



COMMUNICATIONS – A BIT OF HISTORY



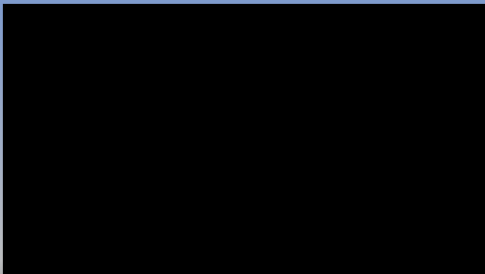
• https://youtu.be/_HOLzShLPoQ

COMMUNICATIONS – A BIT OF HISTORY



• <https://www.youtube.com/watch?v=eQd3H8AmtP0>

COMMUNICATIONS – A BIT OF HISTORY



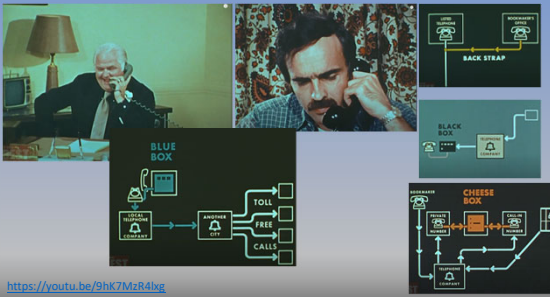
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COMMUNICATIONS – A BIT OF HISTORY



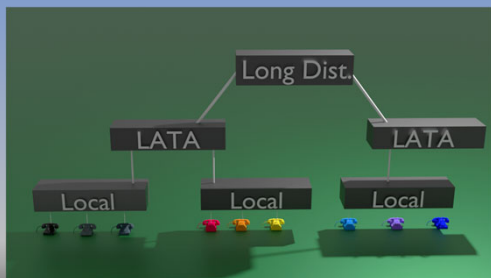
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COMMUNICATIONS – A BIT OF HISTORY

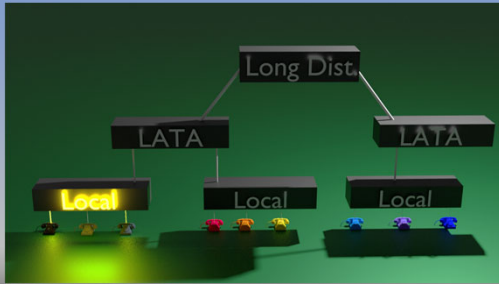


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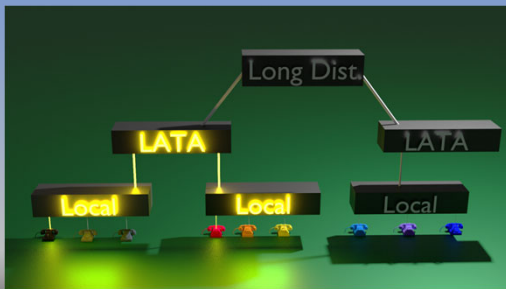
Phone Communications



