Storage Units

I fear that most of the technical articles on the Internet misinterpret some of the common storage units.

THERE'S BEEN A LOT OF CONFUSION OVER 1024 vs 1000, KBYTE vs KBIT, AND THE CAPITALIZATION FOR EACH.

HERE, AT LAST, IS A SINGLE, DEFINITIVE STANDARD:

SYMBOL	NAME	SIZE	NOTES
kB	KILOBYTE	1024 BYTES OR 1000 BYTES	1000 BYTES DURING LEAP YEARS, 1024 OTHERWISE
KB	KELLY-BOOTLE STANDARD UNIT	1012 BYTES	COMPROMISE BETWEEN 1000 AND 1024 BYTES
KiB	IMAGINARY KILOBYTE	1024 √-1 BYTES	USED IN QUANTUM COMPUTING
kb	INTEL KILOBYTE	1023.937528 BYTES	CALCULATED ON PENTIUM F.P.U.
Kb	DRIVEMAKER'S KILOBYTE	CURRENTLY 908 BYTES	SHRINKS BY 4 BYTES EACH YEAR FOR MARKETING REASONS
KBa	BAKER'S KILOBYTE	1152 BYTES	9 BITS TO THE BYTE SINCE YOU'RE SUCH A GOOD CUSTOMER

This article does a good job at clearly providing the relevant information:

> A **kilobyte** is made up of either 1,000 or 1,024 bytes. This distinction can be a little tricky and has to do with the difference between binary math (which computers rely on) and base-10 math (which most humans use in daily life). In practical terms, both definitions of

> kilobyte are used. In some cases, a distinction will be made between a kilobyte (1,000 bytes) and a kibibyte (1,024 bytes), though this is less common.

