AZURE TOPIC- MACHINE LEARNING

CLOUD COMPUTING-

Azure Machine Learning is a cloud service for accelerating and managing the machine learning (ML) project lifecycle. ML professionals, data scientists, and engineers can use it in their day-to-day workflows to train and deploy models and manage machine learning operations (MLOps).

You can create a model in Machine Learning or use a model built from an open-source platform, such as PyTorch, TensorFlow, or scikit-learn. MLOps tools help you monitor, retrain, and redeploy models..

Enterprise-readiness and security

Machine Learning integrates with the Azure cloud platform to add security to ML projects.

Security integrations include:

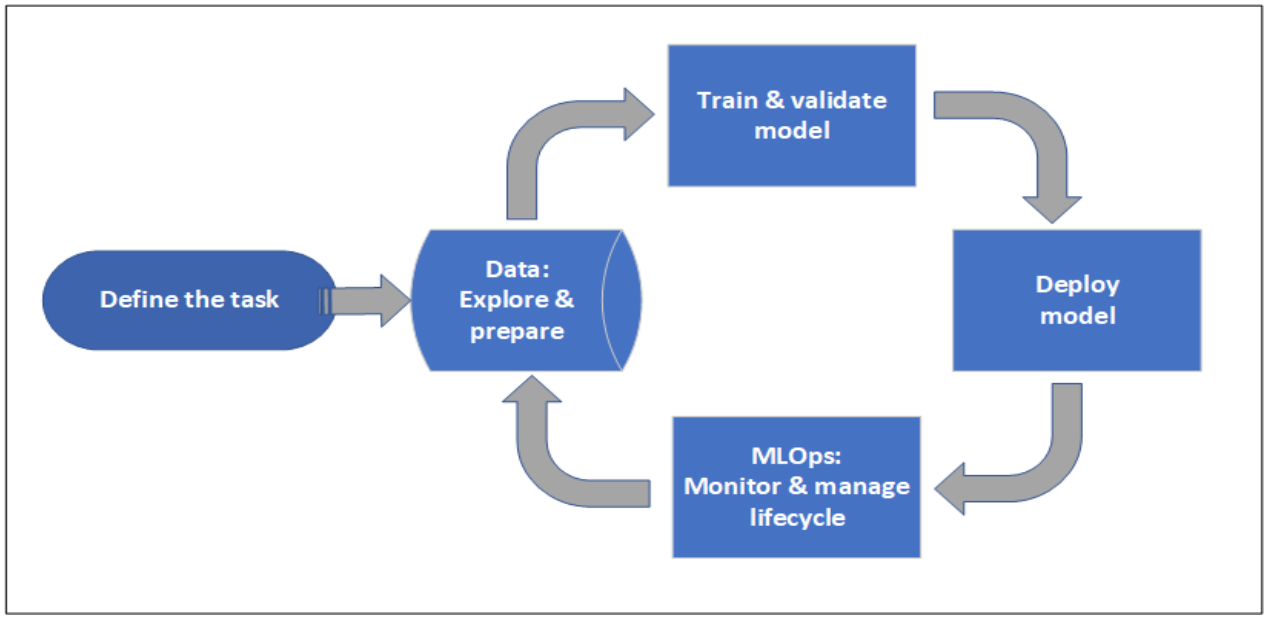
- Azure Virtual Networks with network security groups.
- Azure Key Vault, where you can save security secrets, such as access information for storage accounts.
- Azure Container Registry set up behind a virtual network.

Machine learning project workflow

Typically, models are developed as part of a project with an objective and goals. Projects often involve more than one person. When you experiment with data, algorithms, and models, development is iterative.

Project lifecycle

The project lifecycle can vary by project, but it often looks like this diagram.



A workspace organizes a project and allows for collaboration for many users all working toward a common objective. Users in a workspace can easily share the results of their runs from experimentation in the studio user interface. Or they can use versioned assets for jobs like environments and storage references.

When a project is ready for operationalization, users' work can be automated in an ML pipeline and triggered on a schedule or HTTPS request.

You can deploy models to the managed inferencing solution, for both real-time and batch deployments, abstracting away the infrastructure management typically required for deploying models.

Train models

In Azure Machine Learning, you can run your training script in the cloud or build a model from scratch. Customers often bring models they've built and trained in open-source frameworks so that they can operationalize them in the cloud.

Open and interoperable

Data scientists can use models in Azure Machine Learning that they've created in common Python frameworks, such as:

- PyTorch
- TensorFlow
- scikit-learn

- XGBoost
- LightGBM

Other languages and frameworks are also supported:

- R
- .NET

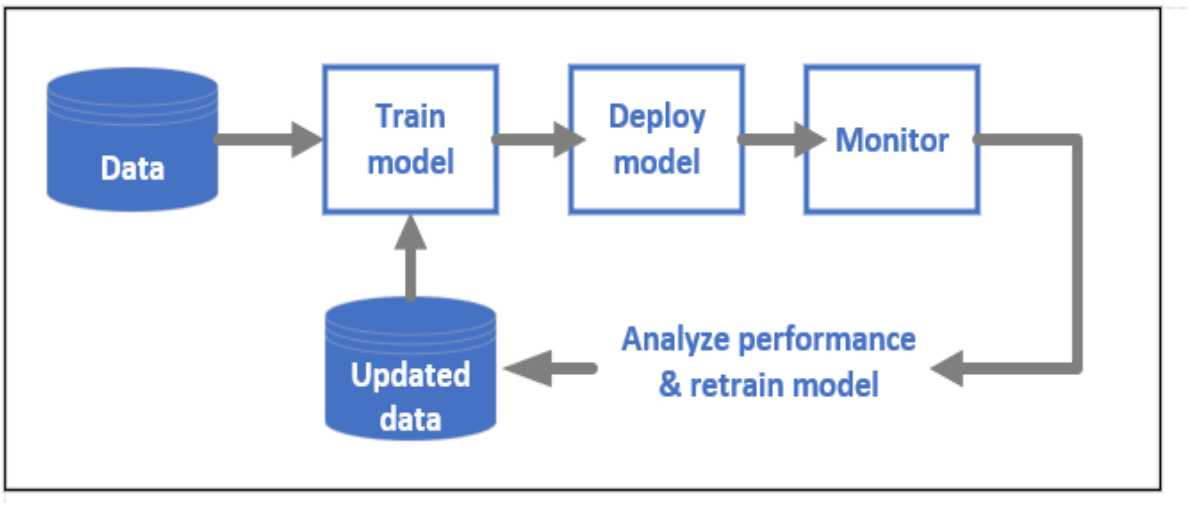
Deploy models

To bring a model into production, you deploy the model. The Azure Machine Learning managed endpoints abstract the required infrastructure for both batch or real-time (online) model scoring (inferencing).

MLOps:DevOps for machine leraning

DevOps for ML models, often called MLOps, is a process for developing models for production. A model's lifecycle from training to deployment must be auditable if not reproducible.

ML model lifecycle



Some key features enabling MLOps include:

- git integration.
- MLflow integration.

- Machine learning pipeline scheduling.
- Azure Event Grid integration for custom triggers.
- Ease of use with CI/CD tools like GitHub Actions or Azure DevOps.