

An Internship Report

On

AWS Cloud Virtual Internship Report

*Submitted in partial fulfillment of the
requirement for the award of the degree of*

Master of Computer Applications



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CERTIFICATE

I hereby certify that the work being presented in the internship report entitled “**AWS Cloud Virtual Internship Report**” in partial fulfillment of the requirements for the award of the degree of Master of Computer Applications in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an authentic record of our own work carried out in Industry Internship [MCAN2333].

To the best of my knowledge, the matter embodied in the project report has not been submitted to any other University/Institute for the award of any Degree.

This is to certify that the above statement made by the candidate is correct and true to the best of my knowledge.

Galgotias University, Greater Noida.

INTRODUCTION

The AWS Cloud Internship served as an immersive and dynamic exploration into the realm of cloud computing, with a specific focus on Amazon Web Services (AWS). Throughout the internship, participants delved into the extensive suite of AWS services, gaining practical skills in cloud architecture, computing, storage, databases, and more. This report encapsulates the essential components of the internship experience, outlining key learning objectives, hands-on projects, challenges addressed, and the overall impact on professional development. As cloud computing continues to reshape the landscape of technology, this internship provided a valuable opportunity for participants to acquire tangible skills, collaborate on real-world projects, and lay the foundation for a future in the ever-evolving field of cloud technology.

Definition: Amazon Web Services (AWS) is a comprehensive cloud computing platform provided by Amazon. It offers a wide array of services, including computing power, storage, databases, machine learning, analytics, and more.

Key Concepts:

1. **Elasticity:** AWS allows users to scale resources up or down based on demand, ensuring optimal performance and cost efficiency.
2. **Pay-as-You-Go:** Users pay only for the resources they consume, avoiding upfront infrastructure costs.
3. **Global Reach:** AWS operates in multiple regions and availability zones worldwide, facilitating low-latency and fault-tolerant applications.

CORE AWS SERVICES:

1. Compute Services:

- Amazon EC2: Virtual servers in the cloud.
- AWS Lambda: Serverless computing for executing code in response to

events.

2. Storage Services:

- Amazon S3: Scalable object storage for data backup and retrieval.
- Amazon EBS: Block storage volumes for EC2 instances.

3. Database Services:

- Amazon RDS: Managed relational databases.
- Amazon DynamoDB: Fully managed NoSQL database.

4. Networking:

- Amazon VPC: Isolated virtual networks for enhanced security.
- Amazon Route 53: Scalable domain name system (DNS) web service.

5. Security and Identity:

- IAM (Identity and Access Management): User access control and permissions.
- AWS Key Management Service (KMS): Secure management of encryption keys.

6. Analytics and Machine Learning:

- Amazon Redshift: Fully managed data warehouse.
- Amazon SageMaker: Machine learning service for building, training, and deploying models.

KEY BENEFITS

1. Scalability:

- **Elasticity:** Easily scale up or down based on demand, ensuring optimal performance during peak times and cost savings during low-traffic periods.

Auto Scaling: Automatically adjusts the number of resources to maintain application performance and reduce costs.

2. Cost Efficiency:

- **Pay-as-You-Go Model:** Pay only for the computing power, storage, and other resources consumed, eliminating the need for upfront investments in hardware.
- **Cost Monitoring and Management Tools:** AWS provides tools to monitor usage, set budgets, and receive alerts, helping organizations control and optimize costs.

3. Reliability:

- **Global Infrastructure:** Multiple availability zones and regions worldwide ensure high availability and fault tolerance.
- **SLA (Service Level Agreement):** AWS offers SLAs with high uptime commitments for its services, providing a reliable foundation for applications.

4. Security:

- **IAM (Identity and Access Management):** Fine-grained control over user access to resources, enhancing security.
- **Encryption:** AWS provides encryption options for data in transit and at rest, ensuring data integrity and confidentiality.
- **Compliance:** AWS complies with various industry standards and certifications, meeting stringent security requirements.

5. Flexibility and Agility:

- **Wide Range of Services:** AWS offers a vast array of services, enabling organizations to choose the best tools for their specific needs.
- **Serverless Computing:** AWS Lambda allows for running code without provisioning or managing servers, enhancing agility and reducing operational overhead.

6. Innovation:

- **Managed Services:** AWS manages underlying infrastructure, allowing

organizations to focus on innovation and application development.

- **Continuous Updates:** Regular updates and the introduction of new services keep organizations at the forefront of technology.

7. Global Reach:

- **Global Content Delivery:** Amazon CloudFront ensures low-latency content delivery by caching content at edge locations worldwide.
- **Global Accelerator:** Improves the availability and performance of applications for a global user base.

8. Disaster Recovery:

- **AWS Backup:** Simplifies the backup of data across AWS services, ensuring data resilience and facilitating disaster recovery.
- **Multi-region Deployments:** Allows for redundancy and disaster recovery strategies across different geographic regions.

9. DevOps Integration:

- **AWS DevOps Tools:** Integration with popular DevOps tools enables seamless automation, continuous integration, and continuous delivery (CI/CD) pipelines.

