



Microsoft Foundry Part 1

CSCI E-94

Fundamentals of Cloud Computing - Azure

Joseph Ficara

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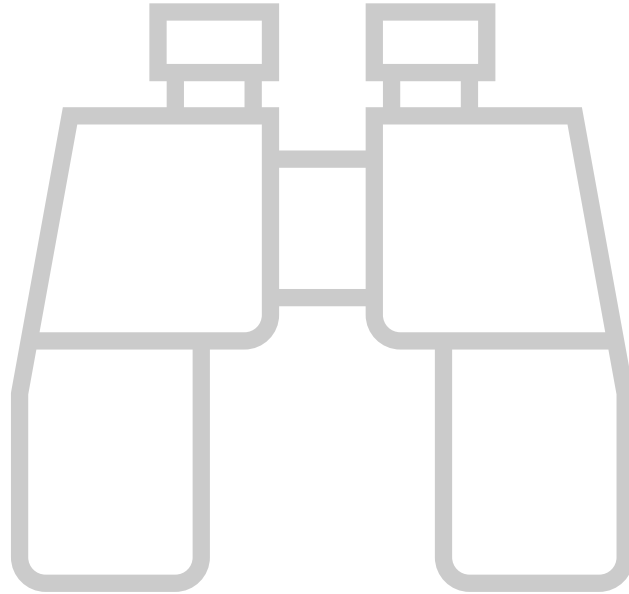


Agenda

- Microsoft Foundry
 - Overview
 - What is it?
 - Why do you care?
 - Essentials
 - Configuring in Azure
 - Simple Chatbot
 - Structured Output JSON



Overview





Microsoft Foundry - Overview

- What is it?
 - Unified AI Platform
 - End-to-end AI development
 - Low-code/no-code prompt flow workflows
 - SDKs
- Experimentation & Deployment
 - Test ideas in the playground
 - Deploy to the cloud

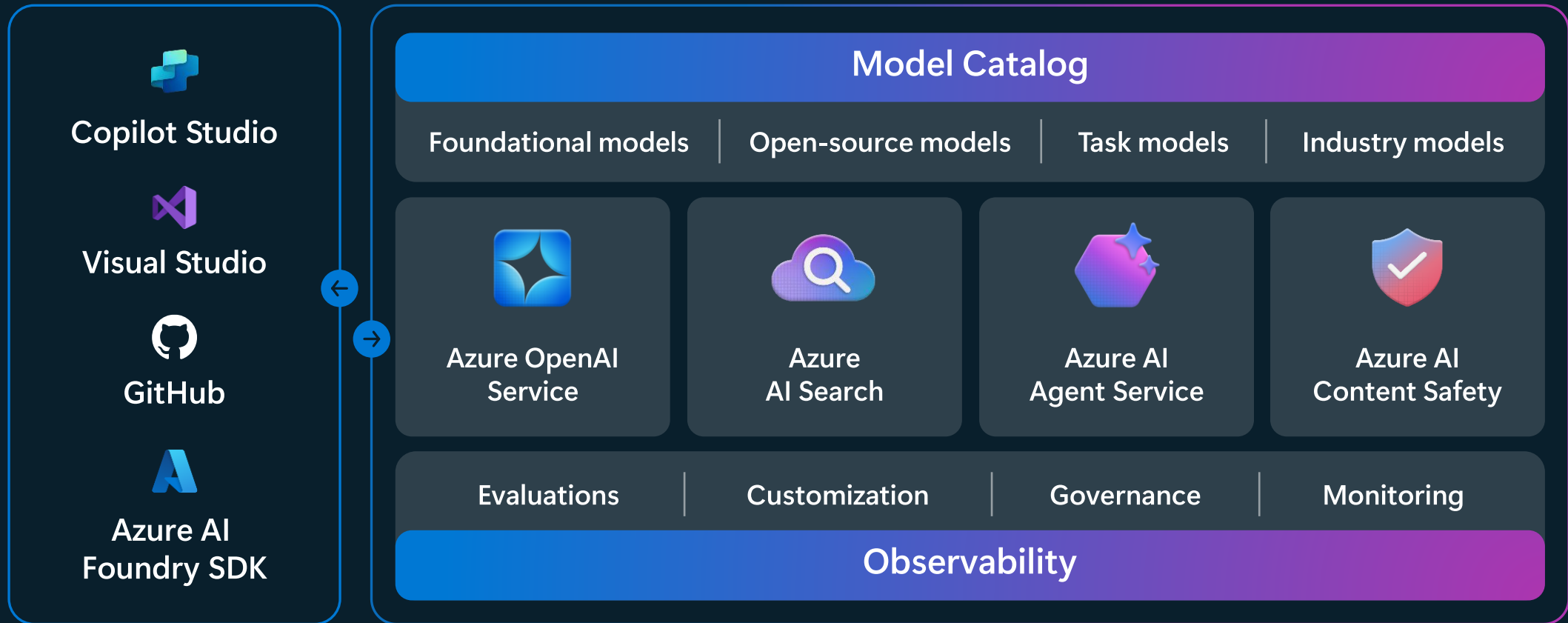


Microsoft Foundry - Overview

- Why do you care?
 - Accelerate development of AI powered solutions
 - Highly available infrastructure
 - One stop place to organize, manage and maintain
 - Your Azure based AI solutions



