# Comparison of AWS and AZURE for COVID-19 Information Retrieval

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**Abstract.** This paper deals with the most well-known and widely used technology which is cloud computing . There are some significant techniques which are needed for the implementation of the cloud computing. These techniques have also been discussed in this report. The cloud service is provided in three cloud computing model and each model will be chosen by the cloud user based on their requirement. These cloud service models has also been discussed in this report. A Covid19 information retrieval system for tracking the disease spread has been developed. This information system web application will be hosted in the AWS and Azure Cloud platform. The significant differences between the AWS and Azure cloud platform will also be discussed based on the pros and cons of each cloud platform .

**Keywords:** Azure · Aws · Cloud services

## 1 Cloud Computing

Cloud computing refers to the delivery of computer services in the cloud in other words computing services can be found through the internet. The various services in cloud computing include; storage, servers networking, software, analytics, and artificial intelligence. The services offered in the cloud bring about faster innovation, economical raise, and flexible resources. To access the services one needs to incur charges. The charges include buying data bundles or sometimes the services might require one to buy them. Organizations and individuals turn to cud computing because of the many advantages it has to offer. Cloud computing has different ways of deploying services including; Public clouds, they are owned by the third-party services providers who deliver servers and storage through the internet. Private cloud refers to services used by specific people i.e. sine business owners. A hybrid cloud is a combination of public and private clouds that are connected to enable them to communicate.

## 2 Cloud Computing Techniques

Cloud computing has various techniques which include;


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### 2.1 Virtualization

This entails giving out of various applications to different users. The purpose of this technology gets to provide the simplest version of the cloud software being offered. This process is often used for flexible applications and processes that need instant running. Virtualization technique is classified into many types;

- **Hardware Virtualization:** The virtual machine has to have some connection for it to work. The connection can be on a hardware device or a hardware server. In the event that the virtual machine is straightforwardly introduced on equipment workers, at that point it is called Hardware virtualization since it is anything but difficult to control a Virtual Machine than an actual worker.
- **Operating System Virtualization:** The virtual machine can be connected to a guest server or an operating system rather than being connected to a hardware server If the virtual machine is introduced in a visitor worker rather than the equipment framework, at that point it is called an Operating framework Virtualization. It expanded the testing circumstance of different programming on different OS stages,
- **Server Virtualization:** The machine can also be connected to a server other than being connected to either a hardware or an operating system server. On the off chance that the virtual machine is introduced on the framework it is called Server Virtualization. It is separated into various assets and used for load adjusting onrequest premise.
- **Storage Virtualization:** Data needs to be stored after collection.. In case of any loss of data with storage virtualization it is easy to restore and back up the data. The way toward gathering actual capacity from various organization stockpiling gadgets is called Storage Virtualization. It is predominantly utilized for back-up and recuperation.
- **Application Virtualization:** Under this technique of cloud computing abstracts the application layer for separating it from the operating system. By providing a level of isolation, this application allows for an application to run in an encapsulated form without being dependent upon the operating system. This technique of cloud computing is used for delivering SaaS services.

### 2.2 Service-Oriented Architecture

This application can divide the serves into two the daily procedure and the business functions. It is a component that gives the cloud applications a space to adjust to fit business needs. SOA is divided into two; software as a service and quality as a service. The quality of service identifies the behavior and function of certain services. The software as a service gives a new mode of delivery to the services providers.

### 2.3 Utility Computing

This model defines the services that are paid for to enable use. It is pay –per-utilize model. It only offers the computational services if it is there are some benefits in place. This model helps in cutting costs and the initial investment. As the enrolling necessities for a business change, the charging in like manner changes properly, without increasing any additional cost. If the client usage has reduced, by then charging cost moreover diminishes fittingly.

### 2.4 Grid Computing

This is the process of connecting more than one server to come up with one major role. Grid computing breaks down big robles into small problems and sends them to the servers that put them in grids. It is often used in e-commerce, it is used to share resources. It involves making use of unused computers and then solve hard problems.

### 2.5 Infrastructure as a Service (IAAS)

It is a readily available resource or infrastructure that is managed and provisioned over the internet. IAAS demand one to pay for it to use. It saves on cost since one pays for what is to be used. It also saves on cost since one doesn't have to buy servers and data infrastructure. All the resource is offered as a separate service and one needs to only buy the one service that is needed. Organizations use IAAS to; Test and improvement.

Gatherings can promptly set up and crush test and improvement conditions, setting up new applications available to be purchased to the public faster. IaaS makes scaling dev-test conditions all over rapid and viable.

Web facilitating.
Running locales using IaaS can be more moderate than ordinary web encouraging.

Capacity and reinforcement.
Affiliations sidestep the capital expense for limit and unpredictability of limit the board, which ordinarily requires talented staff to administer data and meet legitimate and reliable necessities.

