



Introduction to Cloud Computing: Its History, Methods, and Connection to the Grid Computing

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ABSTRACT

Interest in cloud computing is growing across the board, from the IT industry and Business Intelligence to end users. The advantages of cloud computing, also known as internet-based computing, are many, and set it apart from grid computing and other types of computing. Location is not a factor for the information, applications, and services required by a computer and any auxiliary gadgets, such as a mobile phone, personal digital assistant, or tablet. We've covered where cloud computing came from, how it stacks up against grid computing, and all the different ways it may be put to use.

Keywords-- Cloud, SaaS, PaaS, IaaS, Cloud Computing, Grid Computing

INTRODUCTION

A "cloud" is a network that allows users to pool their resources digitally. The cloud's resources are always available to users, whenever they need them. Most consumers choose to have a third party host their internet services rather than create their own in-house network when it comes to cloud computing. Users only need to pay for the services they really utilise. In cloud computing, several computers collaborate to complete a single task. The burden of running programmes doesn't have to be shouldered by local PCs. The "cloud" really consists of several different networks of computers working together to take on this task. As a result, less hardware and software on the user's end is needed. Therefore, all you need to use cloud-based apps is a web browser like Internet Explorer, Chrome, Firefox, Opera, etc. Cloud computing is characterised by its on-demand services, metric services, extensive network coverage, rapid elasticity, resource pooling, multi-tenancy, and shared infrastructure.

In the cloud, you may do things in one of three ways. 1) Software as a service (also known as SaaS) Second, Infrastructure as a Service (IaaS) and Third, Platform as a Service (PaaS). Customers have shown strong support for cloud computing and its associated services, which include popular names like Gmail, Facebook, YouTube, Yahoo, Hotmail, etc. positive effects of To better prioritise productivity and innovation, we need fewer managers. Its extensive uptake can be attributed to its flexibility in the face of a dynamic corporate environment.

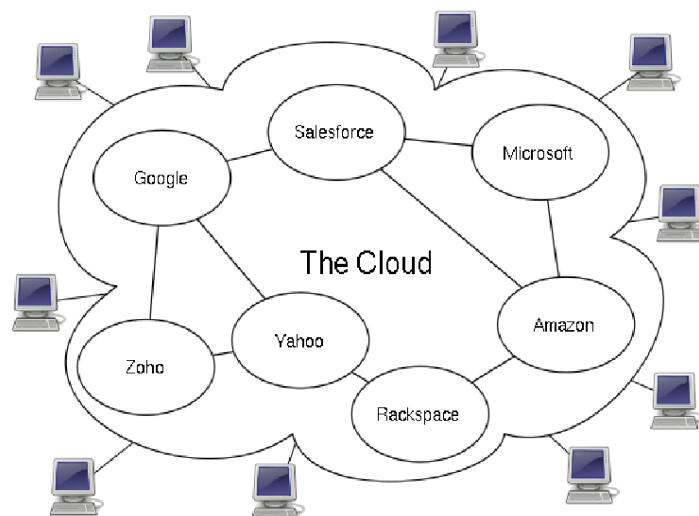


Fig 1.1: Google, Microsoft, SalesForce.com, Amazon, Yahoo, and many more all provide cloud-based services. [5]

EVOLUTION OF CLOUD COMPUTING

Youseff et al. were an early group to describe cloud computing and its parts, and their research helped shape the field's current definition. In their words: "cloud computation is an amalgamation of some new and all old concepts in a lot of different academic fields, including Service-Oriented Architectures, grid and dispersed the field of computing, and hypervisor."

"Cloud computing can be considered a new computing paradigm that allows users to temporarily utilise computing infrastructure over a network, which is supplied as a service by the cloud-provider at possibly one or more levels of abstraction," write Youseff et al. (2008).

Computing in the cloud, as described by Armbrust et al., "refers to both the applications that are delivered as services over the Internet and the computing equipment and systems software in the datacenters providing those services." These services are commonly referred to as "software as a service" (SaaS). Data centre infrastructure and software will be referred to collectively as "the Cloud." Public Clouds are those that give their services to the general public and charge users on an as-needed basis, and the service they provide is known as Utility Computing. The term "Private Cloud" is commonly used to refer to the private, internal datacenters of a business or other organisation. Armbrust et al.'s (2009) definition of "Cloud Computing" includes SaaS and Utility Computing but leaves out Private Clouds.

In contrast to Grid Computing, which uses centralised nodes for both processing and storage, cloud computing shifts these tasks to remote servers under the control of an outside provider.