Microsoft Foundry Overview





Microsoft Foundry - Overview

What is it

- Collaborative Project Management
 - Projects
 - Manage containers, resources, connectivity and security
- Integration with Azure Services
 - AI services
 - Azure Storage
 - Databases



Microsoft Foundry Overview

Open and Modular Platform

New Collaborations

accenture

gretel

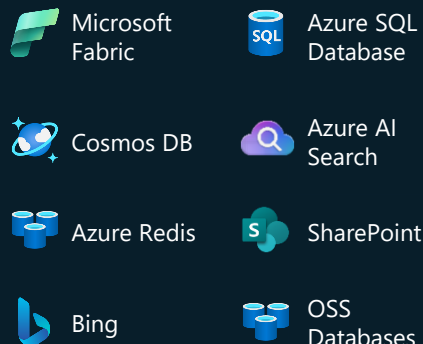
KPMG

scale

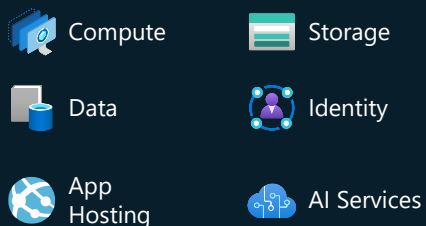
STATSIG

Weights & Biases

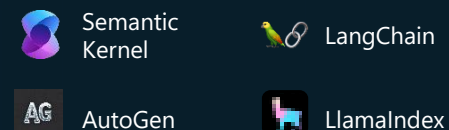
Ingest data



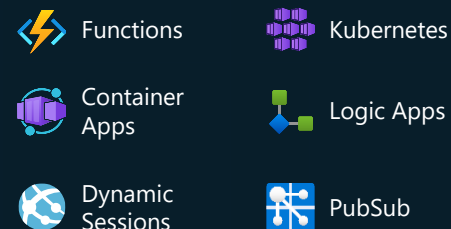
Provision cloud resources



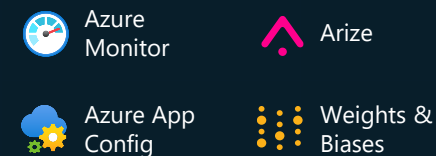
Orchestrate with OSS frameworks



Leverage Azure App Services



Monitor in production



Microsoft
Copilot Studio

Microsoft
Power Platform

Azure AI
Foundry portal

Azure Machine
Learning

GitHub
Enterprise

Visual
Studio Code

Azure
DevOps

Microsoft
Azure Portal



Microsoft Foundry - Overview

- Diverse AI models
 - Over 11,000 models
 - Anthropic Claude
 - DeepSeek
 - Grok
 - Hugging Face
 - OpenAI
 - Microsoft
 - Mistral
 - Other open source and public models



Microsoft Foundry Overview

Support for diverse selection of models

Now 11,299 + Frontier, task, and Open Models



OpenAI
Model Family
(available day 1)



Phi SLM
Model Family



Mistral AI
Model Family



Meta Llama 2
Model Family



Jais G42
Model Family



Cohere
Model Family



Databricks
Model Family



Hugging Face
Collection

New

 NTT DATA

New



New

Industry
AI Models



Microsoft Foundry - Overview

What is it

- Responsible AI
 - Content Safety
 - Input & Output filters
 - Safety validation



