

PREFIXES FOR NUMERICAL UNITS

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In the computer science literature, the prefixes kilo, mega, and so forth are often used on numerical units. These have two different interpretations:

- **Data transmission:** For data transmission, the prefixes used are those defined for the International System of Units (SI), the international standard. In this scheme, prefixes are used as a shorthand method of expressing powers of 10. For example, one kilobit per second (1 kbps) = 10^3 bps = 1000 bps.
- **Data:** The amount of data in computer memory, in a file, or a message that is transmitted is typically measured in bytes. Because memory is indicated by binary addresses, the size of memory is expressed as powers of 2. The same prefixes are used in a way that approximates their use in the SI scheme. For example, one kilobyte (1 kB) = 2^{10} bytes = 1024 bytes.

Prefix Name	Prefix Symbol	Factor	
		SI	Data in bytes
zetta	Z	10^{21}	$2^{70} \approx 10^{21}$
exa	E	10^{18}	$2^{60} \approx 10^{18}$
peta	P	10^{15}	$2^{50} \approx 10^{15}$
tera	T	10^{12}	$2^{40} \approx 10^{12}$
giga	G	10^9	$2^{30} =$ 1,073,741,824
mega	M	10^6	$2^{20} = 1,048,576$
kilo	k	10^3	$2^{10} = 1024$
milli	m	10^{-3}	
micro	μ	10^{-6}	
nano	n	10^{-9}	
pico	p	10^{-12}	

In December 1998 the International Electrotechnical Commission (IEC), the leading international organization for worldwide standardization in electrotechnology, approved as an IEC International Standard names and symbols for prefixes for binary multiples for use in the fields of data processing and data transmission. The prefixes are as follows:

Prefix Name	Prefix Symbol	Origin	Factor
kibi	Ki	kilobinary	2^{10}
mebi	Mi	megabinary	2^{20}
gibi	Gi	gigabinary	2^{30}
tebi	Ti	terabinary	2^{40}
pebi	Pi	petabinary	2^{50}
exbi	Ei	exabinary	2^{60}

It seems doubtful that this new convention will be widely adopted any time in the foreseeable future. However, it is possible you will see these terms in some of the literature. For a further discussion see <http://physics.nist.gov/cuu/Units/binary.html>.