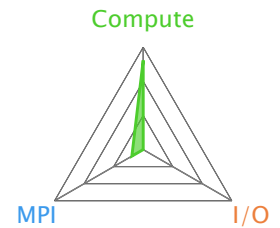


arm
PERFORMANCE
REPORTS

Command: `mpirun -np 5 ../../xspec finite_beta_V5_vmec1`
 Resources: 1 node (16 physical, 32 logical cores per node)
 Memory: 31 GiB per node
 Tasks: 5 processes
 Machine: r453
 Start time: Thu Dec 6 2018 22:04:42 (UTC+11)
 Total time: 2837 seconds (about 47 minutes)
 Full path: `/short/y08/zq1102/SPEC`



Summary: xspec is **Compute-bound** in this configuration

Compute 87.2%

Time spent running application code. High values are usually good.
 This is **high**; check the CPU performance section for advice

MPI 12.8%

Time spent in MPI calls. High values are usually bad.
 This is **very low**; this code may benefit from a higher process count

I/O 0.0%

Time spent in filesystem I/O. High values are usually bad.
 This is **negligible**; there's no need to investigate I/O performance

This application run was **Compute-bound**. A breakdown of this time and advice for investigating further is in the **CPU** section below.

As very little time is spent in **MPI** calls, this code may also benefit from running at larger scales.

CPU

A breakdown of the **87.2%** CPU time:

Scalar numeric ops 45.8%
 Vector numeric ops 1.4%
 Memory accesses 52.8%

The per-core performance is **memory-bound**. Use a profiler to identify time-consuming loops and check their cache performance.

Little time is spent in **vectorized instructions**. Check the compiler's vectorization advice to see why key loops could not be vectorized.

I/O

A breakdown of the **0.0%** I/O time:

Time in reads 0.0%
 Time in writes 0.0%
 Effective process read rate 0.00 bytes/s
 Effective process write rate 0.00 bytes/s

No time is spent in **I/O** operations. There's nothing to optimize here!

MPI

A breakdown of the **12.8%** MPI time:

Time in collective calls 100.0%
 Time in point-to-point calls 0.0%
 Effective process collective rate 377 kB/s
 Effective process point-to-point rate 0.00 bytes/s

Threads

A breakdown of how multiple threads were used:

Computation 0.0%
 Synchronization 0.0%
 Physical core utilization 31.2%
 System load 100.8%

No measurable time is spent in multithreaded code.

Physical core utilization is low. Try increasing the number of processes to improve performance.

Memory

Per-process memory usage may also affect scaling:

Mean process memory usage 652 MiB

Peak process memory usage 851 MiB

Peak node memory usage 49.0%

The **peak node memory usage** is low. Running with fewer MPI processes and more data on each process may be more efficient.

Energy

A breakdown of how energy was used:

CPU not supported %

System not supported %

Mean node power not supported W

Peak node power 0.00 W

Energy metrics are not available on this system.

CPU metrics are not supported (no intel_rapl module)