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P11: An Analysis of Persistent Memory Use with
WHISPER

Summary

The paper discusses WHISPER, a comprehensive test suite to serve as a checker for emerging persistent memory (PM) technologies. Specifically, WHISPER tests applications to see if the properties of PM are being upheld. This is especially important due to the shift towards models such as FlatFlash (P09) which incorporates the use of PM. Using data gathered by WHISPER, the authors introduced the Hands-Off Persistence System (HOPS), which aims to tackle underperforming hardware designs. HOPS would allow for a more efficient design system for upcoming PM implementations.

Strengths

Whisper uses a mix of real world applications instead of relying heavily on pure simulations which allowed real issues to be exposed and subsequently solved. An example of this was the exposure of performance oversights where the number of epochs per transaction was found to be overkill for current hardware.

From the papers that I have read up to this point, a number of them focus on either analysis or just a new implementation of preexisting systems. This paper introduces a new system, HOPS which takes the information gathered from WHISPER and tackles the issues found.

Weaknesses

The paper proposes cutting down epochs by arguing that an epoch is only required after a transaction commit. However in PM, should a short power failure occur before a commit, changes would be logged but the accompanying data will not be present. I infer that after failure recovery, the use of only one epoch would cause log and data transactions to be lost or corrupted.

Future Work

With many different applications handling data transactions differently, it is likely that with additional tests included in WHISPER, more faults will be exposed for different implementations. I can foresee the use of, say, legacy filesystems that were not tested to be used on future PM technologies due to individual issue constraints. Therefore I believe that work on WHISPER should continue on and be placed in the test suite.

Discussion

There are many different applications that can be added to WHISPERs test suite. However, there has to be a line drawn as to what it can / will support. How would researchers, if they intend to further WHISPERs testing radius, eliminate which applications are unnecessary?