Introducing Eclipse CDT.cloud

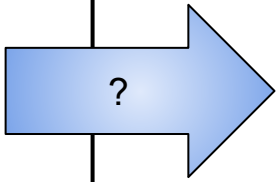
C/C++ tooling in the web

Stefan Dirix

EclipseSource

C/C++ tooling in the web?

Desktop



Web/Cloud

Eclipse CDT.cloud

Eclipse CDT.cloud hosts components and best practices for building customizable web-based C/C++ tools

Since December 2021

CDT.cloud components

TraceCompass.cloud

CDT GDB Debug Adapter

CDT Amalgamator

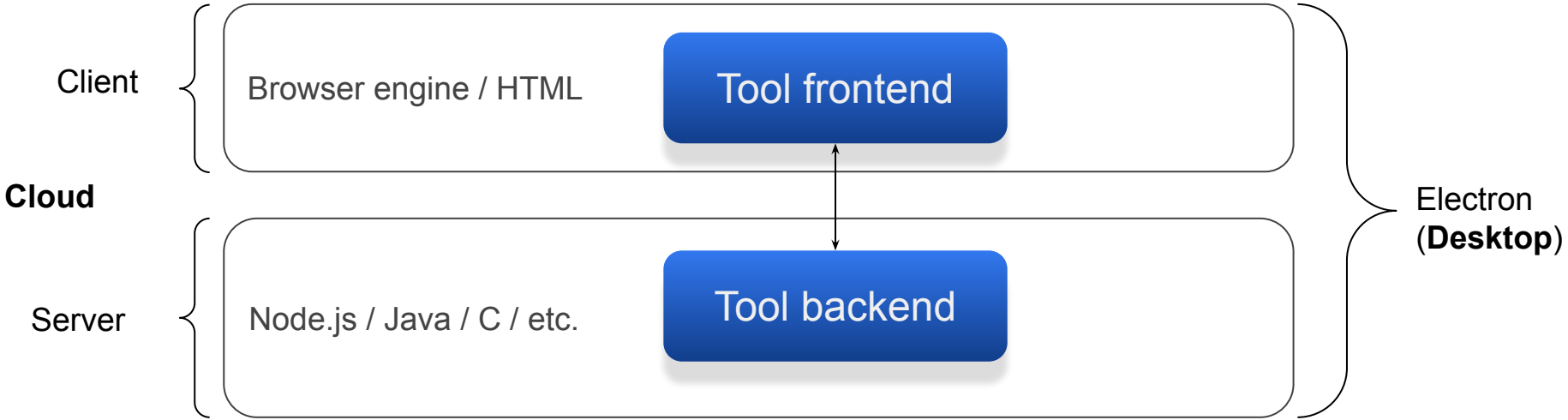
Clangd contexts

CDT.cloud Blueprint

CDT.cloud Blueprint is a template tool for building custom web-based C/C++ tools

- Consists of existing open source components
- Showcases CDT.cloud components
- Prerelease available on all major operating system platforms

Typical architecture of a web/cloud-based tool



Theia vs VS Code

Visual Studio Code

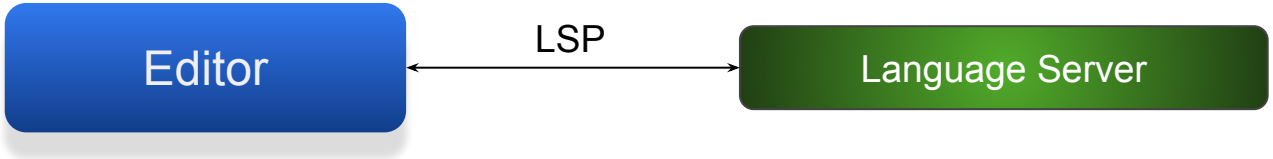
THEIA

- VS Code is an extensible editor
- Theia is a framework for web-based editors and tools

VS Code extensions can be used both in Theia and VS Code

Language support

- Historically: Built into the IDE (e.g. Eclipse CDT)
- Today: Based on LSP (Language Server Protocol)



