

PL1 Grammar Support PoC by Langium

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<https://github.com/asatklichov/pl-one>

<https://github.com/asatklichov/antlr-magic>

Agenda

- PL1 Programming Language
- LSP Support with Langium
- Xtext vs. Langium
- PoC – Hello PL/1 (Langium Supported VSCode Extension)

PL/I

First appeared

1964; 60 years ago

PL/I (**Programming Language One**, and sometimes written **PL/1**) is [procedural](#), [imperative](#) computer [programming language](#) initially developed by [IBM](#).

See PL/I [Application Structure](#)

PL/I – Language References:

[V 6.1 \(all\)](#)

[V 5.3.0](#)

[V 5.1.0](#)

Source Code

```
HELLO:  PROCEDURE OPTIONS (MAIN);

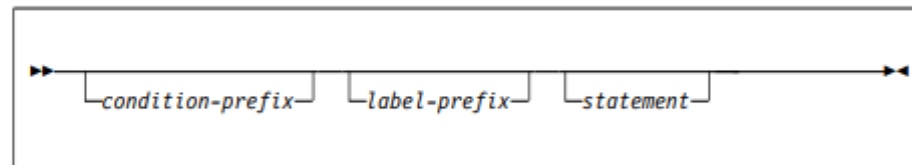
        /* A PROGRAM TO OUTPUT HELLO WORLD */
        FLAG = 0;

LOOP:   DO WHILE (FLAG = 0);
        PUT SKIP DATA('HELLO WORLD!');
        END LOOP;

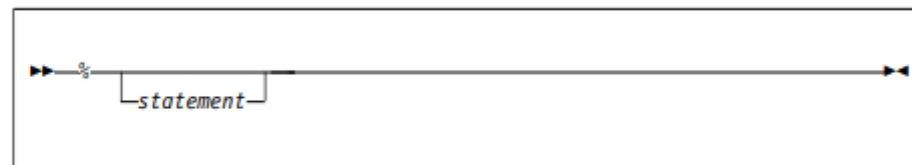
END HELLO;
```

Hello-World [example](#) 😊

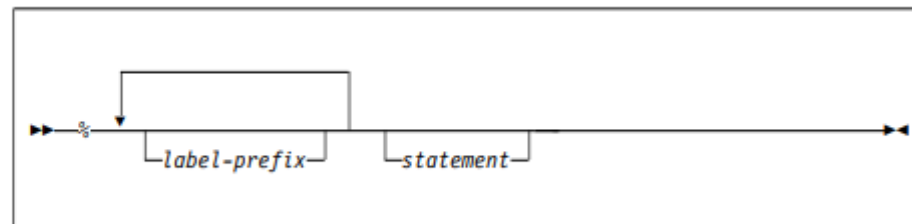
Syntax for a PL/I statement



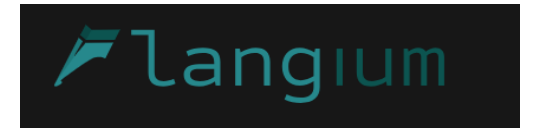
Syntax for a %directive



Syntax for a %statement:



LANGIUM



[Eclipse Langium](#) [**language** and **equilibrium**] is an open source language engineering tool with built-in support for the Language Server Protocol (see blogs - [LSP Magic](#), and [DAP Magic](#), [ANTLR4 Magic](#)), written in TypeScript and running in Node.js, powered by [Chevrotain](#) (*very fast and feature rich JS **LL(k)** Parsing DSL*).

Main reason not to adopt ANTL4 is JAVA on JS environment.

Langium is a future-proof technology stack enables DSLs in VS Code, Eclipse Theia, web applications (**on [browser](#)**), and more.

