DIR.html>.

[LINKTYPE_LAPD]
    "LINKTYPE_LAPD",
    <https://www.tcpdump.org/linktypes/LINKTYPE_LAPD.html>.

[LINKTYPE_LIN]
    "LINKTYPE_LIN",
    <https://www.tcpdump.org/linktypes/LINKTYPE_LIN.html>.

[LINKTYPE_LINUX_IRDA]
    "LINKTYPE_LINUX_IRDA", <https://www.tcpdump.org/linktypes/
    LINKTYPE_LINUX_IRDA.html>.

[LINKTYPE_LINUX_LAPD]
    "LINKTYPE_LINUX_LAPD", <https://www.tcpdump.org/linktypes/
    LINKTYPE_LINUX_LAPD.html>.

[LINKTYPE_LINUX_SLL]
    "LINKTYPE_LINUX_SLL", <https://www.tcpdump.org/linktypes/
    LINKTYPE_LINUX_SLL.html>.

[LINKTYPE_LINUX_SLL2]
    "LINKTYPE_LINUX_SLL2", <https://www.tcpdump.org/linktypes/
    LINKTYPE_LINUX_SLL2.html>.

[LINKTYPE_LOOP]
    "LINKTYPE_LOOP",
    <https://www.tcpdump.org/linktypes/LINKTYPE_LOOP.html>.

[LINKTYPE_LORATAP]
    "LINKTYPE_LORATAP",
    <https://www.tcpdump.org/linktypes/LINKTYPE_LORATAP.html>.

[LINKTYPE_LTALK]
    "LINKTYPE_LTALK",
    <https://www.tcpdump.org/linktypes/LINKTYPE_LTALK.html>.

[LINKTYPE_MFR]
    "LINKTYPE_MFR",
    <https://www.tcpdump.org/linktypes/LINKTYPE_MFR.html>.
```



```
[LINKTYPE_MPEG_2_TS]
    "LINKTYPE_MPEG_2_TS", <https://www.tcpdump.org/linktypes/
    LINKTYPE_MPEG_2_TS.html>.

[LINKTYPE_MTP2]
    "LINKTYPE_MTP2",
    <https://www.tcpdump.org/linktypes/LINKTYPE_MTP2.html>.

[LINKTYPE_MTP2_WITH_PHDR]
    "LINKTYPE_MTP2_WITH_PHDR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_MTP2_WITH_PHDR.html>.

[LINKTYPE_MTP3]
    "LINKTYPE_MTP3",
    <https://www.tcpdump.org/linktypes/LINKTYPE_MTP3.html>.

[LINKTYPE_SCCP]
    "LINKTYPE_SCCP",
    <https://www.tcpdump.org/linktypes/LINKTYPE_SCCP.html>.

[LINKTYPE_MUX27010]
    "LINKTYPE_MUX27010", <https://www.tcpdump.org/linktypes/
    LINKTYPE_MUX27010.html>.

[LINKTYPE_NETANALYZER]
    "LINKTYPE_NETANALYZER",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_NETANALYZER.html>.

[LINKTYPE_NETANALYZER_TRANSPARENT]
    "LINKTYPE_NETANALYZER_TRANSPARENT",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_NETANALYZER_TRANSPARENT.html>.

[LINKTYPE_NETLINK]
    "LINKTYPE_NETLINK",
    <https://www.tcpdump.org/linktypes/LINKTYPE_NETLINK.html>.

[LINKTYPE_NFC_LLCP]
    "LINKTYPE_NFC_LLCP", <https://www.tcpdump.org/linktypes/
    LINKTYPE_NFC_LLCP.html>.

[LINKTYPE_NFLOG]
    "LINKTYPE_NFLOG",
    <https://www.tcpdump.org/linktypes/LINKTYPE_NFLOG.html>.
```

```
[LINKTYPE_NG40]
    "LINKTYPE_NG40",
    <https://www.tcpdump.org/linktypes/LINKTYPE_NG40.html>.

[LINKTYPE_NORDIC_BLE]
    "LINKTYPE_NORDIC_BLE", <https://www.tcpdump.org/linktypes/
    LINKTYPE_NORDIC_BLE.html>.

[LINKTYPE_NULL]
    "LINKTYPE_NULL",
    <https://www.tcpdump.org/linktypes/LINKTYPE_NULL.html>.

[LINKTYPE_PKTAP]
    "LINKTYPE_PKTAP",
    <https://www.tcpdump.org/linktypes/LINKTYPE_PKTAP.html>.

[LINKTYPE_PPI]
    "LINKTYPE_PPI",
    <https://www.tcpdump.org/linktypes/LINKTYPE_PPI.html>.

[LINKTYPE_PPP]
    "LINKTYPE_PPP",
    <https://www.tcpdump.org/linktypes/LINKTYPE_PPP.html>.

[LINKTYPE_PPP_ETHER]
    "LINKTYPE_PPP_ETHER", <https://www.tcpdump.org/linktypes/
    LINKTYPE_PPP_ETHER.html>.

[LINKTYPE_PPP_HDLC]
    "LINKTYPE_PPP_HDLC", <https://www.tcpdump.org/linktypes/
    LINKTYPE_PPP_HDLC.html>.

[LINKTYPE_PPP_PPPD]
    "LINKTYPE_PPP_PPPD", <https://www.tcpdump.org/linktypes/
    LINKTYPE_PPP_PPPD.html>.

[LINKTYPE_PPP_WITH_DIR]
    "LINKTYPE_PPP_WITH_DIR",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_PPP_WITH_DIR.html>.

