5 phases for enterprise migration to Amazon Web Services (AWS)

Develop a strategic and comprehensive migration plan

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Migration Competency

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Executive summary

When migrating to the cloud, companies need to develop a migration strategy that assesses risks and considers all possibilities. For example, if your data center lease is up and you need to move to the cloud, you need to plan how you can do so quickly without drastically changing the way you are used to working. You also need to ensure your infrastructure is organized in a way that will enable you to migrate to the cloud.

Migrating an entire service to a new IT environment means deciding how to migrate all three sub-systems: compute, storage, and networking. This involves identifying the right components and capabilities of the new environment, as well as the tools that will support migration tasks including replication of resources and data syncing. IT teams also need to plan for the longterm and ensure business continuity with the right ongoing operational plan.

Whether you are considering a complete migration to AWS or developing a hybrid environment, you need to have a strategic and comprehensive plan. In this paper, we provide a five-phased approach for a smooth, enterprise-grade migration project to AWS. We cover everything from compute to data migration to protection, discuss how to best handle these challenges when migrating your enterprise to AWS, and provide a wealth of resources and tools from AWS, available in AWS Marketplace, to help you.

The cloud migration discussion is no longer about if it will happen, but rather about what is already happening. Be sure you have the resources, skills, and procedures for transitioning smoothly to best fit a cloud integration to your needs.

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1

The discovery phase

In the discovery phase, enterprises can better understand things like which applications can be migrated and which cannot, and the frequency of users, usage, and who those users are.

Other important considerations when migration applications to the cloud include network configurations, interdependencies, and integration with external systems. You will also want to factor in SLA requirements related to availability, and ensure you have clearly defined recovery time objective (RTO) and recovery point objective (RPO) for of your systems. This will allow you to understand what you need from the perspective of both scalability and a secondary site.

Your industry may also have certain compliance standards and regulations that you'll need to consider; for example, the Health Insurance Portability and Accountability Act (HIPAA) in healthcare, or PCI-DSS for organizations that handle credit card payments. AWS offers services that meet a wide variety of compliance standards that satisfy both US and global regulations.

Make sure you understand your part of the AWS Shared Responsibility Model, as your users' liability won't vanish in the cloud.

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The assessment phase

During the assessment stage, you will begin to assess your migration methods. First, identify the resources you will need and build your migration team. Whether you perform your migration in-house or outsource it to a cloud managed service, there should be good communication between your on-premises system administrators and the new AWS team.

Be sure to itemize the third-party solutions that you use and find out if these can easily migrate to AWS. Get started by checking to see if the vendor's solution is available in AWS Marketplace, and if they already have ready-made images or integration points that can easily be deployed on AWS. In many cases, you can bring your own on-premises licenses.

It is recommended to leverage AWS resources during the assessment stage. For example, AWS Partner Network (APN) Consulting Partners can help design, architect, build, migrate, and manage your workloads and applications on AWS. AWS accelerate offerings can help you acquire the skills required to get things started. AWS solutions architects can help you plan your architecture topology and ensure it adheres with your security and compliance requirements. AWS Professional Services also offers a team of experts, the AWS Professional Services Mass Migration Team, which is focused specifically on helping enterprises with large migrations to the cloud.

Learn more about these AWS Professional Services.

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3

The proof of concept (POC) phase

During the POC phase, you will be testing your workload. This should include any tests for validating the workload performance and the costs associated with running them on AWS. During this phase, you will determine the capacity required in terms of the amount and size of your Amazon Elastic Compute Cloud (EC2) instances, for example.

You will also need to understand the benefits of AWS storage services, and determine if you will be able utilize them to replace or integrate with your on-premises repositories. This could mean leveraging Amazon Relational Database Services (RDS) to run your SQL database or Amazon Glacier to keep your archived data.

Understanding your security requirements is also crucial at this stage, and you can use AWS Security Groups for this. One way to keep an eye on security is to determine which network and security controls are needed, and leverage Amazon's built-in firewall, which offers a basic level of intrusion protection and may be sufficient in certain cases. Additionally, Security Groups, Amazon Virtual Private Cloud (VPC), and dedicated tunnels such as AWS Direct Connect allow you to protect your AWS network and securely move applications and data in and out of your on-premises data center.

Determine your capacity requirements including the amount and size of your Amazon EC2 instances.

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The migration plan phase

Once you decide which applications to migrate, the next phase of your migration plan consists of the blueprint design, the migration tools, a list of assignments and rollback, and “what-if” procedures.

AWS offers migration-related tools to help you, such as the AWS Import/Export disk, which accelerates moving large amounts of data into and out of AWS using portable storage devices for transport. You can also use AWS Management Portal for vCenter, which facilitates migration of VMware resources.

You will want to ensure your data is migrated in a reasonable amount of time and automate tasks where possible. You can use AWS resources including AWS Database Migration Service (DMS), which will help you migrate your relational databases such as Microsoft SQL Server, MySQL, and PostgreSQL to a dedicated Amazon EC2 instance or directly to Amazon RDS.