### 2.6 Software as a Service (SAAS)

It is a method of giving software applications through the internet. It allows users to connect and use the software through the internet. It provides complete software that provides solutions to users. An organization rents certain software, and the users connect to it through the internet. All the resources are located in the data center. The service agreement gives a platform for the service provider to manage hardware and software.

### 2.7 (Platform as a Service) PAAS

It is an environment in the cloud that helps one deliver everything from the cloud-based applications. PaaS fuses structure – laborers, amassing, and frameworks organization – yet likewise middleware, progression gadgets, business understanding (BI) organizations, data base organization systems and that is just a hint of something larger. PaaS is expected to help the absolute web application life cycle: building, testing, sending, directing, and reviving.

PaaS grants you to dodge the expense and complexity of buying and administering programming licenses, the shrouded application structure, and middleware and holder orchestrators.

## 3 Differences Between AZURE and AWS

Amazon Web Services is a cloud service that is from amazon that provides services on different platforms. This platform is used to deploy and create applications in the cloud. Services are designed to work with each other.

Azure was launched and it is the biggest cloud service provider offering commercial services. It offers functionalities and cloud services that are integrated into the environment to achieve scalability and scalability (Table 1).

**Table 1.** Main differences

| AWS | AZURE |
|---|---|
| The users in AWS can configure its images | Azure needs to choose a virtual hard disk to develop a VM which is configured by a third party |
| AWS offers temporary storage which begins every time it is opened and destroyed when is it stopped | Azure offers storage that is temporarily but it is blocked |
| It provides a virtual private cloud that the user utilizes to isolate the networks | It provides a virtual network that the user uses to develop isolated networks |
| AWS supports the hybrid clouds | Azure supports both public and private cloud providers |
| AWS charges per hour | Azure charges per minute |
| AWS has a lot of features and it is flexible enough | Azure is easier o use with a user who is more informed about windows |

### 3.1 The Design of the Two Runnable Systems

The main of this section is to design a cloud computing platform using AWS and Azure platforms. The systems that are designed in this case will be used in the storage and retrieval of the system information for the cloud platform. The system that is created is aimed at storing information for covid 19 patients. The information that is stored and can easily be retrieved from the clouds system, includes the positive cases that are recorded daily and the number of recovered cases that are recorded in each country.


**Fig. 1.** .

The system is designed as shown below using the azure and the AWS cloud platforms (Figs. 1 and 2).

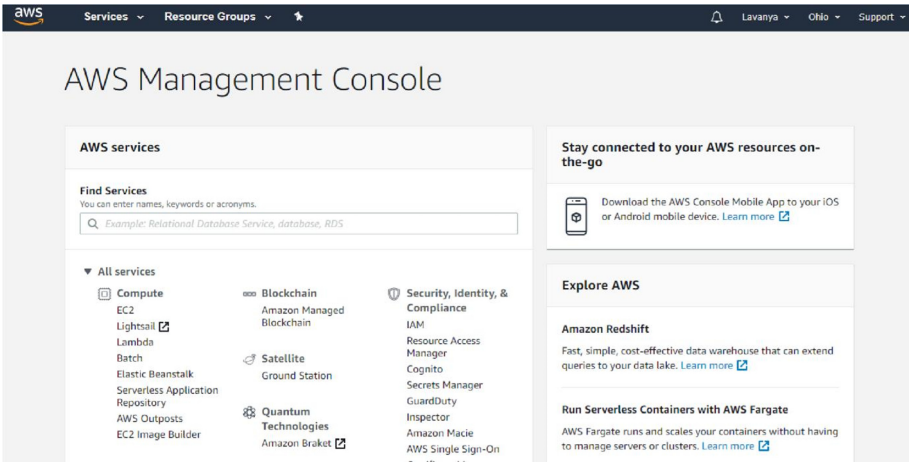



**Fig. 2.** .

Explore the Amazon management console (Fig. 3).

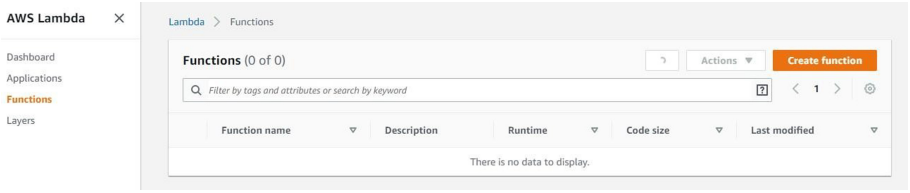



**Fig. 3.** .

Lambda function (Fig. 4).

