An Internship report

on

AWS CLOUD VIRTUAL INTERNSHIP

Submitted in partial fulfillment of the

requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

in

Computer Science and Engineering (Data Science)

by

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Computer Science and Engineering (Data Science)

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Rotarypuram Village, B K Samudram Mandal, Ananthapuramu - 515 701

2024-2025

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Certificate

This is to certify that the project report entitled AWS Cloud Virtual Internship is the bonafide work carried out by B.SWAROOPA bearing Roll Number 214G1A32B1, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Department of Computer Science and Engineering (Data Science) for ten weeks from April 2024 to June 2024.

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EXTERNAL EXAMINER

PREFACE

All India Council for Technical Education (AICTE) has initiated various activities for promoting industrial internship at the graduate level in technical institutes and Eduskills is a Non-profit organization which enables Industry 4.0 ready digital workforce in India. The vision of the organization is to fill the gap between Academic and Industry by ensuring world class curriculum access to the faculties and students. Formation of the All-India Council for Technical Education (AICTE) in 1945 by the Government of India.

Purpose:

With a vision to create an industry-ready workforce who will eventually become leaders in emerging technologies, EduSkills & AICTE launches 'Virtual Internship' program on AWS cloud. This field is one of the most in-demand, and this internship will serve as a primer.

Company's Mission Statement:

The main mission of these initiatives is enhancement of the employability skills of the students passing out from Technical Institutions Business Activities

ACKNOWLEDGMENT

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of people who made it possible, whose constant guidance and encouragement crowned our efforts with success. It is a pleasant aspect that we have now the opportunity to express our gratitude for all of them.

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AWS	Amazon Web Services
CDN	Content Delivery Network
IAM	Identity and Access Management
EC2	Elastic Cloud Compute
VPC	Virtual Private Cloud
KMS	Key Management System
DNS	Domain Name System
EBS	Elastic Block Store
RDS	Relational Database Service
ELB	Elastic Load Balancer

CHAPTER -1

INTRODUCTION

Introduction to AWS:

Amazon Web Services (AWS) was officially launched in 2006, marking the beginning of a significant shift in how computing resources are delivered and consumed. The initial offerings, Amazon S3 (Simple Storage Service) and Amazon EC2 (Elastic Compute Cloud), were designed to address the need for scalable and cost-effective infrastructure solutions. Amazon S3 provided a robust and scalable storage solution, allowing users to store and retrieve any amount of data from anywhere on the web. Meanwhile, Amazon EC2 offered resizable compute capacity in the cloud, enabling usersto run virtual servers with flexibility and scalability.

What is AWS ?

Amazon Web Services (AWS) is a comprehensive and widely adopted cloud computing platform offered by Amazon, providing a vast array of cloud services that include computing power, storage, and networking. Launched in 2006, AWS has revolutionized the way businesses and individuals deploy and manage IT infrastructure. It offers scalable and flexible resources that enable users to run applications, store data, and process information without the need for physical hardware. AWS's suite of services encompasses various domains, including artificial intelligence, machine learning, analytics, databases, and IoT, among others. It operates on a pay-as-you-go pricing model, which allows users to pay only for the resources they consume, thereby optimizing costs and eliminating the need for significant upfront investments. AWS's global infrastructure, with multiple geographic regions and Availability Zones, ensures high availability, reliability, and low latency for applications worldwide. The platform's robust security features, compliance certifications, and extensive range of tools and services make it a preferred choice for businesses of all sizes seeking to innovate, scale, and optimize.

Fig 1.1 AWS Cloud

1.2 Introduction to Cloud Computing:

Cloud computing is a revolutionary approach to delivering and managing computing resources over the internet, enabling users to access a broad range of services, including servers, storage, databases, networking, software, and analytics, without the need for physical hardware or on-site infrastructure. Introduced in the mid-2000s, it allows organizations and individuals to scale resources up or down based on demand, offering unparalleled flexibility and efficiency. **Reducing expenses:** Process mining software can show executives whether a company spends money inefficiently. By reviewing this information, they can better manage resources and streamline production steps.

Importance of Cloud Computing:

Cloud computing is a game-changer in the IT industry, offering critical advantages that have become essential for modern businesses and individuals. Its cost efficiency eliminates the need for significant upfront investments in hardware and infrastructure, replacing it with a flexible pay-as-you-go model. This model allows for scalability and flexibility, enabling organizations to adjust their resources based on current demands seamlessly. Cloud computing also enhances accessibility and collaboration by allowing users to access services and data from any location with an internet connection, supporting remote work and global teamwork.

