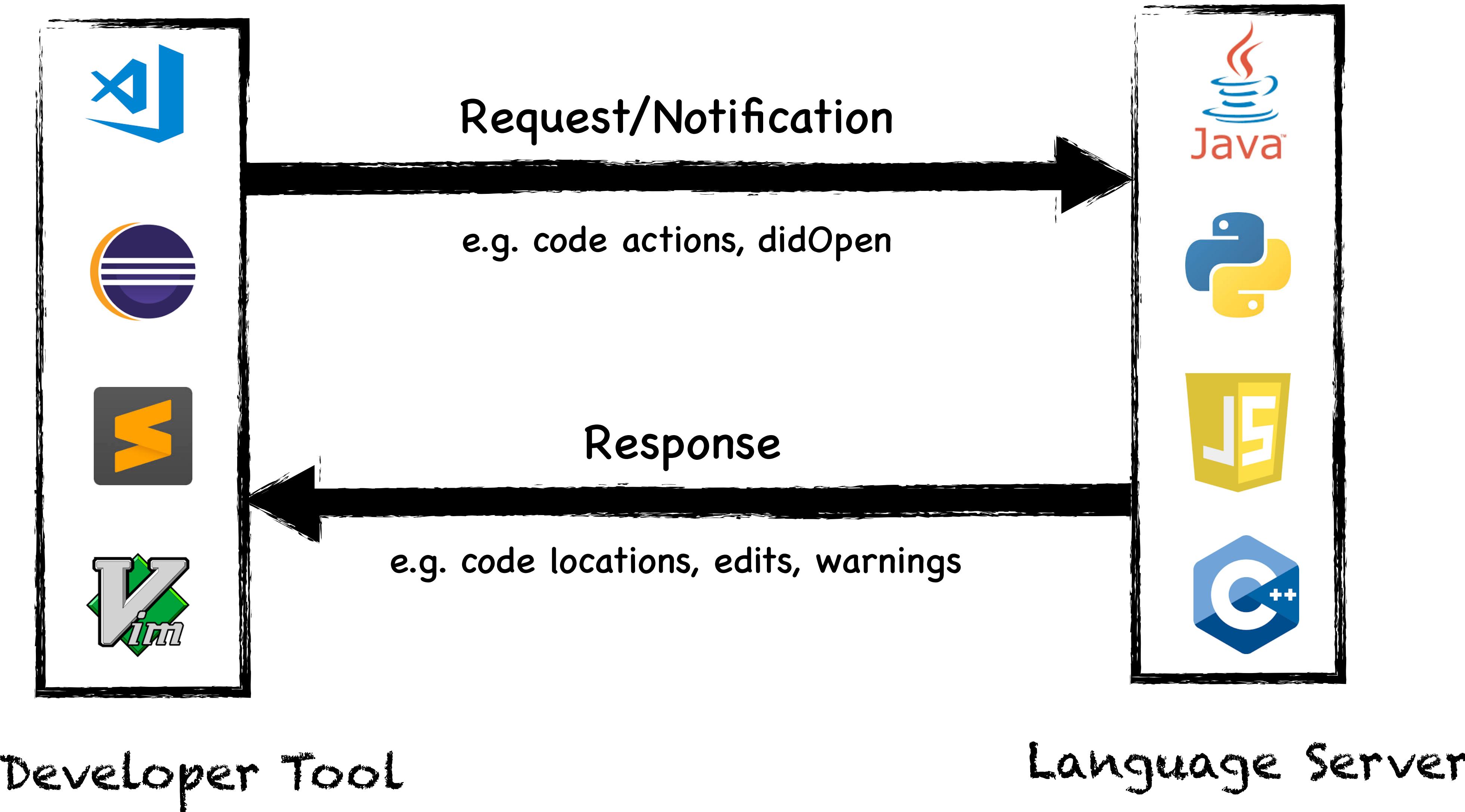


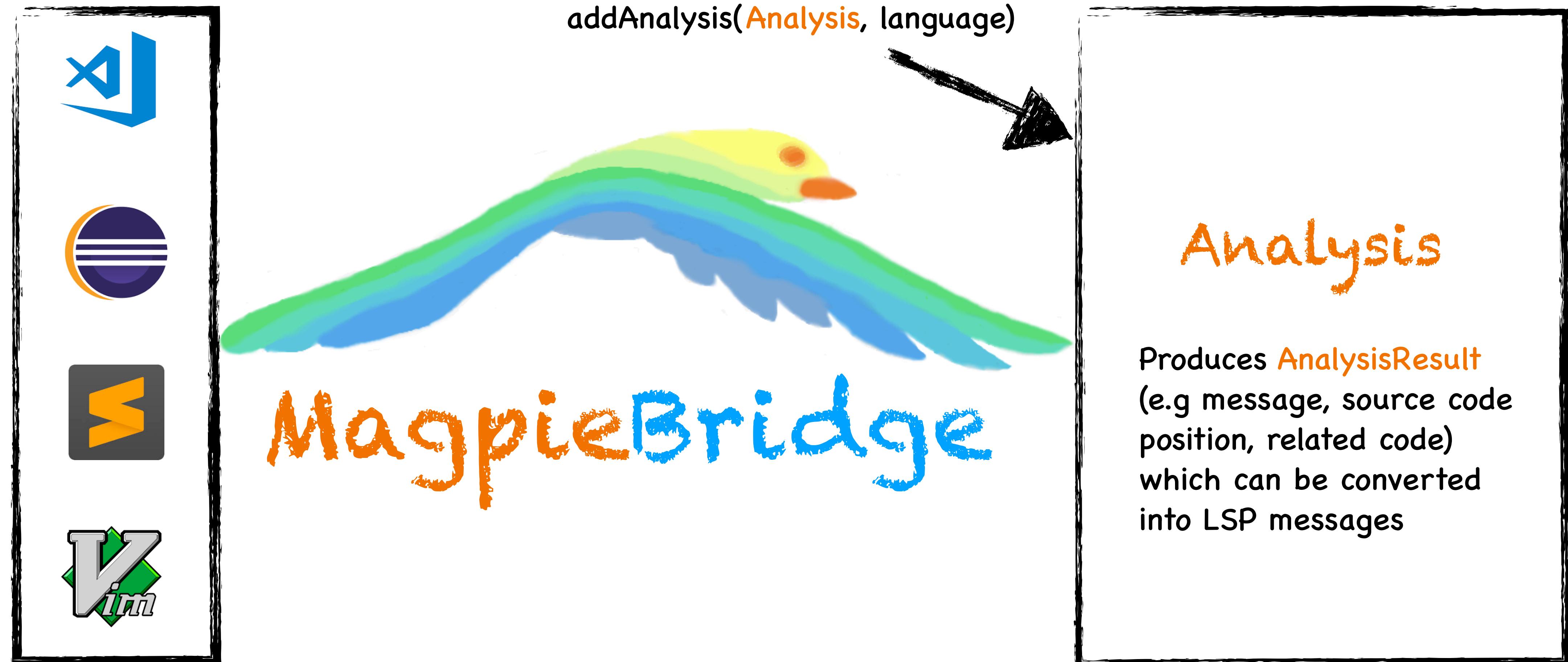
# **DRY** and Use **MagpieBridge** For IDE Integration

