# Intro to Model Context Protocol(MCP) in .Net

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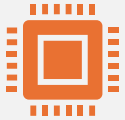
# Introduction



Technical Architect @ Harman, A Samsung Company

Area of Expertise : Building Cloud Native applications

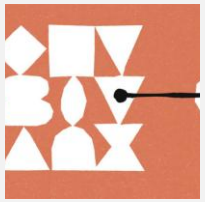
Area of Interest : AI/ML, LLMs, SDV

Location: Bangalore, India

# Agenda

- What is Model Context Protocol(MCP) ?
- Why do we need MCP?
- Architecture of MCP?
- How MCP works ?
- Building MCP server in C#

# What is Model Context Protocol (MCP) ?



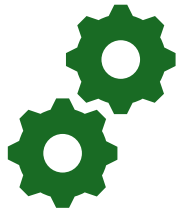
A protocol defined by Anthropic in Nov 2024

MCP is a standard protocol for connecting applications to Large Language Models (LLMs).

Think of it as a universal connector for AI applications.

# Why MCP ?

**Standardization**: Provides a consistent way to connect AI models to data sources.



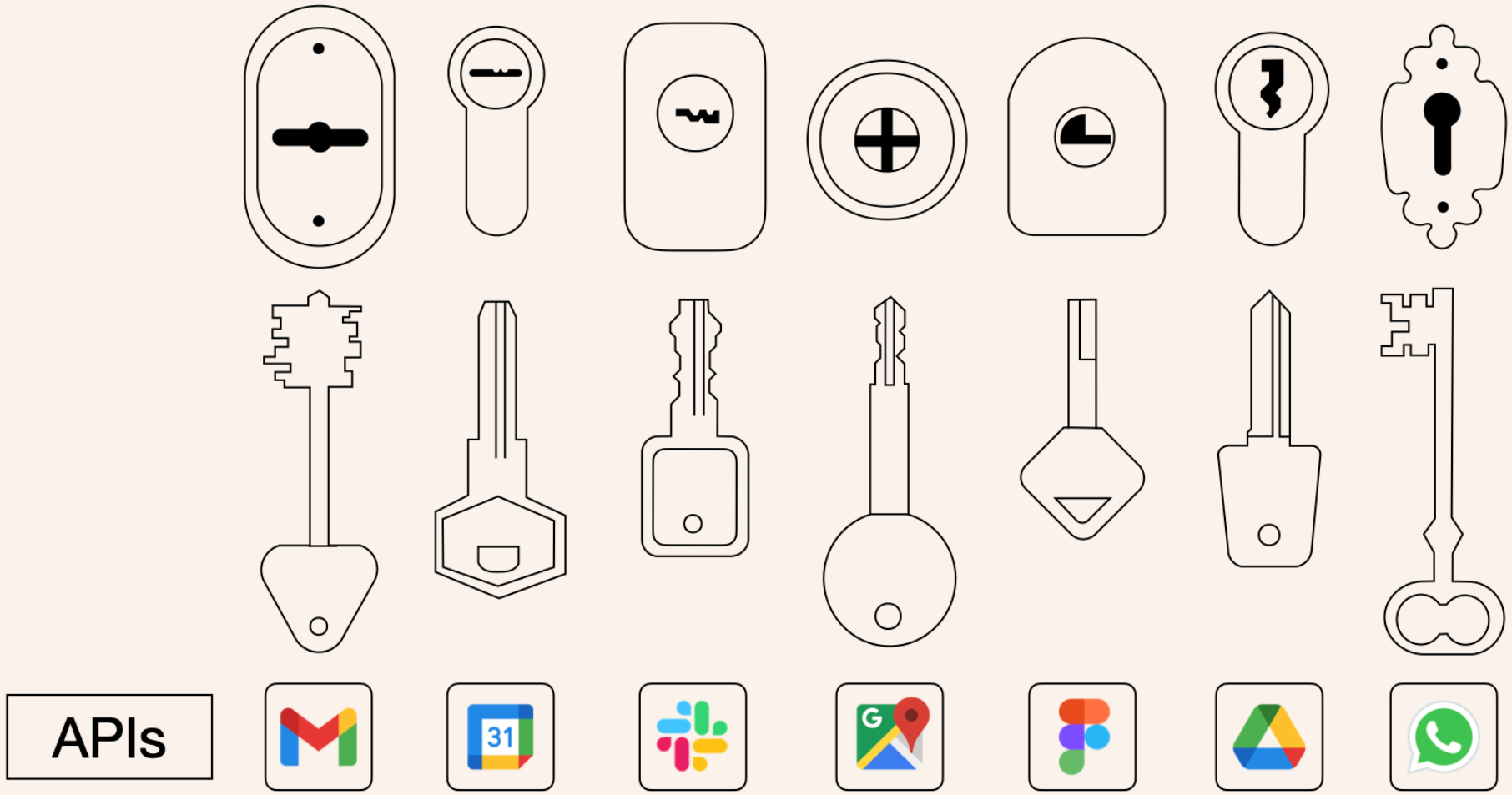
**Integration**: Enhances LLM capabilities by integrating with various tools and data.