C/C++ language servers

CPP tools (ms-vscode.cpptools)

- Very popular and mature
- Includes language server and debug support
- Restrictive license -> Can’t be used outside of VS Code

clangd (llvm-vs-code-extensions.vscode-clangd)

- Part of the LLVM project
- Fully-fledged alternative
- Can be used in Theia (and other tools)

clangd

De facto choice for all IDE vendors

To note:

- Requires build information per source file (“compile_commands.json”)
  - Consequence on build integration
- Multi-project capabilities under investigation

clangd contexts

- C/C++ code often behaves very differently based on the environment, i.e. preprocessing
- This needs to be presented and/or configured via the IDE

Clangd contexts is a Javascript library to manipulate clangd configuration files.

- Example VS Code and CLI integrations are available

Compilation

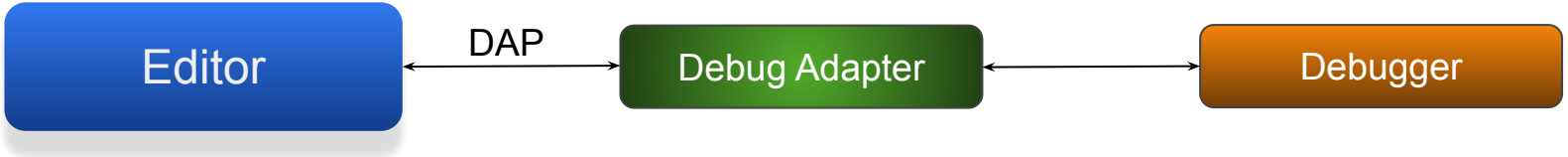
- Traditionally very project-specific

Some options:

- Terminal (CLI)
- Scripts / Tasks
- Cmake tools (ms-vscode.cmake-tools)
- Own UI

Debugging

Accomplished via DAP (Debug Adapter Protocol)



Debug Adapters

- CPP Tools (ms-vscode.cpptools) 🚫
- CDT GDB (eclipse-cdt.cdt-gdb-vscode) from Eclipse CDT.cloud
- CodeLLDB (vadimcn.vscode-lldb)

Embedded:

- Native Debug (webfreak.debug)
- Cortex-Debug (marus25.cortex-debug)

CDT GDB Debug Adapter

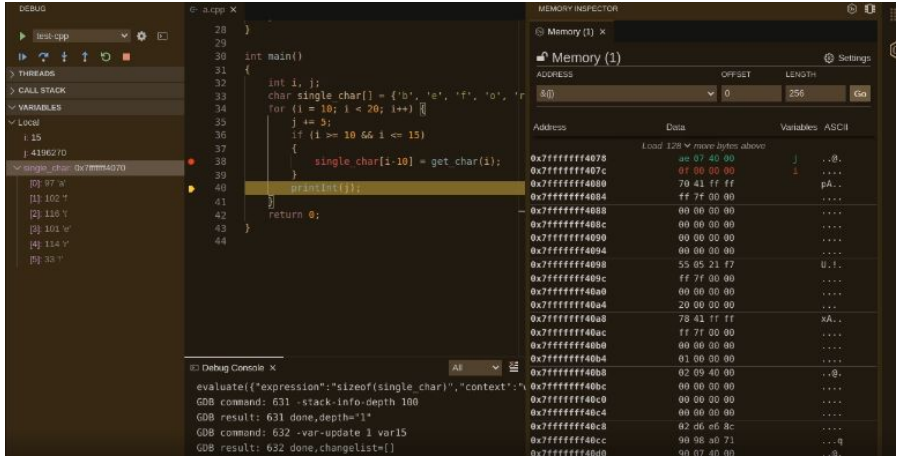
- Debug Adapter for GDB inspired by the Eclipse CDT MI layer.
- In development since 2018