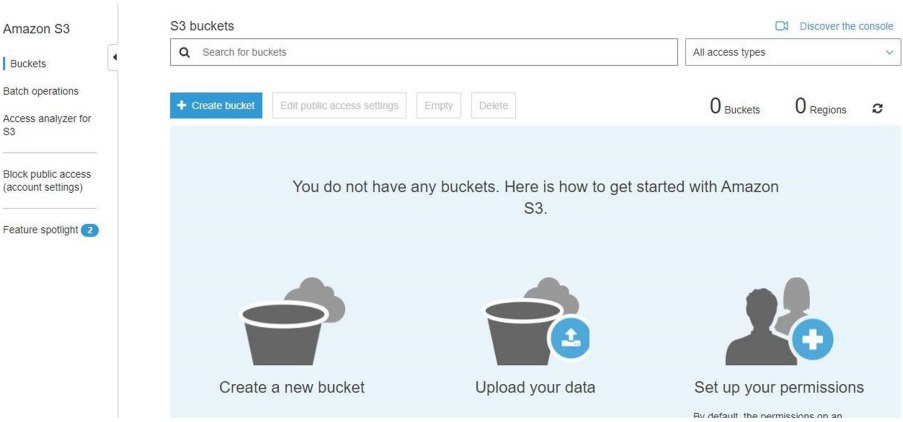



**Fig. 4.** .

Choose S3 functions if applicable (Fig. 5).

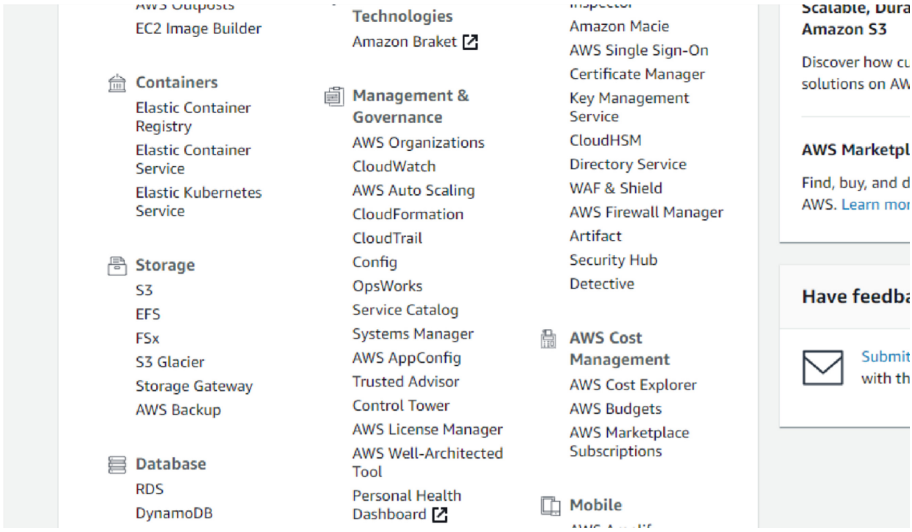



**Fig. 5.** .

View the services that Amazon cloud offers (Fig. 6).

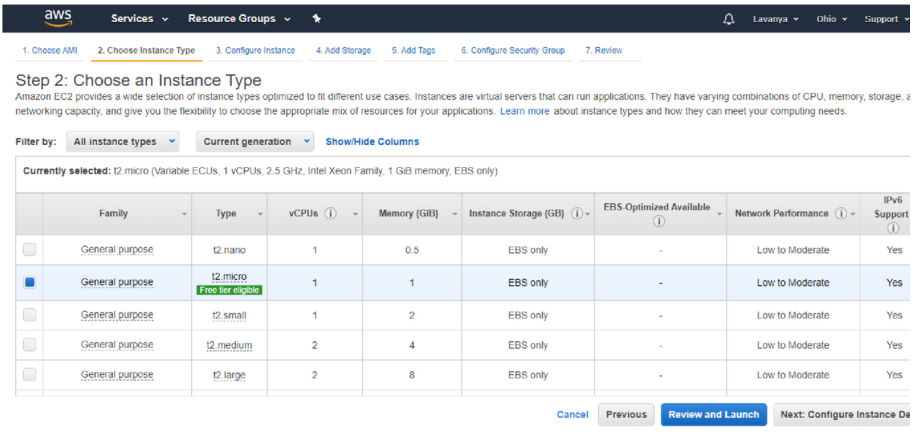



**Fig. 6.** .

Select an instance from the services provided (Fig. 7).

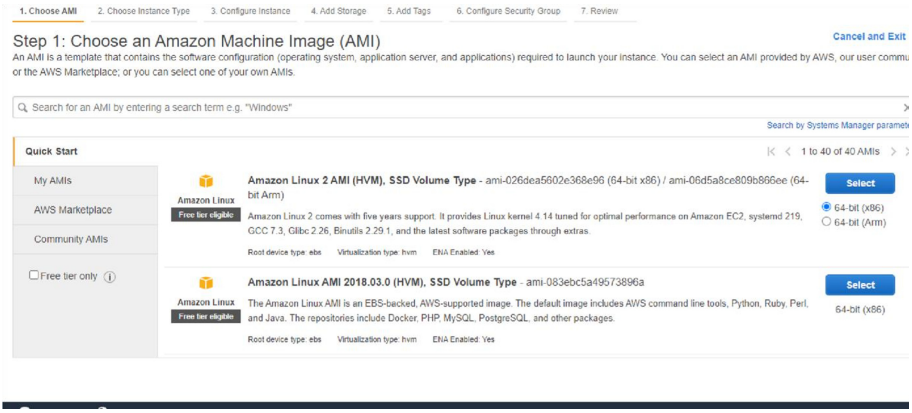



**Fig. 7.** .

Choose an Amazon cloud image (Fig. 8).