Linghui Luo, Paderborn University

# Language Server Protocol (LSP)



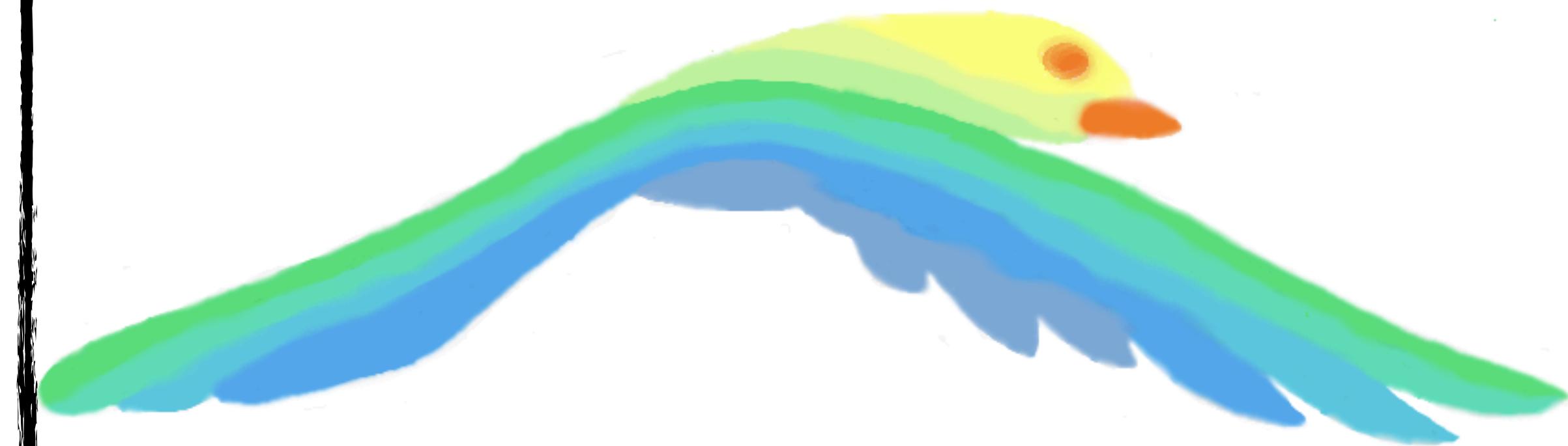
# A Reusable IDE Integration Framework



Developer Tool

**MagpieServer**

# A Reusable IDE Integration Framework



## MagpieBridge

Developer Tool

## ServerAnalysis

Soot, WALA-based Analyses

## ToolAnalysis

Command Line Tools

## MagpieServer

# ServerAnalysis – CogniCrypt

E:\ECOOP\DemoProjectMagpieBridge\src\RSA2.java (DemoProjectMagpieBridge) - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

RSA2.java

```
import java.security.SignatureException;
public class RSA2 {
    private PublicKey publicKey;
    private PrivateKey privateKey;
    public RSA2() throws NoSuchAlgorithmException {
        KeyPairGenerator kpgen = KeyPairGenerator.getInstance("RSA");
        kpgen.initialize(512); No description available.
        KeyPair keyPair = kpgen.generateKeyPair();
        this.privateKey = keyPair.getPrivate();
        this.publicKey = keyPair.getPublic();
    }
    public byte[] sign(String message) throws InvalidKeyException, NoSuchAlgorithmException, SignatureException {
        Signature instance = Signature.getInstance("SHA256withRSA");
        byte[] bytes = message.getBytes();
        instance.update(bytes);
        instance.sign();
        return bytes;
    }
    public boolean verify(String message, byte[] signature)
        throws NoSuchAlgorithmException, InvalidKeyException, SignatureException {
        Signature instance = Signature.getInstance("SHA256withRSA");
        instance.initVerify(publicKey);
        instance.update(message.getBytes());
        boolean isVerified = instance.verify(signature);
        return isVerified;
    }
}
```

src\RSA2.java:

Line	Category	Message	
25:5	CogniCrypt	error	Unexpected call to method update on object of type java.security.Signature. Expect a call to one of the following methods initSign,initVerify
16:5	CogniCrypt	error	First parameter (with value 512) should be any of {2048, 4096}
33:5	CogniCrypt	error	First parameter was not properly generated as generated Pubkey

cognicrypt, Line 16, Column 22

Zur Suche Text hier eingeben

Spaces: 2 Java 09:31 DEU 18.07.2019

# Server Analysis — FlowDroid

The screenshot shows a Visual Studio Code (VS Code) interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Debug, Terminal, Help.
- Title Bar:** Database.java - DemoProjectFD - Visual Studio Code.
- Explorer:** Shows the project structure under "DEMOPROJECTFD".
  - src/main/java/demo/Database.java (selected)
  - src/main/java/demo/DemoServlet.java
  - webapp
  - target
  - .classpath
  - .project
  - .pom.xml
- Editor:** Displays the Java code for `Database.java`. The code contains a `deleteuser` method that constructs a SQL query using a `StringBuilder` and executes it using a `Statement`.
- Problems:** Shows analysis results from FlowDroid.
  - Database.java:**
    - Found a sensitive flow to sink `[stmt.execute(query)]` from the source `[req.getParameter("userName")]` at line 109 in `DemoServlet.java`. FlowDroid(`req.getParameter("userN`)
    - DemoServlet.java[109, 23]: `req.getParameter("userName")`;
    - DemoServlet.java[110, 5]: `Database.deleteUser(userName)`;
    - Database.java[48, 7]: `str.append(userName)`;
    - Database.java[50, 22]: `str.toString()`;
    - Database.java[51, 7]: `stmt.execute(query)`;
  - DemoServlet.java:**
    - Found a sensitive flow to sink `[stmt.executeUpdate(query)]` from the source `[req.getParameter("userName")]` at line 68 in `DemoServlet.java`. FlowDroid(`req.getParameter("userN`)
    - DemoServlet.java[68, 23]: `req.getParameter("userName")`;
    - DemoServlet.java[73, 7]: `str.append(userName)`;
    - DemoServlet.java[75, 22]: `str.toString()`;
- Bottom Status Bar:** Shows file status (3 changes), search bar ("Zur Suche Text hier eingeben"), system icons, and system information (DEU, 09:34, 18.07.2019).