**Flexibility**: Allows switching between different LLM providers.

**Security**: Ensures secure data handling.

# APIs: Every tool needs its own key

Traditional APIs require different authentication and integration for each service,
like needing different keys for different locks




Source: https://norahsakal.com/blog/mcp-vs-api-model-context-protocol-explained/

# Why MCP ?

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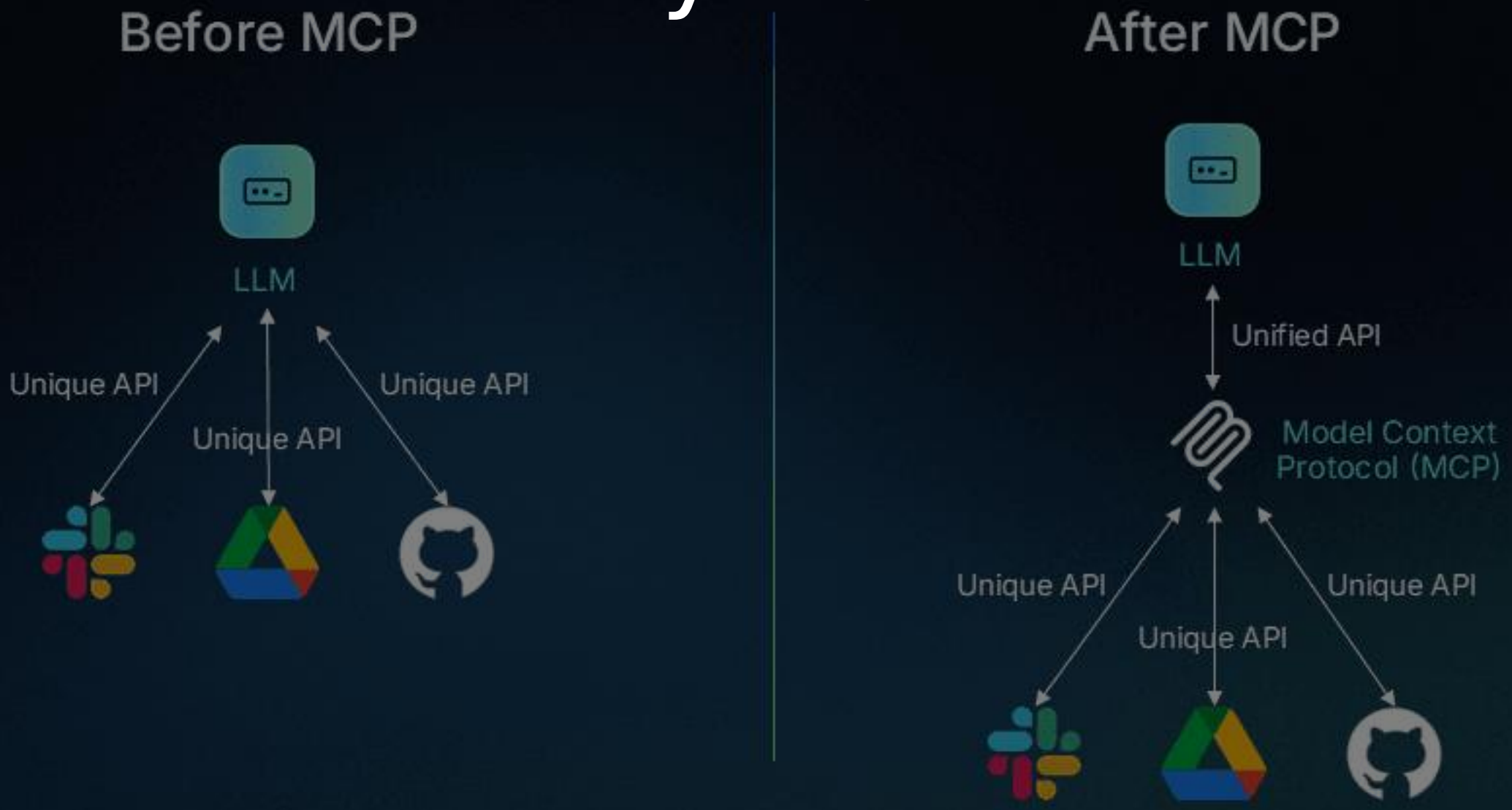



