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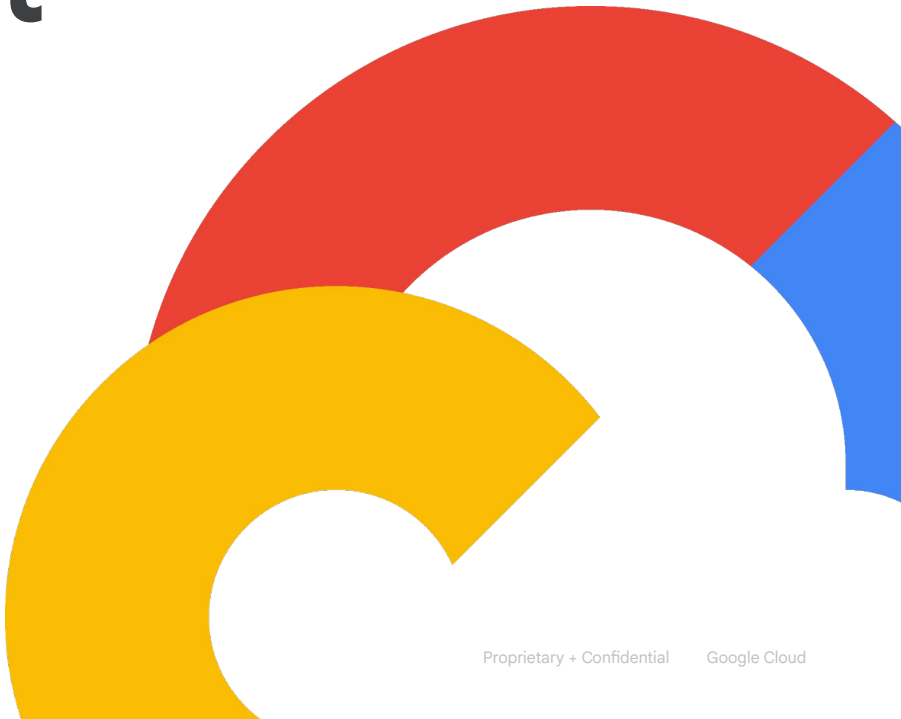
# ADK Enablement Workshop

[Company]

[Date]

Google Cloud



# Agenda

- Introduction - 15mins
- Environment Setup - 15 mins
- ADK Deep Dive - 1 hour
- ADK RAG Sample - 30 mins
- Hackathon - 45 mins

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# Question?

https://ask.corp.google.com/series/7687179900781835160

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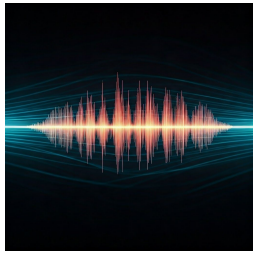
# 01
# Welcome to the Agentic era

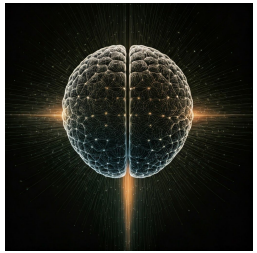
# We are entering a new era of AI innovation and adoption

