Develop an audio-enabled generative AI application

1. Introduction

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/1-introduction

Introduction

Completed

- 1 minute

Generative AI models make it possible to build intelligent chat-based applications that can understand and reason over input. Traditionally, text input is the primary mode of interaction with AI models, but multimodal models are increasingly becoming available. These models make it possible for chat applications to respond to audio input as well as text.

In this module, we'll discuss audio-enabled generative AI and explore how you can use Microsoft Foundry to create generative AI solutions that respond to prompts that include a mix of text and audio data.

2. Deploy a multimodal model

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/2-deploy-multimodal-model

Deploy a multimodal model

Completed

- 3 minutes

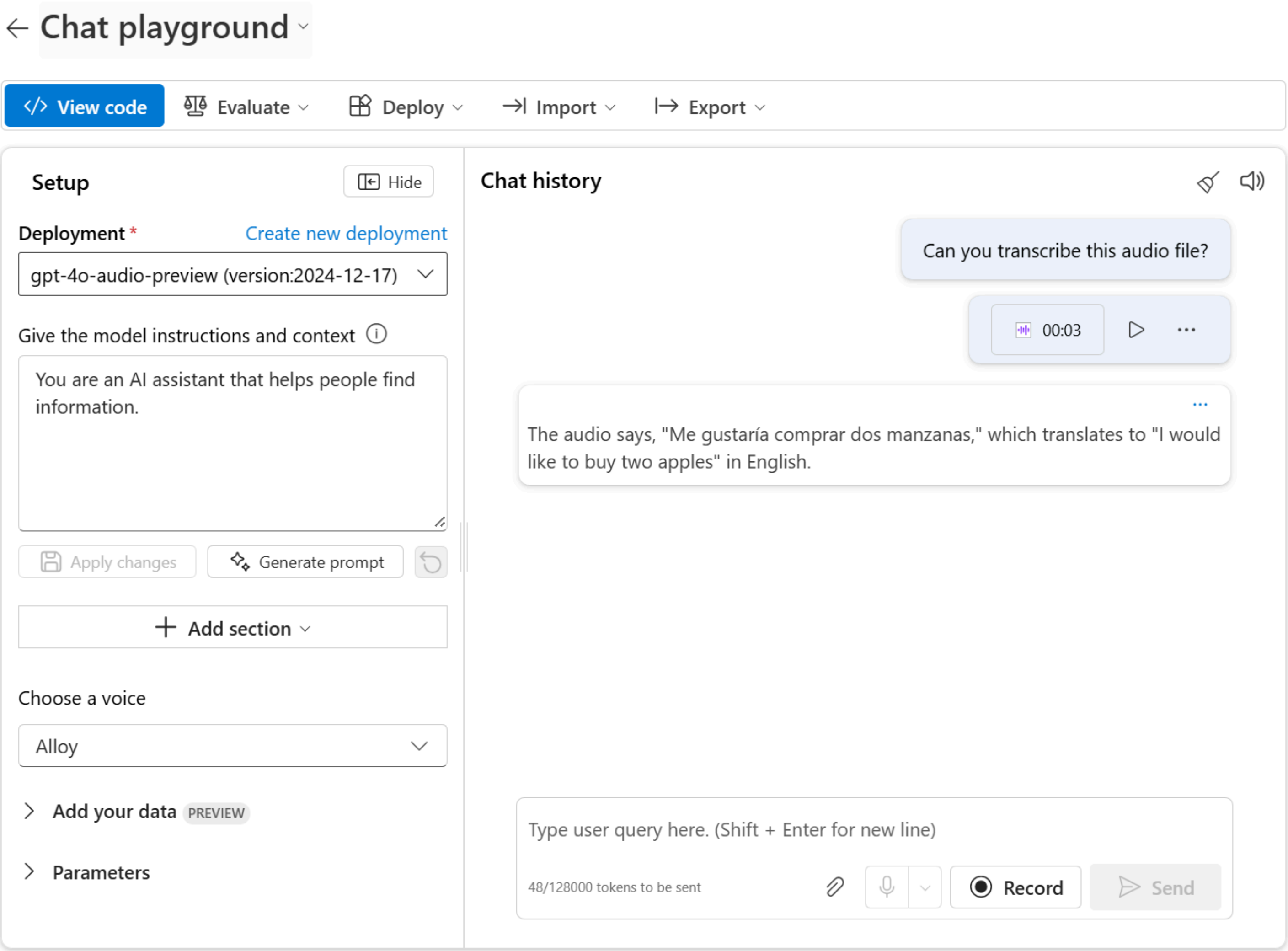
To handle prompts that include audio, you need to deploy a *multimodal* generative AI model - in other words, a model that supports not only text-based input, but audio-based input as well. Multimodal models available in Microsoft Foundry include (among others):

