Microsoft

Introduction to AI and AI on Azure

Agenda

- Introduction to AI
- AI on Azure
- Get started with Azure AI services
- Using Azure AI Services for enterprise applications

Introduction to AI and Azure AI services

Learning Objectives

After completing this module, you will be able to:

1. Describe artificial intelligence and how it compares to machine learning and data science.

2. Describe Azure AI services.

What is Artificial Intelligence?

Software that exhibits human-like capabilities, such as:

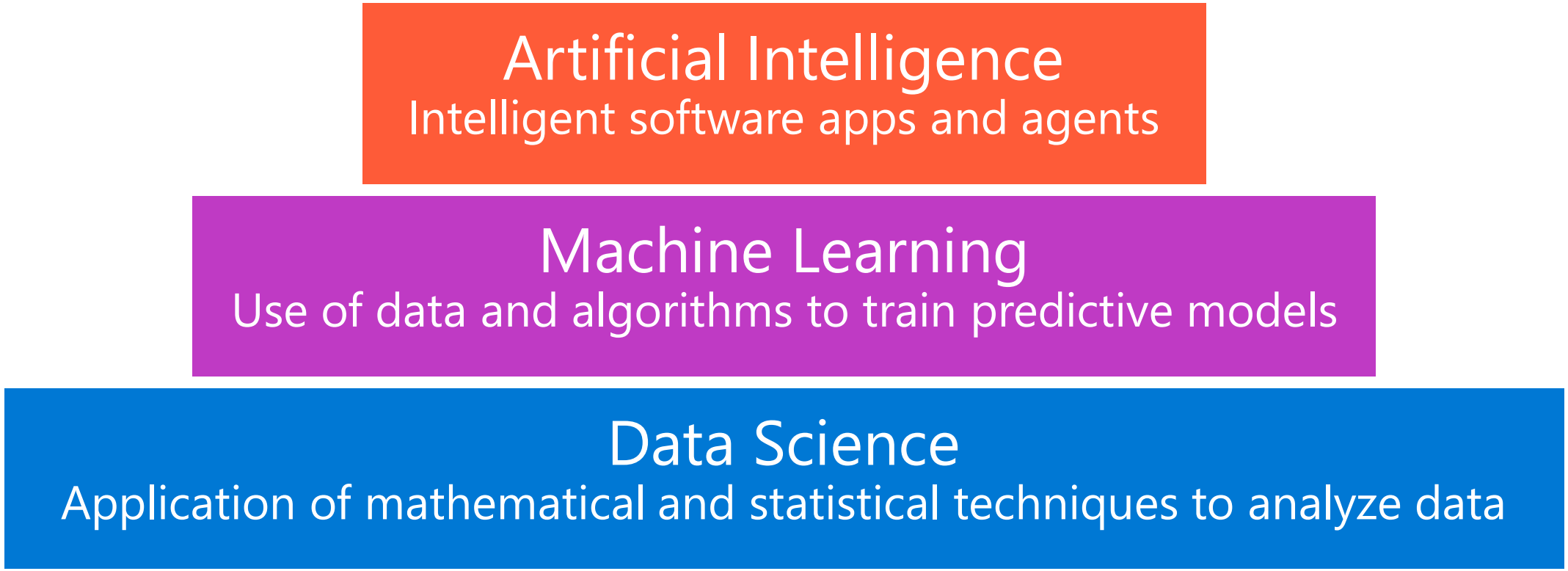
Visual Perception

Text Analysis

Conversation

Decision Making

Data Science, Machine Learning, and AI



AI for Software Engineers

Software Development Skills

- Coding (C#, Python, Node.js, …)
- Consuming APIs (REST or SDKs)
- DevOps (source control, CI/CD)

Conceptual AI Understanding

- Model training and inferencing
- Probability and confidence scores
- Responsible AI and ethics

