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| --- | --- | --- | --- |
| **Overview** |  |  |  |
| **Feature** | **Azure Fabric** | **Azure Synapse Analytics** | **Azure Data Factory** |
| **Purpose** | End-to-end data and analytics platform | Data warehousing, big data processing, and analytics | Data integration and ETL/ELT |
| **Type** | SaaS (Software as a Service) | PaaS (Platform as a Service) | PaaS (Platform as a Service) |
| **Architecture** | Unified platform combining Synapse, Power BI, and Data Factory | Integrated data warehouse and big data processing | Focused on data movement and transformation |
| **Storage** | OneLake (centralized storage) | Data Lake + Dedicated Pool | External storage (Blob, ADLS, etc.) |
| **Compute Engine** | Synapse Spark + SQL-based compute + Power BI | Dedicated/Serverless SQL Pool + Spark Pool | No direct compute (uses integration runtimes) |
| **Release Date** | Public Preview (May 2023) | Released in 2019 | Released in 2015 |

Architecture & Components

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| --- | --- | --- | --- |
| **Feature** | **Azure Fabric** | **Azure Synapse Analytics** | **Azure Data Factory** |
| **Data Integration** | Built-in Data Factory pipelines | Pipelines and Data Flows | Focused on data integration and orchestration |
| **Data Storage** | OneLake (Delta Lake format) | Dedicated/Serverless SQL Pools | No direct storage (relies on external sources) |
| **Data Processing** | Spark, SQL Pools | Spark, SQL Pools | Data flow transformation |
| **Data Science** | Integrated ML models | Spark-based ML | No direct ML support |
| **BI Integration** | Native Power BI | Separate Power BI setup needed | No direct integration |
| **Real-Time Processing** | Yes (Event Hub + Data Activator) | Limited (via Stream Analytics) | Yes (via Event Hub) |

**Key Strengths**

**✅ Azure Fabric**

* Unified platform – combines data engineering, data science, and visualization.
* Direct integration with **One Lake** and **Power BI**.
* Support for **real-time data** with **Event Hub** and **Data Activator**.
* Centralized security and governance.

**✅ Azure Synapse**

* Powerful for **big data processing** and **complex analytical queries**.
* Strong support for **T-SQL** and **Spark-based processing**.
* Works well for structured data (Data Warehouse).

**✅ Azure Data Factory**

* Best for **ETL/ELT** (Extract, Transform, Load) and data integration.
* Large library of **connectors** to various sources (cloud + on-prem).
* Ideal for **data movement** and **orchestration**.

**Performance and Scalability**

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| --- | --- | --- | --- |
| **Aspect** | **Azure Fabric** | **Azure Synapse Analytics** | **Azure Data Factory** |
| **Scalability** | Horizontal scaling with Spark | Horizontal scaling with Synapse Pools | Scaling based on Integration Runtime |
| **Concurrency** | High | High | Medium |
| **Parallelism** | High | High | Medium |

**Use Cases**

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Azure Fabric** | **Azure Synapse** | **Azure Data Factory** |
| **Data Integration** | ✅ Built-in | ✅ Built-in | ✅ Core Strength |
| **Data Processing** | ✅ Spark and SQL-based | ✅ Spark and SQL-based | ✅ Data Flow and Mapping |
| **Data Science** | ✅ Built-in (Synapse + ML) | ✅ ML via Spark | ❌ No direct ML support |
| **Business Intelligence** | ✅ Native Power BI | ✅ Power BI integration | ❌ No direct support |
| **Data Warehousing** | ✅ Lakehouse + Warehouse | ✅ Dedicated Pools | ❌ No direct support |
| **Real-Time Processing** | ✅ Event Hub + Data Activator | ✅ Stream Analytics | ✅ Event-based Triggers |

**Security and Governance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **Azure Fabric** | **Azure Synapse Analytics** | **Azure Data Factory** |
| **Data Encryption** | Managed + Customer Keys | Managed + Customer Keys | Managed + Customer Keys |
| **Role-Based Access Control (RBAC)** | Unified through Fabric | Configured at Synapse level | Configured at ADF level |
| **Row-Level Security** | Yes | Yes | No |

**When to Use What?**

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| --- | --- | --- |
| **Scenario** | **Recommended Tool** | **Why?** |
| **End-to-end data solution** | Azure Fabric | Combines data integration, processing, warehousing, and BI |
| **Big data processing** | Azure Synapse Analytics | Spark-based processing + SQL pools |
| **Data movement and ETL/ELT** | Azure Data Factory | Strong integration and transformation capabilities |
| **Business Intelligence** | Azure Fabric | Native Power BI integration |
| **Data warehousing** | Azure Synapse Analytics / Fabric | Strong support for structured data |
| **Machine Learning** | Azure Fabric / Synapse | Built-in ML support in Spark |

|  |  |
| --- | --- |
| **Summary** |  |
|  |  |
| **Criteria** | **Best Tool** |
| **Data Integration & ETL/ELT** | Azure Data Factory |
| **Data Warehousing** | Azure Synapse Analytics |
| **Big Data Processing** | Azure Synapse (Spark) or Fabric |
| **Business Intelligence** | Azure Fabric |
| **Real-Time Data Processing** | Azure Fabric |
| **Unified Data Platform** | Azure Fabric |

When comparing **Microsoft Fabric**, **Azure Synapse Analytics**, and **Azure Data Factory**, understanding their pricing structures is crucial for effective budgeting and decision-making. Here's a detailed comparison:

**1. Microsoft Fabric**

**Pricing Model:**

* **Unified SaaS Offering:** Microsoft Fabric provides a comprehensive suite of data services under a single platform, simplifying the pricing model.
* **Capacity-Based Pricing:** Costs are determined based on the capacity units selected, which dictate the resources allocated for compute, storage, and other services.
* **Service Inclusions:** The unified pricing encompasses various services such as Data Factory, Synapse, Power BI, and OneLake, eliminating the need for separate billing for each service.

For detailed pricing information, refer to Microsoft's official pricing page.

[azure.microsoft.com](https://azure.microsoft.com/en-us/pricing/details/microsoft-fabric/?utm_source=chatgpt.com)

**2. Azure Synapse Analytics**

**Pricing Components:**

* **Data Integration:** Incorporates Azure Data Factory capabilities, with costs based on pipeline orchestration, data movement, and data flow activities.
* **Warehousing Data:** Pricing depends on the type of SQL pool:
  + **Dedicated SQL Pool:** Charges are based on Data Warehouse Units (DWUs) or vCores allocated.
  + **Serverless SQL Pool:** Costs are calculated per terabyte (TB) of data processed.
* **Data Processing:** Utilizes Spark pools, with pricing based on the number of nodes and their specifications.
* **Storage:** Charges apply for data stored in Azure Data Lake Storage (ADLS) or other linked storage solutions.

For a comprehensive breakdown, consult Microsoft's Synapse pricing details.

**3. Azure Data Factory (ADF)**

**Pricing Elements:**

* **Pipeline Orchestration:** Costs are based on the number of pipeline activities executed.
* **Data Movement:** Charges apply per Data Integration Unit (DIU) hour, influenced by the volume of data moved.
* **Data Flow Execution:** Pricing depends on the compute resources utilized during data transformation processes.
* **Integration Runtime:** Costs vary based on the type (Azure, Self-hosted, or SSIS) and the duration of usage.