# ToolAnalysis – Facebook Infer

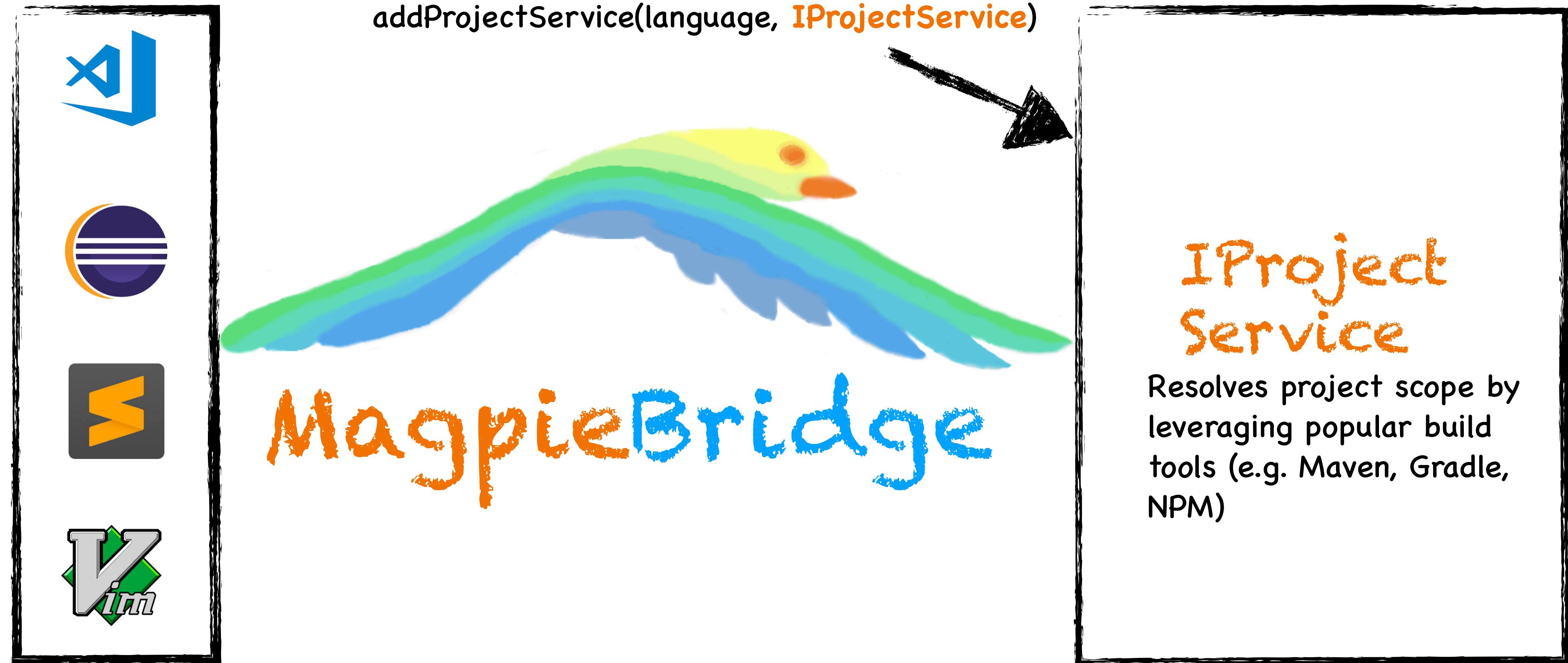
The screenshot shows a browser-based IDE interface for analyzing Java code using Facebook Infer. The top navigation bar includes links for Chrome, File, Edit, View, History, Bookmarks, People, Tab, Window, Help, and various system icons. The address bar shows the URL `c0013693-a63f-4865-bf34-a422e2d6d564.ws-eu01.gitpod.io/#/workspace/MagpieBridge`. The toolbar below the address bar contains links for Apps, music, Learning, ACM, O'REILLY, Udacity, Educative, daily git, My-Website, My-Notes, MagpieBridge, Build Server, Linguee, Private, and Work.

The main window features a dark-themed code editor and a sidebar. The sidebar on the left lists files under the `MAGPIEBRIDGE` package, including `MagpieHttpHandler.java`, which is currently selected. The code editor displays the `MagpieHttpHandler.java` file with line numbers 44 to 72. The code handles HTTP requests, particularly POST requests, by reading form data from the request body and setting configuration options. The bottom right corner of the code editor shows a yellow warning icon.

In the bottom right corner of the interface, there is a small icon of a person with a gear, likely representing user or tool configuration.

The bottom of the screen shows the Eclipse IDE interface, including the Problems view which lists several errors and warnings related to null dereferencing and resource leaks in the `JavaProjectService.java` and `MagpieHttpHandler.java` files.