Microsoft Foundry Overview

Azure AI Content Safety



**Harm
categories**



**Groundedness
detection**



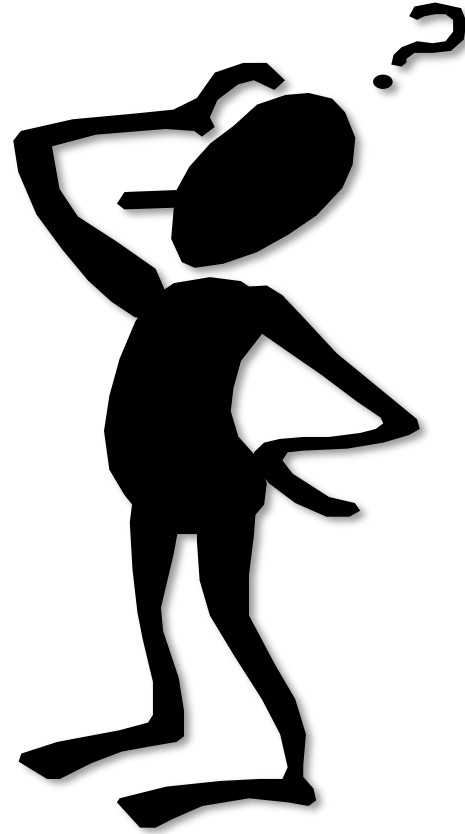
**Prompt
shields**



**Protected
material
detection**



Microsoft Foundry - Overview





Creating a Foundry Resource

- First register the **microsoft.insights** resource provider

Azure services

Create a resource Subscriptions Foundry

Home > Subscriptions >

Subscriptions

Joe Ficara Demo Student 2026 (jficara2026.onmicrosoft.com)

+ Add Manage Policies View Requests View eligible subscriptions Export to CSV

Global administrators can manage all subscriptions in this list by updating their policy setting [here](#).

Showing subscriptions in Joe Ficara Demo Student 2026 directory. Don't see a subscription? [Switch director](#)

Search for any field...

Subscriptions : All (1 of 1) My role == all Status == all

Subscription name ↑↓	Subscription ID ↑↓
2026-Lab_Joe_Ficara Demo Student	2c68c4de-565b-47a2-aa40-70232287ff32

2026-Lab_Joe_Ficara Demo Student | Resource providers

Subscription

Search

Re-register Unregister Refresh Feedback

Filter by name... Status: All Registration Policy: All

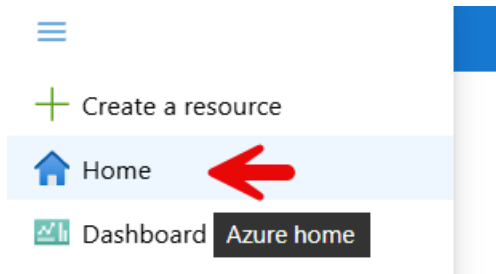
Provider	Status	Registration Policy
Microsoft.Portal	Registered	RegistrationFree
Microsoft.ResourceGraph	Registered	RegistrationFree
Microsoft.ResourceIntelligence	Registered	RegistrationFree
Microsoft.ResourceNotifications	Registered	RegistrationFree
Microsoft.Resources	Registered	RegistrationFree
Microsoft.Search	Registered	RegistrationRequired
Microsoft.SerialConsole	Registered	RegistrationFree
Microsoft.Storage	Registered	RegistrationRequired
Microsoft.Web	Registered	RegistrationRequired
microsoft.insights	Registered	RegistrationRequired
microsoft.support	Registered	RegistrationFree
ArizeAI.ObservabilityEval	NotRegistered	RegistrationRequired
Astronomer.Astro	NotRegistered	RegistrationRequired
Dell.Storage	NotRegistered	RegistrationRequired
Dynatrace.Observability	NotRegistered	RegistrationRequired
GitHub.Network	NotRegistered	RegistrationRequired

Resource providers



Creating a Foundry Resource

- **Next:** Navigate to **Home** and choose Foundry



Azure services





Creating a Foundry Resource

- Fill out the card
 - Resource group,
 - Name
 - East US2
 - Newer models
 - Default project name

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

jficara2026@outlook.com
JOE FICARA DEMO STUDENT 202...

Home > Microsoft Foundry | Foundry >

Create a Foundry resource

Basics Storage Network Identity Encryption Tags Review + create

Design, customize, and manage AI apps and agents at scale. [Learn More](#)

Instance Details

Select the subscription to manage deployed resources and costs. Use resources groups like folders to organize and manage all your resources.

Subscription * ⓘ 2026-Lab_Joe_Ficara Demo Student

Resource group * ⓘ 1 (New) rg_aifoundry
[Create new](#)

Name * ⓘ 2 ai-cscie94-foundry-demo-01 ✓

Region ⓘ 3 East US

[View full pricing details](#)

Your first project

Foundry organizes development artifacts into projects— containers for managing permissions, monitoring, costs, and more. When you create a resource, a project is also created. This "default" project has more capabilities than projects that you create later. [Learn more.](#)

Default project name * 4 01-lecture

Content Review Policy

Foundry provides access to Azure OpenAI models. To detect and mitigate harmful use of the Azure OpenAI Service, Microsoft logs the content you send to the Completions and image generations APIs as well as the content it sends back. If content is flagged by the service's filters, it may be reviewed by a Microsoft full-time employee

[Learn more about how Microsoft processes, uses, and stores your data](#)

[Apply for modified content filters and abuse monitoring](#)

Previous Next 5 Review + create

[Give feedback](#)



Creating a Foundry Resource

- Setup KeyVault
 - Create new

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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Home > Microsoft Foundry | Foundry >

Create a Foundry resource

Basics **Storage** Network Identity Encryption Tags Review + create

In Foundry, you may upload files, create data outputs, and store credentials when you connect to data sources and tools. In the basic configuration, this type of data is stored directly on your Foundry resource. Optionally, you can choose to use your own Azure storage location.

