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BI against Azure Synapse<>PASS Analytics or Azure Analysis Services SQLSATURDAY

Choosing the right architecture.





Agenda

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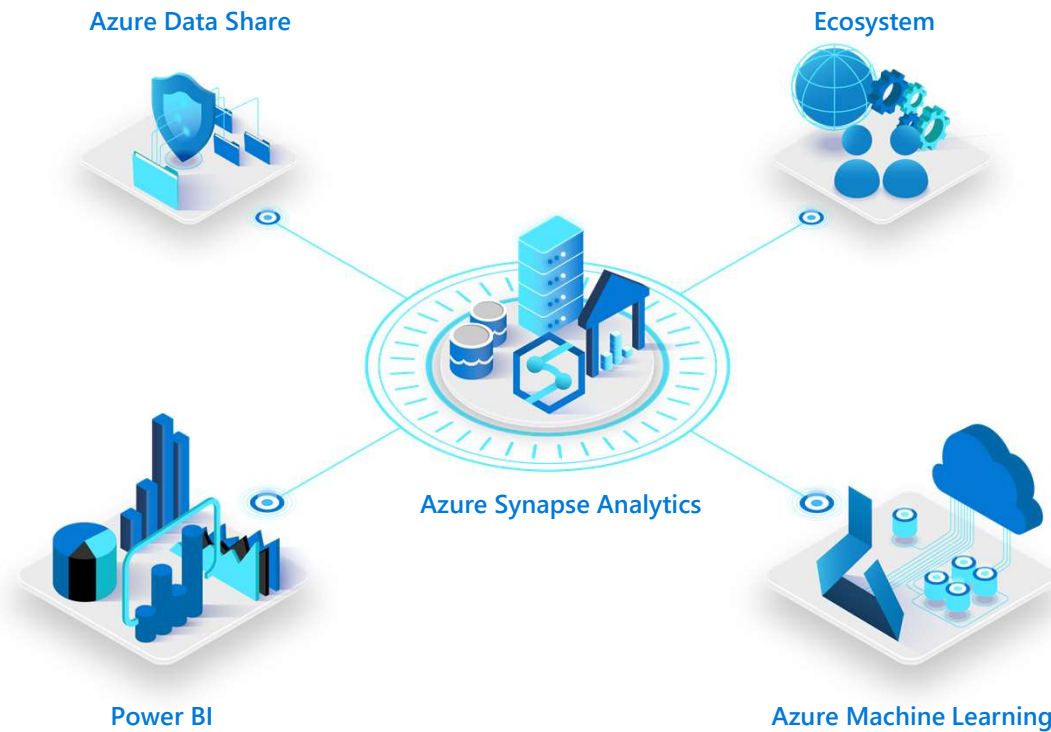
- Azure Synapse Analytics Fundamentals
- Azure Analysis Services Fundamentals
- Modern Data Warehouse Architecture
- When to choose Synapse Analytics
- When to choose Azure Analysis Services
- Let's Speculate on the future
- Q & A Session



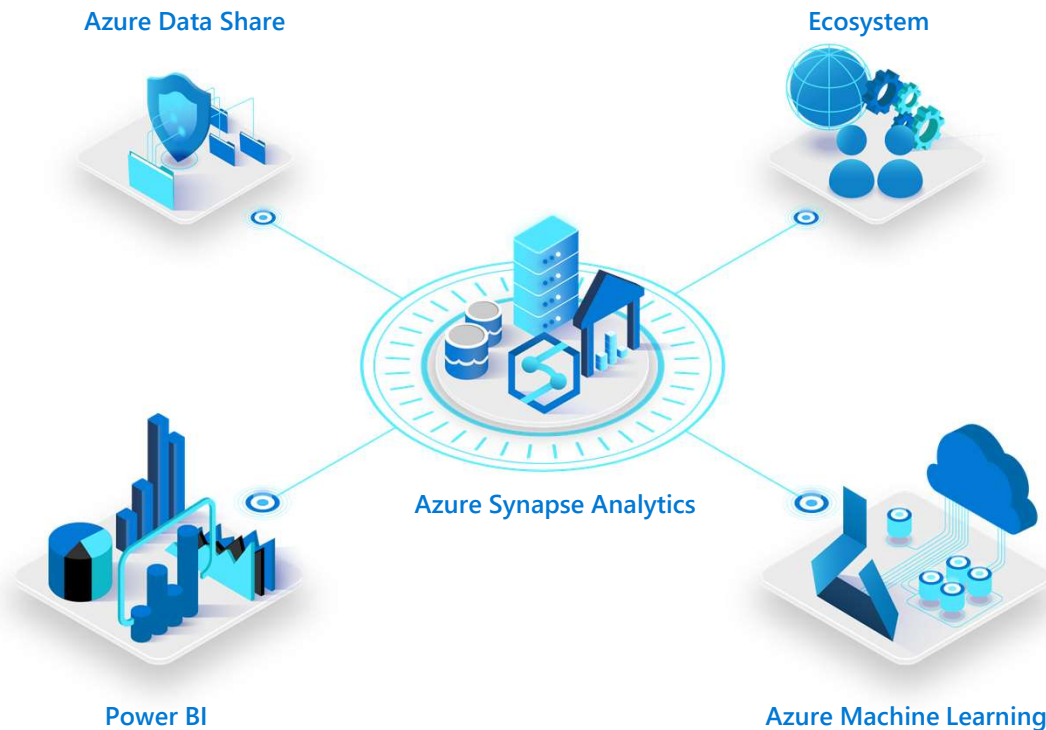
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Azure Synapse Analytics Fundamentals

