AGENT ENGINEERING

MCP for busy professionals

Hai

AGENDA

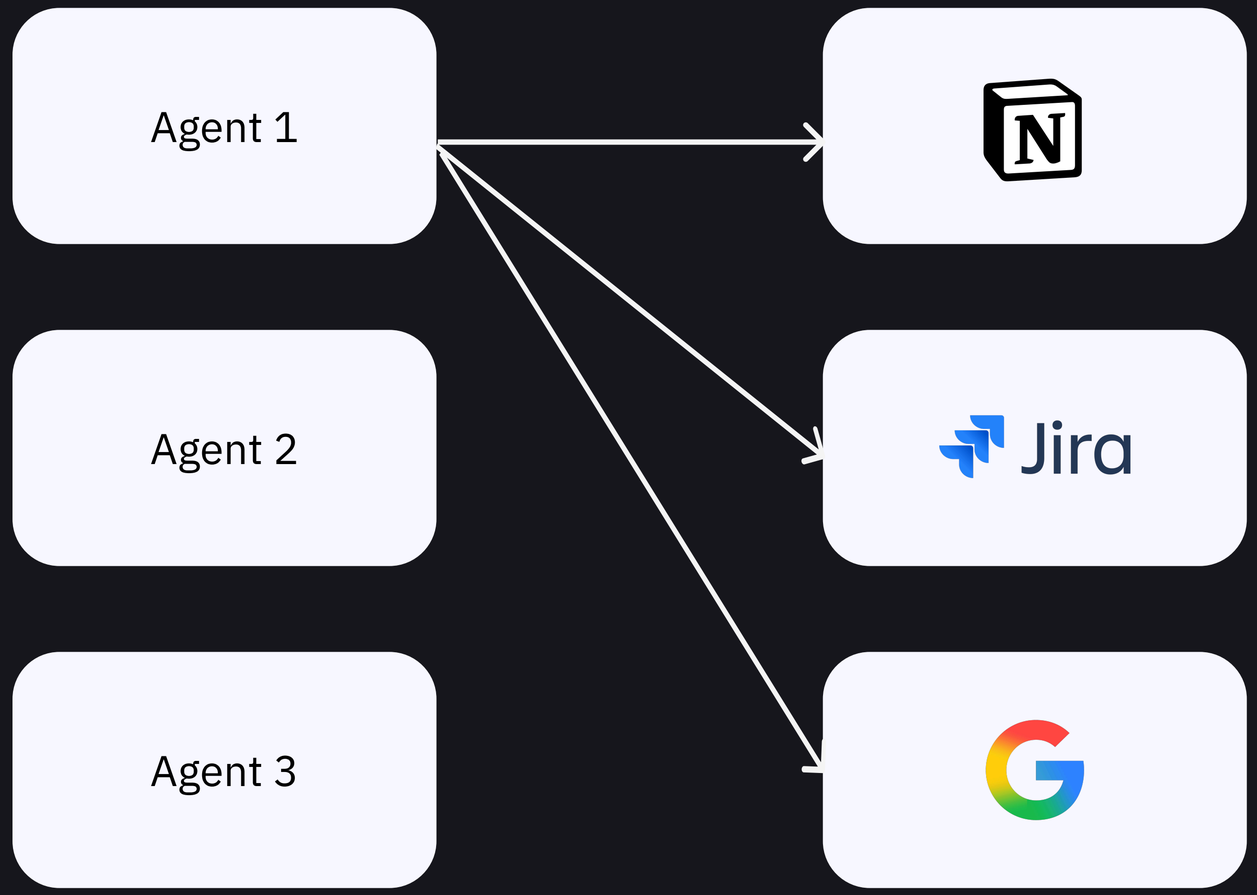
What’s on the menu today?

1. Before MCP
2. MCP explained
3. Use cases
4. Build effective MCP servers
5. Recommended Stack
6. Homework

Agents use tools.

BEFORE MCP

- Too many custom integrations (M x N)
- API specs are too granular for LLM workflows (get_resource_1, update_resource_1, etc..)

