SPEC® MPIL2007 Result

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Supermicro

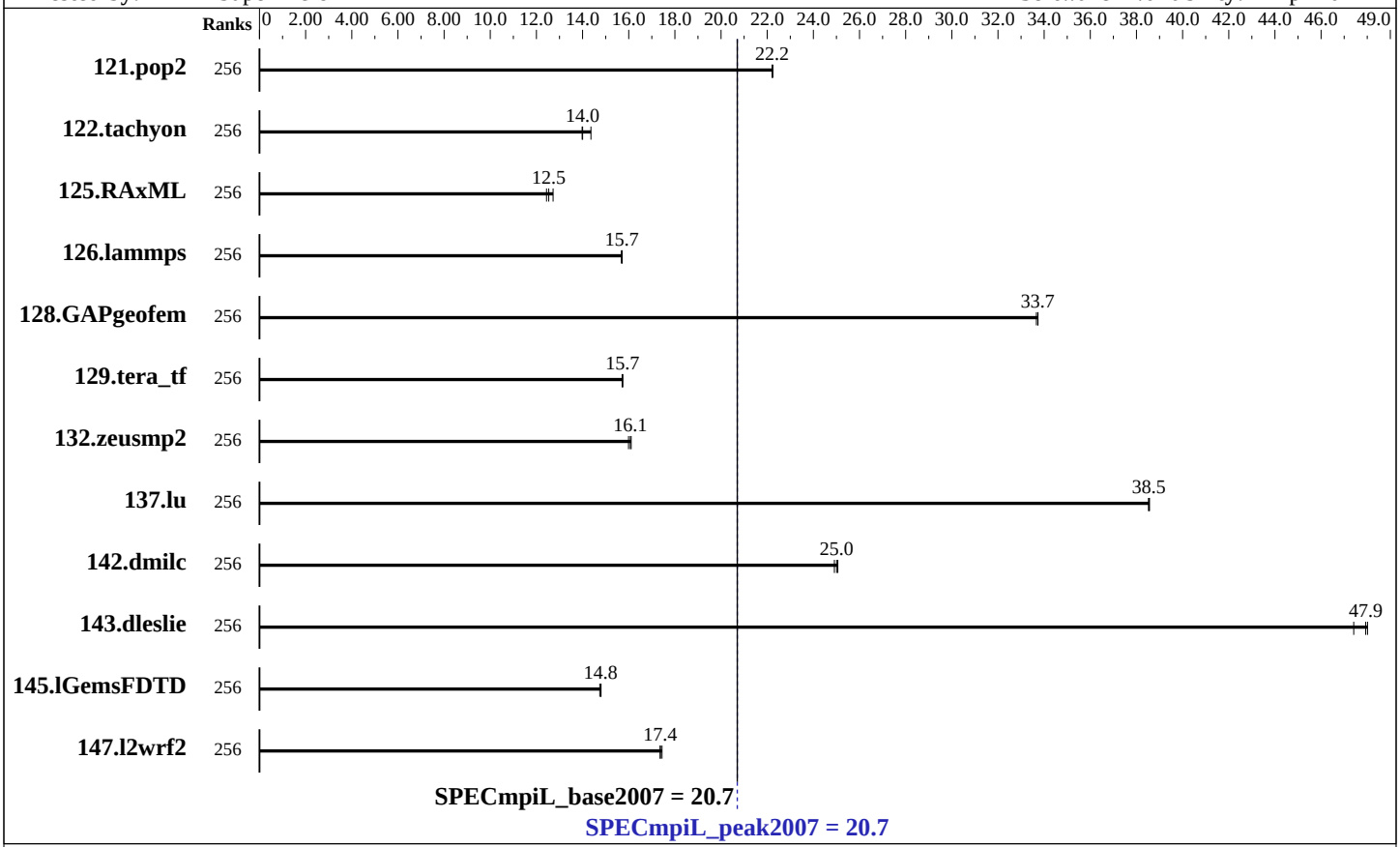
Hyper A+ Server AS -2126HS-TN (AMD EPYC 9755)

