



# **Building Agentic .NET 10 Applications with the Model Context Protocol (MCP)**

Olorunfemi Davis

PETERBOROUGH .NET MEETUP

# Building Agentic .NET 10 Applications with MCP

Standardizing Context for the Future of Smarter AI



# Olorunfemi Davis

## Sr. Platform Engineer, Inflo

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LinkedIn

[linkedin.com/in/olorunfemidavis](https://www.linkedin.com/in/olorunfemidavis)

Website

[olorunfemidavis.com](http://olorunfemidavis.com)

Introduction

KYA

# Key Session Objectives



## Understand MCP

Learn the universal protocol backed by Microsoft and Anthropic for model integration.



## .NET 10 Agents

Explore the evolution of Semantic Kernel and AutoGen into the unified Agent Framework.



## Live Implementation

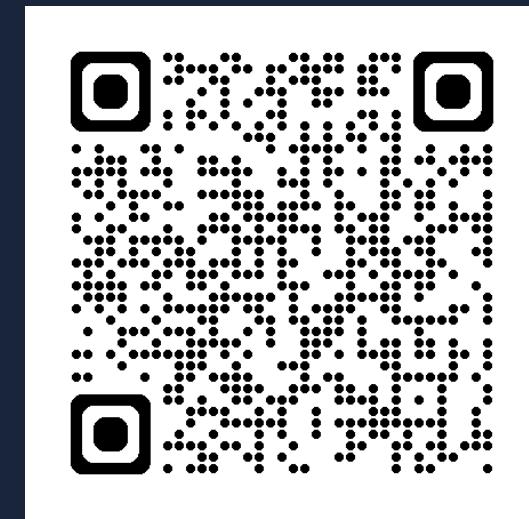
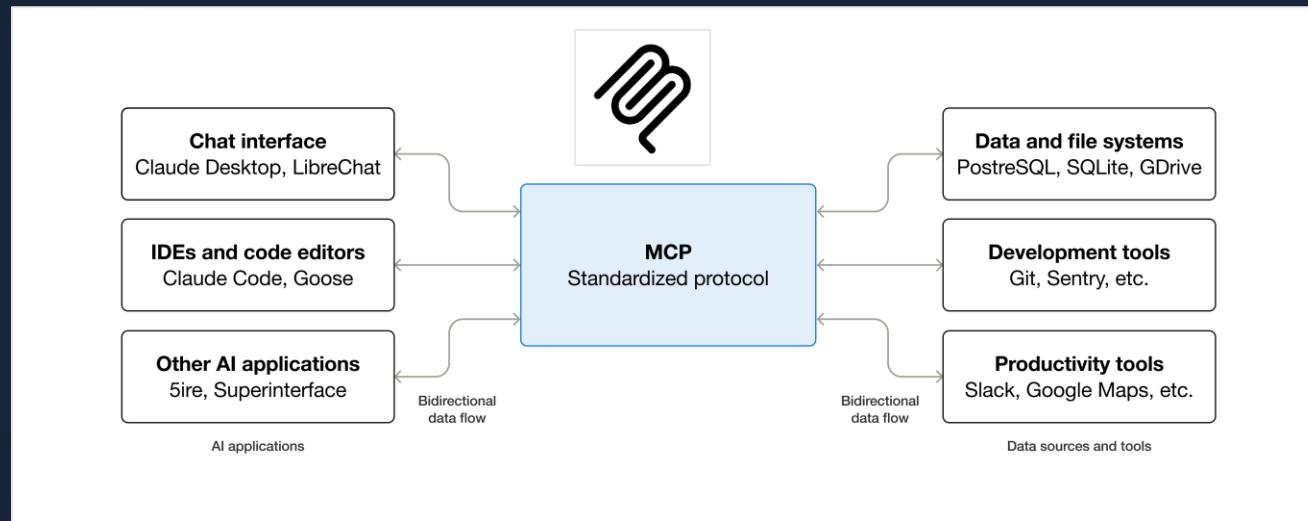
Build custom MCP servers and orchestrate multi-agent database workflows in real-time.