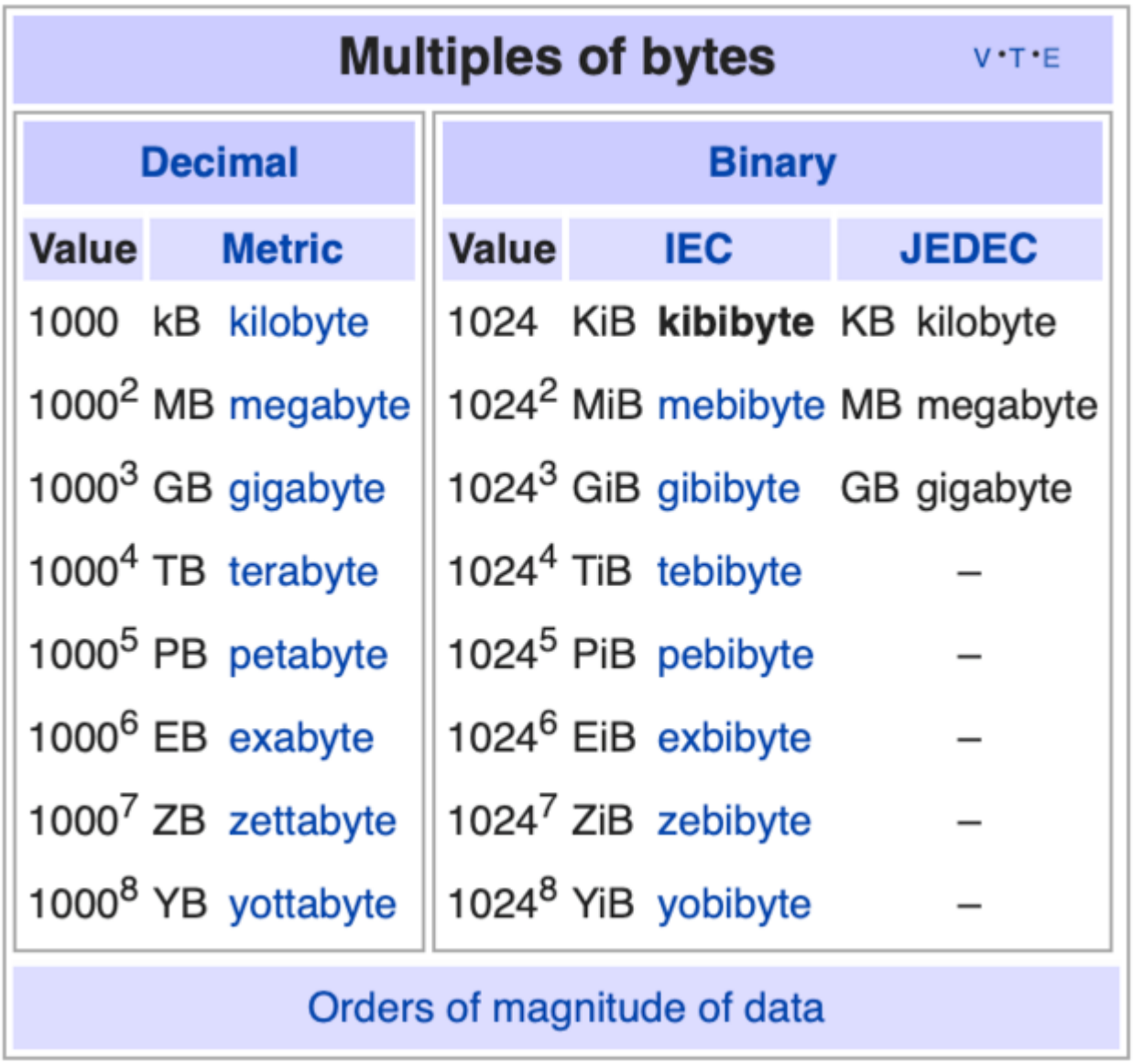
The Real Story

Apart from the funny picture above (Baker's Kilobyte?), the real story can be uncovered by referencing the picture below. Thanks to **this original article** that does a great job at providing the valuable information.

Decimal Prefix (SI)	Value	Value (1000)	Binary Prefix (IEC)	Value	Value (1024)
kilo (k)	10^3	1000	kibi (ki)	2^{10}	1024
mega (M)	10^6	1000^2	mebi (Mi)	2^{20}	1024^2
giga (G)	10^9	1000^3	gibi (Gi)	2^{30}	1024^3
tera (T)	10^{12}	1000^4	tebi (Ti)	2^{40}	1024^4
peta (P)	10^{15}	1000^5	pebi (Pi)	2^{50}	1024^5
exa (E)	10^{18}	1000^6	exbi (Ei)	2^{60}	1024^6
zetta (Z)	10^{21}	1000^7	zebi (Zi)	2^{70}	1024^7
yotta (Y)	10^{24}	1000^8	yobi (Yi)	2^{80}	1024^8

So while most people might misinterpret "kilo" as 1024 when it comes to storage units, the right way is thus "kibibytes". It would be an interesting conversation to discuss kibibytes as most people may not be aware, and this would make you look incredibly smart (and correct) :)

Here is another great image for reference:



Multiples of bytes V·T·E

Decimal			Binary				
Value	Metric		Value	IEC		JEDEC	
1000	kB	kilobyte	1024	KiB	**kibibyte**	KB	kilobyte
1000^2	MB	megabyte	1024^2	MiB	mebibyte	MB	megabyte
1000^3	GB	gigabyte	1024^3	GiB	gibibyte	GB	gigabyte
1000^4	TB	terabyte	1024^4	TiB	tebibyte	–	
1000^5	PB	petabyte	1024^5	PiB	pebibyte	–	
1000^6	EB	exabyte	1024^6	EiB	exbibyte	–	
1000^7	ZB	zettabyte	1024^7	ZiB	zebibyte	–	
1000^8	YB	yottabyte	1024^8	YiB	yobibyte	–	

Orders of magnitude of data

Based on the image above, the following should be used using capital letter first, then lowercase i and then finally capital B for bytes.

- KiB
- MiB
- GiB
- TiB
- PiB
- etc.

Reference Articles

- https://danielmiessler.com/blog/the-difference-between-kilobytes-and-kibibytes/
- https://study.com/learn/lesson/data-storage-units-kb-mb-gb-tb.html

- https://ozanerhansha.medium.com/kilobytes-vs-kibibytes-d77eb2ff6c2a

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