Types of Cloud Computing:

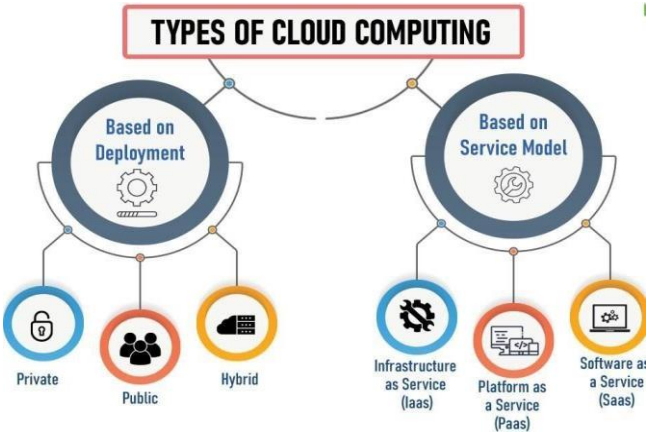

Fig 1.2 Cloud Computing

Deployment Models:

Public Cloud: Public clouds are operated by third-party providers and offer services to multiple organizations over the internet .This model offers high scalability, cost efficiency, and ease of access, making it ideal for businesses that need to quickly scale resources without significant capital investment. Examples include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

Private Cloud: A private cloud is a dedicated environment used exclusively by a single organization. It can be hosted on-premises or by a third-party provider, but it is not shared with other organizations. This model provides enhanced control, security, and customization options, making it suitable for businesses with specific compliance requirements or sensitive data. Private clouds allow organizations to tailor their infrastructure to meet specific needs while maintaining greater control over security and performance.

Hybrid Cloud: Hybrid clouds combine public and private cloud elements, allowing data and applications to be shared between them. This model offers flexibility and optimized resource use. Organizations can keep critical or sensitive workloads on the private cloud while utilizing the public cloud for less sensitive operations or to handle peak demands.

Community Cloud: Community clouds are shared among organizations with common concerns, such as regulatory compliance or security needs. They can be managed by one or more organizations or a third-party provider. Community clouds can be managed by the participating organizations or by a third-party provider.

Service Models:

Infrastructure as a Service (IaaS):

Infrastructure as a Service (IaaS) provides virtualized computing resources over the internet, such as virtual machines, storage, and networks. In this model, the cloud provider manages the physical hardware, but users have control over the operating systems, applications, and configurations. IaaS offers the highest level of flexibility among the cloud service models, allowing organizations to scale resources up or down according to their needs. It is ideal for businesses that require control over their infrastructure but do not want to invest in physical hardware. Examples include Amazon EC2, Microsoft Azure, and Google Compute Engine.

Platform as a Service (PaaS):

Platform as a Service (PaaS) delivers a platform that allows developers to build, deploy, and manage applications without worrying about the underlying infrastructure. The cloud provider manages everything from the operating system to the servers, storage, and networking, enabling developers to focus solely on writing code and developing applications. PaaS simplifies the development process by providing pre-configured environments, development tools, and frameworks, making it easier to develop, test, and deploy applications quickly. Examples include Google App Engine, AWS Elastic Beanstalk, and Microsoft Azure App Services.

Software as a Service (SaaS):

Software as a Service (SaaS) delivers software applications over the internet, typically on a subscription basis. In this model, the cloud provider hosts and manages the software, including maintenance, updates, and security, while users access the application through a web browser. SaaS eliminates the need for local installation and maintenance, making it convenient for end-users who only need to access the software's functionality. It is widely used for applications like email, customer relationship management (CRM), and collaboration tools. Examples include Google Workspace, Microsoft Office 365, and Salesforce. SaaS offers the convenience of ready-to-use applications.

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CHAPTER – 2

AWS CLOUD FOUNDATIONS

Amazon Web Services (AWS) provides a comprehensive suite of cloud computing services that enable businesses to build and deploy applications with flexibility, scalability, and cost efficiency. The AWS Cloud Foundations encompass a broad range of fundamental services and concepts essential for leveraging the full potential of the cloud.

2.1 AWS Global Infrastructure overview:

The AWS Global Infrastructure is designed to provide a robust, scalable, and reliable foundation for delivering services to customers across the globe. This infrastructure is the backbone of AWS's ability to deliver a wide array of cloud services, enabling customers to deploy applications closer to their users, meet regulatory requirements, and achieve high availability and reliability**.**

Fig 2.1 AWS Cloud Infrastructure

Regions: AWS Regions are separate geographic areas where AWS data centers are clustered. Each region is isolated from the others, providing a level of fault tolerance and stability.

Availability Zones: Each region consists of multiple, physically separated Availability Zones. AZs are designed to be isolated from failures in other AZs, offering customers the ability to run apps with high availability and fault tolerance.

Edge Locations: These are locations worldwide where AWS has deployed resources to cache copies of your data closer to end users. AWS uses edge locations for services like Amazon CloudFront and Route 53, reducing latency by serving content faster to users around the globe.

AWS Regional Edge Caches: These are a feature of Amazon CloudFront, a content delivery network (CDN) offered by AWS. They are used to cache content at edge locations, which are strategically situated around the world. This allows for faster delivery of content to users and reduces latency.

Wavelength Zones: There are specific edge locations that are designed to provide ultra-low latency and high-bandwidth access to AWS services and applications. They are typically deployed in conjunction with telecommunications providers and are connected to the AWS global network.