Source: https://www.descope.com/learn/post/mcp

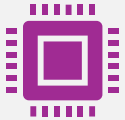
# MCP Architecture

# (Client-Server)

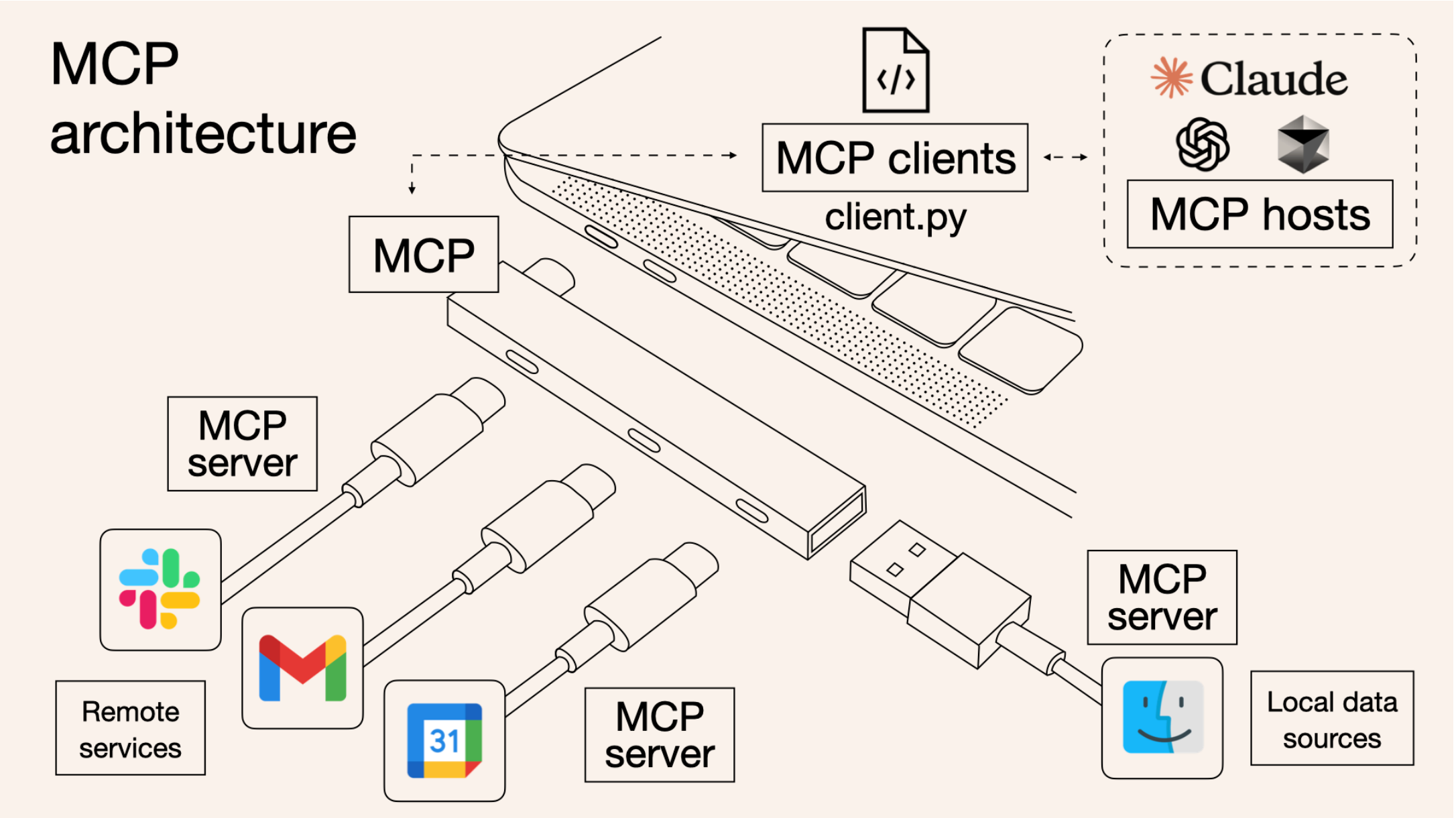
**MCP Hosts**: Programs that want to access data through MCP.

