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# Chapter 1

## Evaluation

Section ?? described the implementation of the Nickel Language Server addressing the first research question stated in sec. ?. Proving the viability of the result and answering the second research question demands an evaluation of different factors.

Earlier, the most important metrics of interest were identified as:

**Usability** What is the real-world value of the language server?

Does it improve the experience of developers using Nickel? NLS offers several features, that are intended to help developers using the language. The evaluation should assess whether developers experience any help due to the use of the server.

Does NLS meet its users' expectations in terms of completeness and correctness and behavior? Being marketed as a Language Server, invokes certain expectations due to previous experience with other languages and language servers. Here, the evaluation should show whether NLS lives up to the expectations of its users.

**Performance** What are the typical latencies of standard tasks? In this context *latency* refers to the time it takes from issuing an LSP command to return of the reply by the server. The JSON-RPC protocol used by the LSP is synchronous, i.e. requires the server to return results of commands in the order it received them. Since most commands are sent implicitly, a quick processing is imperative to avoid commands queuing up.

Can single performance bottlenecks be identified? Single commands with excessive runtimes can slow down the entire communication resulting in bad user experience. Identified issues can guide the future work on the server.

How does the performance of NLS scale for bigger projects? With increasing project sizes the work required to process files increases as well. The evaluation should allow estimates of the sustained performance in real-world scenarios.

Answering the questions above, this chapter consists of two main sections. The first section sec. 1.1 introduces methods employed for the evaluation. In particular, it details the survey (sec. 1.1.1) which was conducted with the intent

to gain qualitative opinions by users, as well as the tracing mechanism (sec. 1.1.2) for factual quantitative insights. Section 1.3 summarises the results of these methods.

## **1.1 Methods**

### **1.1.1 Qualitative**

### **1.1.2 Quantitative**

## **1.2 Process**

## **1.3 Results**

### **1.3.1 Qualitative**

### **1.3.2 Quantitative**