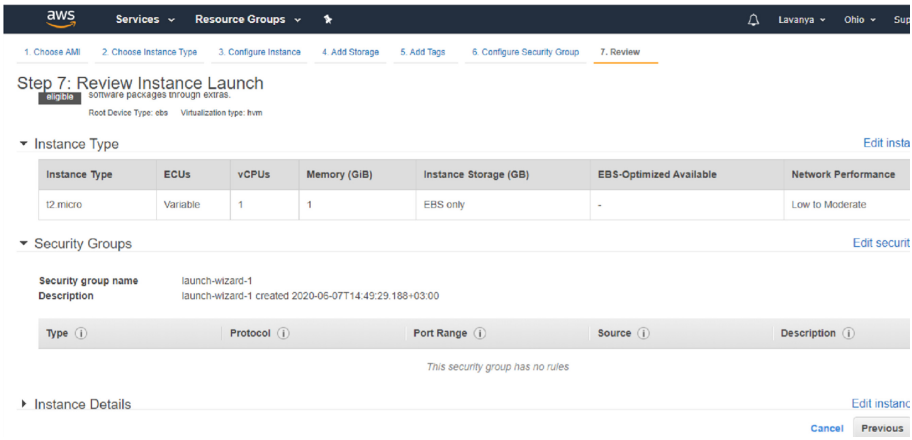



**Fig. 8.** .

Review the selected Amazon instance (Fig. 9).

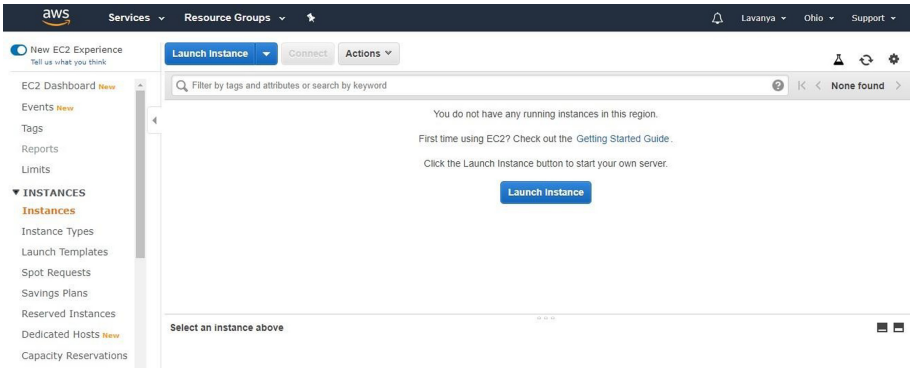



**Fig. 9.** .

Launch Amazon instance (Fig. 10).

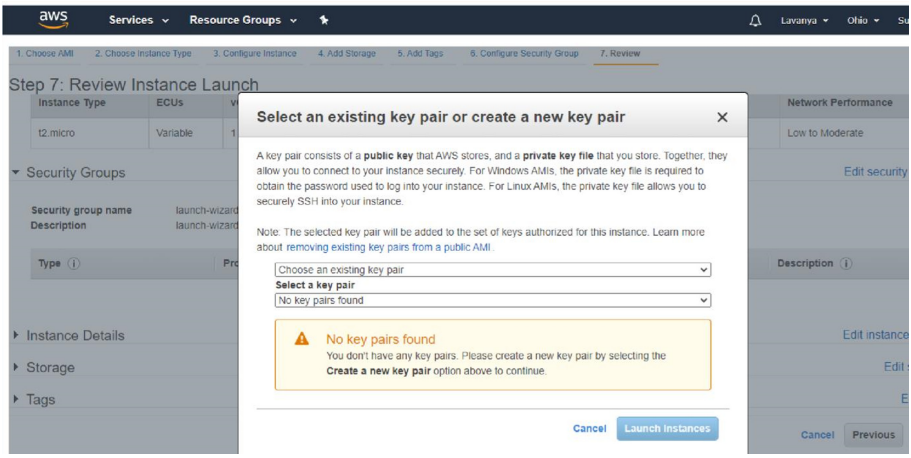
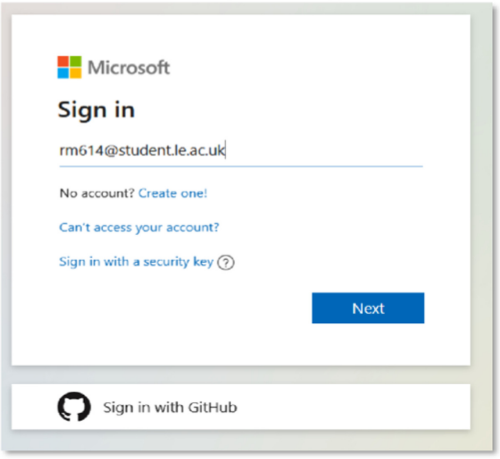


