

GSOC 2025

Lightning Talk



presented by Elvan Konukseven



Google
Summer of
Code

About me

- First year Computer Science MSc student at ETH Zurich.
- Got introduced to Scala through Martin Odersky's course at EPFL.
- Currently contributing to the agentic toolkit of LLM4S



Elvan Konukseven

Switzerland 🇨🇭

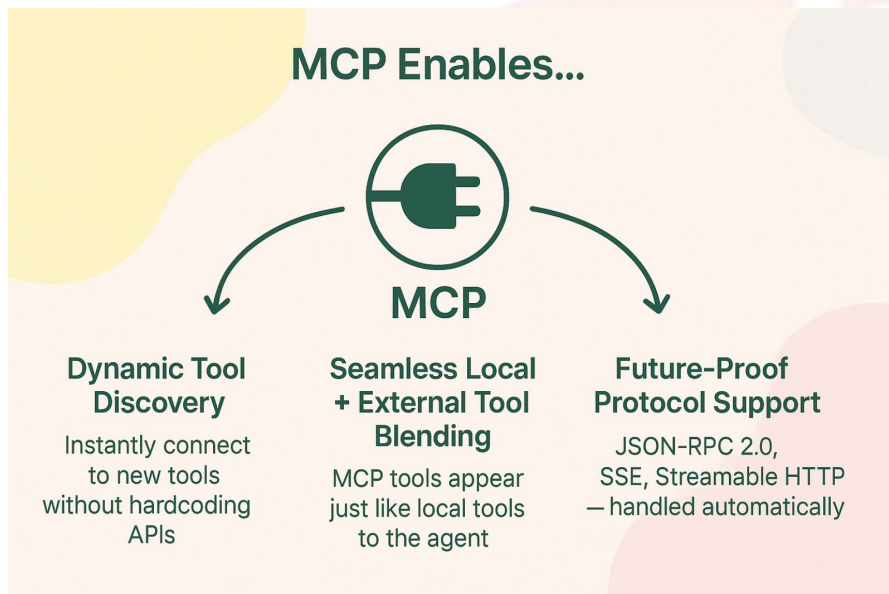
My work so far

11 merged PR's & 3 fundamental features implemented :

- Implemented an MCP connector → for LLM-tool interactions
- Built an Assistant Agent → built in assistant for LLM4S users
- Worked on Context Management → to extend agent's capability

Model Context Protocol

MCP extends LLM4S agent's possible toolset and allows developers to seamlessly connect to any MCP server.



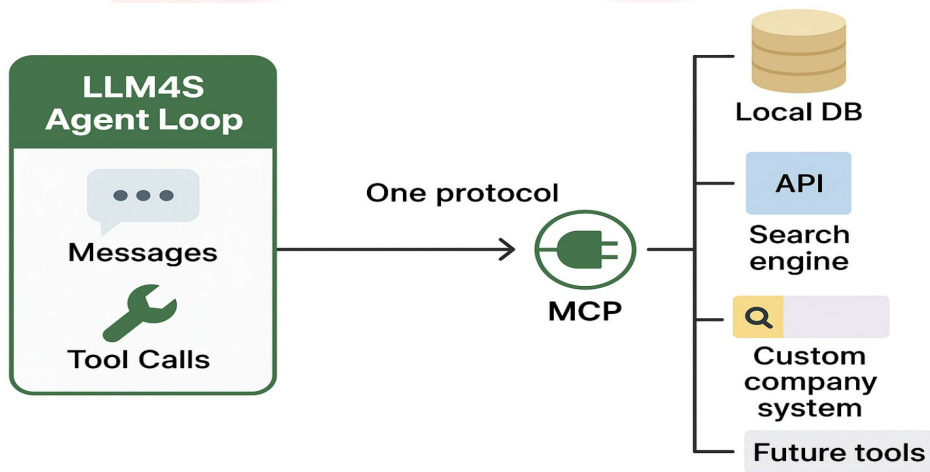
Plug into
any **tool**,
effortlessly

One Protocol. Every Tool. Powered by LLM4S.

One Protocol, Any Tool – MCP unifies every tool source — from local DBs to cloud APIs to future systems — into a single interface your agent already understands.