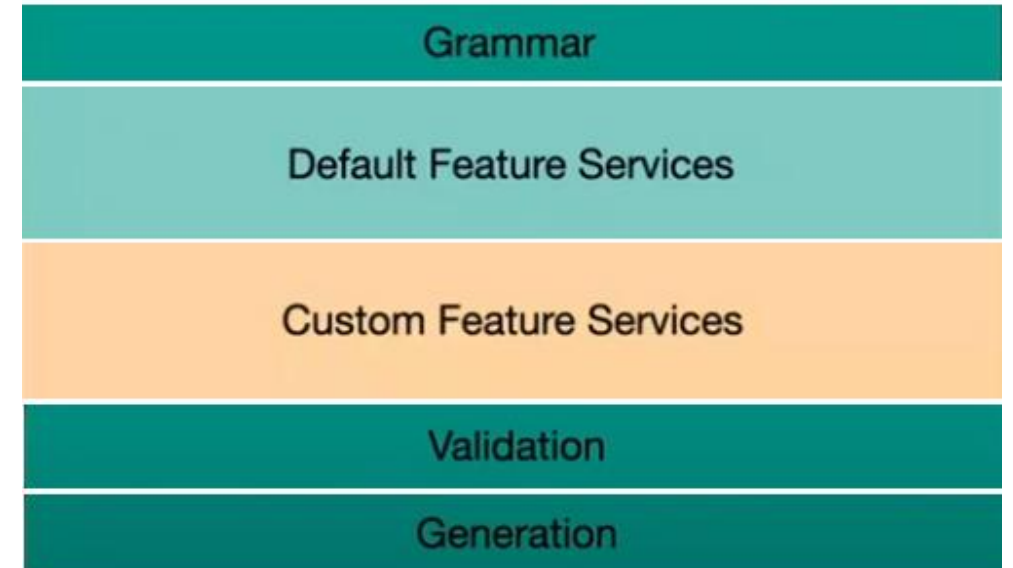
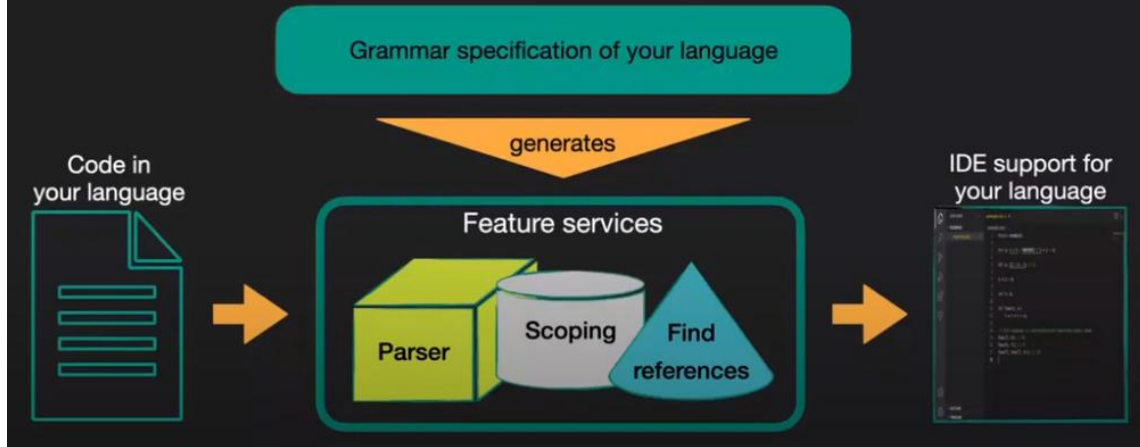
Langium features a command line interface ([langium-cli](#)) that reads a grammar declaration and generates TypeScript type declarations for the AST and more.

Integration with the Language Server Protocol (LSP) is done with [vscode-languageserver](#).

Xtext&Xtend vs LANGIUM

Xtext /Xtend	LANGIUM
<p>Xtext is built upon Eclipse and ANTLR - Java technology stack.</p>	<p>Langium is built upon Visual Code (+Eclipse Theia) and Chevrotain. Typescript is used.</p>
<p>Building a tool that uses an Xtext-based language server with VS Code or Theia means creating a hybrid technology stack Java [e.g. lang-server] and others in TypeScript [e.g. lang-client].</p>	<p>It enables language engineering in TypeScript, Vite/Vistes, and other Node.js libraries - same technology stack Langium wants to keep the concepts that have made Xtext successful, but lift them onto another platform</p>
<ul style="list-style-type: none">▪ GLSP, or CCF Broadcom can be adjusted for PL/1▪ Java, Eclipse, Xtext, EMF, Maven, Gradle, Tycho, Xtend▪ biggest attraction of XText, it is deep integration with XTend for code generation▪ LSP4J is a reference implementation of LSP for Java	<ul style="list-style-type: none">▪ Langium meets Sprotty: combining text and diagrams in VS Code▪ Node.js, VSCode, Typescript, Vite,▪ relying on a mixture of TypeScripts template strings and our own generator utility▪ LSP is designed for Typescript, so VSCode has build in support already

What is **Langium**?



Define Grammar – Just define the syntax of defined language, all other artifacts are generated automatically
IDE support – highlighting, scoping, code completion, find references, validation, ...

Langium Support for VS Code



Langium v3.0.0

Langium | 2,890 | ★★

Support for the Langium Gramm...

[Install](#) ☐ Auto Update ⚙️

★ This extension is recommended by users of the current workspace.

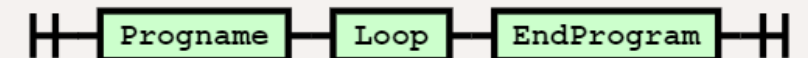
Language Features

- Syntax highlighting
- Completion
- Diagnostics
- Code actions
- Go to definition
- Find references
- Document highlighting
- Document symbols
- Semantic tokens highlighting
- ...

Syntax Diagrams

Langium grammar files can be visualized as syntax diagrams using the *Show Railroad Syntax Diagram*

Prog



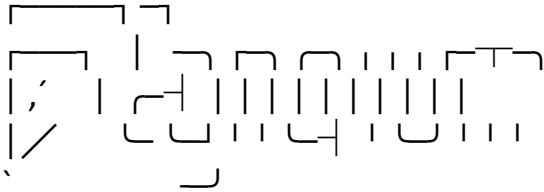
Langium offers a [Yeoman](#) generator to create a new language extension for VS Code.



>npm i -g yo generator-langium

Note: latest-version paradigm, VSCode...

C:\workspace-1\pl1-with-langium>yo langium



Welcome to Langium! This tool generates a VS Code extension with a "Hello World" language to get started quickly. The extension name is an identifier used in the
Your language name: pl-one
? File extensions: .pl1

