**What is data migration?**

data migration refers to transforming data from one source, format, or storage environment to another is called data migration.

the goal of data migration is to that the remains accessible and usable during transitions, while minimizing the risk of data loss, corruption, or disruption to the business processes

**need for data migration:**

**Technology upgrades and replacements:** when an organization upgrades their software applications, databases, or IT infrastructure. Data migration is often required to ensure that the existing data is compatible with the new technology.

**data integration:** Merging multiple systems or databases into a single system is a common scenario. Data migration is needed to bring data from various sources into a unified platform.

**cloud adoption:** many organizations move their data to cloud for cost savings, disaster recovery,

fast scalability, better infrastructure, more security, and can retrieve the data quickly. Data migration is necessary to move data from on-premises to cloud.

**Business process changes:** if an organization changes its business processes data might be restructured or transformed to align with the new work flow

**Data Quality Improvement:** During data migration, organizations often take the opportunity to clean and improve data quality. This might involve data deduplication, standardization, and enrichment

**Data Archiving**: Organizations might move older or less frequently accessed data to archival storage systems. Data migration is involved in transitioning this data to a different storage tier.

**Data Replication and Distribution:** In scenarios where data needs to be replicated across different locations for redundancy or distributed for global access, data migration plays a role in ensuring data consistency.

**Data migration tools:**

Below are the some of data migration tools

* **Talend**
* **Azure data factory**
* **Informatica**
* **Aws glue**
* **Ibm infosphere data stage**
* **Talend cloud**
* **SSIS**
* **Azure synapse**

**What is data migration testing?**

Data migration testing is a crucial phase in the process of data migration, which involves transferring data from one system, storage, or format to another. The goal of data migration testing is to ensure that the data is accurately and completely transferred from the source to the target system while maintaining its integrity, consistency, and usability. This testing process helps identify and rectify any issues or discrepancies that might arise during the data migration process.

Key objectives of data migration testing include:

* **Data Accuracy:** Testing ensures that the data in the target system matches the data in the source system. This includes verifying that all records, fields, and values are accurately transferred.
* **Data Completeness:** Testing checks whether all the data from the source system has been migrated to the target system without any missing records or information.
* **Data Integrity:** The testing process verifies the integrity of data relationships and dependencies. For example, if there are foreign key relationships, these relationships should remain intact after migration.
* **Data Consistency:** Data migration testing ensures that data consistency is maintained across the entire dataset and that there are no anomalies or contradictions.
* **Data Transformation:** If data needs to be transformed during migration (e.g., changing data formats, units, or structures), testing ensures that transformations are applied accurately.
* **Data Validation:** Testing involves validating the migrated data against predefined rules, formats, and business logic to ensure that data meets quality standards.
* **Error Handling:** Testing verifies that error handling mechanisms are in place to address issues that might occur during migration, such as data mapping errors, validation failures, and data conflicts.
* **Performance:** Testing assesses the performance of the data migration process, including data extraction, transformation, and loading, to ensure it meets acceptable timeframes and resource utilization.

**Data migration testing tools:**

* **Validatar**
* **Collibra**
* **IDQ**
* **TALEND**
* **DBfit**
* **DATAMEER**
* **Data centric**
* **QUERY SURGE**
* **Informatica**

**Difference between ETL and ELT:**