Credential storage and application logging

Key Vault (preview) ⓘ [Select Azure Key Vault](#)

Application Insights ⓘ [Select Application Insights](#)

⚠ The configurations below will be the default for all projects created under this Foundry resource. You may override the storage location per project by using infrastructure templates. [Learn more](#)

Agent service

Threads, messages, deployments, and files are managed within your Foundry resource by default. Optionally, integrate your own Azure resources to enforce enterprise security and compliance policies. [Learn more](#)

+ Select Resources Delete

☐ Model Deployment Cosmos DB AI Search Storage Account

Speech and Language service

File upload and outputs of Speech and Language tasks are managed within your Foundry resource by default. Optionally, integrate your own Azure Storage to enforce enterprise security and compliance policies. [Learn more](#)

Previous Next **Review + create**

<https://portal.azure.com/#>

Select Key Vault

Name 6 Failed to load existing resources - you can still create new ones [Create new](#)

7 Add Cancel



Creating a Foundry Resource

- Setup KeyVault
 - Create new

Microsoft Azure | Search resources, services, and docs (G+/J) | Copilot | jficara2026@outlook.com | JOE FICARA DEMO STUDENT 202...

Home > Microsoft Foundry | Foundry >

Create a Foundry resource

Basics **Storage** Network Identity Encryption Tags Review + create

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Credential storage and application logging

Key Vault (preview) ⓘ [Select Azure Key Vault](#)

Application Insights ⓘ [Select Application Insights](#)

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☐ Model Deployment ☐ Cosmos DB ☐ AI Search ☐ Storage Account

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Previous Next **Review + create**

Select Key Vault

Name Failed to load existing resources - you can still create new ones

6 [create new](#)

Key Vault * kv-cscie94-demo-01 ✓

Cancel Create

7 Add Cancel



Creating a Foundry Resource

- Setup
 - App Insights
- Click
 - Review & create



Creating a Foundry Resource

■ Review & Create - Accepts defaults for:

- Network
- Identify
- Encryption
- Tags

[Home](#) > [Microsoft Foundry | Foundry](#) >

Create a Foundry resource ...

Basics Storage **Network** Identity Encryption Tags Review + create

Inbound Access *

- ☒ All networks, including the internet, can access this resource.
- ☐ Selected networks, configure network security for your Foundry resource.
- ☐ Disabled, no networks can access this resource. You could configure private endpoint connections that will be the exclusive way to access this resource.

⚠ Agents APIs only support network injection for Standard Agent set-up. If you would like to deploy a network secured Agent set-up, deploy an Agent template. [Learn more about Agent networking configurations.](#)

[Home](#) > [Microsoft Foundry | Foundry](#) >

Create a Foundry resource ...

Basics Storage Network Identity **Encryption** Tags Review + create

Data Encryption

Your data is encrypted by default using Microsoft-managed keys. For additional control over your data, you may choose to bring your own key for encryption. [Learn more about customer-managed key encryption.](#)

Encrypt data using a customer-managed key ☐

[Home](#) > [Microsoft Foundry | Foundry](#) >

Create a Foundry resource ...

Basics Storage Network **Identity** Encryption Tags Review + create

Identity type *

- ☒ System assigned
- ☐ User assigned

ℹ We'll grant your user identity the **Azure AI User** role so you can develop with all projects under this resource.

To enable other users to use this project:

- Assign **Azure AI User** to develop with projects.
- Assign **Azure AI Project Manager** to develop and manage project settings.

[Learn more](#)



Creating a Foundry Resource

- Review Summary
 - Click Create

Create a Foundry resource ...

Basics Storage Network Identity Encryption Tags Review + create

[View automation template](#)

Basics

Subscription	2026-Lab_Joe_Ficara Demo Student
Resource group	rg_aifoundry
Name	ai-cscie94-foundry-demo-01
Region	East US
Default project name	01-lecture

Storage

Key Vault (preview)	kv-cscie94-demo-01
Application Insights	appi-cscie94-foundry-demo
Storage for Agents service	0 item(s)
Storage Account (preview)	

Network

Inbound Access	All networks, including the internet, can access this resource.
----------------	---

Identity

Identity type	System assigned
---------------	-----------------

Previous

Next

Create

11



Configuring in Azure

- Once deployed navigate to the Foundry UI
 - Pick your foundry instance

Azure services



Create a resource



Foundry



All resources



Microsoft Entr.
ID

Home > Microsoft Foundry



Microsoft Foundry | Foundry

Joe Ficara Demo Student 2026

Search

Overview

All resources

Use with Foundry

Foundry

AI Hubs

Azure OpenAI

AI Search

> More services

> Classic AI services

> Help

+ Create



Manage deleted resources



Manage view

[You are viewing a new version of Browse experience. Click here to :](#)

Filter for any field...

