Making Liferay AI-Ready Through MCP Server

Alejandro Tardín, Team Lead
Petteri Karttunen, Sr Software Engineer
Liferay

Agenda

- What is MCP?
- Introducing Liferay MCP server
- Demo

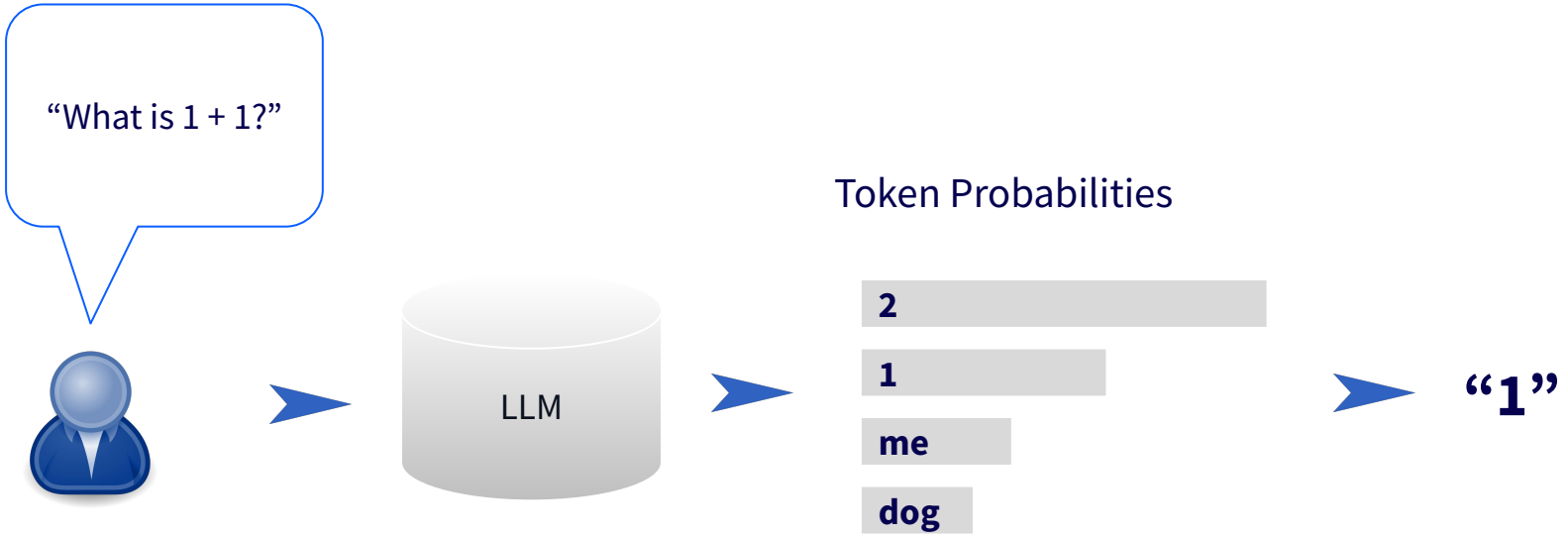
What is MCP?

