

THE LINUX FOUNDATION

Building Custom MCP Servers With FastMCP and Integrating AI Agents Using Google ADK

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Acedemand



여러분 환영합니다

Hello everyone, welcome!



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MLOps Engineer
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Mehmet Hilmi ML

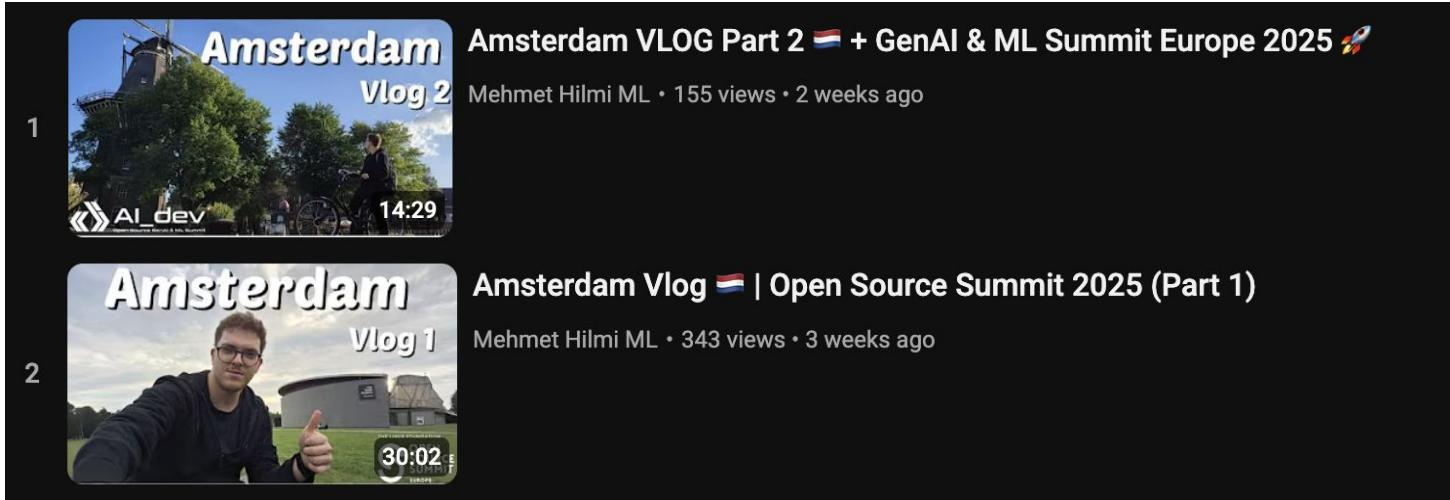
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Hello! My name is Mehmet Hilmi Emel, and this channel was created to share the kn...continued
instagram.com/hilmi_ml and 2 more links

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Session Plan

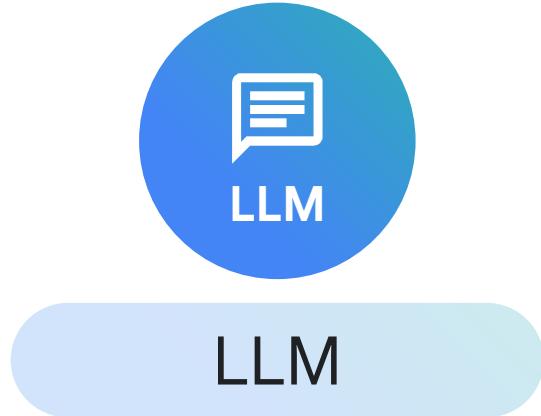
1.5 hour session

30 minutes
theoretical

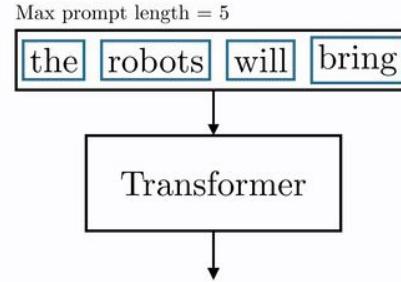
1 hour tutorial

Building Custom MCP Servers With FastMCP and Integrating AI Agents Using Google ADK