Subscription equals all

☐ Name ↑

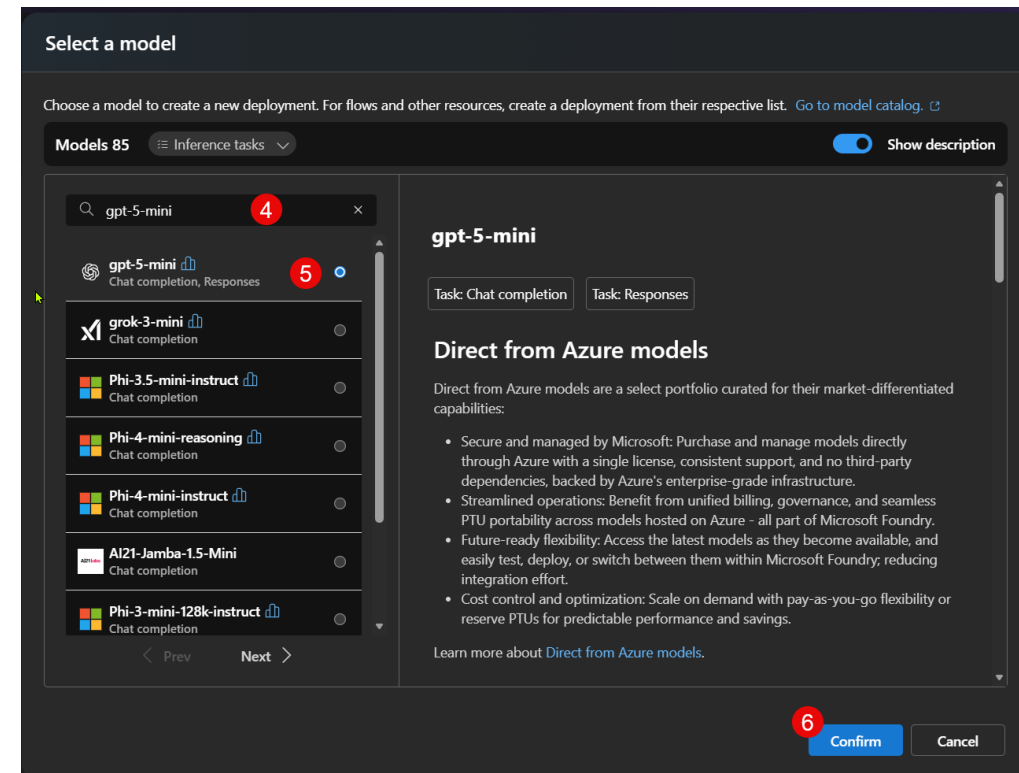
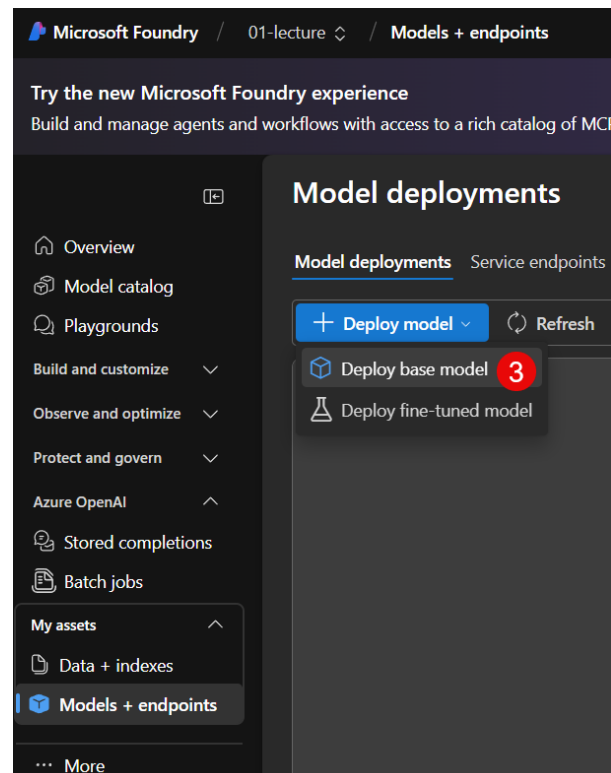
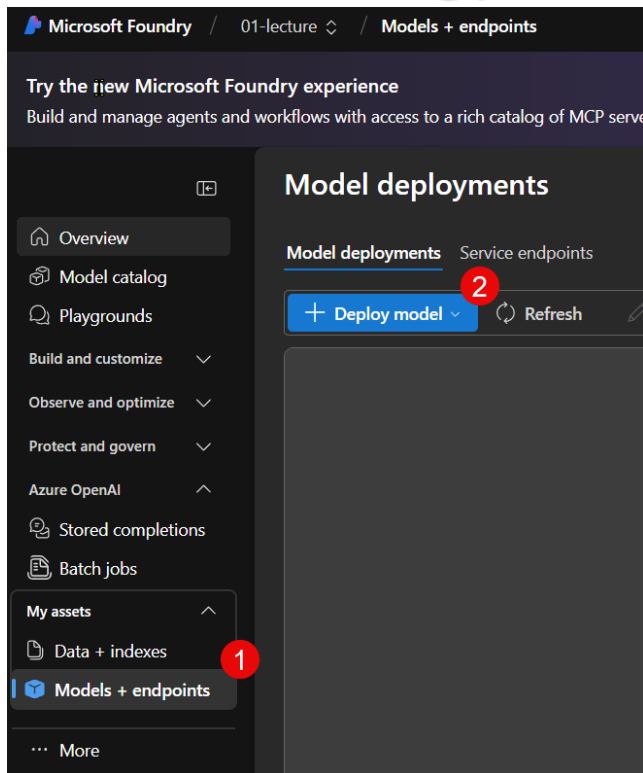
☐ ai-cscie94-eastus-foundry-demo-01

