# The Microsoft Fabric Technology stack

Microsoft Fabric offers a comprehensive technical stack for both Extract, Load, Transform (ELT) and reporting, tightly integrated into a unified platform. Here's a breakdown of the key components:

**For ELT (Extract, Load, Transform):**

1. **Data Factory:**
   * Provides a no-code/low-code environment for building data pipelines.
   * Offers a wide array of connectors to ingest data from diverse sources, including databases, SaaS applications, and files (both on-premises and in the cloud).
   * Facilitates data orchestration and scheduling of pipelines.
   * Integrates with Mapping Data Flows for visual data transformation without extensive coding.
2. **Data Engineering (Synapse Data Engineering):**
   * Offers a robust Apache Spark platform for large-scale data processing and transformation.
   * Supports various coding languages like Python (PySpark), Scala, and SQL.
   * Enables building and managing data lakes and data warehouses.
   * Integrates with Data Factory for orchestrating Spark notebooks and jobs.
3. **OneLake:**
   * Acts as a unified, multi-cloud data lake built into Fabric.
   * Eliminates data silos by providing a single place to store all organizational data.
   * Supports various data formats, including structured and unstructured data.
   * Uses Delta Lake format as the default, enabling ACID transactions and optimized storage.
   * Features like "shortcuts" allow virtualizing data from other storage locations without physical movement.
4. **Data Warehouse (Synapse Data Warehouse):**
   * Provides a scalable SQL-based data warehousing service.
   * Offers high-performance querying capabilities.
   * Separates compute and storage, allowing independent scaling.
   * Supports creating relational data models for structured data storage.
5. **Notebooks:**
   * Interactive environment for data exploration, transformation, and analysis using languages like Python, Scala, and SQL.
   * Ideal for custom transformations and advanced analytics.
   * Can be integrated into Data Factory pipelines for automated execution.
6. **Real-Time Intelligence:**
   * Facilitates ingestion, processing, and analysis of streaming data in real time.
   * Offers a Real-Time Hub with various no-code connectors for data streams.
   * Enables building real-time dashboards and triggering actions based on data patterns.
7. **Databases:**
   * Provides transactional database capabilities (like Azure SQL Database) within Fabric.
   * Supports mirroring data from various operational systems into OneLake for unified analysis.

**For Reporting:**

1. **Power BI:**
   * Serves as the primary business intelligence and visualization tool within Fabric.
   * Allows building interactive reports, dashboards, and visualizations.
   * Offers seamless connectivity to datasets within OneLake, Data Warehouses, and other Fabric components.
   * Integrates AI-powered features like Copilot for generating visuals and insights using natural language.
   * Supports Direct Lake mode for high-performance querying directly against the data lake.
   * Enables embedding reports within Microsoft 365 applications for broader accessibility.
2. **Semantic Models:**
   * Provide a business-friendly layer on top of the underlying data.
   * Define relationships, measures, and calculations for easier data consumption by reporting tools.
   * Enhance data governance and consistency across reports.
3. **Datamarts:**
   * Self-service data warehousing solution built on Power BI.
   * Allows users to perform their own data modeling and create curated datasets for reporting.
4. **Paginated Reports:**
   * Designed for creating formatted, multi-page reports suitable for printing or sharing.

**In summary, the MS Fabric technical stack for ELT and reporting provides a tightly integrated and comprehensive suite of services. Data can be ingested and transformed using Data Factory, Data Engineering, and Real-Time Intelligence, leveraging the unified storage of OneLake and the structured capabilities of the Data Warehouse. Power BI then connects to these processed datasets to deliver insightful and interactive reports and dashboards.**