Considerations for Responsible AI

Fairness

Reliability & Safety

Privacy & Security

Inclusiveness

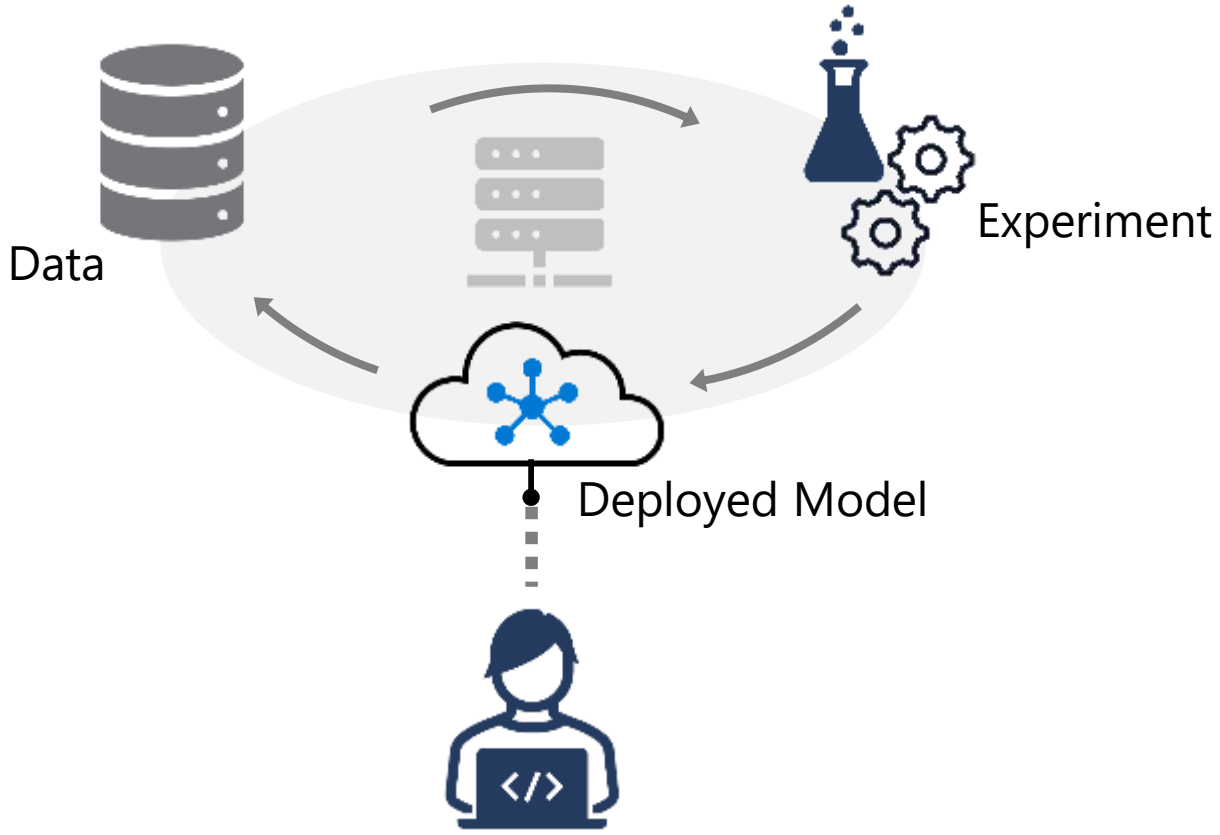
Transparency

Accountability

https://www.microsoft.com/ai/responsible-ai

Azure Machine Learning

Cloud platform for creating and operating machine learning solutions



Azure AI Services

Prepackaged AI services you can integrate into solutions

Capabilities include:

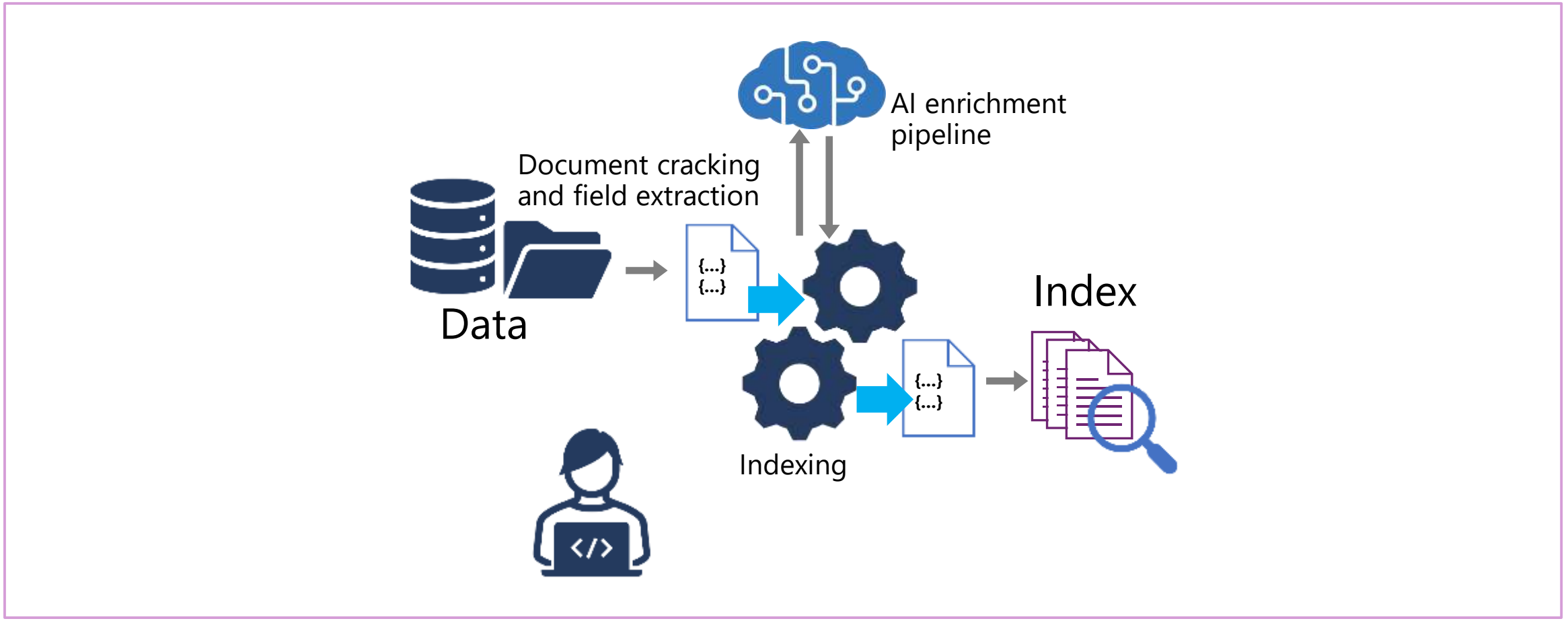
Language	Speech	Vision	Generative
• Text analysis • Question answering • Language understanding • Translation	• Speech recognition • Speech synthesis • Speech Translation • Speaker Recognition	• Image and video analysis • Image classification • Object detection • Optical character recognition	• Generate text completions • Image generation

Azure AI Services

- Azure AI Document Intelligence
- Azure AI Language
- Azure AI Vision
- Azure OpenAI
- Azure AI Search

Azure AI Search

AI-enriched indexing for search and knowledge mining



Get Started with Azure AI services

Learning Objectives

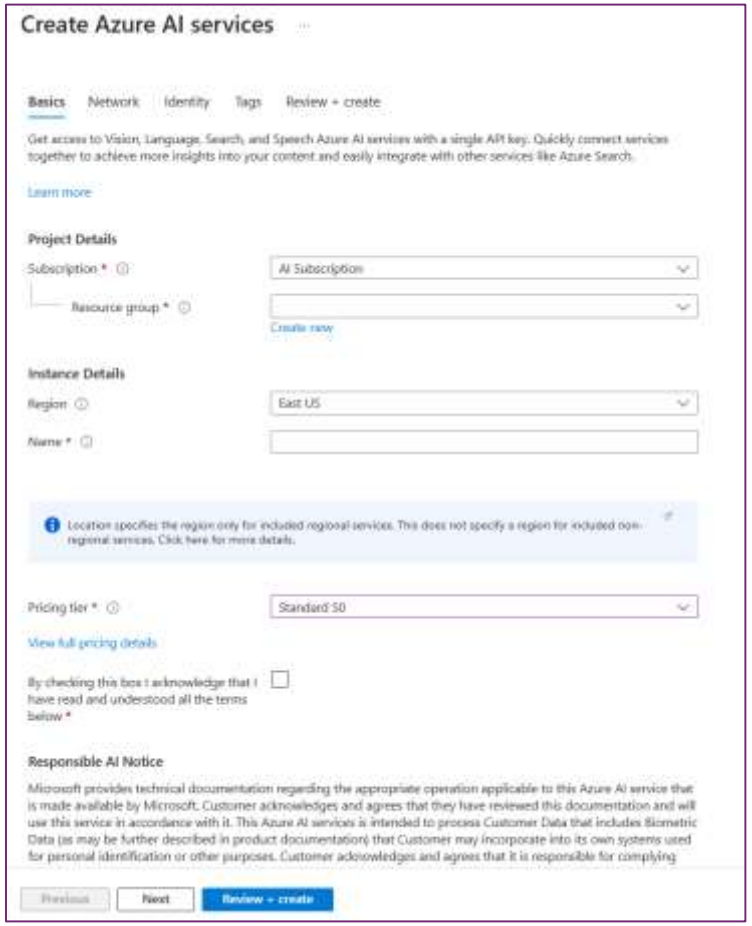
After completing this module, you will be able to:

1. Understand Azure AI APIs.
2. Create and consume Azure AI services resources.

Provisioning Azure AI Services resources

Create a resource in your Azure subscription

- You will create either a *single-service* resource or a *multi-service* resource:
- Multi-service resource **(Azure AI Services):**
  - Access multiple Azure AI Services with a single key and endpoint.
  - Consolidates billing from the services you use.
- Single-service resource (for example, **Language):**
  - Access a single Azure AI service with a unique key and endpoint for each service created.
  - Use the free tier to try out the service.



Endpoints, Keys, and Locations

Information required to connect

Endpoint:

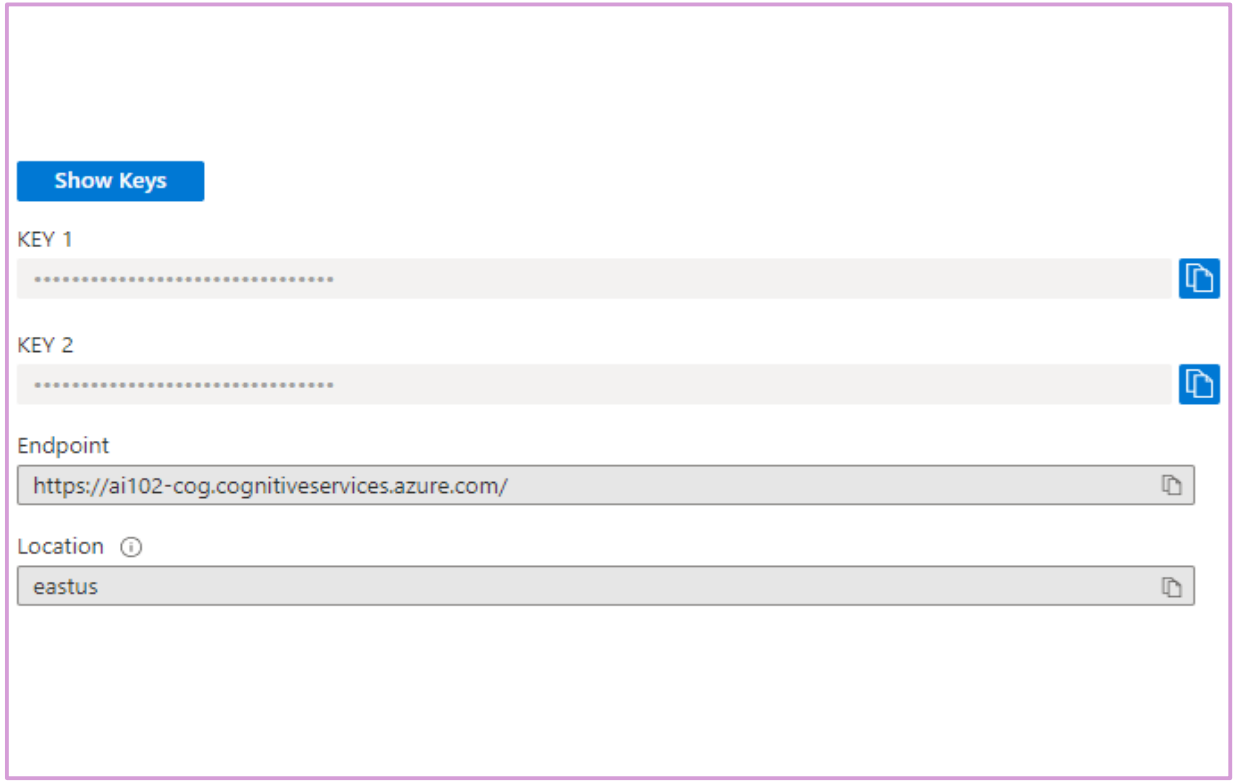
- URL at which service can be consumed
- Required by *most* SDK clients