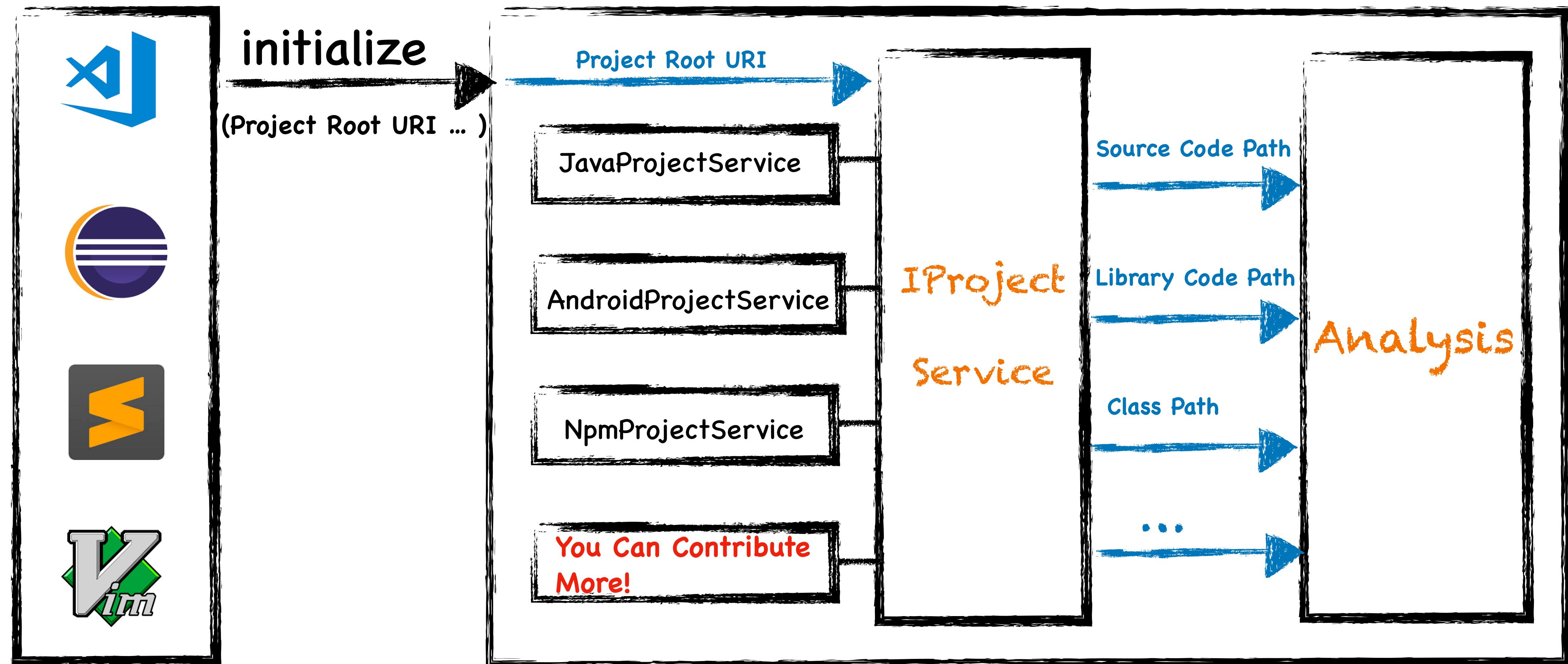
# Reusable Project Services



Developer Tool

MagpieServer

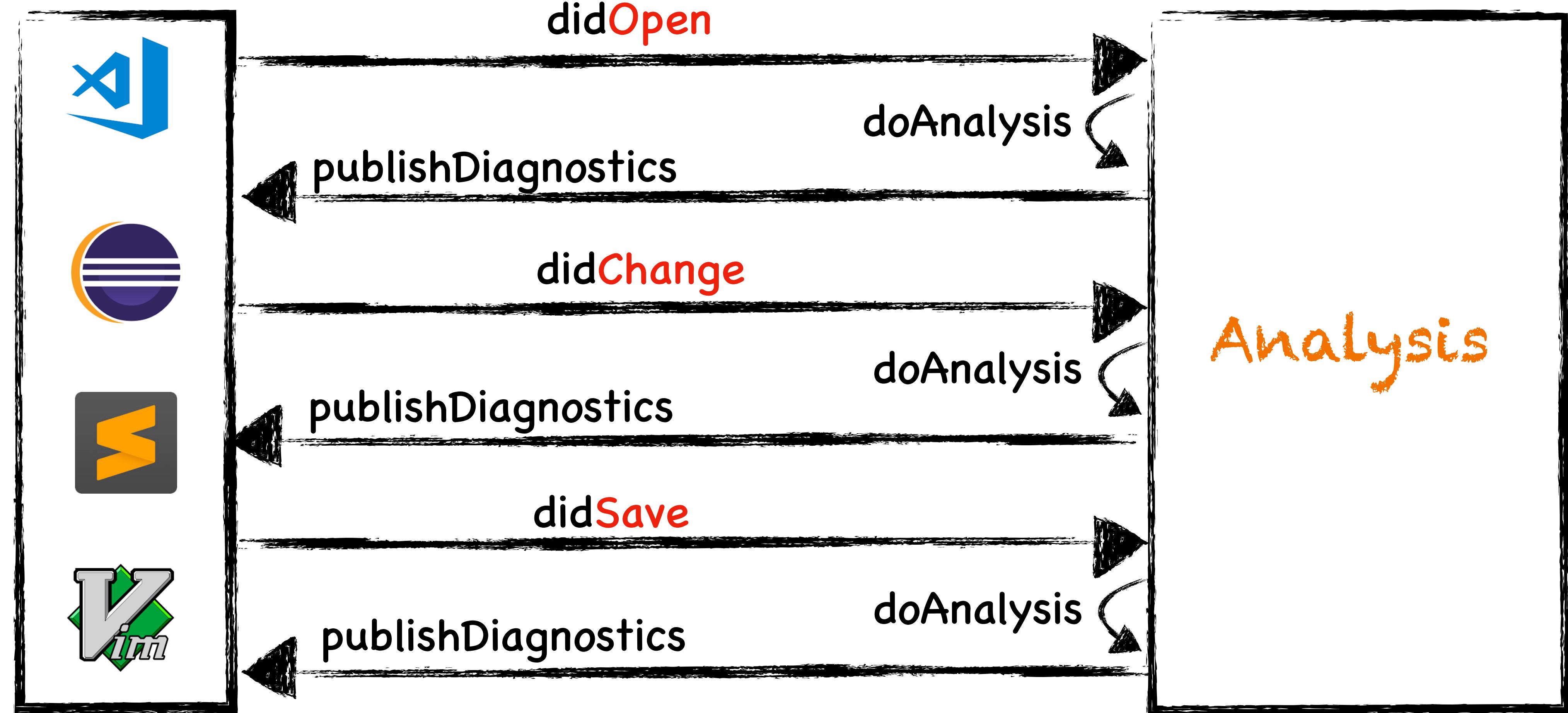
# Reusable Project Services



Developer Tool

MagpieServer

# Instant Detection



Developer Tool