**MCP Clients**: Maintain connections with servers.

**MCP Servers**: Expose specific capabilities through MCP.



**Transport Layer:** STDIO and HTTP + SSE(Server-Side Events)

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# MCP Architecture

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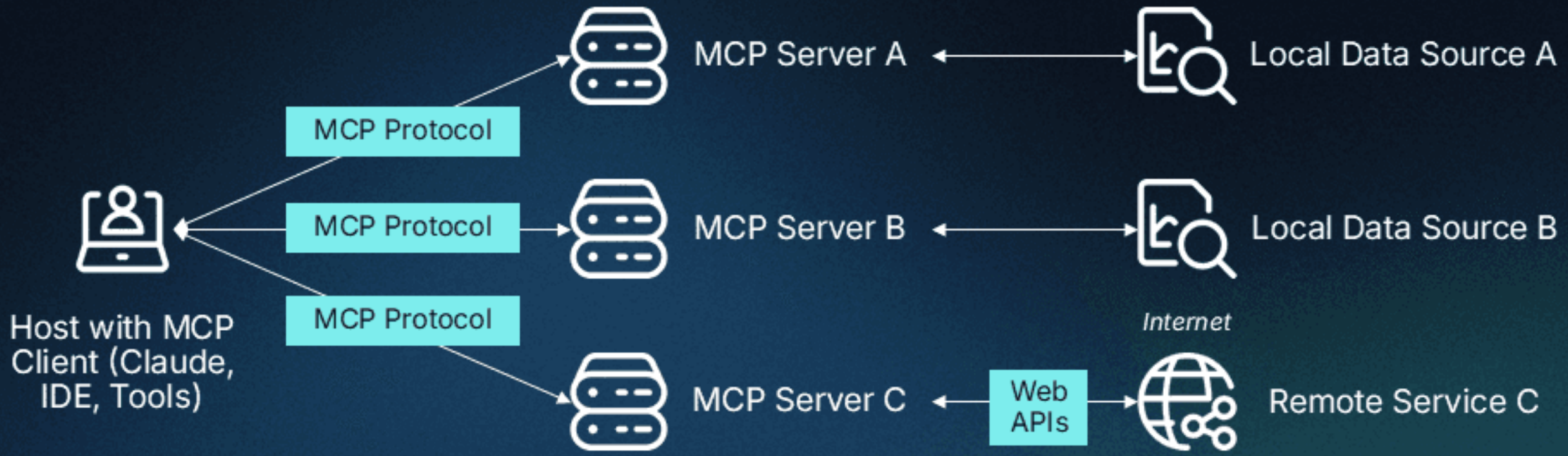


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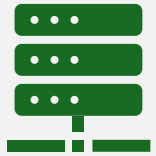
# How MCP works ?

