MASTERING SNOWFLAKE

Advanced level course

Course Outline

Introduction to Cloud data warehouse & Snowflake

Getting started with Snowflake

Virtual Warehouse

Loading data to Snowflake

Unloading Data from Snowflake

Course Outline

Time Travel, Failsafe & Zero Copy Clones

Data Sharing in Snowflake

Snowflake Access Management

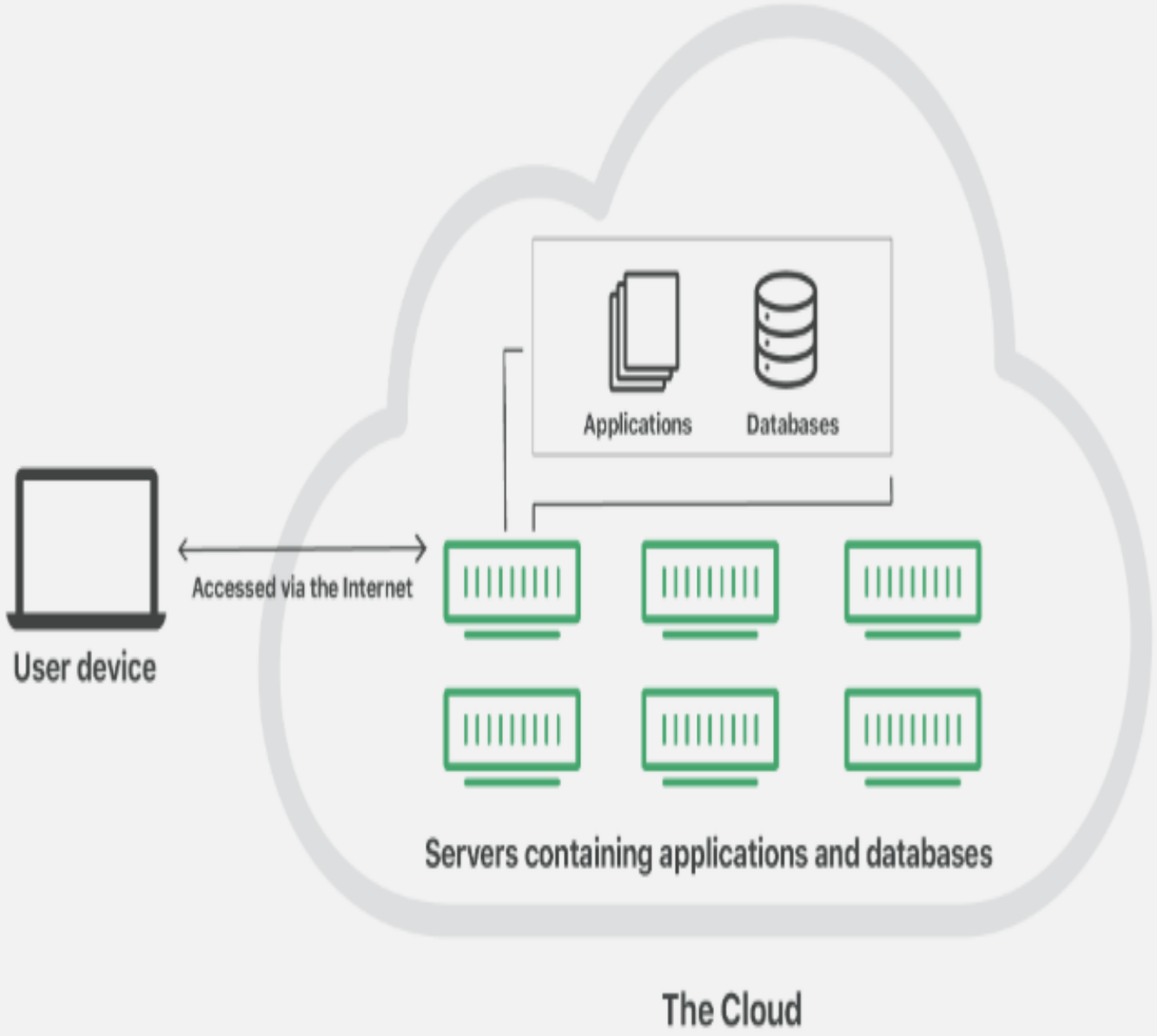
Snowflake SQL

Hands ON Demo on Project

INTRODUCTION TO CLOUD DATA WAREHOUSE & SNOWFLAKE

- Understanding Cloud data warehouse
- About Snowflake
- Architecture : Data Storage , Processing and cloud services
- Supported cloud platforms

Understanding Cloud Data warehouse

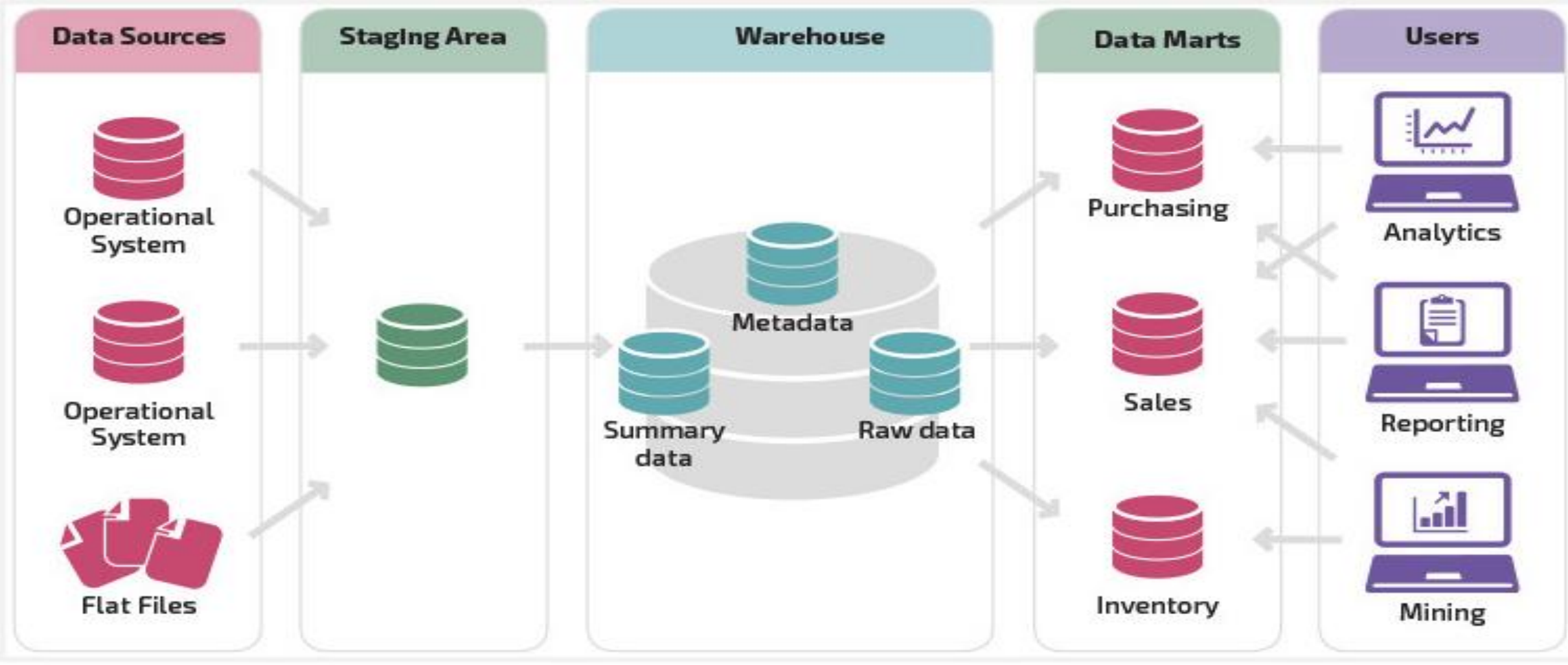


What is cloud ?

