

Cloud Computing Services Versus on-Premise Computing

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This research paper offers the customer with an overview of the Cloud Services over conventional on premises computing. When exploring newly ranges for enterprise organizations, expert need to progressively weigh the assets of Cloud offerings. Vendors are offering appealing starting pricing to attract Cloud tenants as part of their battle to win customers and expand market share. Cloud Service providers offer a diverse set of cloud-based services around the world like data storage, analytics, databases, developer tools, computing, networking, Internet of Things, security, management tools, etc. On the other hand, the customer is responsible for the development, distribution, stacking, and a number of other server-related responsibilities in on-premise data centers. They are generally used to run private clouds, which have the same resources as a public cloud but are not accessible to the general public. Government agencies and major businesses that want to keep their sensitive data secret typically employ on-premise solutions. This data can contain biometric scans, employee compensation statements, company models, and other vital information. This research study lays out the foundations for determining whether to use Cloud or On-Premise Computing in the future.

Keywords: Cloud Computing, AWS, Google Cloud, Sage Maker, Cloud computing services, Data Centers, On Premises computing.

1. Introduction

Cloud computing is a distributed architecture that centralizes system resources on a stable platform to provide computer resources and services on demand [1]. The user has unlimited access to cloud computing modalities at any time. Customers in the cloud computing industry frequently prefer to use a third-party provider for internet service rather than build their own physical infrastructure. Users are entirely liable for the services that they have used [2]. The customer does not need to make huge direct hardware investments or spend a lot of time controlling that technology with cloud computing. Cloud computing enables connecting to servers, storage, databases, and a wide range of application services over the internet a breeze [3]. On the other hand, On-premise computing is that where the customer is responsible for the development, distribution, stacking, and a variety of other server-related tasks. Private clouds, which have the same resources as a public cloud but are not available to the general public, are typically run on on-premise servers[4].Government agencies and major businesses that want to keep their sensitive data secret typically employ on-premise solutions. This data can contain biometric scans, employee compensation statements, company models, and other vital information.

Cloud computing varies from traditional computing in that computer resources or services such as storage and application hosting are provided by third-party service businesses, rather than being kept locally within the Enterprise data center or facility[5].As Compared with on-premise computing, AWS cloud computing services has lot of advantages like data storage, security, least cost, quantifiability, high-performance processing, tractability, regulatory compliance, data access at any time, and data-centric encryption etc.[6].Figures 1 and 2 depict the difference between a on-premise computing environment, in which servers, applications, and storage are hosted within a company's IT infrastructure, and a cloud computing environment, in which computing resources are accessed remotely via the Internet and provisioned by a third party provider[7].

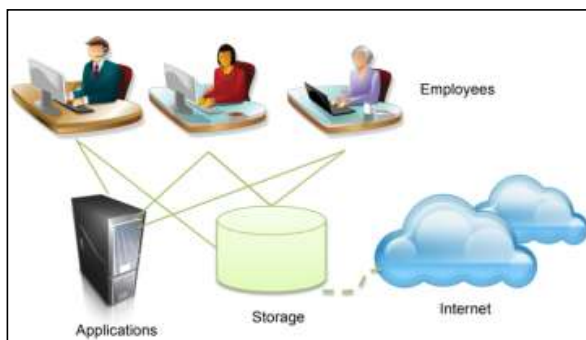


Fig. 1: On-Premise Computing Environment



Fig. 2: Cloud computing Environment

For comparing cloud computing services with on-premise services, this research study is mainly focused on the benefits of data storage on Google cloud. A public cloud provider, such as Amazon Web Services (AWS) or Microsoft Azure, is a Google cloud. [8]. GCP and other cloud partners allow customers to use computer resources hosted in Google's data centers across the world for free or on a pay-per-use basis. As when we are using traditional data storage system, there could always be a limitation to access the data and there is a possibility of data loss as well. To prevent data loss, Google cloud will be an appropriate solution.

2. Literature Review

In 2019, Guddu Kumar[9] provides a look at the challenges that are preventing people from accessing the cloud, as well as a look at the solutions that have been implemented to mitigate the risks associated with these concerns. This article provides a quick overview of Cloud Computing security of data, advantages, and threats.

In 2013 Thomas Boillat et al.[10] Fills a gap in prior cloud-based enterprise software research, which has primarily focused on user uptake. The findings expand the current definition of enterprise SaaS to include emerging enterprise software platforms (enterprise SaaS+PaaS) as a new business model configuration.

SparshVerma et al. [11] provides a comprehensive review of cloud computing. The purpose of this study is to provide light on cloud computing research. This research paper defines cloud computing, its architecture, its properties, and the cloud computing deployment model.

Akshay Kushwaha[3] paper gives customers an overview of the advantages of AWS (amazon web services) cloud over traditional on-premise solutions and exposes them to the services that make up the platform. The primary goal of this study was to modify customers' perceptions of AWS Cloud and provide additional information about why it should be selected over on-premise solutions.