## Model Context Protocol (MCP)

MCP is an open protocol that standardizes how applications provide discovery, actions, and context to LLMs

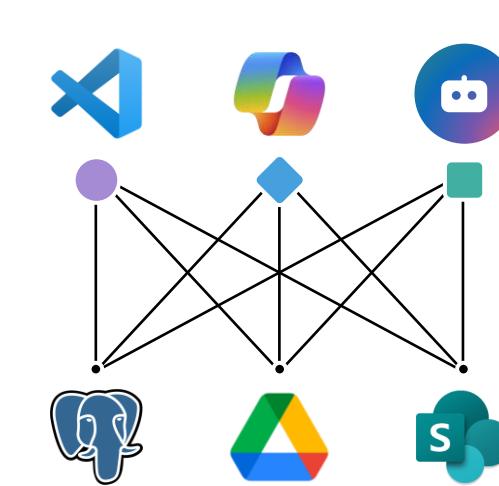
It's like USB-C but for AI

# Model Context Protocol (MCP)

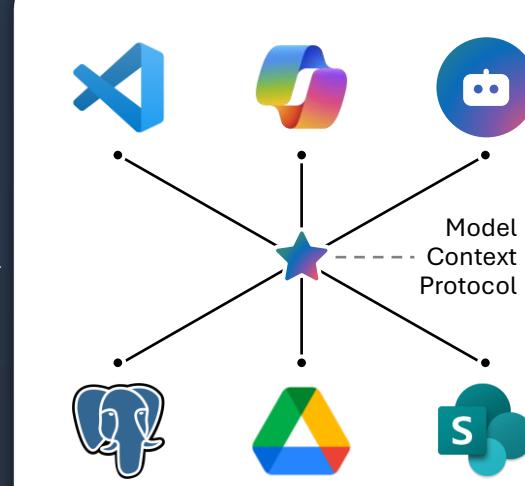


# The Challenge: From Fragments to Agency

MCP simplifies tool access for LLMs



Before MCP  
integration chaos!!!



With MCP  
simplified LLM tools

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# The Universal Standard

The Model Context Protocol

(MCP)

# Protocol Foundations

The Model Context Protocol (MCP) acts as the bridge between AI models (Hosts) and external capabilities (Servers).

By standardizing these connections, developers can build robust integrations once and deploy them across any model tier.



