

${ }^{1946}$ EN
1947 Bardeen, Bratain, Shockley demonstrate first transistor
${ }^{1948}{ }^{\text {Bar }}$
Von Neumann suggests that swithes be added to ENAIC to support code selection
951
4 fist
First tigh-Evel programming language FORTRAN introduced by Backus and BM
${ }^{958}$ The Integrated Circuitis is invented by Jack Kiliby of $T$, and Robert Noyce at Fairchild
1964
${ }^{1965}$ Moore's Law first expressed; intel co-founder states:



CPU Transistor Counts 1971-2008 \& Moore's Law

ipedia. orgmiki/Transistor count
${ }^{1969}$
Intel 1103 computer memory
Intel 4004 - - the first microprocessorernet - first computer to use the desktop metaphor and Graphical User Interface (GUI)
${ }_{1975}^{1974}$. $\qquad$
${ }_{1977}^{1976-}$
Apple 1 , TRS-80, and Commodore Pet computers
${ }^{1978}$ visiif
${ }^{979}$ Wordstar
${ }^{1981}$ IBM PC; MS-Dos operating system
${ }^{1983}$ Ap
Apple Computer introduces the Lisa
${ }^{1984}{ }_{\text {Ap }}$
5 nise

1994
Yahoo estabished
996
${ }^{966}$ Google established
2001 Portable Electronics are taking off.

$2010 \sim 3$ Billion "eacuivalent" transistors on a single chio

## Microprocessors

| Processor ${ }^{\text {a }}$ | Transistor count | Date of introuction | Manutacturer⿴囗 | Procoss ${ }_{\text {a }}$ | Areo |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Intel 4004 | 2,300 | 1971 | Intel | 10 mm |  |
| Intel8008 | 3.500 | 1972 | Intel | 10 mm |  |
| Intele800 | 4,500 | 1974 | Intel | 6 um |  |
| Inteloge | 29,000 | 1979 | Intel | ${ }^{3} \mathrm{um}$ |  |
| Intel 80286 | 134,000 | 1982 | Intel | 1.5 mm |  |
| Intel 80396 | 275,000 | 1995 | Intel | 1.5 mm |  |
| Intel 80486 | 1,180,000 | 1999 | Intel | 1 / m |  |
| Pentium | 3,100,000 | 1993 | Intel | 0.8 m m |  |
| AMD K5 | 4,300,000 | 1996 | AMD | 0.5 mm |  |
| Pentum 1 | 7,500,000 | 1997 | Intel | 0.35 mm |  |
| amo K6 | 8.900,000 | 1997 | AMD | 0.35 mm |  |
| Pentum III | 9.500,000 | 1999 | Intel | 0.25 mm |  |
| AMD KE-III | 21,30,000 | 1999 | AMD | 0.25 mm |  |
| and $\mathrm{K}^{\text {c }}$ | 22,00,000 | 1999 | AMD | 0.25 mm |  |
| Pentum 4 | 42,00,000 | 2000 | Intel | 180 mm |  |
| Atom | 47,00,000 | 2008 | Intel | 45 mm |  |
| Batan | 54,30,000 | 2003 | amD | 130 mm |  |
| AMD K8 | 105,900,000 | 2003 | AMD | 130 mm |  |
| Hanium 2 | 220,000,000 | 2003 | Intel | 130 nm |  |
| Cell | 241,000,000 | 2006 | SonylBMTosthia | 90 mm |  |
| Core 2 Duo | 291,000,000 | 2006 | Intel | 65 mm |  |
| AMO K10 | 463,00,000 ${ }^{\text {(1] }}$ | 2007 | amD | 65 mm |  |
| AMD K10 | 756,00,000 ${ }^{21}$ | 2008 | AMD | 45 mm |  |
| Hanium 2 with 9mb cache | 592,000,000 | 2004 | Intel | 130 nm |  |
| Coreil (auaa) | 731,000,000 | 2008 | Intel | 45 nm | 263 mm |
| Powers | 799,000,000 | 2007 | вв | 65 nm | 341 mm |
| Sx.Core Opleroon 240 | 904,000,000 | 2009 | AMD | 45 mm |  |
| sk.COre Corel7 | 1,170,000,000 | 2010 | Intel | 32 mm |  |
| Dual-Core lataium 2 | 1,700,000,000 ${ }^{3]}$ | 2006 | Intel | 90 mm | 596 mm |
| SxiCOror Xeon 7400 | 1,900,000,000 | 2008 | Intel | 45 nm |  |
| Quad-Core tanium Tukwia | 2,000,000,000 4 ] | 2010 | Intel | 65 mm |  |
| 8.Core Xoon Nehalem-EX | 2,300,000,000 ${ }^{51}$ | 2010 | Intel | 45 mm |  |

gPUs




Also taken from htt://le.wikipedia.org/wiki/transistor count