2.2 AWS Core Services Overview

Fig 2.2 AWS Core Services

2.2.1 Compute Services:

i) EC2 (Elastic Compute Cloud): EC2 provides virtual machines, known as instances, with varying CPU, memory, and storage capacities. You can choose from a range of instance types, including general-purpose, compute-optimized, memory-optimized, and more. EC2 supports various operating systems, such as Windows, Linux, and AWS Linux. EC2 instances run in a Virtual Private Cloud (VPC), providing isolation and security.

ii) Lambda: Lambda allows you to run small code snippets, called functions, written in supported languages like Node.js, Python, and Java. You can trigger these functions through API calls, data changes, schedules, Alexa skills, and more. Lambda provides a managed runtime environment for executing functions and automatically scales to handle demand. You can use Lambda for real-time data processing, API backends, IoT data processing, and serverless architectures.

iii) Elastic Beanstalk: Elastic Beanstalk is a managed platform for deploying web apps and services written in supported languages like Node.js, Python, and Ruby. You can upload your code and configure settings like environment variables and instance types. Elastic Beanstalk then deploys your application to AWS resources like EC2,RDS.

2.2.2 Storage Services:

i) S3 (Simple Storage Service): S3 is an object storage service that allows you to store and retrieve large amounts of data. You can store files, images, videos, and other types of data in S3. S3 provides durable, secure, and highly scalable storage that can be accessed from anywhere on the internet.

ii) BS (Elastic Block Store): EBS is a block-level storage service that provides persistent storage for EC2 instances. You can create EBS volumes and attach them to EC2 instances. EBS provides high-performance storage that can be used for databases, file systems, and other applications.

iii) EFS (Elastic File System): EFS is a file-level storage service that provides a shared file system for EC2 instances. You can create EFS file systems and mount them to EC2 instances. EFS provides a highly available and durable file system that can be used for big data analytics, machine learning, and other applications.

2.2.3 DataBase Services:

RDS (Relational Database Service): RDS is a managed relational database service that supports various database engines, including MySQL, PostgreSQL, Oracle, and SQL Server. You can create and manage databases, perform backups and restores, and monitor performance. RDS provides high availability, durability, and security for your relational databases.

DynamoDB: DynamoDB is a fast, fully managed NoSQL database service that provide single-digit millisecond performance. You can store and retrieve large amounts of data and use secondary indexes to improve query performance. DynamoDB provides high availability, durability, and security for your NoSQL databases.

DocumentDB: DocumentDB is a document-oriented database service that supports MongoDB workloads. You can store and retrieve JSON documents,and use secondary indexes to improve query performance. DocumentDB provides high availability, durability, and security for your document-oriented databases.

2.3 Networking and content delivery:

VPC (Virtual Private Cloud):VPC is a networking service that allows you to create a virtual network in the cloud. You can create subnets, route tables, and network ACLs to manage traffic flow. VPC provides a secure and isolated environment for your resources.

Route 53: Route 53 is a domain name system (DNS) service that allows you to route traffic to your resources. You can create hosted zones, record sets, and health checks to manage traffic flow. Route 53 provides high availability and durability for your DNS needs.

CloudFront: CloudFront is a content delivery network (CDN) service that allows you to distribute content to your users. You can create distributions, origins, and cache behaviors to manage content delivery. CloudFront provides high performance and low latency for your content delivery needs.

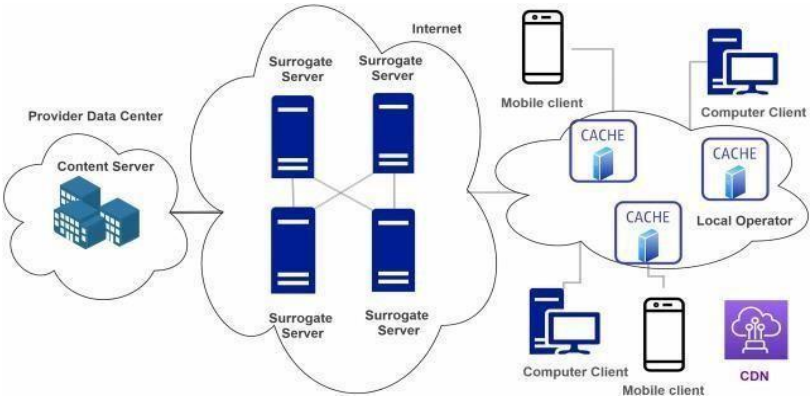

Fig 2.3 Content Delivery

2.4 Cloud Economics and Billing:

Cloud economics refers to the financial management and cost optimization of cloud computing resources. It involves understanding the costs associated with cloud computing, such as usage-based pricing, tiered pricing, and discounts for committed usage. By optimizing cloud economics, organizations can maximize the value of their cloud investments and achieve cost savings. Cloud economics involves analyzing usage patterns, rightsizing resources, and selecting the most cost-effective pricing models. It also involves taking advantage of discounts, such as reserved instances and spot instances, and using cost allocation tags to track costs.

Billing refers to the process of generating and managing invoices for cloud computing services. In the context of cloud economics, billing is a critical component as it directly impacts an organization's cost management and optimization strategies.

Cloud providers offer various billing models, including:

- Usage-based billing: Charging customers based on their actual resource usage.
- Tiered pricing: Offering discounts for higher usage levels.
- Reserved Instances: Discounted pricing for committed usage.
- Spot Instances: Bid on unused capacity for discounted pricing.