[LINKTYPE_PROFIBUS_DL]
    "LINKTYPE_PROFIBUS_DL",
    <https://www.tcpdump.org/linktypes/
    LINKTYPE_PROFIBUS_DL.html>.
```

[illegible]

[LINKTYPE\_USB\_DARWIN]  
"LINKTYPE\_USB\_DARWIN", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_USB\\_DARWIN.html](https://www.tcpdump.org/linktypes/LINKTYPE_USB_DARWIN.html)>.

[LINKTYPE\_USB\_LINUX]  
"LINKTYPE\_USB\_LINUX", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_USB\\_LINUX.html](https://www.tcpdump.org/linktypes/LINKTYPE_USB_LINUX.html)>.

[LINKTYPE\_USB\_LINUX\_MMAPPED]  
"LINKTYPE\_USB\_LINUX\_MMAPPED",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_USB\\_LINUX\\_MMAPPED.html](https://www.tcpdump.org/linktypes/LINKTYPE_USB_LINUX_MMAPPED.html)>.

[LINKTYPE\_VSOCK]  
"LINKTYPE\_VSOCK",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_VSOCK.html](https://www.tcpdump.org/linktypes/LINKTYPE_VSOCK.html)>.

[LINKTYPE\_WATTSTOPPER\_DLM]  
"LINKTYPE\_WATTSTOPPER\_DLM",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_WATTSTOPPER\\_DLM.html](https://www.tcpdump.org/linktypes/LINKTYPE_WATTSTOPPER_DLM.html)>.

[LINKTYPE\_ZBOSS\_NCP]  
"LINKTYPE\_ZBOSS\_NCP", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_ZBOSS\\_NCP.html](https://www.tcpdump.org/linktypes/LINKTYPE_ZBOSS_NCP.html)>.

[LINKTYPE\_ZWAVE\_R1\_R2]  
"LINKTYPE\_ZWAVE\_R1\_R2",  
<[https://www.tcpdump.org/linktypes/LINKTYPE\\_ZWAVE\\_R1\\_R2.html](https://www.tcpdump.org/linktypes/LINKTYPE_ZWAVE_R1_R2.html)>.

[LINKTYPE\_ZWAVE\_R3]  
"LINKTYPE\_ZWAVE\_R3", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_ZWAVE\\_R3.html](https://www.tcpdump.org/linktypes/LINKTYPE_ZWAVE_R3.html)>.

[LINKTYPE\_ZWAVE\_TAP]  
"LINKTYPE\_ZWAVE\_TAP", <[https://www.tcpdump.org/linktypes/LINKTYPE\\_ZWAVE\\_TAP.html](https://www.tcpdump.org/linktypes/LINKTYPE_ZWAVE_TAP.html)>.

[MDB-PCAP] Kaiser, M., "PCAP format for MDB", August 2023,  
<<https://www.kaiser.cx/posts/pcap-mdb/>>.

[OpenVizsla]  
"OpenVizsla protocol description", August 2018,  
<<https://github.com/matwey/libopenvizsla/wiki/OpenVizsla-protocol-description>>.

## [PracConsEthDesign]

Crane, R. C. and E. A. Taft, "Practical Considerations in Ethernet Local Network Design", February 1980, <[http://bitsavers.org/pdf/xerox/ethernet\\_3mb/Practical\\_Considerations\\_in\\_Ethernet\\_Local\\_Network\\_Design\\_Feb1980.pdf](http://bitsavers.org/pdf/xerox/ethernet_3mb/Practical_Considerations_in_Ethernet_Local_Network_Design_Feb1980.pdf)>.

[Radiotap] radiotap.org, "Radiotap Web site", <<https://www.radiotap.org>>.

## [Silabs-Debug-Channel]

"Silabs Debug Channel Format", n.d., <[https://github.com/SiliconLabs/java\\_packet\\_trace\\_library/blob/master/doc/debug-channel.md](https://github.com/SiliconLabs/java_packet_trace_library/blob/master/doc/debug-channel.md)>.

[USBPcap] "USBPcap Capture format specification", <<https://desowin.org/usbpcap/captureformat.html>>.

## [Z\_WAVE\_SERIAL]

"Z-Wave Serial API Host Application Programming Guide", <<https://www.silabs.com/documents/public/user-guides/INS12350-Serial-API-Host-Appl.-Prg.-Guide.pdf>>.

## [I-D.ietf-opsawg-pcap]

Harris, G. and M. Richardson, "PCAP Capture File Format", Work in Progress, Internet-Draft, draft-ietf-opsawg-pcap-05, 3 March 2025, <<https://datatracker.ietf.org/doc/html/draft-ietf-opsawg-pcap-05>>.

## [I-D.ietf-opsawg-pcapng]

T端xen, M., Risso, F., Bongertz, J., Combs, G., Harris, G., Chaudron, E., and M. Richardson, "PCAP Next Generation (pcapng) Capture File Format", Work in Progress, Internet-Draft, draft-ietf-opsawg-pcapng-03, 3 March 2025, <<https://datatracker.ietf.org/doc/html/draft-ietf-opsawg-pcapng-03>>.

[RFC9260] Stewart, R., T端xen, M., and K. Nielsen, "Stream Control Transmission Protocol", RFC 9260, DOI 10.17487/RFC9260, June 2022, <<https://www.rfc-editor.org/rfc/rfc9260>>.

## Authors' Addresses

Guy Harris (editor)  
Email: [gharris@sonic.net](mailto:gharris@sonic.net)

Michael C. Richardson  
Sandelman Software Works Inc

Email: [mcr+ietf@sandelman.ca](mailto:mcr+ietf@sandelman.ca)

URI: <http://www.sandelman.ca/>