

A Brief History of Computers

In The U.S.

Vol 1 The beginning to (about) 2016

Part 1 up to 1959

Part 2 1960 to 2016

According to Bill Olmo

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Computers

- 1964 – Beginners All-purpose Symbolic Instruction Code (BASIC)
 - Developed by John Kenney and Thomas Kurtz at Dartmouth College
 - Enable students in other than science and math to program

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Computers

- 1964 – IBM System/360
 - Six different models of different size and speed
 - All have the same instruction set
 - Solid logic technology
 - *Fortune magazine* dubbed the *System/360* “IBM's \$5 billion gamble”

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| Model | Announced | Shipped[| Scientific performance (kIPS)] | Commercial performance (kIPS] | CPU Bandwidth (MB/sec) | Memory bandwidth (MB/sec) | Memory size (in binary) KB) |
|-------------------------|---------------|----------|--------------------------------|-------------------------------|------------------------|---------------------------|--|
| 30 | Apr 1964 | Jun 1965 | 10.2 | 29 | 1.3 | 0.7 | 8-64 |
| 40 | Apr 1964 | Apr 1965 | 40 | 75 | 3.2 | 0.8 | 16-25 |
| 50 | Apr 1964 | Aug 1965 | 133 | 169 | 8.0 | 2.0 | 64-512 |
| 60 - 62 | Apr 1964 | never | | | | | |
| 70 | Apr 1964 | never | | | | | |
| 20 | Nov 1964 | Mar 1966 | 2.0 | 2.6 | | | 4-32 |
| 91 | Nov 1964 | Oct 1967 | 1,900 | 1,800 | 133 | 164 | 1,024-4,096 |
| 64 - 66 | Apr 1965 | never | | | | | |
| 65 | Apr 1965 | Nov 1965 | 563 | 567 | 40 | 21 | 128-1,024 |
| 75 | Apr 1965 | Jan 1966 | 940 | 670 | 41 | 43 | 256-1,024 |
| 67 | Aug 1965 | May 1966 | | | 40 | 21 | 512-2,048 |
| 44 | Aug 1965 | Sep 1966 | 118 | 185 | 16 | 4.0 | 32-256 |
| 95 | special order | Feb 1968 | 3,800 est. | 3,600 est. | 133 | 711 | 5,220 |
| 25 | Jan 1968 | Oct 1968 | 9.7 | 25 | 1.1 | 2.2 | 16-48 |
| 85 | Jan 1968 | Dec 1969 | 3,245 | 3,418 | 100 | 67 | 512-4,096 |
| 195 | Aug 1969 | Mar 1971 | 10,000 est. | 10,000 est. | 148 | 169 | 1,024-4,096 |
| 22 | Apr 1971 | Jun 1971 | | | 1.3 | 0.7 | 24-32 |

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Computers

- 1965 - Everybody's Doing It
 - RCA Spectra/70
 - CDC 6400
 - Honeywell 200
 - IBM 1130
 - GE 115
- 1966 - and more
 - CDC3300
 - Univac 1108 III
 - CDC 3500
 - IBM System/360 model 90
 - Burroughs B2500 and B6500
 - SDS Sigma 7
 - Univac 9000

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Computers

- 1968 – Microprocessor introduced by Intel
- 1972 - C programming language invented by Dennis Ritchie at Bell Labs
- 1973 – Vinton Cerf and Robert Kahn (not Al Gore) develop the first description of a communication protocol for ARPANET (TCP/IP)

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Computers

- 1973 – Xerox Alto
 - Designed for individual use (but not home use)
 - From Palo Alto Research Center (PARC)
 - Used a mouse (pointing device)
 - Graphical User Interface (GUI)
 - Cost to build was \$12,000
 - Selling price would be \$40,000 but was never sold

(Later we will return to 1974)

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Computers

- 1983 – The term Internet is used to describe the global ARPANET
- 1989 - The World Wide Web (WWW) was invented by English scientist Tim Berners-Lee
- 1991 – The WWW is made available to the general public
 - Previously only government and universities
 - No commercial use
 - A Tennessee senator sponsors a law that allowed commercial use of the internet

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Computers

- 1993 - Mosaic Web Browser
 - Mosaic was developed at the National Center for Supercomputing Applications (NCSA) at the University of Illinois Urbana-Champaign
 - Later became Netscape
 - Later became Firefox
- 1995
 - Netscape IPO starts the dot-com boom

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Computers

- 1999 – Y2K the problem that never happened

- Let's go back to 1974

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Micro Computers

- These were either built by individuals or sold in kits
- 1974 – Micro Instruction and Telemetry Systems (MITS)
Altair 8800
 - Do it yourself kit
 - Sold thousands in first month
- 1975 – Microsoft
 - Bill Gates (dropout) and Paul Allen (graduate) from MIT
 - Founded to make MICROcomputer SOFTWARE
 - Wrote BASIC for the Altair 8800
- 1975 - Homebrew Computer Club was an early computer hobbyist group in Silicon Valley which met until 1986