In 2019, [12] presents an overview of the advantages of Amazon Web Services (AWS) cloud in the current cloud, as well as how it is running well in today's environment, allowing people to use the internet more than ever before. Cloud computing is in high demand in all organizations tasked with

improving service quality while cutting costs, according to the research, because the company only pays for what they use based on incoming and outgoing traffic.

Cameron Fisher [13] centred on laying the foundation for deciding whether to employ Cloud or On-Premise Computing in the future This study illustrates the necessity for cost control and authority while determining between cloud and traditional storage computing. Using evaluations and computations, the expanding cloud options were compared to a more traditional self-reliant approach.

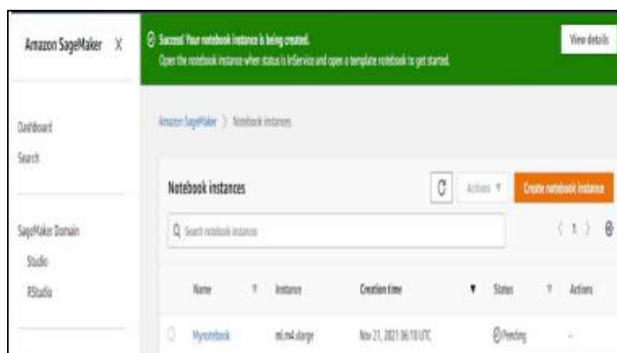
Ranjith D et al.[14]provides an overview of the present status of cloud computing, including the process of cloud computing evolution, cloud computing features, and contemporary cloud computing technology. This research project also includes a comparison of cloud computing platforms like Amazon, Google, Microsoft, and Cloud Sim.

3. Proposed Methodology

The main focus of this research is to provide comparative analysis between Google Cloud platform (GCP) and AWS Sage Maker with traditional storage applications such as spreadsheet generators (MS-Excel, Libre office Calc etc.), CD-ROM, DVD and USB drives etc. Amazon SageMaker is an Amazon Web Services (AWS) managed program that enables predictive analysis tools for creating, developing, and delivering machine learning (ML) models [15].There are number of steps to work in SageMaker given as under:

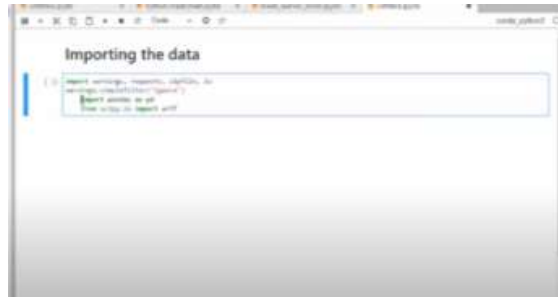
Step 1: For data preparation, create an Amazon SageMaker Notebook instance:

A notebook instance will be created in this step to download and process the data. An Identity and Access Management (IAM) role will be created first as part of the creation process, allowing Amazon SageMaker to access data in Amazon S3.



Step 2: Organize the data

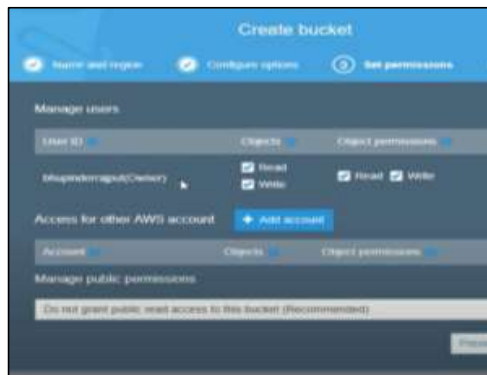
In this step, Amazon SageMaker notebook instance is used to preprocess the data required to train your machine learning model before uploading it to Amazon S3.



Step 3: Create and name the bucket, choose the storage location where data can be stored and select storage class



Step 4: Create the bucket



Step 5: Upload the data to the bucket.



Using SageMaker, data can be stored on cloud and user can access that data anytime anywhere. As when we are using traditional data storage applications, there could always be a limitation to access the data and there is a possibility of data loss as well. To prevent data loss, it will be an appropriate solution.

3.1 Google Cloud

Google Cloud, like Amazon Web Services and Microsoft Azure, is a public cloud vendor that allows clients to utilize computer resources located in Google's data centres throughout the world for free or on a pay-per-use basis. [16]. Google Cloud allows for quick collaboration because data is stored on the cloud rather than on users' computers. Multiple people can work on and access projects at the same time. Google Protects Clients with Investments in Security Google's efforts in physical and process-based security help its customers. A list of benefits of using Google Cloud Platform infrastructure such as: GCP security. Access control. Per-second charging. Budget management. There are number of steps to work in given as under:

Step 1: Create a Google account and create a project.