November 25, 2025

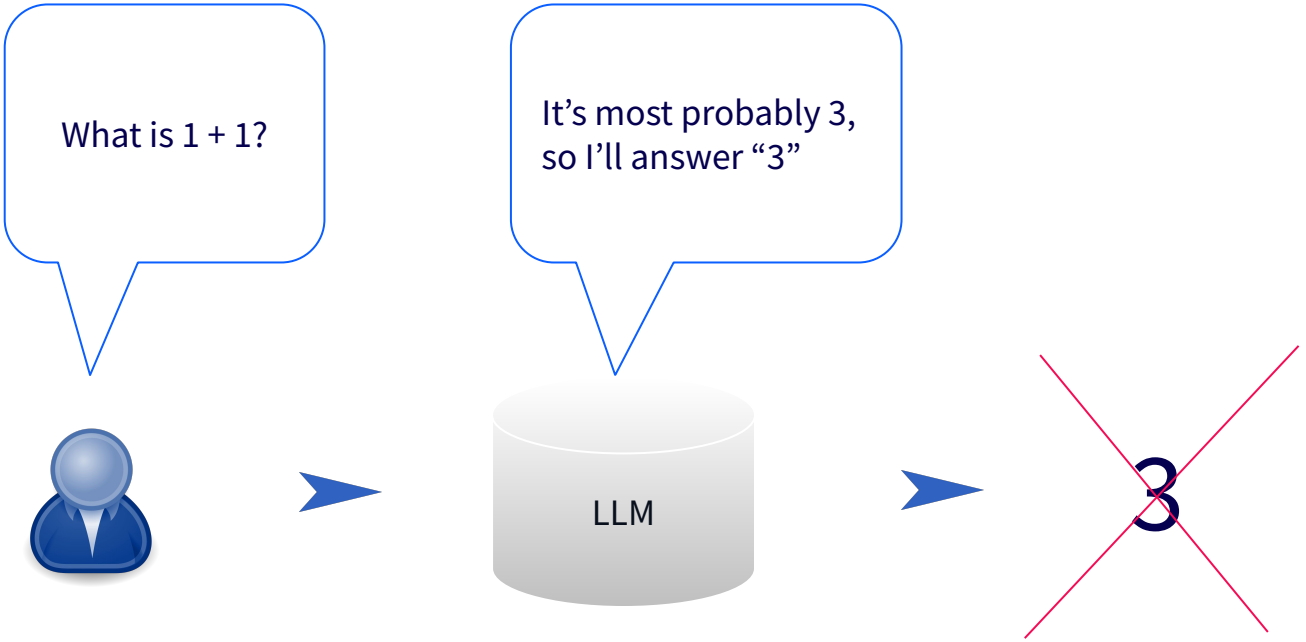
ANTHROP\C

Model **C**ontext **P**rotocol

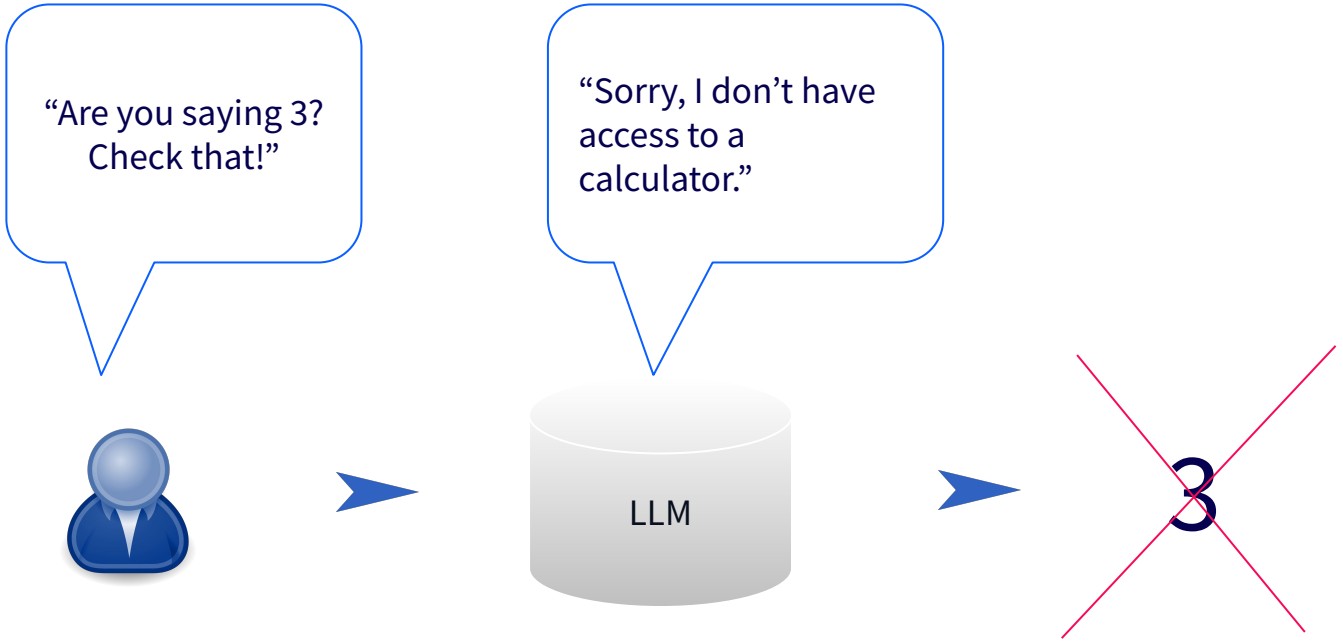
Model Context Protocol

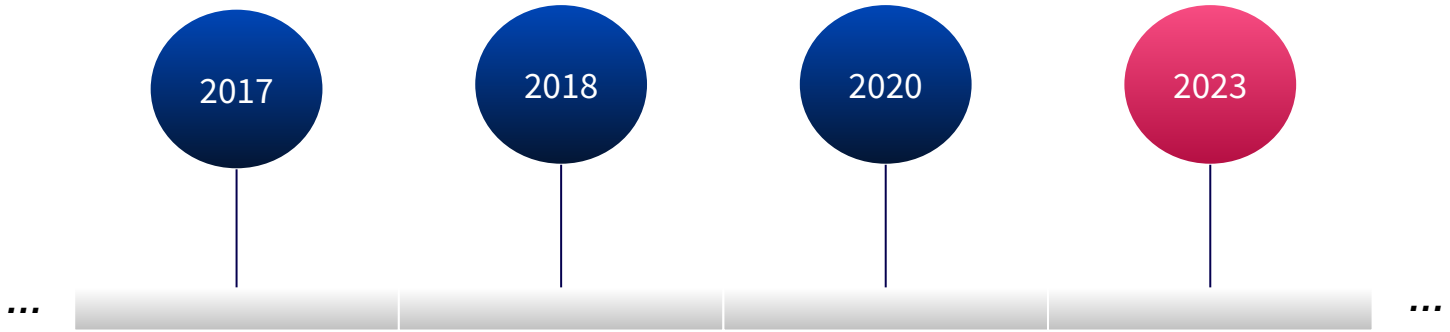

“What is 1 + 1?”
LLM
Token Probabilities
2
1
me
dog
“1”