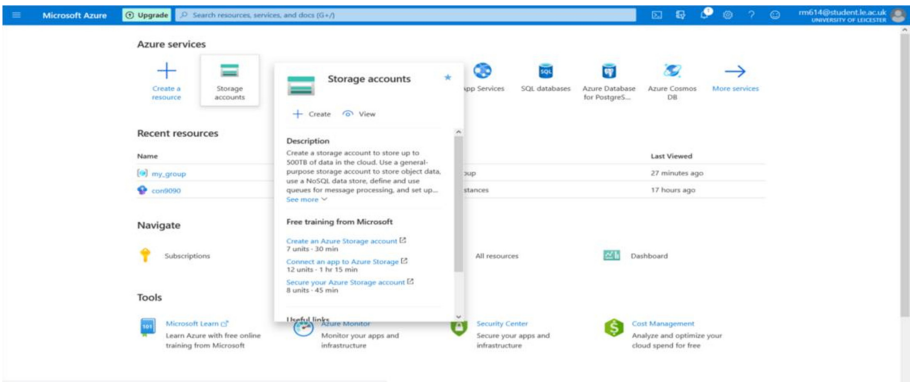

**Fig. 10.** .

### 3.1.1 Azure Implementation.

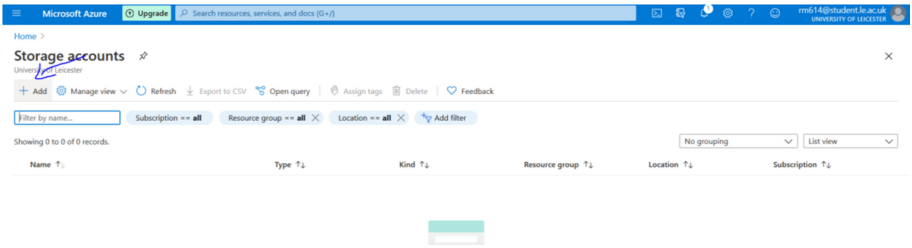
1. First, login to your account.



