

# What is Snowflake?

INTRODUCTION TO SNOWFLAKE

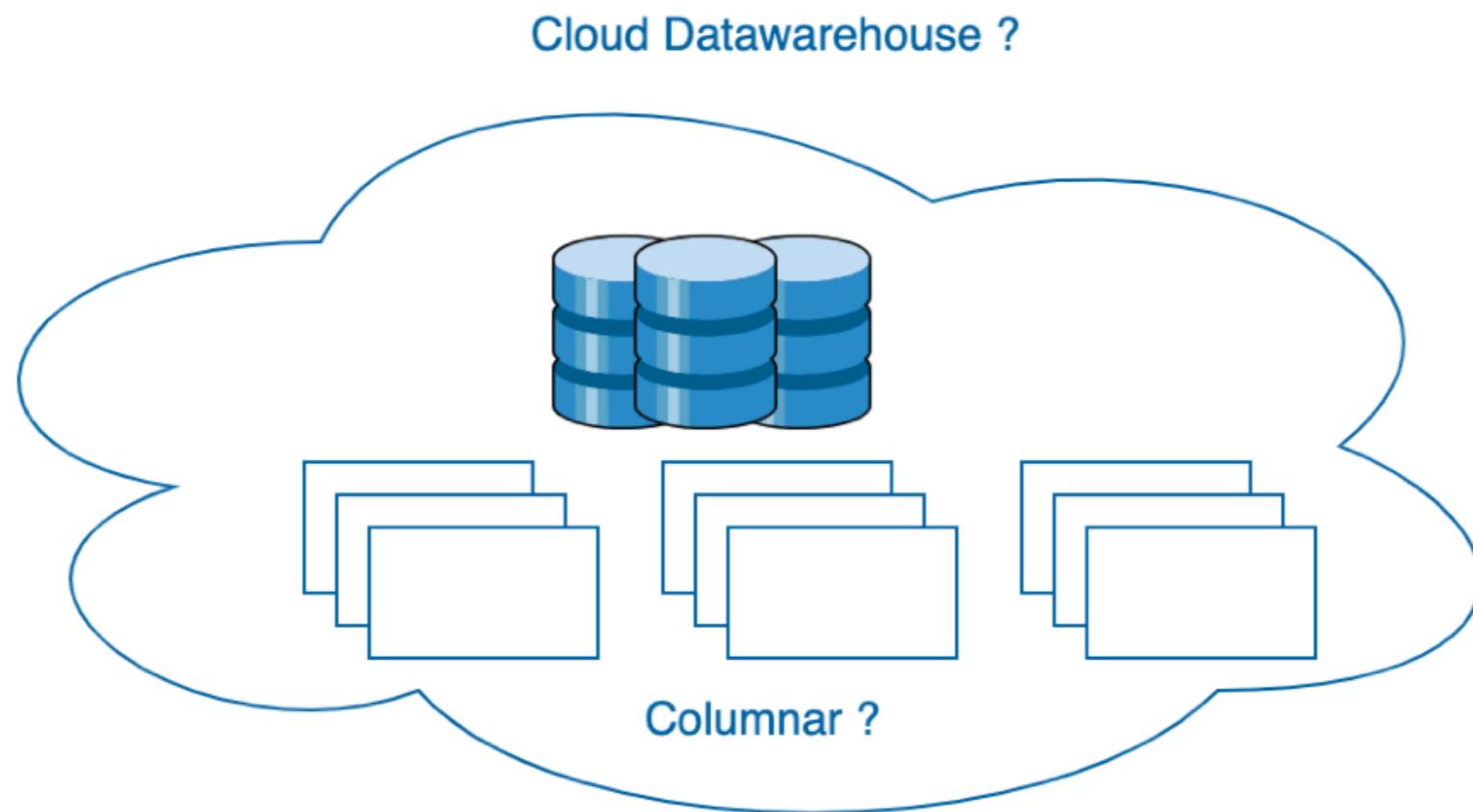


Palak Raina

Senior Data Engineer

# What is Snowflake?

- Cloud data warehouse solution
- Columnar data storage



# Cloud data warehouse

Traditional data warehouse



Cloud data warehouse



