

Cloud & ML : Assignment 1

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Introduction

With the advent of cloud computing, small and large firms have started pivoting to the cloud as the preferred workspace for business. It provides on-demand and timely delivery of computer resources like processing power, storage space, bandwidth etc. In this report we explore the 3 cloud providers : Google, Amazon and IBM and compare three services of each. We compare the IaaS and two SaaS services of each cloud provider below.

IaaS Service - Infrastructure

A cloud computing service that offers compute, storage, and network resources on demand, based on a pay-per-use model, is infrastructure as a service (IaaS).

1. Google Compute Engine

With over 200 countries and territories, Google's cloud network currently extends across 29 regions, 73 zones, and 144 network edge locations.

Computing & Hosting : Google Compute Engine uses KVM as the hypervisor. GCE provides ability small instances of 0.3-Cores and 1 GB RAM, to very large 96-Core CPUs with more than 300GB RAM.

Storage : Its block storage service is powered by Persistent Disk and Compute Engine. It gives the feature to transition to lower-cost classes easily on the user-specified criteria.

Networking : It provides protection against DoS and web-attacks with Cloud Armor.

2. Amazon EC2

AWS now has cloud network locations in 24 regions, 77 zones, 210 network edge locations, and 245 countries.

Computing & Hosting : AWS offers six rigidly defined bare metal configurations. AWS' Wavelength technology can be used for applications requiring ultra-low latency for 5G, which is useful for IoT. There is no bare metal configurations with GPUs.

Storage : With AWS, you can access a variety of customizable storage types, including high-performance file systems and low-cost archive storage. You can also use AWS backup as disaster recovery, as well as AWS service synchronization using AWS CloudEndure.

Networking : AWS VPC lets you create isolated cloud resources and AWS Web Application Firewall lets you control granularly your apps. Some of the features also include a CDN, application hosting, load balancer and cloud DNS.

3. IBM Cloud Infrastructure Center

It provides 60 data centers in 18 zones.

Computing & Hosting : IBM Cloud virtual servers include auto-scaling, cloud security, and compliance tools in addition to providing physical hardware. It also offers a dedicated K8s service which can be used for small operations or global operations. It also provides bare metal configurations with physical NVIDIA GPUs.

Storage : In addition to object and block-based storage, IBM Cloud Backup offers a range of hot and cold storage options for your data. It is also capable of performing large-scale data migrations capable of moving petabytes of data.

Networking : The company offers load balancing, VPS, cloud DNS, virtual private clouds, and even physical gateway appliances like Juniper vSRX and IBM Virtual Router.

Conclusion : With “only” 60 data centers in 18 zones, IBM the least suitable option for distributed clouds. And single 4 GB VM costs \$0.084 per hour. With AWS’ robust security, competitive global coverage, flexible payment options as per Statista reports, AWS market share of IaaS in 2020 is 33%, Google’s is 9% and IBM lagging far behind.

SaaS - Text-to-Speech

The SaaS model is a way of delivering applications over the Internet. Accessing software over the Internet eliminates the need to install and maintain it, freeing you of complex software and hardware management.

1. Google Cloud Text-to-Speech

A group of premium voices are available through the Google Text-to-Speech service, called the WaveNet model, which is also used by Google Assistant and Google Translate. The other group is called Standard voices. Google offers 90 voices in 20 languages Google WaveNet does not offer Speech Marks. In the Google WaveNet group, you can choose in a list of:

US accent: 10 voices; British accent: 5 voices; Australian accent: 5 voices.

Google Cloud WaveNet voices offer per 1 million characters for \$16.

2. Amazon Polly

Amazon Polly offers 2 types of voice quality: neural or standard Text-to-Speech

amongst which the neural voice is the one producing the most natural-sounding speech. It offers 74 Voices in 29 Languages. The neural TTS costs \$16 per 1 million characters. One feature of Polly is that it provides Speech Marks. Now what this is? It is an additional stream of metadata which is very helpful in providing information regarding when particular words, sounds and sentences are pronounced. With the AWS neural options we can select from a list of voices with different accents.

US accent: 9 voices; British accent: 3 voices; Australian, South African, New Zealand accents: 1 voice for each.

3. IBM Watson Text-to-Speech

Watson Text-to-Speech can generate both male and female voices in a wide variety of languages, and it can synthesize text to audio in many ways along with offering concatenative neutral voices. SSML-based text annotated with XML can be incorporated into this software. Enhances SSML to support expressive intonation and to allow for the manipulation of aspects like pitch, velocity, and more in order to expand the range of possible voices. You can also customize the way the software pronounces unusual words you input by utilizing its customization interface.

It offers Expressive TTS free for first 1 million character and thereafter charges 2cents per thousand characters.

Conclusion : Compared to IBM Watson, Amazon Polly is much easier to integrate and use. On the other hand, even though Google Wavenet provides more voices and languages, but Polly wins with the provision of distinct speaking styles. Moreover, Polly is almost 4 times cheaper than Wavenet.

SaaS - Data Analytics

1. Google Looker

Small and large organizations alike can explore their data with Looker, a cloud based data analytics platform. This platform was founded in 2011 and acquired by Google in 2018. Looking at data, visualizing it, and analyzing it are easier with Looker. An interface based on a unique modelling language, LookML, is provided by the tool. Using Looker one can integrate it with big data platforms and databases. It can also be leveraged to visualize data using interactive charts and graphs. One drawback is that it does not come with native support for ML algorithms. Since Looker instances are on AWS, the 2 parties work in coherence to give the user the ability to use ML algos using the Amazon Sagemaker.

Google Looker charges around \$50 per month for the premium features (reading and creating dashboards and reports).

2. Amazon QuickInsights

The Amazon QuickInsight comes with built-in machine learning to create interactive dashboards which can be shared. its pay-per-use BI tool makes data analytics available to big and small enterprises. With the help of the APIs, self-service analytics can be embedded into the applications and the users requiring the access can be authenticated seamlessly. The platforms can also scale automatically from 10 to 10k users. QuickInsight's SPICE in-memory calculation gives protection to the source data and also allows thousands of users to do complex analytics at same time. It provides the ability to integrate data from cloud or on-premise from many 3rd party data sources and AWS services.

The pricing is slightly economical : readers \$0.30 to \$5 per session per user per month, and the standard pricing model with author access is \$12 per user per month.

3. IBM Cognos

By using pattern detection, this paid BI tool can create complex visualizations and answer the questions that are unique to your own company. In addition to having a self-service AI platform, IBM Cognos Analytics is specifically designed to address the business intelligence needs of organizations and individuals. It provides simple intergation with AI and NLP and the flexibility to easily share reports. It has support for SQL language and configuration and also provides ability to connect the data analytics with realtime workflows with ad-hoc reporting.

The pricing levels range from\$15, \$35 to \$70 per month. This is on a higher side when compared to the previous 2 services.

Conclusion : QuickInsights offers a very lucrative priccing model as compared to the other two, but beign relatively newer it still is buggy and lacks a intuitive UI. Whereas, the Cognos comes loaded with features and Query Studio which enables users to analyze complex and large dataa with much ease and in timely manner.

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