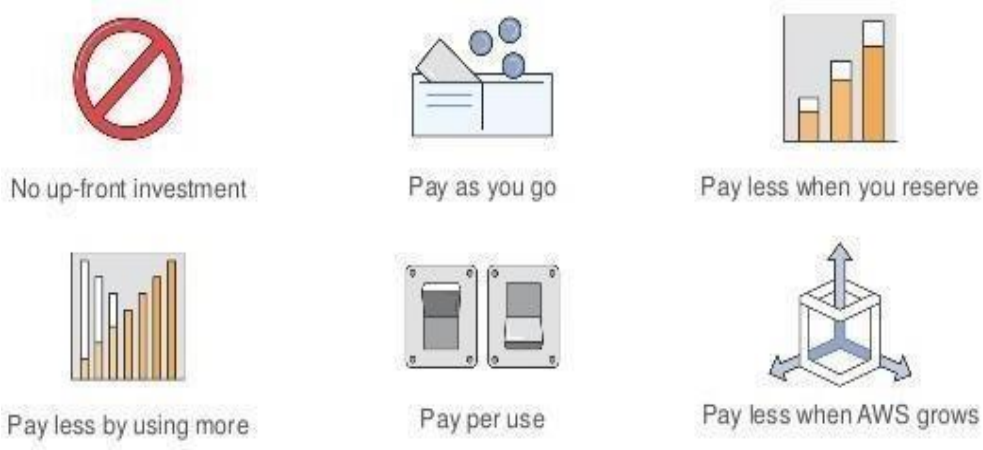

Fig 2.4 Billing and Pricing

2.5 AWS Cloud Security and compliance:

AWS Cloud Security and Compliance refer to the practices and controls used to protect and secure data and applications in the AWS cloud. AWS provides a secure infrastructure and services, but it's the customer's responsibility to ensure their data and applications are secure and compliant with relevant regulations.

2.5.1 Security:

Security in the AWS cloud refers to the practices and controls used to protect and secure data, applications, and infrastructure from unauthorized access, use, disclosure, disruption, modification, or destruction. AWS provides a secure infrastructure and services, but it's the customer's responsibility to ensure their data and applications are secure.

Some key security features and services in AWS include:

- Identity and Access Management (IAM): manages access to AWS resources
- Virtual Private Cloud (VPC): provides a secure network environment
- Security Groups: controls access to instances
- Network ACLs: controls access to subnets
- Encryption: protects data at rest and in transit
- Key Management Service (KMS): manages encryption keys
- CloudWatch: monitors and logs security-related events

2.5.2 Compliance:

Compliance in the AWS cloud refers to the process of ensuring that your cloud resources and data meet specific regulatory, industry, or organizational requirements. AWS provides various compliance programs and certifications to help customers meet these requirements.

Some key compliance features and services in AWS include:

- Compliance frameworks: AWS supports various compliance frameworks such as PCI-DSS, HIPAA/HITECH, GDPR, and more

- Certifications: AWS holds various certifications such as SOC, ISO, and PCI-DSS

- Security and compliance controls: AWS provides security and compliance controls such as IAM, VPC, and encryption

- Audit and logging: AWS provides audit and logging capabilities such as CloudWatch and CloudTrail

- Compliance monitoring: AWS provides compliance monitoring capabilities such as Inspector and Config.

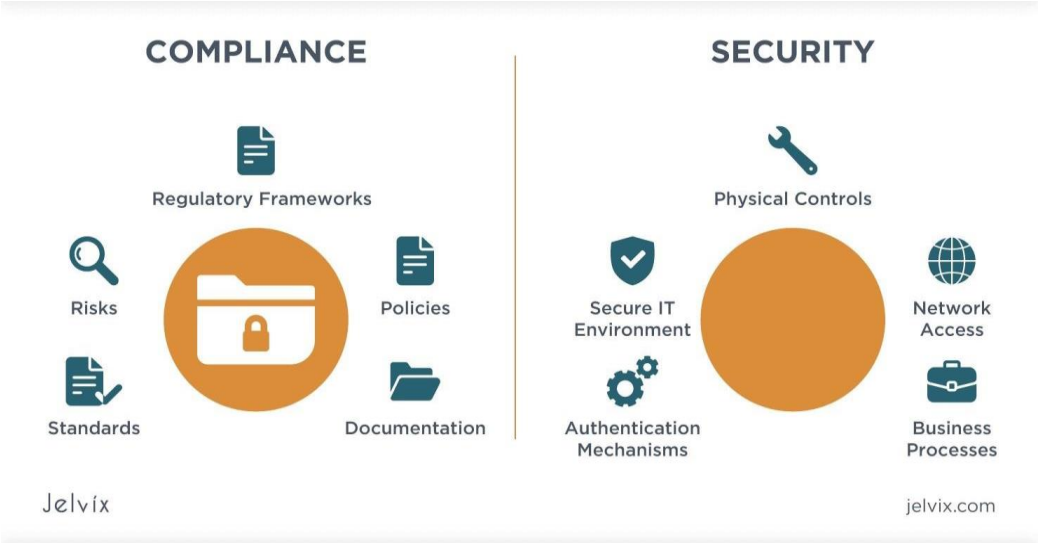

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Fig 2.5.2 Compliance and Security

2.6 Auto Load Balancing:

Auto Load Balancing in AWS is a feature that automatically distributes incoming traffic across multiple targets, such as EC2 instances, containers, or IP addresses, to ensure high availability and scalability. AWS offers several types of load balancers, including Application Load Balancer (ALB), Network Load Balancer (NLB), and Classic Load Balancer (CLB), each suitable for different types of traffic and use cases. By using Auto Load Balancing, applications can ensure high availability, scalability, and improved responsiveness, as traffic is automatically redirected away from unhealthy targets and adjusted to changes in traffic volume.

