<epam>

MCP: Basics

JUNE 2025

DIALX COMMUNITY
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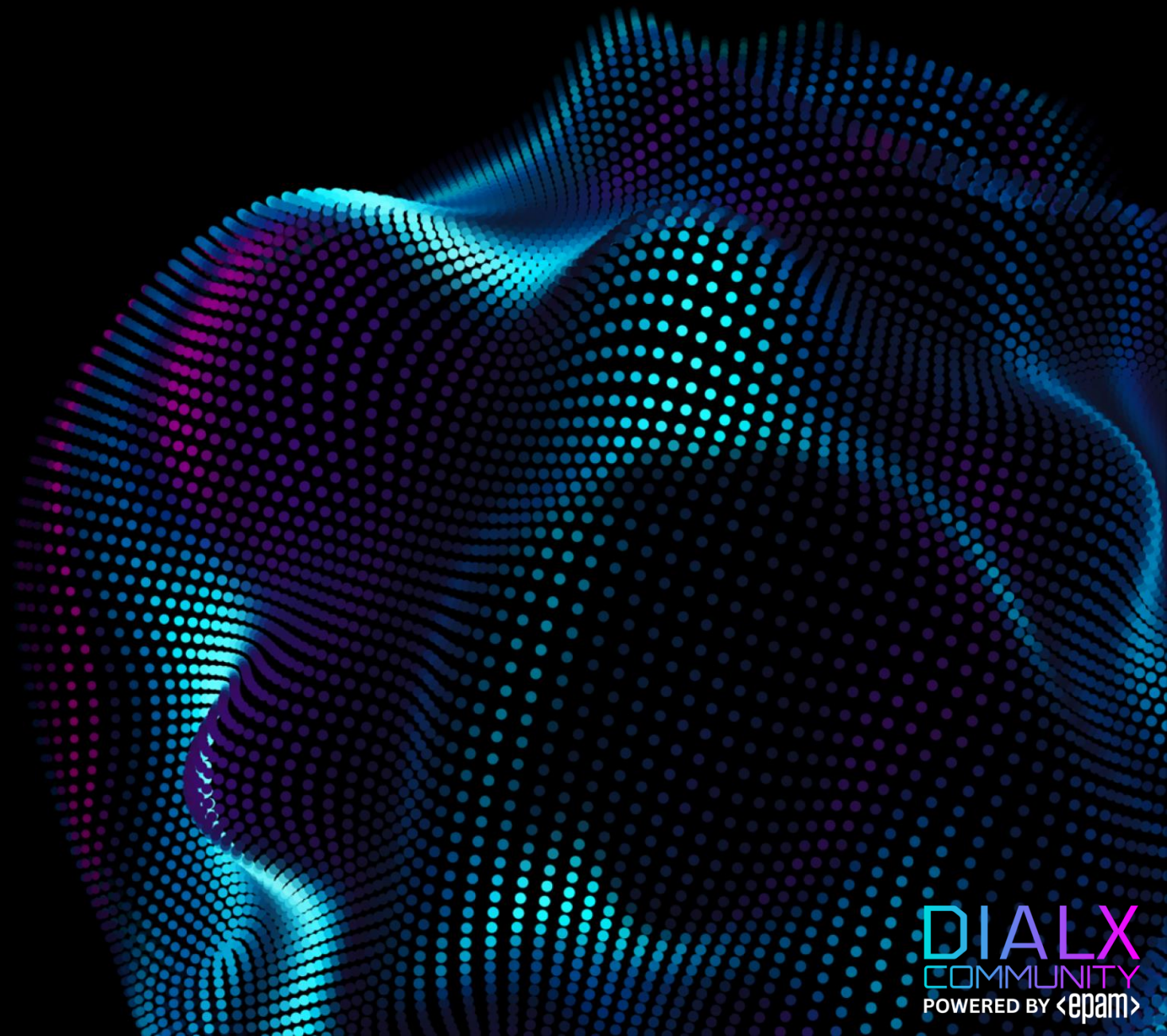
Before we start:

