Python for Beginners

Archer Infotech , PUNE

What is Azure ?

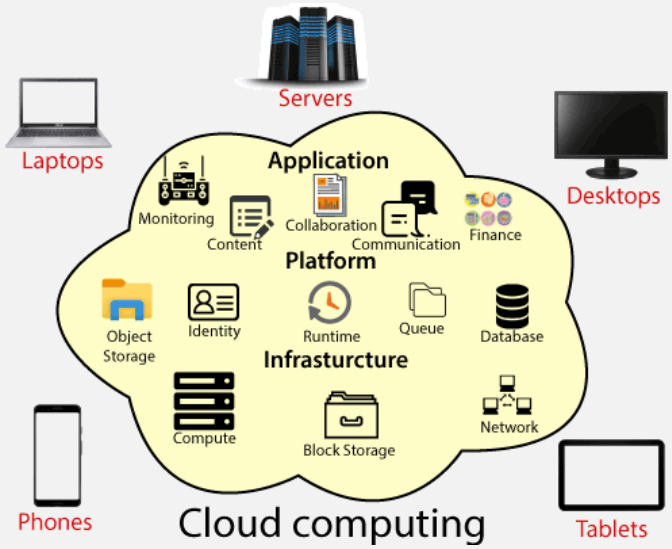
- Azure is a cloud computing platform and an online portal that allows you to access and manage cloud services and resources provided by Microsoft.

- These services and resources include storing your data and transforming it, depending on your requirements.

- To get access to these resources and services, all you need to have is an active internet connection and the ability to connect to the Azure portal.

What is Cloud Computing ?

- **Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale.**
- **You typically pay only for cloud services you use, helping lower your operating costs, run your infrastructure more efficiently and scale as your business needs change.**



What is Cloud Computing ?

Benefits Of Cloud Computing

- **Cost:** It reduces the huge capital costs of buying hardware and software.
- **Speed:** Resources can be accessed in minutes, typically within a few clicks.
- **Scalability:** We can increase or decrease the requirement of resources according to the business requirements.
- **Productivity:** While using cloud computing, we put less operational effort. We do not need to apply patching, as well as no need to maintain hardware and software. So, in this way, the IT team can be more productive and focus on achieving business goals.
- **Reliability:** Backup and recovery of data are less expensive and very fast for business continuity.
- **Security:** Many cloud vendors offer a broad set of policies, technologies, and controls that strengthen our data security.

Types of Cloud Computing

- **Public Cloud : ** Public clouds are owned and operated by a third-party cloud service providers, which deliver their computing resources like servers and storage over the Internet. Microsoft Azure is an example of a public cloud. With a public cloud, all hardware, software and other supporting infrastructure is owned and managed by the cloud provider. You access these services and manage your account using a web browse

- **Private Cloud :** A private cloud refers to cloud computing resources used exclusively by a single business or organisation. A private cloud can be physically located on the company's on-site datacenter. Some companies also pay third-party service providers to host their private cloud. A private cloud is one in which the services and infrastructure are maintained on a private network

- **Hybrid Cloud**

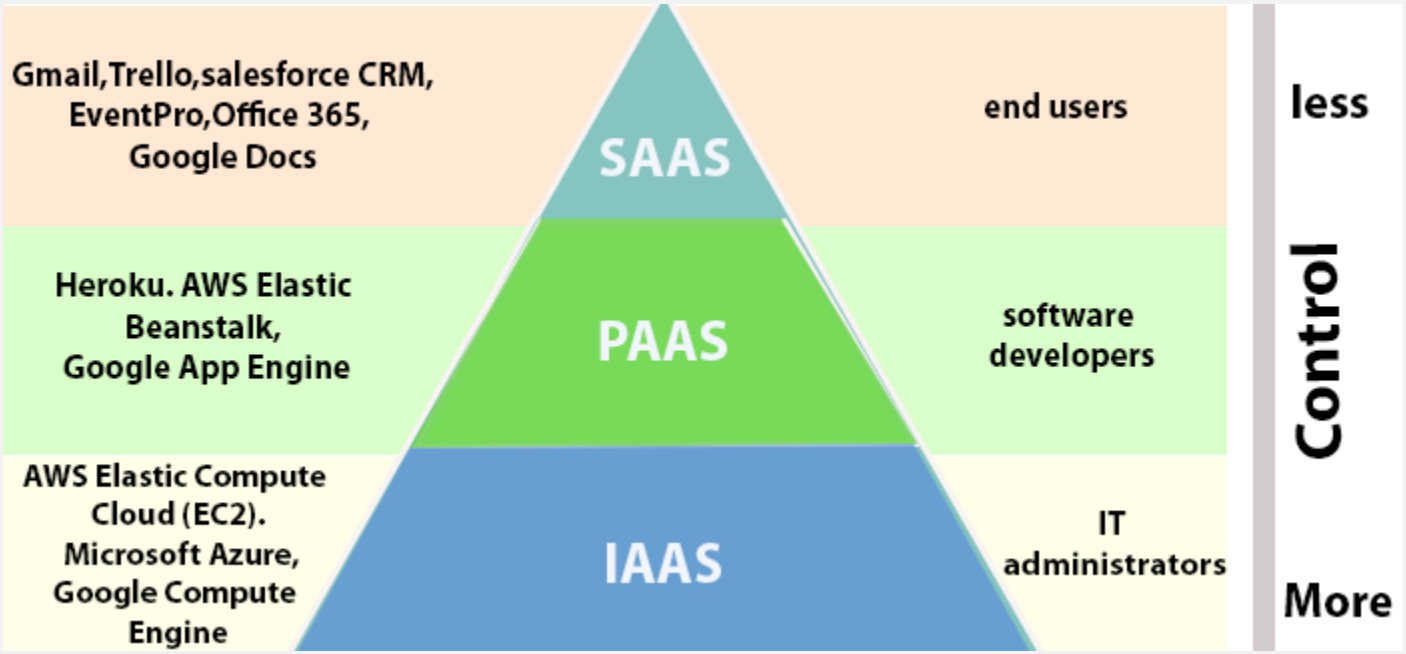
Types of Cloud Services

Infrastructure as a Service (IaaS): In IaaS, we can rent IT infrastructures like servers and virtual machines (VMs), storage, networks, operating systems from a cloud service vendor. We can create VM running Windows or Linux and install anything we want on it..

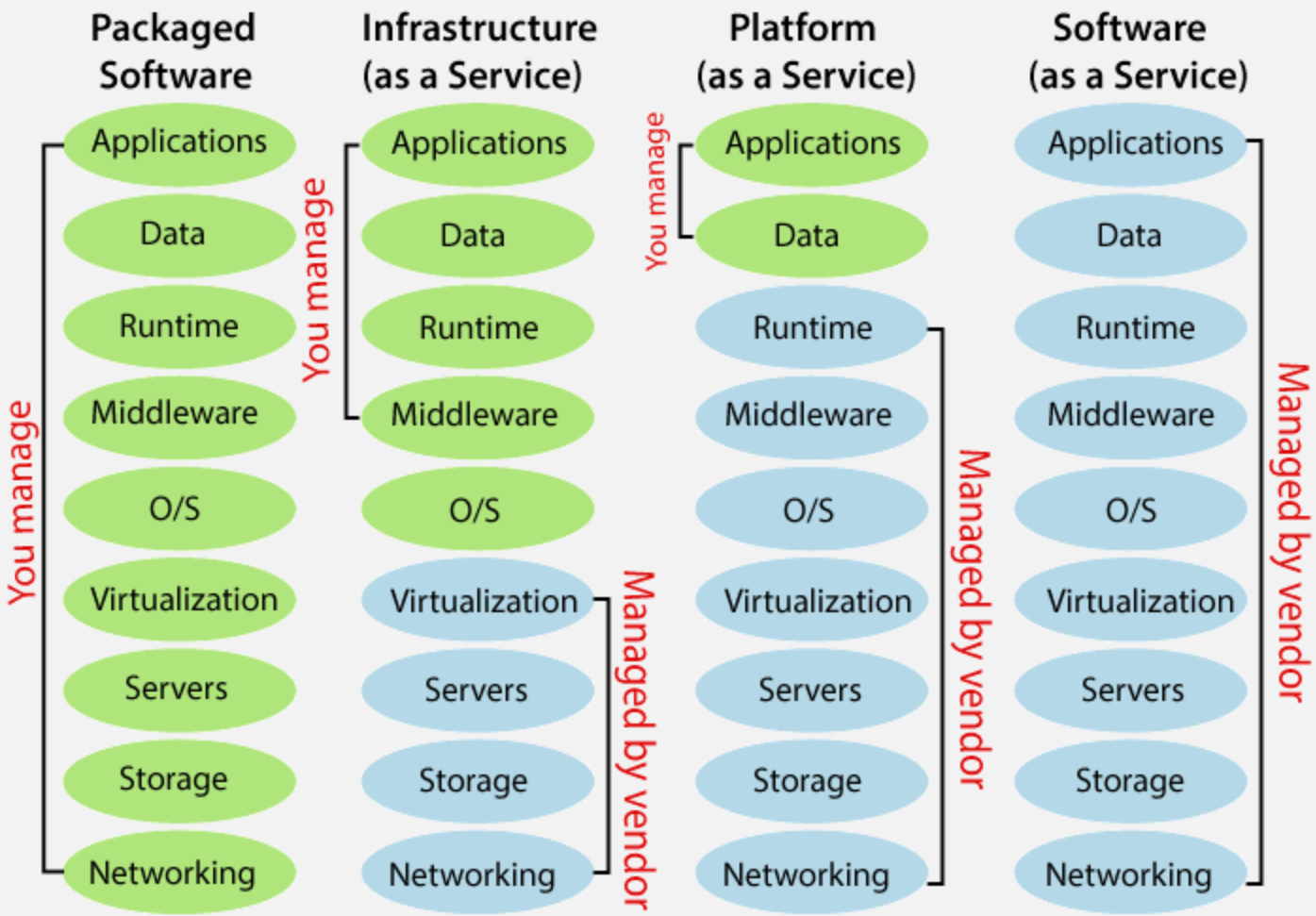
Platform as a Service (PaaS): This service provides an on-demand environment for developing, testing, delivering, and managing software applications. The developer is responsible for the application, and the PaaS vendor provides the ability to deploy and run it. Using PaaS, the flexibility gets reduce, but the management of the environment is taken care of by the cloud vendors.