Evolution of AI Agents



Generating text



Evolution of AI Agents

!! Hallucination



LLM

Prompt

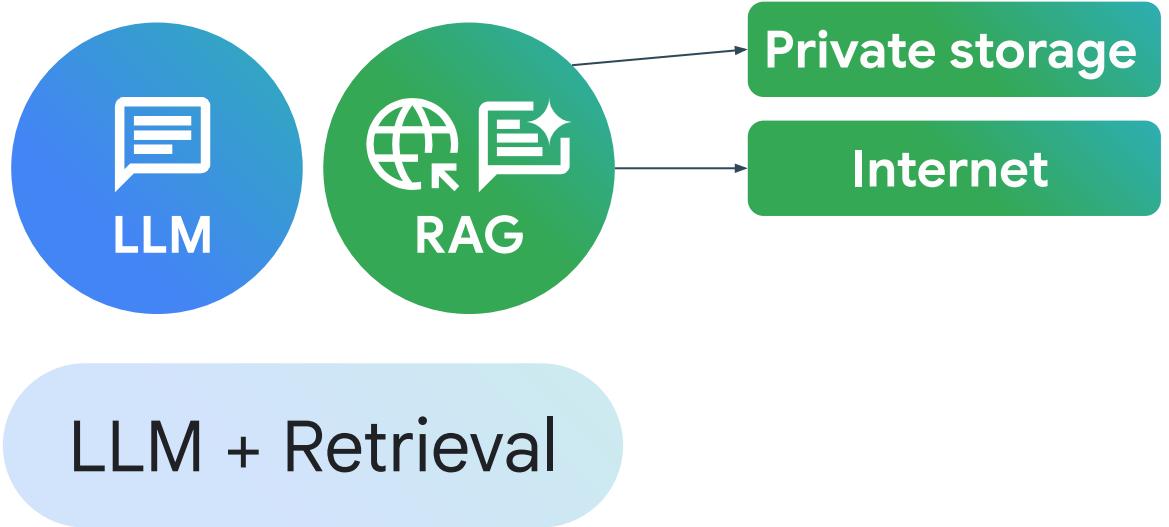
Evolution of AI Agents

!! Knowledge cutoff
!! Data Limitation



LLM + Prompt

Evolution of AI Agents



Evolution of AI Agents



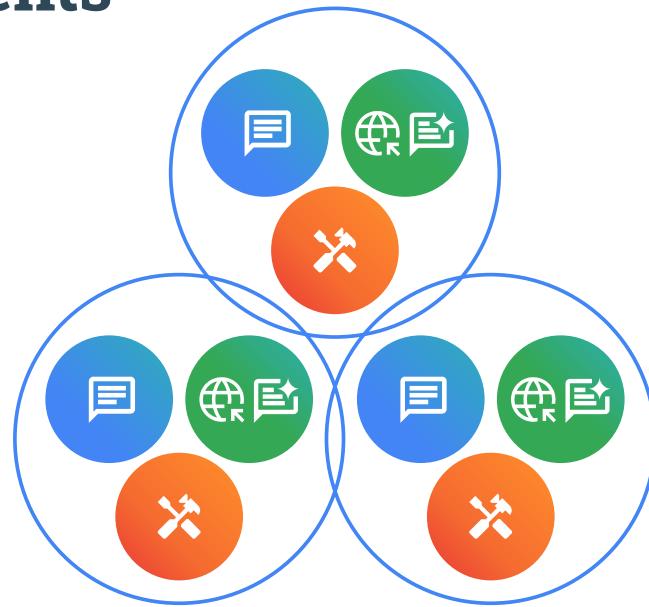
LLM + Retrieval + Actions

Evolution of AI Agents



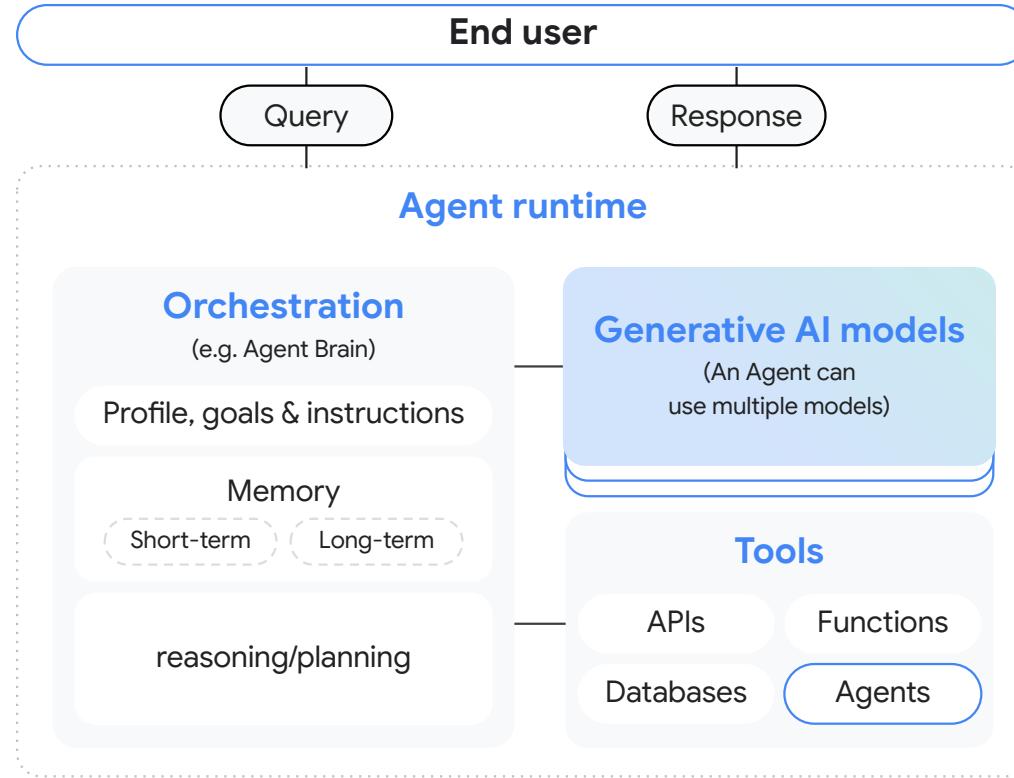
+ Many Tools &
Reasoning Loop

Evolution of AI Agents



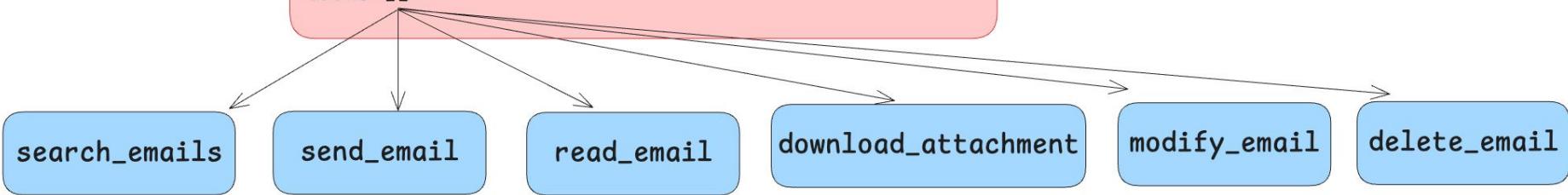
Multi Agent Systems

What is AI Agent?



