SAN Seminar

Cloud Computing

- Instead of buying, owning, and maintaining physical data centers and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS), Google Cloud, Azure Cloud, etc.
- It lets you ‘plug into' infrastructure via the internet, and use computing resources without installing and maintaining them on-premises.

Cloud Storage Architecture

The organizations buy the storage capacity from the providers to store user, organization, or application data. In the past few years, cloud storage has grown in popularity and has become a direct challenger to local storage, mainly due to the benefits it provides:

- **Security:** The backups are located across multiple servers and are better protected from data loss or hacking.
- **Accessibility:** The data stored is accessible online regardless of location.

There are two major providers in the field of cloud storage namely:

- Amazon Web Services
- Google Cloud

AWS

Amazon was frustrated with the speed of its software engineering like maximization of autonomy for engineering teams, adoption of REST, standardization of infrastructure, security, continuous deployments. Amazon was spending 70% of its engineering power on IT and infrastructure problems and less time on customer-facing innovation. In 2003, during an executive retreat at Jeff Bezos’ house, the Amazon leadership team was asked to identify the core strengths of the company. One thing became abundantly clear: Its infrastructures services gave them a huge

advantage over their competition. And thus on March 19, 2006, AWS was publically launched with services like Simple Storage Service (S3) and Elastic Compute Cloud (EC2), with Simple Queue Service (SQS) in its initial stage.

EC2

- It provides virtual computing environments, known as instances.
- Preconfigured templates for your instances, known as Amazon Machine Images (AMIs), that packages the bits you need for your server (including the operating system and additional software).
- Various configurations of CPU, memory, storage, and networking capacity for your instances, known as instance types.
- Storage volumes for temporary data that are deleted when you stop, hibernate, or terminate your instance, known as instance store volumes.

S3

- Customers of all sizes and industries can use Amazon S3 to store and protect any amount of data for a range of use cases, such as data lakes, websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics.
- Amazon S3 provides management features so that you can optimize, organize, and configure access to your data to meet your specific business, organizational, and compliance requirements. Ex: S3 removes all objects within the bucket when a specified date or time period in the object’s lifetime is reached.

> 💡 Lifecycle Management is a set of actions performed automatically on a trigger event.

Amazon DynamoDB

- DynamoDB lets you offload the administrative burdens of operating and scaling a distributed database so that you don't have to worry about hardware provisioning, setup and configuration, replication, software patching, or cluster scaling.

- DynamoDB also offers encryption at rest, which eliminates the operational burden and complexity involved in protecting sensitive data.

Benefits

- **Easy to administer:** Amazon RDS makes it easy to go from project conception to deployment. No need for infrastructure provisioning, and no need for installing and maintaining database software.
- **Highly scalable:** You can scale your database's compute and storage resources with only a few mouse clicks or an API call, often with no downtime. Many Amazon RDS engine types allow you to launch one or more Read Replicas to offload read traffic from your primary database instance.
- **Inexpensive:** You pay very low rates and only for the resources you actually consume. In addition, you benefit from the option of On-Demand pricing with no up-front or long-term commitments or even lower hourly rates via our Reserved Instance pricing.
- **Secure:** Amazon RDS makes it easy to control network access to your database. Amazon RDS also lets you run your database instances in Amazon Virtual Private Cloud (Amazon VPC), which enables you to isolate your database instances and to connect to your existing IT infrastructure through an industry-standard encrypted IPsec VPN. Many Amazon RDS engine types offer encryption at rest and encryption in transit.