10. Community and Support:

- **Active Community:** A large and active user community provides resources, forums, and knowledge sharing.
- **AWS Support Plans:** Different support plans cater to various needs, offering technical assistance and guidance.

PRACTICAL WORK

1. Adding a Storage Layer:

In this module, the focus is on implementing storage solutions using AWS services like Amazon S3 for object storage, Amazon EBS for block storage, Amazon EFS for scalable file storage, and other storage-related services. The goal is to efficiently manage, store, and retrieve data in the AWS Cloud.

2. Adding a Compute Layer:

This module involves setting up a compute infrastructure using services like Amazon EC2 for virtual servers and AWS Lambda for serverless computing. It explores the deployment and management of computing resources to support applications and workloads.

3. Adding a Database Layer:

The emphasis in this module is on creating a database layer using AWS database services such as Amazon RDS for managed relational databases and Amazon DynamoDB for NoSQL databases. It covers database deployment, configuration, and optimization.

4. Creating a Networking Environment:

Here, the focus shifts to creating a networking environment using Amazon VPC (Virtual Private Cloud) to isolate resources and control network configurations. It includes considerations for subnets, routing, and security groups.

5. Connecting Networks:

This module delves into connecting different networks within the AWS environment. It covers topics such as VPN (Virtual Private Network) connections, Direct Connect for dedicated network links, and considerations for network connectivity.

6. Securing User and Application Access:

Security is paramount in this module. It covers the implementation of security measures, including IAM (Identity and Access Management) for user access control, encryption, and other security best practices for applications.

7. Implementing Elasticity, High Availability, and Monitoring:

This module explores strategies for making the infrastructure elastic and highly available, using features like Auto Scaling to adjust resources based on demand and implementing monitoring with Amazon CloudWatch to track system health and performance.

8. Automating Your Architecture:

Automation is a key focus in this module. It involves using AWS services like AWS CloudFormation or AWS CDK (Cloud Development Kit) to automate the deployment and management of resources, ensuring consistency and efficiency.

9. Caching Content:

Caching content is essential for improving performance. This module likely covers AWS services such as Amazon CloudFront for content delivery, and ElastiCache for in-memory caching solutions.

10. Building Decoupled Architectures:

Decoupling components in an architecture enhances flexibility. This module could cover the use of message queues, event-driven architectures, and other patterns to create loosely coupled systems.

11. Building Microservices and Serverless Architectures:

This module focuses on modern application architectures, including microservices and serverless computing. It explores AWS services like AWS Lambda, Amazon API Gateway, and other tools for building scalable and modular applications.

12. Planning for Disaster:

This module likely covers disaster recovery planning using AWS services such as AWS Backup, AWS Disaster Recovery, and strategies for data backup and restoration in case of unexpected events.

CONCLUSION

The AWS Cloud internship has been an invaluable opportunity to delve into the dynamic and expansive world of cloud computing. Throughout this internship, I have gained practical insights and hands-on experience in leveraging Amazon In Web Services to build, deploy, and manage scalable and resilient architectures.

Key Learnings:

1. Comprehensive Understanding of AWS Services:

- Acquired a deep understanding of core AWS services, including storage (S3, EBS, EFS), compute (EC2, Lambda), databases (RDS, DynamoDB), networking (VPC), and more.

2. Practical Application of Cloud Concepts:

- Successfully applied cloud computing concepts to address real-world scenarios, emphasizing elasticity, scalability, and cost-efficiency.

3. Security Best Practices:

- Explored and implemented security measures, including IAM, encryption, and network security, to safeguard resources and data.

4. Automation and Infrastructure as Code:

- Developed proficiency in automating infrastructure deployment using tools like AWS CloudFormation or AWS CDK, enhancing efficiency and ensuring consistency.

5. Networking and Connectivity:

- Established networking environments, connecting networks through VPNs, Direct Connect, and optimizing network configurations for performance and security.

6. Disaster Recovery and Business Continuity:

- Gained insights into disaster recovery planning and implemented strategies to ensure data resilience and business continuity in case of unforeseen events.

7. Monitoring and Optimization:

- Explored monitoring solutions such as Amazon CloudWatch to track system health, and implemented optimization strategies for cost-effective resource management.

ACHIEVEMENTS AND CONTRIBUTIONS:

1. Successful Implementation of Storage Layer:

- Designed and deployed a robust storage layer utilizing Amazon S3 for object storage, EBS for block storage, and EFS for scalable file storage.

2. Compute Infrastructure Setup:

- Established a flexible compute infrastructure using EC2 instances and explored serverless computing with AWS Lambda.

3. Database Management:

- Implemented and optimized databases using managed services like Amazon RDS and DynamoDB, ensuring data integrity and performance.

4. Networking and Connectivity Solutions:

- Created secure networking environments with Amazon VPC and established reliable connections between different networks.

5. Security Measures Implementation:

- Implemented IAM policies, encryption, and other security best practices to safeguard user and application access.

6. Automation for Efficiency:

- Successfully employed automation tools like AWS CloudFormation or AWS CDK to streamline infrastructure deployment and management.