Software as a Service (SaaS): It provides a centrally hosted and managed software services to the end-users. It delivers software over the internet, on-demand, and typically on a subscription basis. E.g., Microsoft One Drive, Dropbox, WordPress, Office 365, and Amazon Kindle. SaaS is used to minimize the operational cost to the maximum extent.

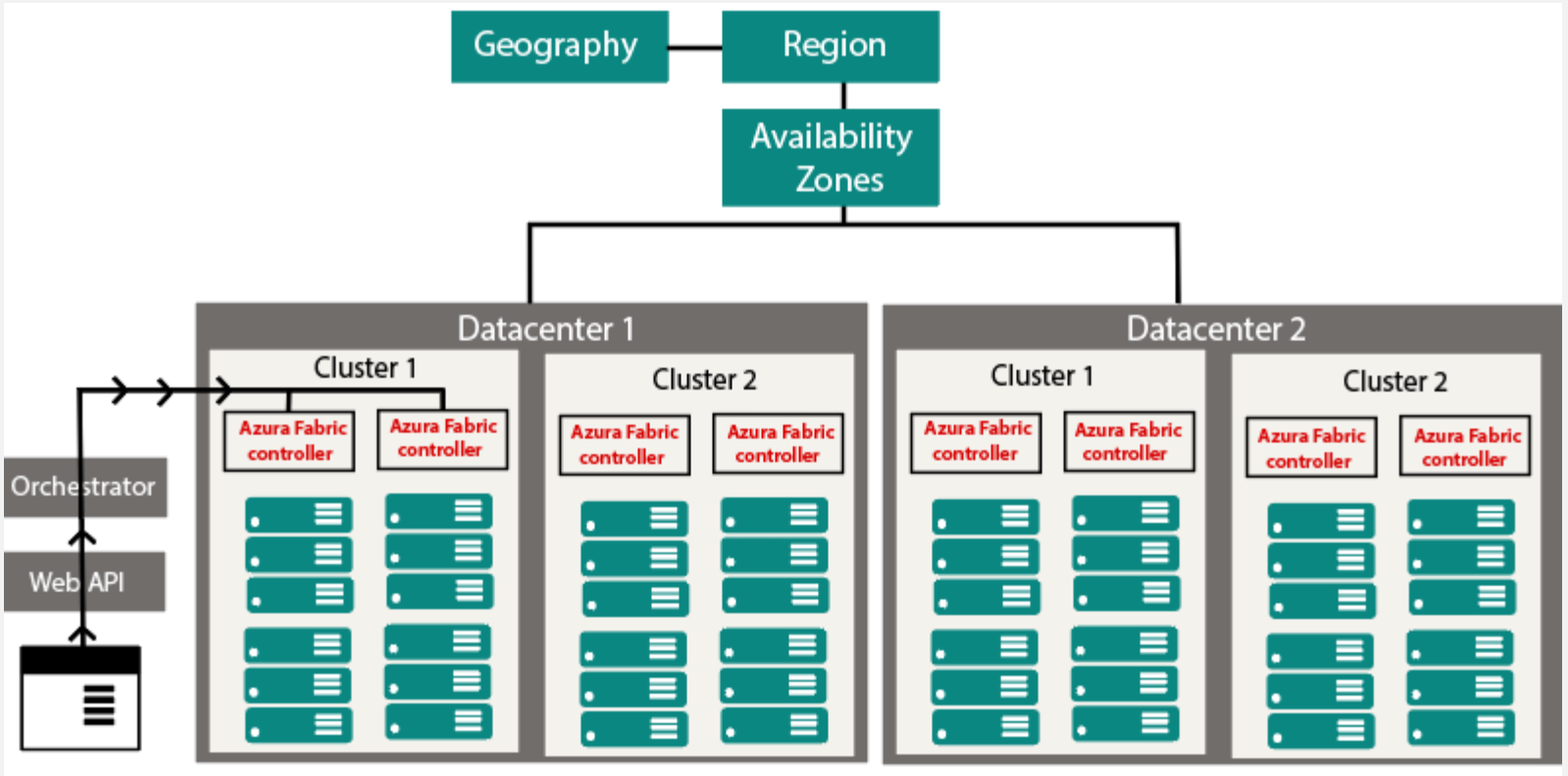
Types of Cloud Services



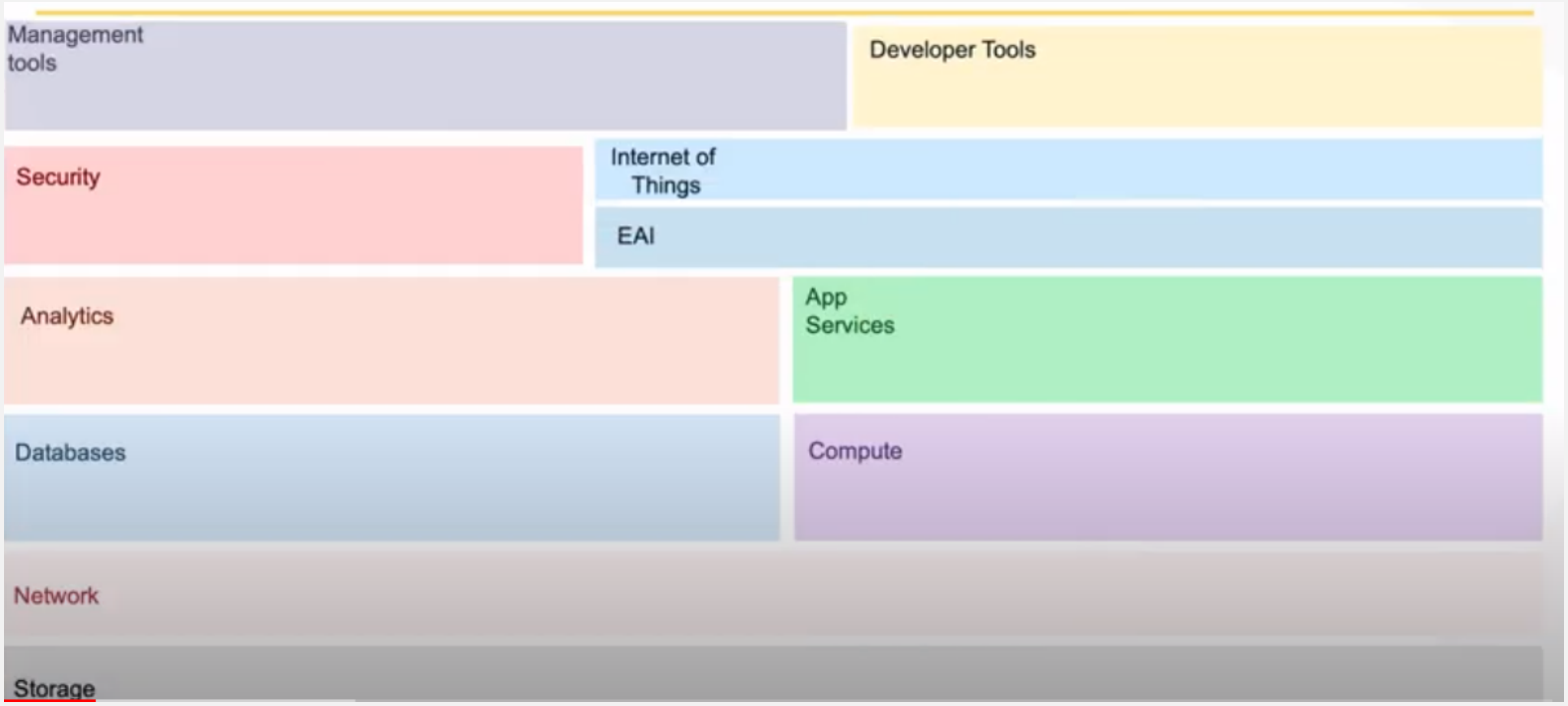
Types of Cloud Services



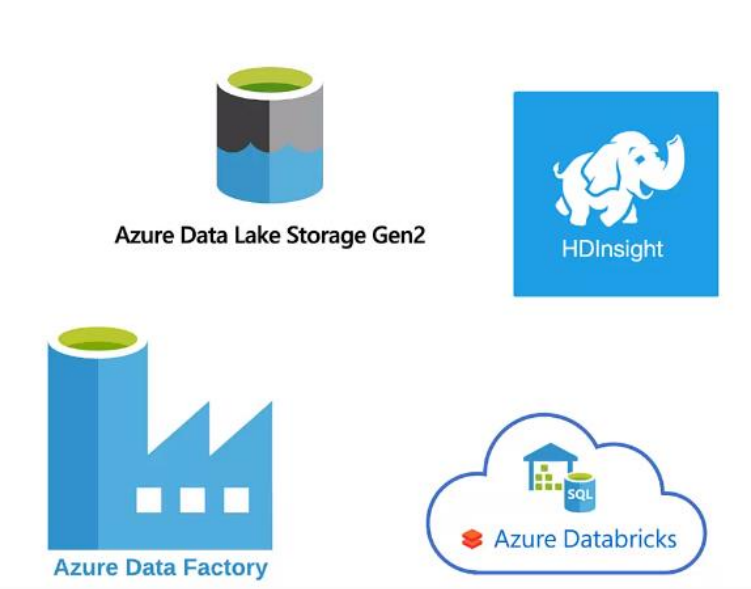
How Azure Works ?

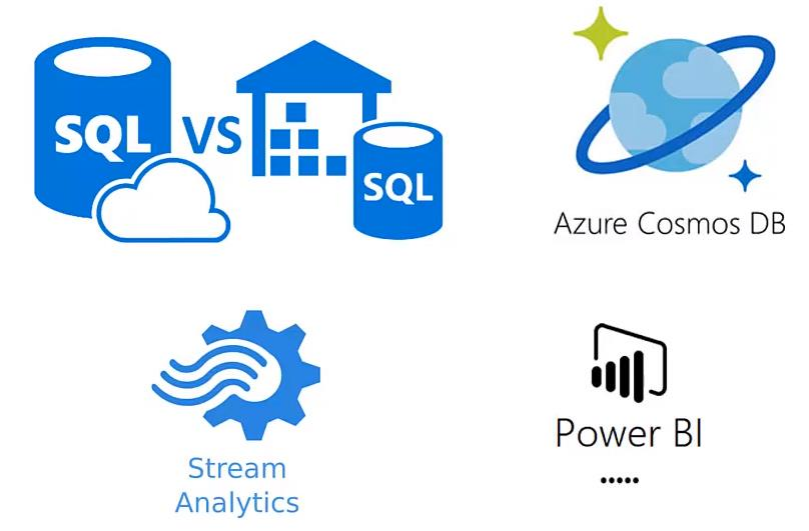


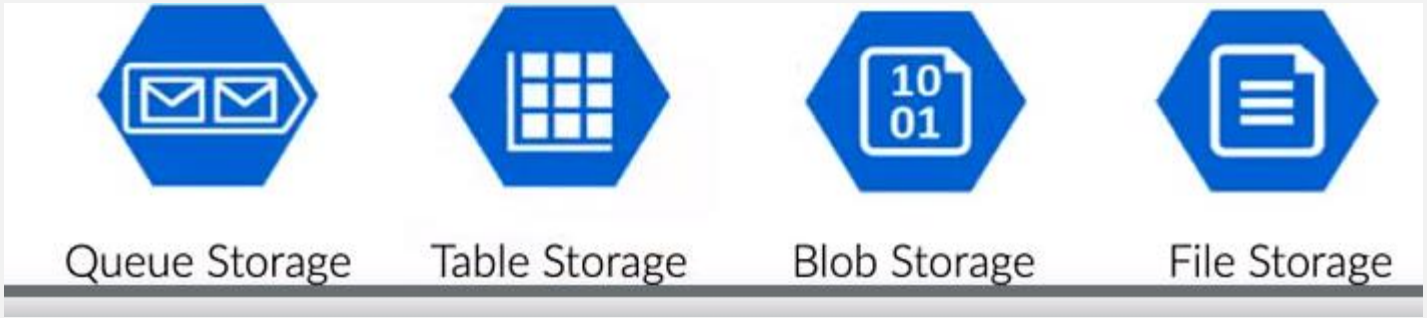
How Azure Works ?



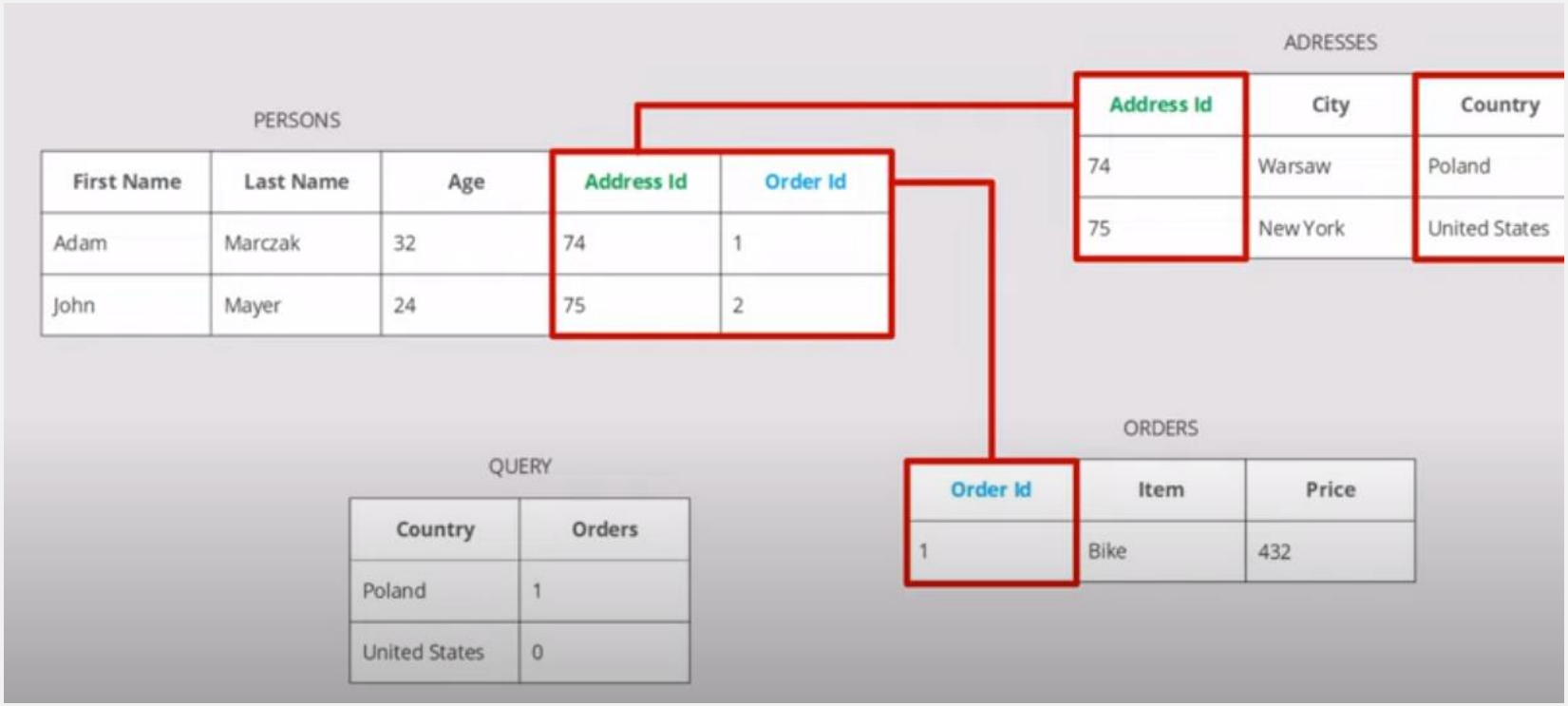
Azure Data Solutions Technologies







Relational Database



Relational Database

Why relational databases?

Relational databases are

1. Perfect for managing **structured data** via
    1. Schema
    2. Constraints
    3. Relationships
2. Include **rich query** capabilities

Relational Data On Azure

- **A database is a collection of data. A database can be as simple as a desktop spreadsheet, or as complex as a global system holding petabytes of highly structured information. The data can be structured in many different ways. A common approach is to store data in a tabular format, with rows and columns. You can define relationships between tables. These databases are called *relational* databases.**

SQL Database

Azure SQL Database is a general-purpose **relational database-as-a-service** (DBaaS) based on the latest stable version of Microsoft SQL Server Database Engine.

