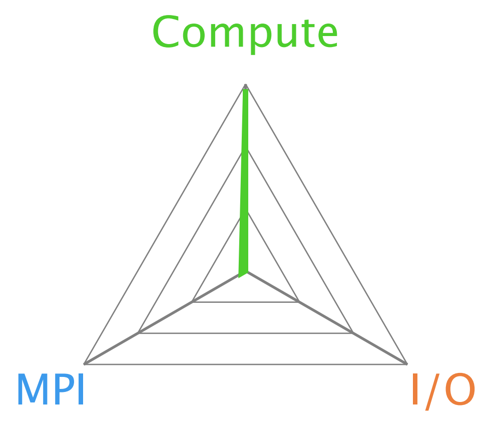
arm
PERFORMANCE
REPORTS

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 11:07:49 2021
Total time:	29 seconds
Full path:	.



Summary: mandelbrot is Compute-bound in this configuration

Compute	97.3%	Time spent running application code. High values are usually good. This is **very high**; check the CPU performance section for advice
MPI	2.8%	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 Metrics section below.

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

CPU Metrics

Linux perf event metrics:

Cycles per instruction	0.72
L2D cache miss	34.2%
Stalled backend cycles	30.0%
Stalled frontend cycles	1.2%

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

MPI

A breakdown of the 2.8% MPI time:

Time in collective calls	100.0%
Time in point-to-point calls	0.0%
Effective process collective rate	607 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	412 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.