An introduction to Snowflake - the data cloud

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Agenda

- A short history
- Overview
- Snowflake as a DB
- Integrations
- Snowpark

The cloud data warehouse

- Initially a response on challenges faced by traditional RDBMS
- Massivelly Parallell Processing (MPP)
- Still a take on EDW

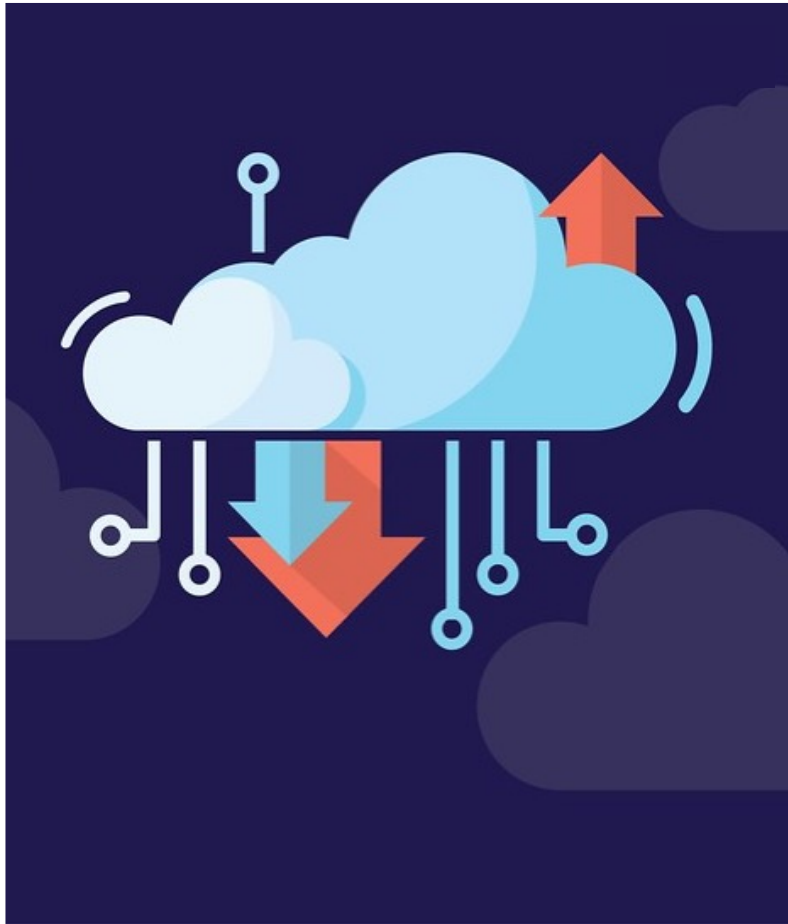
the cloud data platform

Can data lake functionality and EDW merge somehow?

Suggestions for solving the issues:

- Logical data warehouse
- Cloud data warehouse
- Virtualization

Enter the new cloud data platforms



Definition of a cloud data platform

- No longer just your Dad-a-base…
- Storage supporting diverse data types
- Compute and tools supporting diverse workloads
- Tooling for CI/CD, encryption, RBAC etc
- Data management tools

Snowflake

- Established in 2012
- Launched publicly in 2015
- Record IPO in 2020
- Unique architecture with fully separated storage and compute
- Based on ANSI SQL
- Started as a data warehousing service

Snowflake vs Databricks

- Snowflake comes from EDW world
- Databricks from Spark data science and python data engineering