Problem 1: Hallucinations



Problem 2: No Access to Outside World





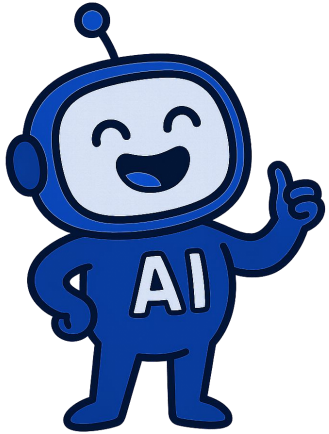
Transformer models by Google

The First **G**enerative **P**re-trained **T**ransformer **GPT-1**

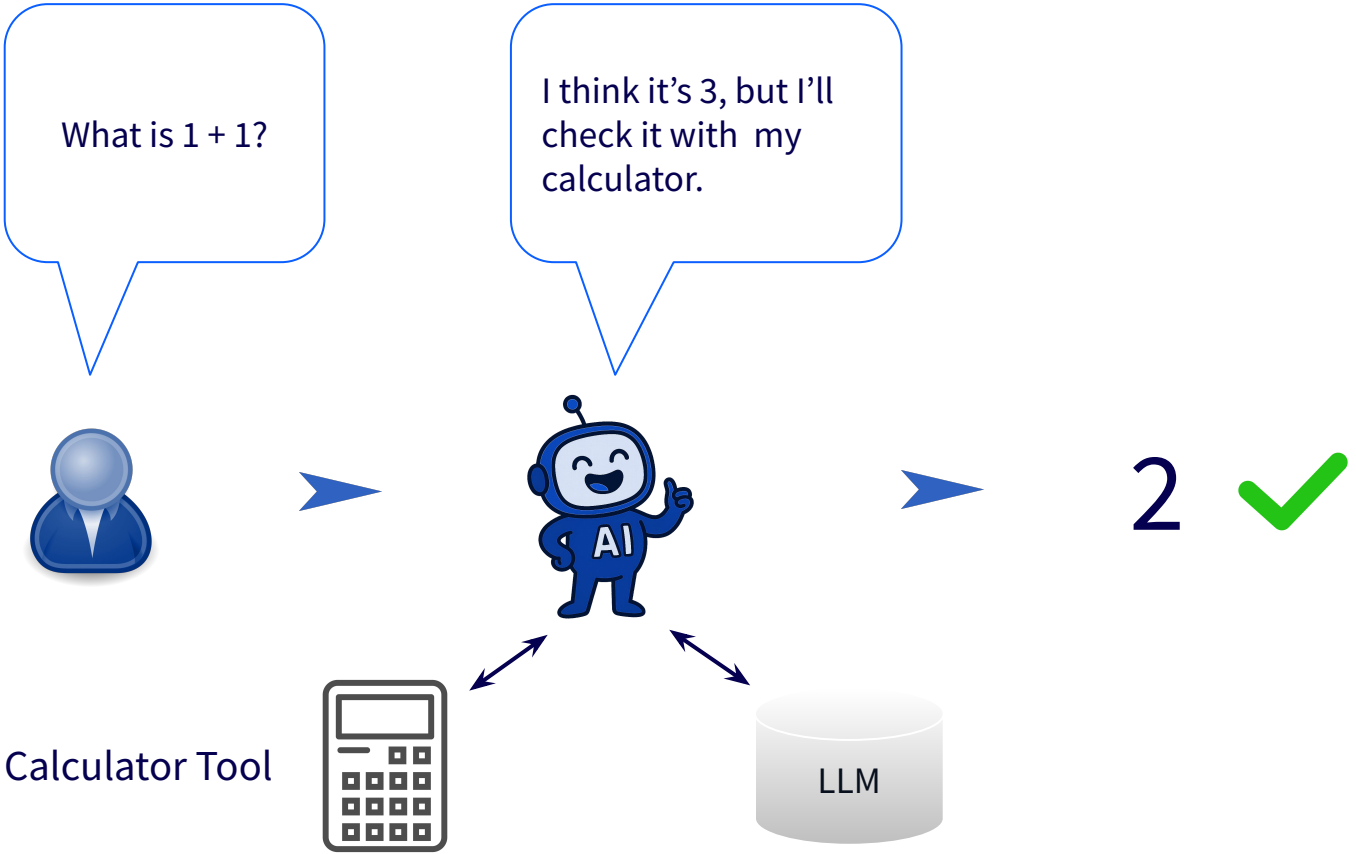
GPT-3. *Zero-shot* reasoning becomes practical.

OpenAI introduced **“Function Calling”** aka. **“Tools”** for GPT-4 and GPT-3.5-Turbo

Welcome AI-Agents!

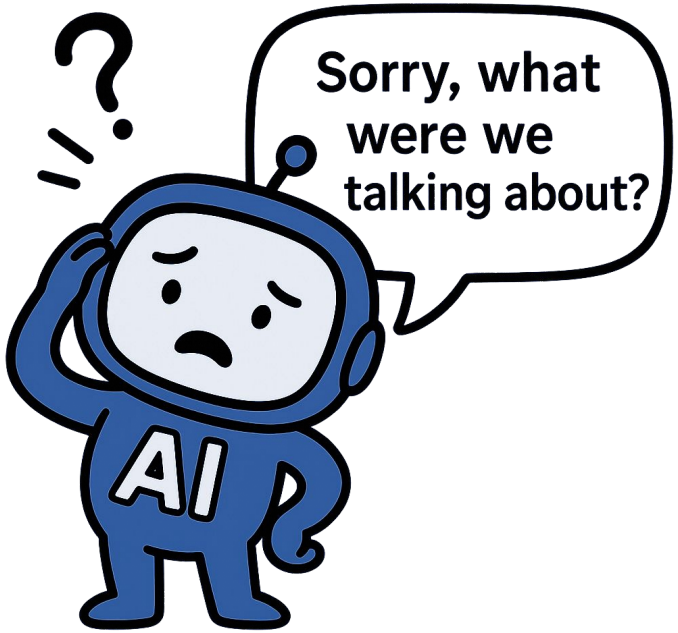


AI Agent = **LLM** (reasoning) + **Tools** (actions)


What is 1 + 1?
I think it's 3, but I'll check it with my calculator.
AI
2
Calculator Tool
LLM

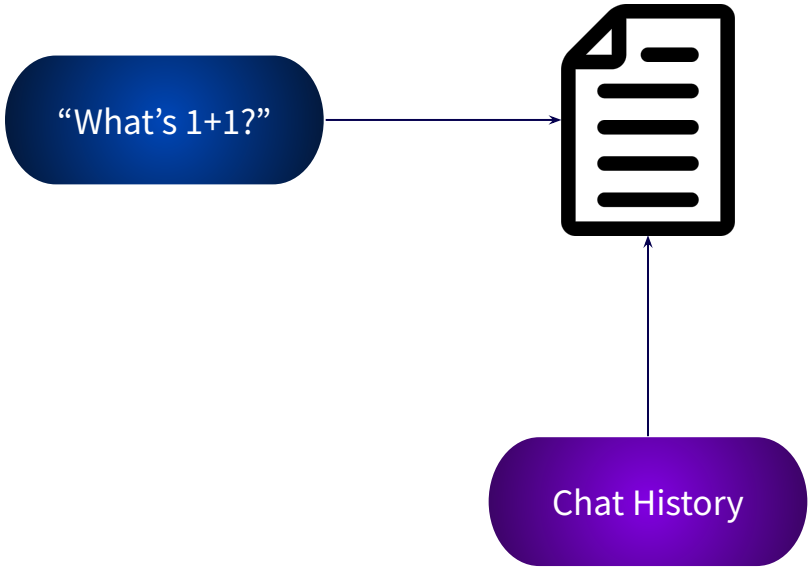
How Do Tools Work?


