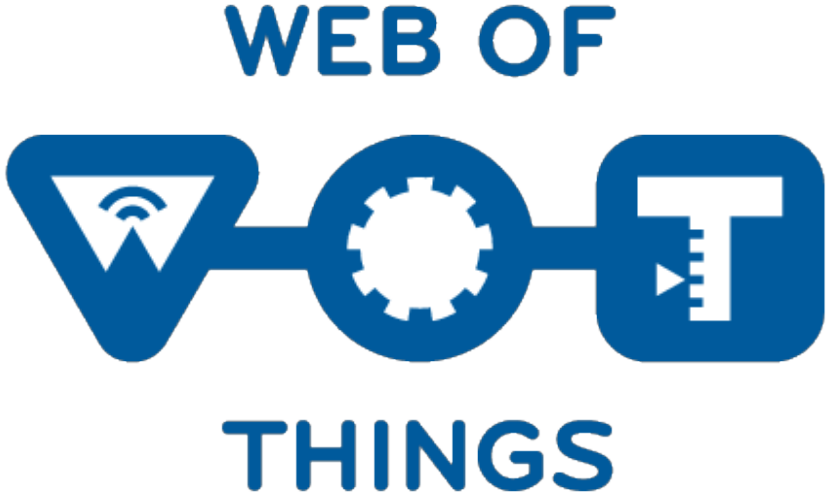

Facilitating Mashups by Integrating WoT-Discovery and Generative AI

W3C TPAC2025 Web of Things Plugfest Outcome

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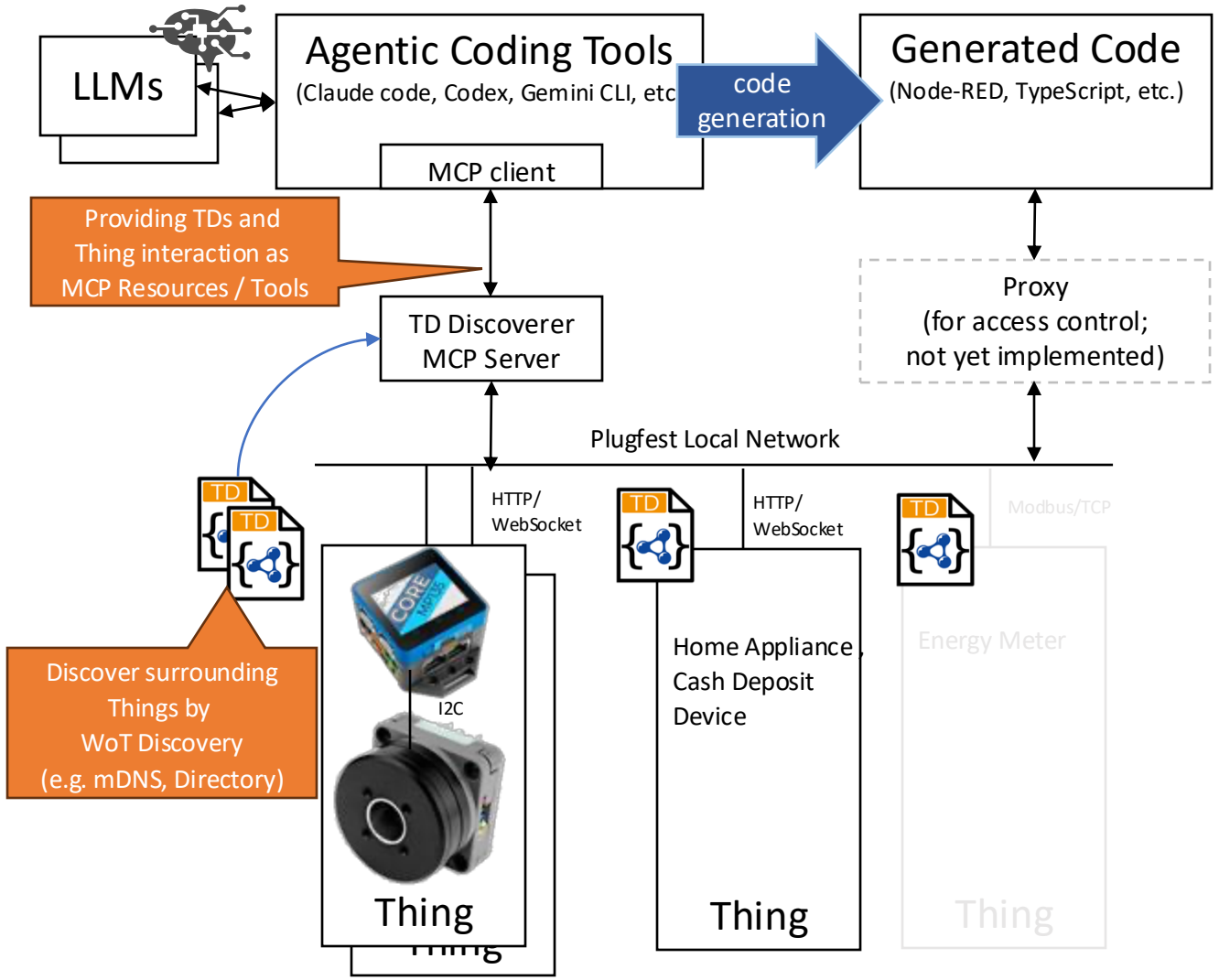
2025-11-12

Overview

- Device onboarding in IoT systems requires significant manual effort.
- WoT WG are building a methodology for interoperability across IoT platforms, focusing on the Thing Description (TD) as the central mechanism:
  - Automatic TD generation from device documentation,
  - TD-capable SDK: Node-wot, Node-RED node generator, etc.
- Recently, "Agentic Coding with generative AI" is becoming more common.
- Our approach: Instead of developing programming language-specific toolkit, we propose language-neutral MCP Server that enables various agentic coding tools to easily retrieve information about Things and provide direct access to the Things.

Configuration of Demo System

- Automatically discover TDs.
- Provide context to Agentic Coding Tools via Model Context Protocol (MCP).
  - Resources: Thing Descriptions and WoT-related documents
  - Tools: TD search, interact with Thing
- Develop orchestration programs using any coding tool that supports MCP.
- Deploy and execute generated programs (with access control).



Lessons Learned

- Generated code accuracy depends on TD's description detail
  - Interface-only definitions lead to difficulty understanding prerequisites/settings, often resulting in incorrect programs. Providing rich context, such as what the thing can be used for, is essential.
- Programming flexibility expanded
  - Programs can be generated by combining standard communication API functions, even without a WoT-specific SDK.
- Large list of interface definitions may confuse the LLM, prolonging thought processes and generating incorrect programs.

Future works:

- Provide richer context (e.g., Knowledge Graphs).
- Try and evaluate generating code for other programming languages and protocol bindings.
- Implement access control features.