Managed Services in AWS

1. App Firewall - AWS WAF (Web App Firewall)
2. Database Services - AWS RDS (Relational Database Services)
3. Cache Management- AWS Elasticache
4. Messaging, Queue & Notification Services - SQS, SNS
5. Serverless Interactive Query Service - Amazon Athena

Any 3rd party which manages the activities backrooted for providing the services for a business which you are handling is called managed services.

- No upfront costs
- No maintenance and upgrade cost
- Other business related benefits(managing the stability of this service.No separate manpower is required)
- Change in business entities(models) can be handled easily
- Improved decision making
- Improved Data Communication speed
- Improved coordination
- Avoid Delays
- Prevent Costly Exception Management
- Improve Customer Satisfaction

Characteristics of managed services:

- Ability to scale
- High Availability
- Redundancy
- Security

RDS - Relational Database Services

Providing a managed SQL services(servers)
RDBMS needs vertical scaling.
Enabling the Multi-AZ option creates a secondary DB in other AZs that RDS uses to fail over automatically in case of failure on the primary instance. This instance cannot be used or accessed until the primary is active.
If deleting the primary the secondary goes down with it.
Read replicas can only be used for reading (No write is permitted).
There are options to change a Read replica into a primary DB after changing we can use it to write and read.
The monthly cost approx is visible while launching the DB
We provide the Instance Database name, Master Username and Password.
Can be launched on Private VPCs or public VPCs.

We can select the AZ on which the DB is created and launched.
Backup configuration is done with a min to max retention period - a maintenance period needs to be specified to take the back
Monitoring, Logs and separate maintenance window can be provided for all the upgrade activities can be configured

Once we launch the Database:
All the details of the configuration is available in the RDS console with Hostname using which we can connect to this DB.

High availability across regions with RDS:
Read replica can be set up in a different region. For the primary DB
It is asynchronous.
If the primary is failed/deleted, then the secondary takes over. The read replica now syncs up with the secondary which is now promoted as the primary.
The 'Replication role' points out to the DB on which the replication is in progress. For master it points to replica/ for replica it points to master.
If the entire region database is gone(including primary and secondary, then a impact will be faced. Also the DNS(Endpoint) of the new region needs to be configured in the application for the change to take effect.

The **Endpoint** is the name /hostname of the DB that is created

Elasticache

The layer between the DB and the application server.
Step 1 check if the data is present in the cache or not.
Step 2 If data is there, serve it to the user. (if data is not present in the cache -> go to step 3)
Step 3 Check for the data from the DB.
Step 4 serves it to the user.

Cache helps reduce 2 steps in between and also the load that is handled by the DB.

2 type of Cache - Redis and Memcache

Number of replicas and multi AZs can be configured for elasticache

Simple Notification Service

Push based notification

Can be delivered to various endpoints:
http(s)
Lambda
email
Mobile Devices
SMS(text)
SQS

Cloud watch Alarm to SNS is possible and often used
SNS, SQS and MQ
SNS -> Subscriber subscribe for the service and notifications are pushed to them
SQS - >End point needs to ask for data - queue service
Amazon MQ - used thru APIs

Does FIFO - First in First out, compromises on the throughput but deliver all the messages with high reliability.
Does deduplication - send a message once which is mistakenly sent more than once within a given period of time.
Messages can be grouped together and sequence is maintained.
Pattern for message delivery retry can be selected.
Policy restrictions can be used

Simple Queue Service

Pull based queue
SQS needs to hold the data.
send messages to multiple points
Lifetime of a message
FIFO(300msgs per second) or Standard(unlimited)
Limited size of a message

Dead letter queue - Exception path- the messages which are not getting used by the consumers. This can be created as a separate queue and added as a dead letter queue from/for another master/happy queue.

Athena

Managed Querying service
Data need not be present in a database format or separate EC2 or RDS.

Data can be present on S3 as CSV, tab separated, custom delimiters, ORC, Parquetand JSON file (any kind of log files) and the data can be queried directly from Athena.
Map the file from S3 in Athena, define the table structure in Athena
Partition - If the file size is too large and you want to query only a certain filtered portion of the data, then you can filter it while adding into Athena and query on them. This is used to save cost as Athena is billed for the amount of data it scans .
History tab shows the scanned data in MB/GBs , all the queries ran on the database

AWS Glue

Managed ETL tool - Extract Transform Load
Manages the metadata of the data and table and databases we used in Athena.
We can edit, delete and manage the tables in Athena from here.

Quicksight

A data source can be added from many sources like - S3, Athena, Jira, Salesforce, Github etc.
While in case of Athena, we were able to write SQL queries and get the result, here we can drag and drop the column and values to create graphs, charts, numerics of data etc. to visualize the data.
Enables us to directly use a tool like Tableau, Spotfire, SAP Business Objects but only meant for a data analysis and preparation of a presentation.
Also has capabilities to be used as a dashboard of the metric that you configure to be visible in presentable format.