Deployment Models

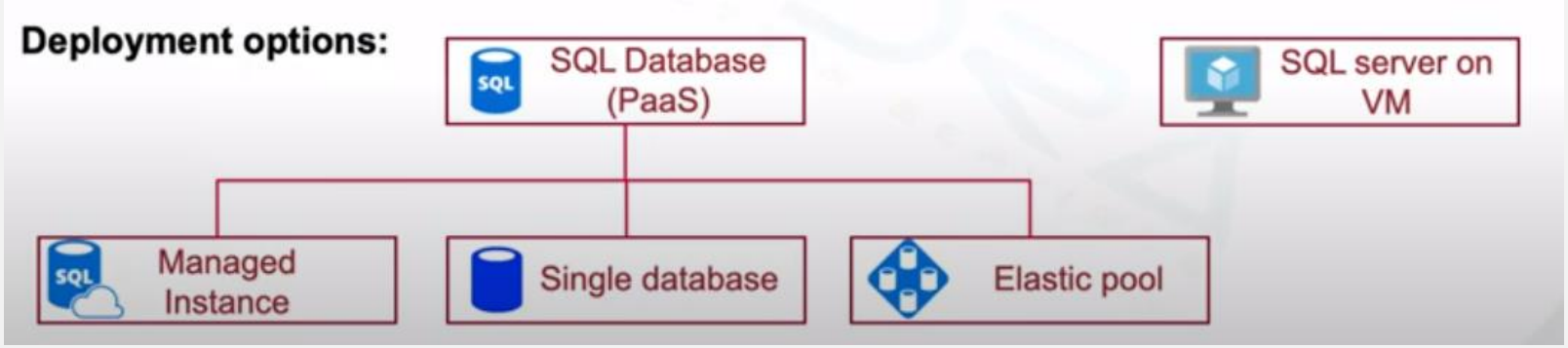
Azure SQL Database provides the three deployment options:

Single is a fully managed, isolated database

Elastic Pool is a collection of single databases with a shared set of resources

Managed Instance is a fully managed instance of the SQL Server

Deployment Models



SQL Logical Server

- A logical server acts as a central administrative point for multiple single or pooled databases, logins, firewall rules, auditing rules, threat detection policies, and failover groups
- The logical server must exist before you can create the Azure SQL database. All databases on a server are created within the same region as the logical server.
- The SQL Database service makes no guarantees regarding location of the databases in relation to their logical servers, and exposes no instance-level access or features.
- An Azure database logical server is the parent resource for databases, elastic pools, and data warehouses.

Elastic Pools

- SQL Database elastic pools are a simple, cost-effective solution for managing and scaling multiple databases that have varying and unpredictable usage demands. The databases in an elastic pool are on a single Azure SQL Database server and share a set number of resources at a set price
- You can configure resources for the pool based either on the DTU-based purchasing model or the vCore-based purchasing model.
- The best size for a pool depends on the aggregate resources needed for all databases in the pool. This involves determining the following:
  - Maximum resources utilized by all databases in the pool (either maximum DTUs or maximum vCores depending on your choice of resourcing model).
  - Maximum storage bytes utilized by all databases in the pool.

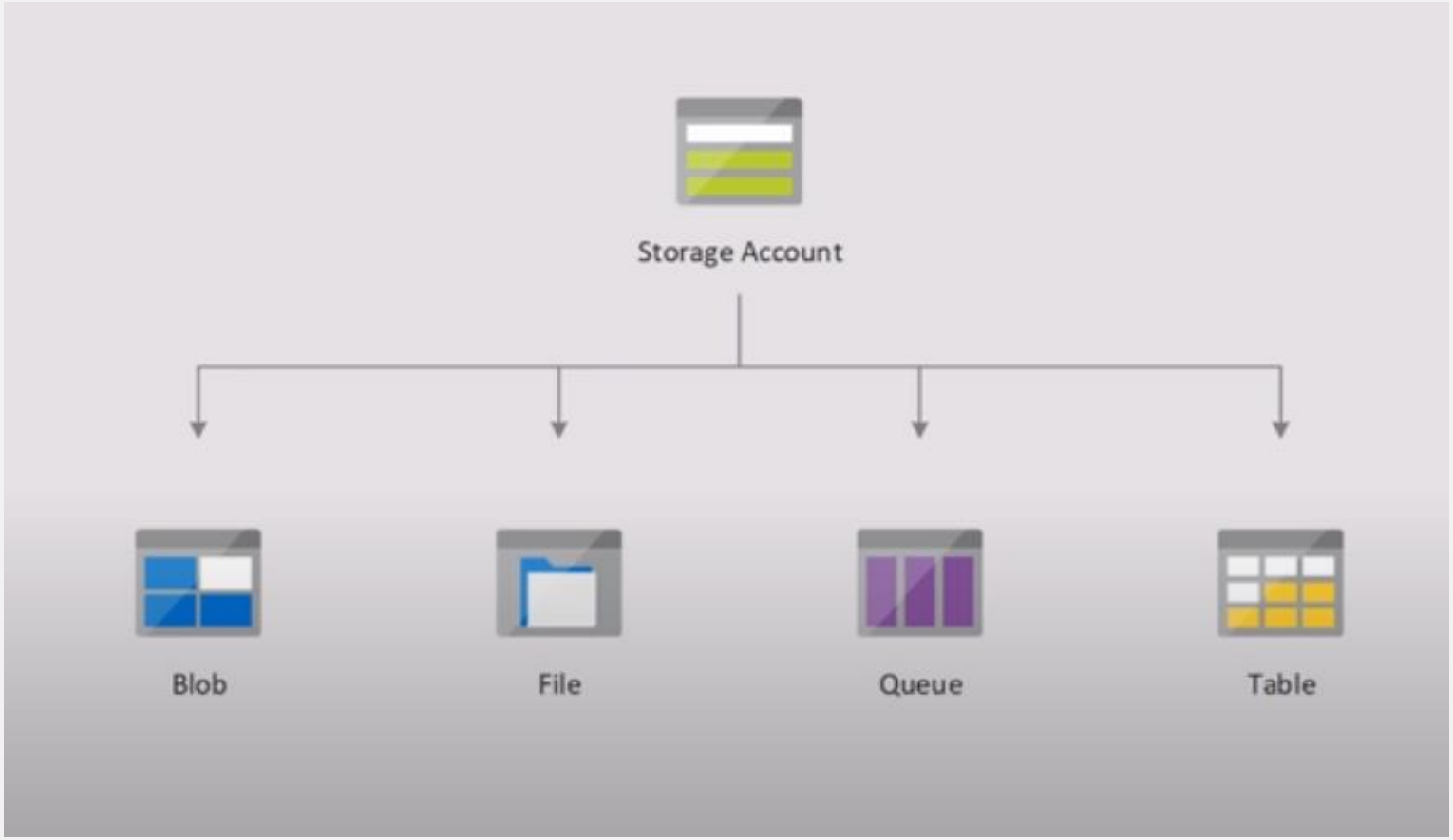
Azure Storage

Azure Storage offers a massively scalable object store for **data objects**, a **file** system service for the cloud, a **messaging** store for reliable messaging, and a **NoSQL store**.