Keys:

- Use *either* key to authenticate

Location:

- Azure data center in which resource is provisioned
- Required by *some* SDK clients

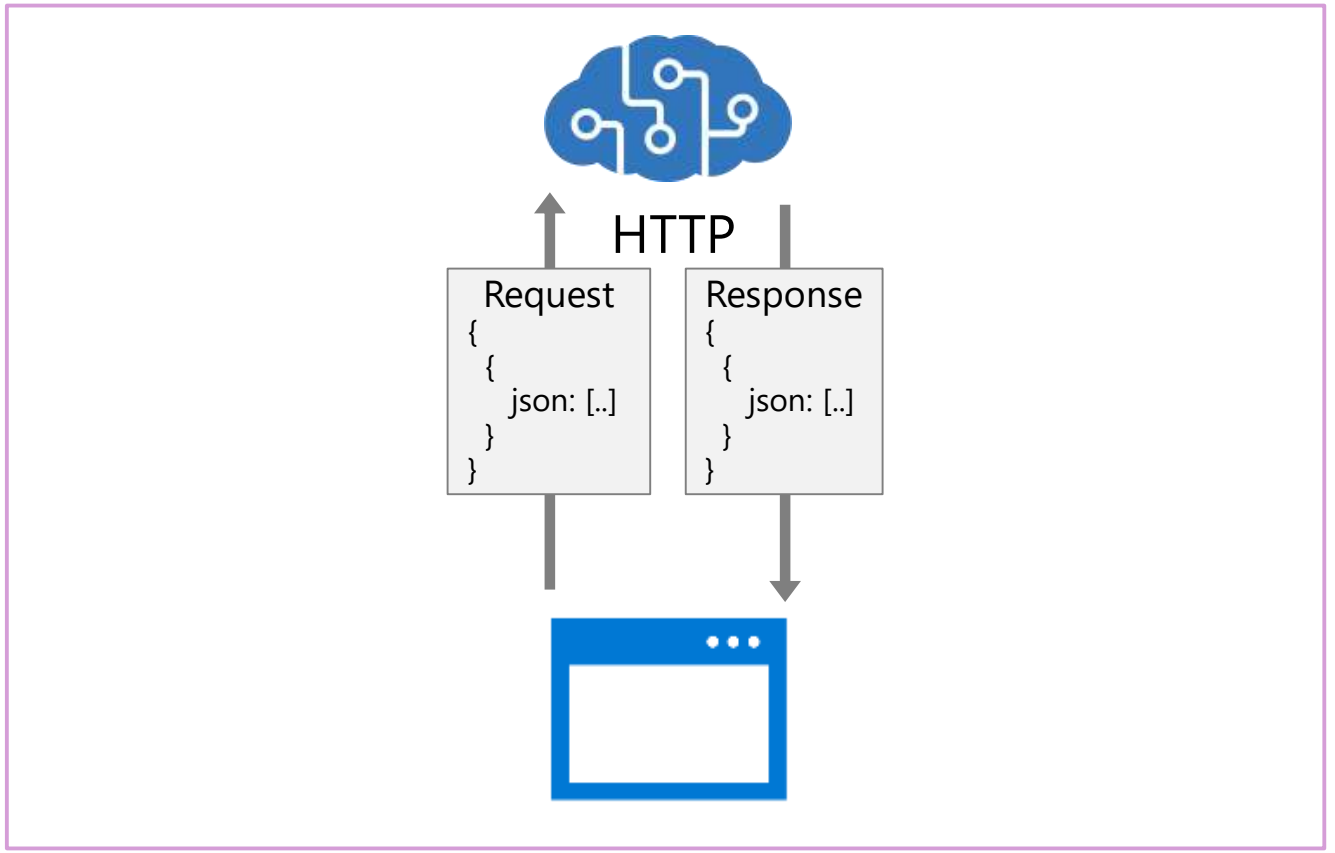


Azure AI Services REST APIs

Clients submit HTTP requests to the resource endpoint

- Key specified in request header
- Input data in JSON format
- Specific schema varies by service and method

