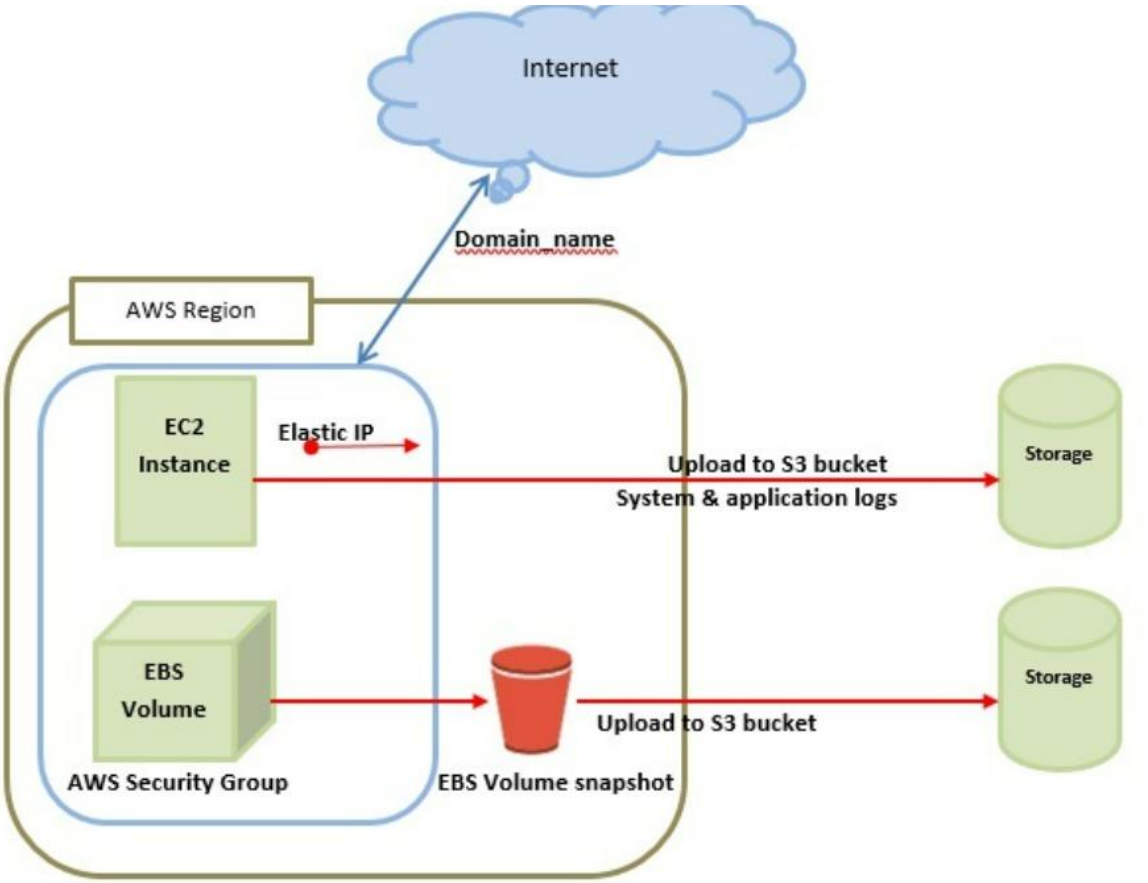
# Amazon Web Services - Basic Architecture

https://www.tutorialspoint.com/amazon_web_services/amazon_web_services_basic_architecture.htm

https://www.tutorialspoint.com/microsoft_azure/microsoft_azure_components.htm

https://www.tutorialspoint.com/microsoft_azure/microsoft_azure_management_portal.htm




**Note** − In the above diagram **S3** stands for Simple Storage Service. It allows the users to store and retrieve various types of data using API calls. It doesn't contain any computing element. We will discuss this topic in detail in AWS products section.

## Load Balancing

**Load balancing** simply means to hardware or software load over web servers, that improver's the efficiency of the server as well as the application. Following is the diagrammatic representation of AWS architecture with load balancing.

Hardware load balancer is a very common network appliance used in traditional web application architectures.

AWS provides the Elastic Load Balancing service, it distributes the traffic to EC2 instances across multiple available sources, and dynamic addition and removal of Amazon EC2 hosts from the load-balancing rotation.

**Elastic Load Balancing** can dynamically grow and shrink the load-balancing capacity to adjust to traffic demands and also support sticky sessions to address more advanced routing needs.

## Amazon Cloud-front

It is responsible for content delivery, i.e. used to deliver website. It may contain dynamic, static, and streaming content using a global network of edge locations. Requests for content at the user's end are automatically routed to the nearest edge location, which improves the performance.

Amazon Cloud-front is optimized to work with other Amazon Web Services, like Amazon S3 and Amazon EC2. It also works fine with any non-AWS origin server and stores the original files in a similar manner.

In Amazon Web Services, there are no contracts or monthly commitments. We pay only for as much or as little content as we deliver through the service.

## Elastic Load Balancer

It is used to spread the traffic to web servers, which improves performance. AWS provides the Elastic Load Balancing service, in which traffic is distributed to EC2 instances over multiple available zones, and dynamic addition and removal of Amazon EC2 hosts from the load-balancing rotation.