MagpieServer

# IDE Features for Diagnostics

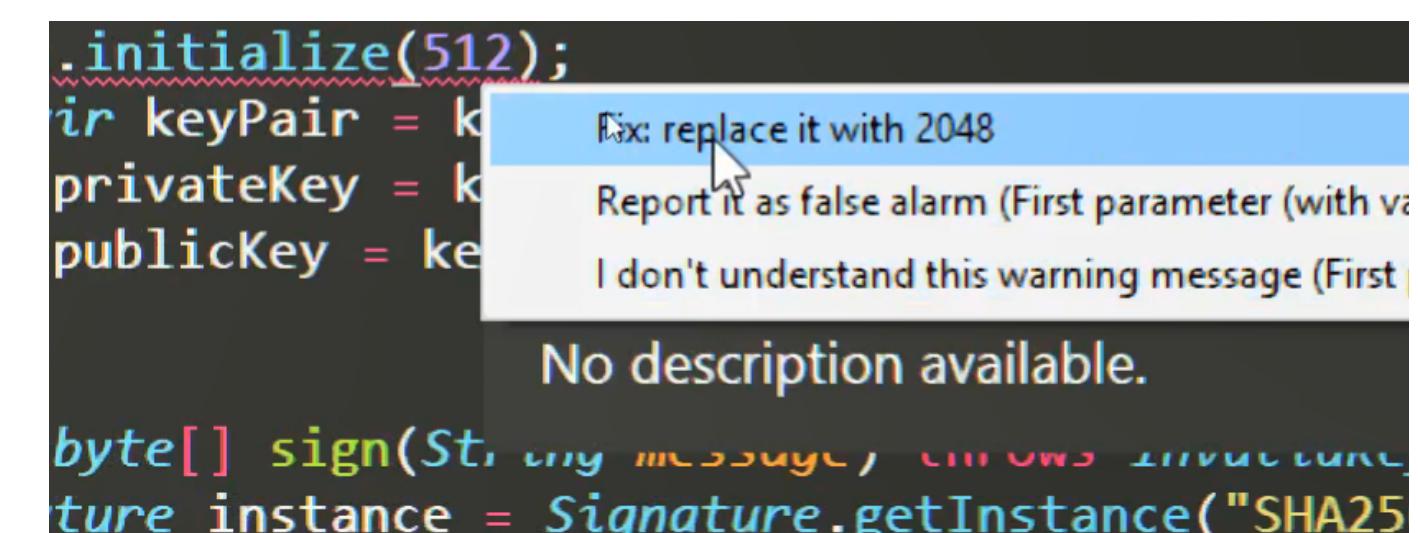
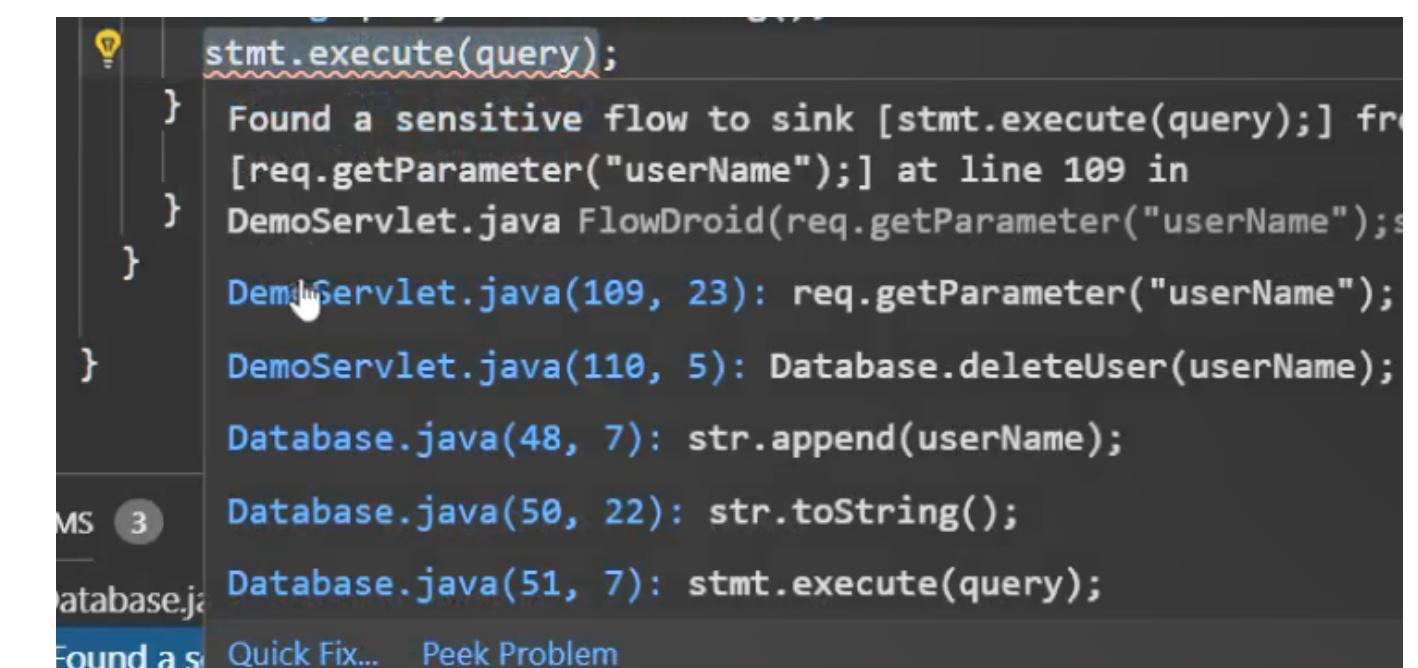
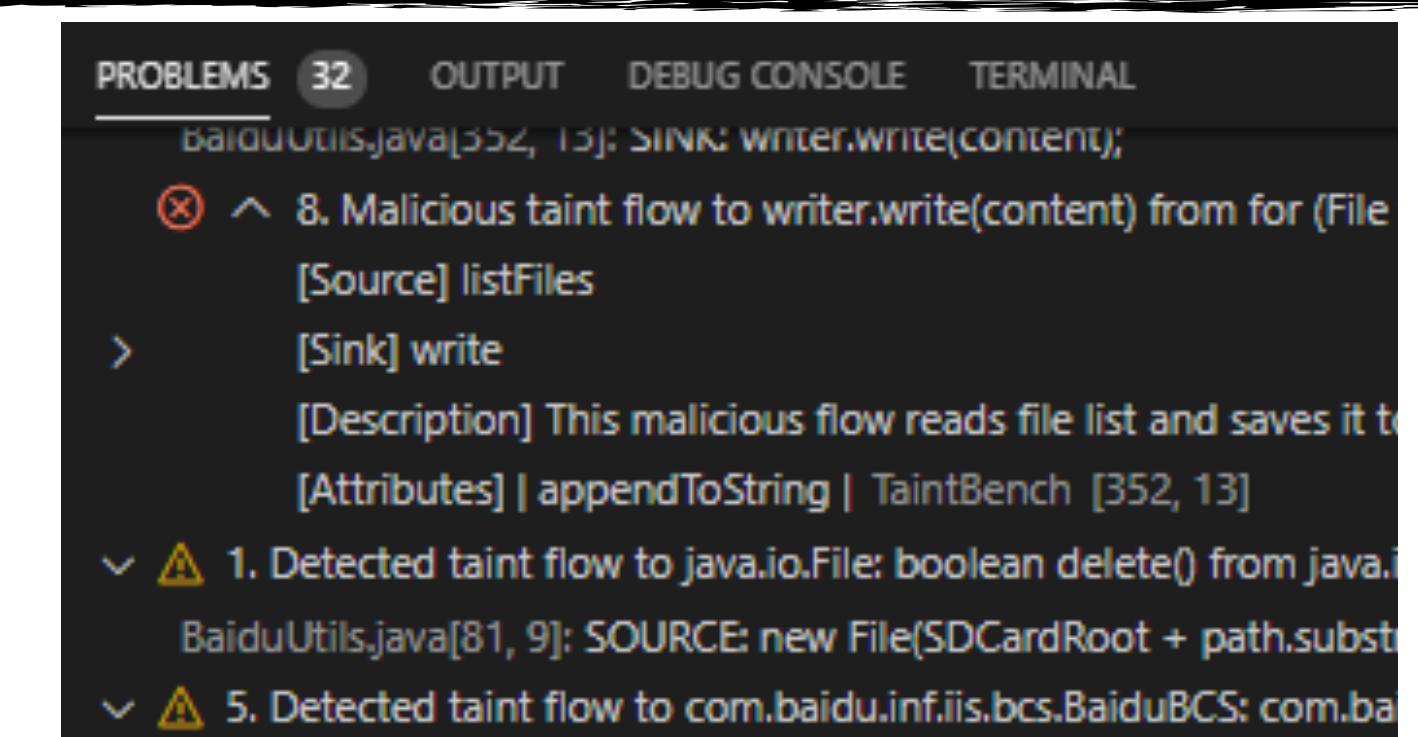
# Markers with different severities