SPECmpiL_peak2007 = 20.7

SPECmpiL_base2007 = 20.7

MPI2007 license: 6569
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Sep-2024
Hardware Availability: Oct-2024
Software Availability: Apr-2024



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	256	175	22.2	**175**	**22.2**	175	22.2	256	175	22.2	**175**	**22.2**	175	22.2
122.tachyon	256	135	14.4	**139**	**14.0**	139	14.0	256	135	14.4	**139**	**14.0**	139	14.0
125.RAxML	256	229	12.7	**233**	**12.5**	235	12.4	256	229	12.7	**233**	**12.5**	235	12.4
126.lammps	256	157	15.7	**157**	**15.7**	157	15.7	256	157	15.7	**157**	**15.7**	157	15.7
128.GAPgeofem	256	176	33.7	**176**	**33.7**	176	33.7	256	176	33.7	**176**	**33.7**	176	33.7
129.tera_tf	256	69.9	15.7	**69.9**	**15.7**	69.8	15.7	256	69.9	15.7	**69.9**	**15.7**	69.8	15.7
132.zeusmp2	256	**132**	**16.1**	132	16.1	133	16.0	256	**132**	**16.1**	132	16.1	133	16.0
137.lu	256	109	38.6	**109**	**38.5**	109	38.5	256	109	38.6	**109**	**38.5**	109	38.5
142.dmilc	256	148	24.9	147	25.1	**147**	**25.0**	256	148	24.9	147	25.1	**147**	**25.0**
143.dleslie	256	64.6	48.0	**64.7**	**47.9**	65.4	47.4	256	64.6	48.0	**64.7**	**47.9**	65.4	47.4
145.lGemsFDTD	256	**298**	**14.8**	298	14.8	299	14.7	256	**298**	**14.8**	298	14.8	299	14.7
147.l2wrf2	256	**472**	**17.4**	470	17.4	473	17.4	256	**472**	**17.4**	470	17.4	473	17.4

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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Software Availability: Apr-2024

Hardware Summary

Type of System:	Homogeneous
Compute Node:	Hyper A+ Server AS -2126HS-TN
Total Compute Nodes:	1
Total Chips:	2
Total Cores:	256
Total Threads:	256
Total Memory:	1536 GB
Base Ranks Run:	256
Minimum Peak Ranks:	256
Maximum Peak Ranks:	256

Software Summary

C Compiler:	Intel oneAPI DPC++/C++ Compiler 2024.2.1
C++ Compiler:	Intel oneAPI DPC++/C++ Compiler 2024.2.1
Fortran Compiler:	Intel oneAPI DPC++/C++ Compiler 2024.2.1
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Intel MPI Version 2021.13
Other MPI Info:	None
Pre-processors:	No
Other Software:	Jemalloc-5.3.0

Node Description: Hyper A+ Server AS -2126HS-TN

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	Supermicro
Model:	Hyper A+ Server AS -2126HS-TN
CPU Name:	AMD EPYC 9755
CPU(s) orderable:	1,2 chips
Chips enabled:	2
Cores enabled:	256
Cores per chip:	128
Threads per core:	1
CPU Characteristics:	Max. Boost Clock upto 4.1GHz
CPU MHz:	2700
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	512 MB I+D on chip per chip, 32 MB shared / 8 cores
Other Cache:	None
Memory:	1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R, running at 6000)
Disk Subsystem:	1 x 3.5 TB NVMe SSD
Other Hardware:	None
Adapter:	None
Number of Adapters:	1
Slot Type:	None
Data Rate:	None
Ports Used:	0
Interconnect Type:	None

Software

Adapter:	None
Adapter Driver:	None
Adapter Firmware:	None
Operating System:	Ubuntu 24.04 LTS 6.8.0-44-generic
Local File System:	ext4
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Submit Notes

```
The config file option 'submit' was used.
mpiexec.hydra -bootstrap ssh -hosts localhost -genv I_MPI_COMPATIBILITY=3 -np $ranks -ppn $ranks $command
```

