OOKAMI PROJECT APPLICATION

Date: **September 03, 2021**

Project Title: A Fine-grained Call Path Profiler for A64FX-based Clusters

Usage:

☒ Testbed

☐ Production

Principal Investigator:

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Usage Description:

In this project, we will develop and evaluate a fine-grained call path profiler for parallel applications running on A64FX-based Ookami cluster. Profilers are well-known to help diagnose performance bottlenecks, pinpoint correctness bugs, and identify security vulnerabilities. We will build the profiler for A64FX atop our prior work---DrCCTProf, a generic profiler for ARM-based clusters. Currently, we have thoroughly tested DrCCTProf on ThunderX2 and AWS Graviton2. In this project, we will first evaluate DrCCTProf on A64FX to see whether it can successful work on this new architecture. We then will add new features to DrCCTProf to analyze SVE instructions and NUMA locality, which will provide optimization guidance for parallel applications, such as scientific applications and machine learning workloads.

Reference
https://xl10.github.io/blog/drcctprof.html
[SC'20] "DRCCTPROF: A Fine-grained Call Path Profiler for ARM-based Clusters", Qidong Zhao, Xu Liu, Milind Chabbi, The International Conference for High Performance Computing, Networking, Storage and Analysis, Nov 15-20, 2020, Atlanta, GA, USA. Best Paper Finalist

Computational Resources:

Total node hours per year: 1500

Size (nodes) and duration (hours) for a typical batch job: There are no typical batch jobs, usually single node for development testing. At the beginning of this project, runs often range from 30 mins to several hours for building and testing DrCCTProf on a single node. Once the development and test are finished, we will run DrCCTProf for applications running across multiple nodes.

Disk space (home, project, scratch): 40GB, 1TB, 1TB

Personnel Resources (assistance in porting/tuning, or training for your users**):**

N/A

Required software:

N/A

If your research is supported by US federal agencies:

Agency:

Grant number(s):