Azure Synapse Analytics Fundamentals



Azure Synapse Analytics Fundamentals

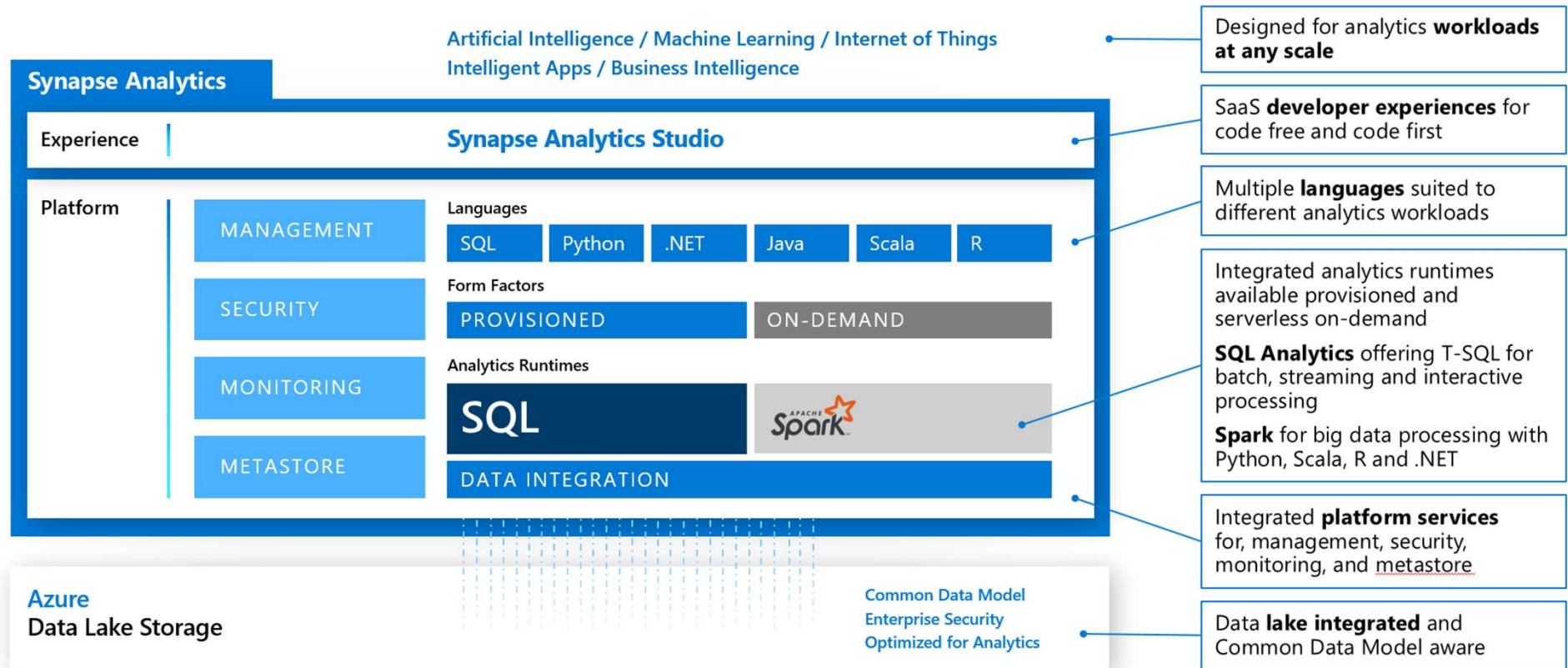


- SQL pool (pay per DWU provisioned) – (GA)
- SQL on-demand (pay per TB processed) – (Preview)
- Spark: Deeply integrated Apache Spark (Preview)
- Data Integration: Hybrid data integration (Preview)
- Studio: unified user experience. (Preview)