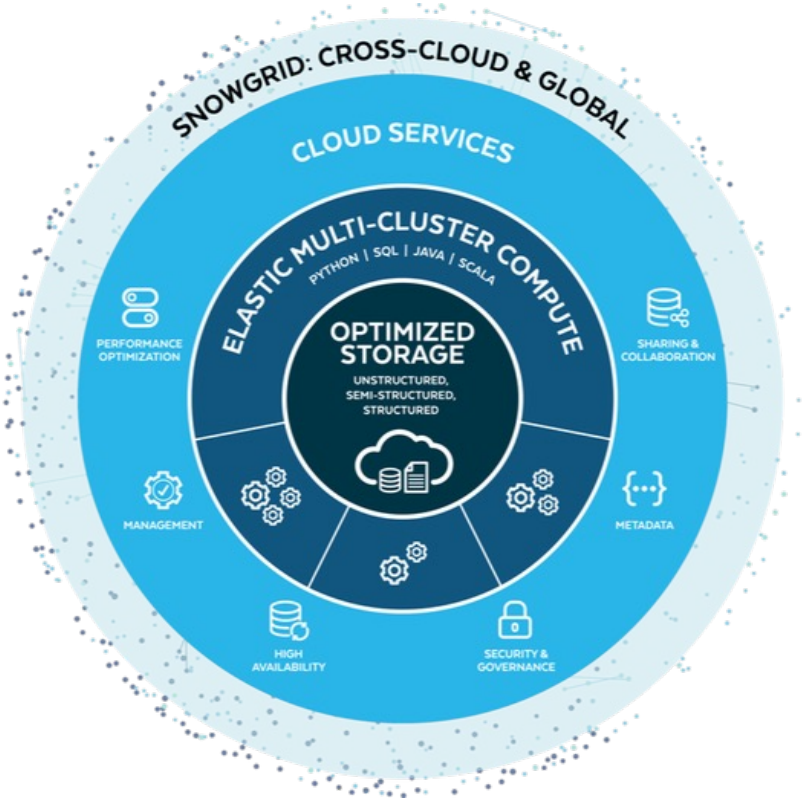
- Converge as both have added new features

Snowflake vs Databricks

- Handbags at dawn

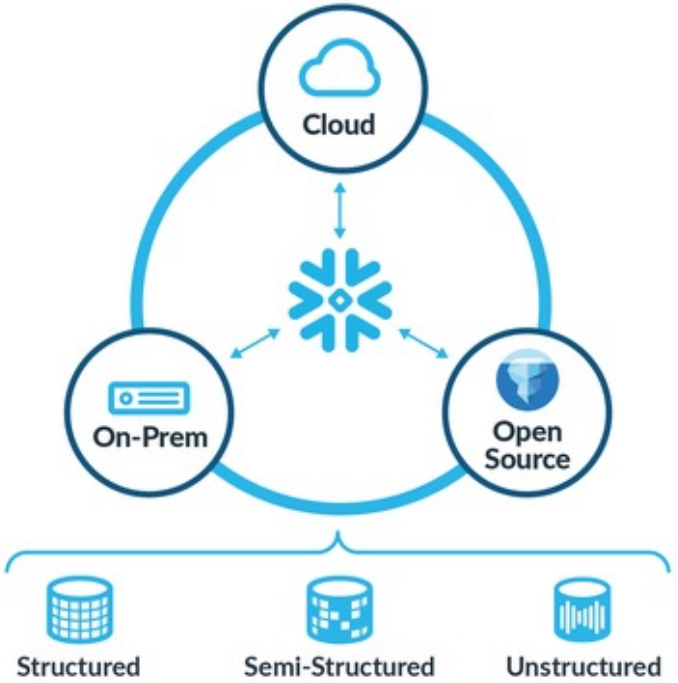
The Snowflake Architecture

- The core Snowflake platform
  - Storage
  - Compute
  - Cloud Services
  - Snowgrid