LLM
Output

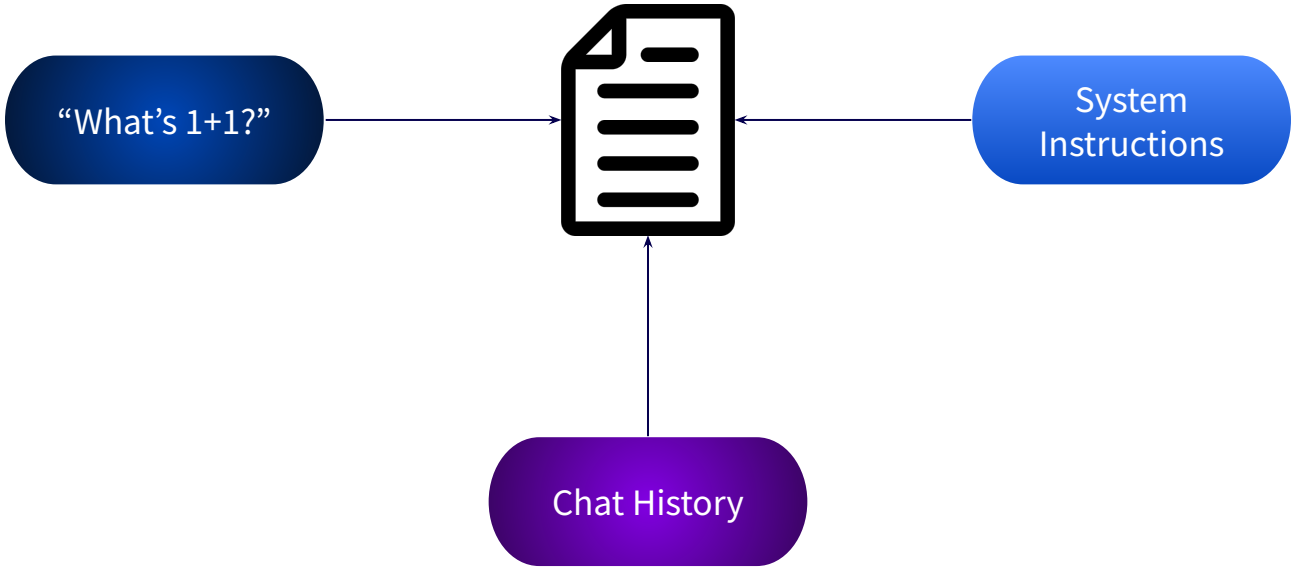

Sorry, what were we talking about?
AI

Model **Context**
Protocol

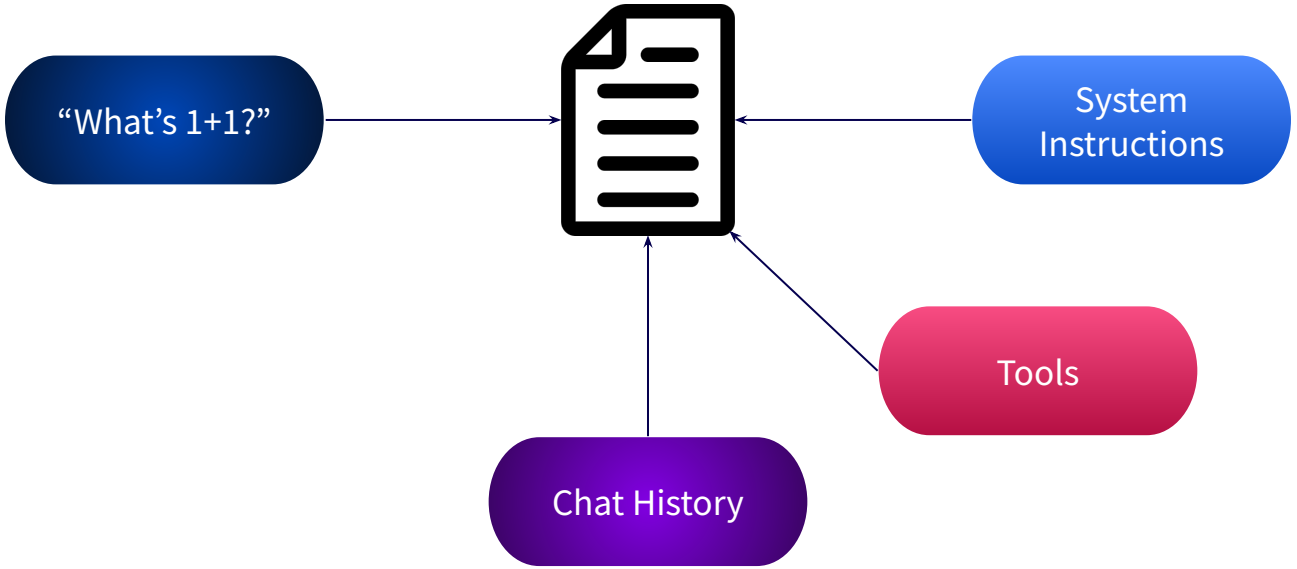
Context

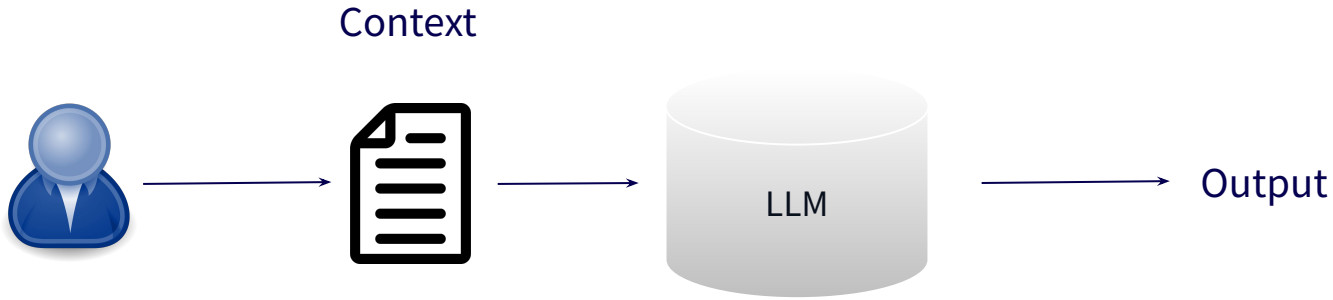


Context



Context




Context
LLM
Output

```
{
  "messages": [
    {
      "role": "system",
      "content": "You are a polite assistant helping the user in math problems."
    },
    {
      "role": "user",
      "content": "I want to calculate the sum of two numbers"
    },
    {
      "role": "user",
      "content": "Got you. Please tell me the numbers so I can tell the sum"
    }
  ],
  "tools": [⟺]
  ...
}
```

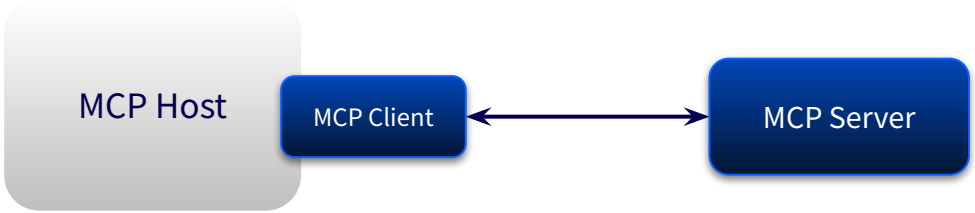
```
{
  "model": "gpt-4",
  "messages": [⟷],
  "tools": [
    {
      "type": "function",
      "function": {
        "name": "sum",
        "description": "Calculate the sum of two number.",
        "parameters": {
          "type": "object",
          "properties": {
            "number_a": {