Elastic Load Balancing can dynamically grow and shrink the load-balancing capacity as per the traffic conditions.

## Security Management

Amazon’s Elastic Compute Cloud (EC2) provides a feature called security groups, which is similar to an inbound network firewall, in which we have to specify the protocols, ports, and source IP ranges that are allowed to reach your EC2 instances.

Each EC2 instance can be assigned one or more security groups, each of which routes the appropriate traffic to each instance. Security groups can be configured using specific subnets or IP addresses which limits access to EC2 instances.

## Storage

Amazon EBS volumes automatically provide redundancy within the availability zone, which increases the availability of simple disks. Further if the volume is not sufficient for our databases needs, volume can be added to increase the performance for our database.

Using Amazon RDS, the service provider manages the storage and we only focus on managing the data.

## Storage & Backups

AWS cloud provides various options for storing, accessing, and backing up web application data and assets. The Amazon S3 (Simple Storage Service) provides a

simple web-services interface that can be used to store and retrieve any amount of data, at any time, from anywhere on the web.

Amazon S3 stores data as objects within resources called **buckets**. The user can store as many objects as per requirement within the bucket, and can read, write and delete objects from the bucket.

Amazon EBS is effective for data that needs to be accessed as block storage and requires persistence beyond the life of the running instance, such as database partitions and application logs.

Amazon EBS volumes can be maximized up to 1 TB, and these volumes can be striped for larger volumes and increased performance. Provisioned IOPS volumes are designed to meet the needs of database workloads that are sensitive to storage performance and consistency.

Amazon EBS currently supports up to 1,000 IOPS per volume. We can stripe multiple volumes together to deliver thousands of IOPS per instance to an application.

### Auto Scaling

The difference between AWS cloud architecture and the traditional hosting model is that AWS can dynamically scale the web application fleet on demand to handle changes in traffic.

In the traditional hosting model, traffic forecasting models are generally used to provision hosts ahead of projected traffic. In AWS, instances can be provisioned on the fly according to a set of triggers for scaling the fleet out and back in. Amazon Auto Scaling can create capacity groups of servers that can grow or shrink on demand.

# What Is Microsoft Azure Architecture?

Azure IAAS architecture for beginners and developers - Part 1
https://www.youtube.com/watch?v=GUpIakLNy_s

https://www.simplilearn.com/azure-architecture-explained-article#:~:text=Microsoft%20Azure%20architecture%20runs%20on,what%20makes%20Azure%20so%20powerful.

https://www.jigsawacademy.com/blogs/cloud-computing/azure-architecture/

https://docs.microsoft.com/en-us/azure/architecture/reference-architectures/app-service-web-app/basic-web-app?tabs=cli

Like other cloud platforms, Microsoft Azure depends on a technology called virtualization, which is the emulation of computer hardware in software. This is made possible by the fact that most computer hardware works by following a set of instructions encoded directly into the silicon. By mapping software instructions to emulate hardware instructions, virtualized hardware can use software to function like “real” hardware.

Cloud providers maintain multiple data centers, each one having hundreds (if not thousands) of physical servers that execute virtualized hardware for customers. Microsoft Azure architecture runs on a massive collection of servers and networking hardware, which, in turn, hosts a complex collection of applications that control the operation and configuration of the software and virtualized hardware on these servers.

This complex orchestration is what makes Azure so powerful. It ensures that users no longer have to spend their time maintaining and upgrading computer hardware as Azure takes care of it all behind the scenes.

## 3) COMPONENTS

- **Compute**

  It presents computing operations like deployment, development, and app hosting in Azure Architecture stages. It has the following components as under:

1. **Virtual Machine:** Allows deploying workload, and languages in each operating system.
2. **Virtual Machine Scale Sets:** Allows employing thousands of identical apparent machines in seconds.

- **Storage**

  Azure Architecture store is a cloud storage determination for neoteric modern machines. It is planning to call the requirement of their customer order for scalability. It ratifies to process, and store 100 terabytes of information.

- **Database**

  This class offer Database as a Service that offers NoSQL and SQL tasks. It also offers databases like Azure Database for PostgreSQL and Azure Cosmos DB.

- **Content Delivery Network**

Content Delivery Network collects fixed web content about the strategy of a placed venue. This assists to furnish speed for hand over the content to people.

- **Security Identify Services**
  Security Identify Services furnishes intuitive capability to respond and identify cloud security as intimidation. It also furnishes to administer sensitive assets and encryption keys.

- **Enterprise Integration Services:**

1. **Service Bus:** Service Bus is a data distribution service which erects on the third person communication arrangement.
2. **SQL Server Stretch Database:** This service assists to move any transparently and cold data securely to the Azure Architecture cloud computing system.

- **Monitoring and Management Services:**
  These services incorporate straightforward administration of Azure Architecture formation.

1. **Azure Resource Manager:** It makes it straightforward to visualize and manage the pecuniary resource in the application.
2. **Automation:** Azure Architecture automation is a path to constantly repeated tasks, automate the manual, error-free, and long-running. The mission is generally performed in an enterprise environment and cloud system.