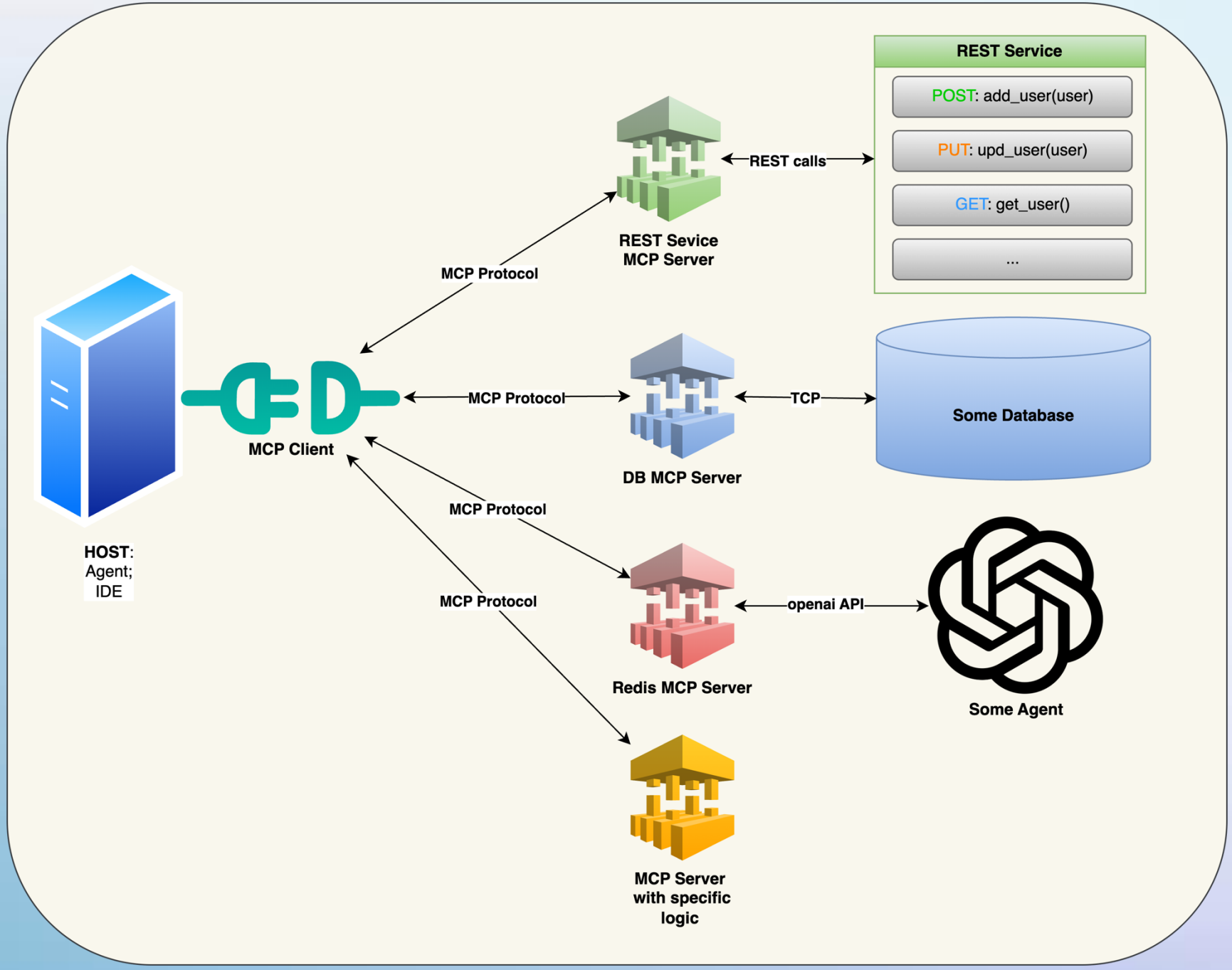
- Raise your hand and ask questions if you have any
- It is better to ask questions when you have
- Also, type them in chat
- We will need DIAL API key for this session
- We will need Docker and compose for this session