During the migration phase, speed is of the essence. You can leverage AWS resources to help you with your migration. For example, the AWS Schema Conversion Tool helps you to migrate data between different database platforms. This tool converts your schemas and stored procedures. If you have large chunks of data that need to be migrated, consider AWS Snowball and AWS Snowball Edge.

Keep in mind that there will be a one-time move of the data on “production day,” as well as the need to continually sync data between the environments as required. Using NetApp Cloud Volumes ONTAP, based on NetApp’s SnapMirror technology, you can replicate on-premises data to AWS.

It is also important to start small and prove value. Consider a phased approach, where you move each application, test it extensively, and validate reliable data replication and the user experience. Also, remember that a rollback is not a failure; rather, you can use your learnings to help you make a stronger migration to the cloud in the future.

As you consider data migration, factor in the amount of data involved and how it synchronizes with your on-premises data repositories.

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The cloud operations phase

The final phase of a successful migration to AWS is cloud operations. During this phase you plan for support and upgrades.

It is important to ensure that you establish 24x7 support for your applications. Make sure that your resources have the AWS skills required to troubleshoot infrastructure issues, and that you stay on top of system maintenance and upgrades.

Consider SLA requirements, including details regarding governance, security, compliance, performance, and uptime. AWS has different SLAs for each product. For example, the SLA for Amazon states that AWS will use commercially reasonable efforts to make Amazon EC2 and Amazon Elastic Block Store (Amazon EBS) each available with a monthly uptime percentage of at least 99.95%.

Build in monitoring and logging to your plans, considering AWS CloudWatch and AWS CloudTrail. Make use of AWS Trusted Advisor, which analyzes your AWS environment and provides best practice recommendations regarding aspects such as cost and security.

Finally, the innovative nature of the cloud brings with it significant and frequent changes. Keeping up with this rapid pace of innovation and change is especially important and should be considered as an ongoing task. You can start by regularly reading the AWS blog.

Keep up with the rapid pace of innovation and change as an ongoing task.

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Learning from past AWS migrations: Customer use cases

While planning your own migration to AWS, it may be helpful to look at two examples of large enterprises who have successfully achieved this type of migration.

General Electric (GE) is migrating more than 9,000 workloads to AWS while tracking to reduce its number of data centers from 34 to four over the next few years. GE also needs to factor in regulations for its core industries, including healthcare and finance, which are heavily regulated by protocols that were written for past eras.

Watch the General Electric case study

SoundCloud, a platform for recordings or uploading existing sound files, utilized various AWS solutions to store and process the massive data sets its users upload each day. SoundCloud uses Amazon S3 and Amazon Glacier to securely store data volumes without worrying about storage or additional operational overhead. SoundCloud Vice President of Engineering Alexander Grosse points out that the key with the migration was starting right away on AWS, and setting up their architecture in a more modular and scalable way from the start.

Read the SoundCloud case study

When enterprises migrate to the cloud, timing is of the essence. Enterprises need to move quickly away from cumbersome, costly, and risky traditional IT projects.

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Start your free trial of NetApp Cloud Volumes ONTAP for AWS

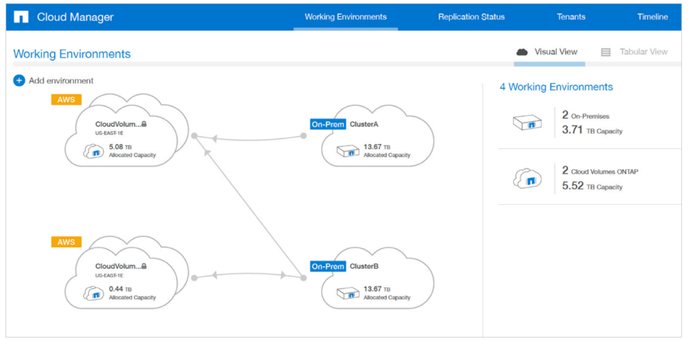
Get started

About NetApp® Cloud Volumes ONTAP Data Management Services

You need to control what happens to your data, no matter where it resides. When you migrate your applications to the cloud, you are still responsible for managing and protecting your business data. Organizations have spent years controlling and aligning the appropriate levels of data performance, protection, and security in the data center to support their applications. As you move to the cloud, you must maintain the same level of control over your data that you have in an on-premises environment. NetApp Cloud Volumes ONTAP helps you manage your data while reducing your cloud storage spend by up to 70%.

NetApp Cloud Volumes ONTAP:

- Creates a virtual NetApp appliance with advanced data management capabilities.
- Runs on Amazon Elastic Compute Cloud (Amazon EC2).
- Uses Amazon EBS as the underlying disk layer.



For more information visit: **cloud.netapp.com**.

Control what happens to your data, no matter where it resides.

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