"The cloud" refers to servers that are accessed over the Internet, and the software and databases that run on those servers

Traditional data warehouse

A data warehouse is a system that gathers data from a wide range of sources within a company and uses the data to support management decision-making



Cloud Data warehouse

Database delivered in a public cloud as a managed service that is optimized for analytics, scale and ease of use

According to the 2019 Analytical Data Infrastructure Market Study, cloud deployment is currently the highest priority for companies (more than 50% of respondents indicated it as either critical or very important)

FEATURE	CLOUD DATA WAREHOUSES	ON-PREMISES DATA WAREHOUSES
Scalability	Cloud DWHs can be instantly scaled up or down according to business needs.	Scalability is possible, yet it's time- and resource-consuming, as this task requires from hours of reconfiguring the hardware, software, and infrastructure to even months if a company has to purchase more hardware.
Availability	Depends on the service level specified by a cloud provider. For example, Amazon, Microsoft, and Google guarantee 99.9% - 99.99% uptime.	Depends on the quality of available hardware, software, and the competence of an in-house IT team.
Security	A cloud provider ensures that the infrastructure is secure, and the data entrusted to them is protected.	Depends on the competence of an in-house IT team.
Performance	• Well-suited for serving multiple geographic locations. • Perfect for query performance measured in seconds. • Unsuitable for query performance measured in milliseconds.	Shows excellent query performance (including the one measured in milliseconds) but only in case the scalability challenge is resolved.
Cost-effectiveness	• No significant initial investments are required (as there's no need to buy hardware, build and manage an IT team, pay for maintenance and support). Still, there will be fees for the development of a cloud DWH and migration, if any. • Potential to pay only for the storage and computing resources actually used.	The solution requires significant initial investments (hardware, team, training).

About Snowflake

Snowflake Inc. is a cloud-based data-warehousing startup that was founded in 2012.

Based in San Mateo, California

Snowflake offers a cloud-based data storage and analytics service, generally termed "data warehouse-as-a-service"

Runs on Amazon S3 since 2014

On Microsoft Azure since 2018

Rolled out on Google Cloud Platform in 2019

SNOWFLAKE RECOGNIZED AS A LEADER BY GARTNER: THIRD CONSECUTIVE YEAR POSITIONED IN THE MAGIC QUADRANT REPORT

What makes Snowflake unique ?

Break free from the past

We designed and implemented a new, unique architecture to stay clear from the limitations of existing architecture and software offerings.

Design for the cloud

On-premise solutions are too complex, too expensive and getting more so each day. We developed Snowflake as a service from the ground up for the cloud, capitalizing on the leading architecture and technology of the public cloud.

Support modern data and applications

People want to focus on deriving insight from data – not configuring, tuning, and managing a data platform. Rather than just deliver traditional software hosted in the cloud, we deliver a data platform as a service.