# Advantages of Cloud data warehouses

Scalability 

Accessibility 

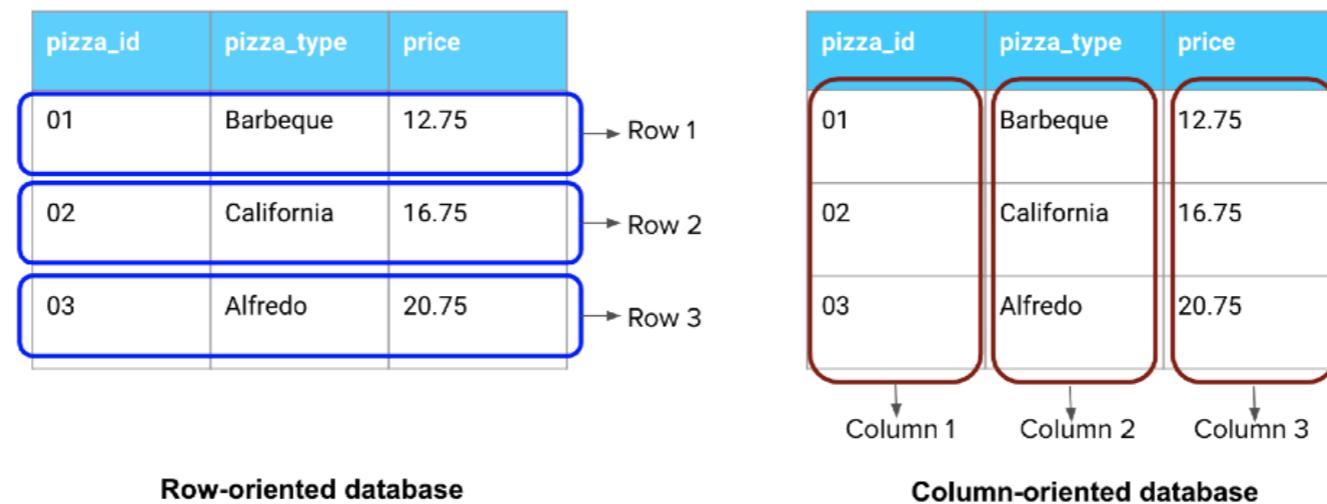
Cost-efficiency 

Lower management effort 

# Row vs. Columnar database

pizza_id	pizza_type	price
01	Barbeque	12.75
02	California	16.75
03	Alfredo	20.75

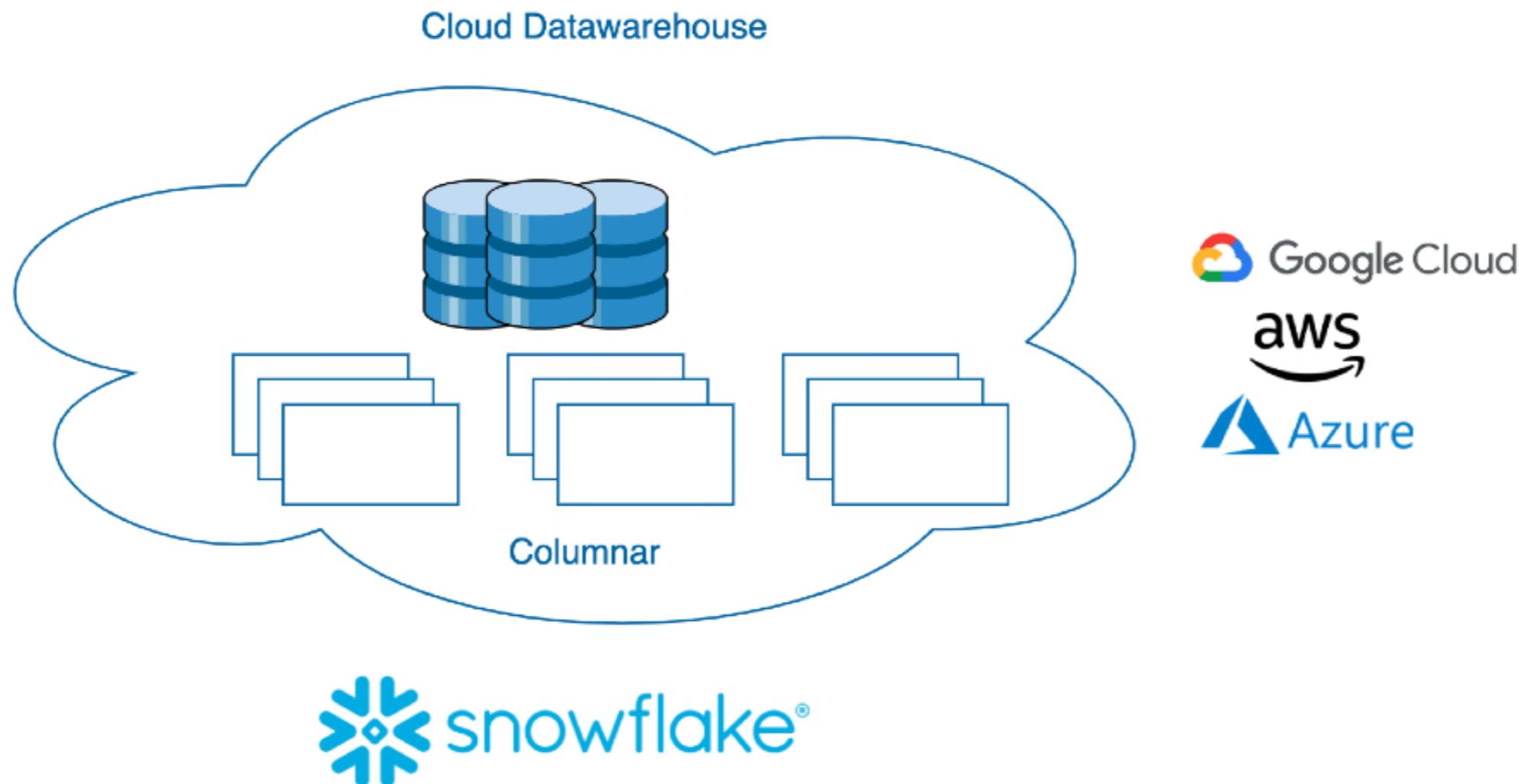
Example: Pizza details table



# Row vs. Columnar database

Category	Row	Columnar
Data Organization	By Rows	By Columns
Data Retrieval	Complete records	Relevant columns
Operations	Transactional	Analytical
Example	Postgres, MySQL, Oracle, Microsoft SQL Server	Snowflake, Amazon Redshift, Google BigQuery, Vertica

