# What is the Cloud?

The first "modern" general-purpose computers, ENIAC and Colossus, were created in the early–mid 20th century. By the 1960s, computers were becoming more commonplace at large institutions, but were still largely inaccessible to many professionals and researchers, let alone everyday consumers.

> Women were the first "computers" – tasked with maintaining the programming necessary to operate the first general-purpose digital computer systems.
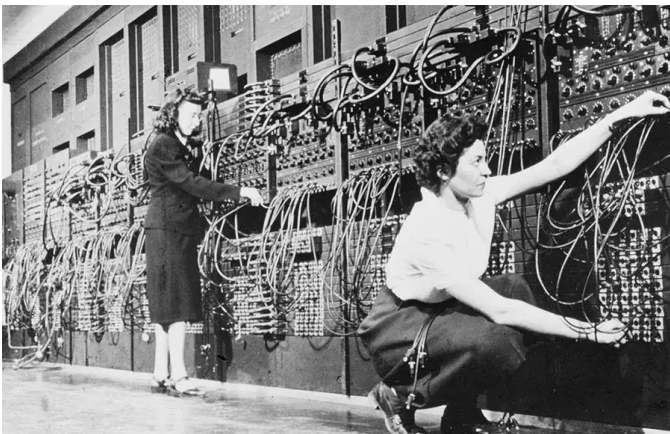

ENIAC
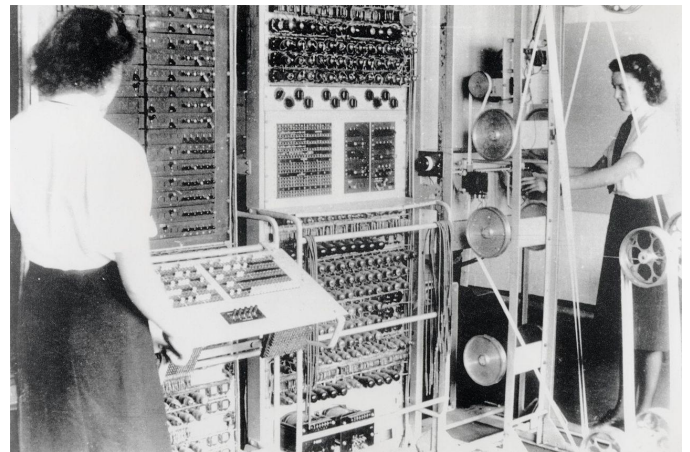
Colossus

Time sharing became a technique that allocated computer resources to multiple users, enabling true multi-tasking for the first time. In the past, programs ran in sequence and tried to completely finish a single task before moving onto the next. Now, each user could run their own program and the server would quickly cycle through each user's task, performing a little bit of each at a time.
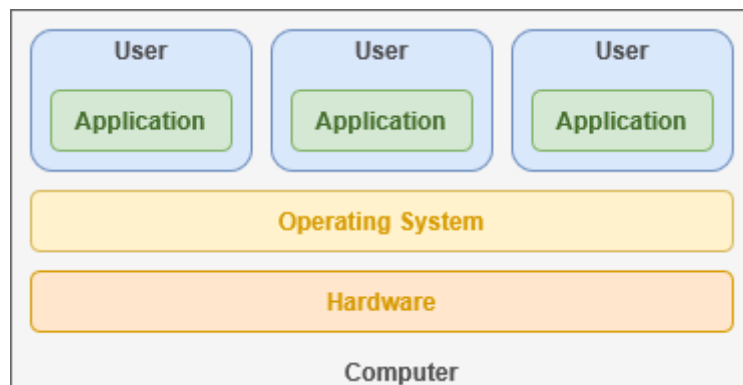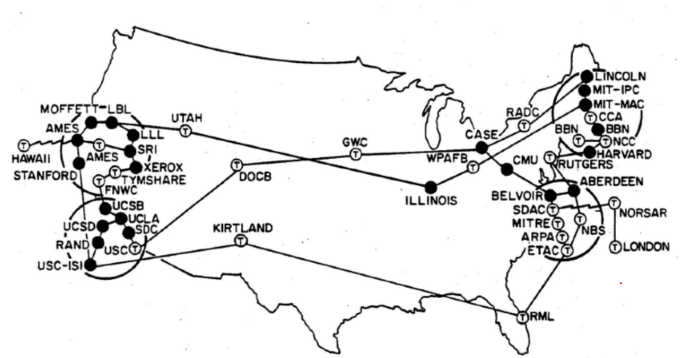

