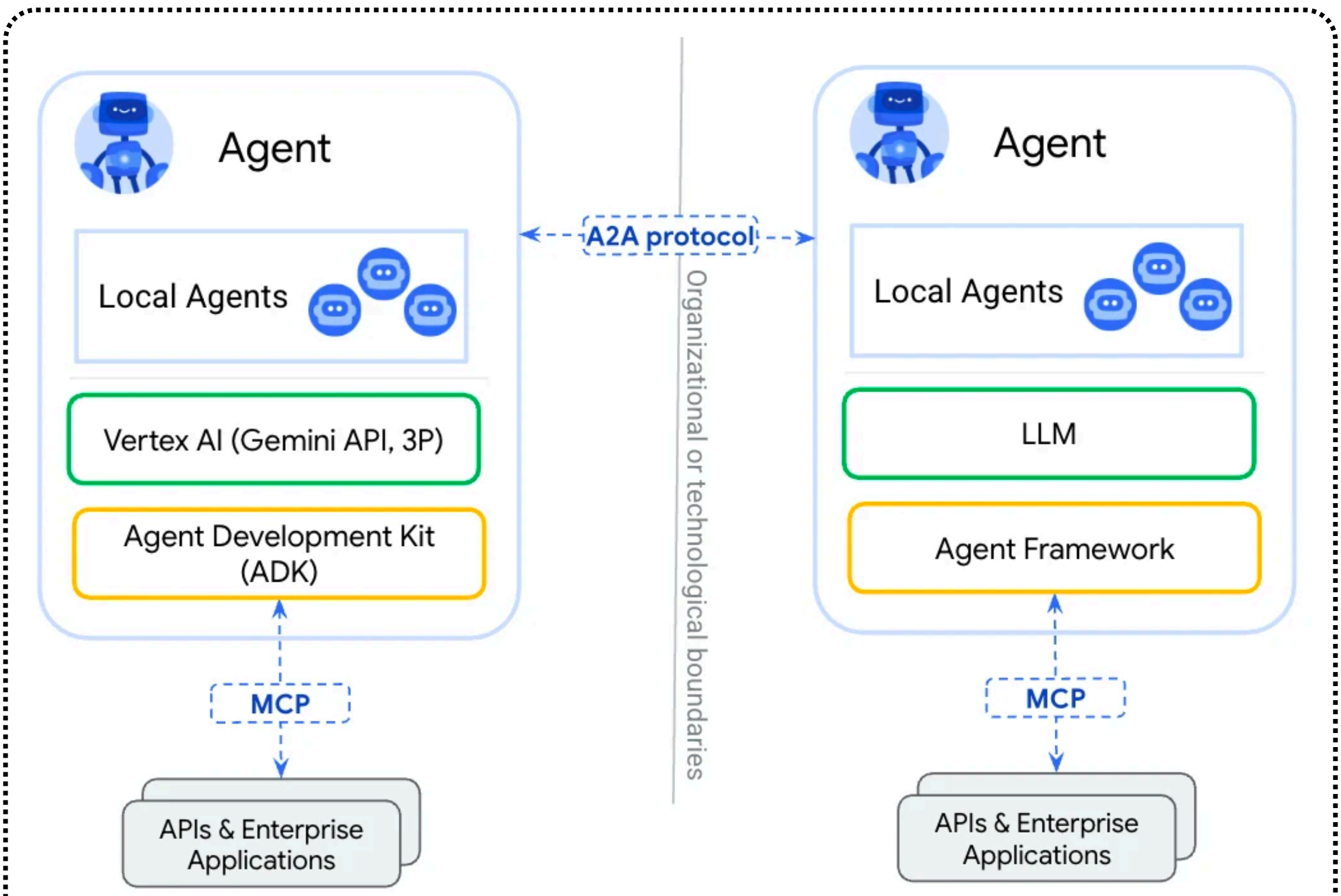
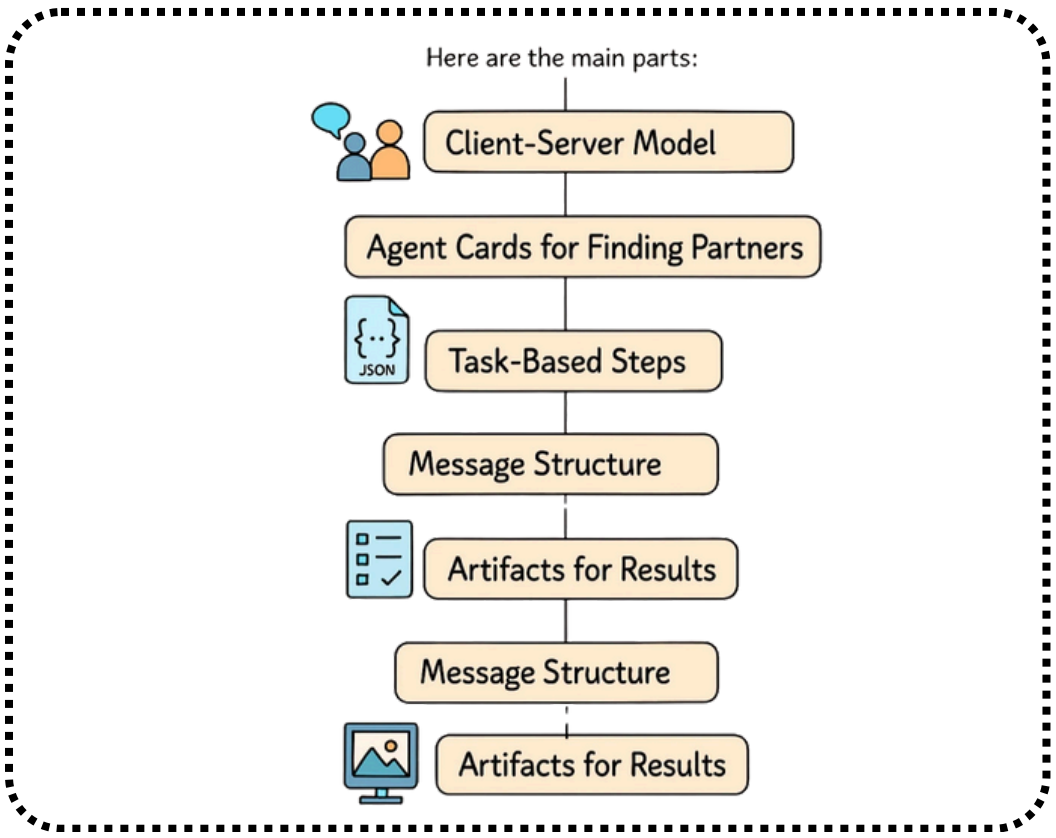
Analytics Vidhya