Agenda:

- Presentation:
  - About MCP
  - Why MCP?
  - Workflow
- Workshop:
  - Finish MCP Server creation
  - Run MCP Server
  - Connect via Postman
  - Write MCP Client
  - Finish Dial Client
  - Finish app.py

About MCP



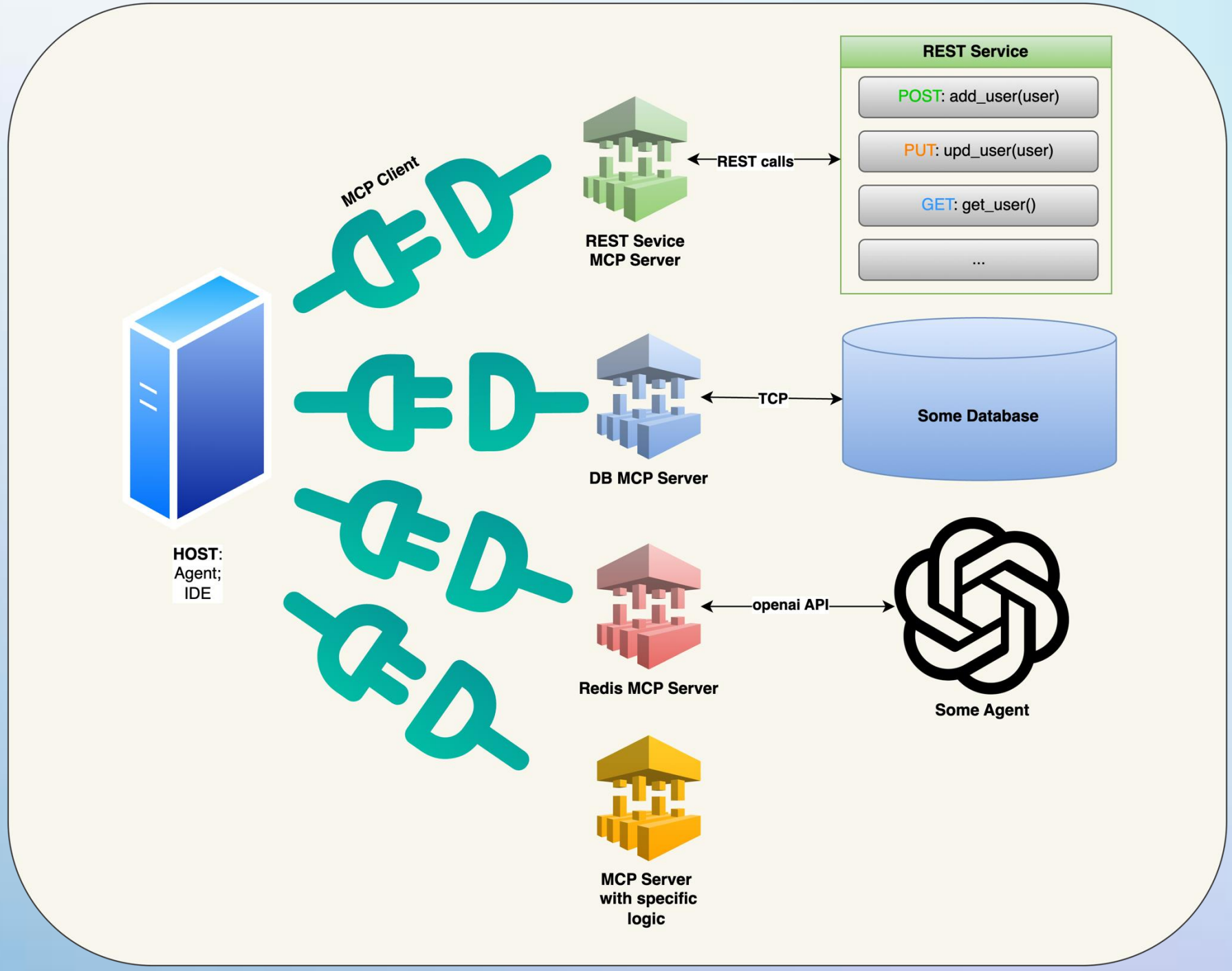


MCP is an open protocol that standardizes how applications provide context to LLMs.

