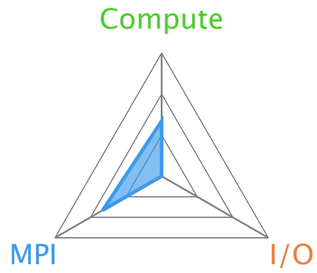
arm PERFORMANCE REPORTS

Command:	aprun -n 4 ./mandelbrot
Resources:	1 node (64 physical, 256 logical cores per node)
Memory:	252 GiB per node
Tasks:	4 processes
Machine:	xcimom2
Start time:	Tue Jul 20 11:14:10 2021
Total time:	62 seconds (about 1 minutes)
Full path:	.



Summary: mandelbrot is MPI-bound in this configuration

Compute	44.8%	Time spent running application code. High values are usually good. This is **low**; consider improving MPI or I/O performance first
MPI	55.2%	Time spent in MPI calls. High values are usually bad. This is **high**; check the MPI breakdown for advice on reducing it
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 MPI-bound. A breakdown of this time and advice for investigating further is in the MPI section below.

CPU Metrics

Linux perf event metrics:

Cycles per instruction	0.77
L2D cache miss	35.3%
Stalled backend cycles	33.5%
Stalled frontend cycles	0.6%

Cycles per instruction is low, which is good. Vectorization allows multiple instructions per clock cycle.

MPI

A breakdown of the 55.2% MPI time:

Time in collective calls	100.0%
Time in point-to-point calls	0.0%
Effective process collective rate	14.2 MB/s
Effective process point-to-point rate	0.00 bytes/s

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!

Threads

A breakdown of how multiple threads were used:

Computation	0.0%
Synchronization	0.0%
Physical core utilization	6.3%
System load	6.3%

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	677 MiB
Peak process memory usage	1.09 GiB
Peak node memory usage	2.0%

There is significant variation between peak and mean memory usage. This may be a sign of workload imbalance or a memory leak.

The peak node memory usage is very 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.