Azure Storage is

- Durable
- Secure
- Scalable
- Managed
- Accessible

Azure Storage



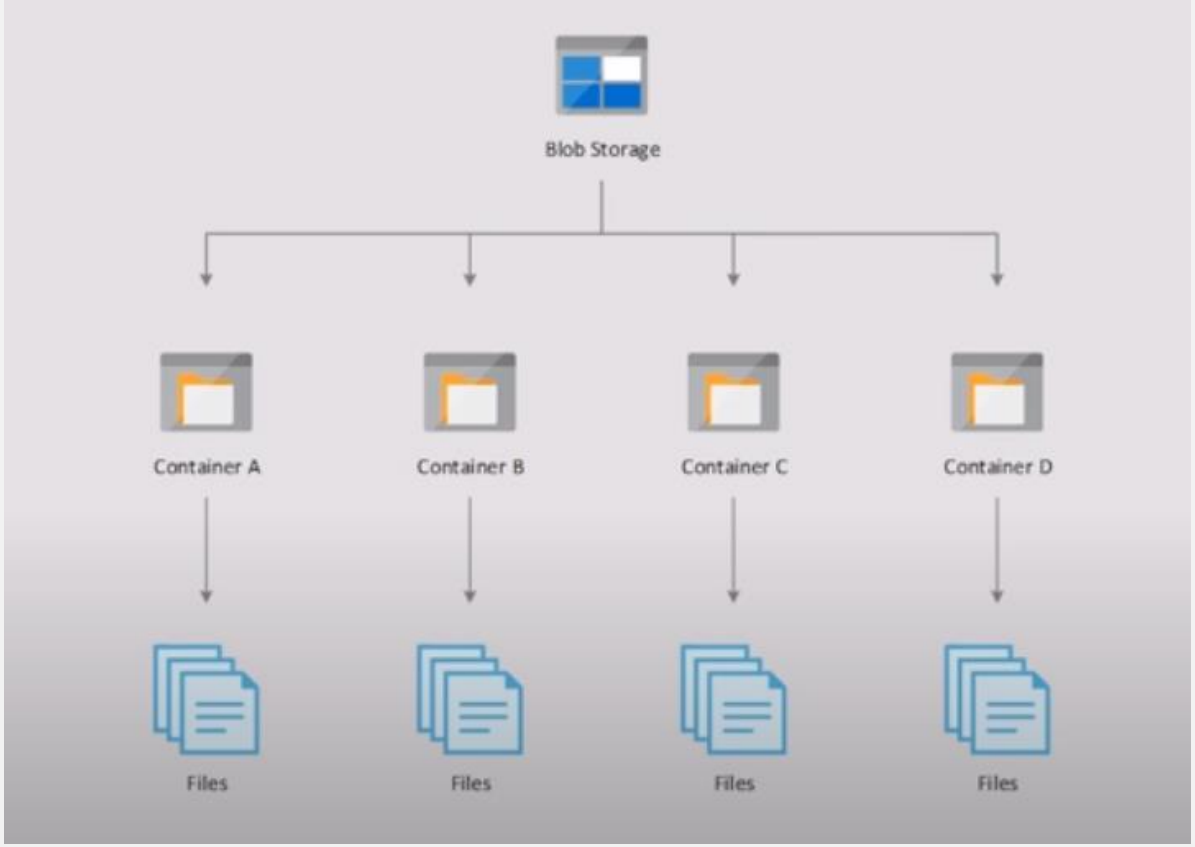
Blob Storage

A massively scalable object store for text and binary data.

Ideal for

- Serving images or documents directly to a browser.
- Storing files for distributed access.
- Streaming video and audio.
- Storing data for backup and restore, disaster recovery, and archiving.
- Storing data for analysis by an on-premises or Azure-hosted service.

Blob Storage

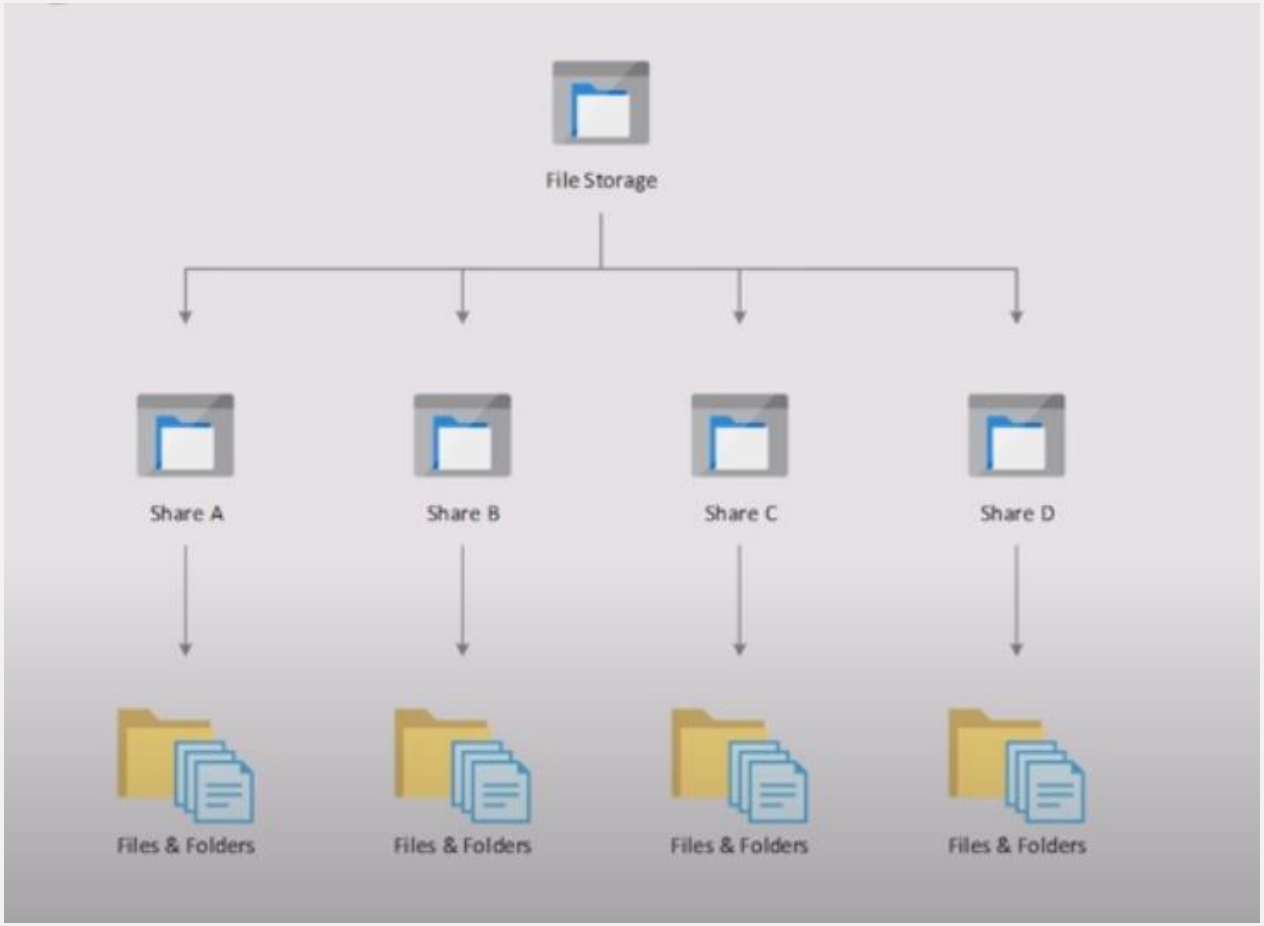


Blob Storage

Azure Storage provides different options for accessing block blob data based on usage patterns.

- **Hot** - optimized for frequent access of objects
- **Cool** - optimized for storing large amounts of data that is infrequently accessed and stored for at least 30 days
- **Archive** - optimized for data that can tolerate several hours of retrieval latency and will remain in the Archive tier for at least 180 days

File Storage



Message Queue

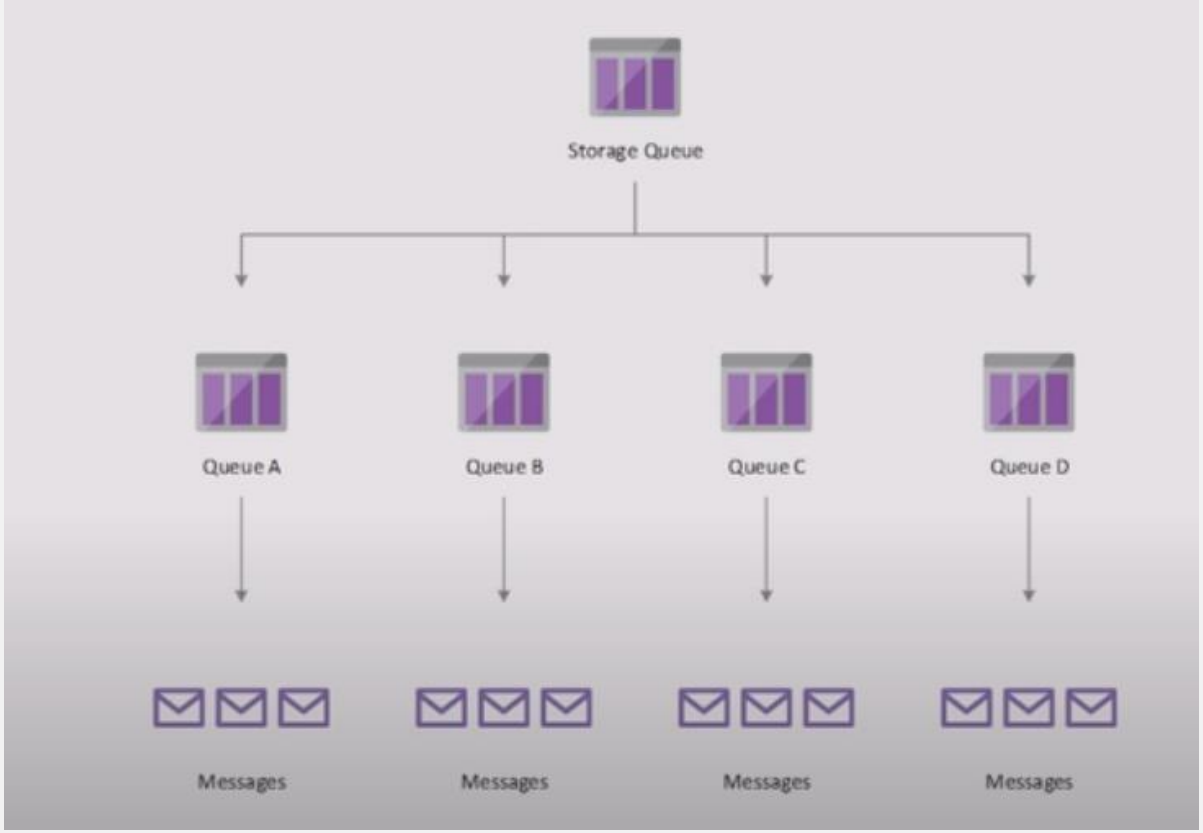
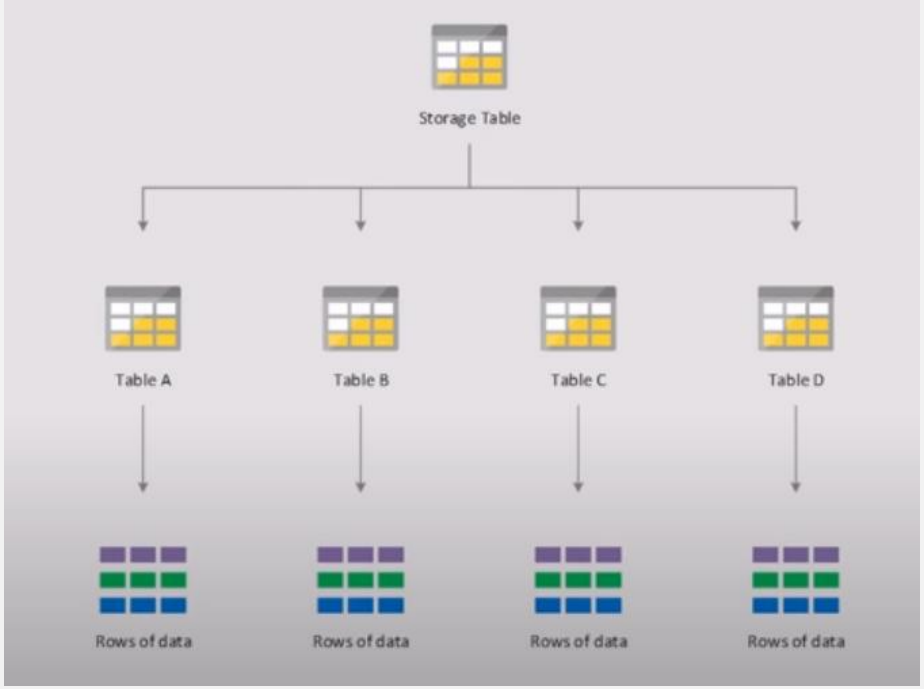