- Microsoft **Phi-4-multimodal-instruct**
- OpenAI **gpt-4o**
- OpenAI **gpt-4o-mini**

> **Tip**
>
> To learn more about available models in Microsoft Foundry, see the **Model catalog and collections in Microsoft Foundry portal** article in the Microsoft Foundry documentation.

Testing multimodal models with audio-based prompts

After deploying a multimodal model, you can test it in the chat playground in Microsoft Foundry portal. Some models allow you to include audio attachments in the playground, either by uploading a file or recording a message.



Deployment *

gpt-4o-audio-preview (version:2024-12-17)

Give the model instructions and context

You are an AI assistant that helps people find information.

Choose a voice

Alloy

Can you transcribe this audio file?

00:03

The audio says, "Me gustaría comprar dos manzanas," which translates to "I would like to buy two apples" in English.

Type user query here. (Shift + Enter for new line)

48/128000 tokens to be sent

In the chat playground, you can upload a local audio file and add text to the message to elicit a response from a multimodal model.

3. Develop an audio-based chat app

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/3-develop-audio-chat-app

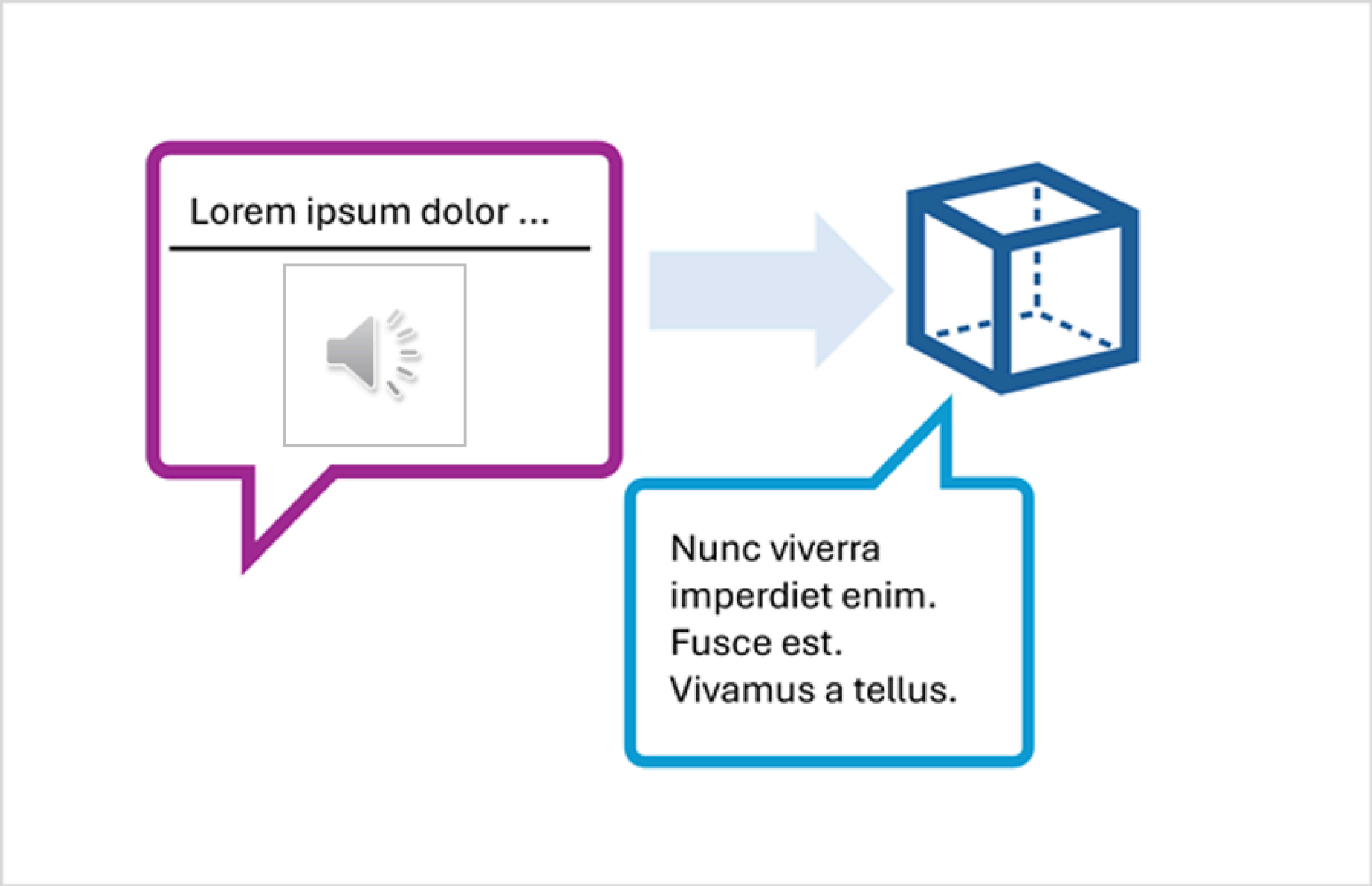
Develop an audio-based chat app

Completed

- 5 minutes

To develop a client app that engages in audio-based chats with a multimodal model, you can use the same basic techniques used for text-based chats. You require a connection to the endpoint where the model is deployed, and you use that endpoint to submit prompts that consists of messages to the model and process the responses.

The key difference is that prompts for an audio-based chat include multi-part user messages that contain both a *text* content item and an *audio* content item.



The JSON representation of a prompt that includes a multi-part user message looks something like this:

```
{
    "messages": [
        { "role": "system", "content": "You are a helpful assistant." },
        { "role": "user", "content": [
            {
                "type": "text",
                "text": "Transcribe this audio:"
            },
            {
                "type": "audio_url",
                "audio_url": {
                    "url": "https://....."