☐ ai-cscie94-eastus2-foundry-demo-01



Configuring in Azure

- Deploy a model
 - Pick **gpt-5-mini**





Configuring in Azure

- Deploy a model
 - Enter a Deployment Name
 - Choose a deployment type

Deploy gpt-5-mini

Deployment name *

gpt-5-mini

Deployment type

Global Standard

Global Standard: Pay per API call with the highest rate limits. Learn more about [Global deployment types](#).

Data might be processed globally, outside of the resource's Azure geography, but data storage remains in the AI resource's Azure geography. Learn more about [data residency](#).

Deployment details

Model version

2025-08-07

Capacity

150K tokens per minute (TPM)

Content safety

DefaultV2

Authentication type

Key

Resource location

East US

Version upgrade policy

Once a new default version is available

Customize

Deploy

Cancel



Test in playground

- You can now experiment in the playground

The screenshot shows the Microsoft Foundry interface. At the top, the breadcrumb navigation reads: Microsoft Foundry / 01-lecture / Deployments / gpt-5-mini. Below this is a banner for the new Microsoft Foundry experience. On the left sidebar, the 'Model catalog' option is highlighted with a green cursor. The main content area is titled 'gpt-5-mini' and has two tabs: 'Details' (selected) and 'Metrics'. In the 'Details' tab, there is a row of action buttons: 'Open in playground' (highlighted with a red arrow), 'Request quota', 'Edit', and 'Delete'. Below these buttons, the 'Endpoint' section is visible, containing a 'Target URI' field with a long URL and a 'Key' field with a masked value (dots).



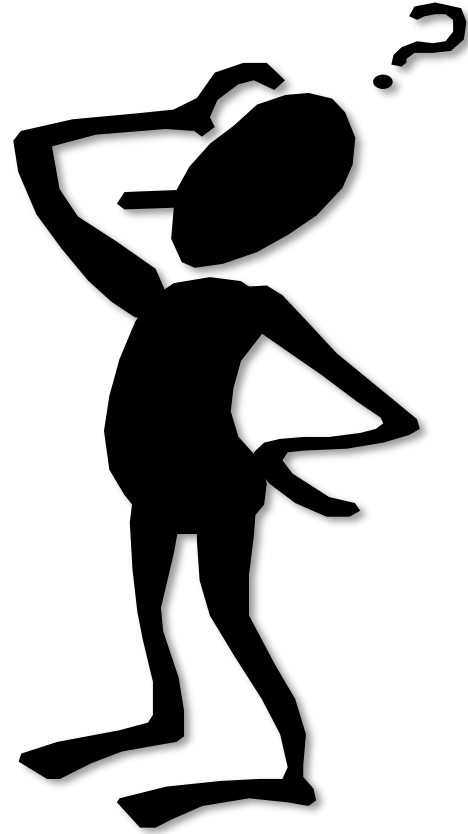
Demo

Create Microsoft Foundry, Project & Test deployment

Azure Portal



Configuring in Azure





Let's Code!

