International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 12 Issue 2 ǁ February 2024 ǁ PP. 121-123

Research Area of Cloud Computing For Next Generation of Computing.

Mr. Bhramarabara Biswal, Mrs. Debarchana Rout
Department of Master in Computer Application, College Of Engineering Bhubaneswar, Odisha, INDIA.

ABSTRACT
A marvel of the twenty-first century, cloud computing has applications in almost every sector of the economy. It has certain limitations being a new technology. To address those flaws, efforts are constantly made to make improvements. It is thought that the upcoming cloud technologies will address these drawbacks. The few next-generation cloud technologies—distributed cloud, fog computing, and edge computing—are the focus of this study. In addition to enabling more responsive communications in specific regions, the distributed cloud enhances global service communications. Cloud providers employ the distributed approach to enable reduced latency and increased efficiency for their cloud services. We discover that there aren't many opportunities for things like faster content delivery, IoT implementations, better security, and cost efficiency in distributed clouds. Nevertheless, it presents certain difficulties, like data exposure to cybercriminals upon transmission from open networks. The results show that fog computing shortens processing times, minimizes operating expenses, and boosts security. However, the heavy reliance on data transit is one of the trickiest parts of fog computing. Consumer data can be managed as close to the source as possible at the network's edge with the help of an edge computing system. Edge computing offers numerous benefits in a number of fields, such as transportation, healthcare, and network optimization. The development of the internet of things and the unexpected spike in data generated by IoT-connected devices have had a significant influence on the popularity of some of the next generation cloud technologies. One could argue that challenges can be gradually overcome. It is feasible to say that challenges can be progressively overcome because next-generation cloud technologies offer solutions that satisfy a variety of modern business needs. Businesses may take some time to adopt next-generation cloud technologies as they weigh the advantages and disadvantages, and the shift may be gradual.

Date of Submission: 04-02-2024 Date of acceptance: 16-02-2024

I. INTRODUCTION:

The end-all cure for issues like erratic traffic spikes, computer overloads, and possibly expensive data processing and backup hardware investments is being heralded as cloud computing. It could transform the IT industry by changing the way hardware is created and acquired, increasing the allure of infrastructure and software as services. In actuality, cloud computing is a paradigm for computing that, in addition to the current Internet-based IT service delivery and consumption model, offers dynamically scalable and frequently virtualized resources over the network. The main advantages of cloud computing are lower costs and easier use. Cloud service providers are specialists in the services they offer, which include operating systems, storage, software, hardware, and rentals. Consequently, a business can concentrate on its primary goal as opposed to hiring a variety of IT staff. For instance, a company can get backup staff from a backup specialist, so it doesn't need to hire backup staff. The backup cloud provider will most likely offer superior support compared to hiring ad hoc workers to handle it. This method of outsourcing computing not only saves businesses money up front, but also over time. It is not necessary for a company to make plans for changes in resource usage. Pay-as-you-go cloud computing services relieve cloud users of laborious tasks like software and equipment maintenance and updates.

II. CLOUD COMPUTING MODELS

Based on the services they offer, cloud computing includes a range of solutions, from grid and utility computing to application service provision. This article discusses the most well-known models that support the cloud paradigm. Cloud computing resources include operating systems, hardware infrastructure, software services, and data storage. Depending on the kind or level of granularity of the service, there are three primary cloud delivery models: platform-as-a-service (PaaS), software-as-a-service (SaaS), and infrastructure-as-a-service (IaaS). To access cloud services, which can be set up on a range of locations (organizational buildings) and devices (desktops, laptops, tablets, and smartphones), cloud consumers will use cloud client programs.

Infrastructure-as-a-Service

In this paradigm, cloud users receive raw IT resources like hardware, storage, IP addresses, and firewalls over the Internet. A collection of virtual machines are run on real IT resources by hypervisors. Virtualized copies of these resources are then made available to cloud users. Users of the cloud have the ability to set up any environment and software on these platforms, as well as extensive control over the management and security of these resources. IaaS cloud providers include Rackspace Open Cloud, Google Compute Engine, Amazon Web Services (AWS), Windows Azure, and IBM SmartCloud Enterprise.

