

# AWS Cloud Migration



In this article — ‘AWS Cloud Migration’ will discuss upon — what is cloud migration, why we need them, how we do them and AWS tools available for migration.

## **What is Cloud Migration ?**

Cloud migration is a process of moving data, applications or other services to a cloud computing environment from an on-prem Data center.

Migrating your project means moving your data from the on-premises data center to cloud. In this case, cloud is the virtualization used over a data center to make the functionalities more flexible. Many companies like GoDaddy, Expedia, Netflix, startups etc., have recently moved their business to cloud. Again, Migration is a big task and AWS facilitates Migration in phases.

## **Need for Migration**

Business is no easy task when it comes to handling situations like security, scaling up or down, etc. Let's look at a few scenario where *AWS Migration* could be a better resort.

1. More users coming in and High Performance.
2. Faster Implementation and Deployment needs.
3. Expensive to manage the growing database.
4. Data Center Mishap Going Down.

We can conclude that the following are key reasons to migrate to cloud:

- Zero capital cost on infrastructure.
- Security
- Scalable (Vertically and Horizontally)
- Productivity

- Pay what you use
- Easy to manage services.
- Reduced operational costs.

If you Migrate to Cloud then the problems mentioned above will get handled automatically. Let's move further and understand what Migration is.

### **Phases of AWS Migration**

AWS Cloud Migration is a step by step process which consists of planning, preparation and discovery, migrate and optimize. However, it is more complex as the process involves different phases. Let me now talk about the various phases of Migration:

#### **Phase 1: Migration Preparation and Business Planning**

In this phase you identify the need, objective and benefits of cloud migration. You perform a POC and verify the outcome to compare the performance and costs. There are times you need not require moving your entire business to the cloud. This is where segregation is important. You need to identify the applications which can be Migrated, and which cannot. This is what the first phase is all about.

#### **Phase 2: Assessment – Choosing Your Migration Method (Discovery & Analysis & Assessment)**

First step is to identify the assets that need to be migrated to cloud, gather the details such as number of servers to migrate, road map to migration, record business critical activities, server size, memory utilization, cpu utilization, environment type and data. You can use "AWS Application Discovery Service" to check the technical details by installing it in your server. Depending on the data, AWS provides different ways to Migrate your application e.g. [AWS Snowball](#), [AWS Snowmobile](#), [AWS Direct Connect](#), etc. Also, assess the cost for renting servers, storage, network and support. Prepare the checklist for regulatory and compliance assessment and perform the security assessment.

#### **Phase 3: Proof of Concept (POC) for AWS Storage/Designing**

Once you know how and what you are migrating, next, you have to plan delivery priorities and design your AWS Cloud Migration process. You will identify the dependencies (upstream and downstream components). Define the organization or account strategy for users, VPC strategy and what cloud pattern it will be (Hybrid/Fully Cloud) and other parameters like security.

#### **Phase 4: Migration to AWS**

Now that you have all the pre-requisites like the blueprint, Migration tools, list of assignments, backups and its synchronization with your on-premises data repositories. You can finally migrate your project/application to AWS Cloud. Once you have Migrated your project to cloud, reliability, and durability are the added benefits you get. For application code/server migration use AWS Server Migration Service, for database you can use AWS Database Migration Service and other import/export AWS services.

#### **Phase 5: Enterprise Cloud Operations (Operate and Optimize)**

At this point, you have already migrated to AWS, and AWS will bring updates that you'll need to incorporate in your existing architecture. Optimize your architecture, have your support team ready to look for the new features and cost optimization things, improving applications using serverless, use AWS monitoring and logging services, implement CloudFormation and DevOps.

### Application Migration Strategies 'The 6 R's'

The complexity of migrating existing applications varies, depending on the architecture, Amazon came up with different strategies which they commonly termed as 6 R's. Let's look into each of them:

Strategy	Description
Re-host	Also called as 'Lift and Shift'. Move applications without changes or with minimal changes.
Re-platform	Do minimal change to the system or minimal change to Architecture which help in deriving benefit from Cloud migration. Like moving application into AWS managed services.
Re-Purchase	Replacing the Application with a New one but on the Cloud instead of on-prem. Example replacing legacy application with new application built on Cloud or buying cloud compatible
Re-Factor	Developing(re-build) application with cloud native features. Example moving the existing code into Server-less compatible code.
Retire	Decommissioning the application / service which is no longer in use or replaced.
Retain	Critical business applications which may have to be reconsidered for migration or there could be other varying reasons including unsupported in Cloud environment or not cost effective or no business justification.

### Benefits of AWS Migration

1. **Elasticity**:- Adding and Removing capacity whenever it is needed is the greatest benefit of elasticity.
2. **Disaster Recovery**:- With a 99.95% guaranteed uptime, businesses can be confident knowing that their data will always be available.
3. **Enhanced Cost Management**:- The IaaS platform provides two major benefits. First, an IaaS such as Amazon Web Services is available as a monthly service. Secondly, it eliminates the need to continue to purchase and maintain physical hardware.

## Services for AWS Migration

Out of the many tools provided by Amazon to automate data migration, I'll be talking about the more commonly used ones.



**AWS Migration hub**: AWS provides a single location for tracking Migration process. Migration Hub gives you the freedom to choose the Migration partner and tools that fit your needs.



**AWS Server Migration service (SMS)**: AWS SMS is an agentless service that helps migrate loads of on-premise workload to AWS easier and faster. It allows you to automate Migration and track replication of Server. It makes coordinating with your large scale-server Migration easy.



**Amazon S3 transfer acceleration**: This makes the transfer of files over long range to AWS S3 bucket faster and secure.



**AWS Snowball**: It is a petabyte-scale data transfer solution that uses secure devices to transfer a large amount of data in and out of AWS.