# Client-Server Architecture

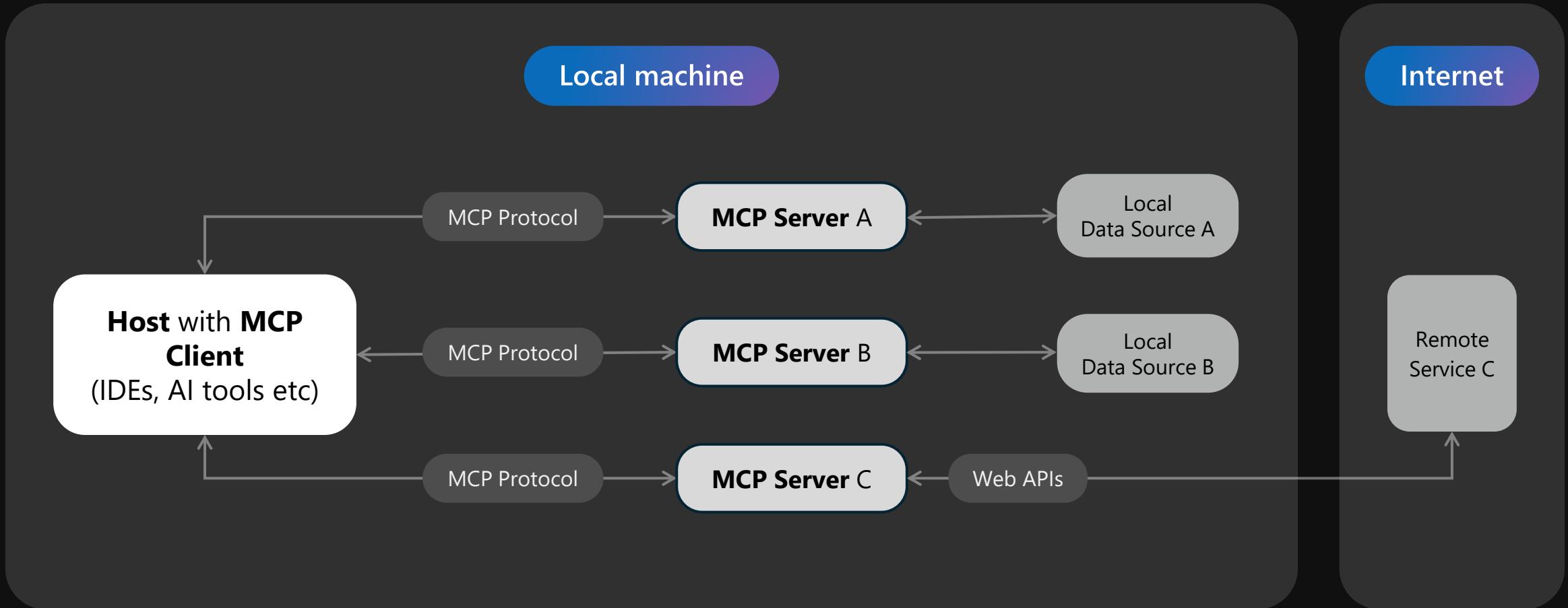
## MCP Servers

Build using the official C# SDK to expose Tools, Resources, and Prompts directly from your proprietary business logic.

## Human-in-the-Loop

Standardized tool execution that enables secure, human-supervised interactions with databases and private APIs.

# General architecture



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# The Agentic Ecosystem

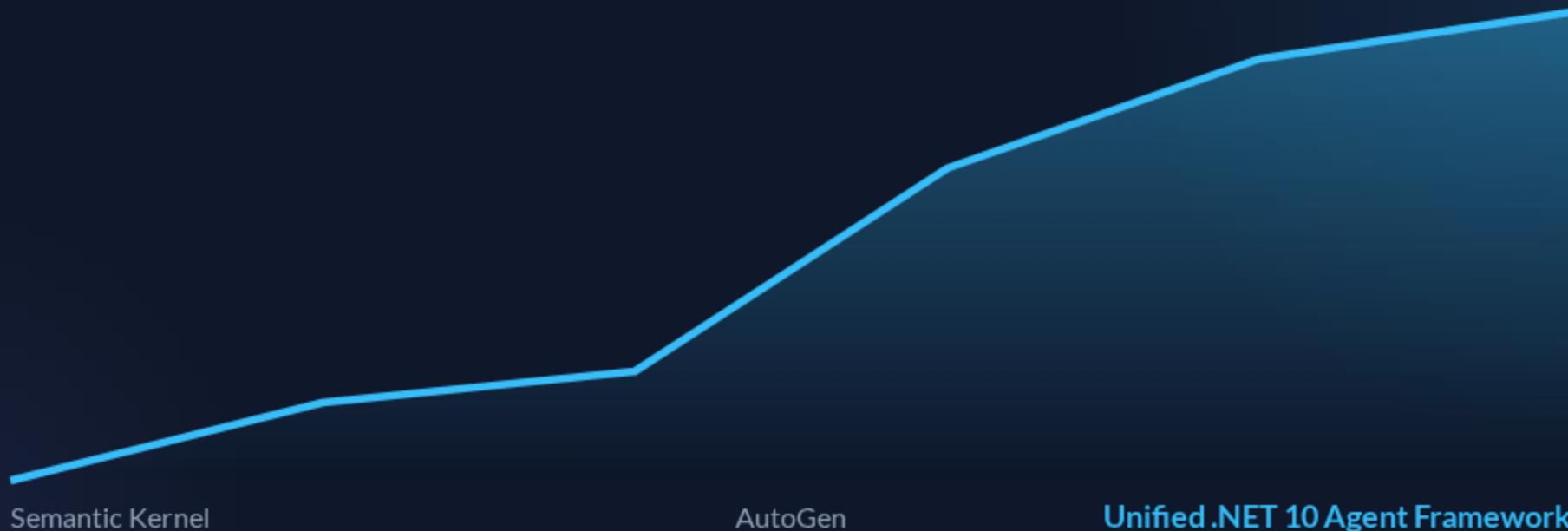
Orchestration in .NET 10



# Agent

Semi-autonomous software that can be given a goal and will work to achieve that goal without you knowing in advance exactly how it's going to do that or what steps it's going to take.