## Key trends



**Multimodality and Thinking Models**

Interact with images, video, and audio in addition to text



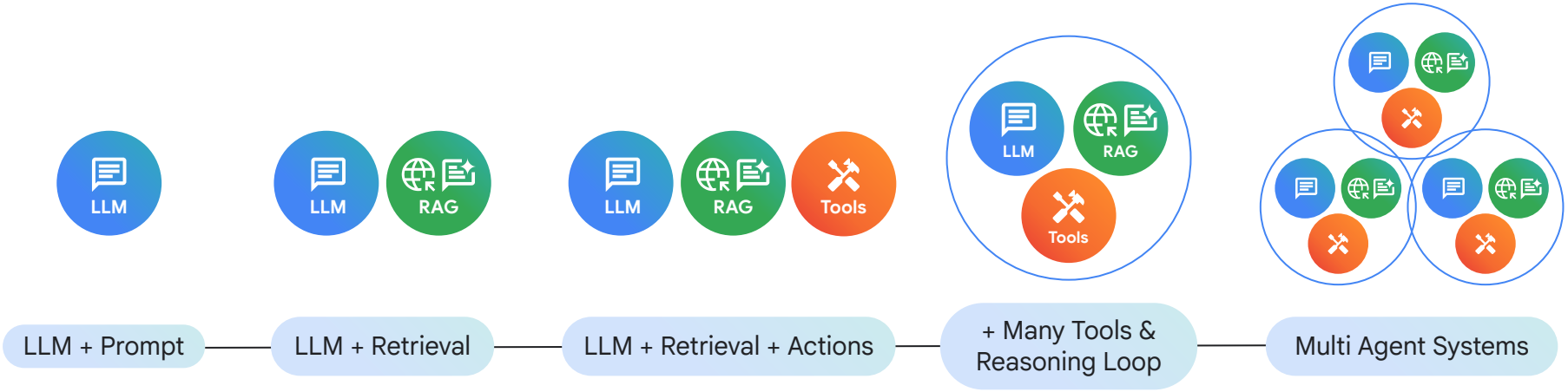
**Agentic Workflows**

reasoning, planning, and memory with autonomy to make decisions and adapt.