Platform-as-a-Service

Cloud providers also offer ready-to-use platforms as a service to cloud users who want more outsourcing of computation and administration. This idea allows for the rental of a fully virtualized environment that has an operating system image loaded. Databases, web servers, and development platforms are usually included. Cloud users can install and manage apps that operate in a virtualized environment after purchasing a platform. The amount of system governance and control decreases as the cloud provider installs, updates, and maintains the platform. The policies and practices of the cloud provider determine all aspects of security, including hardware and operating system security.

Software-as-a-Service

This is the most precise delivery method when cloud users access third-party apps via the Internet. There are options for both paid and free use, such as Google Docs and DropBox for file synchronization. When using cloud software, the user has minimal control over the security of the data it accesses and how it functions. The cloud software provider bears all of the administrative burden.

III. CLOUD DEPLOYMENT MODELS

A growing number of companies are gradually moving most, if not all, of their IT operations to corporate cloud computing. The company has several options when it comes to ownership and administration of the cloud. In the realm of cloud computing, four primary deployment types exist.
a) Public cloud: An organization that offers cloud services and makes its infrastructure accessible to the general public or a sizable industry group is in charge of a public cloud. The cloud's operational control, data security, and infrastructure are all under the purview of the CP. A public cloud may be owned, managed, and run by a commercial, academic, or government organization, or by a mix of these. It is situated on the property of the cloud service provider.In an architecture for a public cloud, all Important parts of the multitenant infrastructure are situated outside the corporate firewall. Applications and storage can be paid for or provided for free over the Internet via a secure IP address. Simple consumer-style services like on-demand internet apps or capacity from Amazon, Google, Yahoo mail, and other companies are offered by this type of cloud.and complimentary picture storage from LinkedIn or Facebook. Public clouds can accommodate demand and are less expensive than private or hybrid cloud services, but they typically don't have service level agreements (SLAs) and may not offer the same level of protection against data loss or corruption. Customers and companies who don't need the same level of service as what is expected behind the firewall can utilize the public cloud. Moreover, restrictions and adherence to privacy regulations—which are the responsibility of subscribers or corporate end users—may not always be present in public IaaS clouds. Pay-per-use costs for public clouds can start at just pennies per gigabyte, making them affordable for both small and medium-sized businesses as well as consumers. Services include file sharing, photo and music sharing, and laptop backup.The public cloud's affordability is its main advantage. Subscribers only pay for the equipment and services they really use, and they are free to adjust as circumstances change. Furthermore, there is a notable reduction in the management overhead for subscribers. The primary concern is security, but several public cloud providers have demonstrated superior security protocols, and these businesses might possess greater resources and expertise.

Private Cloud

An organization's own IT infrastructure is where a private cloud is installed. The business has the option of managing the cloud internally or by contracting with a third party. Moreover, storage devices and cloud servers could be situated on or off campus.

Private clouds can provide software (applications) or storage as a service to branch offices, as well as infrastructure as a service (IaaS) to staff members or business units, internally via an intranet or the Internet via a VPN. Private clouds provide a way to stay inside the security perimeter of the company's network while delivering and billing for individual or combined services using already-existing infrastructure in both scenarios. Services provided by the private cloud include database on demand, email on demand, and storage on demand.

Hybrid Cloud

A hybrid cloud architecture consists of one or more private, public, or communal clouds connected by proprietary or standardized technology that permits data and application mobility. Critical data can be kept in a secure area of the cloud with a hybrid cloud system, while less sensitive data can take advantage of public cloud features.

A hybrid public/private cloud solution could be very desirable for smaller businesses. Many applications for which security concerns are less of a concern can be offloaded at significant cost savings without committing the organization to moving more sensitive data and apps to the public cloud.