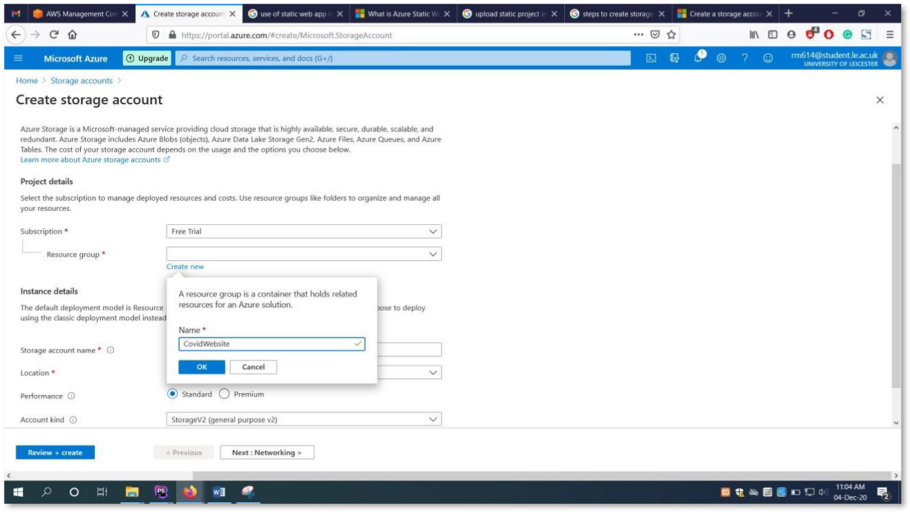

2. Once you are logged in, click on “Storage Account” service.




3. After that, click on the add button

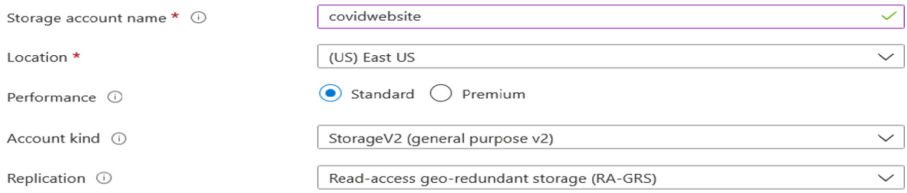



4 Under the Resource group field, select your desired resource group, or create a new resource group.



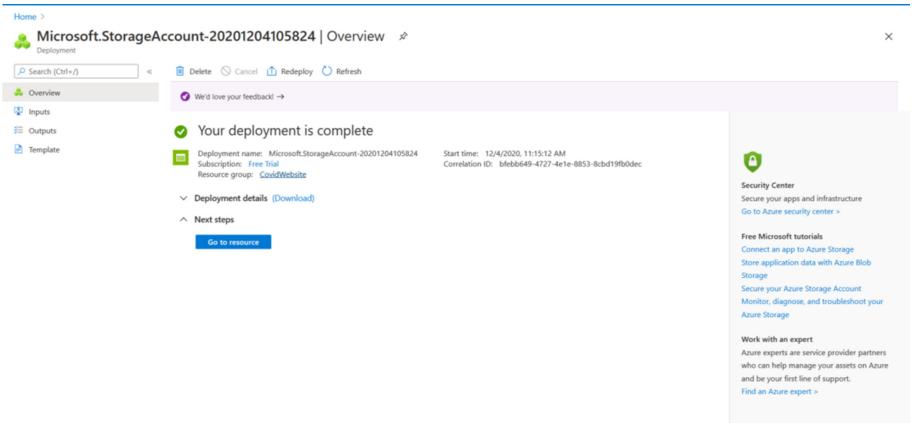

5. Next enter a name for your storage account.

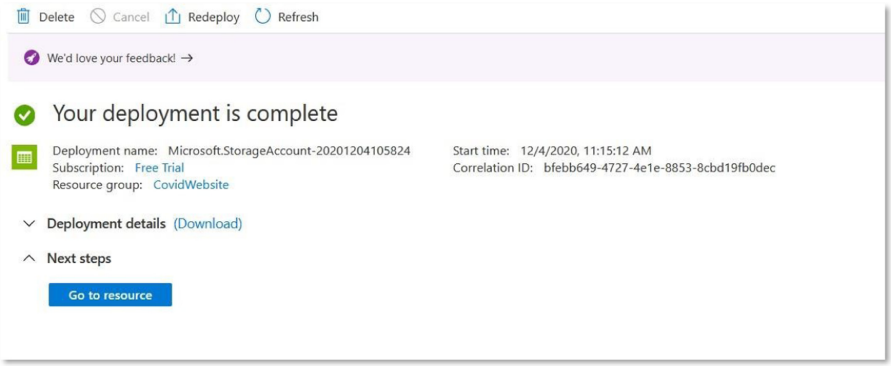

6. Select a location for your storage account and after that set the Account kind field to Storage V2*(general purpose-v2)*.



