Databases on AWS

→ Elasti Cache is used to retrive the data very quickly by storing the most frequently used data in Cache.

1) Mem Cached
2) Redis.

→ Most Common queries are stored in EC.

→ RDP - OLTP

1) SQL
2) MySQL
3) PostGRESQL
4) Oracle
5) Aurora
6) MariaDB

→ DynamoDB - NoSQL

→ Redshift - OLAP of amazon, used for data warehousing in the cloud.

→ DB is never given an Public IP address it has only domain name.

→ Both Security groups of Ec2 and MySQL DB needs to be Same Security group.

→ Two types of Backups

Automated - allow to recover your DB to any point in time within a retention Period
- These are defaultly enabled.
→ Free space in S3 equal to size of DB

Snapshots - These are done Manually
- Stored even after you delete the original RDS instance

→ When backup is restored a Completely new Domain is Created.

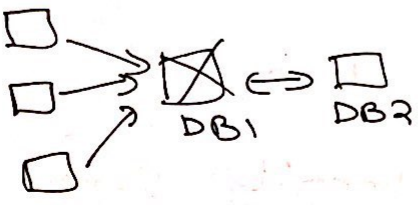
→ Encryption is done by (KMS) Service.

→ Existed DB Cant be encrypted.

→ 7 days - 35 days retention Period.

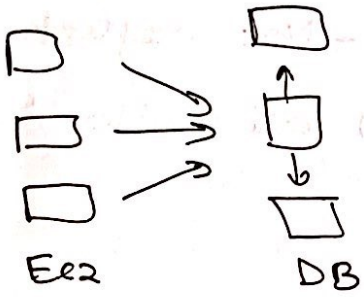
→ DB → Snapshot DB → Copy of Snapshot → Can be Encrypted

→ Multi AZ :



→ Multi AZ's are for Disaster recover only not for improving Performance.

→ Read Replica



5 Read Replicas

→ Read only copy of our application. This is asynchronous where as Multi AZ is Synchron

→ Not available for SQL & oracle.

→ used for Scaling.

→ You can have read replicas that have multi AZ.

→ They can be Promoted to become own DB

→ Read replica can be in a second region.

Dynamo DB

→ SSD Storage

Spread across 3 Data Centeries

Eventual Consistent Reads - 1 sec

Strongly Consistent Reads - Not reflected untill all writes successful

→ Write Throughput - 10 units

Read Throughput - 50 units

Storage Costs $0.25 Gb Per month

→ Expensive for writes, less for reads.

→ Reserved Capacity is Present.

→ Scaling is very easy and on the fly.

→ RDS has downtime when Scaling whereas DynamoDB doesnot have any.

Redshift

⇒ Fast, Powerful, managed data warehouse service in the cloud.

→ 1) Single Node (160 G)

2) Multi Node

⇒ Leader Node

→ Compute Node (upto 128 Compute Nodes)

→ Columnar Data Storage is storing data as a series of rows organized by data by Columns,

⇒ Advanced Compression because Column data can be Compressed in a better view.

⇒ Doesnot require indexes, materialized views and uses less space than traditional RDS.

⇒ Massive Parallel Processing, distributes load on all the Nodes.

→ Price : Compute Node

Backup

Data Transfer

→ Encrypted in Transit by SSL
Rest by AES-256

→ Takes care of Key Management (KMS)

→ Currently only available in 1 AZ.

→ restore Snapshots to new AZ in the event of an outage.

→ Store data sequentially on the disk.

→ Elastic Cache → 1) Mem Cached
↓
A widely adopted memory object Caching System
2) Redis
↓
In memory Key-Value Store
Multi AZ redundancy is achieved.

→ Elastic Cache is good choice if it is read heavy and not prone to frequent changes

→ Redshift for OLAP & Warehousing.

Aurora

→ Relational DB which is speed and more available. 5 times better than MySql.

→ Cheaper then oracle.

→ Start with 10 GB to 64TB
each Scale 10TB

Compute to 32vCPU's and 244GB of Memory.

→ 2 Copies of data at 3 AZ ie 6 Copies

→ handles loss of 2 copies of data by write
3 copies of data by Read.

→ It is self healing. repairs automatically

→ Replicas
- Aurora Replica (15)
- MySql Read Replica (5)

failover is automatically updated to Aurora but not in MySql replica.