1010110101101010110101101010101101011010101010101101110110101010101101010101010
1010110110110101010101101010101101010101010101011010101010101011010101010101001
01010101001010101010110100110101010101010110101010101010101010101010101011010101010
10101100101010110101101
011010101011010101010110100010110
101010101010101010110101010101010101001010101011010101010101010101010101010101
010110
1010101010101010101010101100110
10011001
001
01001
01010101010010110011001
01010101111101
010101001
0101101010000101010101001
0101010101010101001
101
101
001
10001



Simple Chatbot

- Basic Requirements:
 - Allow a caller to pass in a prompt
 - Using a POST request
 - Use an **SLM** to process the content of the prompt
 - **SLM** -> Small Language Model
 - Return the result from the **SLM**
 - To the caller



Simple Chatbot

- Nuget packages needed

```
· · <ItemGroup>
· · · · <PackageReference Include="Microsoft.AspNetCore.OpenApi" Version="10.0.2" />
· · · · <PackageReference Include="Swashbuckle.AspNetCore" Version="10.1.0" />
· · · · <PackageReference Include="Azure.AI.OpenAI" Version="2.1.0" />
· · · · <PackageReference Include="Microsoft.Extensions.AI" Version="10.2.0" />
· · · · <PackageReference Include="Microsoft.Extensions.AI.OpenAI" Version="10.2.0-preview.1.26063.2" />
· · </ItemGroup>
```



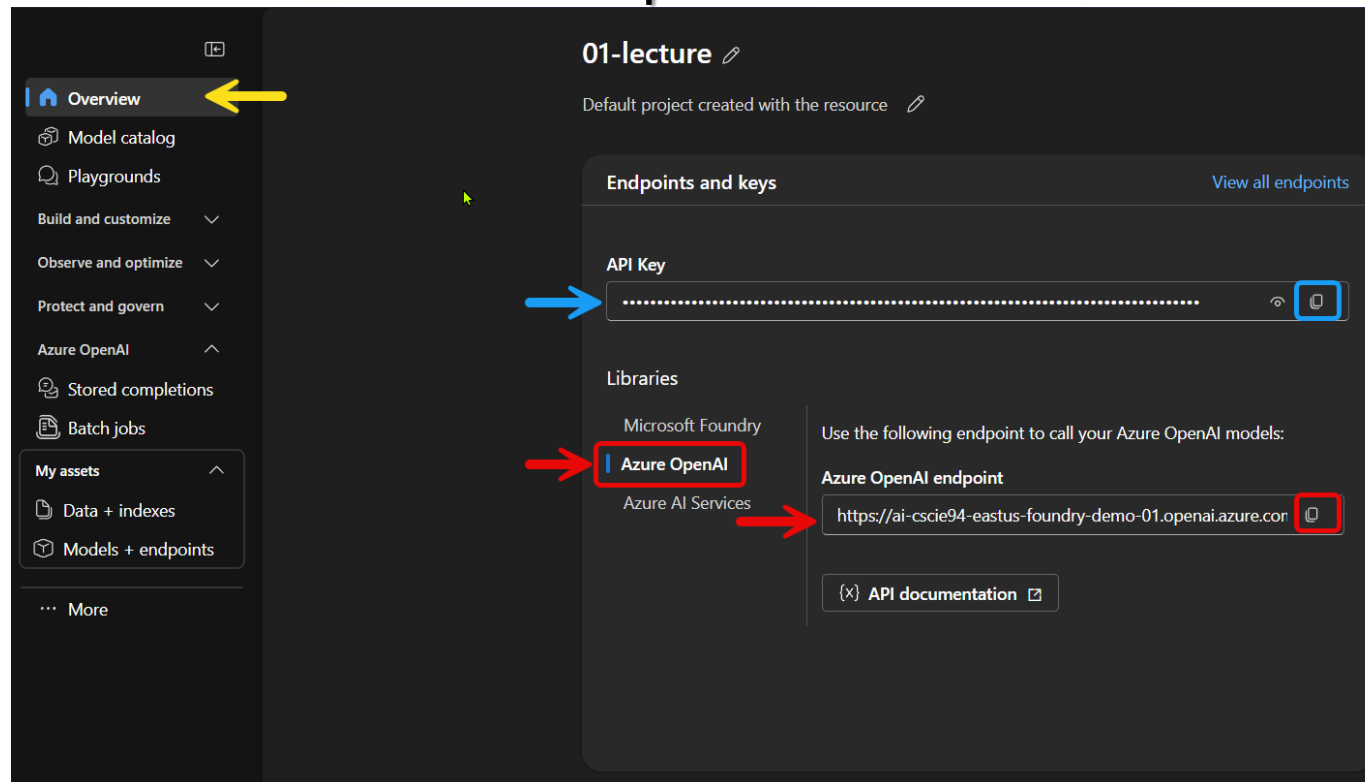
Simple Chatbot

- How it works
 - Reads settings
 - **Uri** to your Azure OpenAI Service in the connected resources
 - **ApiKey** to access the model
 - Connect to a deployed **gpt 5 mini SLM**
 - Using the settings defined by the **AISettings**
 - Passes the string provided in the body of the POST request
 - To the SLM
 - Returns result from the SLM
 - As the result of the **POST** request



Test in playground

- URL and API Key
 - Be sure to **choose OpenAI** to obtain the correct URL!