**Knowledge Frontier**

reimagining how employees and AI find, access, and interact with information

# AI Agents
# An Evolution




**What is next?**

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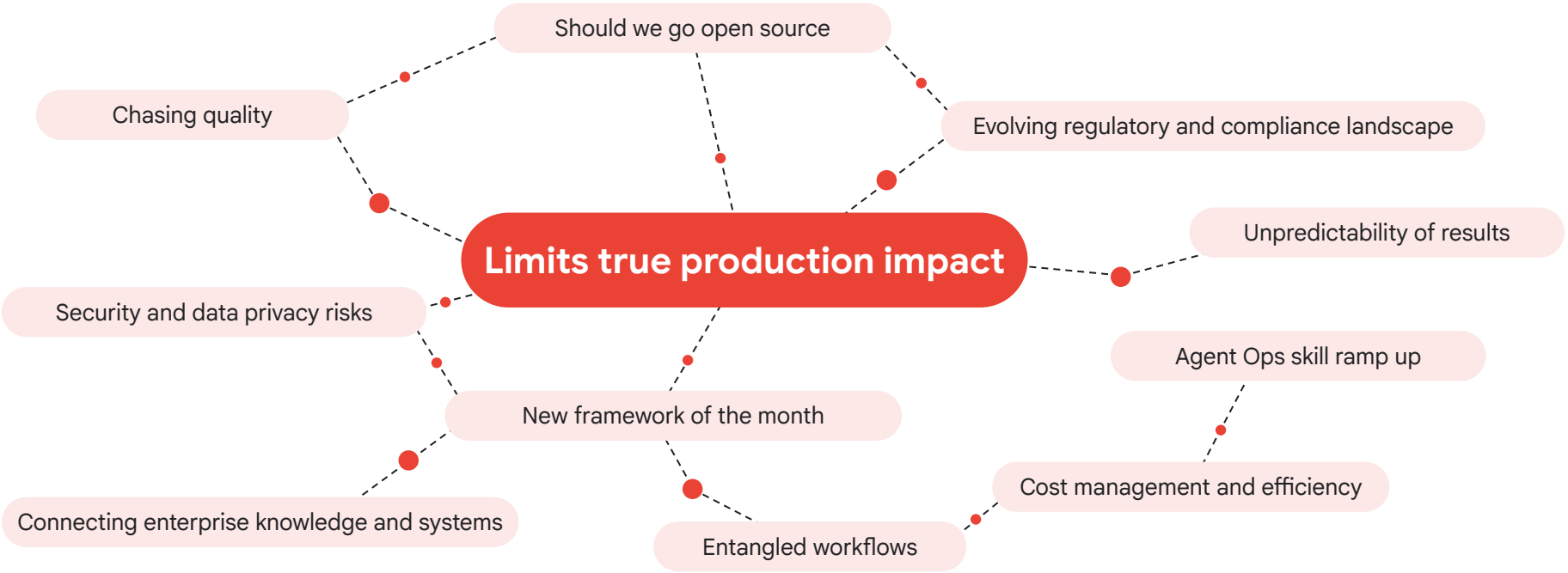
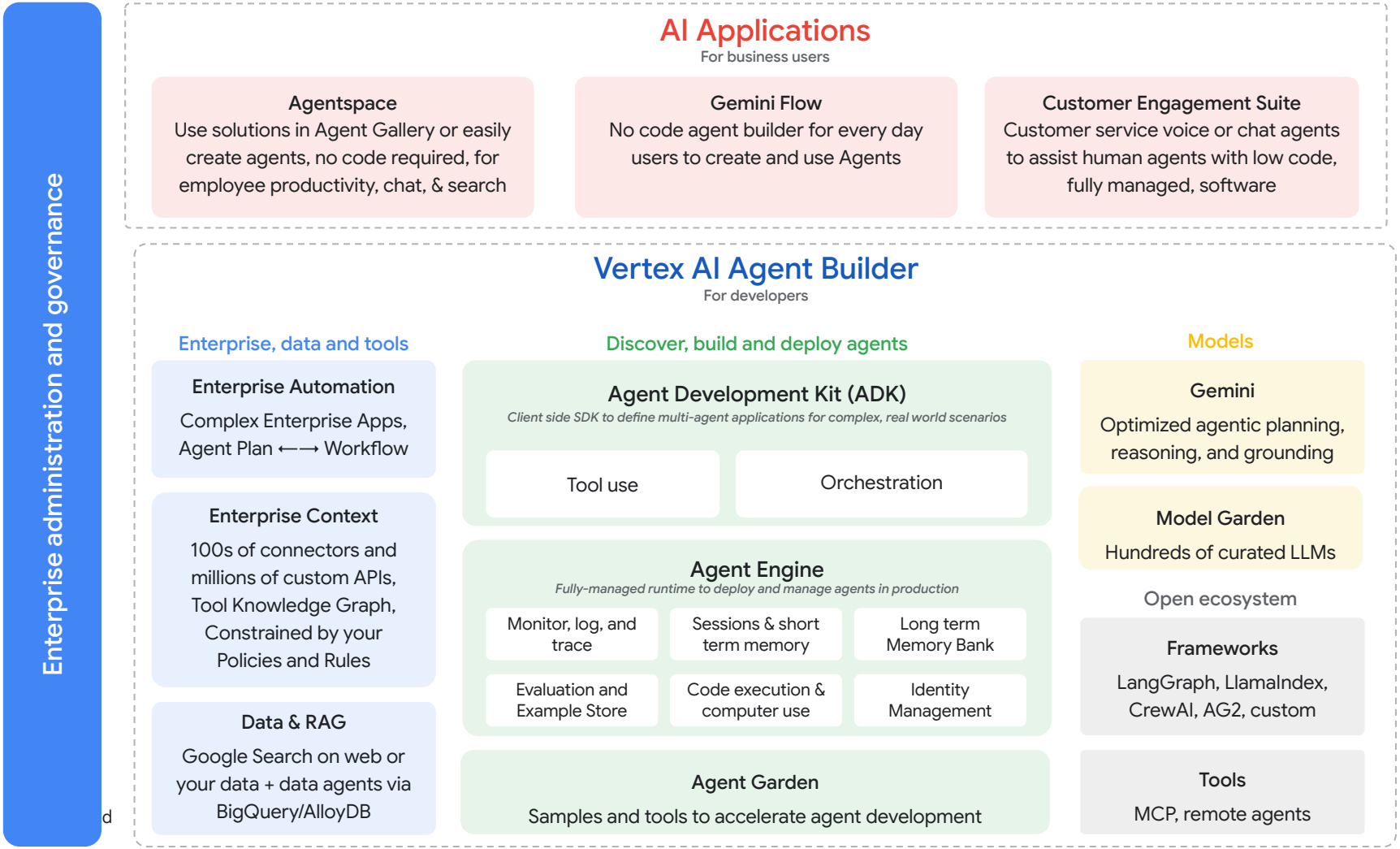
# Taking agents to production is hard