DIFFERENT APPROACHES OF CLOUD COMPUTING

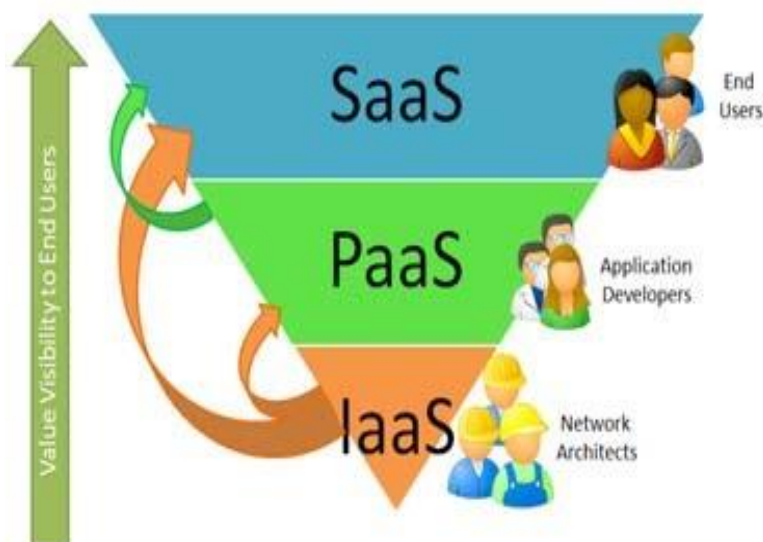


Fig 1.2 : Various Cloud Computing Methodologies [6]

SOFTWARE AS A SERVICE (SAAS)

SaaS can only be accessed with a web browser and an active internet connection. Our phrase for applications that are prebuilt, vertically integrated, and available on a worldwide scale is "software as a service," or "SaaS." Email distribution and use, HR administration, payroll processing, database management, and similar services all fit under this broad area. It might be broken down into two simple categories.

SaaS, or "software as a service," is a deployment paradigm for managing cloud-hosted software.

The Benefits of SaaS Software

SaaS Software as a service refers to a broad category of computer programmes that may be accessed online.

There are several well-known vendors in the SaaS market. Take the web-based version of Microsoft Office as one example.

In order for the many applications that make up a SaaS to talk to one another, an API or similar programming interface is used.

The use of software as a service is skyrocketing.

SaaS is typically used in corporate systems that have heavy external contact.

SaaS is used for short-term uses, as will be explained in detail in the following subsection Consider the case of collaborative tools available online.

EXPLAIN PAAS (PLATFORM AS A SERVICE).

Users of Pass have access to all the features and tools they need to develop and deploy their own custom cloud-based apps, code, and software. The focus is on the software and the development environments. Clients can create software that meets their specific requirements with the help of application servers (like Java or the .Net framework) and database servers (like My SQL or Oracle). It streamlines the process of creating, deploying, and updating web applications across all supported platforms.

PaaS may be broken down into two primary categories:

1) Unlimited Access Pass

Try to Imitate a Discrete Stack, Step 2

3) Access for Owners

Advantages

Saving money is possible when all applications are developed, deployed, and tested in a single environment.

You may try out the software in its online iteration without having to download and set it up beforehand. Facebook, Gmail, Yahoo, etc., and its ilk are utilised by virtually everyone nowadays.

Finally, it is scalable, reliable, and secure by design.

A complete and accurate understanding of user actions. Payment for service use is entirely voluntary.

Fifth, the application's shared architecture enables several users to do multiple things at once.

IaaS stands for "infrastructure as a service."

Providing hardware, networking, storage, operating systems, and storage devices as a service is known as infrastructure as a service (IaaS). The cloud computing architecture known as "infrastructure as a service" (IaaS) combines public and private networks. IaaS is quickly surpassing SaaS and PaaS as the preferred alternative consumption paradigm for IT services.

Advantages

The characteristics that best characterise IaaS are as follows: IaaS delivers resource distribution as a service. There are two methods in which IaaS enables dynamic scaling. Lastly, IaaS offers a sliding scale of prices.

Infrastructure as a Service allows for the sharing of physical resources between several users or clients.

Second, it may be expanded to any size.

Finally, there is no need for leadership.

Table 1: Milestones of computer history

| NUMBER OF YEAR | TECHNOLOGY NAME |
|----------------|-----------------------------------|
| 1623 | First calculating machine |
| 1837 | Analytical machine |
| 1885 | Electrical logic machine |
| 1890 | Tabulating machine |
| 1936 | Electrical logic machine realized |
| 1941 | Z3 |
| 1945 | ENIAC |
| 1947 | Transistor |
| 1957 | IBM 704 |
| 1964 | IBM SYSTEM/360 |
| 1964 | DEC'S minicomputer PDP-8 |
| 1969 | ARPAnet |
| 1969 | Intel microprocessor 4004 |
| 1971 | Intel microprocessor 8008 |
| 1973 | First pc miracal |
| 1973 | Tv Type writer |
| 1974 | Mark 8 |
| 1974 | Xerox's minicomputer alto |
| 1975 | Altair 8800 |
| 1981 | IBM PC |
| 1983 | TCP/IP Protocol for Arpanet |
| 1988 | Internet commercialization |
| 1989 | Worldwide web |
| 1990 | Grid computing |
| 2000 | SaaS |
| 2007 | Cloud computing |

BUSINESS AND DEVELOPING TECHNOLOGY

PLAYS A MAJOR ROLE IN RISE OF CLOUD COMPUTING

There are three primary market drivers that have contributed to the development and widespread adoption of cloud computing among both end-user organisations and service providers.