Snowflake Architecture: Data Storage Processing & Cloud services

Snowflake Architecture

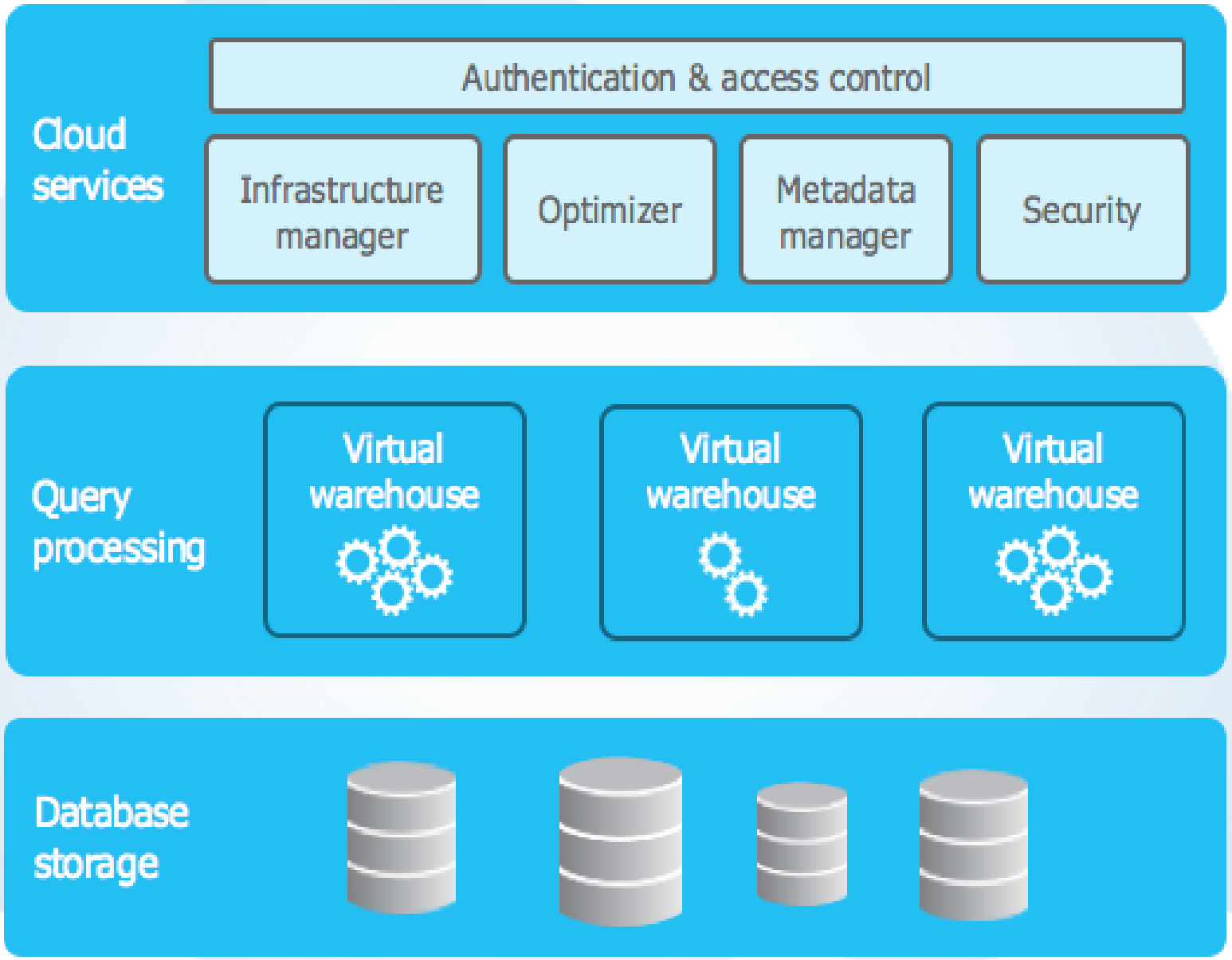
Hybrid of

- **Shared-disk database architectures**

Snowflake uses a central data repository for persisted data that is accessible from all compute nodes in the data warehouse

- **Shared-nothing database architectures**

Snowflake processes queries using MPP (massively parallel processing) compute clusters where each node in the cluster stores a portion of the entire data set locally



Cloud Services

The cloud services layer is a collection of services that coordinate activities across Snowflake

Query Processing

Query execution is performed in the processing layer. Snowflake processes queries using "virtual warehouses"

Database Storage

When data is loaded into Snowflake, Snowflake reorganizes that data into its internal optimized, compressed, columnar format. Snowflake stores this optimized data in cloud storage