# Snowflake



# Snowflake use cases

 Business Intelligence

 Data Science

 Data Ingestion

 Data warehousing

 Data Sharing

# **Let's practice!**

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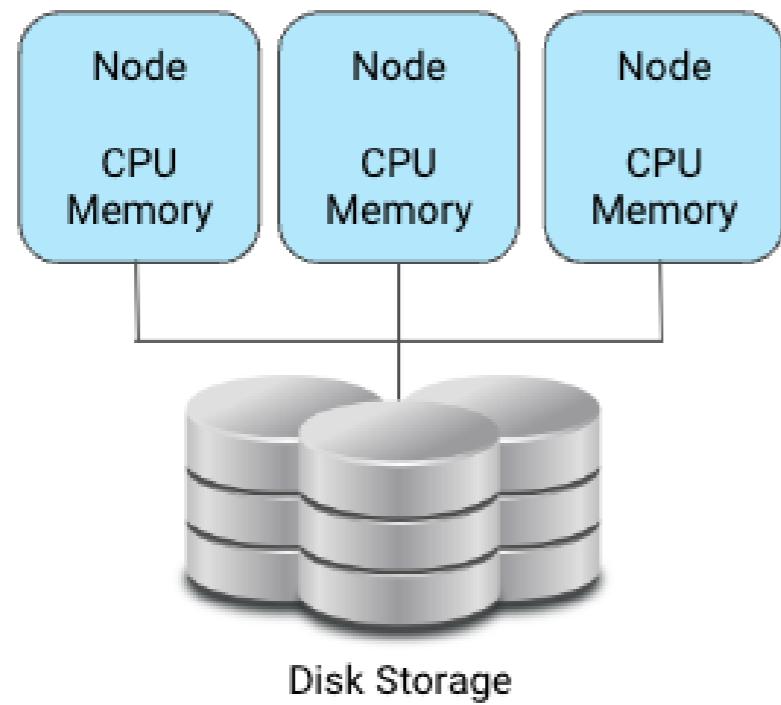
# Snowflake Architecture

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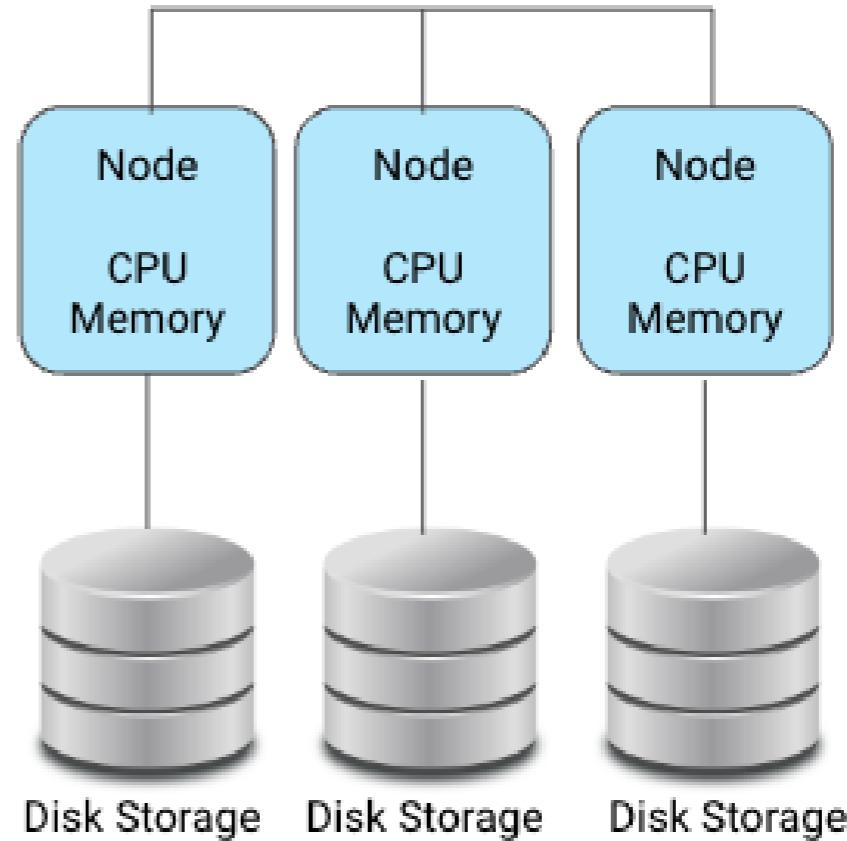