Azure Synapse Analytics Fundamentals

Limitless analytics service with unmatched time to insight



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Azure Synapse SQL Pool

Azure Synapse SQL Pool

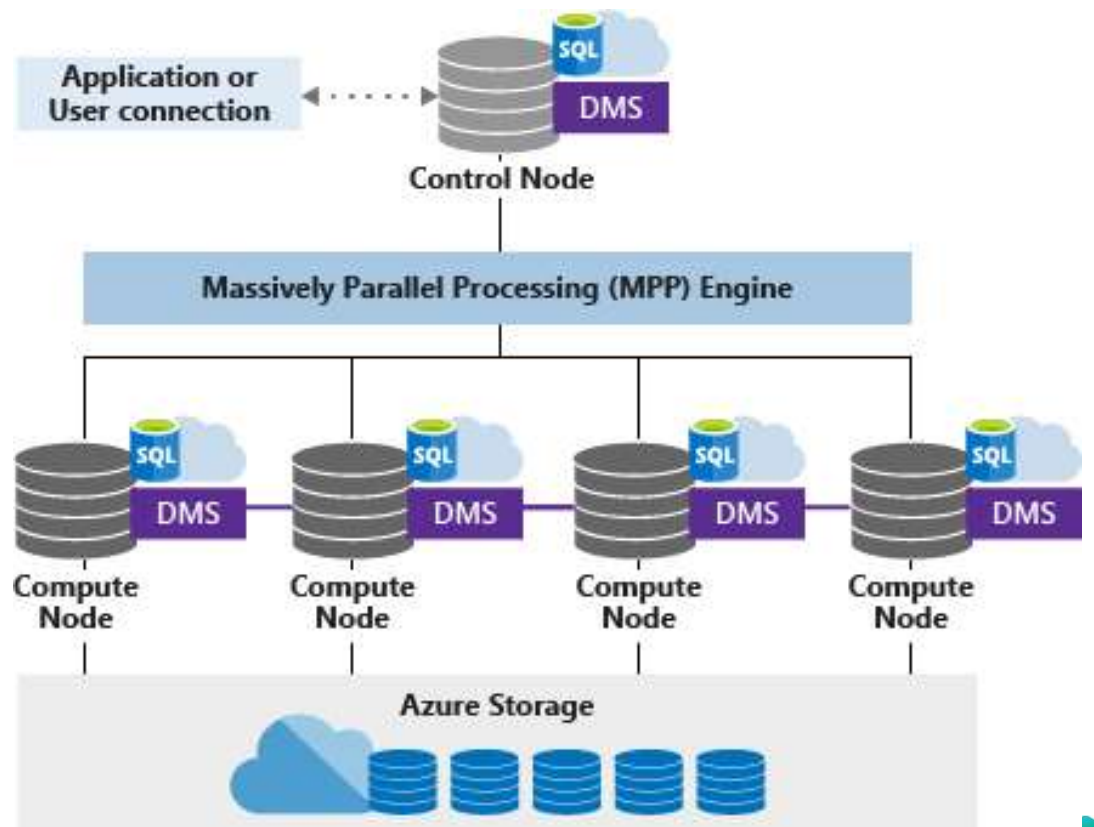


- A cloud iteration of APS (formerly PDW)
- A cloud-based Enterprise Data Warehouse (EDW) that uses Massively Parallel Processing (MPP)
- Allows running complex SQL across terabytes of data leveraging multiple nodes
- Accepts fast ingestion of data using Polybase
- With scalable compute and limitless storage



