MLflow is an **open-source platform** designed to manage the entire machine learning (ML) lifecycle. It streamlines the process of developing, deploying, and maintaining ML models by providing tools for experimentation, reproducibility, and collaboration.

Key Components of MLflow

1. **MLflow Tracking**:
   - Tracks experiments, including parameters, metrics, and artifacts.
   - Enables comparison of different ML runs.
   - Logs results to a central or local tracking server.
2. **MLflow Projects**:
   - Defines ML workflows with reusable and reproducible components.
   - Uses a standardized format to package code, dependencies, and execution instructions (e.g., `MLproject` files).
3. **MLflow Models**:
   - Standardizes model packaging so that models can be deployed across various platforms.
   - Supports multiple frameworks like TensorFlow, PyTorch, Scikit-learn, and XGBoost.
4. **MLflow Model Registry**:
   - A centralized repository to manage the lifecycle of ML models.
   - Supports versioning, stage transitions (e.g., Staging → Production), and metadata tracking.
5. **MLflow Deployment**:
   - Provides tools to deploy models to serving platforms (e.g., REST APIs, cloud services).
   - Integrates with tools like Docker, Kubernetes, and cloud providers.

Key Features

- **Experiment Tracking**: Logs parameters, metrics, code versions, and output files (e.g., models, datasets).
- **Reproducibility**: Enables consistent reproduction of experiments using logged data.
- **Scalability**: Works with local setups or large distributed environments.
- **Framework-Agnostic**: Supports most ML frameworks and tools.
- **Integration**: Integrates with cloud platforms like AWS, Azure, and Databricks.

Common Use Cases

1. **Experiment Management**: Tracking and comparing multiple ML experiments.
2. **Model Packaging**: Simplifying the deployment of ML models in different environments.
3. **Collaborative Development**: Teams can share results and models using MLflow's central tracking server.

4. **Model Deployment**: Serving models with minimal setup using its built-in deployment functionality.

MLflow is widely used in production-grade machine learning pipelines to streamline workflows and improve collaboration across teams.