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Personal Computers

- 1976 – Apple Computer (later renamed Apple I)
 - Designed and hand built by Steve Wozniak
 - Sold by Steve Jobs for \$666.66
 - First fully assembled Computer
- 1977- Tandem Radio Shack (TRS) TRS80
 - Known by some as the Trash80
 - "*The \$599 personal computer*"
 - 4KB Storage, CRT 32 or 64 characters wide and 16 lines deep

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Personal Computers TRS 80



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Personal Computers

- 1977 – Apple II
 - The first large selling PC
 - MOS Technology 6502 microprocessor
 - Color display
- 1979 – VisiCalc Spreadsheet invented by Bricklin and Frankston at Harvard Business School
- 1981 - IBM PC
 - 64K memory (i. e. storage), floppy disk drive optional
 - Intel 8088 microprocessor
 - Open system architecture
 - Microsoft teams with IBM to make the Dick Operating System (DOS)

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Personal Computers

- 1982 - Compaq Computer Corporation
 - Produced some of the first IBM PC compatible computers
 - First company to legally reverse engineer the IBM Personal Computer
 - Paved the way for “IBM Compatible” personal computers sold by many companies

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Personal Computers

- 1983 – Lotus Development Corp introduces 1-2-3
 - Spreadsheet program
 - Replaces and enhances VisiCalc
- 1983 – Microsoft introduces Windows
 - A graphical personal computer operating environment
 - Not shipped until 1985

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Personal Computers

- 1989 – America Online (AOL)
 - Included online games
 - Users with a Modulator Demodulator (MODEM) could dial into AOL
 - AOL members can email each other
 - 1993 AOL was able to provide public Internet service

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Personal Computers

- 1990 – Microsoft introduces Windows 3
 - Improved the design, mostly because of virtual memory
 - Improved the user interface
 - Achieve broad commercial success, selling 2 million copies in the first six months
 - Many versions follow (3.1, 95, NT, 98, ME, 2000, XP, Vista, 7, 8, 10)
- 1992 – Microsoft introduces the Office Suite
 - Word
 - Excel
 - Power Point

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Personal Computers

- 1993 – Mosaic developed by Mark Andreessen at the University of Illinois
 - It has been credited with popularizing the World Wide Web.
 - It was also the first browser to display images inline with text instead of displaying images in a separate window.
 - Often described as the first graphical web browser
- 1994 – AMAZON.COM
- 1994 - Mosaic Communications Corporation started by Marc Andreessen
 - Netscape Navigator browser
 - Within four months of its release, it had taken three-quarters of the browser market
 - Eventually (2003) becomes Firefox

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Personal Computers

- 1995 – Internet Explorer (IE) introduced by Microsoft
 - Compete with Netscape
 - Start of the browser wars
- 1995 - Yet Another Hierarchically Organized Oracle (YAHOO)
 - Founded by Jerry Yang and David Filo in 1994 who were electrical engineering graduate students at Stanford
 - Jerry and David's Guide to the World Wide Web
- 1995 – eBay the Auction Web
 - First product sold was a broken laser pointer

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Personal Computers

1998 – Google founded by Larry Page and Sergey Brin while they were Ph.D. students at Stanford

- Started in 1995 as a research project
- A better system that analyzed the relationships between websites
- Nicknamed their new search engine "BackRub"
- Changed the name to Google, originating from a misspelling of the word "googol"
- In May 2011, the number of monthly unique visitors to Google surpassed one billion for the first time
- Eventually Google becomes a verb, as in "I Googled it."

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Personal Computers

- 2001 – Dell Computer
 - 1984 - Michael Dell buys \$1,000 of surplus computer parts
 - He builds and sells computers out of his dorm room
 - Introduces selling custom made computers directly to users

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Personal Computers

- 2006 – Amazon introduces the Elastic Compute Cloud
 - References to "cloud computing" in its modern sense appeared as early as 1996
 - The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer
- 2008 – Google Chrome
 - Eliminate updates by storing everything in the cloud
- 2014 – Windows 10

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Now What?

“Lawrence Livermore National Laboratory just bought a \$1 million supercomputer that mimics the human brain to perform complex cognitive tasks while consuming less power than a lightbulb.

The national lab is the first testbed for an array of TrueNorth chips developed by IBM. TrueNorth takes a radically different approach to computing than the von Neumann architecture in use since the 1946’s ENIAC.”

Carolyn Said
San Francisco Chronicle, March 30 2016

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Dharmendra S. Modha

- “I was not there when ENIAC was unveiled, but I have a palpable sense that we are at a similar turning point in the history of computing. The technological and practical possibilities are immense and could touch every sphere of science, technology, business, government, and society. I am optimistic that the enduring value of our work will be the inspiration of a completely different way of thinking about computing. It will, I believe, spawn an outpouring of creativity by universities, startups, established tech companies, and by professionals in countless industries and occupations.
- We are not there yet. Indeed, TrueNorth is a *direction* and not a *destination*! The end goal is building *intelligent business machines* that enable a *cognitive planet*, while *transforming industries*. Exciting!”
- Dharmendra S. Modha, manager and lead researcher of the Cognitive Computing group at IBM Almaden Research Center.

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END OF PART 2

COMMENTS?

Thanks for listening.