IV. CONCLUSION:

The most amazing technological advancement of the past few decades is cloud computing. This is because, compared to other technologies in the field, it has become mainstream more quickly. Not only is cloud computing advantageous for businesses and organizations, but it also benefits average consumers. It enables us to run software programs without requiring that we install them on our PCs. There will be significant technological advancements this decade. The IT infrastructure is undergoing a revolution thanks to AI and IoT, which is also increasing the amount of data created. As a result, efficient datacenters and innovative methods for real-time access to vast amounts of data are required. Considering all of the benefits that cloud computing offers companies, it makes sense to say that cloud computing is quickly taking on the role of the new normal. Future concerns like cyber-security, quality control, and large data management are being helped by cloud computing. In addition, cloud computing is opening up new technologies to the public as services, including decentralized ledger technology and artificial intelligence. Decentralizing computation away from the current resource concentration of data centers and combining infrastructure from multiple suppliers seem to be the general trends. Typical single-provider cloud services are not like this. In order to satisfy consumer demand, new computer models are developing. The developing computer architecture and changing cloud infrastructure will have an impact on many different sectors. Because they will increase the connection between people and things, they will play a crucial role in enabling the Internet-of-Things paradigm. In quickly taking on the role of the new normal. Future concerns like cyber-security, quality control, and large data management are being helped by cloud computing . In addition, cloud computing is opening up new technologies to the public as services, including decentralized ledger technology and artificial intelligence. Decentralizing computation away from the current resource concentration of data centers and combining infrastructure from multiple suppliers seem to be the general trends. Typical single-provider cloud services are not like this. In order to satisfy consumer demand, new computer models are developing. The developing computer architecture and changing cloud infrastructure will have an impact on many different sectors. Because they will increase the connection between people and things, they will play a crucial role in enabling the Internet-of-Things paradigm.

References

[1]. Anderson, D. P., Korpela, E. and Walton, R. (2005) 'High-performance task distribution for volunteer computing', in First International Conference on e-Science and Grid Computing (e-Science'05). IEEE, pp. 8-pp.

[2]. Atieh, A. T. (2021) 'Establishing Efficient IT Operations Management through Efficient Monitoring, Process Optimization, and Effective IT Policies', Empirical Quests for Management Essences, 1(1), pp. 1–13. Available at: https://researchberg.com/.

[3]. Bilal, K. et al. (2018) 'Potentials, trends, and prospects in edge technologies: Fog, cloudlet, mobile edge, and micro data centers', Computer Networks, 130, pp. 94–120.

[4]. Coady, Y. et al. (2015) 'Distributed cloud computing: Applications, status quo, and challenges', ACM SIGCOMM Computer Communication Review, 45(2), pp. 38–43.

[5]. Dastjerdi, A. V. and Buyya, R. (2016) 'Fog computing: Helping the Internet of Things realize its potential', Computer, 49(8), pp. 112–116.

[6]. Durrani, M. N. and Shamsi, J. A. (2014) 'Volunteer computing: requirements, challenges, and solutions', Journal of Network and Computer Applications, 39, pp. 369–380.

[7]. Endo, P. T. et al. (2011) 'Resource allocation for distributed cloud: concepts and research challenges', IEEE network, 25(4), pp. 42–46.

[8]. Ghazizadeh, A. (2012) 'Cloud computing benefits and architecture in e-learning', in 2012 IEEE seventh international conference on wireless, mobile and ubiquitous technology in education. IEEE, pp. 199– 201.

[9]. Goyal, S. (2014) 'Public vs private vs hybrid vs community-cloud computing: a critical review', International Journal of Computer Network and Information Security, 6(3), p. 20. Iorga, M. et al. (2018) 'Fog computing conceptual model'.

[10]. Jadeja, Y. and Modi, K. (2012) 'Cloud computing-concepts, architecture and challenges', in 2012 International Conference on Computing, Electronics and Electrical Technologies (ICCEET). IEEE, pp. 877– 880.

[11]. Khan, W. Z. et al. (2019) 'Edge computing: A survey', Future Generation Computer Systems, 97, pp. 219–235.

[12]. Khanagha, S. et al. (2020) 'Mutualism and the dynamics of new platform creation: A study of Cisco and fog computing', Strategic Management Journal.

[13]. Krishnaraj, N. et al. (2022) 'The Future of Cloud Computing: Blockchain-Based Decentralized Cloud/Fog Solutions–Challenges, Opportunities, and Standards', in Blockchain Security in Cloud Computing. Springer, pp. 207–226.

[14]. Ludwig, A. and Schmid, S. (2015) 'Distributed cloud market: Who benefits from specification flexibilities?', ACM SIGMETRICS Performance Evaluation Review, 43(3), pp. 38–41.