Service returns JSON response

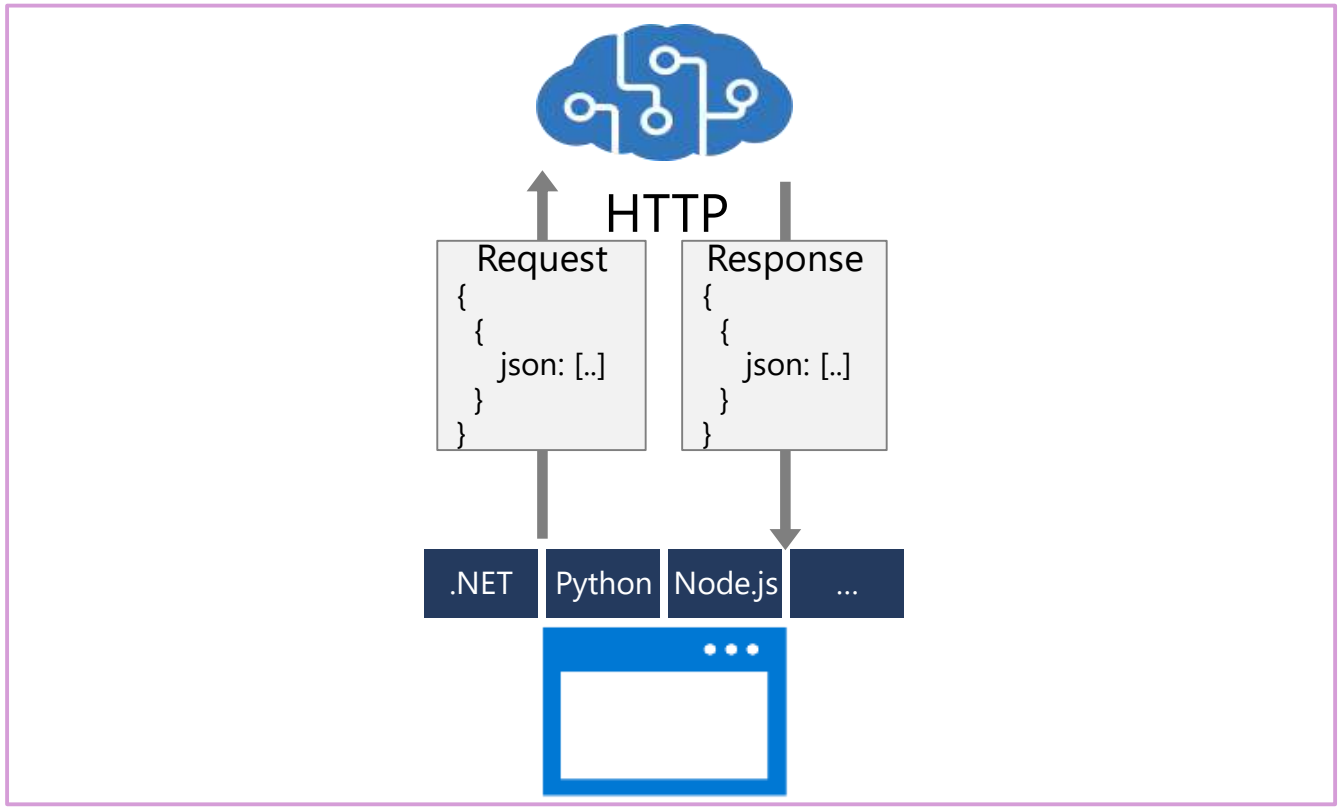


Azure AI Services SDKs

Runtime library abstracts REST interface

Multiple SDKs for each service:

- .NET
- Python
- Node.js
- Java
- Others…



Using Azure AI Services for enterprise applications

Learning Objectives

After completing this module, you will be able to:

1. Consider and manage authentication and network security for Azure AI services.
2. Manage costs, view metrics, and manage alerts and diagnostic logging.
3. Deploy to secure containers and consume Azure AI services from containers.

