# Use AWS Migration Tools Like AWS Migration Hub, Server Migration Service (SMS), and Database Migration Service (DMS) to Perform Migrations on AWS

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***Abstract*- The study examined the role of AWS Migration Hub, Server Migration Service and Database Migration Service and enabled the efficiency of cloud migrations. Eth highlighted the factors with the help of which the tools automated the processes and minimised the downtime while ensuring the data integrity. This provided the organisation with the streamlined and secured approach for migrating workloads on to the clouds of ASW. and provision of Central visibility of the process related to the migration. This particular essay will be exploring the features, purpose and benefits of each of the tools and will also explain how they are collectively responsible for enhancing the effectiveness and efficiency while focusing on the accuracy of processes related to cloud migration on AWS.**

## I. INTRODUCTION

In the current years, organisations have increasingly migrated their information technology work clothes to the cloud for gaining scalability, operational resilience and cost efficiency. Amazon Web Services (AWS) has become one of the most important and leading providers of cloud due to the automation tools and wide ranges of services that are simplifying the process of migration. However, servers, migrating data and applications from the legacy environment or on-premises to AWS can be extremely complex without the proper utilisation of tools. AWS is responsible for providing a suitable native migration solution which are named as AWS Migration Hub, AWS Database Migration Service and AWS Server Migration Service that are streamlining and monitoring the transitions. These are the common tools that are responsible for enabling the seamless workload migration by ensuring the data integrity, automating replication,

## II. UNDERSTANDING AWS MIGRATION

Cloud migration can be considered as the process of transferring databases, applications and work clothes from the systems on-premises or other platforms of cloud to AWS cloud environment. It can be stated that AWS is responsible for supporting the multiple migration strategies collectively which are also known as 6Rs[1]. This understanding is involving the following factors such as the rehost, re-platform, repurchase, retire and retain. These are also responsible for guiding the organisations in terms of choosing the most appropriate path for migration. As work clothes are growing more complex the manual migration method becomes prone and inefficient to errors. The automation tools such as the DMS, SMS and AWS Migration Hub are responsible for reducing the downtime and accelerating the transition while focusing on the minimising of data loss. These are the common tools that are part of the AWS migration and transfer portfolio which are designed in terms of integrating with other services of AWS such as identity and access management, CloudWatch and CloudExplorer. Together they are offering the organisation with an end-to-end solution that is helping for developing plants and tracking the journeys of migration while executing the effectiveness of the journey securely.

## III. AWS MIGRATION HUB

***Overview***

A w s migration has been acting as the central dashboard for managing and tracking different migrations across the partner tools and AWS. It enables the teams of IT to visualise the progress and status of various migration projects in a single place[2]. Rather than changing among the different tools, users are capable of monitoring the databases, servers and applications collectively which are also helping in the large-scale migrations as well as management of complexities.

***Main features***

This particular platform is responsible for providing centralised visibility while allowing the organisations in terms of tracking the key performance indicators such as the cutover progress and replication status. It is also integrating seamless understanding of AWS server migration service, DMS and third-party solutions such as the CloudEndure[3]. Migration Hub is also responsible for involving the discovery service that are scanning on-premises resources while examining the process of generating the cost estimates before the migration.

***Advantages***

AWS Migration Hub is simplifying the project management by consolidating the factors of all data in one console while reducing the button of administrative understanding related to the monitoring of individual components. It is also ensuring transparency highly, enhancing the process of decision making and supporting the challenge mitigation process with the help of early detection of the delays in migration.

***Example use case***

For example, a multinational company migrating hundreds of applications from multiple data centres are utilising migration in terms of tracking the status of the migration and dependency. Moreover, by offering the unified insights, the tools are also responsible for improving the coordination among the technical teams and are focusing on ensuring that the entire plan of migration is staying aligned with the timelines of the organisation.