              "type": "integer"
            },
            "number_b": {
              "type": "integer"
            }
          },
          "required": [
            "number_a, number_b"
          ]
        }
      }
    },
    {
      "type": "function",
      "function": {
        "name": "multiply",
        "description": "Multiply two numbers.",
        "parameters": {
```

Model Context

Protocol

MCP Components

1. MCP Host
2. MCP Client
3. MCP Server



MCP Host (Agent)

- My agent app
- Camunda workflow
- n8n workflow
- VS Code
- Cursor IDE
- CLI
- …

MCP Client

1. Discovers tools and resources in the MCP server
2. Delivers those to the model context
3. Executes model's tool call requests
4. Delivers the results back to the model

(Everything in a standardized format)

MCP Server

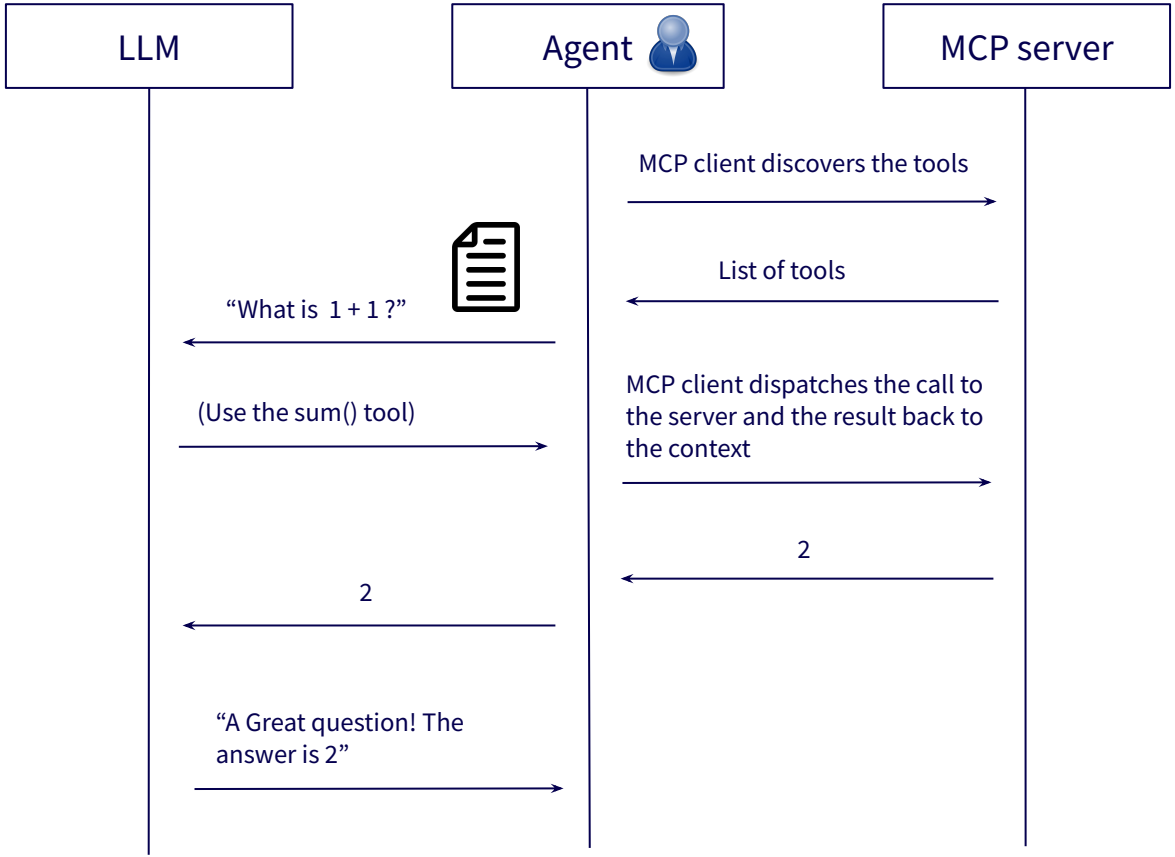
- **Provides:**
  - Tools (actions the model can perform)
  - Resources (data the model can read or search)
  - Prompts
- **Can be:**
  - Local
  - Remote

