

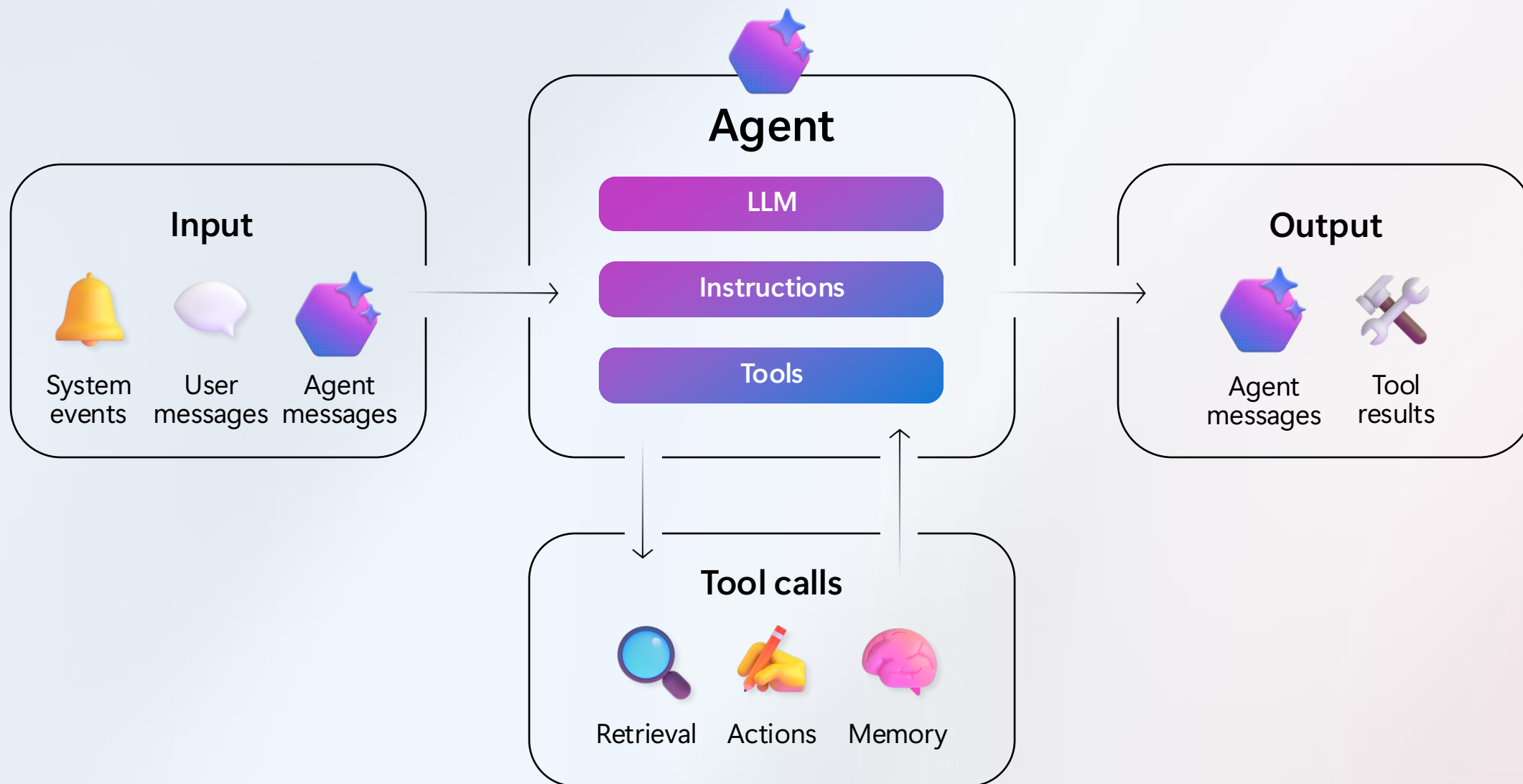


AI @ Wintercircus

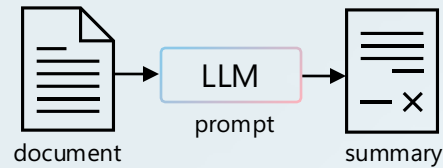
Multi-agent systems with Semantic Kernel

Eduard van Valkenburg
Senior Software Engineer – Semantic Kernel - Python

What is an agent?