- Offered as library and VS Code extension

Debug Memory Inspector

Recently contributed to Theia

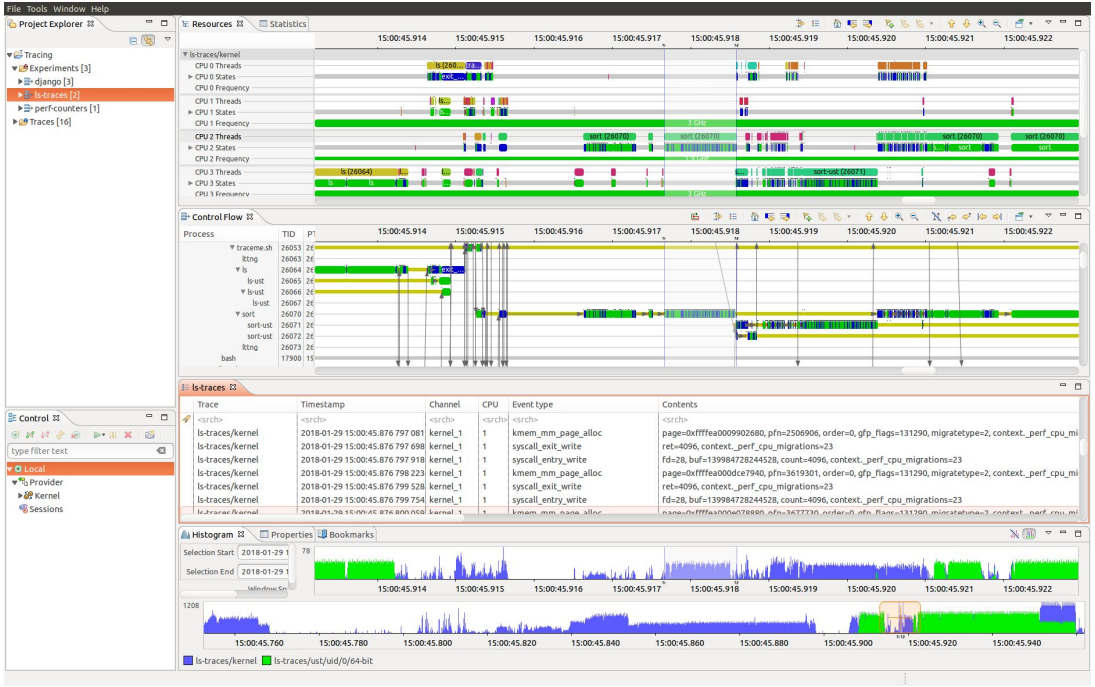
- Currently Theia only
- Works out of the box with any adapter which can provide memory information
- “@theia/memory-inspector” available since Theia 1.29



TraceCompass.cloud

Eclipse Trace Compass is a powerful visualization tool to solve performance and reliability issues by reading and analyzing traces and logs of a system.

TraceCompass.cloud



TraceCompass.cloud

- Major refactoring into a client server architecture using Trace Server Protocol
- Integration in Theia available

Interested?

- What's cooking in the TraceCompass.cloud project?
  Today at 16:15 by Bernd Hufmann

CDT.cloud Blueprint

- Plan to release with every Theia community release
- Serves as a simultaneous release for all CDT.cloud Blueprint components

CDT Amalgamator

- Debug adapter that allows common control over multiple debug adapters simultaneously
- Allows to combine different debug adapters in a heterogeneous system

Current state: Proof of Concept

CDT.cloud Community

Open project which values community involvement

Weblinks:

- cdt-cloud.io
- github.com/eclipse-cdt-cloud/cdt-cloud

Forum:

- github.com/eclipse-cdt-cloud/cdt-cloud/discussions

CDT.cloud Community

Community meetings every two months:

- Tuesday, December 13, 2022 · 17:30 – 18:20
  https://meet.google.com/fyw-gpev-ujs

Other recommended sessions

Today, 12:30, Eclipse Theia - News and Noteworthy!

Today, 17:00, Diagram Editors with GLSP: Why flexibility is key

Today, 19:30, BoF: Building (web-based) tools with Eclipse

Tomorrow, 17:00, Theia.cloud - Running Theia-based products in the cloud

Questions?

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+1

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