To set up Auto Load Balancing, users create a load balancer, configure settings and targets, and enable health checks and Auto Scaling.

Load balancing options to support different use cases and requirements. By leveraging Auto Load Balancing, users can ensure their applications are always available and responsive, even in the face of changing traffic demands.

Auto Load Balancing in AWS provides several benefits, including:

1. High Availability: Ensures that applications are always available and accessible.
2. Scalability: Automatically adjusts to changes in traffic volume.
3. Fault Tolerance: Detects and redirects traffic away from unhealthy targets.
4. Improved Responsiveness: Reduces latency and improves application responsiveness.

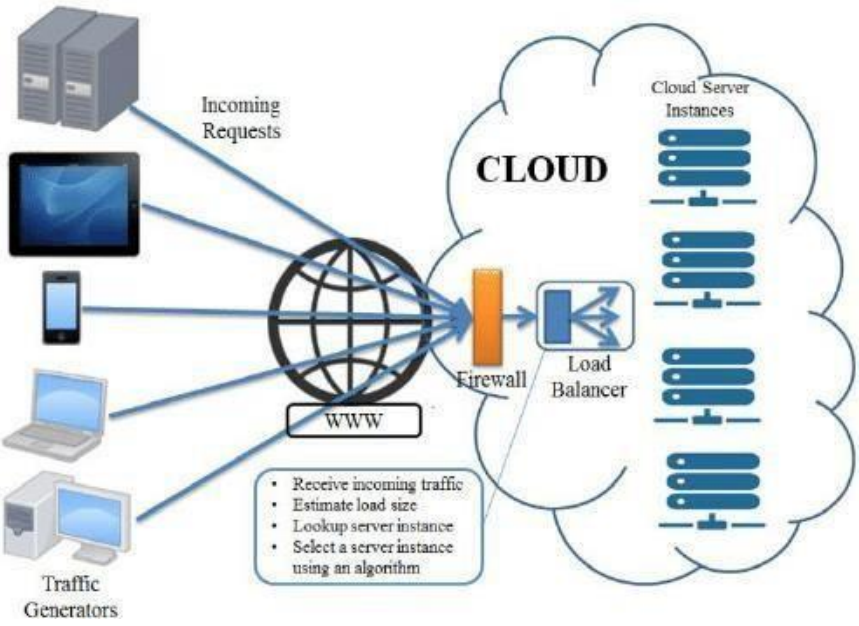

Fig 2.6 Working of Auto Load Balancing

To set up Auto Load Balancing in AWS, follow these steps:

1. Create a load balancer (ALB, NLB, or CLB).
2. Configure the load balancer with the desired settings (e.g., protocol, port, and targets)
3. Add targets (EC2 instances, containers, or IP addresses) to the load balancer.
4. Configure health checks to monitor target health.
5. Enable Auto Scaling to adjust the number of targets based on traffic demand.

CHAPTER 3

AWS Cloud Architecting

3.1 Introduction to cloud Architecting:

Cloud architecting is the process of designing and building cloud computing systems that meet specific business requirements. It involves creating a cloud architecture that is scalable, secure, efficient, and cost-effective. A cloud architect is responsible for designing cloud infrastructure and applications, migrating existing systems to the cloud, ensuring cloud security and compliance, optimizing cloud performance and cost, and collaborating with stakeholders to understand business requirements.

This requires understanding cloud computing models, deployment models, service providers, design patterns and principles, security and compliance frameworks, migration strategies, and cost optimization techniques. A well-designed cloud architecture can help organizations increase scalability and flexibility, improve efficiency and reduce costs, enhance security and compliance, and support business growth and innovation.