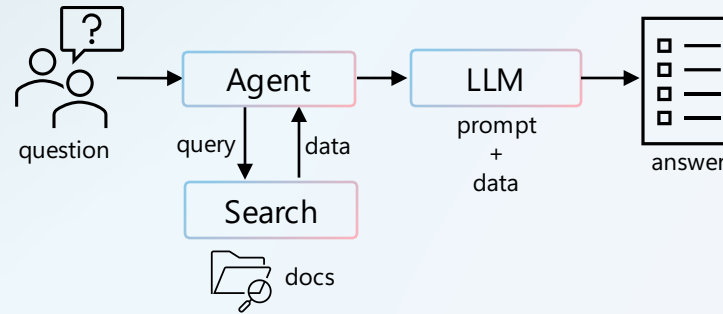


Spectrum of Agentic Solutions



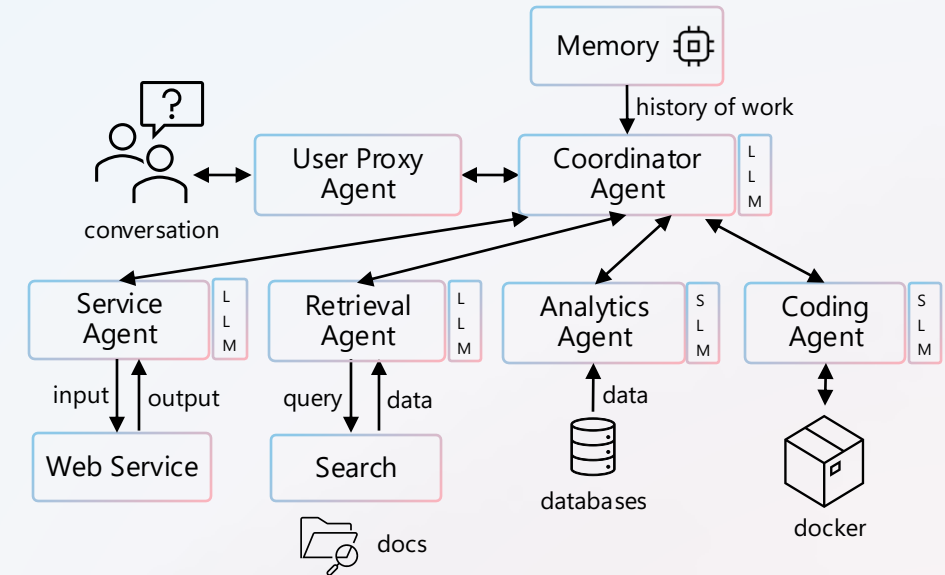
No Tools Agent
Narrow one-shot task

Ex: summarize text



Single Agent
Clearly scoped iterative task

Ex: providing an answer with supporting evidence to a complex question



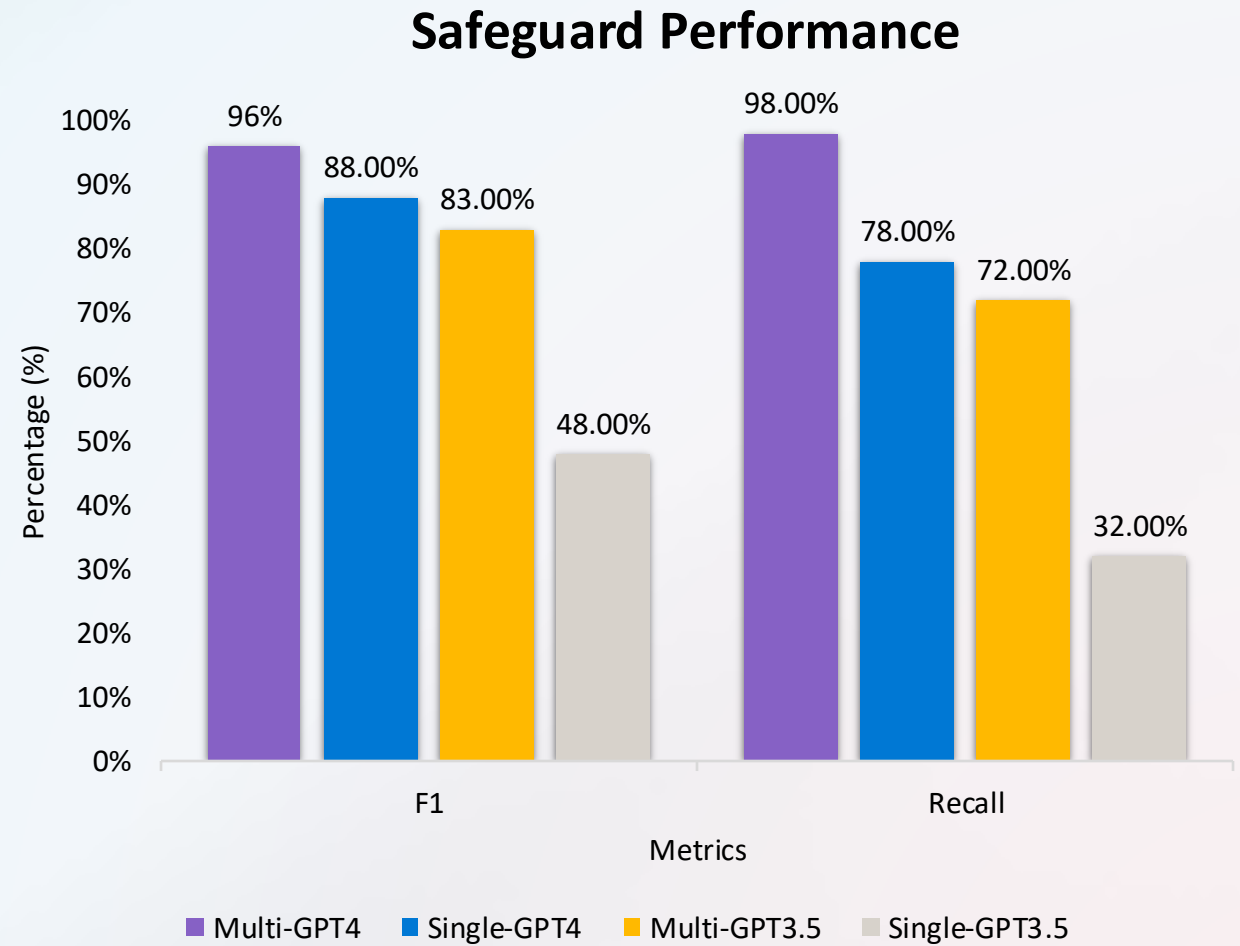
Multi-agent Systems
Wide scope complex use case requiring diverse skills

Ex: Propose 2 Instagram marketing campaigns including assets that would leverage the top 2 recent trends in our past quarter US Sales to boost our mailing list user base and predict the impact of each campaign

When should I use multi-agents over a single agent?