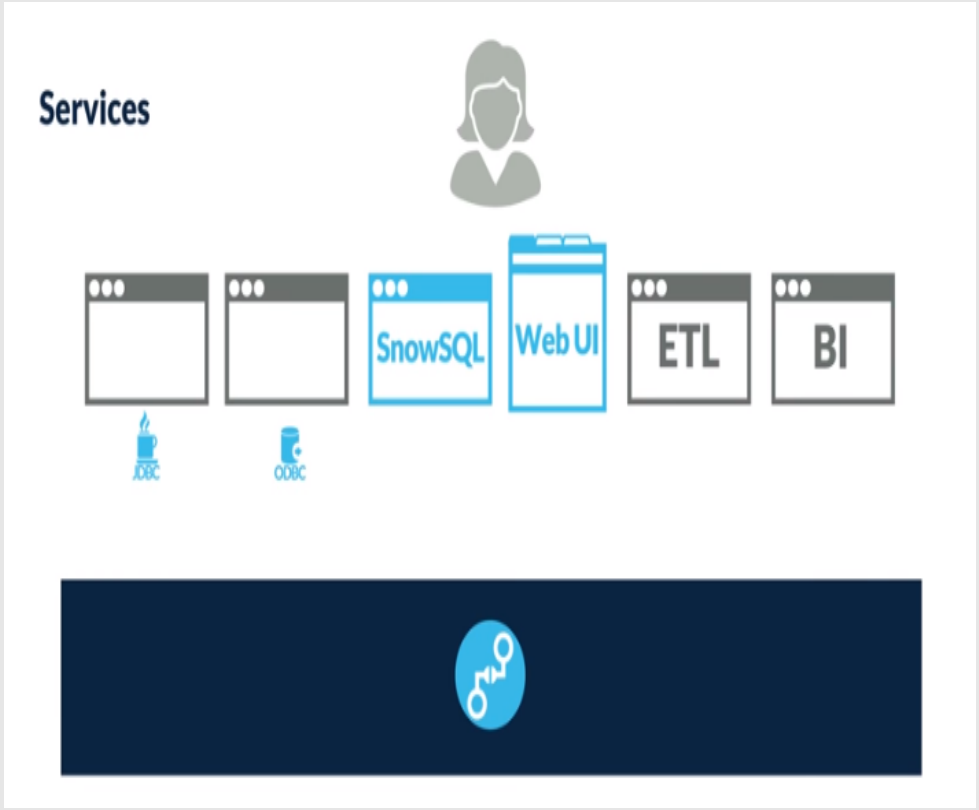
Storage

- Structured Relational data store in Datatypes:
  - Varchar
  - Number
  - Boolean
  - Timestamp etc.
- Semi Structured Data (Avro, JSON, Parquet) stored in
  - Variant

Compute

Services

- Authentication
- Infrastructure management
- Metadata management
- Query parsing and optimization
- Access control



Supported cloud platforms

Amazon Web Services (AWS)

Google Cloud Platform (GCP)

Microsoft Azure (Azure)

QUIZ

Data Storage is independent of compute

- True
- False

Answer : True

DataBase Storage Layer manages

a. VWH
b. Metadata
c. Query Processing
d. MPP

Answer : Metadata

NoSQL is example of

a. Share Disk Architecture
b. Share Nothing Architecture

Answer : Share Nothing Architecture

Which of the following is true about SF Architecture

a. It is Share Disk Architecture
b. It is Share Nothing Architecture
c. Uses VWH for MPP
d. All of the above

Answer : all of the above

Recap

Cloud Database : Database delivered in a public cloud as a managed service that is optimized for analytics, scale and ease of use

Snowflake Inc. is a **cloud-based data-warehousing** startup that was founded in 2012.

Snowflake recognized as a leader by **Gartner**

Snowflake Uniqueness :
Break from Past
Designed for cloud
Support Modern Data and Applications

Snowflake Architecture:
Hybrid of Shared disk database architecture and Shared nothing database architecture
3 Layers: Database Storage, Query Processing, Cloud Services