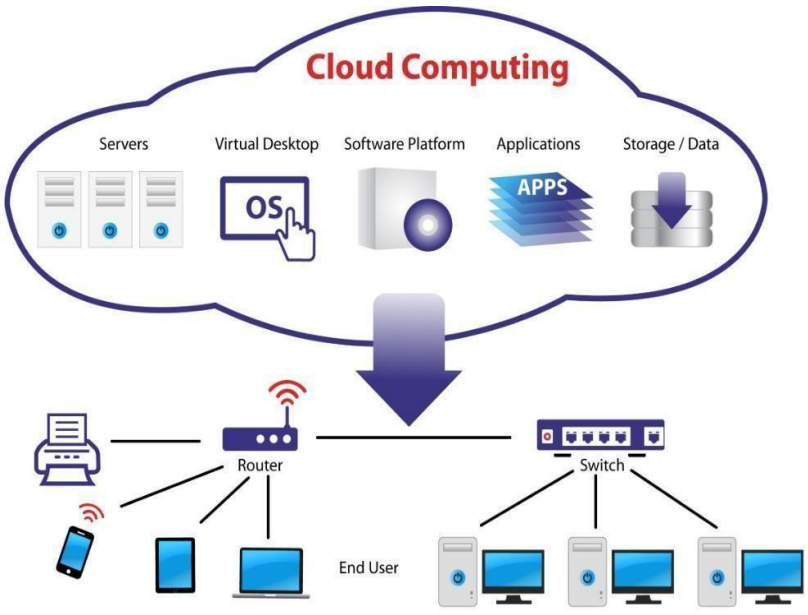

Fig 3.1 Cloud Computing Architecture

3.2 Creating a Networking Environment:

Creating a networking environment in the cloud is a crucial step in setting up a secure and efficient cloud infrastructure. It involves designing a virtual network (VPC) architecture, creating subnets, and configuring routing rules to enable communication between cloud resources and on-premises systems. Additionally, network security groups and access control lists (ACLs) need to be configured to ensure secure access to cloud resources.

By creating a networking environment, organizations can segment their networks for security and compliance purposes, optimize network performance and latency, and support business applications and services. Furthermore, a well-designed networking environment ensures scalability and high availability for network resources, which is essential for supporting growing business demands. By following best practices and using cloud provider tools and services, organizations can create a robust and secure networking environment that meets their business needs.

To ensure high availability and scalability, it's essential to design a networking environment that can adapt to changing business demands. This includes configuring load balancers, autoscaling, and network address translation (NAT) gateways. Load balancers distribute traffic across multiple resources, while autoscaling ensures that resources are added or removed based on demand. NAT gateways provide a highly available and scalable way to access resources in a VPC.

By following best practices and using cloud provider tools and services, organizations can create a robust and secure networking environment that meets their business needs. This includes using cloud provider-managed services such as AWS Direct Connect, Azure ExpressRoute, and Google Cloud Interconnect to establish dedicated network connections between on-premises systems and cloud resources. Additionally, regular monitoring and maintenance of the networking environment are crucial to ensuring continuous security and performance

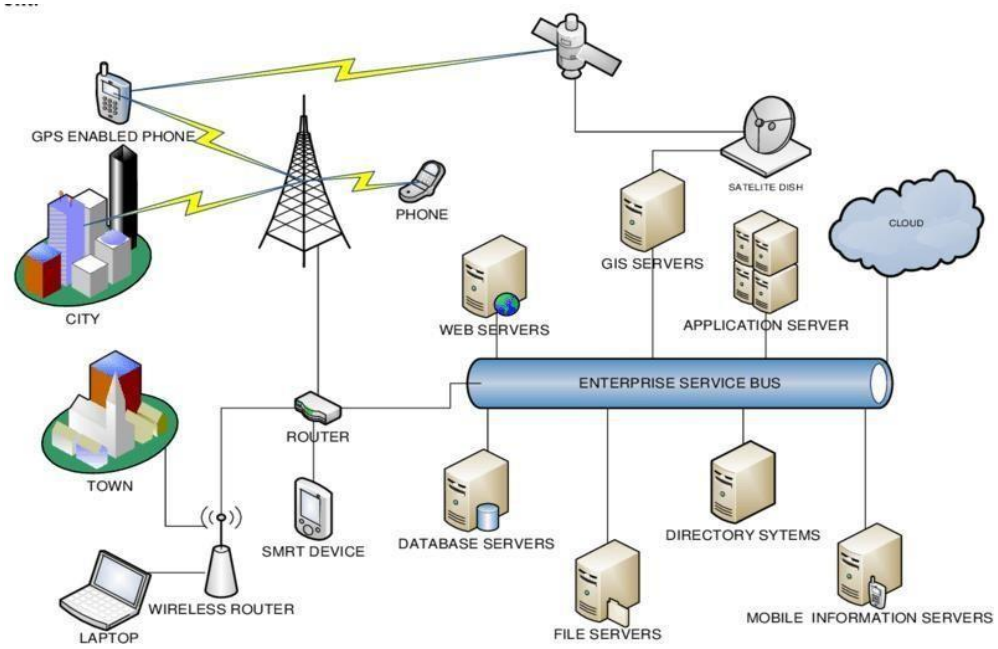

Fig 3.2 Networking Environment

Open System Format on XLoud refers to the ability of XLoud, a cloud-based platform, to support open standards and formats for data exchange and integration. This allows for seamless communication and collaboration between different systems, applications, and services, promoting interoperability and flexibility.

Benefits of Open System Format on XLoud:

- Improved interoperability: Enables integration with various systems and applications, fostering collaboration and data exchange.

- Increased flexibility: Supports multiple formats and standards, allowing users to choose the best approach for their needs.

- Enhanced scalability: Facilitates the addition of new systems and services, promoting growth and expansion.

- Reduced vendor lock-in: Users are not tied to a specific vendor or format, ensuring freedom and choice.

- Simplified data exchange: Streamlines data sharing and exchange, reducing complexity and errors.

- Promotes innovation: Encourages the development of new applications and services, driving innovation and progress.