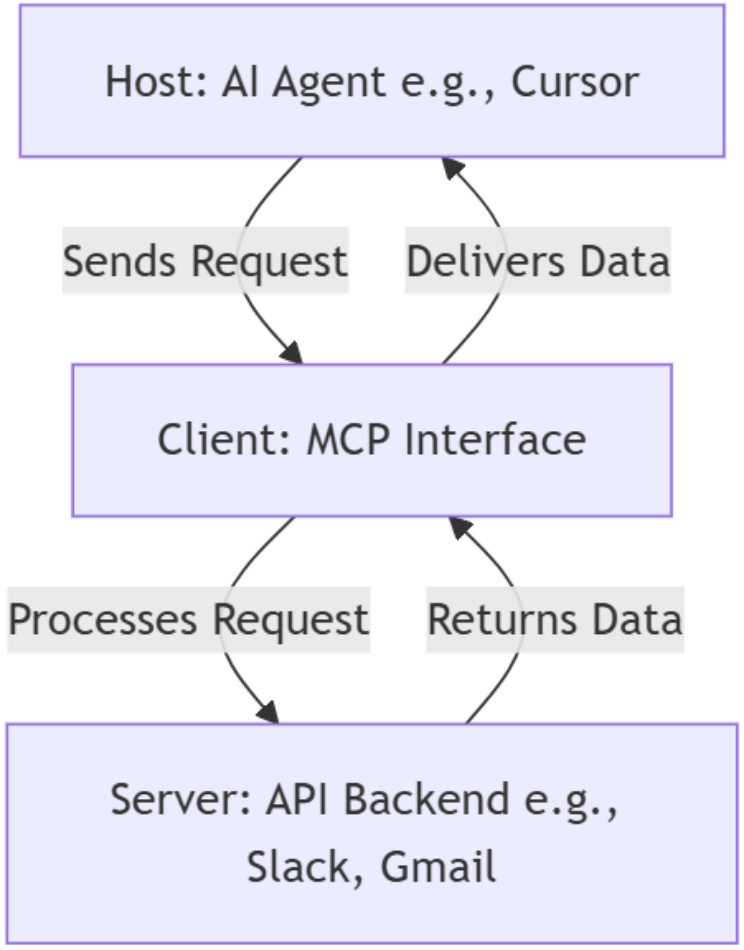
**Host** requests data.



**Client** connects to the server.

**Server** provides the requested data.

# How MCP works ?




Source: https://ssojet.com/blog/the-model-context-protocol-mcp-explained-a-game-changer-for-ai-and- startups/

# Distribution

**Source Code Package**

**Docker**

# MCP Server – Time Source Code - Packages

- Microsoft.Extensions.Hosting
- ModelContextProtocol

```
using Microsoft.Extensions.Hosting;
using ModelContextProtocol.Server;
```

# MCP Server – Time Source Code - Server

```
6   Console.WriteLine("Starting MCP .Net BLR server...");
7
8   var builder = Host.CreateApplicationBuilder(args);
9   builder.Services
10      .AddMcpServer()
11      .WithStdioServerTransport()
12      .WithToolsFromAssembly();
13
14  await builder.Build().RunAsync();
15
16  Console.WriteLine("MCP .Net BLR server stopped.");
17
```

# MCP Server – Time Source Code - Tool

```
19    [McpServerToolType]
      0 references
20    public class TimeTool
21    {
22        [McpServerTool, Description("Get the current time")]
          0 references
23        public string GetCurrentTime()
24        {
25            return DateTime.UtcNow.ToString("o");
26        }
27    }
```

# Demo

# Thank you – Q & A

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https://t.me/joinchat/lifUJQ_PuYT757Turx-nLg