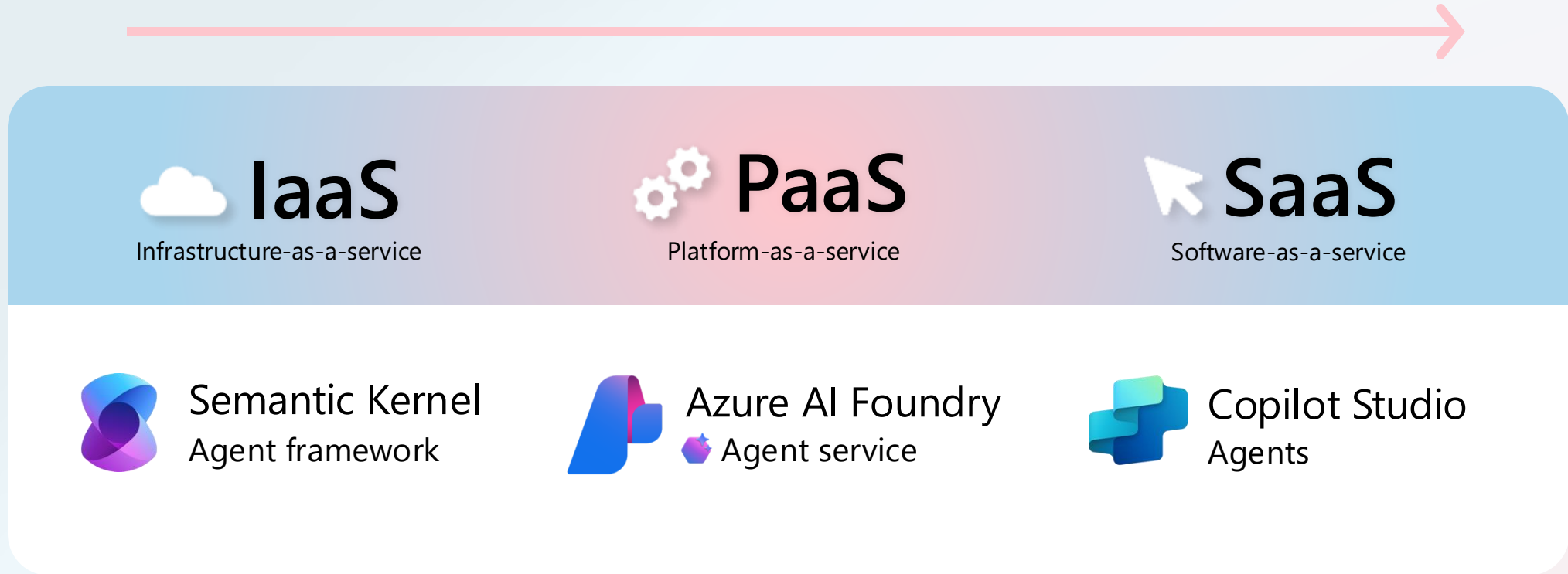
Multi agent systems can solve more complex tasks

Single agents can solve a wide range of problems and are simpler to implement. Multi agent systems should only be used if a single agent is unable to solve the challenge, to handle tasks that involve more data, diverse roles, or complex workflows.



Microsoft has different ways of building agent systems

Platform Integrations, ease-of-use, and development speed



Control, visibility, and customization



Azure AI Foundry

AI Agent Ecosystem

Authoring Tools

Visual Studio

GitHub

Knowledge



Microsoft Fabric



Azure Cosmos DB



SharePoint



Microsoft Graph



Azure AI Search



Microsoft Bing

Enterprise Trust

VNet deployments

OBO Auth

BYO-resources

Managed Identities

Agent catalog

Ready-made agents to kickstart your agent workforce

Agent frameworks (SK & AG)

