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Zürich, September 26, 2011

**BSc Thesis (17KP)**  
**Datenbanktechnologie**

**Topic: Implementation and Evaluation of a Key-Value Store for Flash-based Storage**

Solid state drives (SSD) gained increasingly importance in the database field over the last years. The increase in capacity and at the same time the decrease of price made them more and more interesting for the storage of large amounts of data. The asymmetry of read and write access time poses new challenges and raises the need for specialized access methods and algorithms.

Aim of the thesis is to develop a key-value store specialized for flash-based storage.

The work is divided into the following steps:

1. Literature research on the efficient data management on flash-based storage [3, 4].
2. Implementation of a key-value store for flash based storage [2, 1, 5].
3. Experimental analysis.

The expected outcome is a thesis with a strong focus on the implementation aspects, small code examples might be used to illustrate the descriptions. The thesis should be structured as a scientific paper following the university guide lines. At the end of the work the student should give a 10 min. presentation at one of the database technology group meetings.

The student is encouraged to develop the code and thesis in an incremental fashion during the working period. There will be weekly or biweekly meetings with the supervisor, where the student sends the current state of the work one day before the meeting to the supervisor.

**References**



- [1] B. K. Debnath, S. Sengupta, and J. Li. Flashstore: High throughput persistent key-value store. *PVLDB*, 3(2):1414–1425, 2010.
- [2] B. K. Debnath, S. Sengupta, and J. Li. Skimpystash: Ram space skimpy key-value store on flash-based storage. In T. K. Sellis, R. J. Miller, A. Kementsietsidis, and Y. Velegrakis, editors, *SIGMOD Conference*, pages 25–36. ACM, 2011.
- [3] S.-W. Lee and B. Moon. Design of flash-based dbms: an in-page logging approach. In C. Y. Chan, B. C. Ooi, and A. Zhou, editors, *SIGMOD Conference*, pages 55–66. ACM, 2007.
- [4] S.-W. Lee, B. Moon, and C. Park. Advances in flash memory ssd technology for enterprise database applications. In U. Çetintemel, S. B. Zdonik, D. Kossmann, and N. Tatbul, editors, *SIGMOD Conference*, pages 863–870. ACM, 2009.
- [5] S. T. On, Y. Li, B. He, M. Wu, Q. Luo, and J. Xu. Fd-buffer: a buffer manager for databases on flash disks. In J. Huang, N. Koudas, G. J. F. Jones, X. Wu, K. Collins-Thompson, and A. An, editors, *CIKM*, pages 1297–1300. ACM, 2010.

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Start date: 26/09/2011

End date: 03/02/2012

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