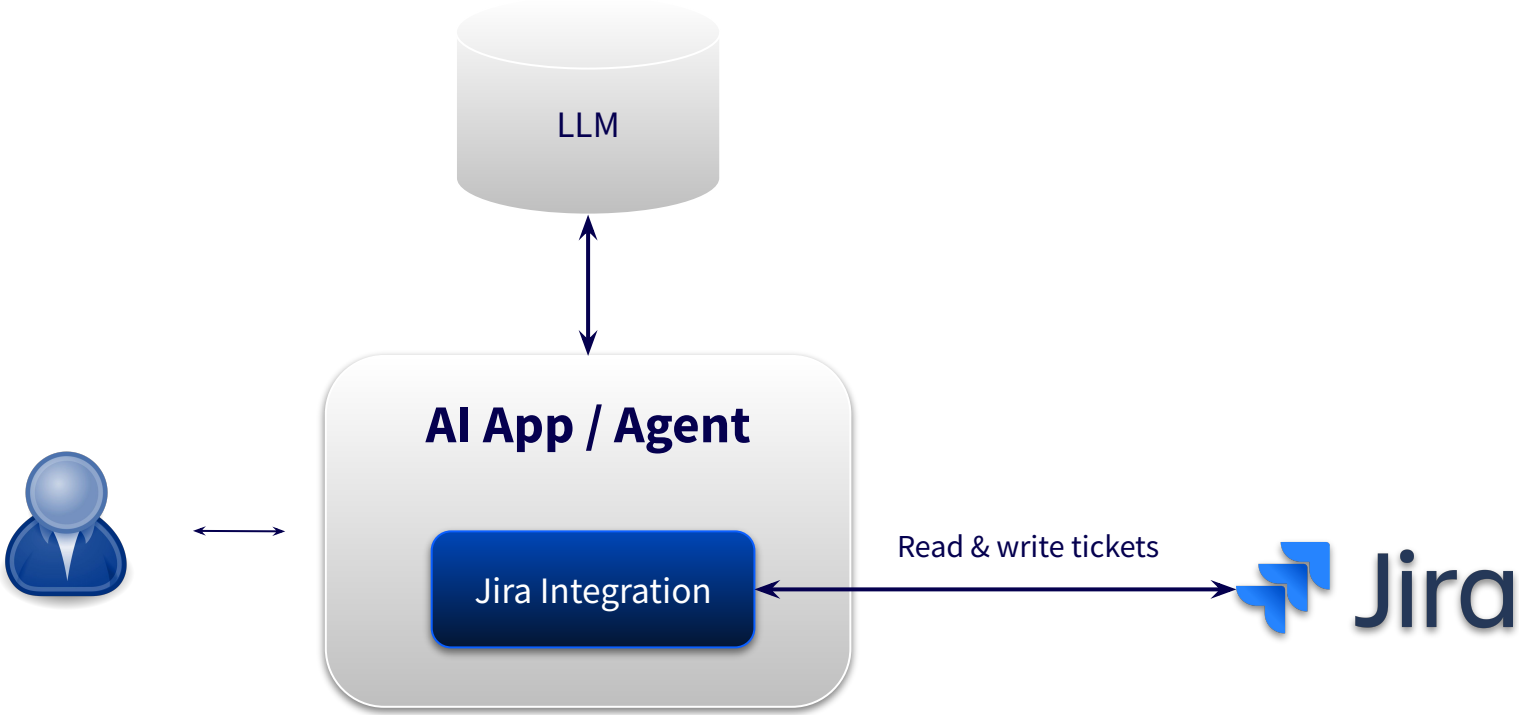
Using Tools Pre-MCP

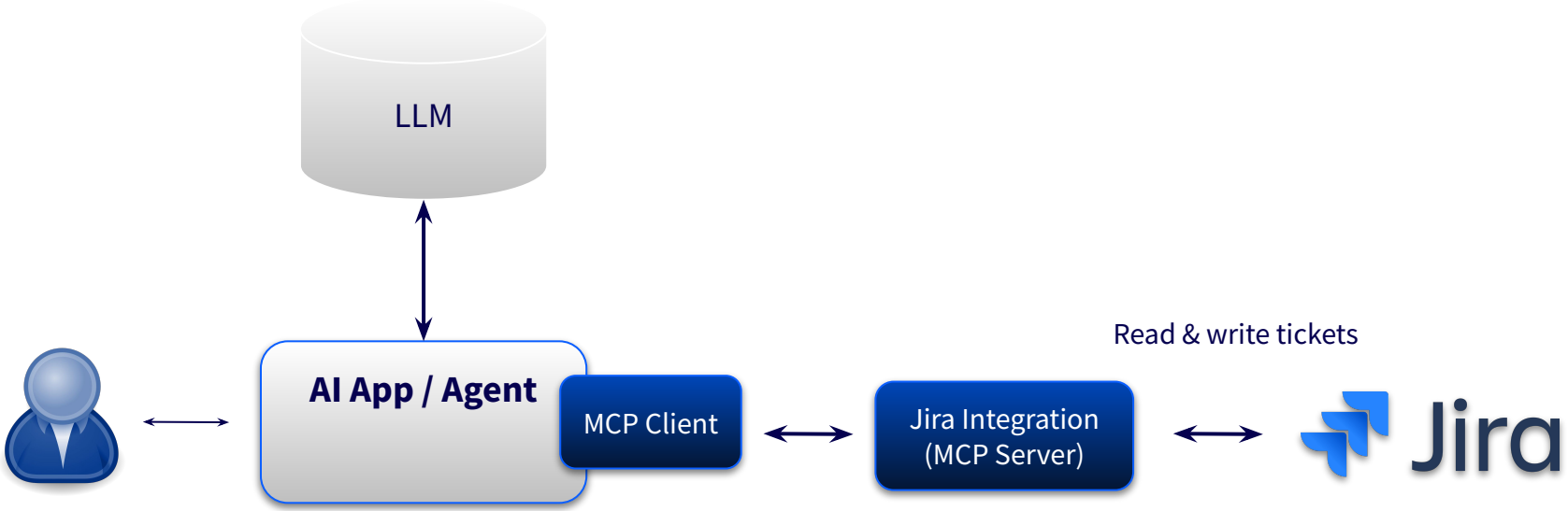
```
public class MyAgent {

    static class MathTools {

        @Tool(name = "sum", description = "Returns the sum of two integers")
        public int sum(int a, int b) {
            return a + b;
        }
    }

    public static void main(String[] args) {

        ...

        Assistant assistant = AiServices.builder()
            .chatLanguageModel(myChatLanguageModel)
            .tools(new MathTools())
            .buildAssistant();

        ...
    }
}
```