Table Storage

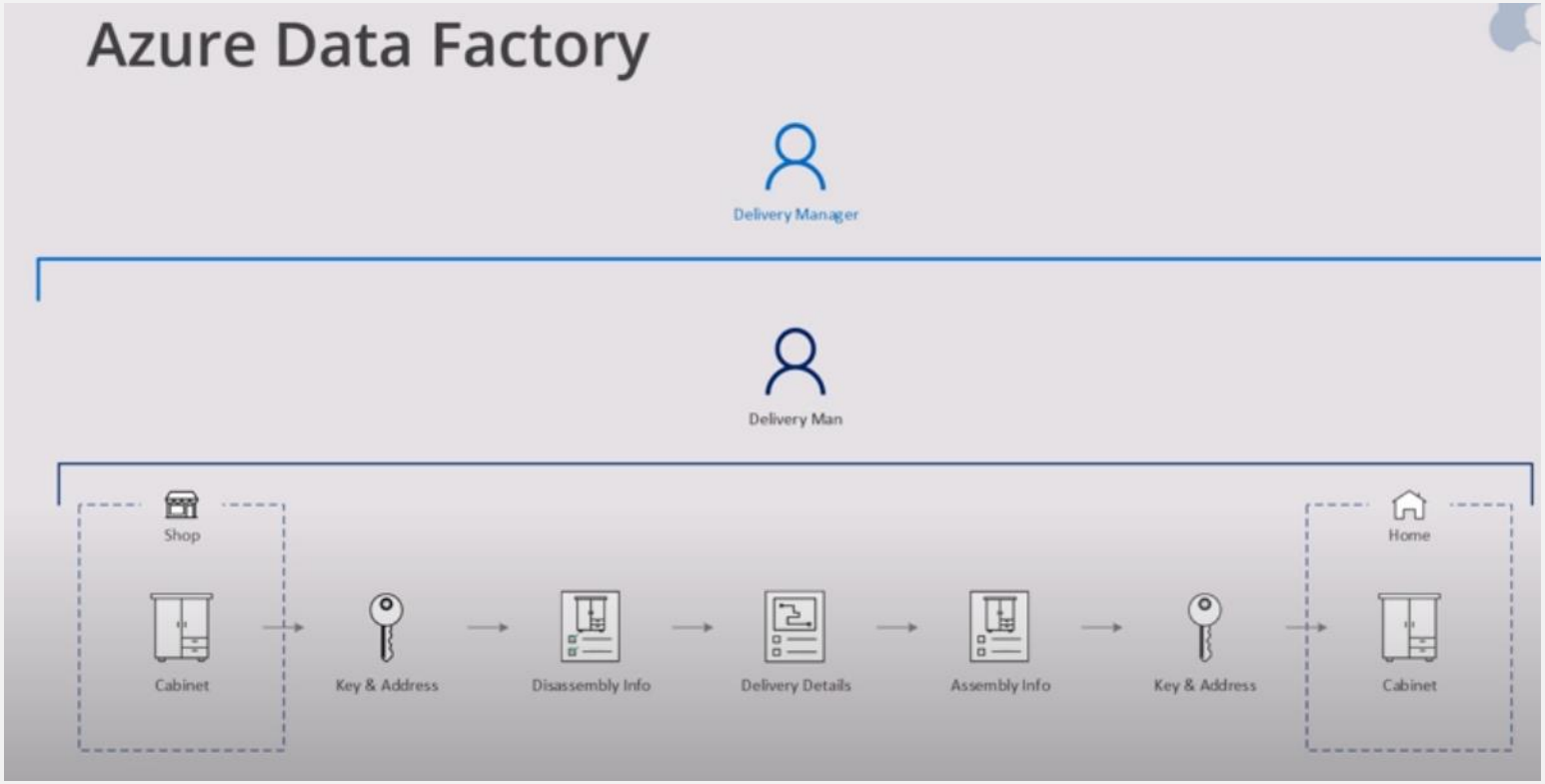
A NoSQL store for schemaless storage of structured data.



Data Factory

Data Factory is a cloud data integration service used to compose data storage, movement, and processing services into automated data pipelines.

Data Factory



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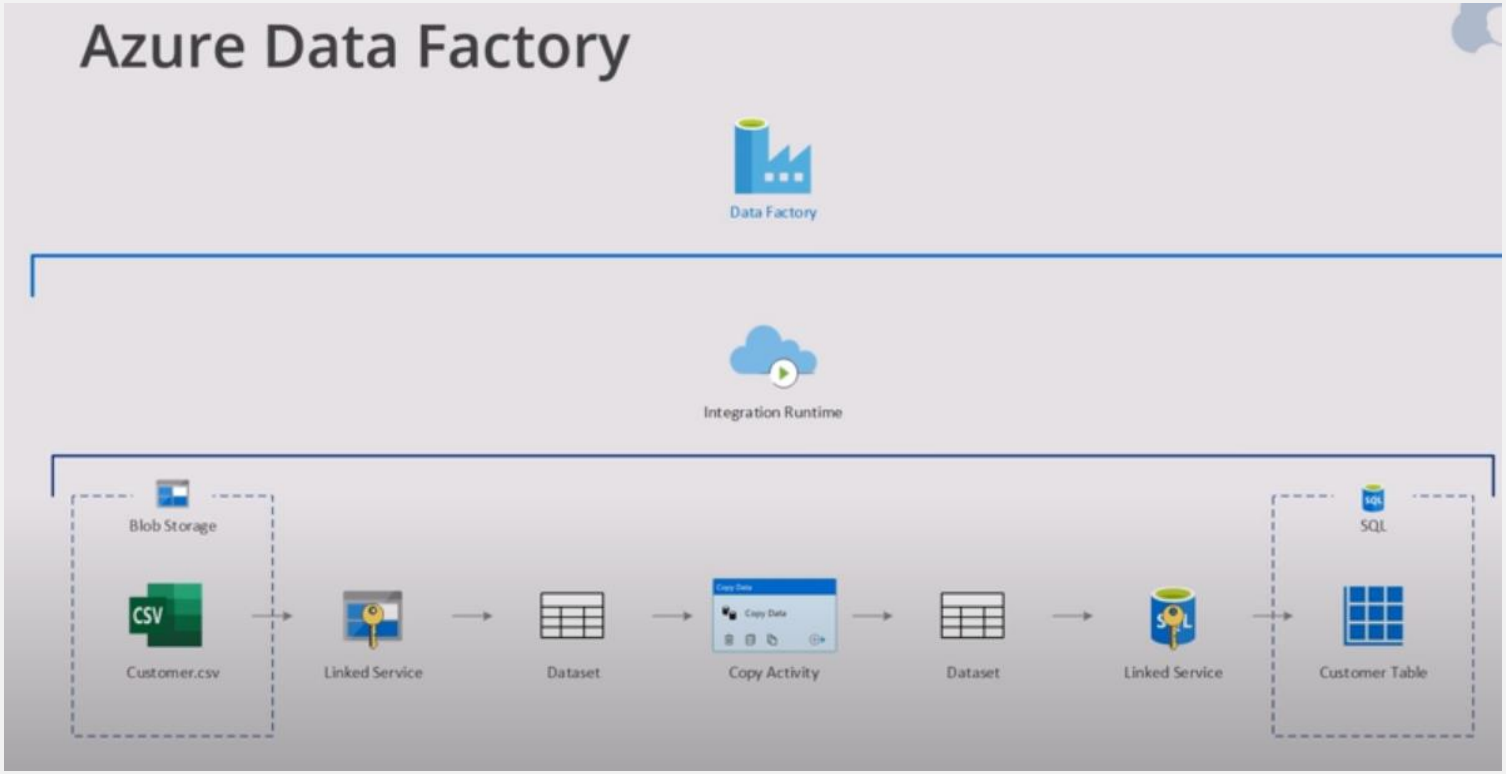