Azure Synapse SQL Pool

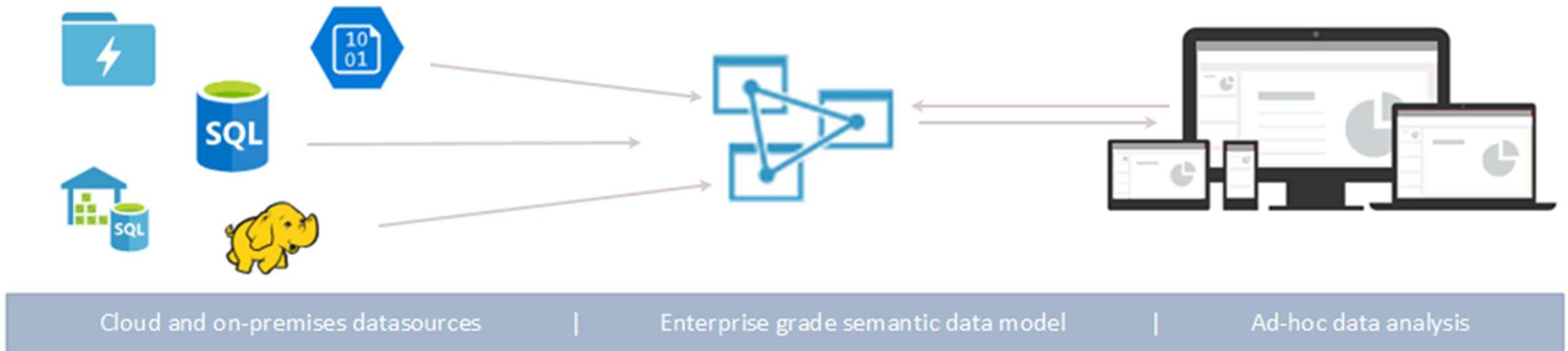
- Node based
 - Control Node
 - Compute Nodes
- Decoupled Storage
 - Distributed Datafiles
 - Blob Storage
 - Local NVMe caching



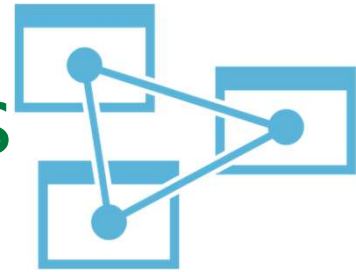
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Azure Analysis Services Fundamentals

Azure Analysis Services Fundamentals



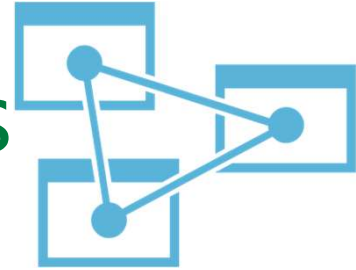
Azure Analysis Services Fundamentals



- Fully managed platform (PaaS)
- Provides enterprise-grade data models in the cloud
- Allows to combine data from multiple data sources
- Able to define metrics and aggregations
- Secure your data in a single, trusted tabular semantic data model
- Easier and faster way to browse massive amounts of data for ad-hoc data analysis



Azure Analysis Services Fundamentals



- Tiers
 - Developer (D1): 20 QPUs, 3 GBs, No Scale Out.
 - Basic (B1, B2): 40~80 QPUs, 10-16 GBs
 - Limited Concurrency, No Scale Out, For Smaller Tabular models
 - Standard Tier (S0~S9, S8v2*, S9v2*)
 - 40 ~ 1280 QPUs, 10 ~ 400 GBs
 - For mission-critical production applications
 - Elastic Concurrency
 - Advanced data refresh for near real-time data model updates
 - Supports all tabular modeling features



Azure Analysis Services Fundamentals

The screenshot displays the Microsoft Azure portal interface for configuring an Analysis Services instance. The breadcrumb navigation shows 'Home > awsales - Scale Out'. The left-hand navigation pane includes sections for 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'SCALE', and 'MODELS'. The 'Scale Out' option under the 'SCALE' section is highlighted with a red rectangle. The main content area shows the 'Scale Out' configuration for the 'awsales - Scale Out' instance. It features a 'Number of query replicas' slider set to 3 (with a maximum of 7) and a toggle for 'Separate the processing server from the querying pool' set to 'Yes'. The 'Save' button is visible at the top of the configuration area.