The introduction of information technology to a company

Eventually, sharing will be automatic.

The Sway of Technological Populism

Analysis of Cloud and Grid Computing in Comparison

A comparative study between cloud and grid computing is shown in the following table, which may be used to track the evolution of cloud computing. There are several issues with grid computing that have kept it from fully satisfying its customers. The IT industry is consequently considering Cloud Computing as the next phase of computing. Since it is not constrained by the constraints of the grid, cloud computing has become a popular topic in the IT industry and among end users. The cloudiness over the grid was determined using the given parameters. As can be seen from the above, cloud computing has rapidly become an integral element of today's society.

TABLE 2: Comparative study of Cloud Computing with Grid Computing

| Grid Computing | Cloud Computing |
|---|--|
| Aim: Resources are shared in collaboration manner. | Aim: Resource sharing depends upon use of service. |
| Abstraction: In this, the level of abstraction is very low. | Abstraction: level of abstraction is high |
| Scalability: The degree of scalability is low | Scalability: Scalability is high |
| Multitask: it performs multitasking. | Multitask: It also performs multitasking. |
| Transparency: Transparency is low. | Transparency: Transparency is high. |
| Security: The security in grid computing is low because it depends upon grid certificate service. | Security: The security in cloud computing is high because of virtualization. |
| Operating System: It supports any standard operating system. | Operating System: In the concept of cloud computing, multiple operating systems can run. |
| Ownership: Multiple owners can take ownership. | Ownership: Single ownership. |
| Users: Few numbers of users can use it. | Users: More numbers of users can use at same time. |
| Example: GIMPS, SETI | Example: Google, Facebook, Amazon |
| Future: Cloud Computing | Future: Next generation of Computing |

FUTURE SCOPE OF CLOUD COMPUTING

It's common knowledge at this point that cloud computing plays an essential role in today's society. This new development completely challenges our standard understanding of computers. Consumers have shown a positive reaction to cloud computing because of its low learning curve and low setup time. 70% of Americans will be using it in some capacity by the end of the next decade, whether at home or at work, according to some studies. As a result of ubiquitous use of cloud-based services like email and social networking sites, the concept of cloud computing is already common parlance.

One reason cloud computing is so promising is the widespread availability of fast internet connections. Satellite internet has made the world much more accessible and interconnected. Instantaneous global communication is now possible because to cloud-based applications like Skype, Whats App, etc. Onboard services are now being offered through satellite. As time goes on, cloud computing improves and becomes more dependable than older approaches. Future cloud computing verification methods will require centralised trust. Centralised data storage is the future of the cloud. This allows companies to potentially create large datasets. Project administration in massive data sets is made possible in this way.

Several factors will contribute to cloud computing's continued success in the future: 1) the proliferation of high-speed internet Two) You will have a great time. The hardware will no longer be tied to the 4) Always-up-to-date software The eradication of paper is only one more evidence among many that proves my point. Cloud computing, then, has both a promising past and an even brighter future.

India's Version

Small and medium-sized enterprises in India cannot afford the current iteration of technology, which is why cloud computing is so vital. This is similar to how most Indians abandoned landlines in favour of cell phones a decade ago.

Many Indians do not have the money or access to high-end computers required to use the many e-Government online services. Since 70% of Indians have to get by on less than \$2 per day, they simply cannot afford a laptop, desktop computer, etc., to use e-Government services.

Nasscom and Deloitte predict that by 2020, the Indian cloud computing business would be worth USD 16 billion. Another consulting firm, Zinnov Management Consulting, estimates that the cloud computing industry would grow from its current worth of USD 400 million to USD 4.5 billion by 2015. Over 2 million new jobs might be created in India by 2015 because to cloud computing, according to a new analysis by MicrosoftIDC.

Conclusion

Features, background, and a comparison to grid computing are all covered in this paper's introduction to cloud computing. After then, the advantages of various cloud computing approaches were discussed. After doing some research, we saw just how intricate and fast growing the subject of cloud computing is. The widespread economic and societal impact of cloud computing is now clear.

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