Users could connect through a "terminal" that maintained the illusion that it was a personal computer running only their task when in actuality it was only a personal portal to a shared local server. Before the internet was even invented, we had begun our exploration into the concept of
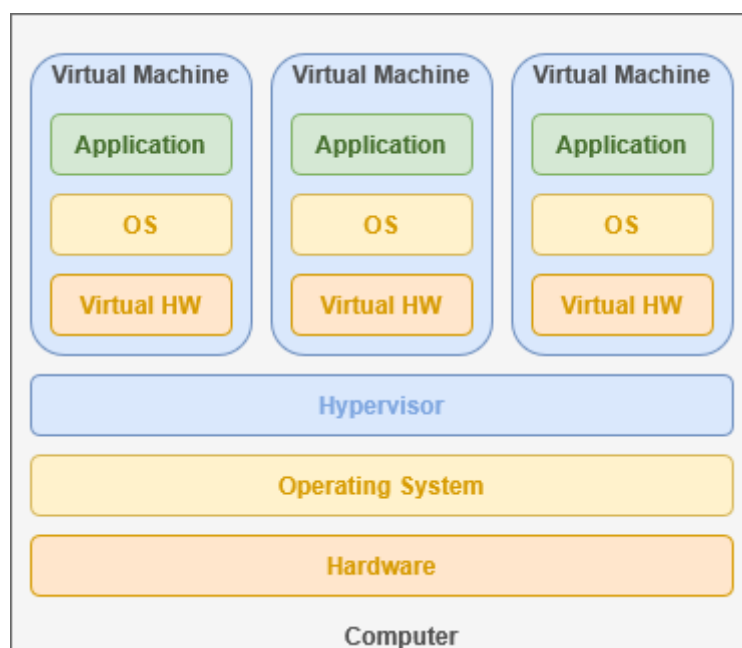
the modern "cloud".

ADM-3A

ARPANET

ARPANET (Advanced Research Projects Agency Network), unveiled in 1969, marks the creation of the long-distance Internet and implemented the same TCP/IP standards we use to this day. At the same time, IBM's CP-40 expanded upon time sharing to create virtualization – or dividing a single computer's hardware resources into multiple software environments. This allowed the creation of multiple secure and isolated server environments within a single physical hardware system.

> Skilled Navajo weavers were employed to build the first digital processing units.

By 1991, the modern internet as we know it was released to a world-wide consumer base. By subscribing to an internet service provider, anyone could connect to the world wide web. Before the turn of the century the

first theory of cloud computing is defined, creating a foundation for easily scalable servers.

This technology allows independent hardware systems to be linked together over a network and share their resources towards supporting a unified service. Distributed computing enabled websites to support a hundred thousand users by balancing the work load across virtual clusters instead trying to juggle everything on one server.


This allowed individual data centers to be spread across the globe. Whenever a service was accessed over the internet, the user could be geo-located and directed to the server that was closest to them. This provided a better connection quality, split up the workload and created more space for physical data storage.

By the early 2000s, technology companies had invested heavily into this infrastructure. This enabled businesses to forego hosting their own internal technology infrastructure within their building space and instead rely on an external contracted service.

Google and Apple both released services targeting corporations and consumers, offering access to storage space and cloud-based tools. Soon after, Amazon Web Services (AWS) introduced their "cloud" computing and storage services wherein businesses could rent remotely managed server resources and storage space. Dropbox was released in 2007, offering 2GB of free cloud storage to everyone by heavily utilitizing AWS cloud services.

This marks an ascent of hosted open-source software services like WordPress – who currently power a sizeable portion of internet websites and control a commandeering majority of the CMS industry. By 2012, the open-source Apache web-server software is hosting almost 60% of all websites on the internet. As of 2025, the most popular server software is the open-source nginx that focuses on flexibility, performance and versatility.

Contemporary cloud computing combines virtualization, distributed computing, and secure internet connections to build vast server farm infrastructures around the globe. By dividing up server clusters into numerous isolated software environments, data centers essentially create digital apartments for multiple tenants.
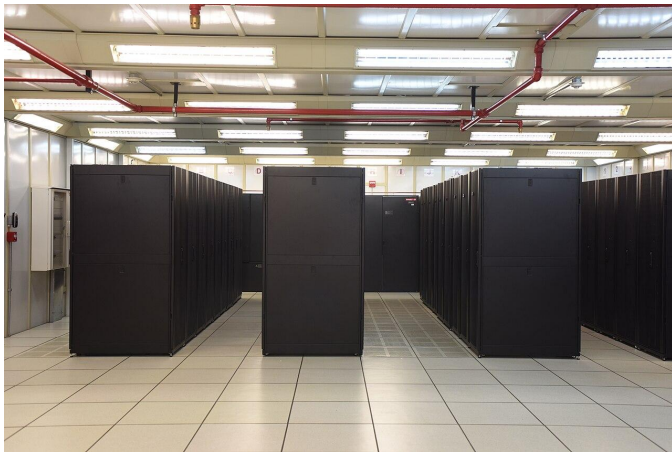