# 02
# Vertex AI Agent Builder


Enterprise administration and governance
AI Applications
For business users
Agentspace
Use solutions in Agent Gallery or easily create agents, no code required, for employee productivity, chat, & search
Gemini Flow
No code agent builder for every day users to create and use Agents
Customer Engagement Suite
Customer service voice or chat agents to assist human agents with low code, fully managed, software
Vertex AI Agent Builder
For developers
Enterprise, data and tools
Enterprise Automation
Complex Enterprise Apps, Agent Plan ⟷ Workflow
Enterprise Context
100s of connectors and millions of custom APIs, Tool Knowledge Graph, Constrained by your Policies and Rules
Data & RAG
Google Search on web or your data + data agents via BigQuery/AlloyDB
Discover, build and deploy agents
Agent Development Kit (ADK)
Client side SDK to define multi-agent applications for complex, real world scenarios
Tool use
Orchestration
Agent Engine
Fully-managed runtime to deploy and manage agents in production
Monitor, log, and trace
Sessions & short term memory
Long term Memory Bank
Evaluation and Example Store
Code execution & computer use
Identity Management
Agent Garden
Samples and tools to accelerate agent development
Models
Gemini
Optimized agentic planning, reasoning, and grounding
Model Garden
Hundreds of curated LLMs
Open ecosystem
Frameworks
LangGraph, LlamaIndex, CrewAI, AG2, custom
Tools
MCP, remote agents

# Why agents on Google Cloud

01

### Higher quality

Achieve higher performance for real world utility through our vertical integration across client, server, and model

02

### Production ready

Build agents with the platform we stand behind and use to build our own solutions.

03

### Built for enterprise

Handle enterprise requirements with HiTL flows and guardrails, policy enforcement, and Google Cloud security & compliance

04

### Open Ecosystem

Enjoy interoperability to future proof investment and bridge the gap to existing popular frameworks tools and connectors

05

### One stop shop

Accelerate development with all you need to build agents: frameworks, tools, runtimes, active learning, solutions and models (Gemini, Vertex AI Model Garden, fine tuned models)



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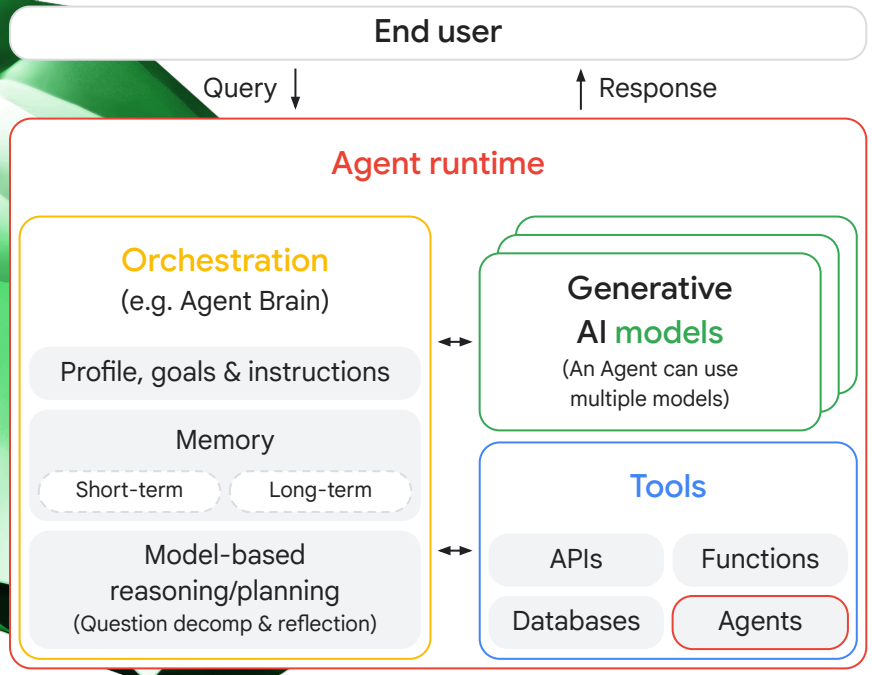
# 03
# Agent Dev Kit (ADK)

A client side framework for developers define, test, and iterate on multi-agent applications