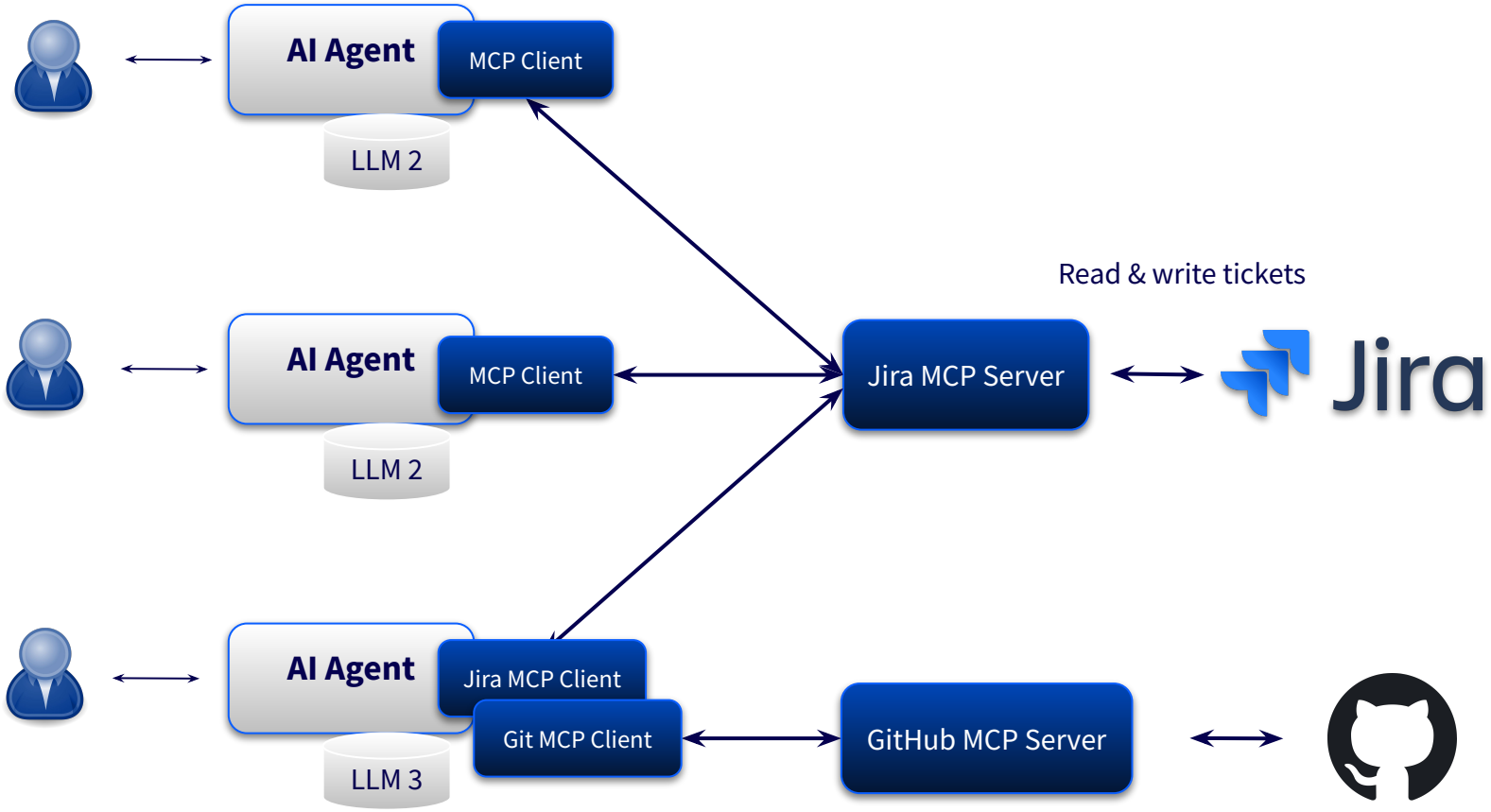
Tools With MCP

```
public class MyAgent {

    public static void main(String[] args) {

        ...

1)      McpTransport transport = new HttpMcpTransport.Builder()
                .sseUrl("http://localhost:3001/sse")
                .build();

2)      McpClient mcpClient = new DefaultMcpClient.Builder()
                .transport(transport)
                .build();

3)      ToolProvider toolProvider = McpToolProvider.builder()
                .mcpClients(List.of(mcpClient))
                .build();

         Assistant assistant = AiServices.builder(Bot.class)
                .chatModel(model)
4)              .toolProvider(toolProvider)
                .build();

        ...
    }
}
```