ARSAT Data Center

Google Data Center

By contracting out online services, corporations lose physical ownership of their data and have the potential to shirk their responsibilities for digital stewardship. This has led to a great deal of uncertainty about data privacy, unauthorized access and legal compliance: with digital data outside the physical control of a company, how could they ensure their digital security? For better or worse, data centers power much of the internet and have become a driving force behind technological expansion.
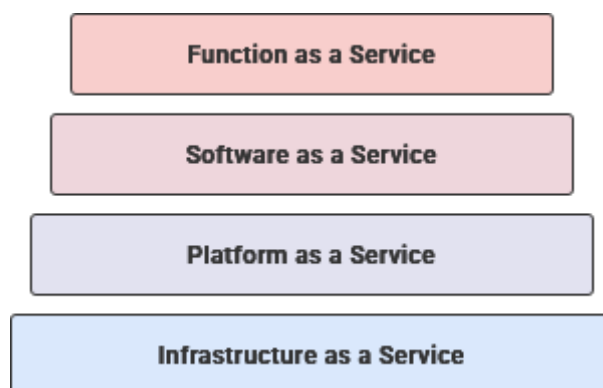
This vast infrastructure has led to a standardized "cloud computing" service model focused on providing a spectrum of granularity in regards to what is managed by the client versus the cloud computing service provide.

Dns

Infrastructure as a Service
The practice of renting maintained computer systems allowing for expanse usage scenarios.

Code_blocks

Platform as a Service
Subscription service to software deployment platforms like Docker allowing rapid deployment.

Terminal

Software as a Service
Connects users – occasionally on behalf of a corporation – to web-based software, such as office and file-hosting services.

Function

Function as a Service
Singular functions to be completed, typically paid per usage, such as image or data processing.

On one end, the client is in complete control over how they utilize their rented hardware while the other occurs completely behind-the-scenes.

	Self-Hosted	IaaS	PaaS	SaaS	FaaS
Input and Output ⟨··⟩	👤	👤	👤	👤	☁
Application	👤	👤	👤	☁	☁
Security	👤	👤	☁	☁	☁
Database	👤	👤	☁	☁	☁
Operating System	👤	👤	☁	☁	☁
Virtualization	👤	☁	☁	☁	☁
Server	👤	☁	☁	☁	☁
Storage	👤	☁	☁	☁	☁
Networking	👤	☁	☁	☁	☁
Facilities	👤	☁	☁	☁	☁

While these technologies were groundbreaking for creating global internet platforms, they have had many impacts on <u>privacy</u> and <u>technology development</u>. You may <u>lose access to your data</u> at any point because service provider decides they don't want to host your content. With its current trajectory, cloud computing threatens to completely <u>monopolize and privatize</u> the very infrastructure that powers the Internet. More than <u>85% of global business are expected to adopt a "cloud-first" approach</u> by 2025.

<u>Federation</u> is nascent computing concept that enables servers to share services that can operate across multiple autonomous servers. By <u>decentralizing</u> the ownership of a software, we can ensure no one entity can unilaterally control the service. The <u>Fediverse</u> – or a collection of social networking services – all operate using a standardized protocol that allow them to communicate while maintaining individuality.
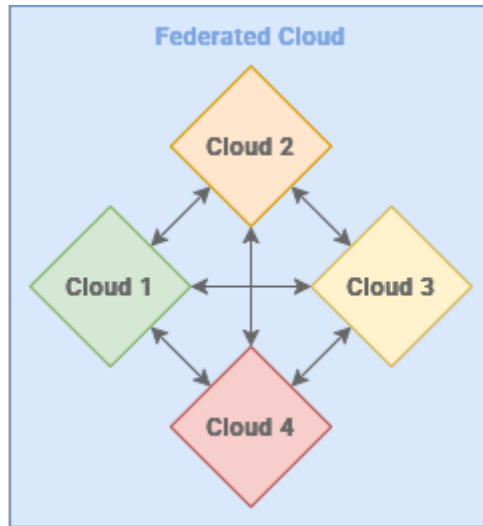
By utilizing these same cloud computing technologies, anyone has the ability to host their own services – even from home. Linux, Docker and all of the necessary software are open-source, available for free to anyone. When self-hosting your own cloud server, you have the power – and responsibility – to act as an infrastructure, platform and software provider.

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