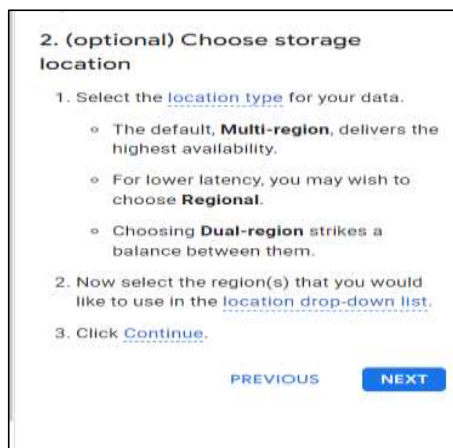


The screenshot shows the 'New Project' form in Google Cloud Platform. It contains the following fields and options:

- Project name ***: Shaina
- Project ID ***: shaina-35309 (with a refresh icon)
- Organization ***: google.com (with a dropdown arrow)
- Location ***: google.com (with a 'BROWSE' button)

At the bottom, there are two buttons: **CREATE** and **CANCEL**.

Step 2: Choose the google storage.

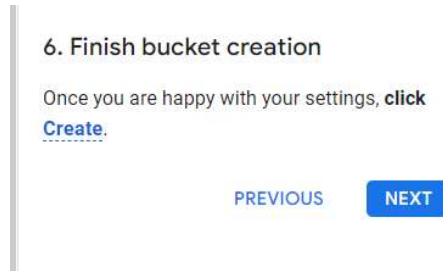


The screenshot shows the '2. (optional) Choose storage location' step in Google Cloud Platform. It contains the following instructions:

- Select the [location type](#) for your data.
 - The default, **Multi-region**, delivers the highest availability.
 - For lower latency, you may wish to choose **Regional**.
 - Choosing **Dual-region** strikes a balance between them.
- Now select the region(s) that you would like to use in the [location drop-down list](#).
- Click [Continue](#).

At the bottom, there are two buttons: **PREVIOUS** and **NEXT**.

Step 3: Create a bucket for storage and update data.



3.2 On premises computing

Unlike cloud software, which is hosted on the vendor's server and accessed via a web browser, on-premise software is installed locally on your company's PCs and servers. A selection must consider a variety of other aspects in addition to accessibility, such as software ownership, cost of ownership, software upgrades, and other services such as support and implementation. But, the limitations are:

1. Big investment spending — Capital expenditure (CapEx) is commonly required since on-premise solutions typically require a large initial investment. In addition, to ensure support and functionality enhancements, maintenance fees must be included.
2. On-premise deployments take longer to complete since servers and each PC or laptop must be installed separately.

3.3 Distinction Between On-Premise and Cloud - based services

(i) Distribution: On-premises: In on-premises environment, resources are deployed in-house and within an enterprise's IT infrastructure. The solution, as well as all of its accompanying processes, are the responsibility of an organization.

Although there are numerous varieties of cloud computing (public cloud, private cloud, and hybrid cloud), in a public cloud computing environment, resources are stored on the service provider's premises, but businesses can access and utilize as much as they want at any one time.

(ii) Expense: On-premises software deployments are responsible for the continuous costs of server hardware, power consumption, and space.

Cloud computing: Companies who opt to use the cloud computing model only pay for the services they use, with no administration or upkeep fees, and the price fluctuates dependent on usage.

(iii) Safety: On-premises: Businesses with highly sensitive data, such as the government and financial sectors, require the security and privacy provided by an on-premises environment. Despite the cloud's promise, many businesses are concerned about security, so an on-premises system, despite its restrictions and higher cost, makes far more sense.

Cloud Computing: The most fundamental constraint to cloud computing implementation continues to be security concerns. Many noteworthy cloud breaches have happened, causing alarm among IT organisations all around the world. Employee personal information, such as login credentials, to intellectual property theft are all security problems.

4. Future Scope

Cloud computing alludes to the openness of on-request handling resources, particularly figuring constrain and data stockpiling, without having the client managing it direct and viably. As a result, dispersed computing is the way toward sharing such resources through the net. The clients get the specialists, applications, and capacity by utilizing the net.IT frameworks to embrace a hybrid cloud computing demonstrate where committed assert stage runs for facilitating application base loads, and an isolated and shared asset stage serves trespassing crest stack. Given the flexible nature of the cloud foundation, it makes a circumstance where cloud assets are utilized as an expansion of existing foundation. For end of the work, amplifying the hybrid cloud computing demonstrate scope to stateful applications such as n-tier web administrations may be a common and challenging step. Numerous modern issues emerge such as session upkeep, benefit time estimation, and information consistency. We are working on quick information on request benefit and joining the energetic web benefit scaling approach proposed in into our instrument.

5. Conclusion

To entirety up, cloud computing investigate is an in-depth ponder of cloud computing that's so important in modern times. As the computerized space proceeds to extend, so does the significance of cloud computing. Helpful within the arrangement of on-demand administrations as contradicted to conventional forms of server foundation, cloud computing is around to induce greater and superior in terms of its utilize and notoriety.

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