# AI Agents plan, reason, and execute tasks for users




## Four key components

**Model(s):**
Used to reason over goals, determine the plan and generate a response

**Tools:**
Fetch data, perform actions or transactions by calling other APIs or services

**Orchestration:**
Maintain memory and state (including the approach used to plan), tools, data provided/fetched, etc.

**Runtime:**
Execute the system when invoked



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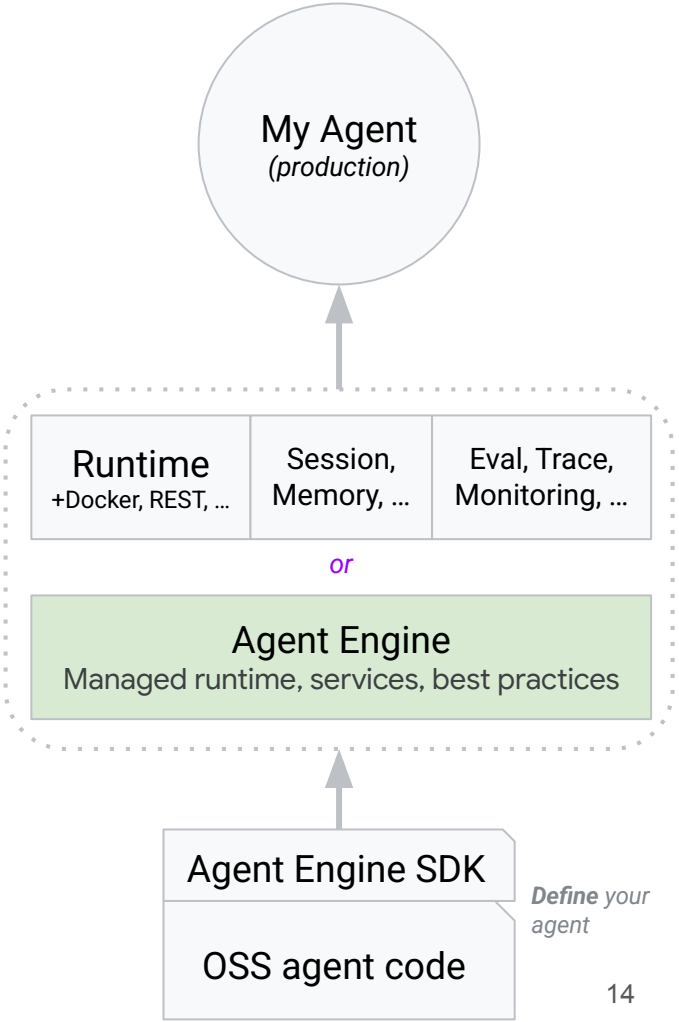
# 04
# Vertex AI Agent Engine

