Octet Encyclopedia Article

Octet

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Octet

An octet is a storage unit that is always composed of a sequence of exactly eight bits. A **bit** (a contraction of *bi*nary digi*t*) is the smallest piece of information (or unit of **data**) used by a computer. A bit possesses a binary **value**, either zero (0) or one (1). By general definition of the binary numbering system, an octet ranges in mathematical value from zero (00000000) to 255 (11111111) because 2 to the power of 8 (2^8) produces 256 different combinations (or possibilities). Nearly all computers are designed to store data and execute instructions in multiples (or strings) of bits. A **byte** is formed from strings of bits, and is a unit of data that can represent information such as single characters, numerals, etc. An octet is a byte of eight bits. The smallest value of an octet is "00000000" (zero), and the largest value is "11111111" (255 in decimal notation). Although bytes are most often eight-bit strings, they are not required to be of that particular size. For instance, a byte may be a sequence of 9 bits on some 36-bit computers. Octet, on the other hand, is always designated as an eight-bit unit. For instance, four eight-bit octets form a 32-bit word.

The term octet is normally used in networking, in preference to the term byte, because, as said earlier, some systems use the term byte for units that are not eight bits long. Historically, the octet was applied to eight bits when some computer systems began to represent a byte as a size other than eight bits. Today bytes usually range in size from four to ten bits, but octets always consist of eight bits. The term octet is derived from the Latin word "octo" that means "eight."