General Notes

```
MPI startup command:
  mpiexec.hydra command was used to start MPI jobs.
RAM configuration:
  Compute nodes have 1 x 64 GB RDIMM on each memory channel.
BIOS settings:
  SMT = Disabled
  NUMA nodes per socket = NPS4
  ACPI SRAT L3 Cache as NUMA Domain = Enabled
  Determinism Control = Manual
  Determinism Enable = Power
  xGMI Link Configuration = 4 xGMI Links
  4 Link xGMI max speed = 32Gbps
  TDP Control = Manual
  TDP = 500
  Package Power Limit Control = Manual
  Package Power Limit = 500
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Base Compiler Invocation

C benchmarks:
`mpiicc -cc=icx`

C++ benchmarks:

126.lammps: `mpiicpc -cxx=icpx`

Fortran benchmarks:
`mpiifort -fc=ifx`

Benchmarks using both Fortran and C:
`mpiicc -cc=icxmpiifort -fc=ifx`

Base Portability Flags

121.pop2: `-DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LP64`
122.tachyon: `-DSPEC_MPI_LP64`
125.RAxML: `-DSPEC_MPI_LP64`
126.lammps: `-DMPICH_IGNORE_CXX_SEEK`
128.GAPgeofem: `-DSPEC_MPI_LP64`
132.zeusmp2: `-DSPEC_MPI_LP64`
142.dmilc: `-DSPEC_MPI_LP64`

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Base Portability Flags (Continued)

147.l2wrf2: -DSPEC_MPI_LP64

Base Optimization Flags

C benchmarks:
-Ofast -ipo -march=skylake-avx512 -mtune=skylake-avx512 -ansi-alias

C++ benchmarks:

126.lammps: -Ofast -ipo -march=skylake-avx512 -mtune=skylake-avx512 -ansi-alias

Fortran benchmarks:
-Ofast -ipo -march=skylake-avx512 -mtune=skylake-avx512 -nostandard-realloc-lhs -align array64byte

Benchmarks using both Fortran and C:
-Ofast -ipo -march=skylake-avx512 -mtune=skylake-avx512 -ansi-alias -nostandard-realloc-lhs -align array64byte

Base Other Flags

C benchmarks (except as noted below):
-limf -Wl,--rpath=/usr/local/lib -ljemalloc

142.dmilc: -Wno-implicit-function-declaration -Wno-implicit-int -limf -Wl,--rpath=/usr/local/lib -ljemalloc

C++ benchmarks:

126.lammps: -Wno-register -limf -Wl,--rpath=/usr/local/lib -ljemalloc

Fortran benchmarks:
-limf -Wl,--rpath=/usr/local/lib -ljemalloc

Benchmarks using both Fortran and C:

121.pop2: -limf -Wl,--rpath=/usr/local/lib -ljemalloc

128.GAPgeofem: -Wno-implicit-function-declaration -Wno-implicit-int -limf -Wl,--rpath=/usr/local/lib -ljemalloc

132.zeusmp2: -Wno-implicit-function-declaration -limf -Wl,--rpath=/usr/local/lib -ljemalloc

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Base Other Flags (Continued)

147.l2wrf2: `-Wno-implicit-function-declaration -Wno-implicit-int -Wl,-z,muldefs -Wl,-z,muldefs -limf -Wl,--rpath=/usr/local/lib -ljemalloc`

Peak Optimization Flags

C benchmarks:

122.tachyon: `basepeak = yes`

125.RAxML: `basepeak = yes`

142.dmilc: `basepeak = yes`

C++ benchmarks:

126.lammps: `basepeak = yes`

Fortran benchmarks:

129.tera_tf: `basepeak = yes`

137.lu: `basepeak = yes`

143.dleslie: `basepeak = yes`

145.lGemsFDTD: `basepeak = yes`

Benchmarks using both Fortran and C:

121.pop2: `basepeak = yes`

128.GAPgeofem: `basepeak = yes`

132.zeusmp2: `basepeak = yes`

147.l2wrf2: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/Intel_compiler_flags_hpc.2024.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/Intel_compiler_flags_hpc.2024.xml`

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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