Develop a multi-agent solution with Microsoft Foundry Agent Service

1. Introduction

https://learn.microsoft.com/en-us/training/modules/develop-multi-agent-azure-ai-foundry/1-introduction

Introduction

Completed

- 2 minutes

Microsoft Foundry Agent Service can help you develop sophisticated, multi-agent systems that can break down complex tasks into smaller, specialized roles. Using connected agents, you can design intelligent solutions where a primary agent delegates work to sub-agents without the need for custom orchestration logic or hardcoded routing. This modular approach boosts efficiency and maintainability across a wide range of scenarios.

Imagine you're on an engineering team that receives a constant flow of support tickets including bugs, feature requests, and infrastructure issues. Manually reviewing and sorting each one takes time and slows down your team's ability to respond quickly. With a multi-agent approach, you can build a triage assistant that assigns different tasks to specialized agents. The sub-agents might perform tasks such as classifying ticket type, setting priority, and suggesting the right team for the work. With a multi-agent approach, these specialized agents can work together to streamline the ticketing process.

In this module, you learn how to use connected agents in Microsoft Foundry. You also practice building an intelligent ticket triage system using a collaborative multi-agent solution.

2. Understand connected agents

https://learn.microsoft.com/en-us/training/modules/develop-multi-agent-azure-ai-foundry/2-understand-connected-agents

Understand connected agents

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- 5 minutes

As AI solutions become more advanced, managing complex workflows gets harder. A single agent can handle a wide range of tasks, but this approach can become unmanageable as the scope expands. That's why Microsoft Foundry Agent Service lets you connect multiple agents, each with a focused role, to work together in a cohesive system.

What are connected agents?

Connected agents are a feature in the Microsoft Foundry Agent Service that allows you to break large tasks into smaller, specialized roles without building a custom orchestrator or hardcoding routing logic. Instead of relying on one agent to do everything, you can create multiple agents with clearly defined responsibilities that collaborate to accomplish tasks.

At the center of this system, there's a main agent that interprets user input and delegates tasks to connected sub-agents. Each sub-agent is designed to perform a specific function, such as to summarize a document, validate a policy, or retrieve data from a knowledge source.

This division of labor helps you:

- Simplify complex workflows
- Improve agent performance and accuracy
- Make systems easier to maintain and extend over time

Why use connected agents?

Rather than scaling a single agent to handle every user request or data interaction, using connected agents lets you:

- Build modular solutions that are easier to develop and debug
- Assign specialized capabilities to agents that can be reused across solutions
- Scale your system in a way that aligns with real-world business logic

This approach is especially useful in scenarios where agents need to perform sensitive tasks independently, such as handling private data or generating personalized content.

Using connected agents to automate workflows offers many benefits, for example:

- **No custom orchestration required** - The main agent uses natural language to route tasks, eliminating the need for hardcoded logic.
- **Improved reliability and traceability** - The clear separation of responsibilities makes issues easier to debug since agents can be tested individually.
- **Flexible and extensible** - Add or swap agents without reworking the entire system or modifying the main agent.

Connected agents make it easier to build modular, collaborative systems without complex orchestration. By assigning focused roles and using natural language delegation, you can simplify workflows, improve reliability, and scale your solutions more effectively.

3. Design a multi-agent solution with connected agents

https://learn.microsoft.com/en-us/training/modules/develop-multi-agent-azure-ai-foundry/3-design-multi-agent-solution

Design a multi-agent solution with connected agents

Completed

- 5 minutes

In a connected agent solution, success depends on clearly defining the responsibilities of each agent. The central agent is also responsible for how the agents will collaborate. Let's explore how to design a multi-agent program using Microsoft Foundry Agent Service.

Main agent responsibilities

The main agent acts as the orchestrator. It interprets the intent behind a request and determines which connected agent is best suited to handle it. The main agent is responsible for:

- Interpreting user input
- Selecting the appropriate connected agent
- Forwarding relevant context and instructions
- Aggregating or summarize results

Connected agent responsibilities

Connected agents designed to focus on a single domain of responsibility. A connected agent is responsible for:

- Completing a specific action based on a clear prompt
- Using tools (if needed) to complete their task
- Returning the results to the main agent

Connected agents should be designed with a single responsibility in mind. This makes your system easier to debug, extend, and reuse.

Set up a multi-agent solution with connected agents

1. **Initialize the agents client**

   First, you create a client that connects to your Microsoft Foundry project.

2. **Create an agent to connect to the main agent**

   Define an agent you want to connect to the main agent. You can do this using the `create_agent` method on the `AgentsClient` object.

   For example, your connected agent might retrieve stock prices, summarize documents, or validate compliance. Give the agent clear instructions that define its purpose.

3. **Initialize the connected agent tool**

   Use your agent definition to create a `ConnectedAgentTool`. Assign it a name and description so the main agent knows when and how to use it.

4. **Create the main agent**

   Create the main agent using the `create_agent` method. Add your connected agents using the `tools` property and assign the `ConnectedAgentTool` definitions to the main agent.

5. **Create a thread and send a message**

Create the agent thread that is used to manage the conversation context. Then create a message on the thread that contains the request you want the agent to fulfill.

6. **Run the agent workflow**

   Once the message is added, create a run to process the request. The main agent uses its tools to delegate tasks as needed and compile a final response for the user.

7. **Handle the results**

   When the run completes, you can review the main agent's response. The final output may incorporate insights from one or more connected agents. Only the main agent's response is visible to the end user.

Designing a connected agent system involves defining focused agents, registering them as tools, and configuring a main agent to route tasks intelligently. This modular approach gives you a flexible foundation for building collaborative AI solution that scale as your needs grow.

4. Exercise - Develop a multi-agent app with Microsoft Foundry

https://learn.microsoft.com/en-us/training/modules/develop-multi-agent-azure-ai-foundry/4-exercise

Exercise - Develop a multi-agent app with Microsoft Foundry

Completed

- 30 minutes

If you have an Azure subscription, you can complete this exercise to develop a multi-agent solution using connected agents in Microsoft Foundry Agent Service.

> **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-multi-agent-azure-ai-foundry/5-knowledge-check

Module assessment

Completed

- 3 minutes

6. Summary

https://learn.microsoft.com/en-us/training/modules/develop-multi-agent-azure-ai-foundry/6-summary

Summary

Completed

- 1 minute

In this module, you learned how to design and implement multi-agent solutions using Microsoft Foundry Agent Service.

Connected agents let you break down complex tasks by assigning them to specialized agents that work together within a coordinated system. You explored how to define clear roles for main and connected agents, delegate tasks using natural language, and design modular workflows that are easier to scale and maintain. You also practiced building a multi-agent solution. Great work!