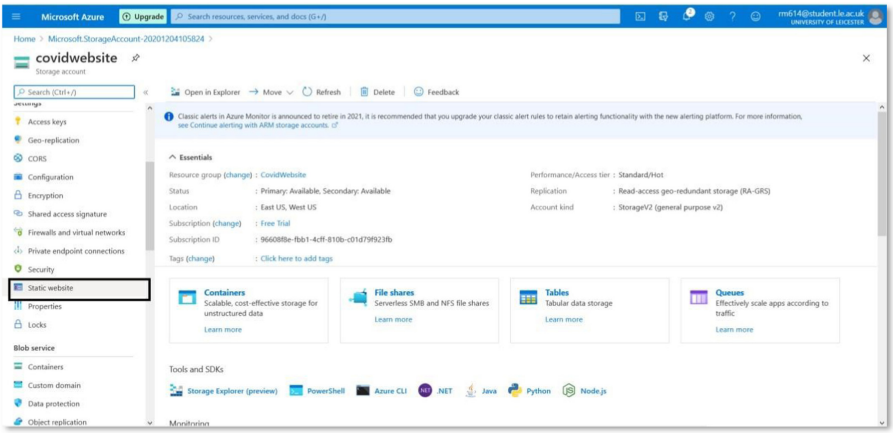

7. Now click on the "Review + create" button.


8. Now, here is your storage account details.

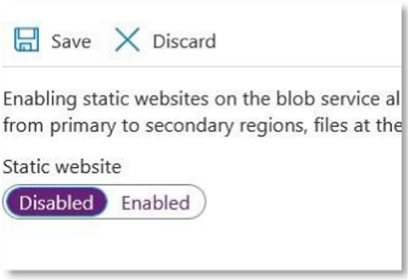




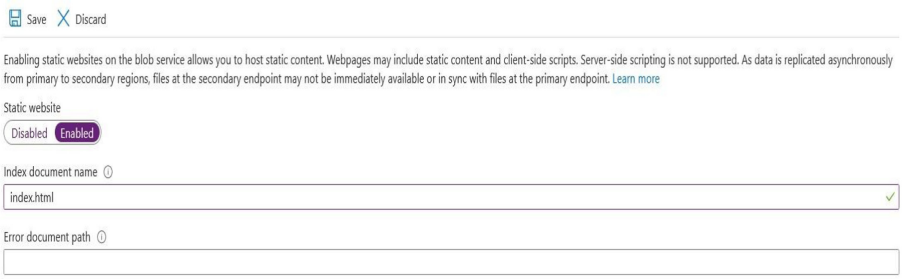

9. Now open "static website" manager from the side bar.



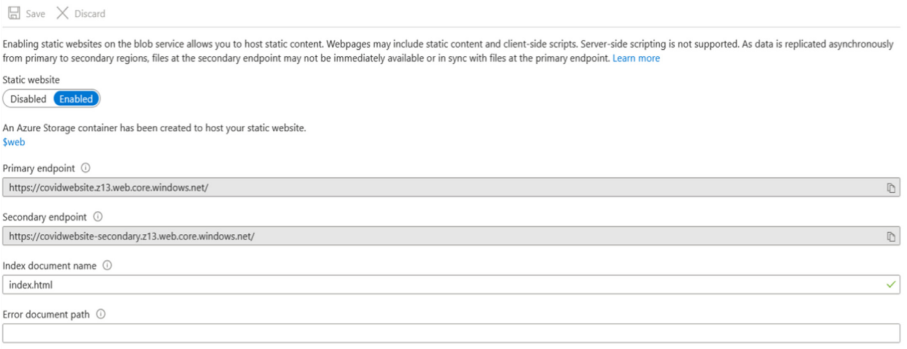

10. Enable the static website option.



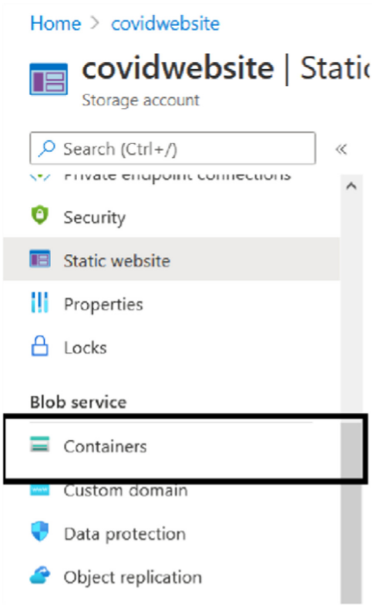

11. Enter your index document name and after that click on the save button.



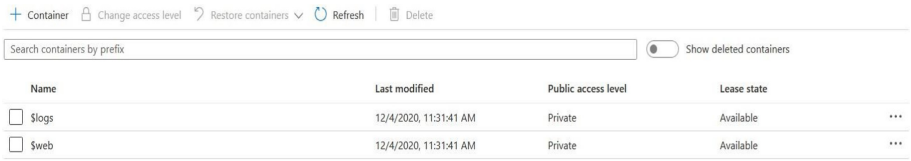

12. Now copy the primary endpoint for later.
EndPoint: https://covidwebsite.z13.web.core.windows.net/

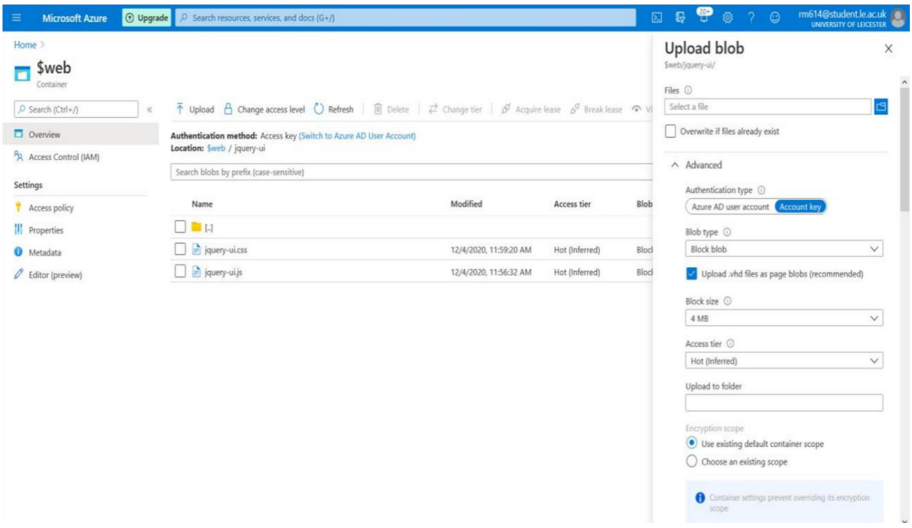



13. Open container manager.

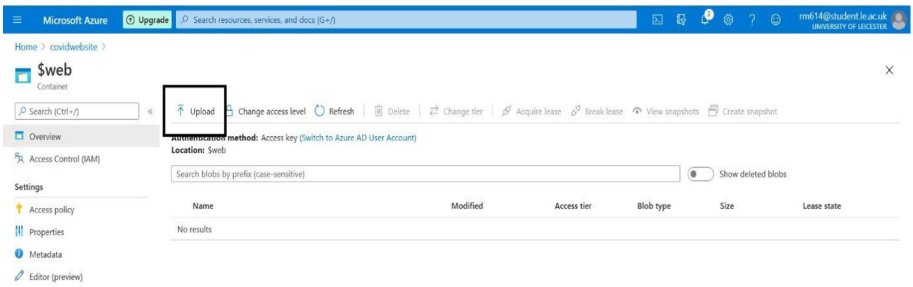



14. Now select "$web" from the container listing.

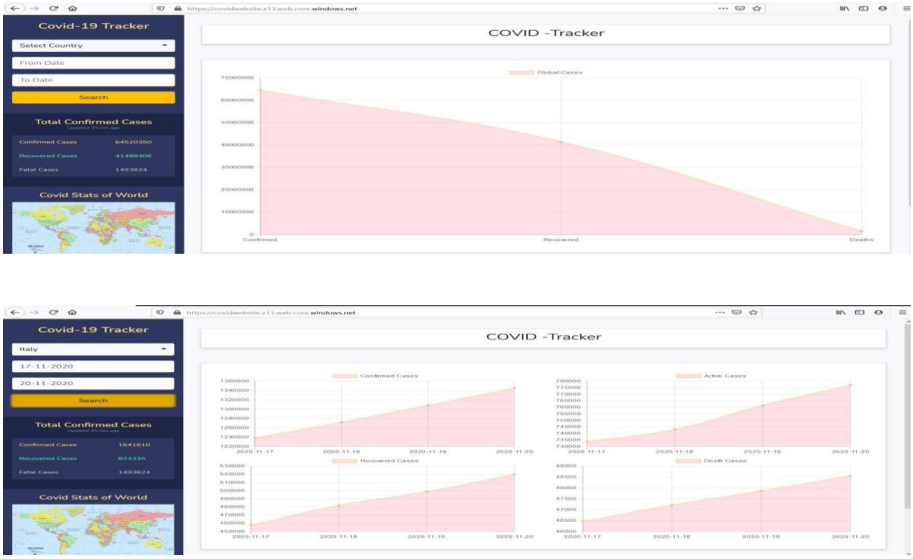



15. Click on the upload button to upload your files.




16. Now you just need to select your files and then click on upload button.
17. Here is your website link: https://covidwebsite.z13.web.core.windows.net/







# 4 AWS

## 4.1 Pros of AWS

Following are the key benefits of AWS cloud platform

1. There is a detailed documentation and videos for using the features of AWS are provided on the AWS website.
2. This cloud platform is very cost effective for the companies ranging from start-ups to the large organizations. This is less expensive when compared to the on-premise infrastructure services.
3. Auto-scaling feature is very much useful for changing needs. The organizations need not worry about the guessing of scaling the resources based on the business changes.

4. Security of AWS services are said to be the best. Since AWS services are used by the many big organizations and government organizations, AWS gains huge trust and it is considered as a secured cloud service platform.
5. The performance and productivity of the business can be improved by using the backup and recovery services of AWS cloud platform.
6. AWS cloud services have commitment towards innovation and providing many new services.
7. AWS is the global cloud service provider (Arunkumar 2019).

### 4.2 Cons of AWS

1. Though the AWS cloud services are well designed still there are some issues related with the services.