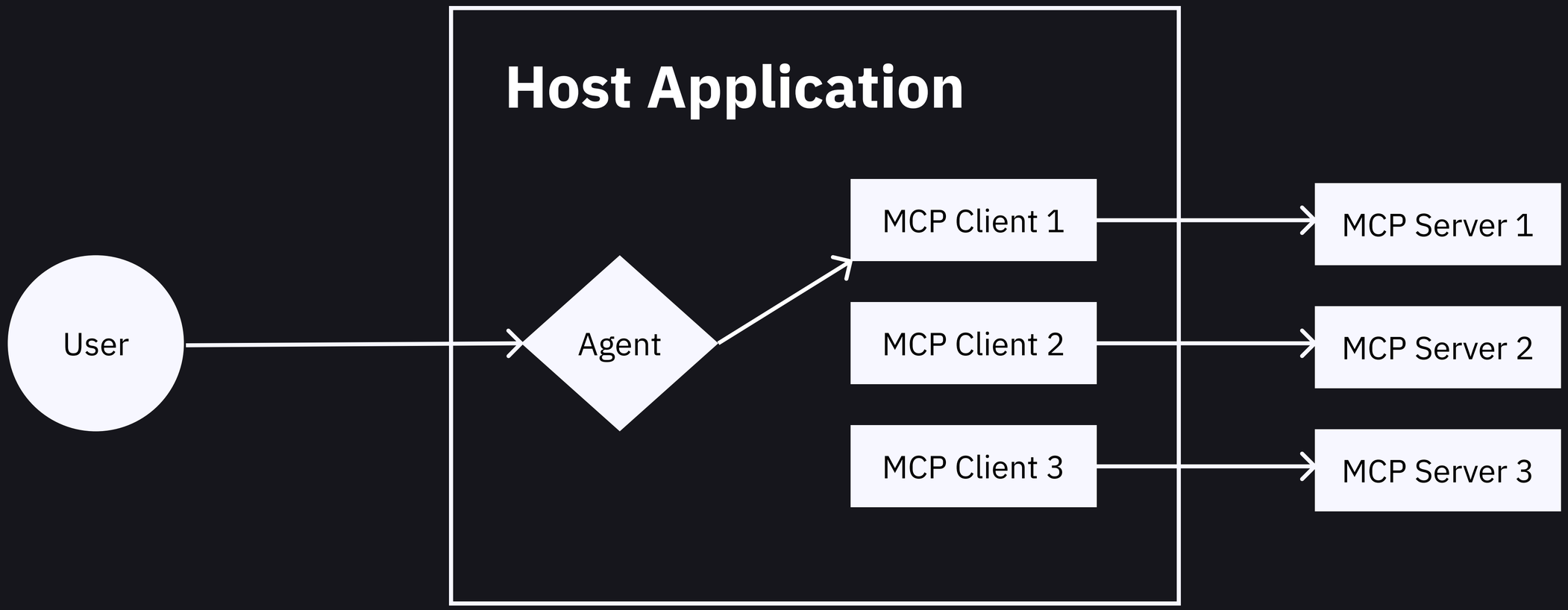


Why not just hit API endpoints?

Agents must process everything in an API unlike humans who can ignore irrelevant parameters, making traditional REST APIs cognitively expensive and inefficient for AI consumption

“It all ties back to Context Management!” - Hai

Agents use tools. MCP servers provide them amongsts other things


Host Application
User
Agent
MCP Client 1
MCP Client 2
MCP Client 3
MCP Server 1
MCP Server 2
MCP Server 3

A common misconception: apps like Cursor is “Host”, not “Client”.

What can MCP servers provide your agent with?

1. Tools
2. Resources (RAG)
3. Prompts

SERVER USE CASES

1. Expose your API endpoints (bad)
2. Expose LLM workflows (good)
3. Expose RAG resources
4. Expose prompts (never seen an implementation

CLIENT USE CASES

1. Equip your agent / agentic workflow with more tools without wasting dev time
2. Tap into retrieval systems that your agent doesn’t know about yet
3. Agent-to-agent communication (not yet)

Where can MCP servers be?

1. Local (stdin/stdout)
2. Remote (SSE / StreamableHTTP)

Exciting update: Elicitation!

1. New protocol
2. Server can ask client for input
3. Great for human in the loop
4. Enables complex workflows

Read more:

- Introducing MCP elicitation: Request user input at runtime (WorkOS)
- Elicitation (MCP Official Docs)

Lessons learned building MCP servers

There’s more than just wrapping API endpoints

- Workflows, not API endpoints
- Don’t be too granular
- (Optional) Make SQL tools

TYPESCRIPT

For client:

- AI SDK MCP client
- OpenAI Agents SDK (TS) tools calling

For building server:

- Vercel’s MCP Adapter

PYTHON

For client:

- FastMCP Client
- OpenAI Agents SDK (Python) tools calling

For building server:

- FastMCP

RESOURCES

Additional resources to read

This expands on the topics we talked about today

Use MCP server as tools (AI SDK)

Deploy an MCP server on Vercel (Vercel)

MCP Server template (Vercel)

Agent Engineering Bootcamp MCP Server (Hai)

Build an MCP server in Python using FastMCP (FastMCP)

Block’s playbook for designing MCP servers (Block)

MCP Server registry (Smithery)

Homework this week

1. Add an MCP server of your choice to your agent’s toolkit
2. (Bonus) Build an MCP server

Q&A