## (**ERROR**, **WARNING**, **INFO**)

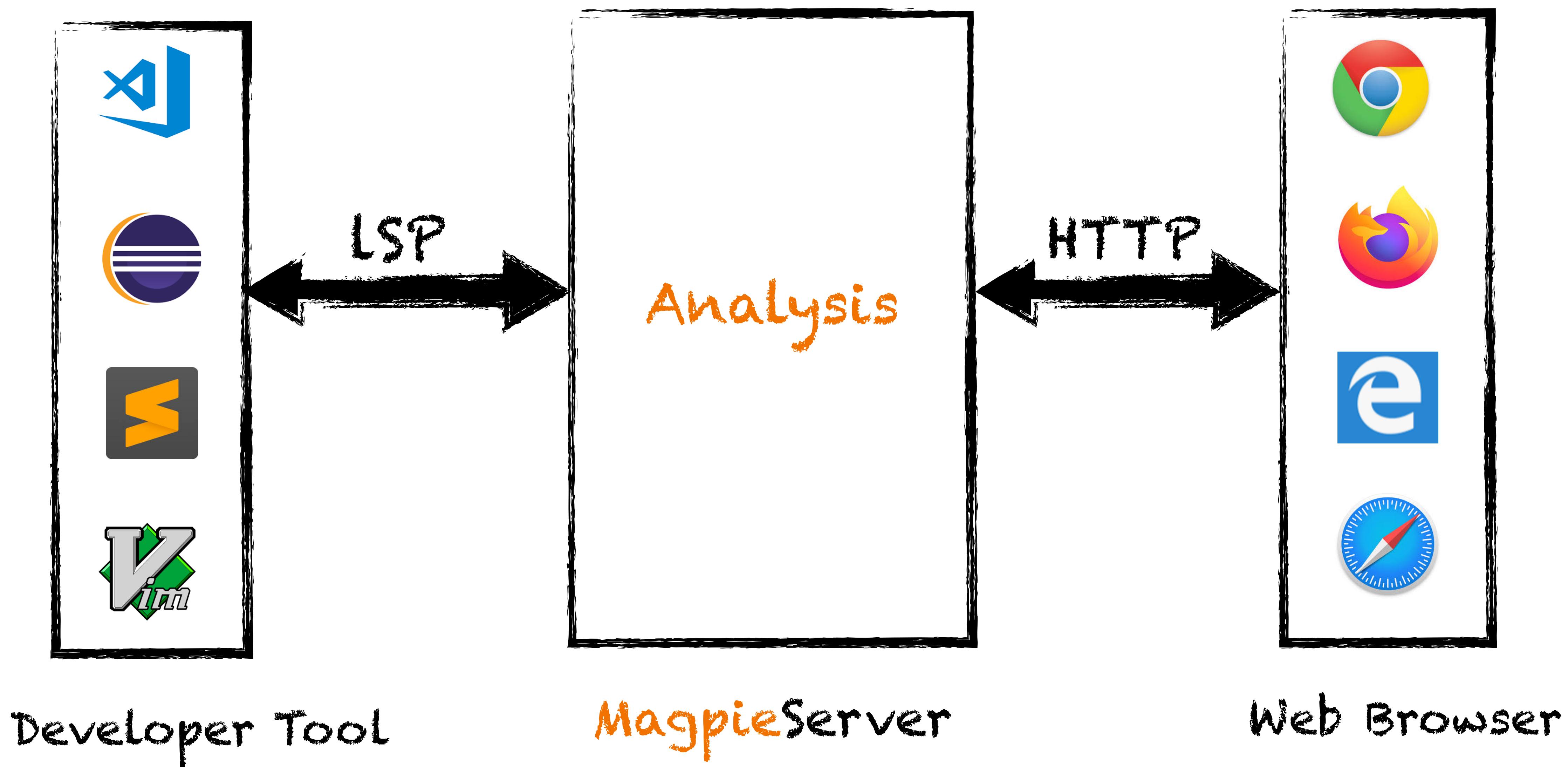
# Related code in hover message (Witness path)

# Advanced features

(Quick fixes, Open URI, False alarm reporting ...)



