IEEE 802.3, Ethernet

Description:

Protocol suite: TCP/IP.
Protocol type: Data link and physical layer protocol.
Ethertype:
Multicast addresses:
URI:
MIME subtype:
SNMP MIBs: iso.org.dod.internet.mgmt.mib-2.snmpDot3RptrMgt (1.3.6.1.2.1.22).
iso.org.dod.internet.mgmt.mib-2.snmpDot3MauMgt (1.3.6.1.2.1.26).
iso.org.dod.internet.mgmt.mib-2.powerEthernetMIB (1.3.6.1.2.1.105).
Working groups:
Links: IANA: Ethernet assigned numbers.

Preamble	SFD	IEEE 802.3 header	Data :::	FCS

Preamble. 7 bytes.
Indicates that the frame is about to begin.

SFD, Start Frame Delimiter. 8 bits. Always set to 0xAB.
Indicates that the frame delimiter is about to begin.

IEEE 802.3 header

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Destination address																																																
Source address																																															
Ethertype																												Data :::																			

Destination Address. 6 bytes (48 bits).
MAC address of the destination node. This may be a unicast, multicast or broadcast address.

Source Address. 6 bytes (48 bits).
The unicast MAC address of the source node.

Ethertype. 16 bits.
The number of bytes encapsulated or the protocol type of the next higher protocol.

Data. Variable length, 46 to 1500 bytes.

FCS, Frame Check Sequence. 4 bytes.
A CRC used to verify the integrity of the frame.

Glossary:

CSMA/CD, Carrier Sense Multiple Access with Collision Detection.
Algorithm. Used when transmitting frames. The network is checked for other transmissions. When the way is clear, the frame transmissions can begin. If a collision is detected, a jam frame is generated. A random backoff period is calculated and the frame is scheduled to be retransmitted later.

IEEE 802.3ab, 1000BASE-T.

IEEE 802.3ac, VLAN tagging.
This extension adds the capability to use VLAN tags within the frame. The maximum frame size is increased to 1522 bytes.

IEEE 802.3ad, Link Aggregation.

IEEE 802.3ae, 10Gb/s Ethernet.

IEEE 802.3af, DTE power via MDI.

IEEE 802.3ak, 10GBASE-CX4.

IEEE 802.3z, Gigabit Ethernet.

MAU, Media Access Unit.
A type of hub by which computers share a connection point in a network. Hubs connect different segments of a LAN together.

Repeater.
(RFC 2108) A bitwise store-and-forward device. It recognizes activity and bits, but does not process incoming data based on any packet-related information (such as checksum or addresses). A repeater has no MAC address, no MAC implementation, and does not pass packets up to higher-level protocol entities for processing.

Repeater-unit.
(RFC 2108) The portion of the repeater set that is inboard of the physical media interfaces. The physical media interfaces (MAUs, AUIs) may be physically separated from the repeater-unit, or they may be integrated into the same physical package.

RFCs:

[RFC 1042] A Standard for the Transmission of IP Datagrams over IEEE 802 Networks.

- STD: 43.
- Obsoletes:
  RFC 948.

[RFC 2108] Definitions of Managed Objects for IEEE 802.3 Repeater Devices using SMIv2.

- Category: Standards Track.
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3RptrMgt (1.3.6.1.2.1.22).
- Obsoletes:
  RFC 1516.

[RFC 2239] Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs) using SMIv2.

- Category: Standards Track.
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3MauMgt (1.3.6.1.2.1.26).

[RFC 2464] Transmission of IPv6 Packets over Ethernet Networks.

- Category: Standards Track.
- Obsoletes:
  RFC 1972.

[RFC 3621] Power Ethernet MIB.

- Category: Standards Track.
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.powerEthernetMIB (1.3.6.1.2.1.105).

[RFC 3636] Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs).

- Category: Standards Track.
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3MauMgt(1.3.6.1.2.1.26).
- Obsoletes:
  RFC 1515, RFC 2668.

[RFC 4448] Encapsulation Methods for Transport of Ethernet over MPLS Networks.

- Category: Standards Track.

Publications:

Obsolete RFCs:

[RFC 948] TWO METHODS FOR THE TRANSMISSION OF IP DATAGRAMS OVER IEEE 802.3 NETWORKS.

- Obsoleted by:

RFC 1042.

[RFC 1368] Definitions of Managed Objects for IEEE 802.3 Repeater Devices.

- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3RptrMgt (1.3.6.1.2.1.22).
- Obsoleted by:
  RFC 1516.

[RFC 1515] Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs).

- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3MauMgt (1.3.6.1.2.1.26).
- Obsoleted by:
  RFC 3636.

[RFC 1516] Definitions of Managed Objects for IEEE 802.3 Repeater Devices.

- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3RptrMgt (1.3.6.1.2.1.22).
- Obsoleted by:
  RFC 2108.
- Obsoletes:
  RFC 1368.

[RFC 1972] A Method for the Transmission of IPv6 Packets over Ethernet Networks.

- Category: Standards Track.
- Obsoleted by:
  RFC 2464.

[RFC 2668] Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs).

- Category: Standards Track.
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.snmpDot3MauMgt (1.3.6.1.2.1.26).
- Obsoleted by:
  RFC 3636.
- Obsoletes:
  RFC 2239.