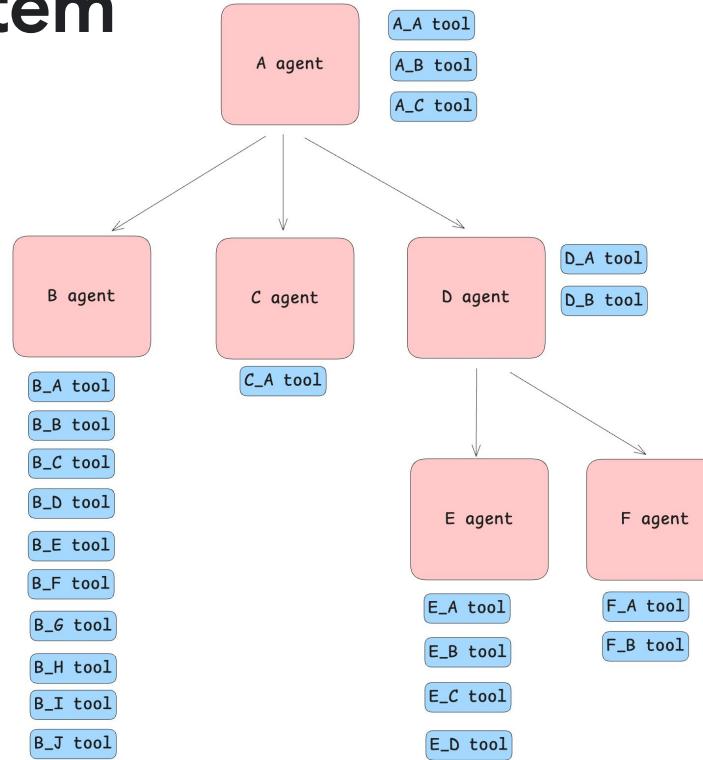
Mail Agent

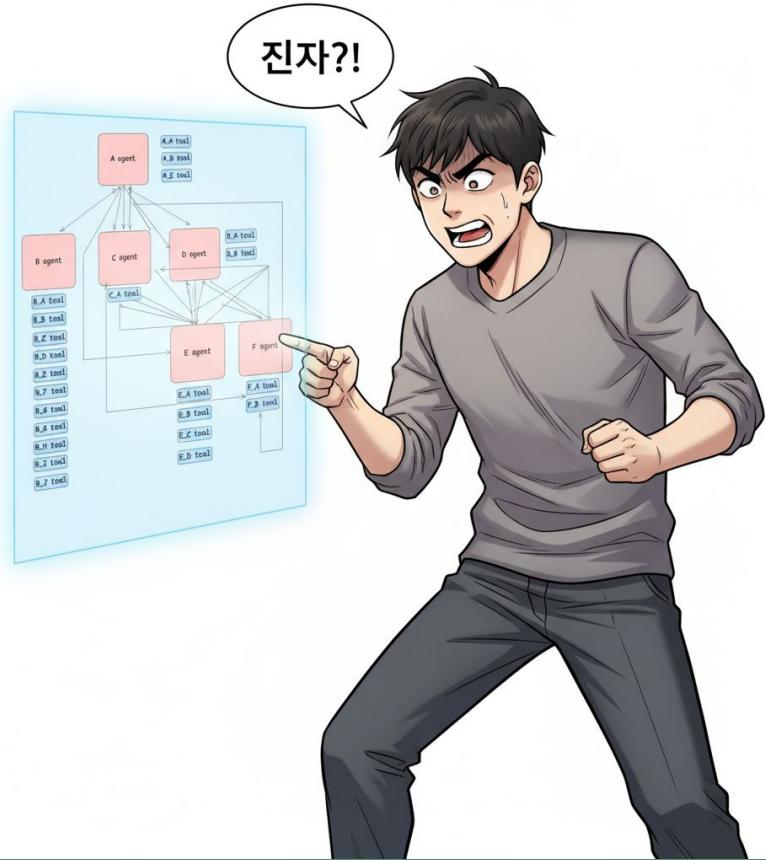
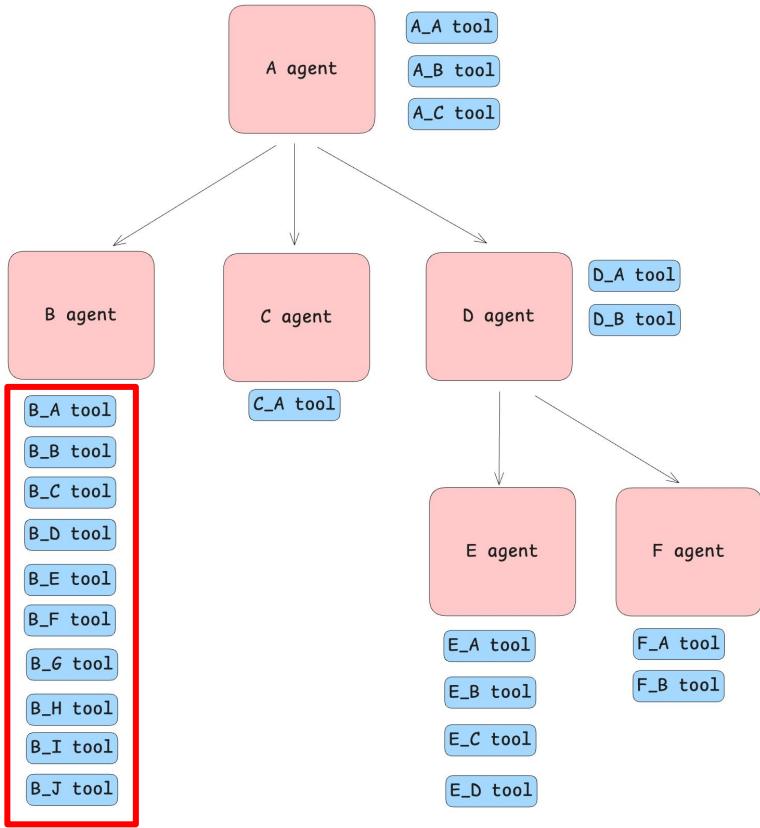
```
name="email_agent",
model="gemini-2.0-flash",
description= "You are an AI agent.."
instructions="When a user asks a question, first.."
tools=[]
```



**Everything is great.
But what about Multi-Agent Systems?**

An Example of a Multi-Agent AI System







Some Challenges

- ✖ Long and time-consuming development process
- ✖ Repeatedly rebuilding tools that do the same thing
- ✖ Same tools for different frameworks