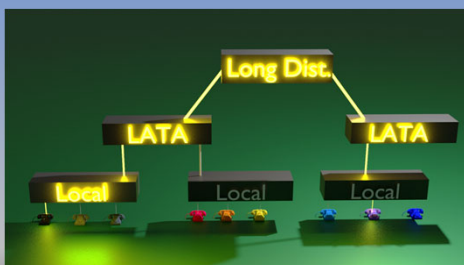
Phone Communications



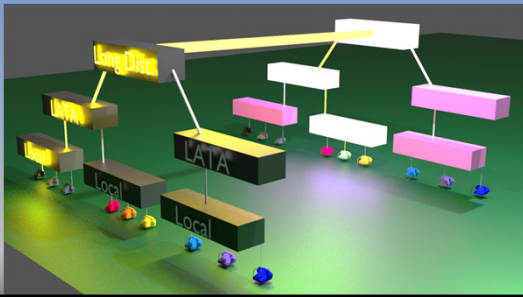
Phone Communications



Phone Communications



Phone Communications



Computer Technology & the Internet

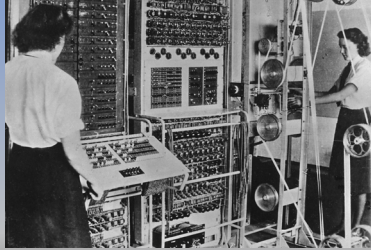
- Computerization has brought the largest influx of innovation in the gaming industry in the last 40 years
- Computer and computerized technology is moving at a rapid pace
- Gaming law moves at a much slower pace

COMPUTERS – A BIT OF HISTORY

- To understand where we are and why we are, it may help to provide a bit of history so that the technology concepts that impact laws and legal compliance are easier to understand

COMPUTERS – A BIT OF HISTORY

- Early computers, like Colossus pictured on the right, were single task single purpose machines
- Colossus was designed to apply binary math to encrypted communications to break the encryption



COMPUTERS – A BIT OF HISTORY

- Harvard 1 was a room sized mechanical electrical computer that calculated mathematical tables

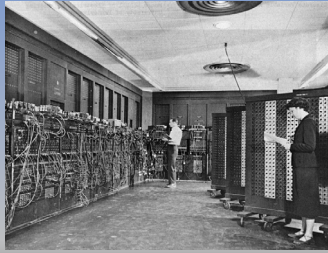


COMPUTERS – A BIT OF HISTORY

- In 1943 the first programmable computer, ENIAC, began operation

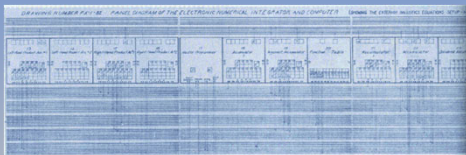


COMPUTERS – A BIT OF HISTORY



- While programmable for different tasks, ENIAC's programs were a series of switches and wires plugged into specific orders.

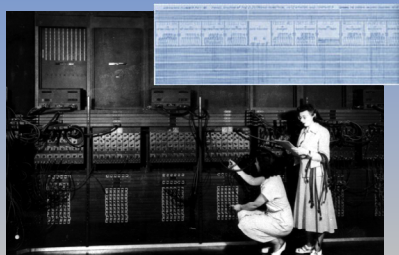
COMPUTERS – A BIT OF HISTORY



- Programs were "stored" on wiring/panel diagrams outside of the computer

COMPUTERS – A BIT OF HISTORY

- Programmers, would read the panel/wiring diagrams to set the ENIAC computer up for a particular set of operations (a program)

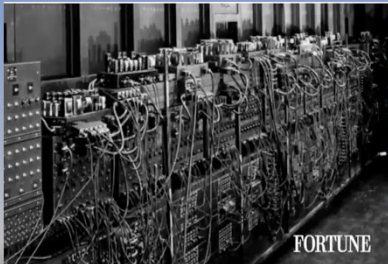


COMPUTERS – A BIT OF HISTORY

- Early programmers were primarily women

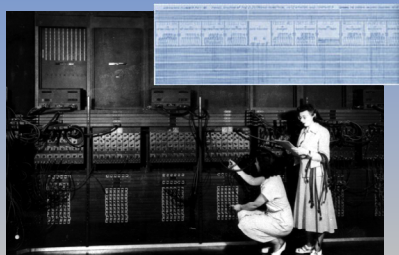


COMPUTERS – A BIT OF HISTORY



COMPUTERS – A BIT OF HISTORY

- Clearly, storage through notes, and programming by creating a matrix of wires and switches was a labor intensive, time consuming task.
- IBM found a better way



COMPUTERS – A BIT OF HISTORY

- IBM had a history of using punch cards for tabulating
 - Punch cards were adapted from the textiles industry
- IBM adapted punch cards to store computer programs for digital computers