# Evolution of AI in .NET



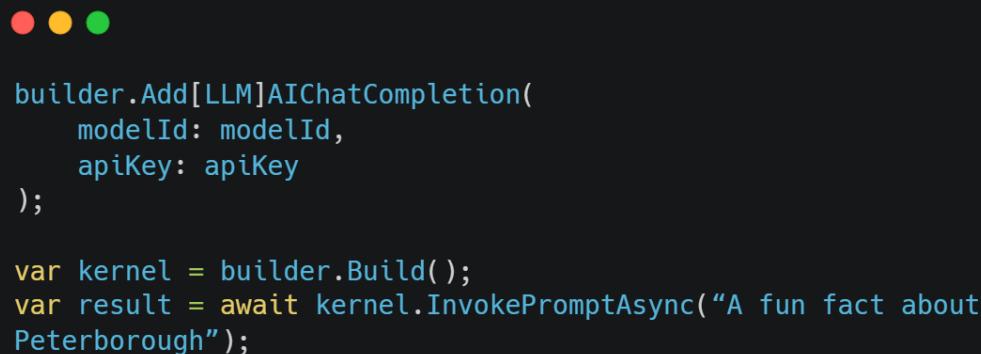
*Transitioning from standalone libraries to a cohesive, vendor-agnostic orchestration layer.*

# Semantic Kernel

## The `IChatClient` Interface

A clean, vendor-agnostic abstraction for seamless interaction with OpenAI, Anthropic, or local LLMs.

Part of the new `System.AI` namespace, providing enterprise-grade standardization for AI clients.

A screenshot of a terminal window with a dark background. In the top left corner, there are three colored dots: red, yellow, and green. The terminal displays the following code:

```
builder.Add[LLM]AIChatCompletion(  
    modelId: modelId,  
    apiKey: apiKey  
);  
  
var kernel = builder.Build();  
var result = await kernel.InvokePromptAsync("A fun fact about  
Peterborough");
```

# AutoGen

← ⌂ ⓘ http://127.0.0.1:8081/gallery/?galleryId=1

**AutoGen Studio**  
Build Multi-Agent Apps

**Gallery**

**Galleries** 1

[+ New Gallery](#)

All Galleries

**Default Component Gall...**  
v1.0.0 22 components  
3 minutes ago

**Default Component Gallery**  
A default gallery containing basic components for human-in-loop conversations

22 components v1.0.0

**Teams** (5) **Agents** (4) **Tools** (6) **Models** (4) **Terminations** (3)

**5 Teams**

**autogen\_agentchat.teams.Rou...**  
**RoundRobin Team**  
A single AssistantAgent (with a calculator tool) in a RoundRobinGroupC...  
▼

**autogen\_agentchat.teams.Sele...**  
**Selector Team**  
A team with 2 agents - an AssistantAgent (with a calculator tool) and ...  
▼

**autogen\_agentchat.teams.Sele...**  
**Web Agent Team (Operator)**  
A team with 3 agents - a Web Surfer agent that can browse the web, a V...  
▼

**autogen\_agentchat.teams.Sele...**  
**Deep Research Team**  
A team with 3 agents - a Research Assistant that performs web searches...  
▼

**autogen\_agentchat.teams.Rou...**  
**Peterborough .NET meetup Team**  
Event assistance for the team.  
▼

[+ Add Team](#)