Veo



Model Context Protocol

ANTHROP\IC

MCP =



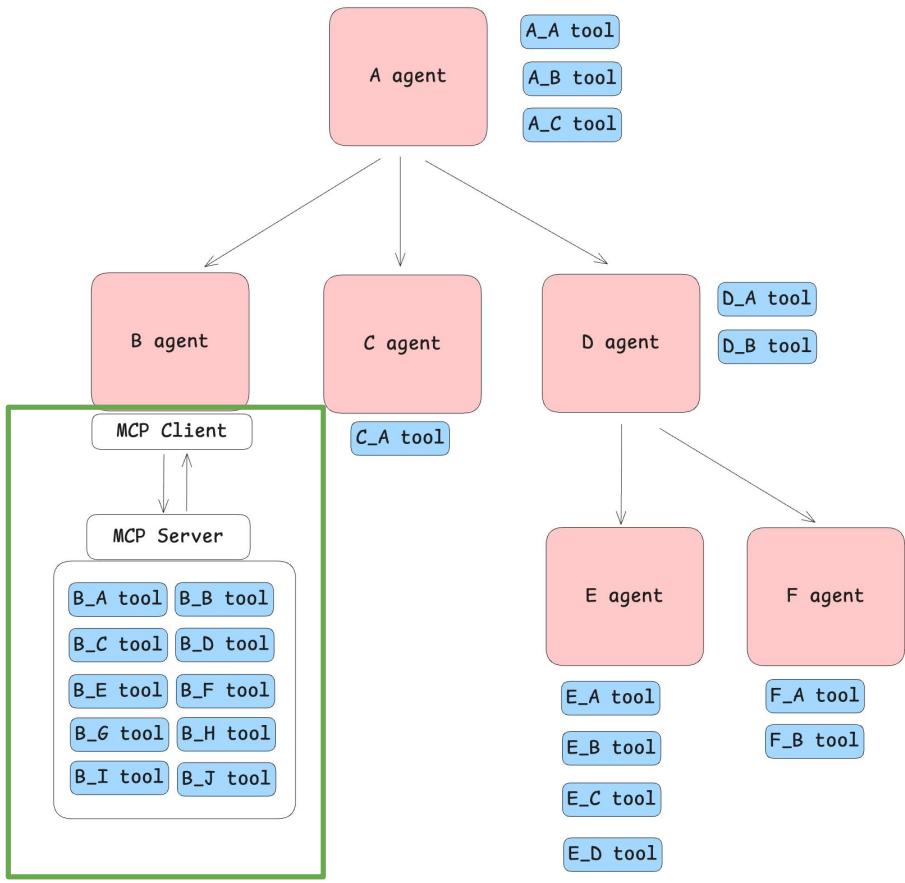
USB-C

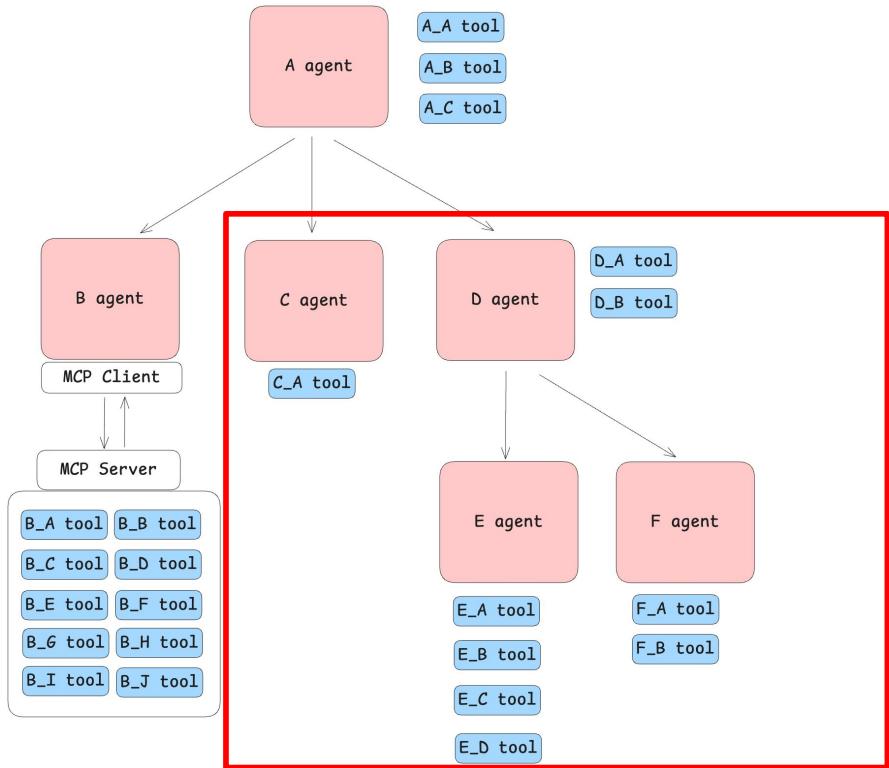
Just as USB-C provides a standardized way to connect electronic devices, MCP provides a standardized way to connect AI applications to external systems.