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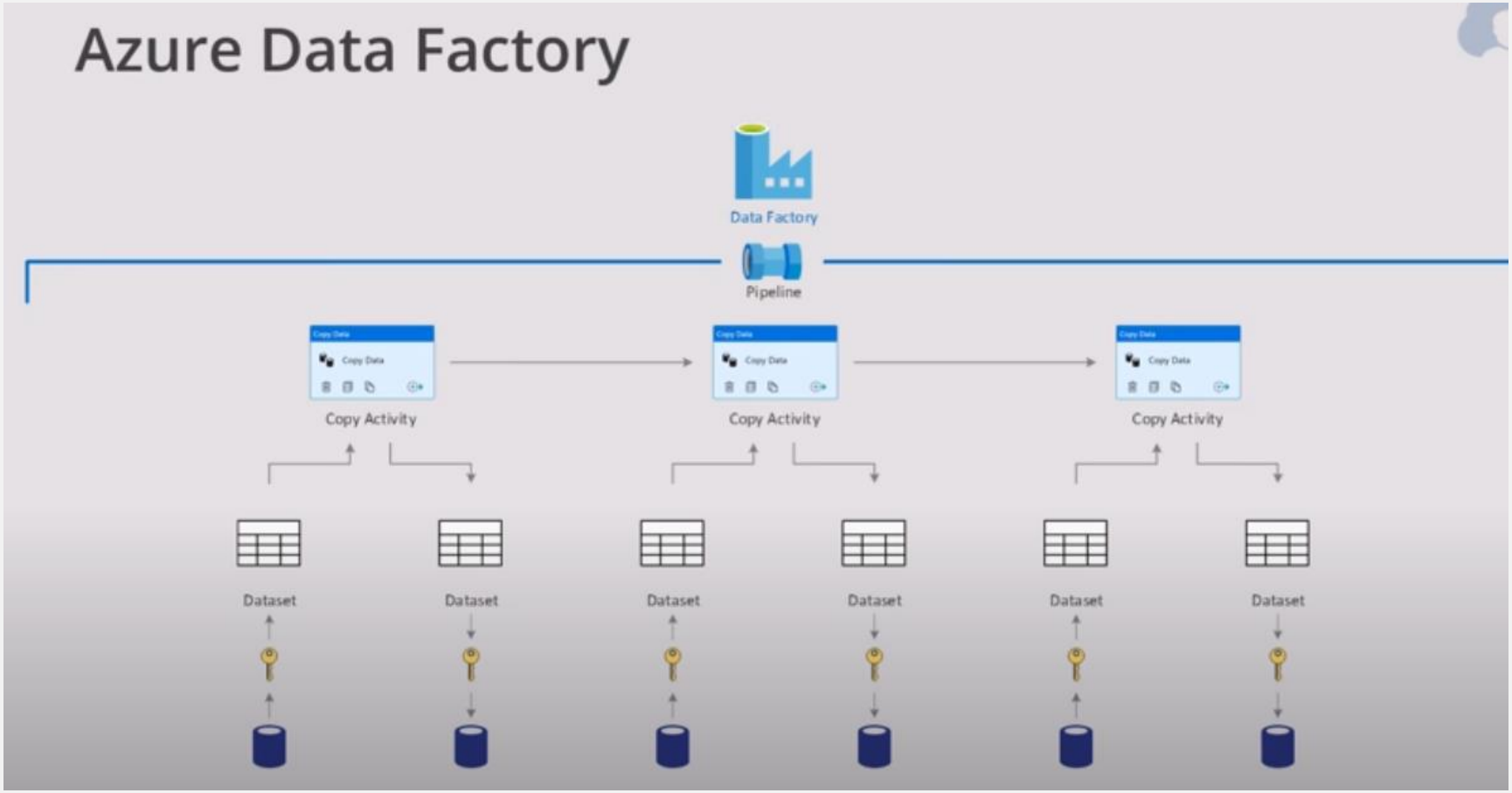
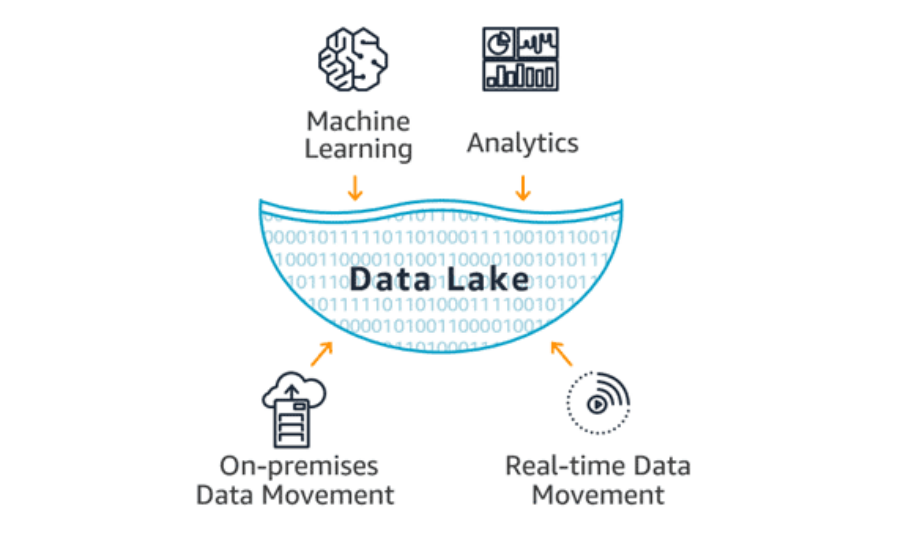


Data Lake Storage

- A data lake is a central storage repository that carries **big data** from many sources of raw data in its native form until it is needed.
- It can store **structured, unstructured data, or semi-structured**, which means data can be kept in a more flexible format for future use.
- A data lake is capable of Store and analyzes **petabyte-size** files and trillions of objects.
- It also Develops massively parallel programs easily.



Data Lake Storage

Azure Data Lake Store provides a single repository where small or large organizations upload data of just about infinite size.

It is designed for high-performance processing and analytics from **Hadoop Distributed File System** tools and applications, including support for low latency workloads.

It allows **structured** and **unstructured** data in their native formats.

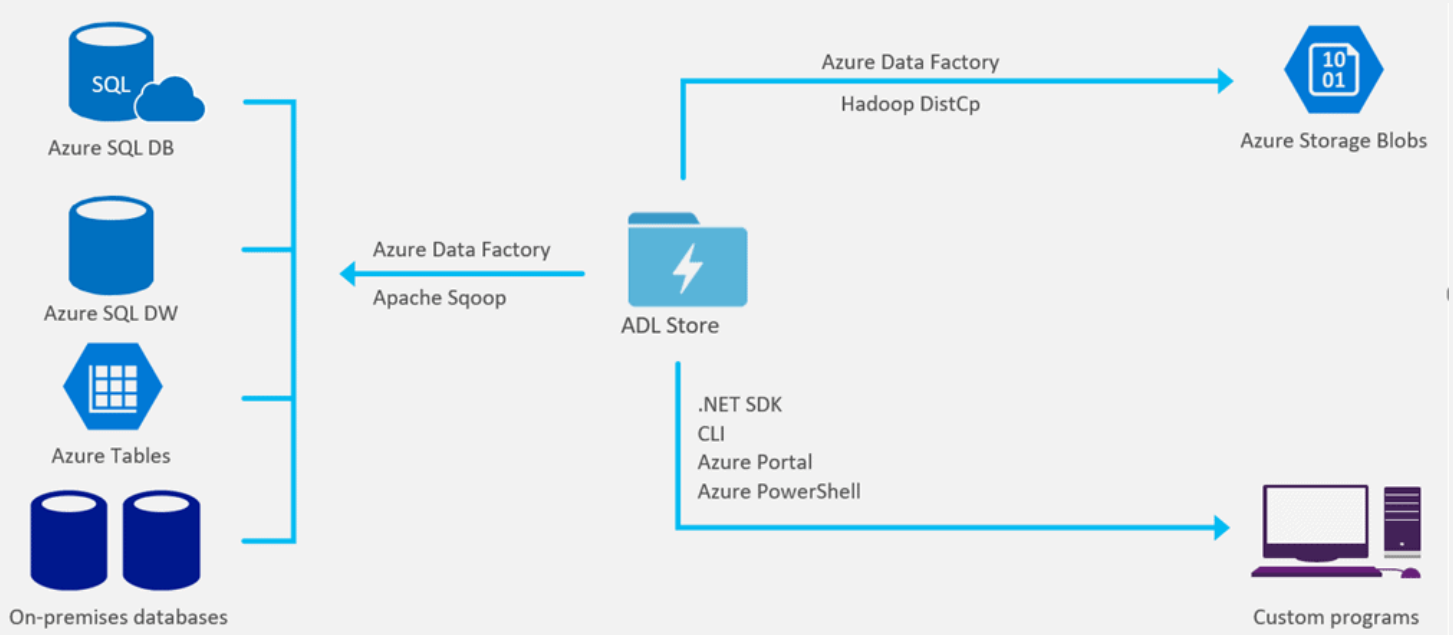
It allows for huge throughput to boost analytic performance.

