

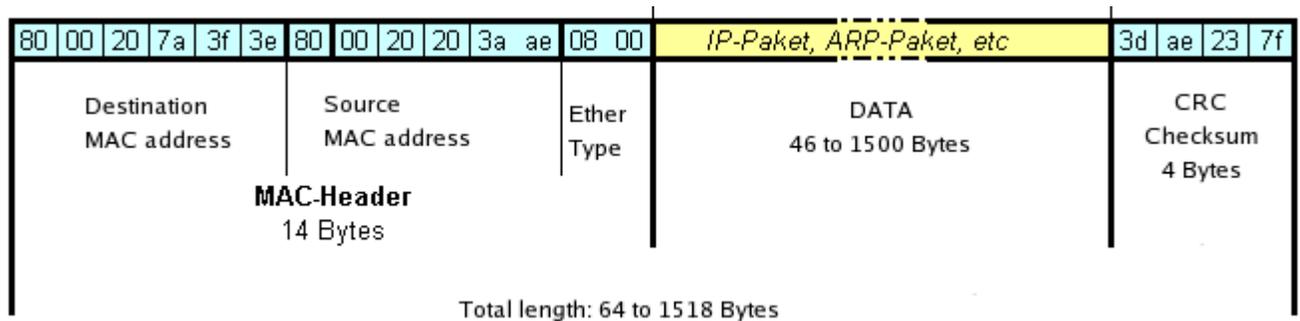
Ethernet frame types and the EtherType field

Frames are the format of data packets on the wire.

There are five types of Ethernet frame:

- Original Ethernet Version I (no longer used)
- The Ethernet Version 2 or Ethernet II frame, the so-called DIX frame (named after [DEC](#), [Intel](#), and [Xerox](#)), this is the most common today, as it is often used directly by the [Internet Protocol](#).
- Novell's homegrown Variation of IEEE 802.3 ("raw 802.3 frame") without LLC
- IEEE 802.x LLC frame
- IEEE 802.x LLC/SNAP frame

The different frame types have different formats and [MTU](#) values, but can coexist on the same physical medium.



The most common Ethernet Frame format, type II

The original Xerox Version 1 Ethernet had a 16 bit length field, although the maximum length of a packet was 1500 bytes. This length field was soon re-used in Xerox's Version 2 Ethernet as a label field, with the convention that values between 0 and 1500 indicated the use of the original Ethernet format, but higher values indicated what became known as an [EtherType](#), and the use of the new frame format. This is now supported in the [IEEE 802](#) protocols using the [SNAP header](#).

EtherType	Protocol
0x0800	IP Internet Protocol (IPv4)
0x0806	Address Resolution Protocol (ARP)
0x8035	Reverse Address Resolution Protocol (RARP)
0x809b	AppleTalk (Ethertalk)
0x80f3	Appletalk Address Resolution Protocol (AARP)
0x8137	Novell IPX (alt)
0x8138	Novell
0x86DD	Internet Protocol, Version 6 (IPv6)

Type field (EtherType) for some common protocols

IEEE 802.x defined the 16 bit field after the MAC addresses as a length field again. As Ethernet I framing is no longer used, this allows software to determine whether a frame is an Ethernet II frame or an IEEE 802.x frame, allowing the coexistence of both standards on the same physical medium. All 802.x frames have an LLC field. By examining the LLC field, it is possible to determine whether it is followed by a SNAP field.

[Novell](#)'s "raw" 802.3 frame format was based on early IEEE 802.3 work. Novell used this as a starting point to create the first implementation of its own [IPX](#) Network Protocol over Ethernet. They did not use any LLC header but started the IPX packet directly after the length field. In principle this is not interoperable with the other later variants of 802.x Ethernet, but since IPX has always FF at the first byte (while LLC has not), this mostly coexists on the wire with other Ethernet implementations (with the notable exception of some early forms of [DECnet](#) which got confused by this).

Novell [Netware](#) used this frame type by default until the mid nineties, and since Netware was very widespread back then (while IP was not) at some point in time most of the world's Ethernet traffic ran over "raw" 802.3 carrying IPX. Since Netware 4.10 Netware now defaults to IEEE 802.x with LLC (Netware Frame Type Ethernet_802.2) when using IPX. There is a [Classical Series of Usenet Postings](#) (<http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&c2coff=1&frame=right&th=887b61494cf0c72a&seekm=1993Sep17.191208.13580%40novell.com#link1>) by Novell's Don Provan that have found their way into numerous FAQs and are widely considered the definitive answer to the Novell Frame Type jungle.

The 802.x variants of Ethernet are not in widespread use on common networks currently, with the exception of large corporate Netware installations that have not yet migrated to Netware over IP. The most common type used today is Ethernet Version 2, as it is used by most [Internet Protocol](#)-based networks, with its [EtherType](#) set to 0x0800. There exists

a [well defined standard](http://www.ietf.org/rfc/rfc1042.txt) (<http://www.ietf.org/rfc/rfc1042.txt>) for encapsulating IP traffic in [IEEE 802.3](#) frames with LLC/SNAP headers, but it is commonly not supported.

IP Version 6 over Ethernet is also standardized based on IEEE 802.x. with LLC/SNAP.

[Novell IPX](#) is probably the only network protocol that supports all 4 current frame types.