By adopting open system formats, XLoud demonstrates its commitment to openness, collaboration, and customer freedom, making it an attractive platform for businesses and organizations seeking flexibility and scalability in their cloud infrastructure.

3.3 Implementing Elasticity, High Availability and Monitoring:

3.3.1 : Implementing Elasticity:

Elasticity in cloud computing enables resources to scale up or down in response to changing workloads, ensuring scalability and performance. This is achieved through autoscaling, which automatically adds or removes resources based on demand. Load balancing distributes traffic across multiple resources to ensure no single point of failure, and scalability ensures resources can handle increased workload without performance degradation. By implementing elasticity, organizations can match resource capacity to changing demand, optimize costs, and improve user experience.

3.3.2 Implementing High Availability:

High Availability ensures resources are always accessible and operational, using redundancy to duplicate resources and ensure continuity in case of failure. Failover automatically switches to backup resources in case of failure, and disaster recovery ensures business continuity in case of catastrophic failures. By implementing High Availability, organizations can minimize downtime, reduce data loss, and improve overall system reliability.

3.3.3 Implementing Monitoring:

Monitoring provides real-time visibility into resource performance and health, tracking performance metrics such as resource utilization, response times, and error rates. Log analysis analyzes log data to identify trends and anomalies, and alerting notifies

administrators to potential issues before they become critical.

By implementing Monitoring, organizations can identify and resolve issues quickly, optimize resource utilization, and improve overall system performance.

3.4 Automating Our Architecture:

Automating your architecture involves using various tools and techniques to manage and deploy cloud resources efficiently, consistently, and repeatedly. Infrastructure as Code (IaC) tools, such as AWS CloudFormation, Azure Resource Manager, or Google Cloud Cloud Development Kit (CDK), define and deploy cloud resources using code templates. Configuration management tools like Ansible, Chef, or Puppet manage and configure resources, ensuring consistency and compliance. Automated monitoring detects issues and alerts teams automatically, while automated logging collects and analyzes log data to identify trends and anomalies. Automated security implements security controls and compliance checks to ensure adherence to policies. By automating your architecture, you can improve efficiency, reduce manual errors, and streamline processes. You can also enhance scalability, scaling resources up or down with ease

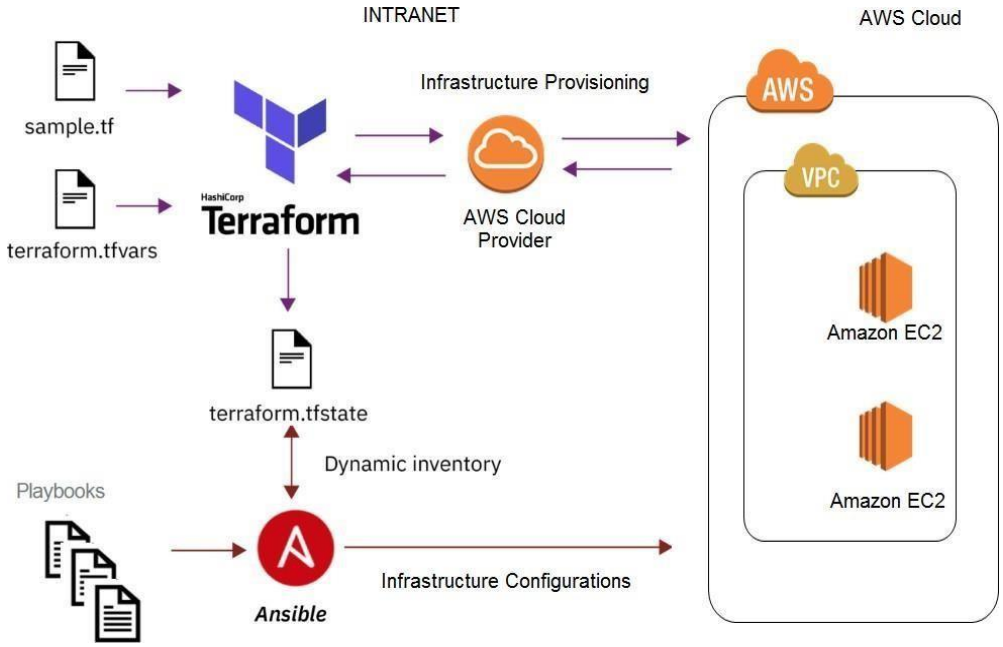

Fig 3.4 Automating the Infrastructure

Process of automating the architecture:

1. Define your infrastructure configuration in a Terraform configuration file.

2. Initialize the Terraform working directory using "terraform init".

3. Plan the Terraform deployment using "terraform plan".

4. Apply the Terraform configuration using "terraform apply".

5. Terraform automatically provisions and configures the cloud resources defined in your configuration file.

Benefits of using Terraform:

- Version control your infrastructure configuration

- Consistent and reproducible deployments

- Automated provisioning and management of cloud resources

- Support for multiple cloud providers (AWS, Azure, GCP, etc.)

-Extensive library of pre-built modules for common infrastructure pattern.