It offers high availability, durability, and reliability.

Azure storage services are better than **Amazon S3** because it gives an integrated analytics service and places no limits on file volume.
Types of ADLS.

- **ADLS Gen1.**
- **ADLS Gen2.**

Data Lake Storage



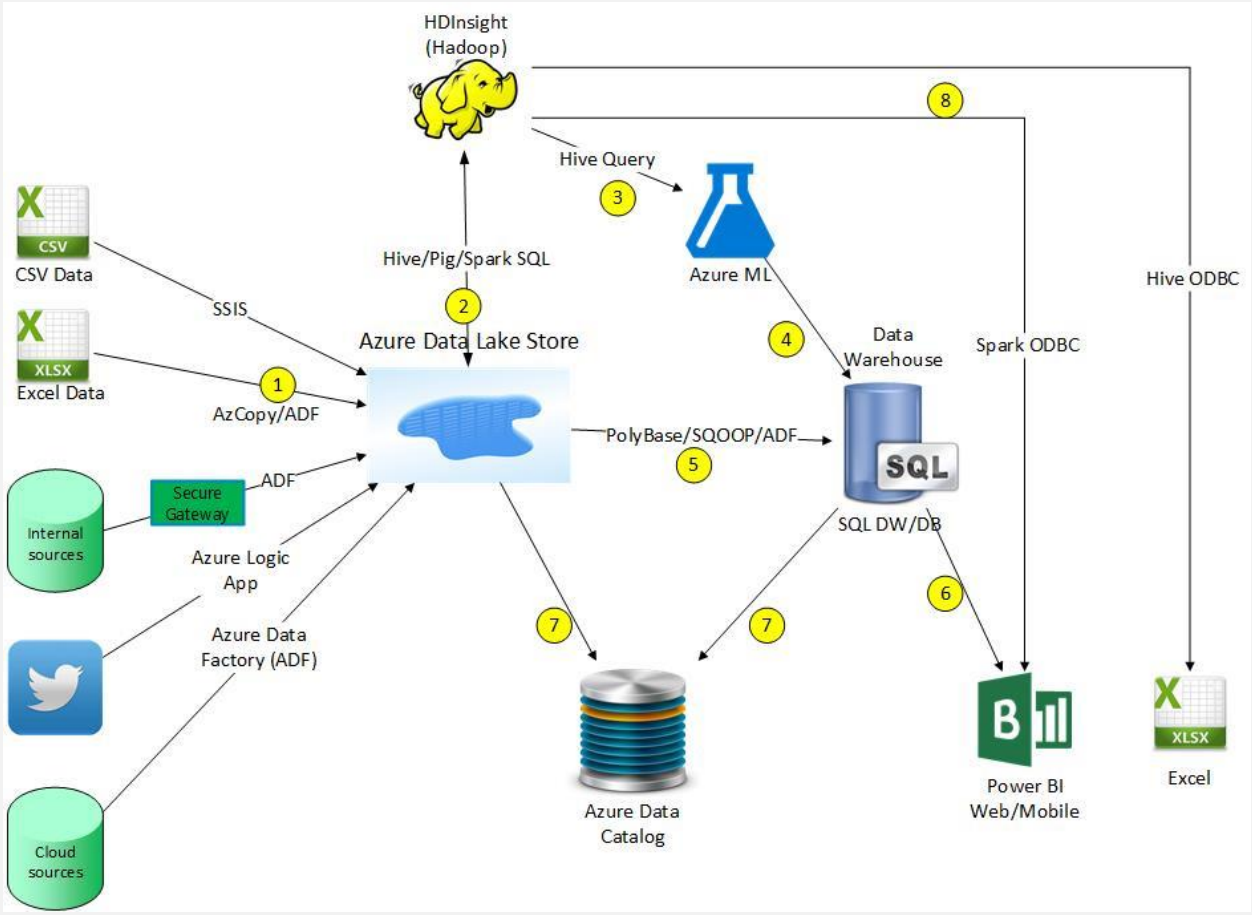
Data Lake Storage

- **Azure Data Lake includes all the facilities required to make it easy for data scientists, developers, and analysts to store data of any shape, size, and speed.**

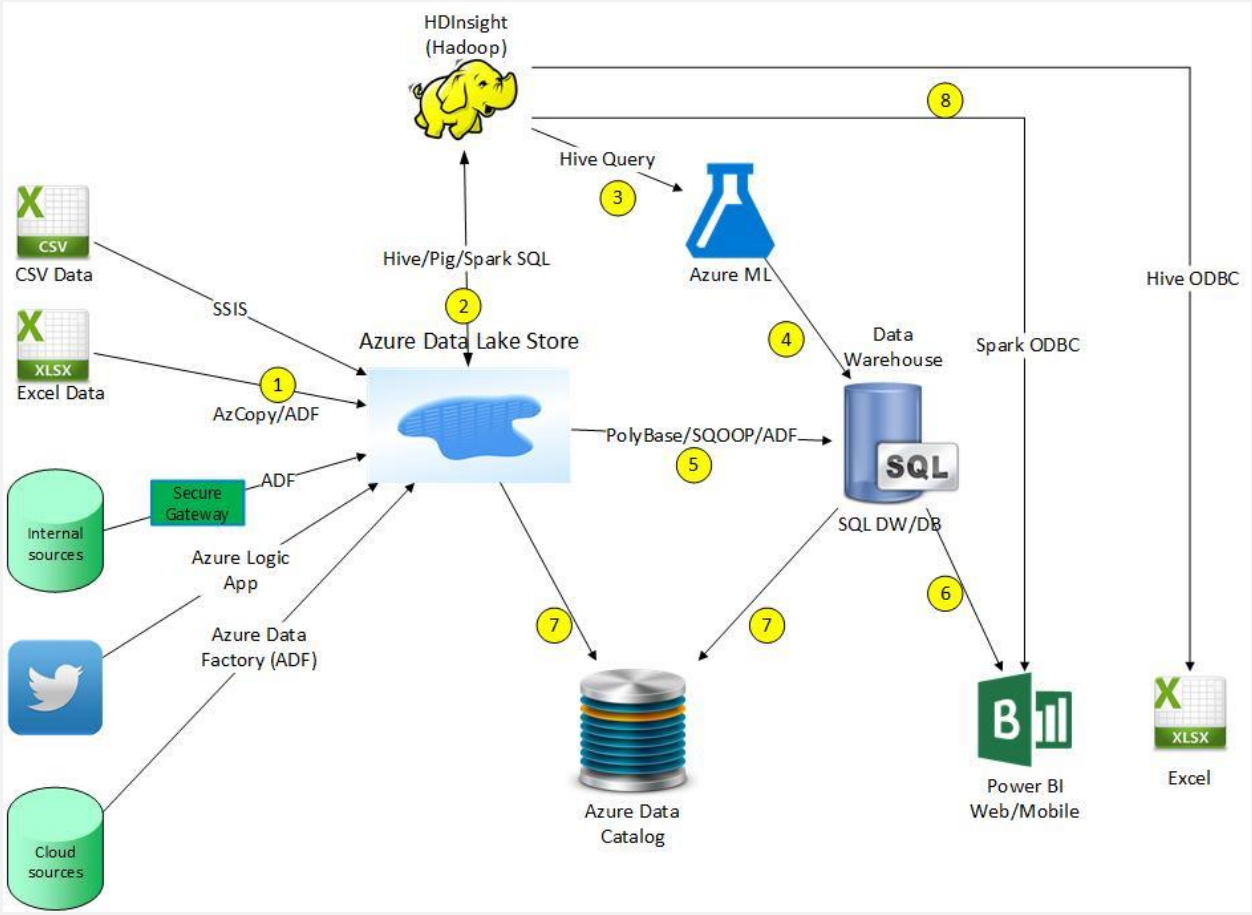
- **It does all types of analytics and processing across platforms and languages.**

- **It removes all the difficulties of ingesting and storing all of your data while making it faster to get up and running with streaming, batch, and interactive analytics.**

Data Lake Storage



Data Lake Storage



THANK YOU !!!

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