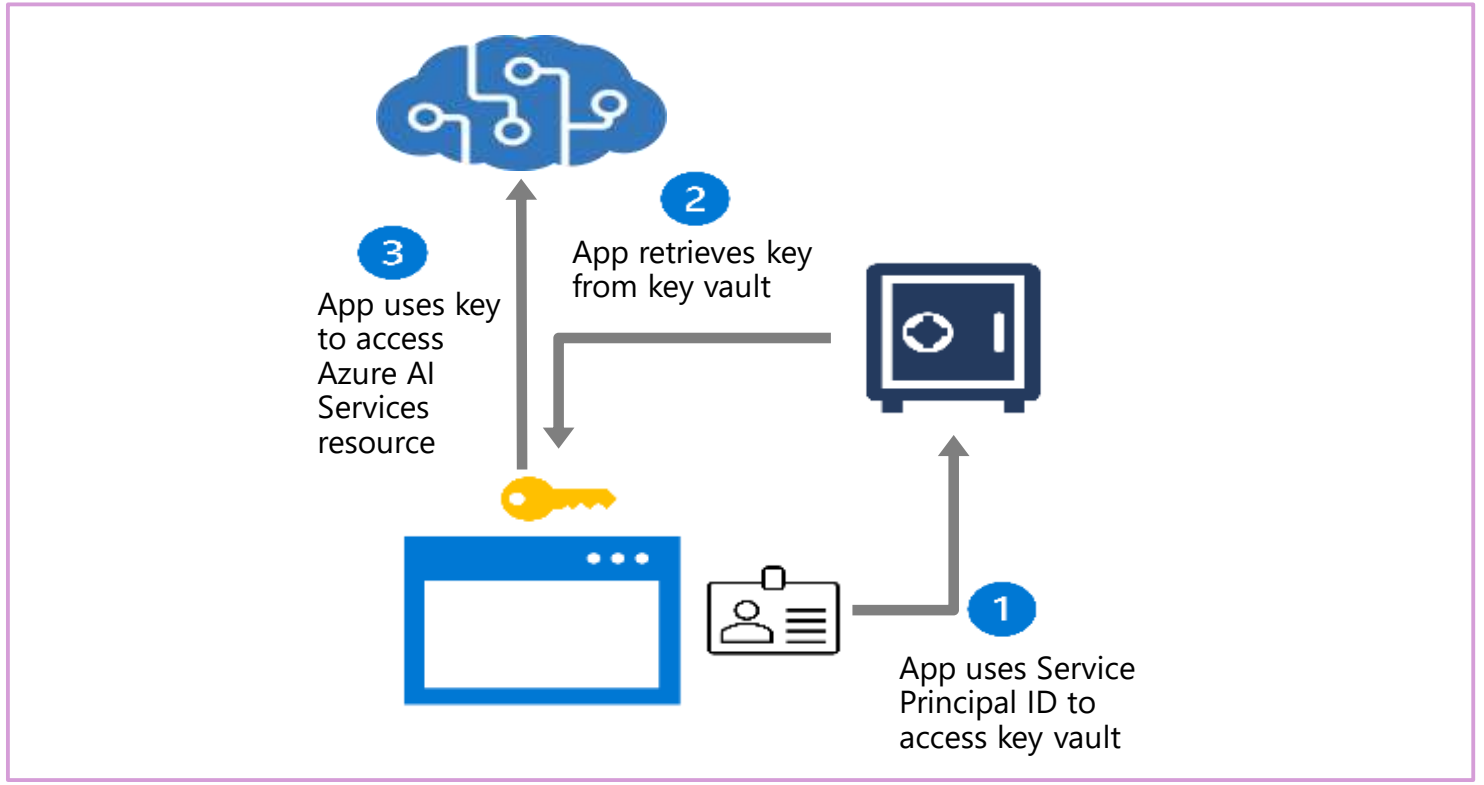
Considerations for Azure AI Services security

Regenerate keys regularly to protect access

- To avoid service interruption, switch apps to use key 2 before regenerating key 1; and vice-versa

Consider protecting keys by storing them in Azure Key Vault

- Apps can use a Service Principal as a managed identity to retrieve keys from Key Vault



Monitoring Azure AI Services Activity

Alerts

- Alerts will ensure that the correct team knows when a problem arises.
- Every alert or notification available in Azure Monitor is the product of a rule

Metrics

- Metrics are numerical values
- The metrics are collected at regular intervals and are useful for alerting.
- Metrics are stored in a time-series database.