Client SDKs for enterprise and production agentic systems

Agent tools

Orchestration

Channels

Foundry Agent Service

Deploy and manage agents with fully-managed runtime

Multi-agent workflows

Built-in threads

Long-term memory

Evaluation

Tracing & Monitoring

Governance + Safety

Foundry Models



OpenAI



Llama



Grok



Flux



Mistral



Phi



Cohere



Paige

stability.ai

Stability



Hugging Face

Industry Models



Foundry Labs

Muse

Magentic-One

Aurora

OmniParser

Open Ecosystem



A2A

Protocols



MCP



OpenAPI

Connectors



Google VertexAI



Amazon Bedrock



CrewAI



LangChain



ElasticSearch



Pinecone



Logic Apps



Azure Functions

Agentic Scenarios

Deterministic Process
Deterministic Outcome

Traditional Software

Deterministic Process
Probabilistic Outcome

Customer Support
Marketing Campaign

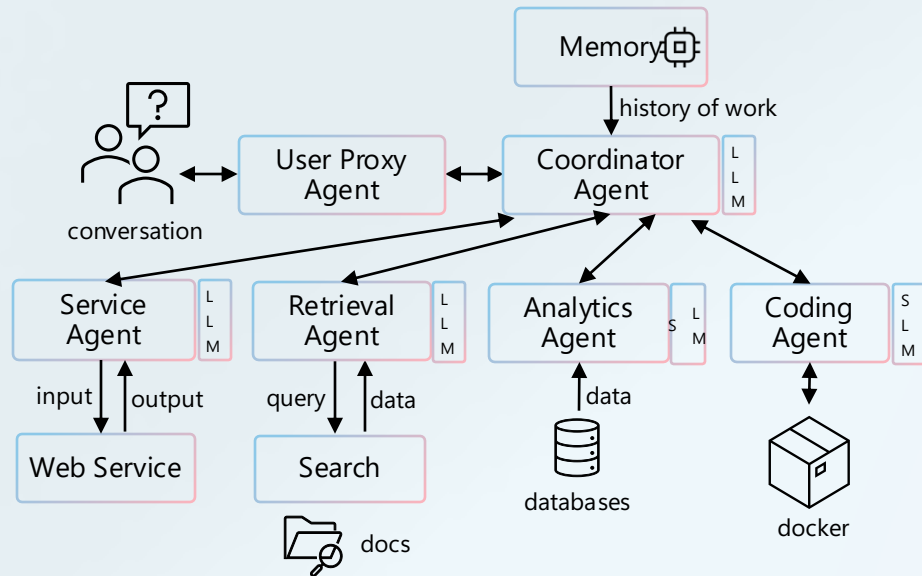
Probabilistic Process
Deterministic Outcome

Loan Reviewer

Probabilistic Process
Probabilistic Outcome

Research Agents

Agent systems with Semantic Kernel

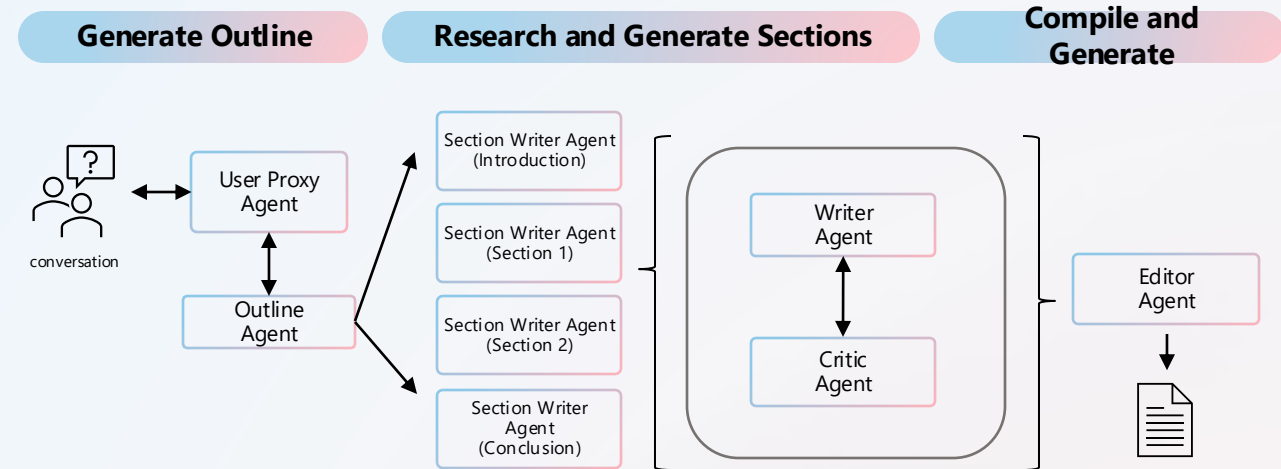


Agent Framework

LLM-driven orchestration

Creative reasoning and decision-making

Ex: Propose 2 Instagram marketing campaigns including assets that would leverage the top 2 recent trends in our past quarter US Sales to boost our mailing list user base and predict the impact of each campaign