Agent Loop Ready – The LLM4S agent loop handles messages and tool calls natively; MCP just drops new capabilities straight into that flow, no code changes.

Scalable by Design – Add, swap, or upgrade tools without touching the core → growth without friction.



The Assistant Agent

- 1) Interactive Loop
- 2) Session Management
- 3) User Experience

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LLM4S Assistant Agent

Available Tools:
• get_weather
• search-emails
• get-email-content
• count-daily-emails
• send-email
• list-folders
• move-emails
• delete-emails

Commands:
• /load "Session Name" - Continue a previous session
• /help - Show this help message
• /new - Start a new conversation
• /save [title] - Save current session
• /sessions - List recent sessions
• /quit - Save and exit

Just type your message to start chatting or load a session!

19:59:33.499 [sbt-bg-threads-1] INFO org.llm4s.assistant.AssistantAgent — Created new session: b11be5f6-a2cd-4599-9fd9-a874a8586859

User> Hi, today is 31st of August 2025. My birthday!

Assistant> Happy Birthday! 🎉🎂 How can I assist you today to make your birthday even more special?

User> Did i receive any email today ??
20:00:13.076 [sbt-bg-threads-1] INFO org.llm4s.agent.Agent — Executing tool: search-emails with arguments: {"start_date":"2025-08-31","end_date":"2025-08-31","subject":"","sender":"","body":"","folder":"inbox","max_results":10,"start_from":0}
20:00:13.092 [sbt-bg-threads-1] INFO org.llm4s.mcp.StdioTransportImpl — StdioTransport(claude-post-email-server) writing to stdin: {"jsonrpc":"2.0","id":"3","method":"tools/call","params":{"name":"search-emails","arguments":{"start_date":"2025-08-31","end_date":"2025-08-31","subject":"","sender":"","body":"","folder":"inbox","max_results":10,"start_from":0}}}
20:00:14.665 [sbt-bg-threads-1] INFO org.llm4s.mcp.StdioTransportImpl — StdioTransport(claude-post-email-server) received from stdout: {"jsonrpc":"2.0","id":"3","result":{"content":[{"type":"text","text":"Found emails (showing 1 results starting from position 0):\n\nID | From | Date | Subject\n-----\nn68 | Elvan Konukseven <elvankonukseven@gmail.com> | Sun, 31 Aug 2025 19:49:28 +0200 | Happy birthday Twin\n\nShowing results 1-1. Use start_from=10 to get the next page.\nUse get-email-content with an email ID to view the full content of a specific email."}],"isError":false}}
20:00:14.684 [sbt-bg-threads-1] INFO org.llm4s.agent.Agent — Tool search-emails completed successfully in 1606ms. Result: "Found emails (showing 1 results starting from position 0):\n\nID | From | Date | Subject\n-----\nn68 | Elvan Konukseven <elvankonukseven@gmail.com> | Sun, 31 Aug 2025 19:49:28 +0200 | Happy birthday Twin\n\nShowing results 1-1. Use start_from=10 to get the next page.\nUse get-email-content with an email ID to view the full content of a specific email."

Assistant> You received an email today with the subject "Happy birthday Twin" from Elvan Konukseven. Would you like to see the full content of this email?
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Context Management

- 1) **Token-aware window:**
Keep only as much chat history as fits a token cap.
- 2) **Rolling structured summary:**
A tiny state that captures key facts. This lets you safely drop old turns without losing context.
- 3) **Deterministic compression first:**
Before adding tool outputs to the prompt, run a filter that keeps only signal (code, tables, IDs, errors) and strips noise (boilerplate, ads, duplicates).
- 4) **Backup LLM compressor**
Use a second LLM to compress the largest offenders with strict, factual instructions.





My mentors:

Rory Graves

A Scala advocate and software engineer with 30+ years of experience across diverse systems. He has contributed to Scala compiler optimizations and supports AI/ML research while mentoring developers. Beyond tech, he is a martial artist, windmill tour guide, and public speaking mentor.

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Kannupriya Kalra

Backend engineer and community leader specializing in type-safe, functional AI development. With 10+ years' experience, she's led engineering at Sky, mentored Google Summer of Code contributors, and spoken at conferences worldwide, shaping how typed languages integrate with modern AI.

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