

Scalable and user friendly user interface for time-series analytics for OpenTSDB

Roberto Martín Muñoz

University of Stavanger, Faculty of Science and Technology



Universitetet
i Stavanger

Introduction

OpenTSDB is a scalable database built on top of HBase and specifically designed for managing time series data. This database is used worldwide, specifically at the University of Stavanger to store and access time series data such as daily weather and data from sensors around the building.

The OpenTSDB database has a web interface in which one can fetch data represented in plots. While it is adept at managing data, the interface is basic and does not allow the analyst to zoom in on the data points or navigate easily through them. Ultimately, this results in wasted time for the analyst, as they must change the query over and over again.

To address the problem of the interface, we will provide a dashboard based in NodeJS (JavaScript) that will allow an analyst to navigate through the data in a more interactive way and provide contextual information about the data. The main part of the thesis, will be comparing different methods of getting data from OpenTSDB to the NodeJS server, such as through the analytical language R, the scripted Python, through the clients in JavaScript or directly with NodeJS.

Methodology

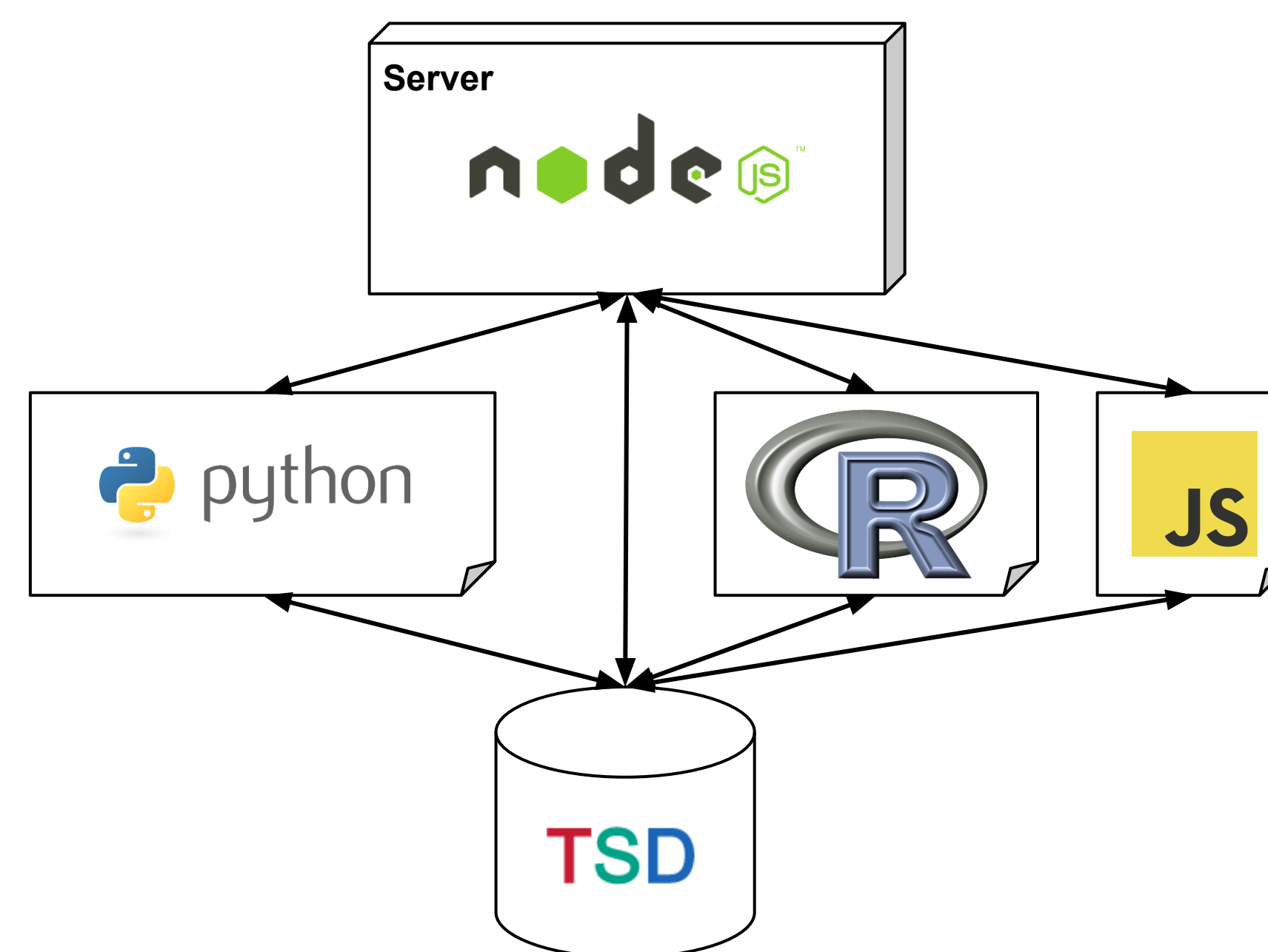


Fig: General overview of the system

For the proposed system, we created openTSDBnode, an entire NodeJS server, with user authentication, following the Model View Controller (MVC) pattern. We used bootstrap for making an user friendly interface. For the connection with different languages we created different libraries, like nodetsdb (nodejs - opentsdb), nodetsdb-client (nodejs - client - opentsdb), a nodejs wrapper for a python script and another wrapper for R language.