For developers to deploy, manage, and scale agents in production

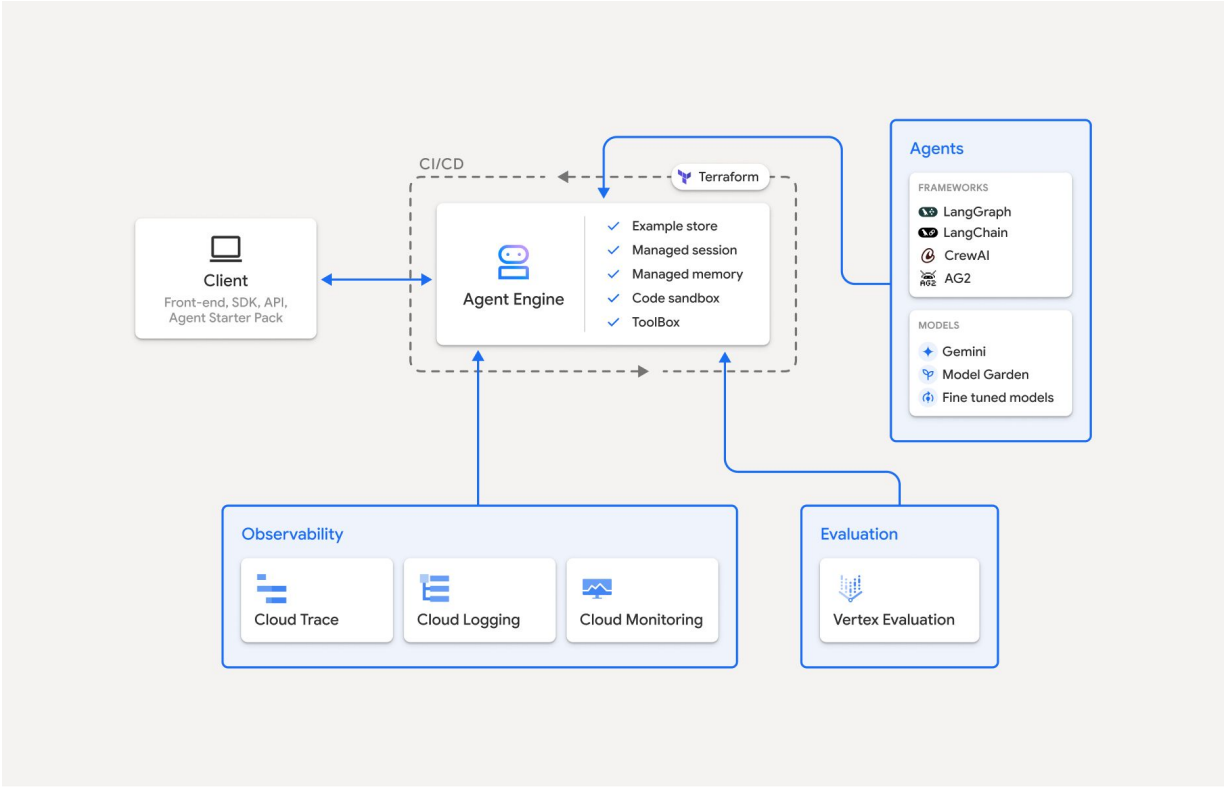
# Vertex AI Agent Engine

Simplify agent deployment with a fully managed runtime

| | |
|---|---|
| **Scalable Deployment** | • Reliable and **scalable agent deployments**<br>• APIs to **manage** and **query agents**<br>• **Security** (e.g., VPC-SC) and **authentication** |
| **Manage end to end** | • Tools for **session** and **memory management**<br>• **UI** to list, view, and converse with agents<br>• Agent **monitoring** and **analytics** |
| **Quality & evaluation** | • **Evaluation tools** to measure agent quality<br>• **Autorater** to gauge agent user sentiment<br>• **Example Store** to improve agent performance |
| **Provider agnostic** | Use any **model:**<br>• **Gemini**<br>• 3P models in the **Vertex AI Model Garden**<br>• **Fine tuned** models<br>• **OSS** models<br>Supported **frameworks:**<br>• **Agent Framework** from Google Cloud<br>• **3P OSS**: LangGraph, LangChain, Crew AI, AG2 |