# MagpieBridge Provides More User Control

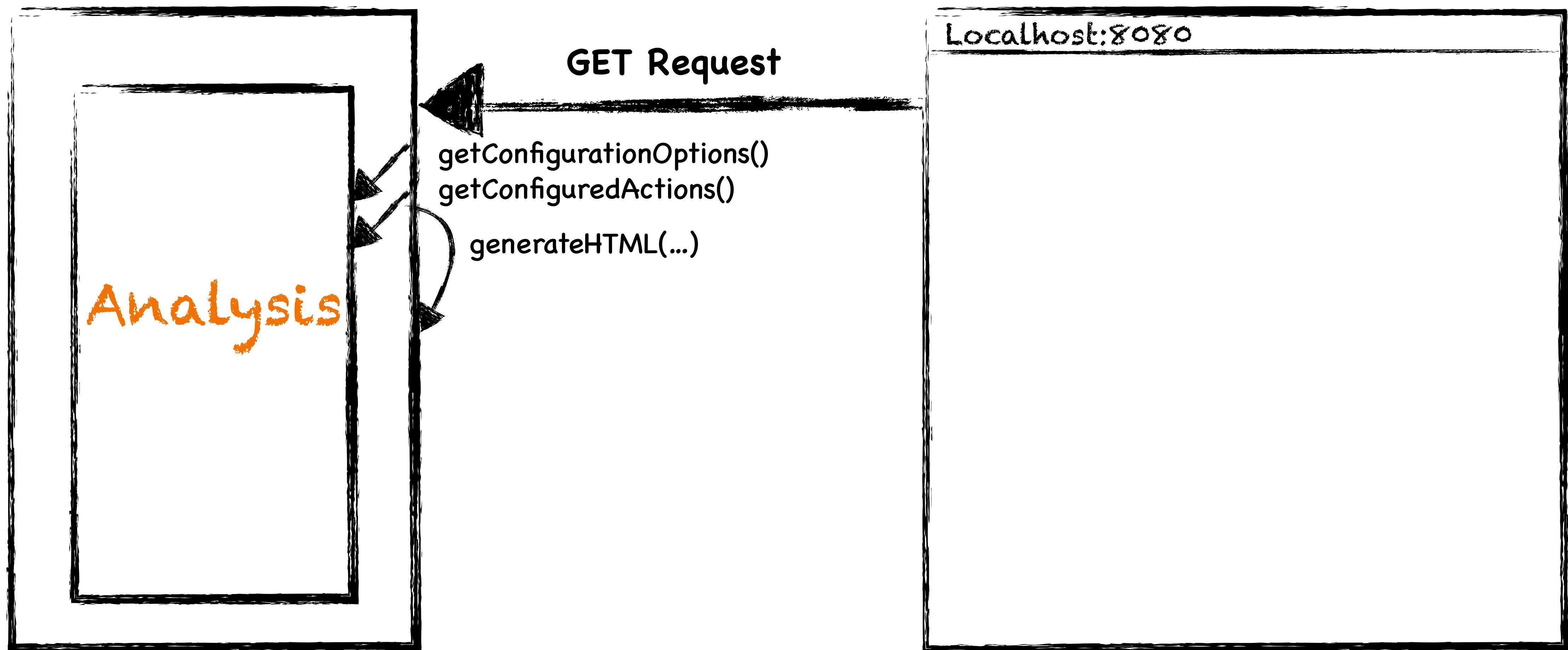


Developer Tool

MagpieServer

Web Browser

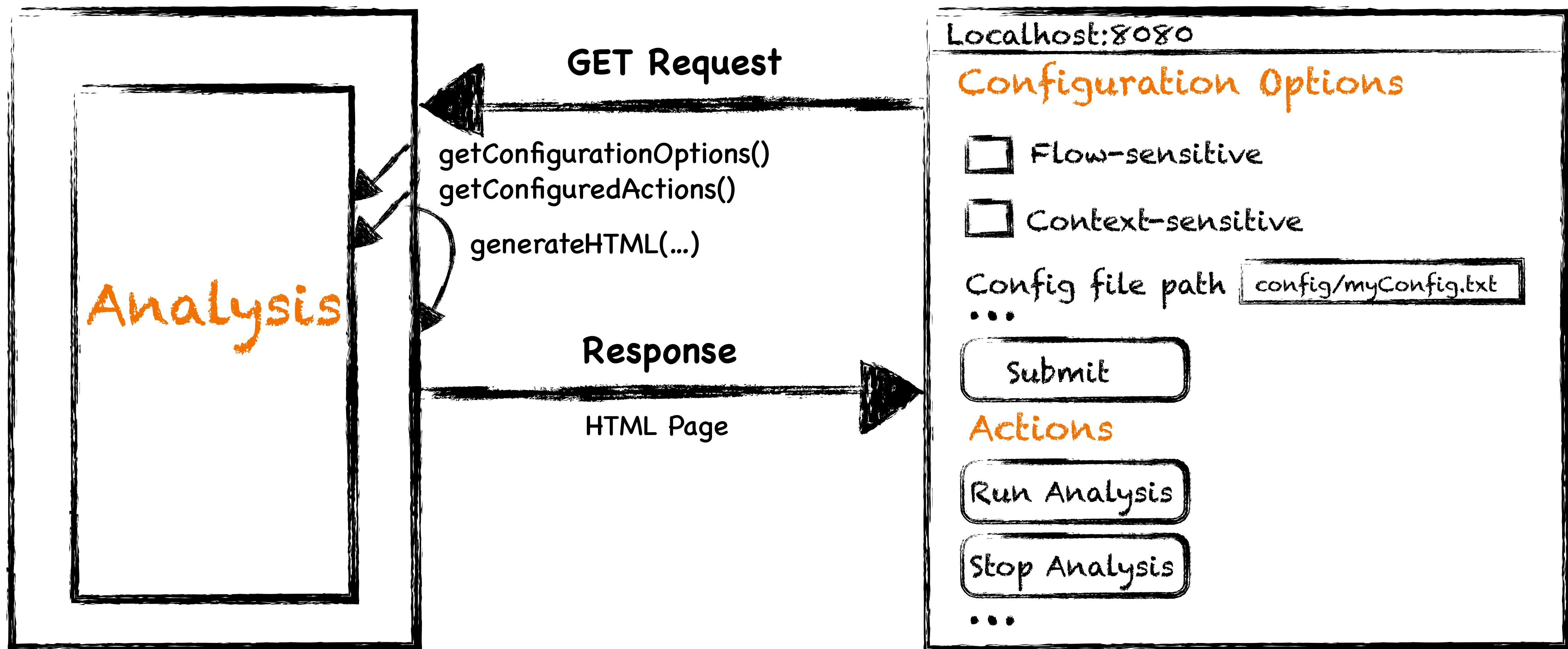
# MagpieBridge Provides More User Control