Results

We test the 4 different connectors with 3 different tests (set-3, 4567 datapoints, set-2, 2435 datapoints, set-1, 1284 datapoints) repeating them 4 times each.

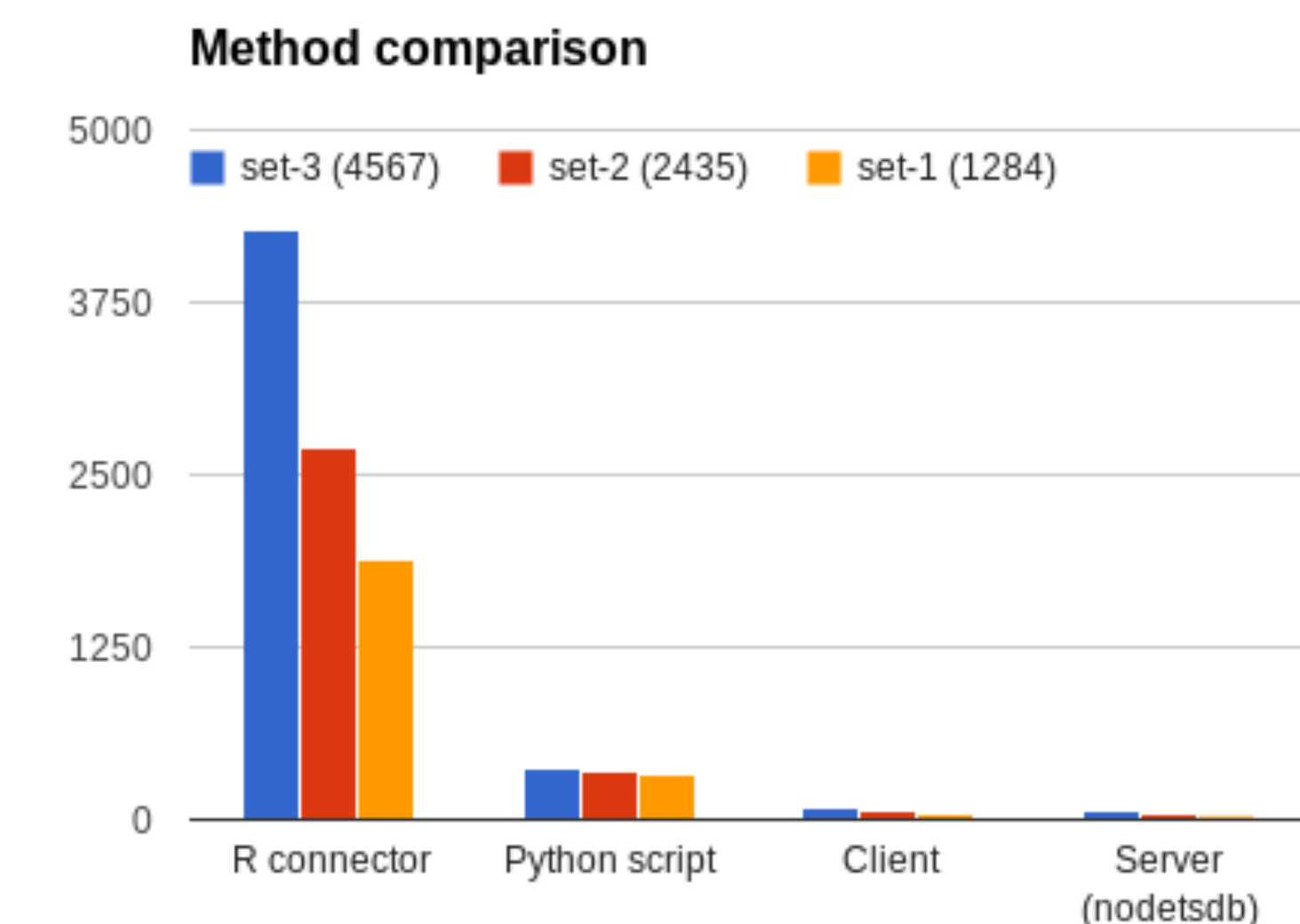


Fig: Average ms retrieving datapoints

Conclusions

openTSDBnode is a scalable and user friendly dashboard that implements four different connections with different programming languages that will enable data manipulation in any of the languages mentioned above.

openTSDBnode as well as the main libraries are released to the community with a BSD 3-Clause License.