Diagnostic settings

- Configure diagnostic settings is to provide detailed information for diagnostics and auditing.
- Diagnostic Destinations:
  - Log Analytics Workspace
  - Event Hubs
  - Azure Storage

Logs

- Logs contain time-stamped information about changes made to resources.
- The log data is organized into record
- The logs can include numeric values, but most include text data
- The most common type of log entry records an event

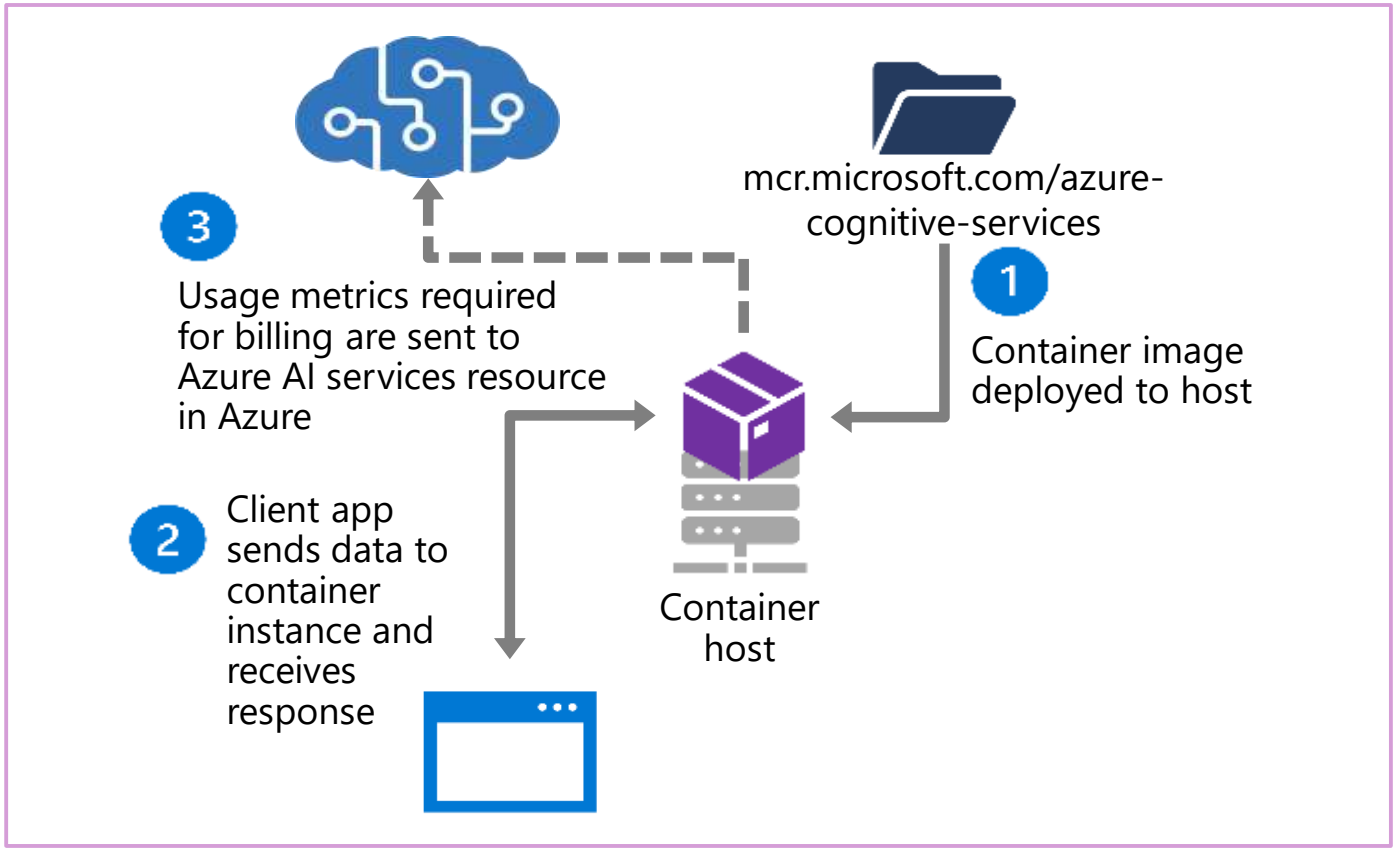
Azure AI Services and Containers

Container images are available for commonly used Azure AI services APIs

- Deploy containers to:
- Local Docker hosts
- Azure Container Instances
- Azure Kubernetes Services clusters
- others…

Enables more control over data sent to public Azure AI service endpoint

- An Azure AI services resource is still required, and the container must communicate with it to send billing data



Learning Path Recap

In this learning path, we:

Described artificial intelligence and how it compares to machine learning and data science.

Described Azure AI services.

Understood how to get started with Azure AI services

Understood how to use Azure AI Services for enterprise applications