Agent-to-Agent Protocol





The Problem: AI Agents Working in Isolation

AI agents are getting smarter and can handle complex tasks. But they are limited because they can’t easily team up. When agents can’t communicate, companies have to build special links between them or have people manually pass information back and forth. This makes things slow and stops AI from working together effectively. For instance, if one agent needs some customer data held by another agent; without a standard way to ask, or a set protocol, the process stops.

The Solution: A2A Protocol

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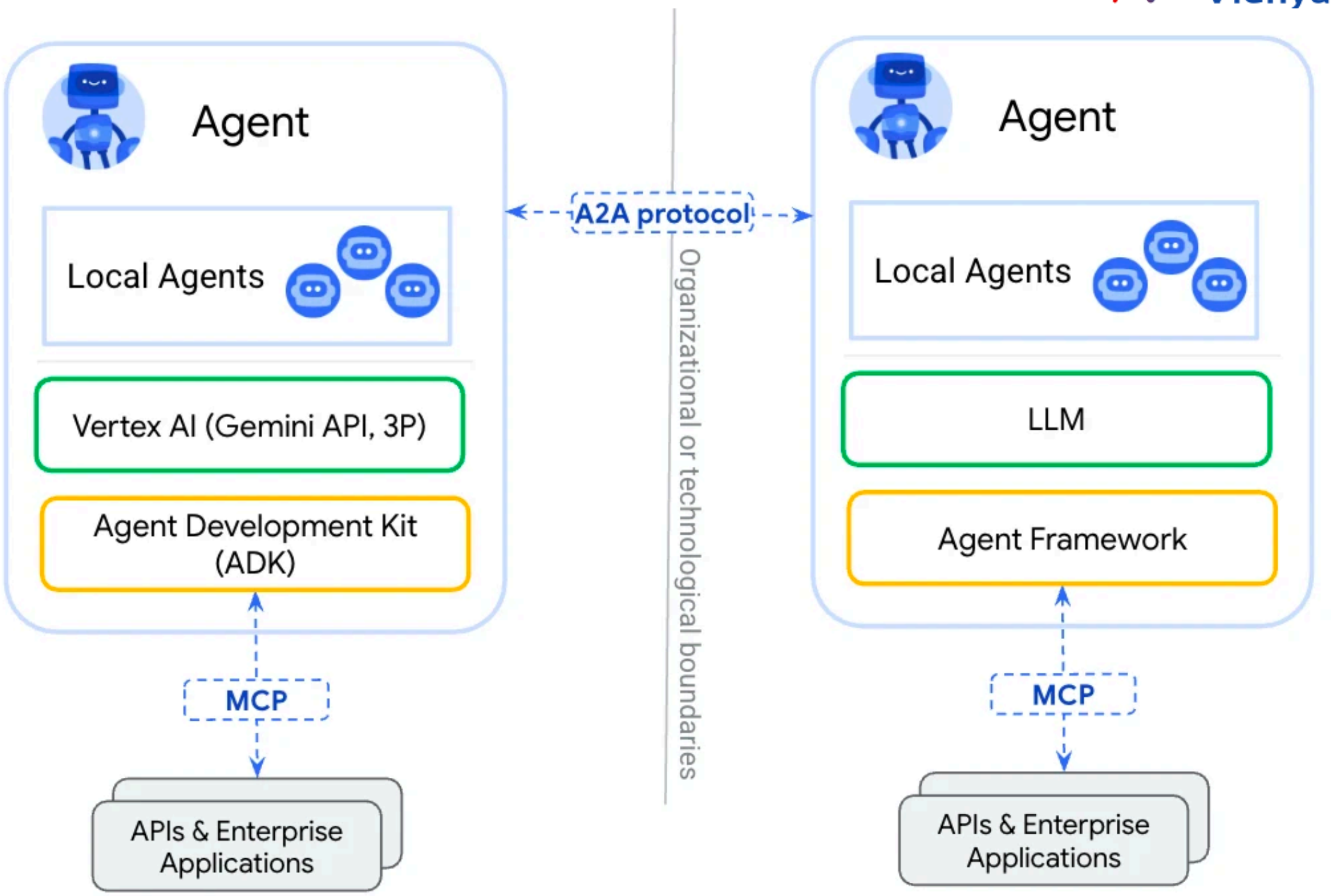