Microsoft Azure

Home > awsales - Scale Out

awsales - Scale Out
Analysis Services

Search (Ctrl+/)

Save Discard

Number of query replicas

3 (Maximum: 7)

Separate the processing server from the querying pool

No Yes

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

SCALE

Pricing Tier (Scale QPUs)

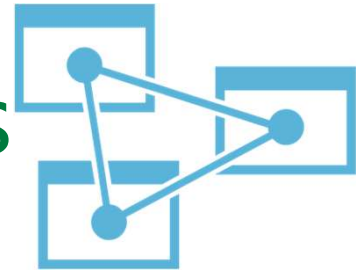
Scale Out

MODELS

Manage



Azure Analysis Services Fundamentals



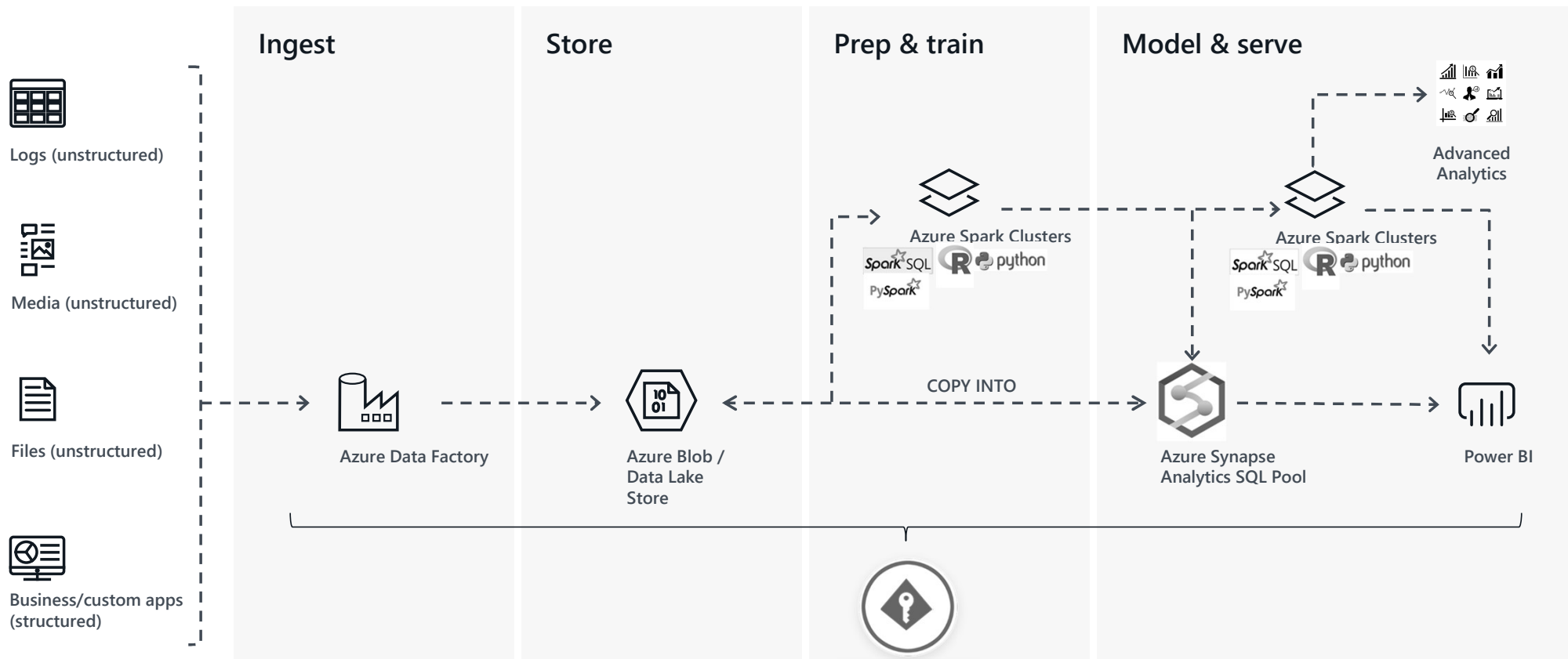
- Built on SQL Server Analysis Services
- Tabular models only. Version 1200 and up.
- Both in-memory and DirectQuery
- Calculated tables, DAX
- Partitions, perspectives, row-level security, bi-directional relationships, and translations are all supported