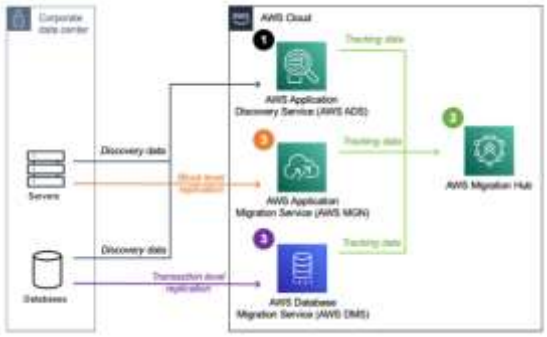


**Figure 1: AWS Migration Hub**

## IV. AWS SERVER MIGRATION SERVICE (SMS)

***Overview***

AWS Server Migration Service can be considered as the fully automatic service that has been designed for migrating the workloads on-premises with the virtual machines. It is also supporting the major platforms of virtualisation while approaching the reconfiguration.

***Process***

Migration with the help of SMS includes three primary stages such as the SMS connector, service replicator and the replicated instances[4]. These are the three steps that are helping the organisation in order to launch and taste the products before performing the final outcome.

***Advantages and key features***

The tool is responsible for allowing the incremental replication while ensuring the least disruption towards the operation of business. It is also automatic conversion with the help of virtual machines while focusing on the formats of Amazon EC2.

***Example use case***

A financial service organisation can migrate the legacy data centre while containing hundreds of VMs to the utilisation of AWS related to SMS.

**Figure 2: AWS Server Migration Service (SMS)**

## V. AWS DATABASE MIGRATION SERVICE (DMS)

***Overview***

AWS Database Migration Service is managed by the cloud services that are facilitating the migration of databases from the on-premises to AWS. It is supporting both homogeneous migration while focusing on the heterogeneous migration as well.

***Process***

The process includes the creation of replication examples while defining the target in points and sources and configuring the task of migration[5]. DMS is also responsible for supporting the three migration modes such as the change data capture, full data load and combination of the both.

***Benefits and features***

DMS supports multiple databases in jeans involving the Amazon Redshift and DynamoDB. It is also integrating the AWS schemas conversion tool (SCT) for automatically converting the schema of data basis and code during the migration among the different engines.

***Example use case***

It can be stated that an e-commerce organisation migrating from the Microsoft SQL server to the Amazon Aura can utilise the DMS with CDC in order to keep the sources and destination databases synchronised.

## VI. COMPARATIVE ANALYSIS OF MIGRATION TOOLS

AWS Migration Hub, SMS and DMS are complementing each other in terms of providing a complete ecosystem of migration. Migration Hub is acting like the central control panel that is capable of monetary and managing all the ongoing migrations[6]. On the other hand, SMS is focusing on the migrating virtual machines as well as the servers of workloads. Finally, it can be stated that the automation and visibility abilities of DMS are handling the synchronisation and transformation of the databases.

## VII. CHALLENGES AND BEST PRACTICES

Despite the efficiency of the tools, migrations using AWS tools are also facing multiple challenges involving the data security concerns, network latency and legacy system dependencies[7]. In terms of overcoming the challenges, AWS are recommending the conduct of remigration examination utilising the discovery features of Migration Hub while focusing on the integration of IAM policies and performing the best practices of pilot migrations.

## VIII. CONCLUSION

Server migration service, AWS migration has and Database Migration Service together are forming a robust suitable tool for executing the cloud migration successfully. Migration hard is providing the unified tracking virus SMS automated the virtual machine transfer and DMS ensured the continuous replication of the database securely. By leveraging the practices, organisations reduced the migration complexity, challenges and down time while accelerating the transformation of cloud.

### Abbreviations and acronyms

AWS-Amazon Web Services
SMS- Server Migration Service
DMS- Database Migration Service
EC2- Elastic Compute Cloud
IAM- Identity and Access Management
SCT- Schema Conversion Tool

### Equations

The migration efficiency (η) can be expressed as:
η=Tmanual−TAWSTmanual×100\eta = \frac{T_{manual} - T_{AWS}}{T_{manual}} \times 100η=TmanualTmanual−TAWS×100
where TmanualT_{manual}Tmanual is the time for manual migration and TAWST_{AWS}TAWS is the time using AWS tools, showing the percentage improvement achieved.

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