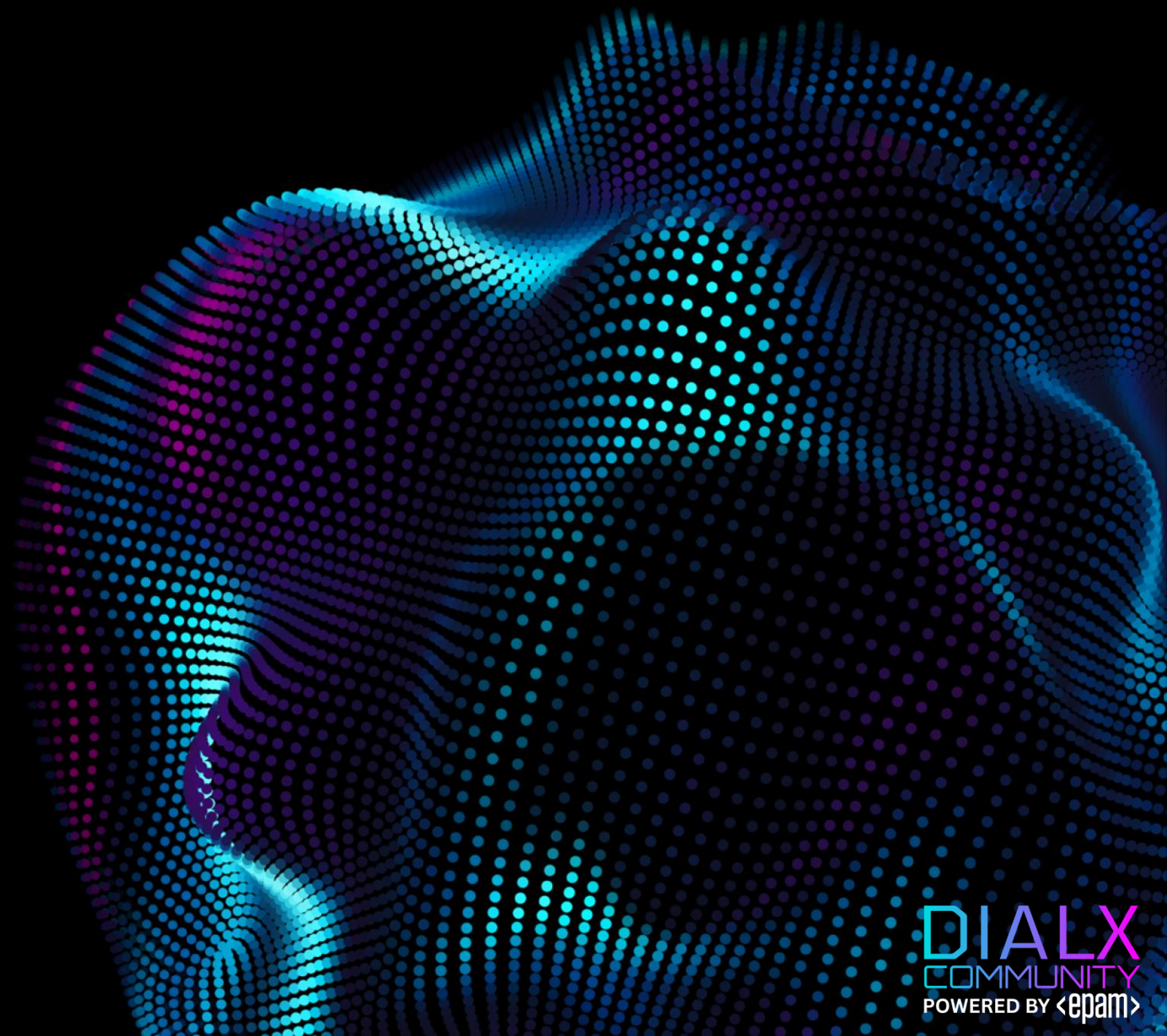
MCP Hosts: Programs like Claude Desktop, IDEs, or AI tools that want to access data through MCP

