

Border-collie on PostgreSQL

Concurrent Programming

Programming Project #4

Final due date: Dec. 18, 2022 (HARD DEADLINE)

1 TASK OVERVIEW

Refer to the paper Border-Collie: A Wait-free, Read-optimal Algorithm for Database Logging on Multicore Hardware. Implement the protocol on PostgreSQL.

2 TASK DETAILS

The goal of this project is to understand the design principles of Border-Collie protocol and implement it on a real system. Implement the Border-Collie protocol on PostgreSQL and test the performance using sysbench.

3 GENERAL REQUIREMENTS

- Refer to *project4_appendix.pdf* and download the project skeleton code.
- Implement the Border-Collie protocol on PostgreSQL.
- Test your protocol's performance using sysbench and submit a patch file.
- You are also required to write a Wiki report.
- Remember to keep the programming ethics. Plagiarism issues will not be forgiven.

Your report should include:

1. Overall design of your implementation.
2. Details on non-trivial issues that you faced.
3. Performance analysis of the new version.

4 TEST PROTOCOL

We will use sysbench to test your protocol's performance. If you have implemented the protocol correctly, it would improve the throughput of the database engine. Test your implementation using the provided sysbench script. Remember that correctness comes first but you should also focus on the performance in this project.

5 TEST ENVIRONMENT

Submissions will be tested in a server with the following environment:

Processor	2 x Intel Xeon CPU E5-2630 v4 @ 2.20GHz
Configuration	20 Cores / no hyperthreading
Main Memory	256 GiB / no swap space

6 SUBMISSION

You should upload your project into the **project4** directory of your “hconnect” repository. **DO NOT** upload the entire postgres directory. Submit the patch file as discussed on the lab session. **Enjoy the project and have fun !!!!**