MagpieServer

Web Browser

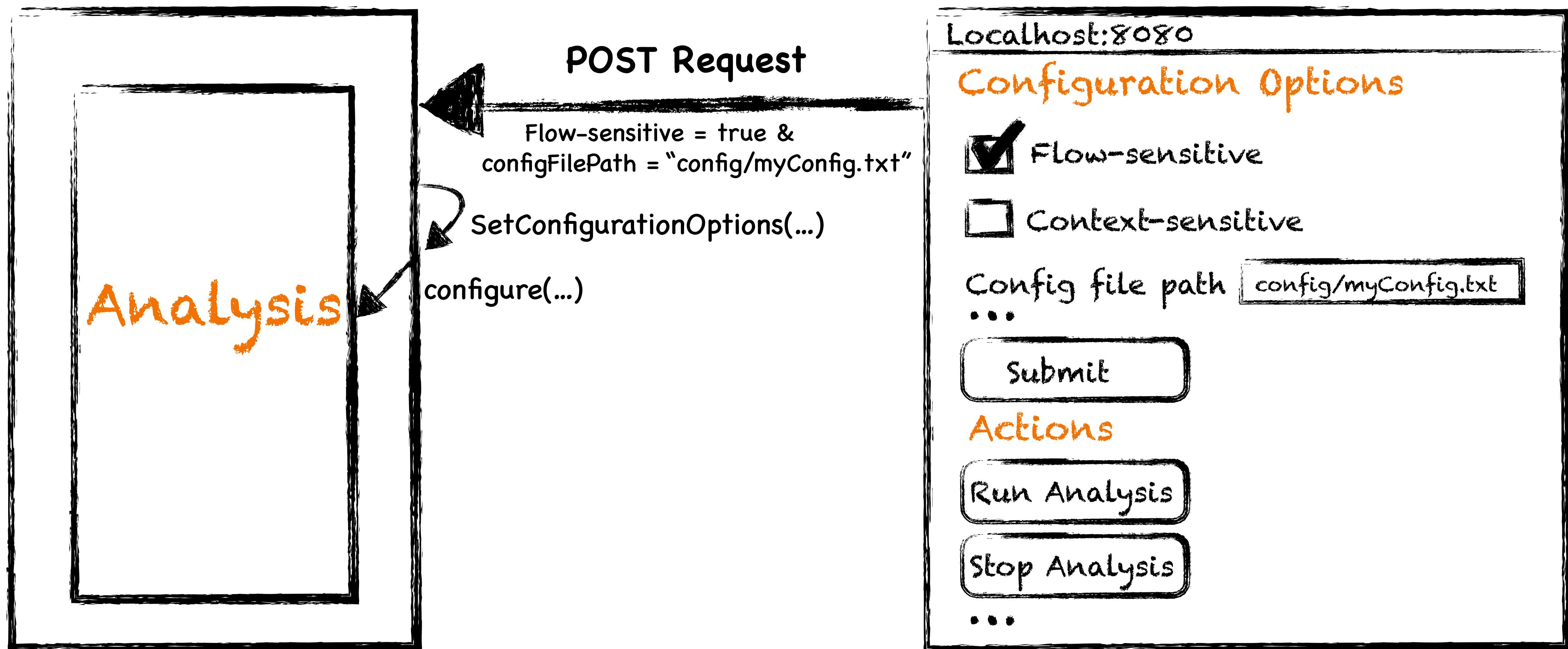
# MagpieBridge Provides More User Control



MagpieServer

Web Browser

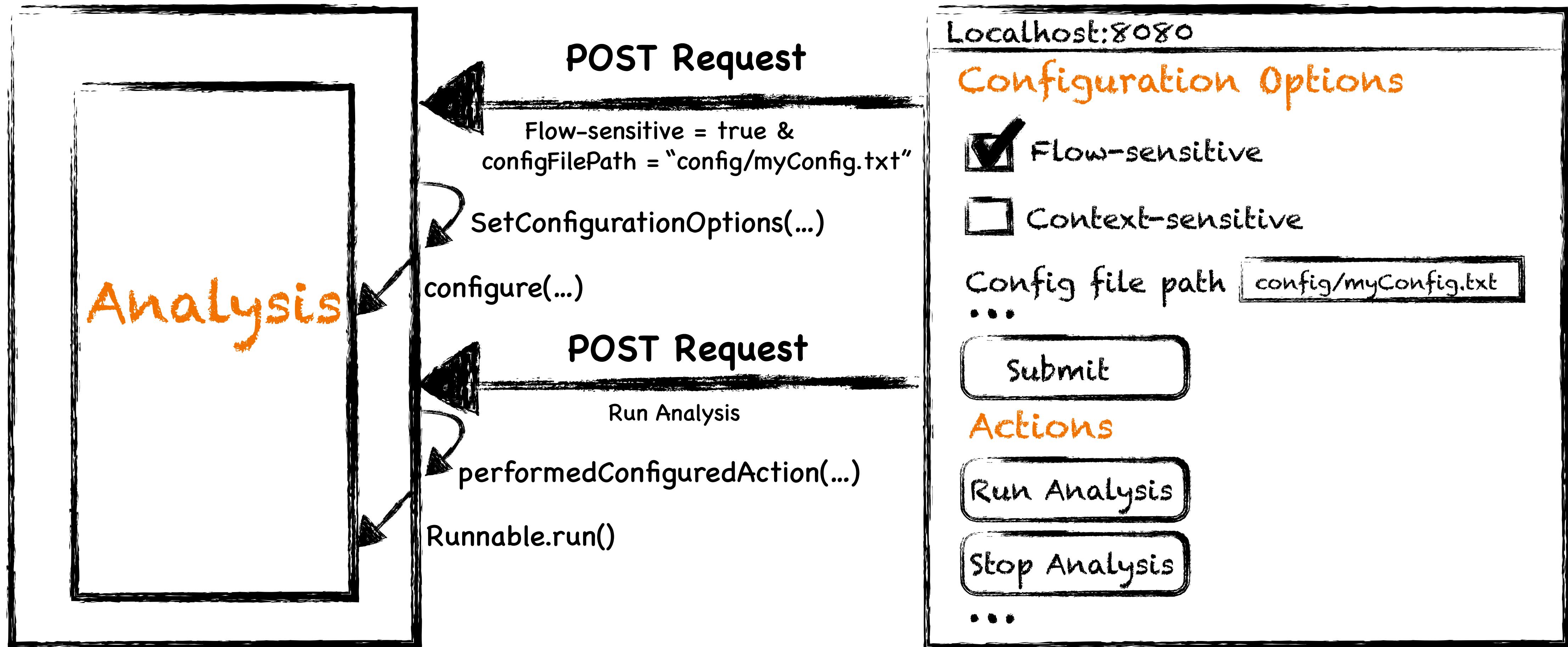
# MagpieBridge Provides More User Control



MagpieServer

Web Browser

# MagpieBridge Provides More User Control



MagpieServer

Web Browser

Interested? Visit

<https://github.com/MagpieBridge>

to find Tutorials and Examples