Simple Chatbot

- How do you do it?
 - Get an instance of **IChatClient**
 - Using dependency injection, in your controller's constructor
 - Create a **ChatOptions**
 - Include settings to direct the SLM
 - **Temperature (GPT 5 mini only accepts a Temperature of 1)**
 - The randomness of the SLM/LLM's responses
 - Lower values = more deterministic
 - Higher values = increase creativity
 - **MaxOutputTokens**
 - Maximum number of tokens the SLM/LLM can generate in a response



Simple Chatbot

- Submit the prompt
 - Using **IChatClient** instance & **GetResponseAsync** method
 - Provide
 - The **ChatOptions** instance
 - The **prompt** provided by the call to the REST API
- Return the result from the SLM
 - To the caller



Demo

Simple Chatbot

SimpleWebAPIChatDemoSolution.sln

SimpleWebAPIChatDemo.csproj



Structured Output JSON

- Why structured output?
 - Facilitates integration into your business logic
 - Makes it easier to deal with results
 - Strongly typed output
- How do you do it?
 - Get an instance of **IChatClient**
 - Using dependency injection
 - In your controller's constructor



Structured Output JSON

- Nuget packages needed

```
··<ItemGroup>
····<PackageReference Include="Microsoft.AspNetCore.OpenApi" Version="10.0.2" />
····<PackageReference Include="Swashbuckle.AspNetCore" Version="10.1.0" />
····<PackageReference Include="Azure.AI.OpenAI" Version="2.1.0" />
····<PackageReference Include="Microsoft.Extensions.AI" Version="10.2.0" />
····<PackageReference Include="Microsoft.Extensions.AI.OpenAI" Version="10.2.0-preview.1.26063.2" />
··</ItemGroup>
```



Structured Output JSON

How do you do it ...

- Create the shape you expect to be returned
 - A public C# Class with public properties
 - Used to define the JSON structure to be returned
- Generate the JSON Schema
 - Using **Nuget** package [NJsonSchema](#)
- Create a **ChatResponseFormatJson** instance
 - Supply the schema
 - That defines the desired output format



Structured Output JSON

How do you do it ...

- Create a **ChatOptions**
 - Specify the **ResponseFormat**
 - With the **ChatResponseFormatJson** instance
 - Include settings to direct the SLM
 - **Temperature**
 - The randomness of the SLM/LLM's responses
 - Lower values = more deterministic
 - Higher values = increase creativity
 - **MaxOutputTokens**
 - Maximum number of tokens the SLM/LLM can generate in a response
 - Etc...



Structured Output JSON

How do you do it ...

- Submit the prompt using **GetResponseAsync**
 - Include the **ChatOptions** instance
 - Include an enhanced user **prompt**
\$"Identify and return a JSON list of the most important 3 key phrases from the following text: {prompt}";
 - The prompt in the interpolated C# string is the input from the user



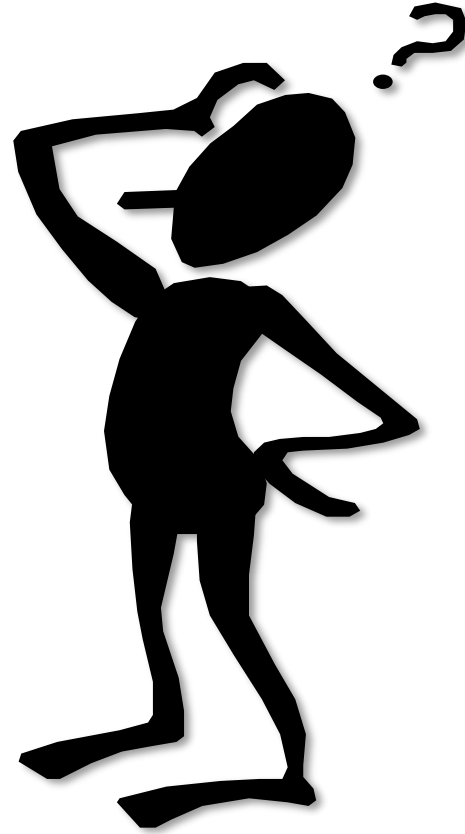
Demo

Structured Output JSON

StructuredOutputWebAPISolution.sln
StructuredOutputWebAPI.csproj



Questions





Further Reading

■ Microsoft Foundry

- [What is Microsoft Foundry? - Microsoft Foundry | Microsoft Learn](#)
- [Microsoft Foundry architecture - Microsoft Foundry | Microsoft Learn](#)
- [Microsoft Foundry frequently asked questions - Microsoft Foundry | Microsoft Learn](#)