Process Framework

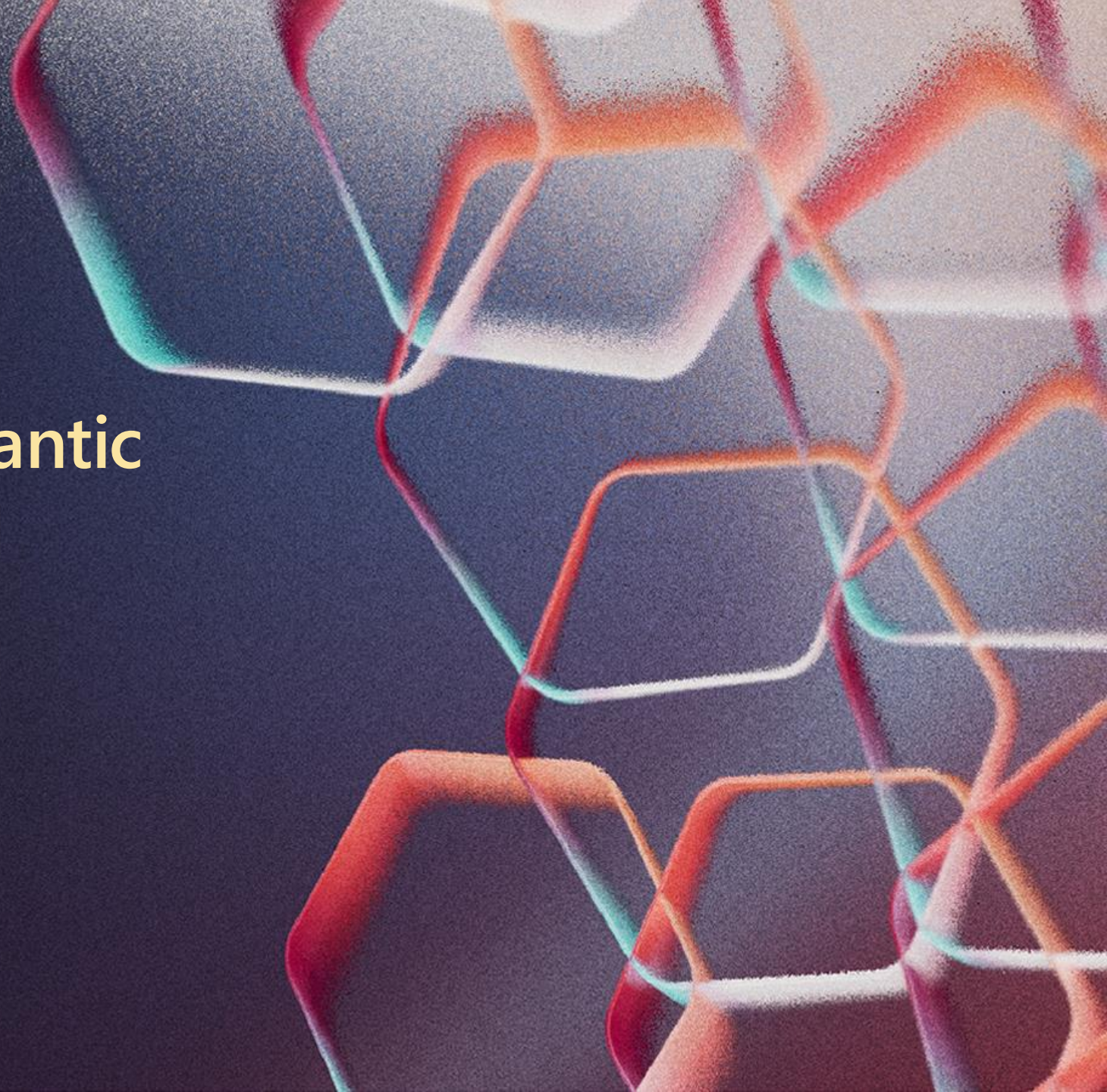
Workflow-driven orchestration

Deterministic and predictable execution pattern

Ex: Execution the Deep Research process to generate a document outline, write and refine section and synthesize into final document