This image depicts two agents communicating across organizational or technological boundaries using an A2A protocol. Each agent manages the local agents and interacts with APIs & Enterprise Applications using MCP (Model Context Protocol). The A2A protocol facilitates direct communication between these high-level agents, while the MCP handles the interaction of each agent with other systems like API or applications.

A2A works alongside other ideas like Anthropic's MCP, which gives single agents access to required tools and information. A2A adds to this by letting these capable agents use their tools together.

5 Principles Behind A2A

The agent to agent protocol follows five main ideas to make sure it works well for businesses and can grow over time.

- **Focus on Agent Abilities**: A2A helps agents work together naturally, even if they don't share memory or tools. It allows cooperation while letting agents operate independently.

- **Use Common Web Standards**: Instead of making everything new, A2A uses well-known web standards like HTTP, Server-Sent Events (SSE), and JSON-RPC. This makes it easier to adopt and use this protocol with existing technology.

- **Build in Security**: The protocol includes strong security from the start. It supports standard ways to check identity and permissions, which is critical for business use.

- **Support Long Tasks**: A2A can handle jobs that take hours or days. It gives updates along the way, which is needed for complex business operations.

- **Handle Different Data Types**: A2A knows communication isn't just text. And so, it supports text, audio, video, and interactive data like forms, letting agents use the best format for the job.

How A2A Works

The agent to agent protocol uses a client-server setup for organized communication.

Here are the main parts:

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Client-Server Model

Agent Cards for Finding Partners

Task-Based Steps

Message Structure

Artifacts for Results

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- **Client-Server Model**: One agent (the “client”) asks for a task to be done. Another agent (the “server” or “remote” agent) does the task. These roles can change during the conversation. This model is basic to the AI agent communication protocol.

- **Agent Cards for Finding Partners**: A key feature of A2A is the “Agent Card.” It’s a JSON file that acts like an agent’s profile. It lists the agent’s ID, name, job, type, security needs, and what it can do. This helps the client agents find the right server agent for a specific task.

- **Task-Based Steps:** The main work unit is called a “task.” Tasks go through clear steps: submitted (started), working (in progress), input-required (needs more info), completed (finished well), failed (had an error), or cancelled (stopped early). This structure helps manage workflows.

- **Message Structure**: Inside tasks, agents talk using “messages.” Messages contain “parts” that hold the actual content (text, files, data, forms). This allows for sending rich information.

For more information, kindly visit this article

AI Agents Intermediate

Agent-to-Agent Protocol: Helping AI Agents Work Together Across Systems

Explore Google's Agent to Agent (A2A) protocol and learn what it does, how it works, and how it sets an example for agentic AI communication.

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