**AWS Snowmobile**: It is an exabyte scale data transfer solution to move an extremely large amount of data to AWS. Snowmobile makes the transfer of massive volumes of data easier.



**Amazon Kinesis Firehose**: *It is the easiest out of all the methods. It can capture and automatically load streaming data into Amazon S3. You can analyze real-time data to get timely insights of Migration.*

Now that you know everything about AWS, and *AWS Migration*, let me show you a use case where you will be migrating a Virtual OS from my local machine to AWS Cloud.

### **AWS Data Migration**

Data can be moved from on-prem to AWS Data center using following means,

- **Amazon S3 Transfer Acceleration** — Faster Transfer over internet, just change the endpoint you use with your S3 bucket and acceleration is automatically applied.
- **AWS Snowball** — a petabyte-scale data transport solution that uses secure appliances to transfer large amounts of data into and out of AWS.
- **AWS Direct Connect** — you establish a dedicated network connection between your network and one of the AWS Direct Connect locations for transfer.

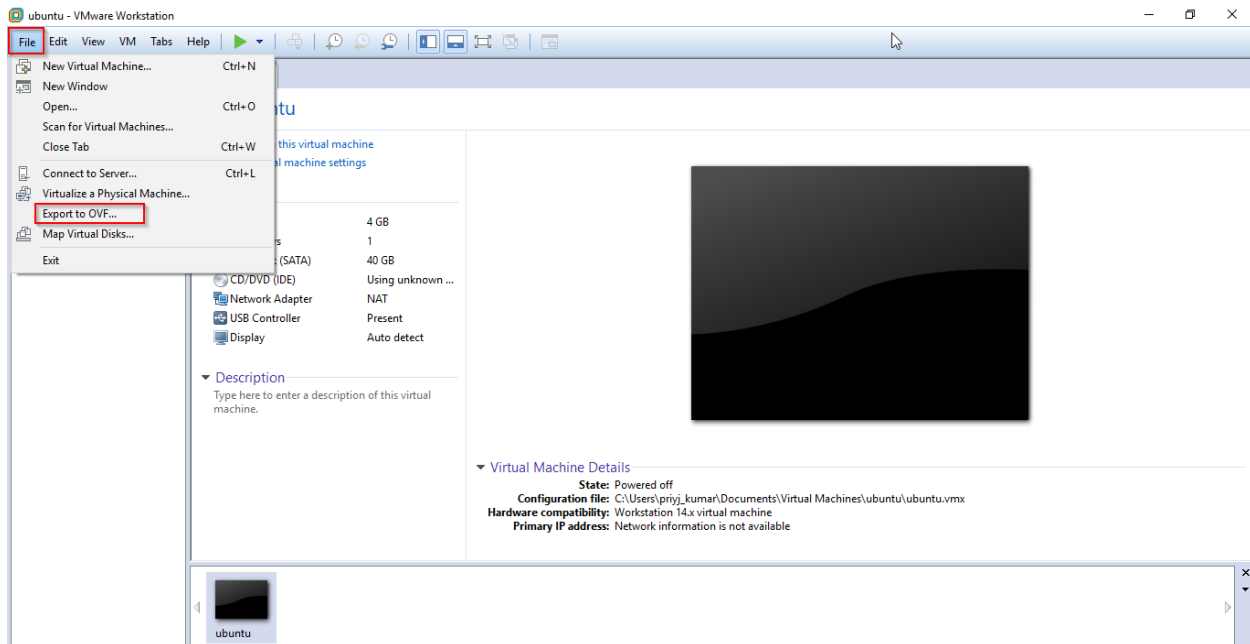
### **Demo: Implementing Migration using Import/ Export method**

You will be migrating an on-premises Virtual OS running on VMWare to AWS using Import/Export (AWS Direct Connect) method.

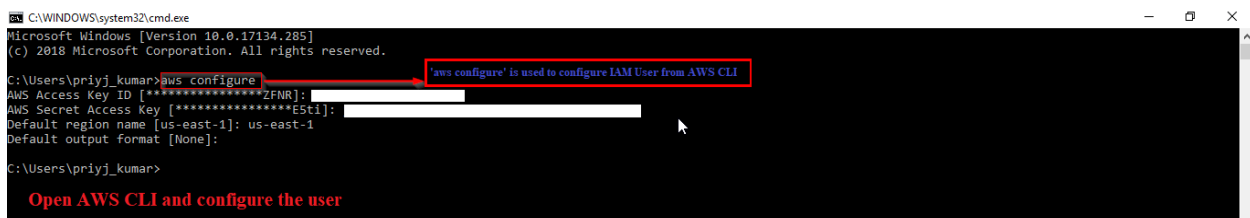
### **Pre-requisite**

1. [VMware Workstation installed on your Local Machine](#)
2. [Running AWS Account](#)
3. [Created IAM User On AWS](#)
4. [AWS CLI Configured On Your Local Machine](#)
5. [Created S3 Bucket on AWS](#)

Create a **.vmdk** export file for Ubuntu 14.04.



2. Download & configure AWS CLI.



3. Create an IAM User.

IAM – User - Add User – AccessType (Programmatic Access) – Attach Admin Access Policy – Create User.

4. Create an S3 bucket and add file(image file of the OS).
5. You can upload the file using AWS CLI also.  
aws s3 cp "source path" <s3 bucket>
6. Once the file is uploaded, create an AMI for the imported image file.  
Aws ec2 import-image –description "AWS Linux" --disk-containers <file:///containers.json>
7. Now your AMI is available, and you can see in under AMI in EC2 and run it as and when needed.

In this way, we have successfully migrated a virtual OS on AWS.

Probably by now you should have got a fair idea about AWS Cloud Migration Strategy and process, tools, and transfer mechanisms available.

