

Paper Review

“ Profiling Platform Storage Using IO500 and Mistral ”

1. Summary

This paper presents an IO500 tune on Astra, an arm-based Sandia machine with an all-flash, Lustre-based storage array. This paper uses Mistral to do fine-grained profiling. The challenge with getting a top score for IO500 is to tune the parameters to balance the hard and easy bandwidth tests against the hard and easy metadata tests. By using Mistral, we can find the overhead of IO500 and perform optimization specifically.

Astra is a HPC system built on Aarch64. Astra contains 2592 nodes and is networked with a QDR InfiniBand interconnect. This paper generalized a process for configuring the full-scale tests:

- 1) Obtain system information and theoretical characteristics.
- 2) Set test directories' stripe size based on test files' size and number of storage targets.
- 3) Determine number of nodes to use.
- 4) Increase the cores per node to maximize bandwidth, until the bandwidth for ior easy reasonably approaches a theoretical limit.
- 5) Adjust the cores per node to balance bandwidth and metadata results

The profiling result shows a performance instability due to the arm processor's weak performance. Some work has been done, such as tuning drivers and using different filesystems. The result proved the storage system's performance.

2. Advantages

- + This paper runs IO500 on a new device (AArch64). It is valuable because it shows a method to tune IO500 and proves the new architecture's value.

3. Disadvantages

- The fundamental of this paper is the new chip. The method of this paper is common, such as analyzing the cost of profiling, tuning drivers, trying different file systems. This paper is valuable because of the new chip and new architecture, but it is not a fantastic paper from my perspective.