Storage

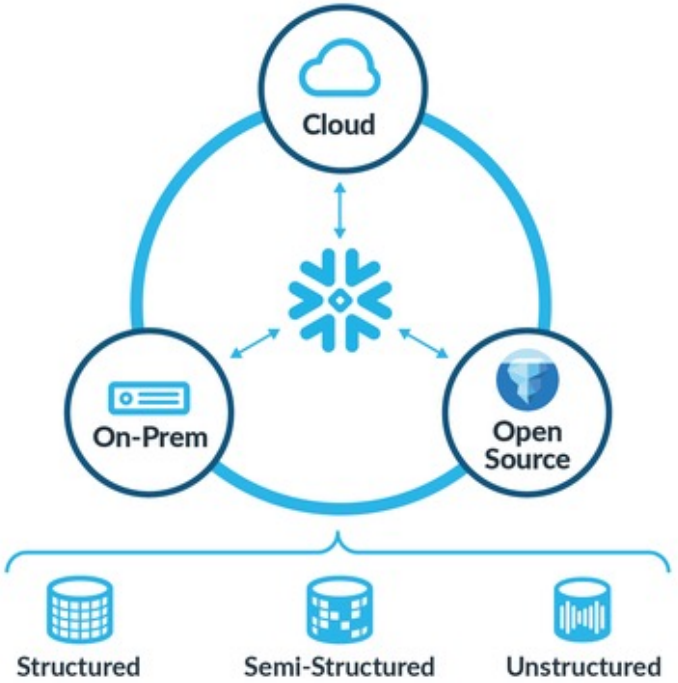
- Databases for ACID + RDBMS
  - Automated partitioning
  - Time travel
  - Autotuned
- Internal Stage for semi- & unstructured
- External stages to on-prem & cloud



Storage

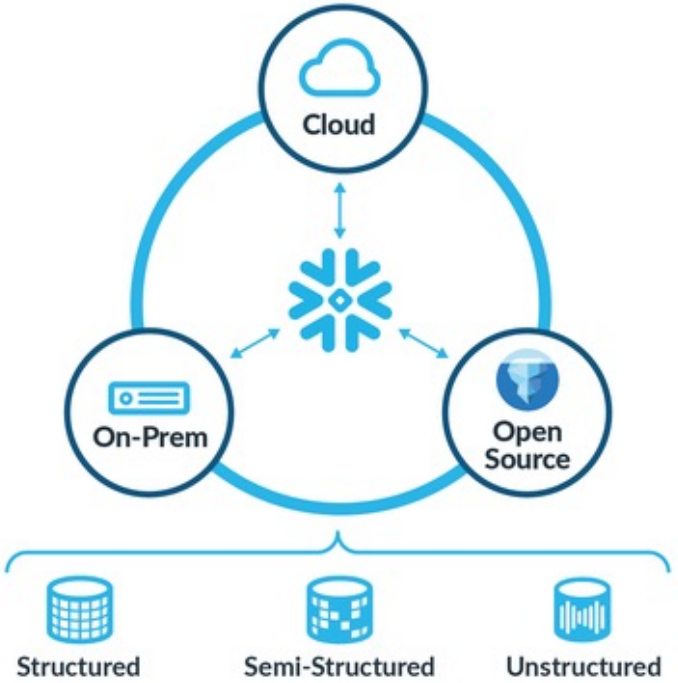
- Cloud stages support S3, GCS & ADLS
- On-prem only S3-compatible

- External stages support
  - JSON/XML/CSV…
  - Avro/Parquet…
  - Apache Iceberg
  - Delta Lake