                }
            }
        ] }
    ]
}
```

The audio content item can be:

- A URL to an audio file in a web site.
- Binary audio data

When using binary data to submit a local audio file, the **audio_url** content takes the form of a base64 encoded value in a data URL format:

```
 {
    "type": "audio_url",
    "audio_url": {
       "url": "data:audio/mp3;base64,<binary_audio_data>"
    }
}
```

Depending on the model type, and where you deployed it, you can use Microsoft Azure AI Model Inference or OpenAI APIs to submit audio-based prompts. These libraries also provide language-specific SDKs that abstract the underlying REST APIs.

In the exercise that follows in this module, you can use the Python or .NET SDK for the Azure AI Model Inference API and the OpenAI API to develop an audio-enabled chat application.

4. Exercise - Develop an audio-enabled chat app

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/4-exercise

Exercise - Develop an audio-enabled chat app

Completed

- 30 minutes

If you have an Azure subscription, you can complete this exercise to develop an audio-enabled chat app.

Note

> If you don't have an Azure subscription, you can sign up for an account, which includes credits for the first 30 days.

Launch the exercise and follow the instructions.

Launch Exercise

5. Module assessment

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/5-knowledge-check

Module assessment

Completed

- 3 minutes

6. Summary

https://learn.microsoft.com/en-us/training/modules/develop-generative-ai-audio-apps/6-summary

Summary

Completed

- 1 minute

In this module, you learned about audio-enabled generative AI models and how to implement chat solutions that include audio-based input.

Audio-enabled models let you create AI solutions that can understand audio and respond to related questions or instructions. Beyond just identifying spoken words, some models can also use reasoning based on what they hear. For instance, they can summarize a message or assess the speaker's sentiment.

> **Tip**
>
> For more information about working with multimodal models in Microsoft Foundry, see **How to use image and audio in chat completions with Azure AI model inference** and **Quickstart: Use speech and audio in your AI chats**.