MCP Clients: Protocol clients that maintain 1:1 connections with servers

MCP Servers: Lightweight programs that each expose specific capabilities through the standardized Model Context Protocol

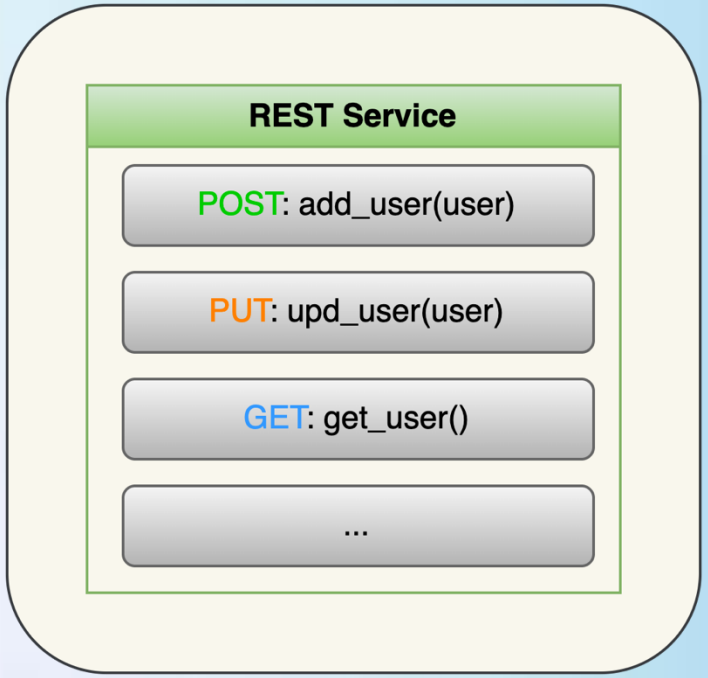

REST Service
POST: add_user(user)
PUT: upd_user(user)
GET: get_user()
...
REST calls
REST Sevice
MCP Server
MCP Client
HOST:
Agent;
IDE
TCP
Some Database
DB MCP Server
openai API
Some Agent
Redis MCP Server
MCP Server
with specific
logic

Why MCP?



Why MCP:

Let's imagine that we have some REST Service to work with users in our system, and we want to create an Assistant or Agent to work with this Service endpoints as tools.