# Agent Engine Architecture



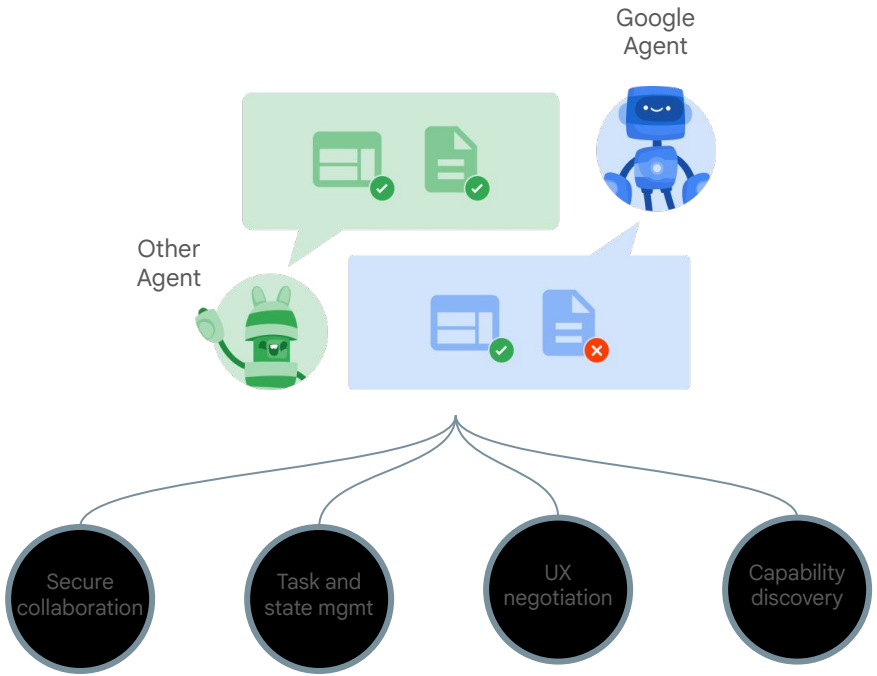
Google

# A2A protocol

# A2A protocol

## Unlock collaborative, agent-to-agent scenarios with a new open protocol

- **Seamless Agent Collaboration:** Introduces a standard protocol for autonomous, opaque agents built on different frameworks and by various vendors to communicate and collaborate effectively with each other and with users, addressing the current lack of agent interoperability.
- **Simplifies Enterprise Agent Integration:** Provides a straightforward way to integrate intelligent agents into existing enterprise applications, allowing businesses to leverage agent capabilities across their technology landscape.
- **Supports Key Enterprise Requirements:** Offers core functionalities essential for secure, enterprise-grade agent ecosystems, including capability discovery, user experience negotiation, task and state management, and secure collaboration.



# A2A protocol complements MCP

## MCP for resources and tools. A2A for applications and agents.

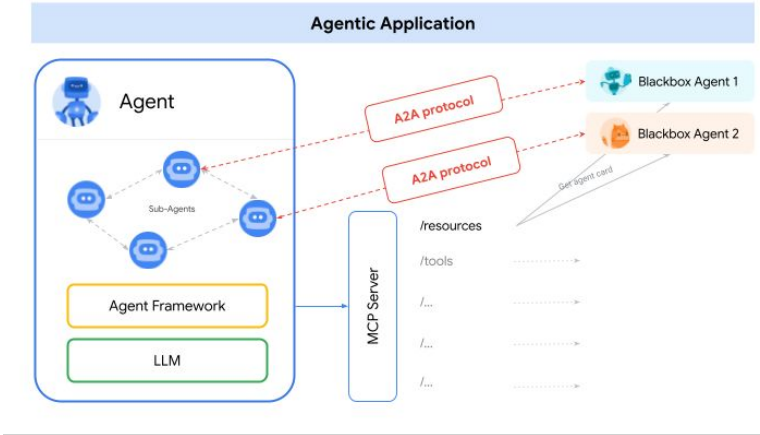
Tools have structured and known inputs and outputs. MCP is becoming the standard, creating ecosystem and reducing agent<>tool integration complexity.

Agents interactions are dynamic and multi-modal. They involve user interfaces, multiple users, other agents, and evolving conversations and goals. A2A is a standard designed specifically handle the dynamic nature of multi-agent systems.

**Dynamic negotiation:** A2A helps agents discover other agents with Agent Card describing capabilities and skills. Agents can work in their natural modalities.

**Collaborative nature:** A2A supports multi-turn, multi-agent, asynchronous collaboration on (long-running) tasks.

A2A's agent card should be provided to a client agent as a resource. For this you can use MCP's resources or other context provider.