Multi-agents with Semantic Kernel

Demo



Microsoft's agent frameworks*

Orchestrate agents with **AutoGen** and **Semantic Kernel**



State-of-the-art
research SDK



Production-ready
and stable SDK

Research

Production

Shared Agent Runtime

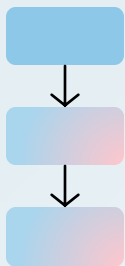
Deploy them to
Azure AI Foundry



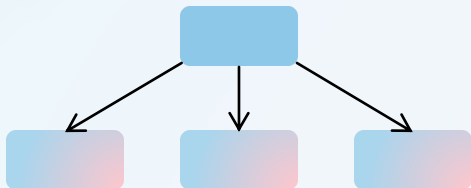
Azure AI Foundry Agent Service

Multi-Agent Orchestration Patterns

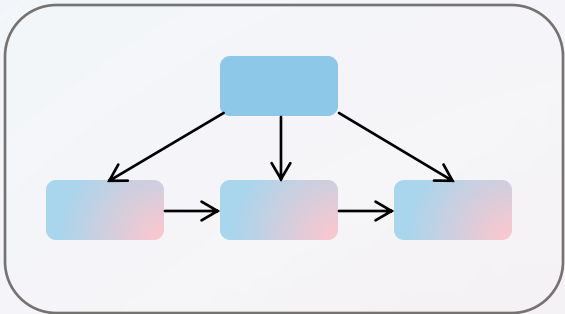