Tools

Prompts

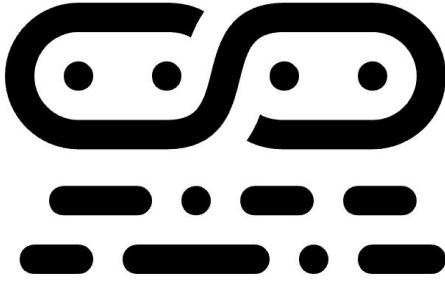
Resources

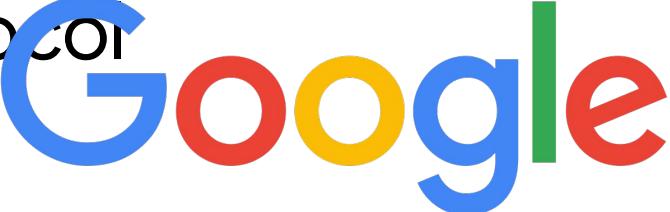


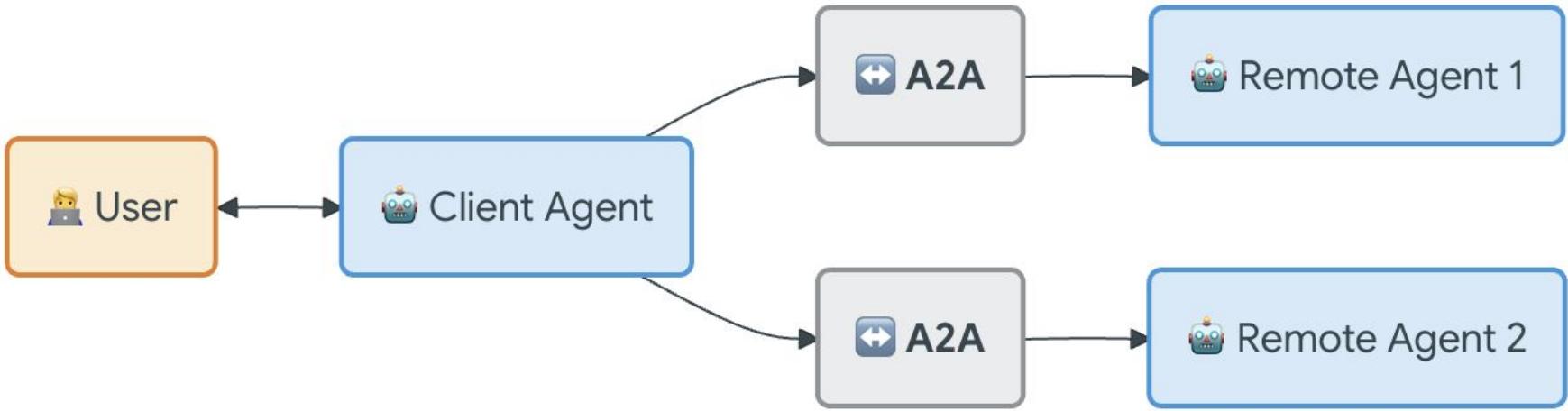




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Agent2Agent (A2A)
Protocol 



A2A ❤️ MCP





Tutorial Time !!