# Open standards for connecting Agents

## Connect Agents to Tools and Other Agents using MCP and A2A

### MCP (Model Context Protocol)

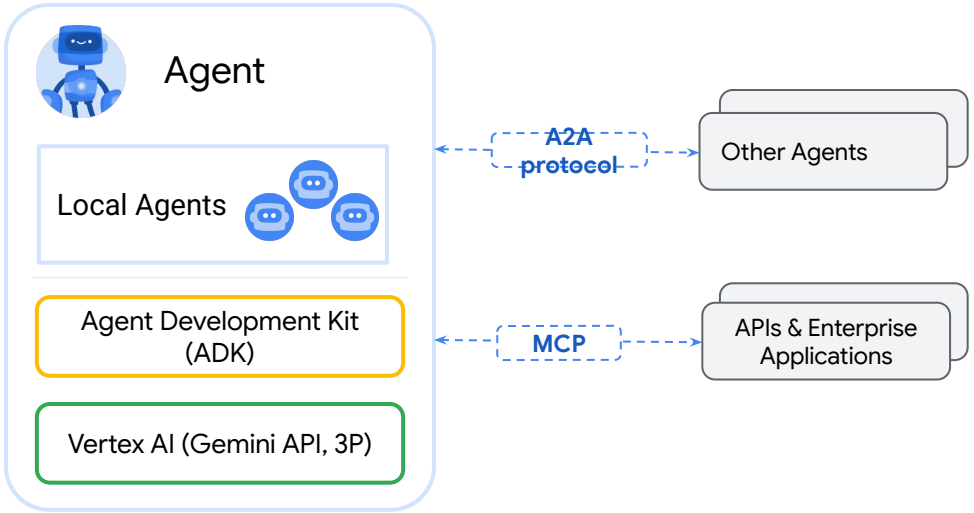
***for tools and resources***

- Connect agents to tools, APIs, and resources with structured inputs/outputs.
- ADK supports MCP tools. Enabling wide range of MCP servers to be used with agents.

### A2A (Agent2Agent Protocol)

***for agent-agent collaboration***

- Dynamic, multimodal communication between different agents without sharing memory, resources, and tools
- Open standard driven by community.
- Samples available using ADK, LangGraph, Crew.AI



# Learn more about the Agent Development Kit

- ADK Code Repo
- Documentation

# Thank you

We love to get your feedback

Google Cloud

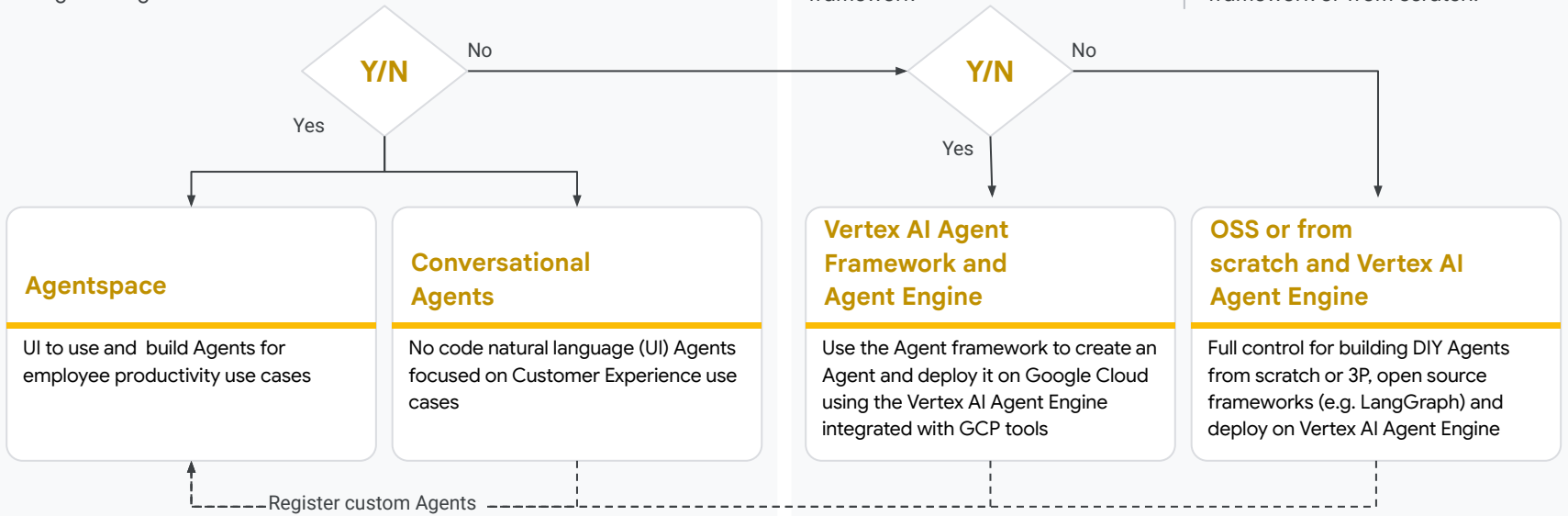
# I want to build an Agent

## Which Google Cloud option should I use?

I am a **Business user** and want to build Agents using a rich UI (**no code**) to create deterministic workflows along with config based gen AI Agents.

I am a **developer** and want to **customize** an agent **with code** using Vertex AI's client side agent framework

I want to build and maintain Agent code using an OSS python framework or from scratch.

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# Building agents across abstraction layers

Using Google Cloud, build agents at your preferred level of abstraction