Sequential



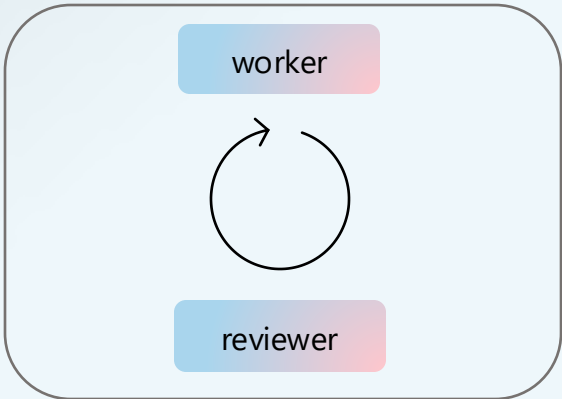
Concurrent



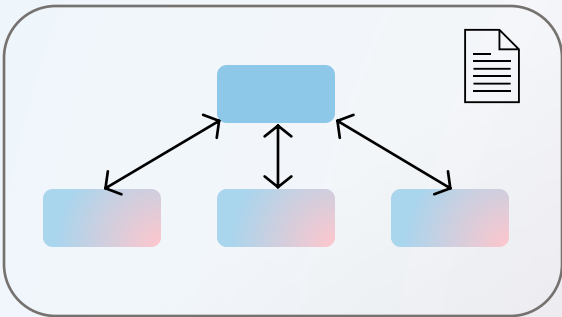
Handoff



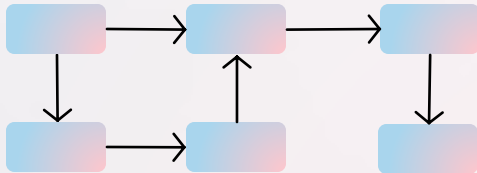
Group Chat

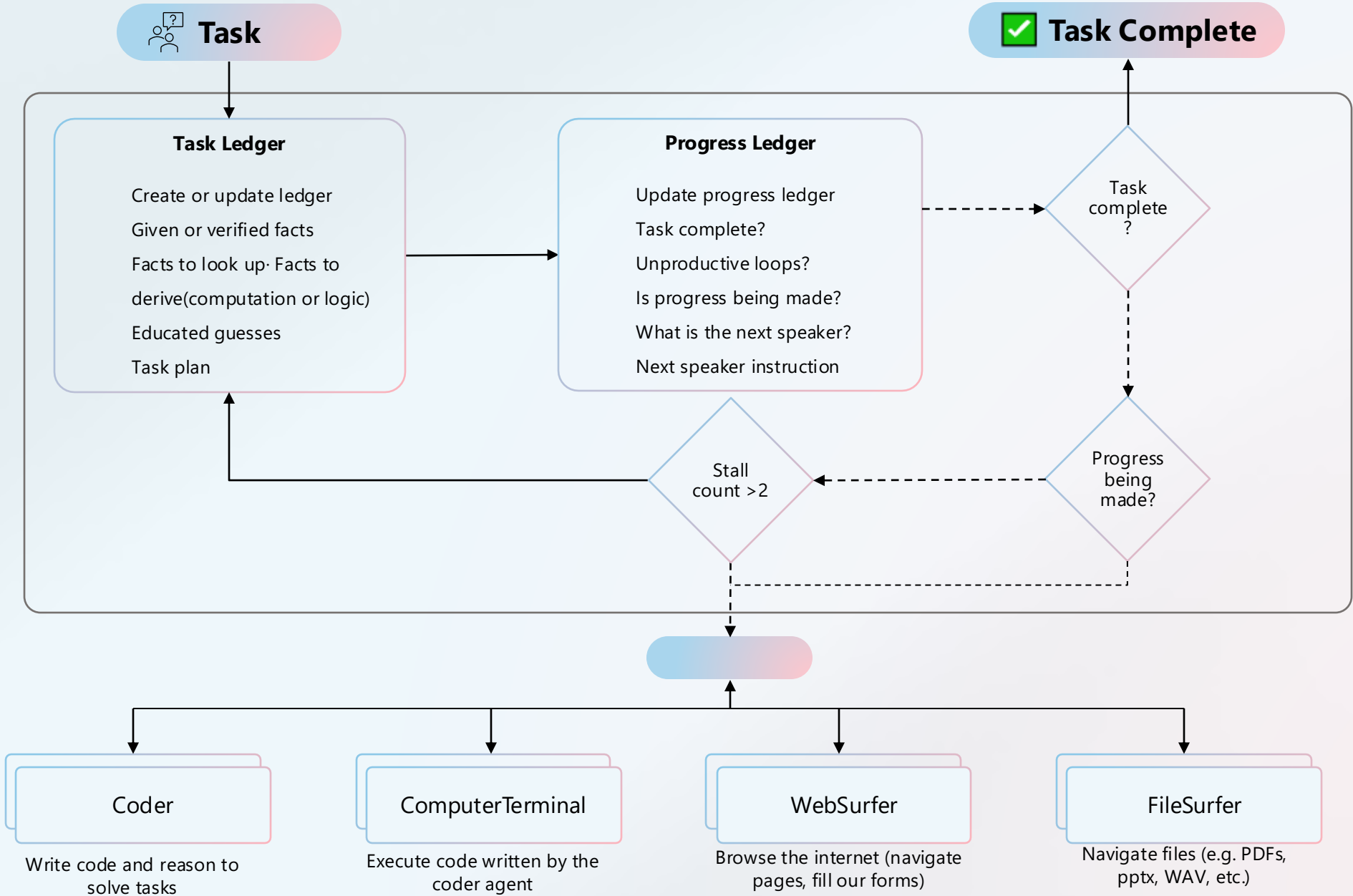


Magentic



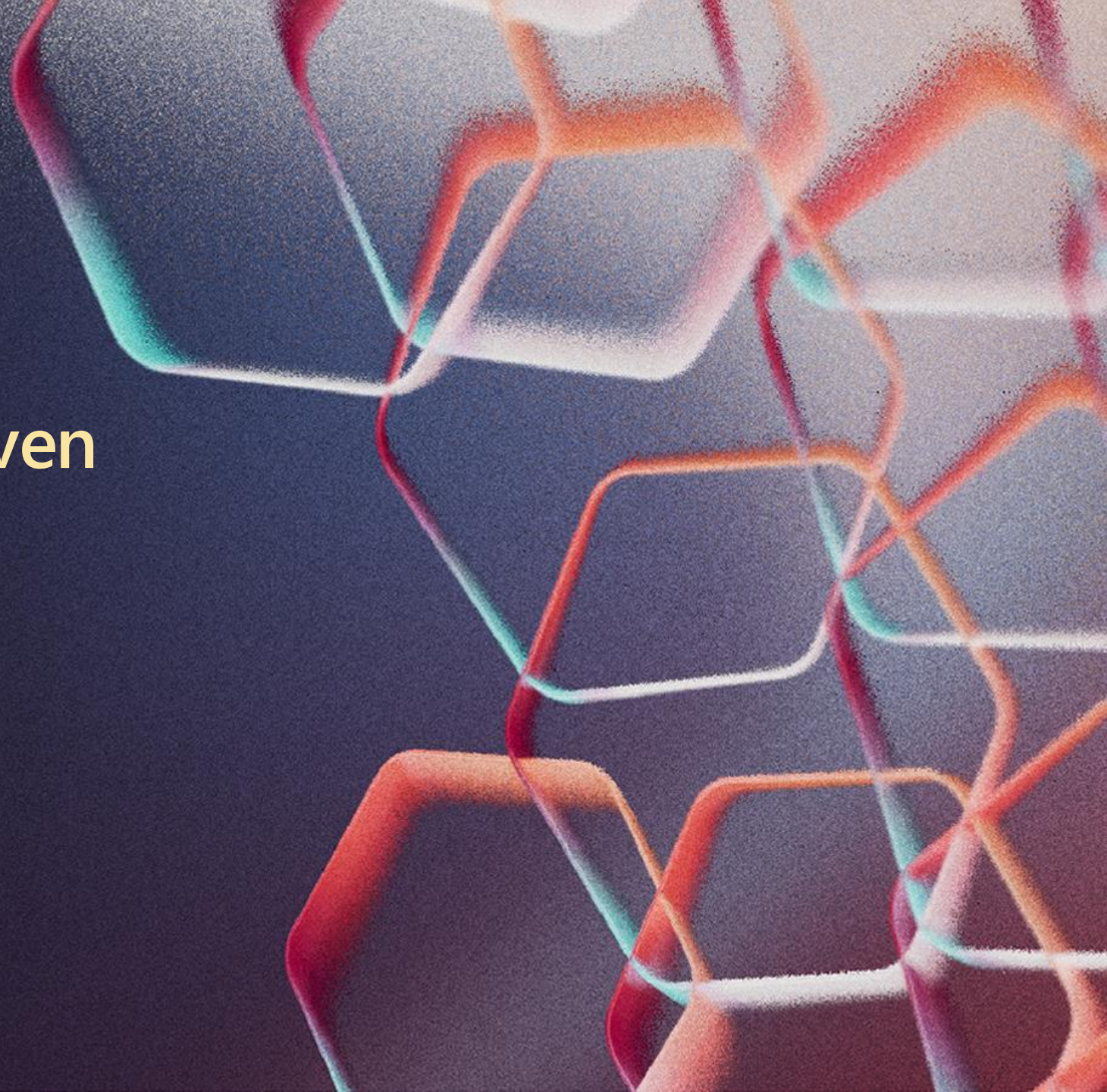
Workflow Process





Magentic One LLM-driven orchestration

Demo

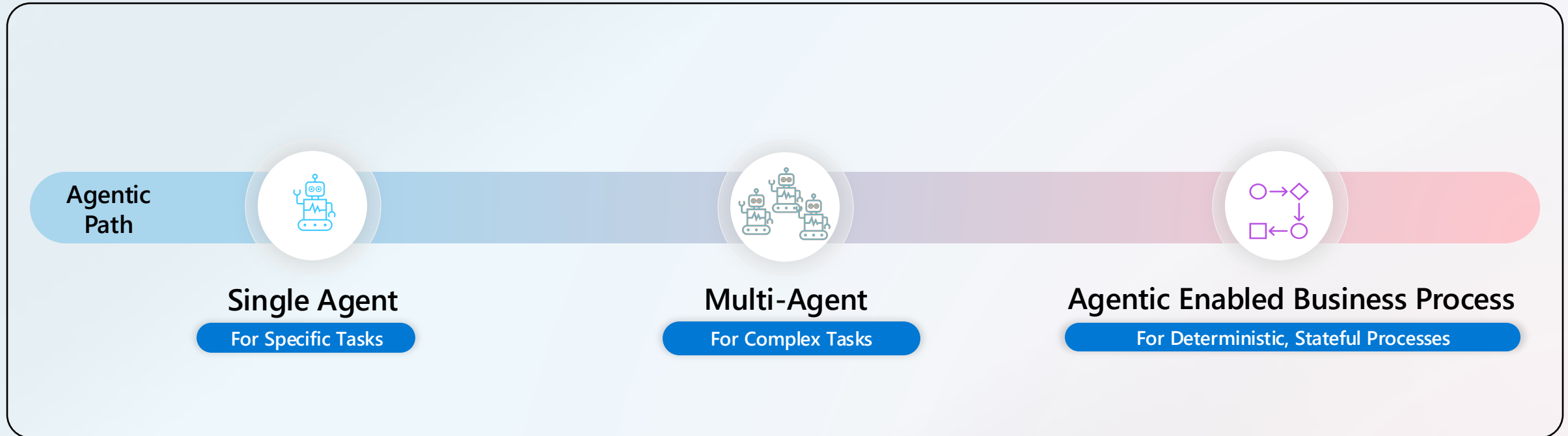


Process driven orchestration

Demo



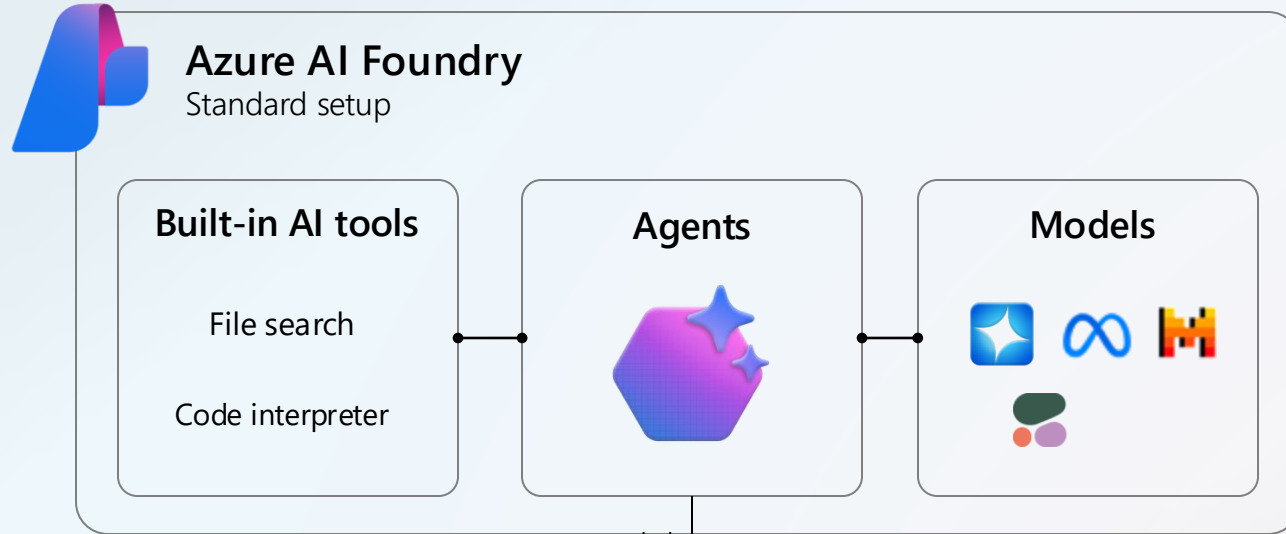