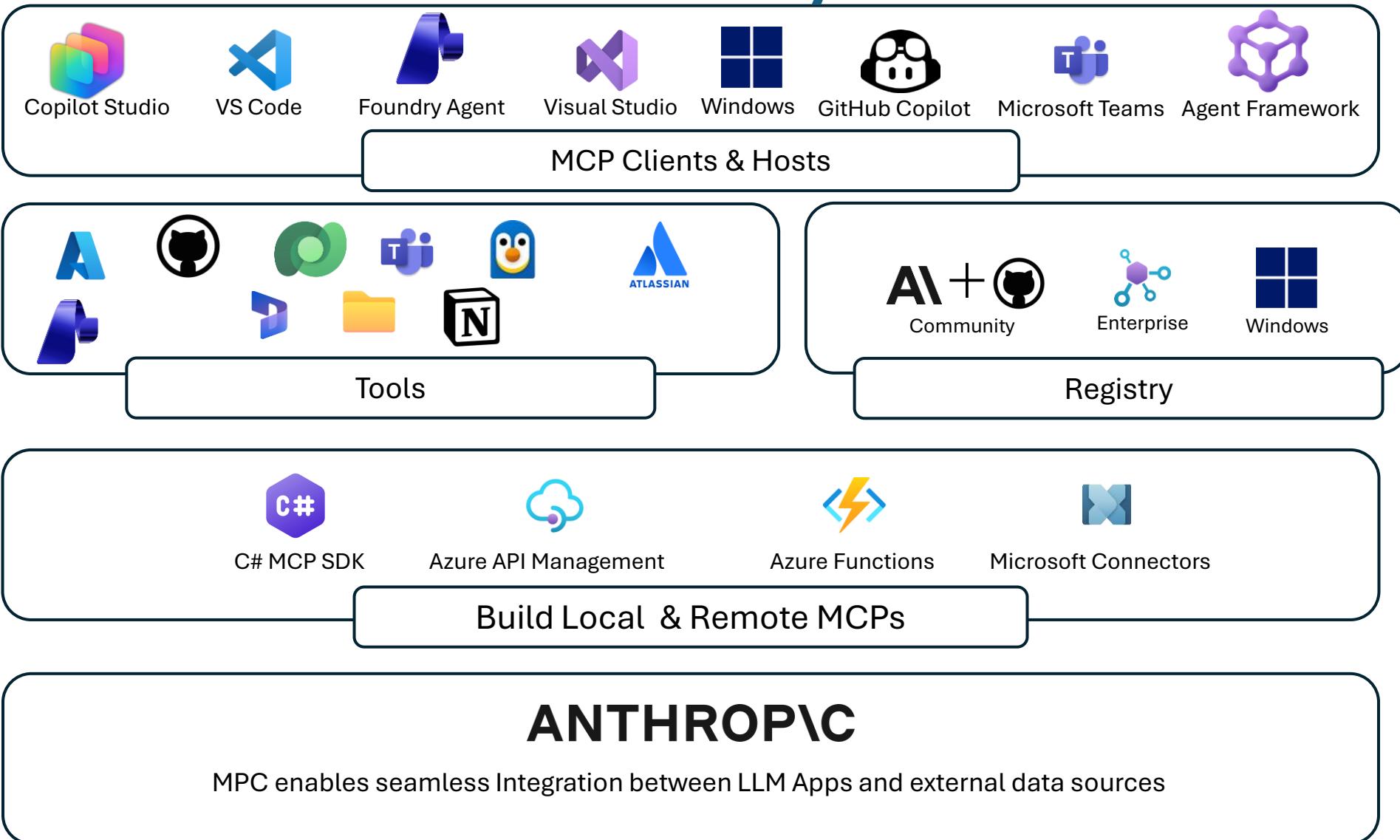
# Live Demo Activities

## **MCP Server Hosting**

Building a custom server to expose propriety logic as an LLM tool.

# How can MCP help us?

# Model Context Protocol At Play



Model Context Protocol

# Who Should Learn More?

- .NET Developers** eager to explore the latest .NET 10 features.
- Solution Architects** looking for scalable AI integration standards.
- Cloud Engineers** focused on hosting agentic components in Azure.
- AI Enthusiasts** curious about the Microsoft and Anthropic collaboration.



# Any Questions?

Thank you for joining the Peterborough .NET Meetup

[meetup.com/peterborough-net-meetup](https://meetup.com/peterborough-net-meetup)