Master Thesis – A Performance Comparison of SQL and NoSQL Databases for 5G Radio Base Station Configuration

Background
Ericsson wants to investigate if its current storage system of xml-files can be replaced by a database solution of either SQL or NoSQL type, and understand which database solution is preferable.

The current storage system, which the new database is supposed to replace, is an important source of configuration data for the 5G Radio Base Station. It is used for development and test of Ericsson’s 5G network. However, as the storage system is decentralized and accessed by several development teams, there is a risk of outdated configuration data being used. A centralized database solution would thus be beneficial to minimize time and effort needed to make updates and it would reduce errors caused by the updated configuration not being adopted. The database needs to store information about the model of the 5G system. Limitations and requirements exists for the database, for example regarding hardware configurations.

Thesis Description
The proposed research questions the thesis aims to answer are:

- What are the behaviors of the implemented SQL and NoSQL solutions and how do they differ?
- How can the performance of the implemented SQL and NoSQL solutions be evaluated?
- What are the trade-offs of the implemented SQL and NoSQL solutions?

The following steps are envisioned as part of the thesis work to answer the research question:

- Develop one SQL and one NoSQL database solution, suitable for this kind of data.
- Implement a proof of concept for the proposed database solutions applied to Ericsson’s configuration requirements and limitations.
- Evaluate the performance of the database solutions and compare their performances, behavior, and trade-offs.

The project is highly modifiable, and the thesis student(s) will have the possibility to modify the research questions and proposed steps.

The thesis will be concluded with a result presentation for the Ericsson team.

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Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2022

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