Cheap and Large CAMs for High Performance Data-Intensive Networked Systems

NOTE: Your slides/presentation only need to cover background information necessary to answer the given questions (in a clear and well-organized manner). You are allowed to borrow contents from other resources, such as online slides, as long as you acknowledge them. The presentation should be mostly question-focused and proceed mostly in a Q&A format. Please include the questions in your slides. Don’t write detailed answers in the slides and read them to the class. Instead, use bullet points, graphs, or animations to explain your answers to the class.

In your Q&A report, use text to more thoroughly answer the questions. Include a short paragraph at the beginning of the report to summarize the paper.

(1) “A key idea behind BufferHash is that instead of performing individual random insertions directly on flash, DRAM can be used to buffer multiple insertions and writes to flash can happen in a batch.” Very briefly explain the difference between the ways of FAWN and BufferHash in which they locate a KV pair written on the flash?

(2) “BufferHash consists of multiple super tables. Each super table has three main components: a buffer, an incarnation table, and a set of Bloom filters.” Use Figure 1 to describe BufferHash’s data structure.

(3) “This is an in-flash table that contains old and flushed incarnations of the in-memory buffer.” Please explain the relationship between the buffer and the incarnation.

(4) “Since the incarnation table contains a sequence of incarnations, the value for a given hash key may reside in any of the incarnations depending on its insertion time.” Please explain why Bloom filters are needed.

(5) “A super table supports all standard hash table operations” Describe the steps involved in insert, lookup, update/delete operations.

(6) Does BufferHash support range search?