Agent Development Kit



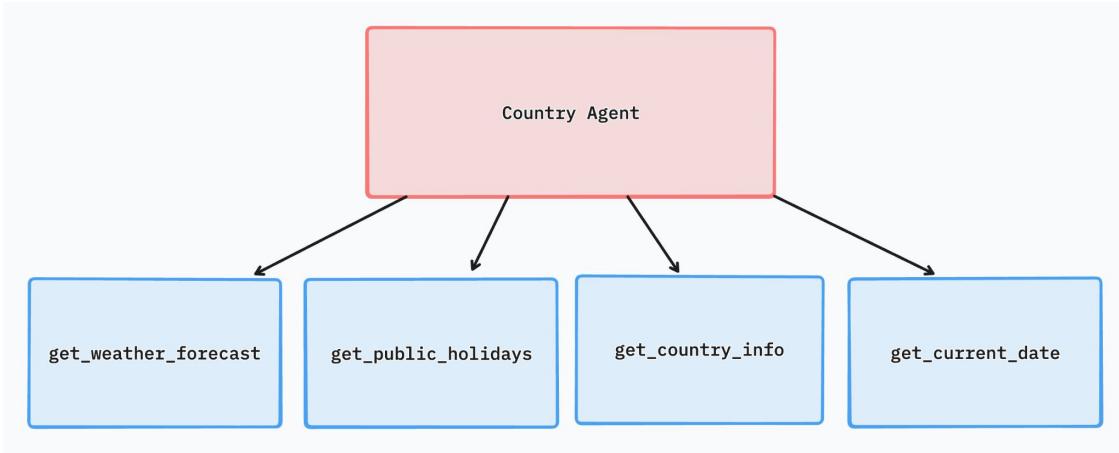
Open Source Summit Europe 2025

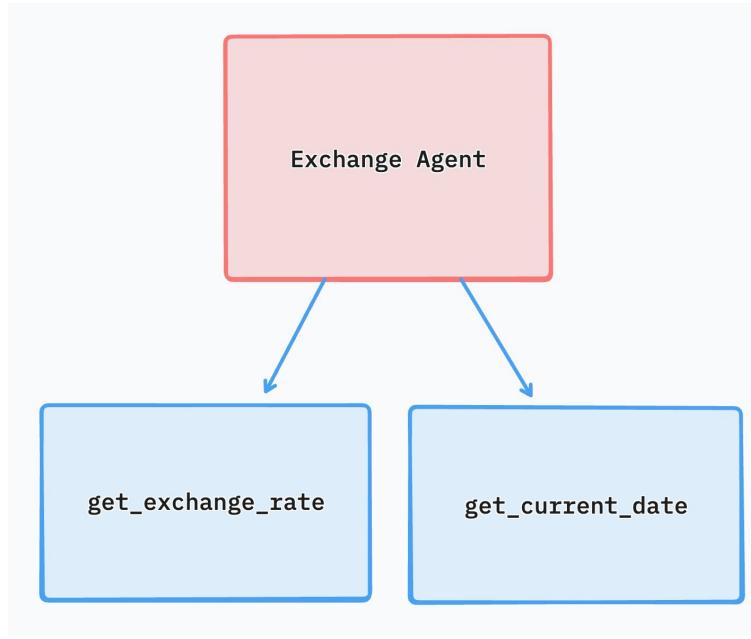


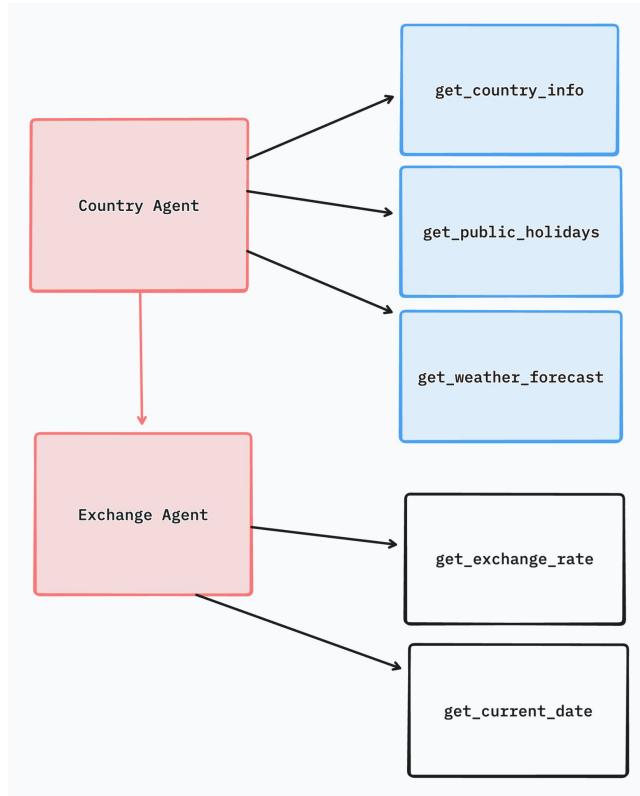


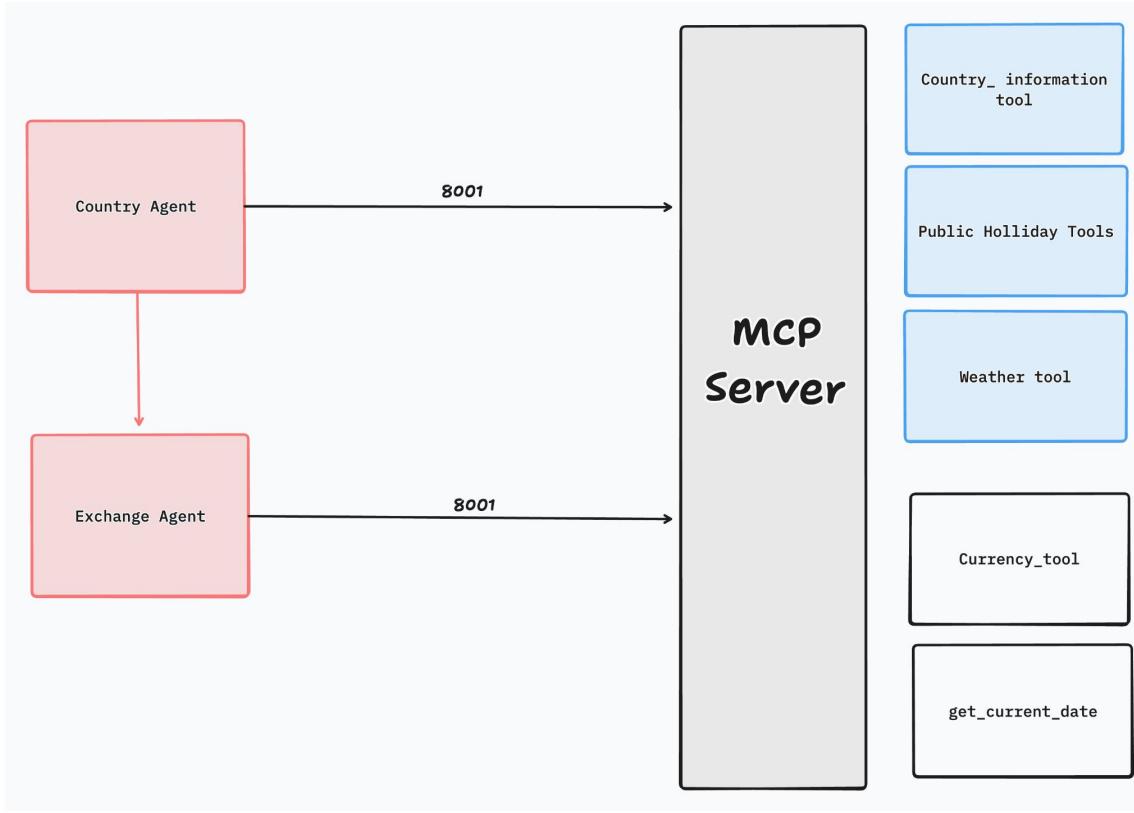
agentgateway

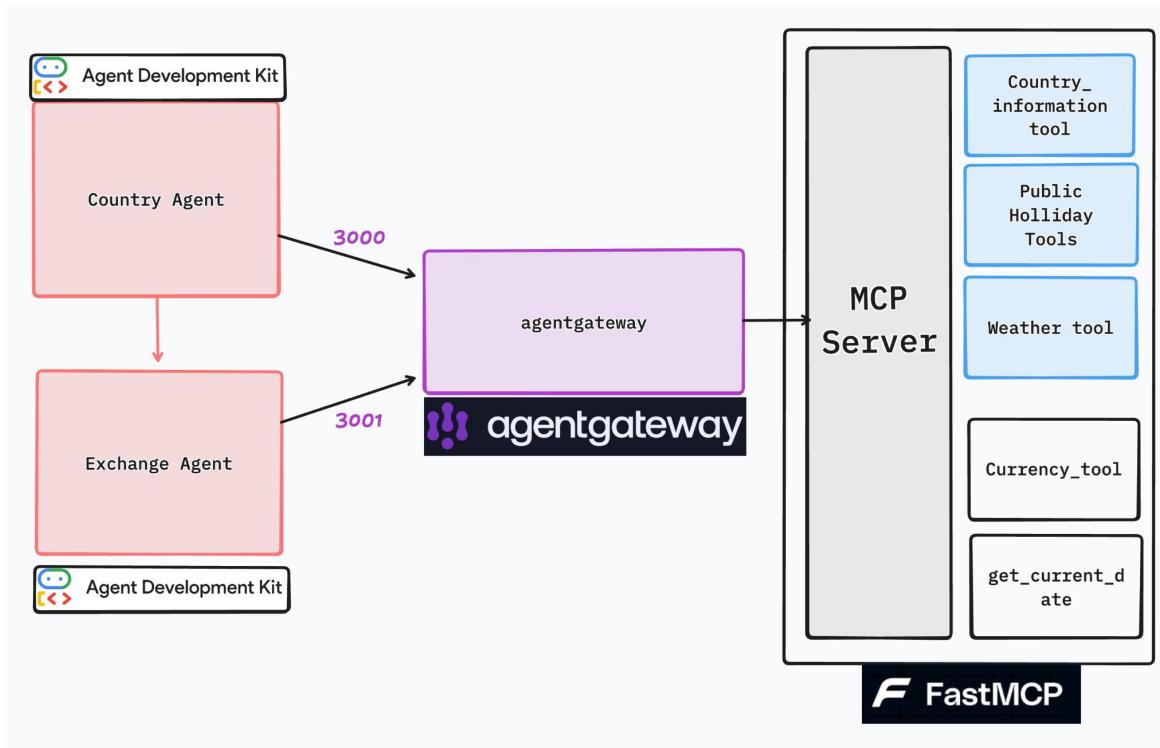
Agentgateway is an open source project that is built on AI-native protocols to connect, secure, and observe agent-to-agent and agent-to-tool communication across any agent framework and environment.







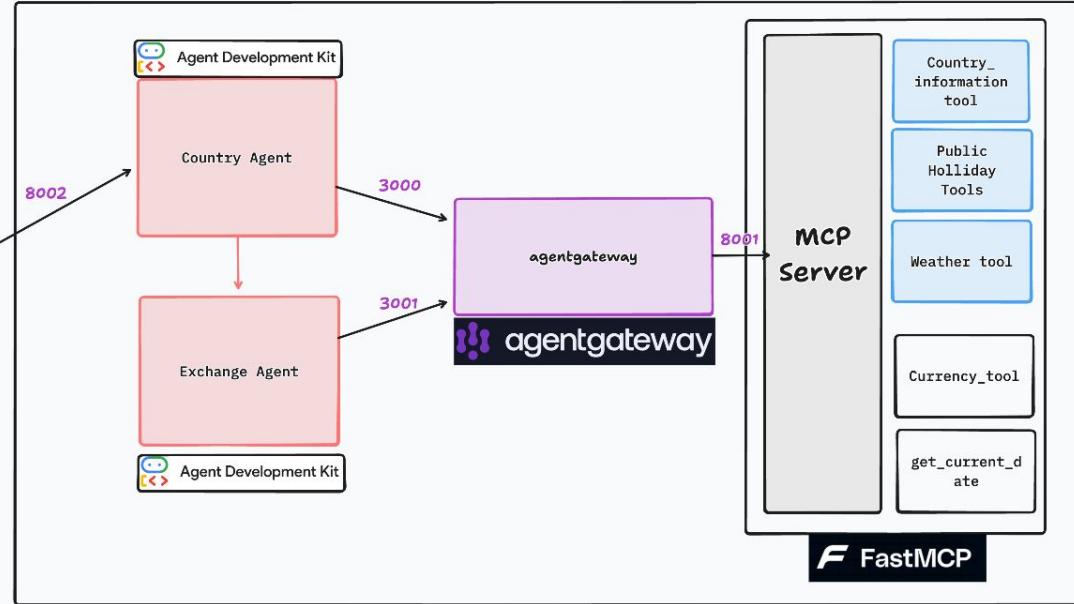




client agent



server agent



You can find all the steps from the tutorial in this PDF file

Building a Multi-Agent AI System with Google ADK, MCP, and AgentGateway

This document provides a comprehensive, step-by-step guide to developing a sophisticated, multi-agent AI system. We will utilize the [Google Agent Development Kit \(ADK\)](#) to build our agents, refactor tools using [FastMCP](#), and implement robust security and governance using [AgentGateway](#).



Introduction & About the Author

This document was prepared by [Mehmet Hilmı Emel](#), an AI and Cloud Technology professional from Turkey, currently based in Istanbul and working at Acedemand IT. He is passionate about Artificial Intelligence applications, Cloud Technology, and Natural Language Processing (NLP).

Mehmet actively combines his hobbies with a strong desire to learn and share knowledge. He produces projects, detailed YouTube videos, and Instagram posts explaining his work in these advanced fields. His YouTube channel also features vlogs from his travels to various tech events.

This guide was created specifically for his speaking session at the [Open Source Summit South Korea 2025](#). It is intended to serve as a detailed, step-by-step kilavuz (guide) to help attendees replicate the project on their own after the session.

Connect with Mehmet:

- [YouTube](#)
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1. Initial Project Setup

We begin by establishing a Python virtual environment and installing the required dependencies.



[Google Drive](#)

들어주셔서 감사합니다
Thank you for listening.