Storage

- Create External Tables
- Build materialized views on semi-structured data



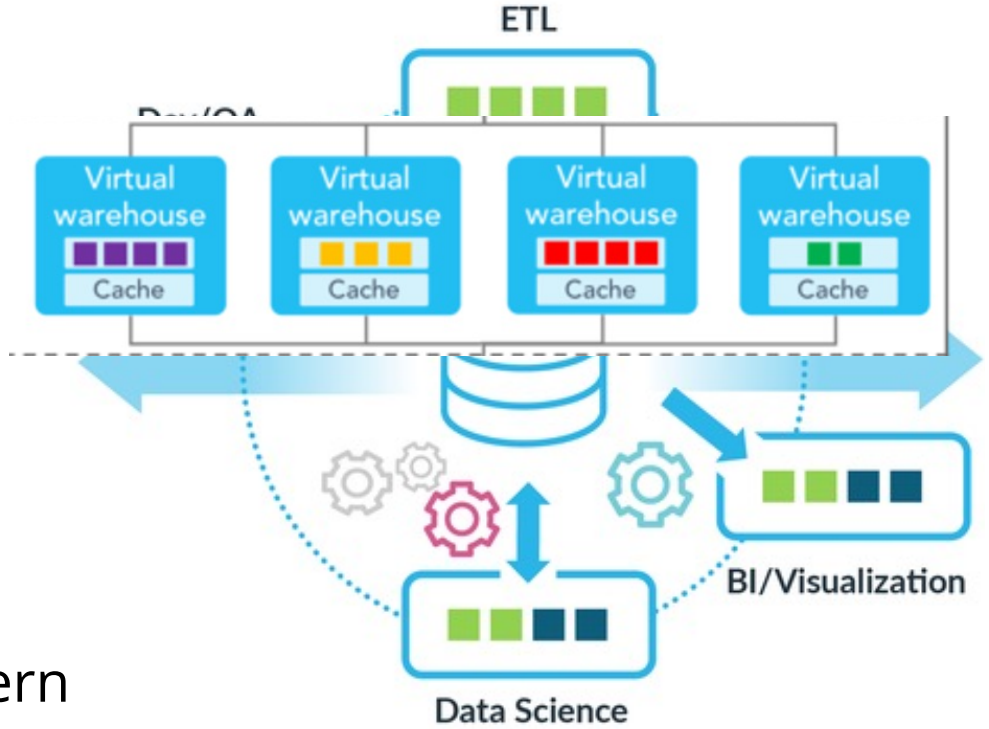
Compute

- Called warehouses
- Elastic
  - From XS -> 6XL
- 2 types
  - Normal
  - Snowpark (memory) optimized
- Auto-pause + instant restart

Compute

- Consists of CPU & RAM
- Cache
- Separate warehouses per usecase

- Be mindful of auto-pause = cache emptied
- Plan your usecase usage pattern



Cloud Services

- The central administration and control layer
- 4 pillars
  - Maintenance & tuning
  - Administration
  - Networking & Encryption
  - Resource Manager

Cloud Services – 4 pillars

- Maintenance & tuning
- Administration
- Networking & Encryption
- Resource Manager

Cloud Services – 4 pillars

- Maintenance & tuning
- Common meta-data repository
- Snowflake is “DBA-free”
  - Auto-tuning of queries
  - Auto-partitioning
  - Auto-indexing/”Indexfree”

Cloud Services – 4 pillars

- Administration
  - Transaction manager
  - Security/RBAC
  - Authentication & Authorization
- Networking & Encryption
  - Intra-cluster
  - Cloud connectivity
- Resource Manager
  - Cluster management