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Modern Data Warehouse

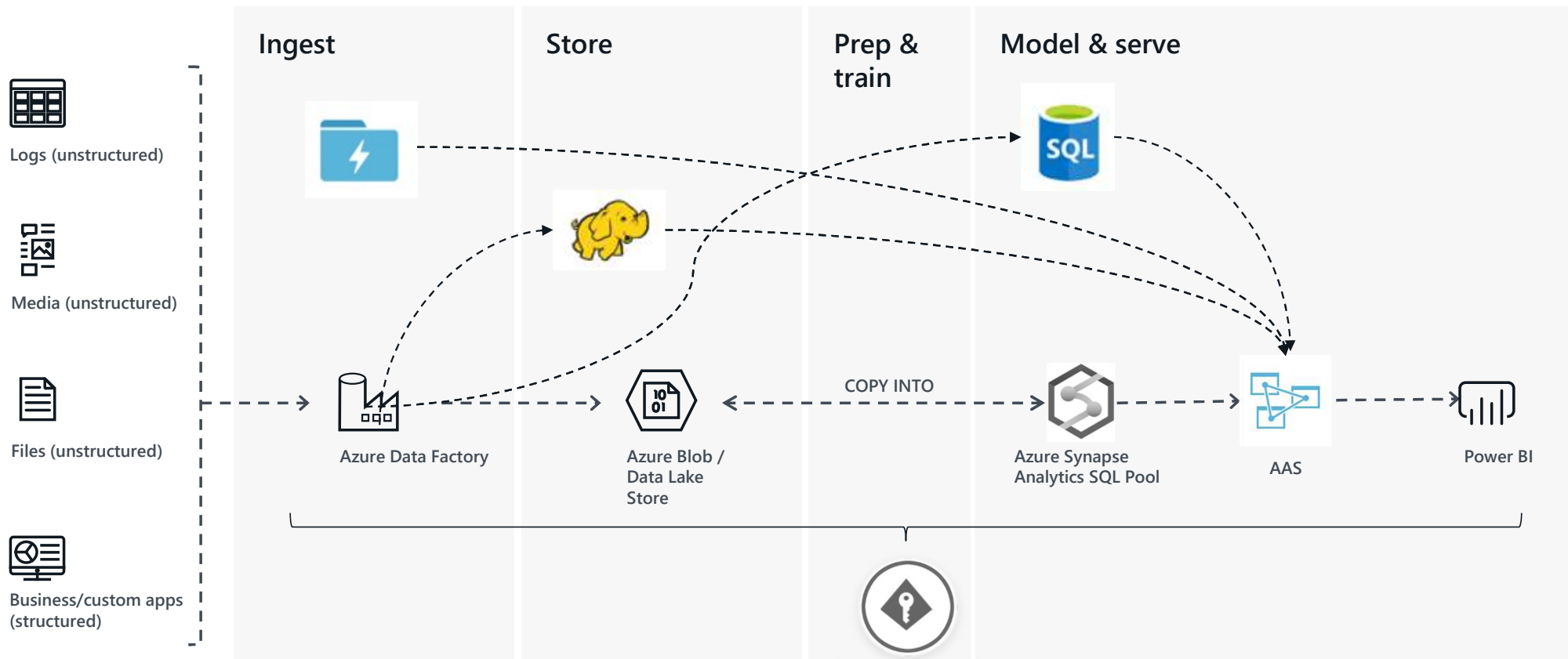
Modern Data Warehouse



Microsoft Azure also supports other Big Data services like Azure HDInsight and Azure Data Lake to allow customers to tailor the above architecture to meet their unique needs.




Modern DW & AAS



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When to Choose Synapse SQL Pool or Azure Analysis Services

When to Choose Synapse SQL Pool

- Multi-Terabyte to Petabyte Scale
- Very Complex Queries and Aggregations
- Data Mining, Data Exploration
- Complex ELT
- Low to mid concurrency (128 or less)
- Flexible Scalability with MPP power for CRUD
- True Data Warehouse / OLAP environment



When to Choose AAS

- Few TBs or less data (high compression data)
- Multiple sources that can correlate
- High Read Concurrency (thousands of users)
- Slice and Dice with DAX
- Rapid Dashboard development from Tabular
- When scaling Synapse SQL Pool to thousands of users



- Let's Speculate on the future
- Multi-Dimensional is dead
- Azure Synapse Ecosystem: on-demand, multi-source can skew AAS deployments
- AAS will continue to support on-premises tabular migrations
- DAX is not cross-solution compatible
- SQL, Python and R will supersede





References

- <https://docs.microsoft.com/en-us/azure/analysis-services/analysis-services-overview>
- <https://docs.microsoft.com/en-us/azure/sql-data-warehouse/massively-parallel-processing-mpp-architecture>
- <https://www.sspaeti.com/blog/olap-whats-coming-next/>