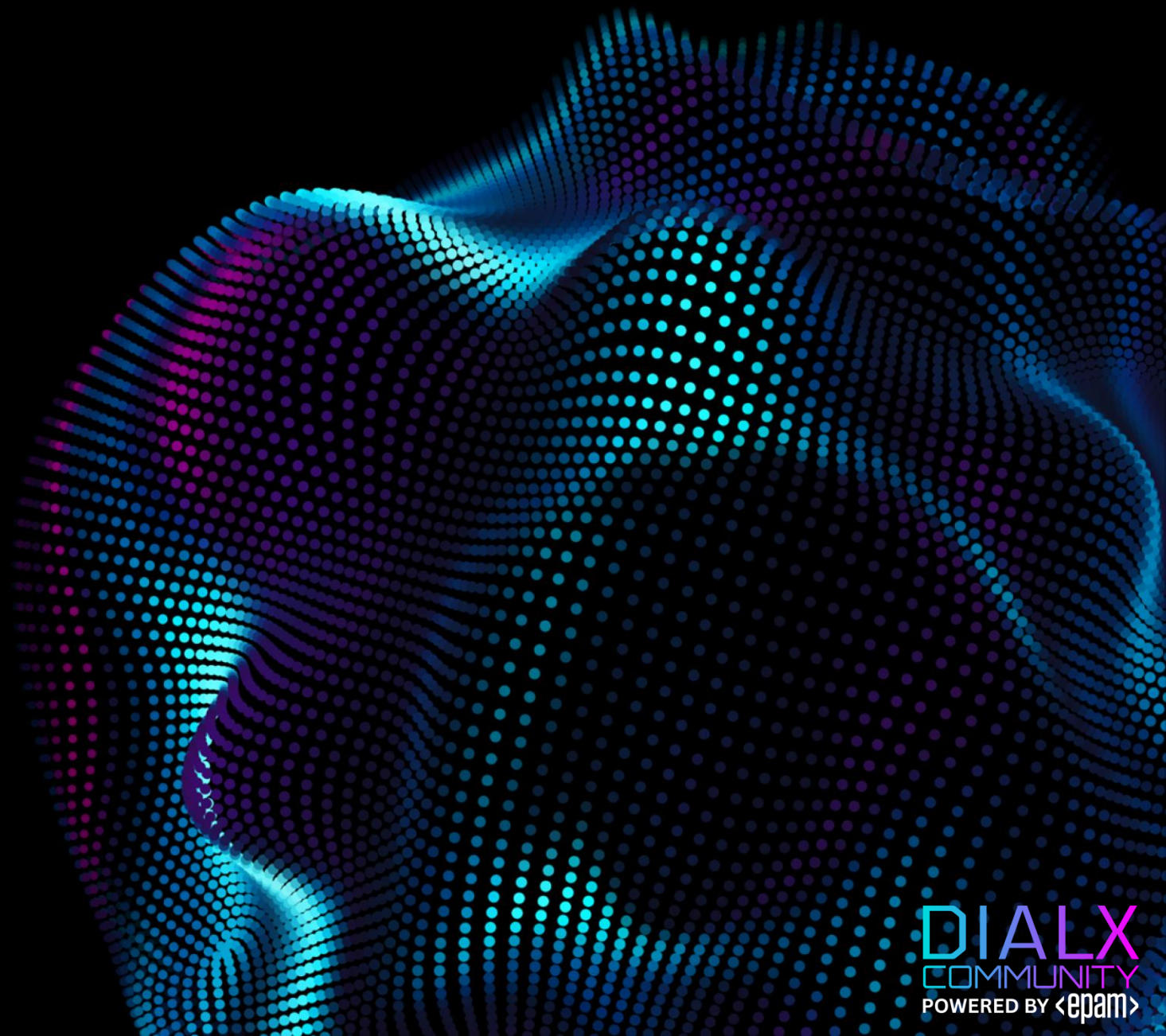
To achieve that we can just create an adapter (client), provide tool schemas to orchestration model and a handler that will be able to call adapter when some tool from Service is called.

Now we have our custom adapter (client) and some potential customers want to to use our REST Service as tools for their AI-powered applications as well.

We can just send them the copy of adapter...
What if our adapter is written on Python but they have Java on project?
What if they have many similar services as tools?

With MCP we standardize communications between Host (our app) and some external services (REST services, storage, agents, etc..)

Workflow



Workflow, Key details:

Base Protocol	• JSON-RPC (Remote Procedure Call) message format • Exchange and negotiate capabilities • Share implementation details
Tools	Functions for the AI model to execute
Resources	Context and data, for the user or the AI model to use (not covered in this practice)
Prompts	Templated messages and workflows for users (not covered in this practice)
Auth	The Model Context Protocol provides authorization capabilities at the transport level, enabling MCP clients to make requests to restricted MCP servers on behalf of resource owners. (not covered in this practice)

https://modelcontextprotocol.io/specification/2025-06-18/basic

https://modelcontextprotocol.io/specification/2025-06-18

Workflow:

1. Initialization

The initialization phase MUST be the first interaction between client and server. During this phase, the client and server:

- **Establish protocol version compatibility**
- **Exchange and negotiate capabilities**
- **Share implementation details**