LLM
Agent
MCP server
MCP client discovers the tools
List of tools
“What is 1 + 1 ?”
(Use the sum() tool)
MCP client dispatches the call to the server and the result back to the context
2
2
“A Great question! The answer is 2”


LLM
AI App / Agent
Jira Integration
Read & write tickets
Jira


LLM
AI App / Agent
MCP Client
Jira Integration
(MCP Server)
Read & write tickets
Jira


AI Agent
MCP Client
LLM 2
AI Agent
MCP Client
LLM 2
AI Agent
Jira MCP Client
Git MCP Client
LLM 3
Read & write tickets
Jira MCP Server
Jira
GitHub MCP Server

Copilot -> Liferay MCP Server

```
{
  "servers": {
    "liferay": {
      "url": "http://localhost:8080/o/mcp/sse",
      "type": "http",
      "headers": {
        "Authorization": "Basic dGVzdEBsaWZlcmF5LmNvbTp0ZXN0"
      }
    }
  }
}
```

Summary

MCP Business Benefits

- Lower integration costs ; write once use from anywhere
- Faster rollout of new AI capabilities.
- Simpler governance and auditing
- Improved agent predictability and reliability
- …

= shorter time to market & lower costs, happier users

Liferay MCP Server

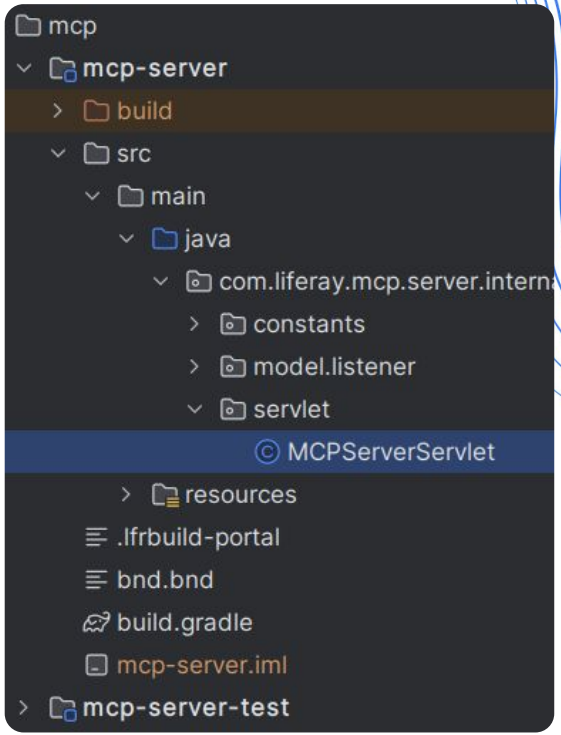
Liferay DEVCON

Liferay MCP Server

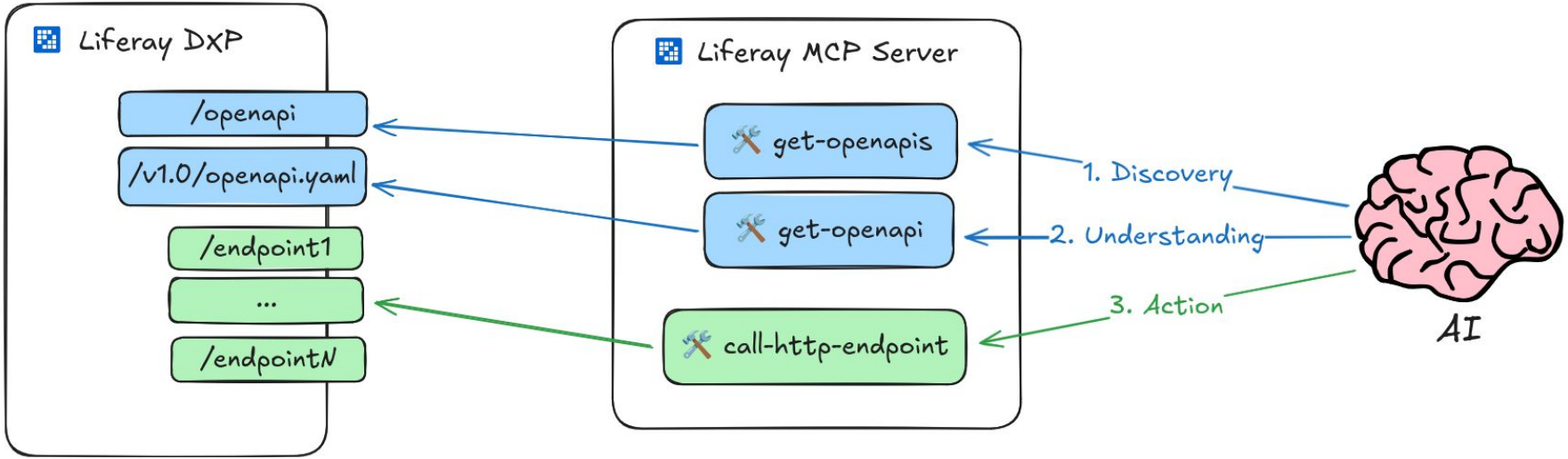
An embedded MCP Server that exposes tools 🛠️ to provide access to every DXP REST API.

http://localhost:8080/o/mcp/sse

It supports 🔒 authorization through HTTP header and works over HTTP Server Sent Events.



Liferay MCP Server



Demo

Demo

We will develop an entire application using AI and Liferay's MCP server:

- Data model (objects).
- A widget page with a form.

And then we will collect and analyze the data with AI.

What will it be…?

Liferay Quiz 🧠!

How much **do you know** about Liferay?

There will be prizes 🏆 for the winners!

Liferay Quiz 🧠!

GitHub Repository

https://github.com/4lejandrito/liferay-devcon-2025-mcp

Thanks!

Remember to Rate Us ★ ★ ★ ★ ★

alejandro.tardin@liferay.com
petteri.karttunen@liferay.com

Liferay DEVCON