Palak Raina  
Senior Data Engineer

# Shared-Disk and Shared-Nothing Architecture



Shared-Disk Architecture



Shared-Nothing Architecture

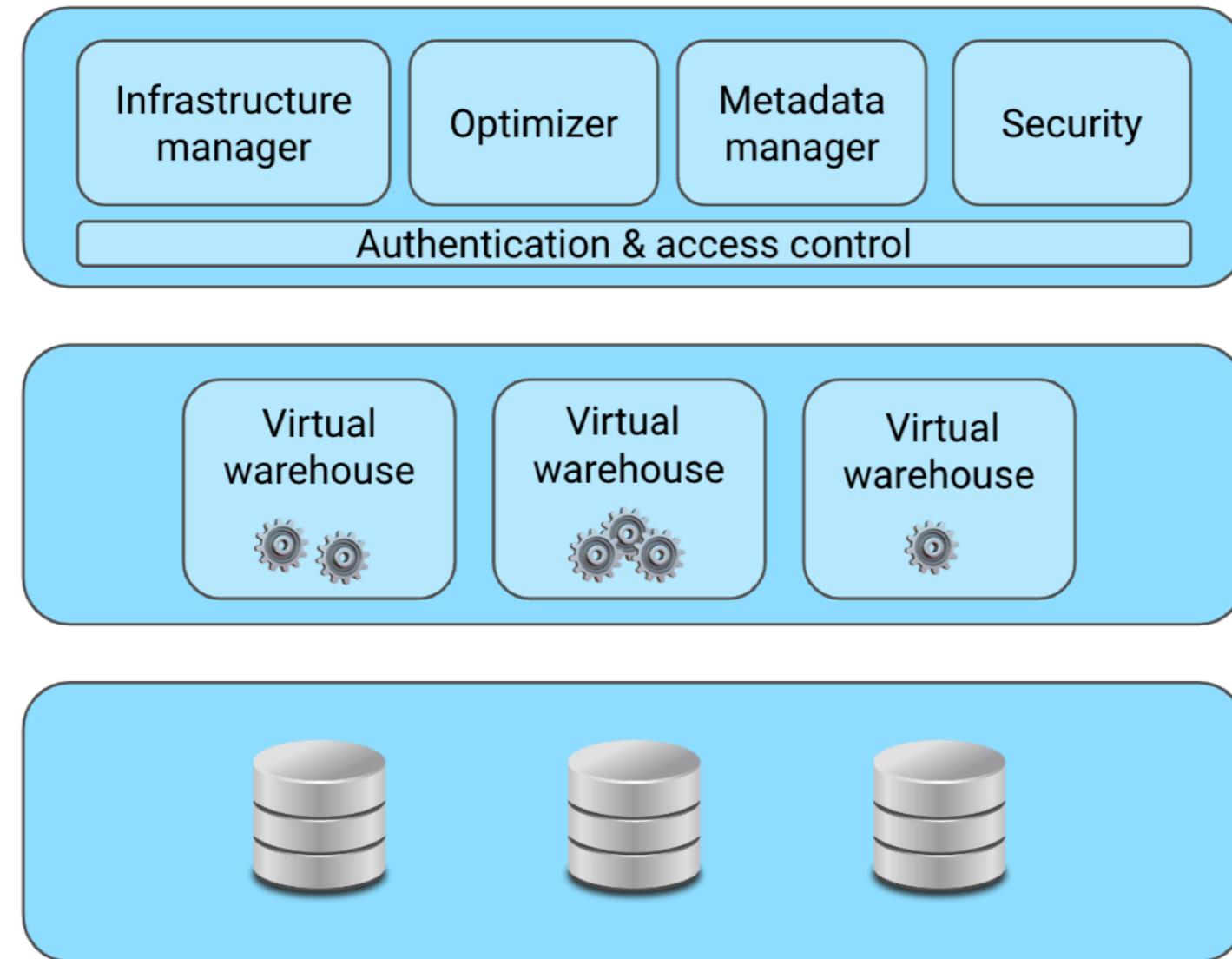
# Decoupling Storage & Compute

- Efficient data storage.
- Independent data processing.
- Components operate without interdependence.

## Benefits

- Enhanced scalability.
- Faster data processing and response.
- Cost-effective operations.