COMPUTERS – A BIT OF HISTORY

- Programs and data stored on punch cards can be reloaded and run on demand.
- However, programs only work when the cards are in the exact right order



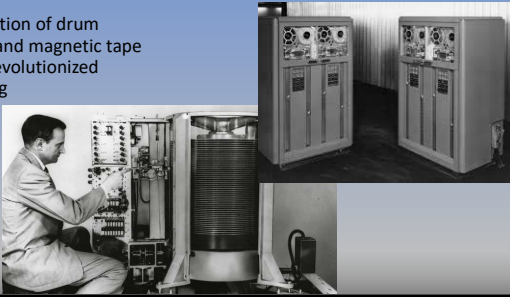
COMPUTERS – A BIT OF HISTORY

- While superior to diagram cards with wires and switches, punch cards had storage issues and the holes could wear out, ruining a program



COMPUTERS – A BIT OF HISTORY

- The invention of drum memory and magnetic tape storage revolutionized computing



COMPUTERS – A BIT OF HISTORY

- With magnetic tape storage, data and programs could be stored, recalled and processed electronically
- This also allowed the first use of the computer terminal as we know it
- However, early implementations had 1 terminal per computer

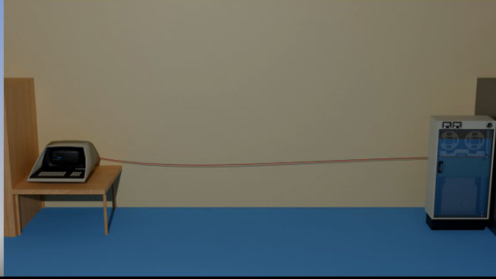


COMPUTERS – A BIT OF HISTORY

- The character terminal allowed direct input into the computer
- To facilitate terminal communications, the RS-232 serial interface became the de facto communications interface
- Serial communications allowed for communications to occur 1 bit at a time in one direction at a time

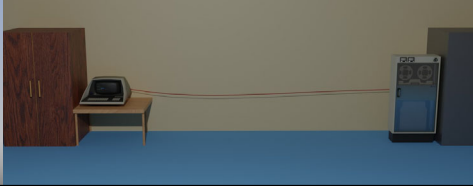


COMPUTERS – A BIT OF HISTORY



COMPUTERS – A BIT OF HISTORY

- 1 data terminal per computer was far less than optimal.
- Multiple terminal computing would increase the efficiency of programming and operations
- To facilitate this, additional RS-232 interfaces were added and multi-user and multi-session operating systems needed to be invented to share the resources of a single computer

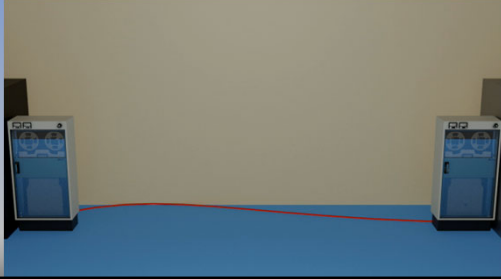


COMPUTERS – A BIT OF HISTORY

- While allowing multiple terminals was helpful, having computers talk to each other would also be helpful
- Computer scientists realized data terminal serial interface could be used to facilitate computer to computer communications.



COMPUTERS – A BIT OF HISTORY



COMPUTERS – A BIT OF HISTORY

- In the 1960s researchers at multiple universities and the federal government realized that computer-to-computer communications could allow projects to leverage work among different institutions while minimizing duplication
- A way was needed to allow computers in disparate locations to communicate with one another

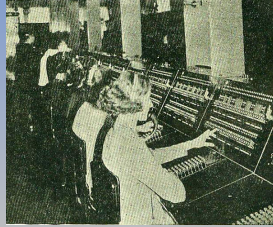
COMMUNICATION – A BIT OF HISTORY

- The solution was to use the vast telephone network system to allow wide area communications between computers
- However, the phone system was highly inefficient for computer use
- Computers could communicate hundreds of bits per second in a dense use of phone lines in the 1960s
- The phone system of the 1960s was never built for a series of short calls, and short long distance calls were very expensive