2. Notification

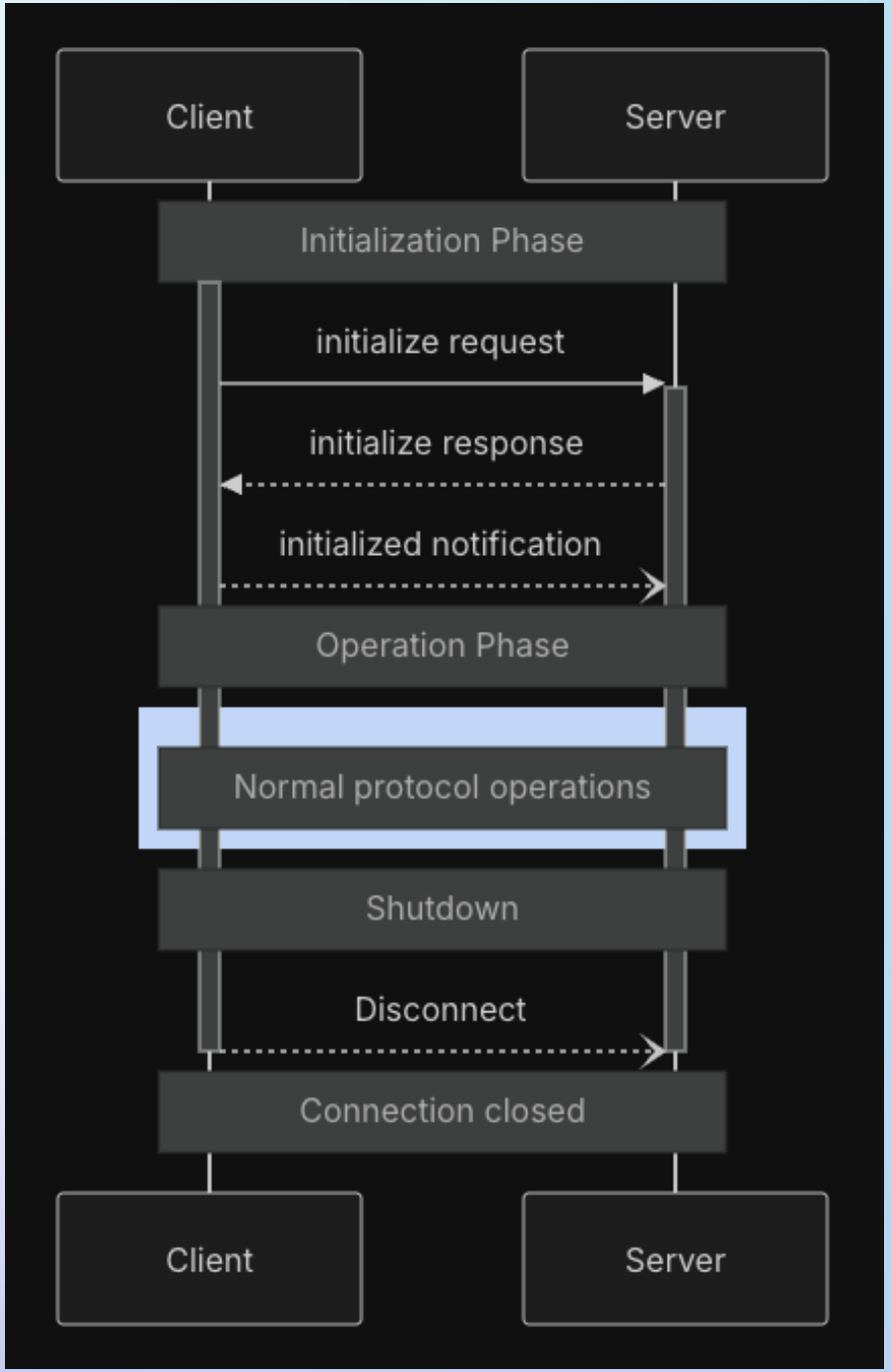
After successful initialization, the client MUST send an initialized notification to indicate it is ready to begin normal operations:

3. Operation

During the operation phase, the client and server exchange messages according to the negotiated capabilities.

4. Shutdown

During the shutdown phase, one side (usually the client) cleanly terminates the protocol connection. No specific shutdown messages are defined—instead, the underlying transport mechanism should be used to signal connection termination.



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