# Snowflake Architecture



Cloud Services Layer



Compute Layer/  
Query Processing Layer

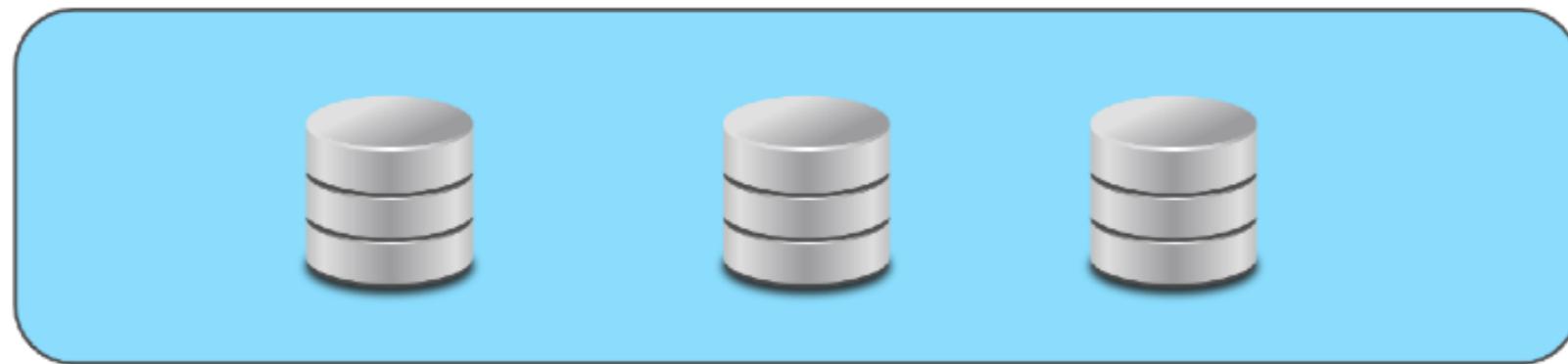


Storage Layer



# Storage Layer

- Columnar storage
  - Efficient data retrieval
  - Analysis
- Optimized
- Compressed
- Tables, schemas, databases