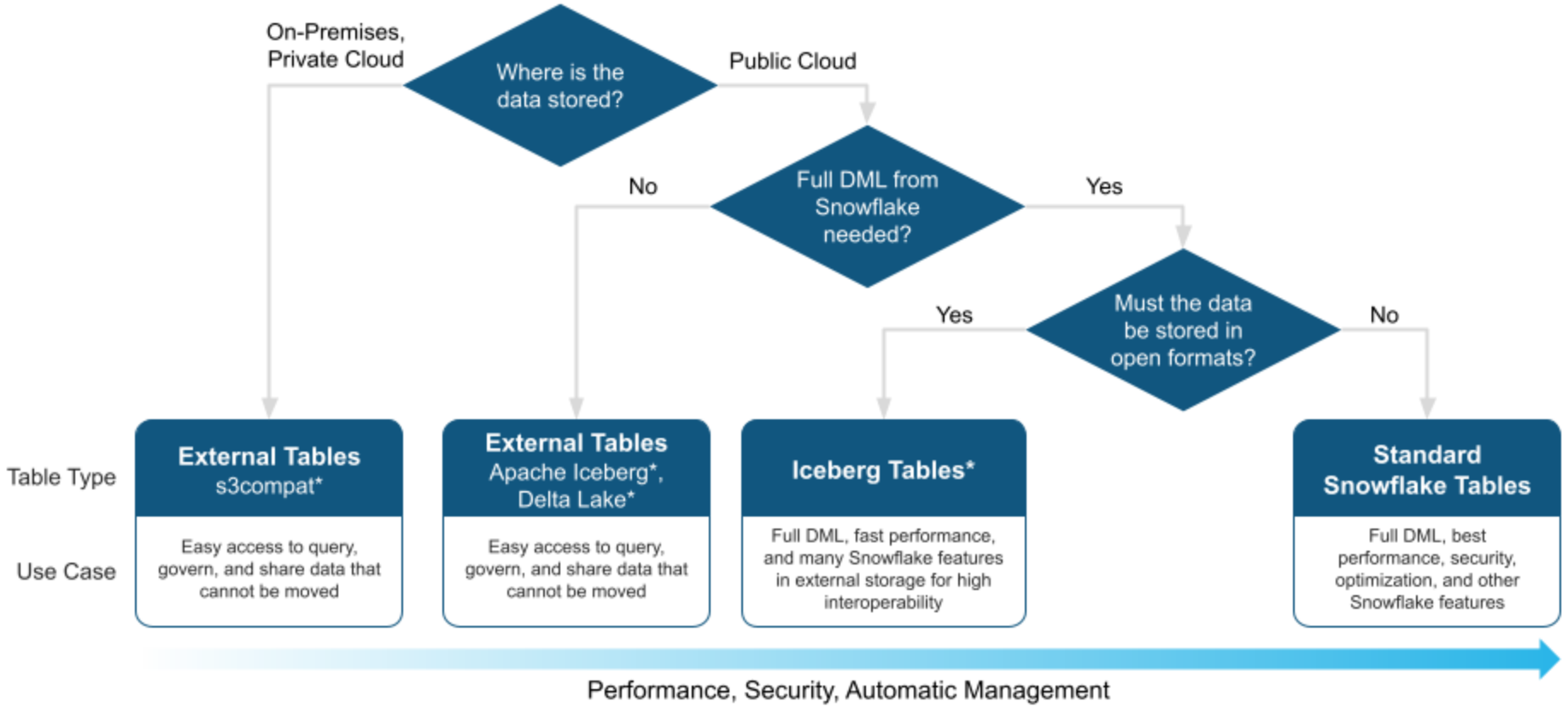
The Snowflake Architecture

- Snowgrid
  - Global Snowflake internal network
- Cloud Agnostic

Snowflake Table Types

*Private Preview

For Analytical Workloads



The Snowflake Architecture

- Snowpark
- Streamlit

Snowpark

- Expands Snowflake from traditional RDBMS
- Python – offers traditional dataframe APIs
- Also ML modelling and opreations APIs

- Can run inside warehouses
- Can run on containers (Snowpark Container Services)

Streamlit

- Company aqcuired by Snowflake 2022
- Build interactive apps with Python that runs on Snowflake
- Web apps, widgets – with unique URLs that can be shared
- Still in public preview

The Snowflake Marketplace

- From the consumer
  - Search, discover and sample datasets globally
  - Access datasets –
    some free, some commercial
  - No need to run ETL processes to fetch data
  - Directly start querying the data inside own account
  - Can combine internal and marketplace data

The Snowflake Marketplace

- From the producer
  - Share data with users outside your organization
  - This done through listings
  - Listings can be global or limited to select users/organizations
  - Datasets can be a one-off, an update or stream.
  - No special development needed
  - Listings can be private, free or paid

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Thank you very much for your attention.

Vielen Dank für Eure Aufmerksamkeit.