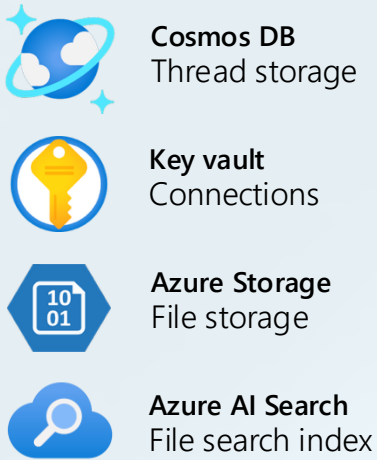
Agentic systems



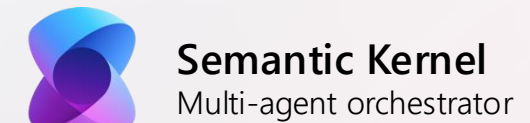
Agent System with Azure AI Foundry



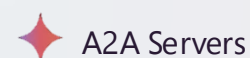
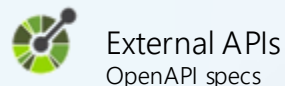
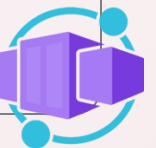
BYO resources



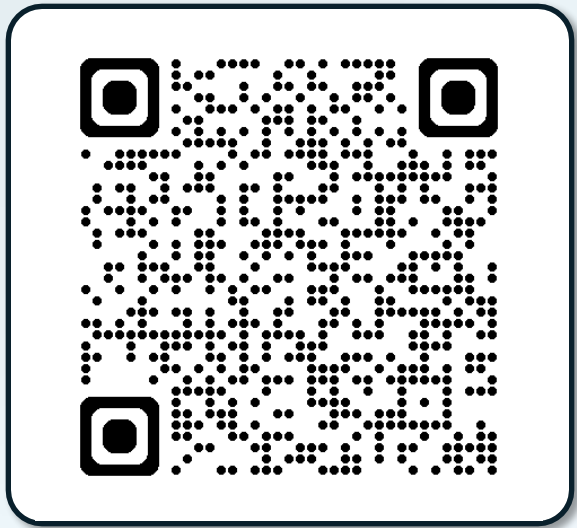
AI tool resources



Azure Container Apps

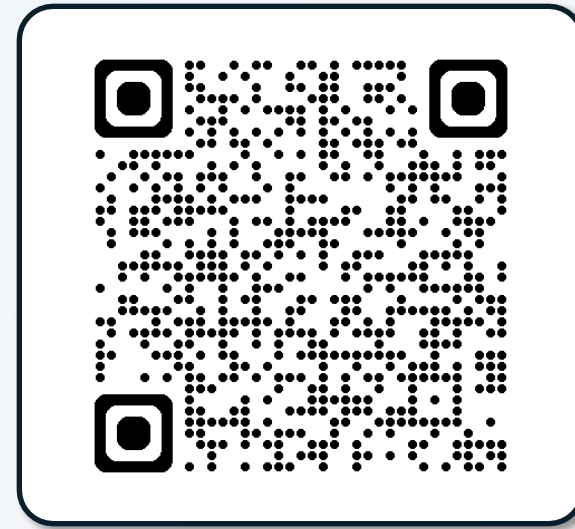


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