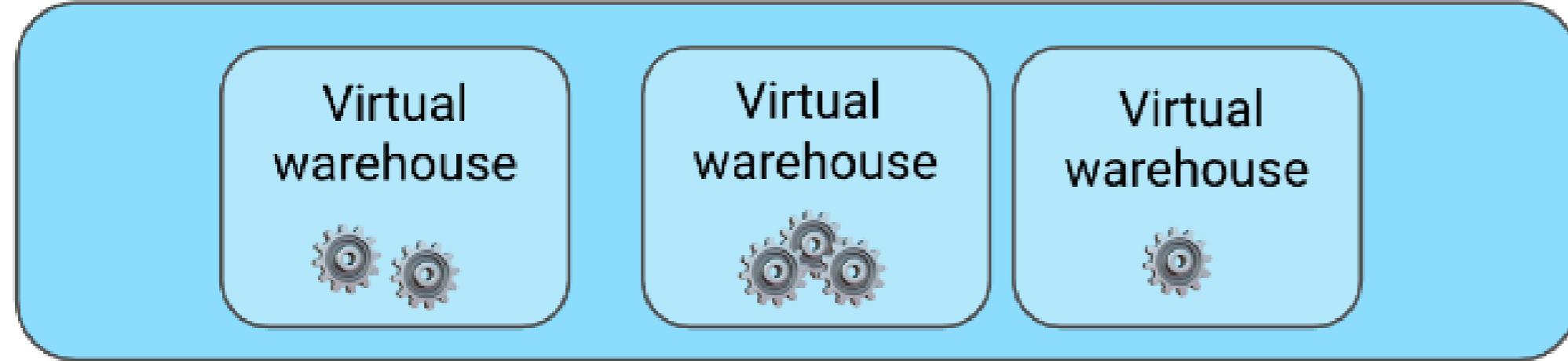


Storage Layer



# Compute Layer

- Query execution
- Virtual warehouses



Compute Layer/  
Query Processing Layer

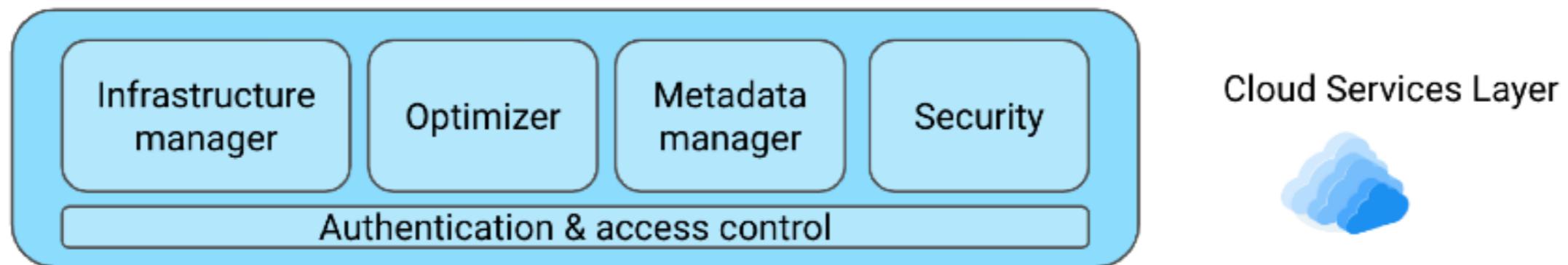


# Compute Layer - virtual warehouse

- Scalability
- Performance
- Cost-effectiveness
- Different sizes: XS, S, M, L, XL

# Cloud Services Layer

- Infrastructure management
- Query Optimization
- Authentication
- Access control
- Security



# **Let's practice!**

## **INTRODUCTION TO SNOWFLAKE**

# Snowflake Competitors and why use Snowflake

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Palak Raina  
Senior Data Engineer

# Snowflake Competitors



Google  
Big Query



databricks



amazon  
REDSHIFT



Postgre<sup>SQL</sup>

# Comparison: Architecture, Scalability & Management

Feature	Snowflake	Google BigQuery	Amazon Redshift	Databricks	Postgres
<b>Architecture</b>	Decoupled storage and compute	Serverless, Decoupled storage and compute	Depends on the cluster you chose	Decoupled storage and compute	Relational database management system (RDBMS): Traditional monolithic architecture
<b>Scalability</b>	Faster autoscaling	Automatic Scaling	Scaling with some delay	Automatic Scaling	Manual
<b>Management</b>	Low			Medium	

# Security & Data Support

## Security

- Access Controls
- Encryption

## Unstructured Data Support - Databricks

- Text, images, and audio

## Semi-Structured Data Support

- JSON
- Avro
- Parquet
- CSV

# Integration & Pricing

Feature	Snowflake	Google BigQuery	Amazon Redshift	Databricks	Postgres
<b>Integrations with Cloud Providers</b>	Multi-cloud	Multi-cloud through connections	Single Cloud	Multi-cloud	Can be deployed on multi-cloud
<b>Pricing</b>	Compute ( per second) and storage billed separately	Compute( per slot) and storage billed separately. Options: On-demand or Capacity pricing	Compute (per hour) and storage billed separately	Compute (per second/per minute) and storage billed separately	Open-source (no license fees), varies with hosting provider

# What makes Snowflake Unique?

- Unique architecture - decoupling compute, storage
- Secure data sharing
- High performance
- Multi-Cloud Support
- Pricing

# Why use Snowflake?

- Large-scale data sets
- Multi-Cloud Support
- Pricing
- Ease of use

# SnowflakeSQL vs. PostgreSQL

- American National Standards Institute(ANSI) SQL

Example:

```
select * from orders
```

# **Let's practice!**

## **INTRODUCTION TO SNOWFLAKE**