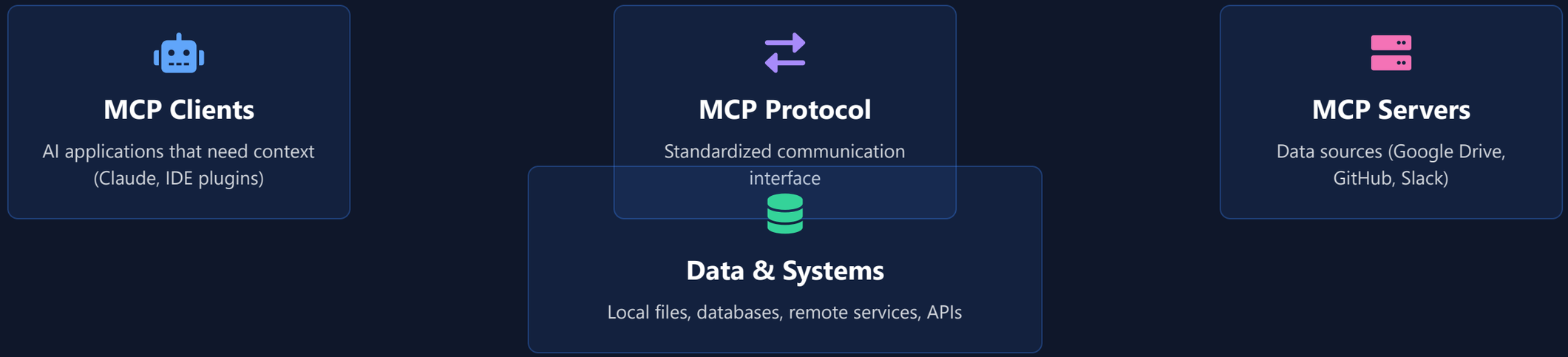
Model Context Protocol (MCP)

A Universal Standard for AI Connectivity

MCP is an open protocol that standardizes how applications provide context to Large Language Models.

Think of MCP like a USB-C port for AI applications — providing a standardized way to connect AI models to different data sources and tools.



Why MCP Matters

- Replaces fragmented integrations with a single protocol
- Connects AI systems with existing data sources
- Improves AI responses with relevant context

How MCP Works & Benefits

Key Components

Client API
AI tools (Claude, IDEs) that connect to MCP servers

Protocol
Standardized communication format with queries, resources, and capabilities

Server API
Data providers that expose resources through MCP endpoints

```
// Example MCP Connection
client.connect("github-server")
  .queryRepos({ owner: "anthropic" })
  .getFiles({ path: "/examples" })
```

Pre-built MCP Servers

GitHub
Access repos, code, issues and PRs

Slack
Connect to channels, messages

Google Drive
Access documents and files

Postgres
Query database content

Workflow Example

1. User asks Claude "Summarize our recent GitHub PR discussions"
2. Claude connects to GitHub MCP server via client
3. MCP server fetches PR data and returns to Claude
4. Claude provides a summarized response with context

Security
Data remains within your infrastructure. MCP servers control what can be accessed and by whom.

Interoperability
Connect to multiple data sources with a single protocol. Switch between AI providers easily.

Open Source
Community-driven ecosystem with SDKs for Python, JavaScript, C#, and other languages.

New Developments in Generative AI

Agentic AI

AI systems that autonomously take actions on behalf of users. They can proactively anticipate needs and execute complex workflows across applications.

Self-directed | Task orchestration

Multimodal AI

Systems trained on diverse data types (text, images, audio, video) creating more holistic and human-like cognitive experiences.

Cross-modal reasoning | Rich inputs/outputs

Retrieval-Augmented Generation

Enhances AI outputs by retrieving knowledge from external data sources before generating responses, improving factual accuracy.

Fact-based | Knowledge integration

Sentimental AI

Systems that analyze and interpret human emotions from text, speech, and visual inputs, enabling more empathetic interactions.

Emotion analysis | Personalization

Quantum AI

Combines quantum computing with AI to solve complex problems more efficiently than classical computers, opening new frontiers.

Exponential speedup | Advanced optimization

Explainable AI

Models designed to provide transparency into their decision-making processes, building trust and enabling better oversight.

Transparent decisions | Ethical compliance

The Future of AI in 2025

"In 2025, AI will evolve from a tool for work and home to an integral part of both. AI-powered agents will do more with greater autonomy and help simplify your life at home and on the job."

6 AI Trends for 2025
Microsoft Research

- More capable AI models
- AI companions for everyday life
- Resource-efficient infrastructure