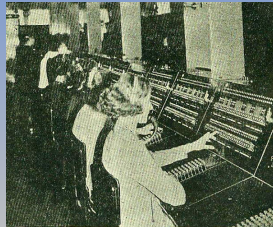
COMMUNICATION – A BIT OF HISTORY

- Computers could transmit up to 300 bits per second in the 1960s
- Phone calls were short for computers
- Also, each computer to computer communication would require a separate phone call because the phone network was a circuit switched network



COMMUNICATION – A BIT OF HISTORY

- To make matters worse, the cost for long distance calls was significant as each circuit created by switches incurred additional cost



COMPUTERS – A BIT OF HISTORY

- Circuit Switched Networks dedicate a communication line between two parties to a communication
- Do you know what happens when someone tries to establish communication with someone already on a dedicated line communication?



Communications

- A better solution was needed
- That solution was to use a persistent network in which information is broken into packets and routed between origin and destination

Communications



- <https://youtu.be/rHHpwcZiEW4>

Communications

- With wide area packet switching, an interconnection of networks was possible



- <https://youtu.be/7NpczzIsnLU>

Communications

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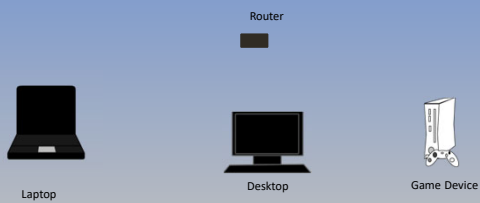


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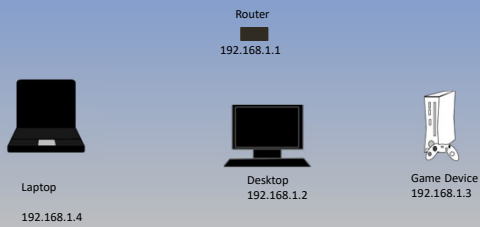
Computing + Communications

- On a packet switched network, every device has an IP address
 - MAC Terminal `ipconfig getifaddr en1`
 - Win CMD `ipconfig`

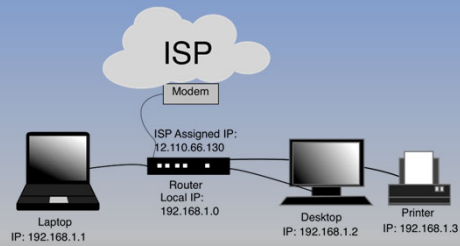
Computing + Communications



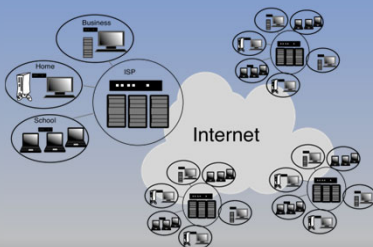
Computing + Communications



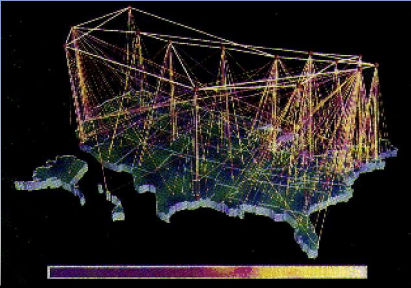
Computing + Communications



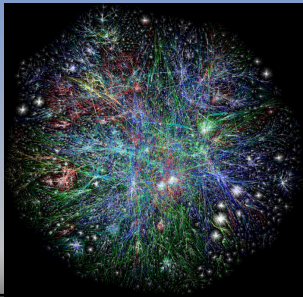
Computing + Communications



Computing + Communications



Computing + Communications



TENSION