CHAPTER-4

REAL TIME APPLICATIONS OF CLOUD COMPUTING

Cloud computing is the delivery of various services over the internet, including storage, computing power, databases, networking, software, analytics, and intelligence. Instead of owning physical servers or data centers, companies can rent access to anything from applications to storage from a cloud service provider. Cloud computing has become an integral part of many industries, enabling businesses to operate more efficiently, scale rapidly, and innovate faster.

Fig 4.1 Applications of Cloud Computing

1. Healthcare:

Cloud computing has revolutionized the healthcare industry by enabling the storage and management of Electronic Health Records (EHRs) in a centralized and secure environment. Healthcare providers can access patient data, such as medical histories, lab results, and treatment plans, from any location, which enhances patient care and coordination. Additionally, cloud computing supports telemedicine, allowing patients to consult with doctors remotely via video conferencing, which is especially beneficial

in rural or underserved areas.

2. Finance and Banking:

The finance and banking sector relies heavily on cloud computing to provide secure, scalable, and efficient services to customers. Online banking platforms hosted on the cloud allow customers to manage their accounts, transfer money, and access financial products from anywhere in the world. Cloud computing also plays a critical role in fraud detection by leveraging machine learning algorithms that analyze transaction data in real time to identify suspicious activities.

3. Retail and E-commerce:

Retailers and e-commerce businesses utilize cloud computing to host online stores, manage inventory, and process payments efficiently. Cloud-based platforms allow retailers to offer personalized shopping experiences by analyzing customer data, such as browsing history and purchase behavior, to recommend products that align with individual preferences. Additionally, cloud computing supports supply chain management by providing real-time visibility into inventory levels, demand forecasts, and logistics, helping retailers optimize their operations.

4. Entertainment and Media:

The entertainment and media industry has seen a significant transformation with the adoption of cloud computing. Streaming services like Netflix, Spotify, and Amazon Prime Video use cloud infrastructure to deliver high-quality content, such as movies, music, and TV shows, to millions of users worldwide simultaneously. Content Delivery Networks (CDNs), powered by cloud providers, ensure that content is cached and delivered from servers closest to the user's location, reducing latency and enhancing the viewing or listening experience.

5. Education:

Educational institutions are increasingly adopting cloud computing to enhance learning experiences and streamline administrative tasks. Online learning platforms, such as Coursera, Udemy, and Khan Academy, are built on cloud infrastructure, allowing students to access courses, submit assignments, and interact with instructors from anywhere.

6. Image-editing:

There are several applications available today that offer free image editing. These cloud computing services offer a variety of functions, such as graphic user interfaces and image editing, resizing, cropping, and special effects (GUI). Additionally, these programs include customizable brightness and contrast options. Additionally, they offer highly sophisticated functions that are simple to use. Famous examples include Fotor and Adobe Creative Cloud.

7. Antivirus Application:

There are also numerous antivirus programmes accessible for support. These cloud application services guarantee the system's efficient operation. They provide numerous advantages to consumers, including system cleaning, malware detection, and virus removal. This antivirus is free of charge and is considered the best antivirus for your personal computer. By sending the information to the cloud data centre and repairing it, this application's main purpose is to detect malware.

CHAPTER 5

LEARNING OUTCOMES OF INTERNSHIP

1. Gain a deep understanding of cloud computing principles, including its benefits, deployment models (public, private, hybrid), and service models (IaaS, PaaS, SaaS).

2. Understand how to create, configure, and manage AWS resources using the AWS Management Console and AWS CLI.

3. Learn how to design and implement cloud architectures that are scalable, resilient, and cost-effective, following AWS best practices.

4. Understand AWS security features, such as encryption, security groups, and IAM policies, and how to implement them to secure cloud environments.

5. Understand strategies for optimizing cloud spending, such as right-sizing instances, using reserved instances, and implementing auto-scaling.

6. Explore emerging technologies in the cloud space, such as artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), and edge computing, and how they integrate with AWS services.

CHAPTER 6
CONCLUSION

In conclusion, AWS Cloud Computing internship has been an invaluable learning experience, providing me with both theoretical knowledge and practical skills in cloud technologies. Throughout the internship, I gained a deep understanding of cloud computing concepts and the extensive suite of services offered by AWS. By working on real-world projects, I learned to design and deploy scalable, secure, and cost-effective cloud solutions, applying best practices in cloud architecture and security.

I also developed a strong foundation in DevOps practices and automation, enabling me to manage and optimize cloud resources efficiently. The hands-on experience with AWS tools and services, combined with exposure to emerging technologies like AI, machine learning, and IoT, has broadened my technical expertise and prepared me for future roles in cloud computing.

This internship has significantly enhanced my problem-solving, collaboration, and communication skills, which are crucial for success in any technology-driven environment. As I move forward in my career, the knowledge and experience gained during this internship will serve as a solid foundation for pursuing advanced roles in cloud computing and contributing to innovative cloud-based solutions in the industry.

INTERNSHIP CERTIFICATE

REFERENCES

- ✓ **https://aws.amazon.com/certification/certified-solutions-architect-associate/**
- ✓ **https://aws.amazon.com/certification/certified-cloud-practitioner/**
- ✓ **https://aws.amazon.com/training/awsacademy/**