2. There are some security issues when the users configure some option which is faced by every cloud provider.
3. The cloud services of AWS is specific to the country. The users of all the countries cannot access the same cloud services.
4. AWS sometimes allow the access of data by other companies without the concern of the data owner.
5. Sometime bill shocks are experienced by the users. This can be avoided by setting the "enable monitoring" and get the notification when the usage exceeds the threshold set by the user (Cog Editor 2020).

## 5 Azure

### 5.1 Pros of Azure

1. 1. Azure provides high availability of services which is ranging from low percentage of 90 and high percentage of 99.95. In an entire year, there will be only 4.5 h of downtime.
2. This provides high security by using multi factor authentication and various password strategies.
3. Azure offers very good scalability features.
4. This is very cost-effective solution for many organizations.
5. Redundancy of data makes the easier service and data access.
6. Allows the organizations to configure the hybrid infrastructure.
7. This provides a wide range of artificial intelligence services (Gaille 2018).

### 5.2 Cons of Azure

1. The users need to understand the Azure customization options before configuring based on the requirement.
2. There is less contribution in documentation.
3. This needs effort in improving the technical support.
4. There are only less open source features.

## 6 In Conclusion

Pandemic caused some issues for cloud providers like Microsoft, Google and Amazon Web Services as the market goes down all over the world, but the clouds provides flexibility for enterprises that struggles to maintain their normal operations. Both Microsoft Azure and Amazon AWS web service can be used for Covid-19 data retrieval. AWS has created data lakes to help health workers and scientists to analyse and defend spreading of Covid-19, even then the facilities that offered by Microsoft Azure like high reliability and availability for the services that offered to the consumers and Azure seems cost effective cloud service with attractive pay-as-you-go pricing packages makes Azure more convenient for users.

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