



SPEC® MPIM2007 Result

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IBM Corporation

SPECmpiM_peak2007 = 5.26

IBM BladeCenter JS22 Express (4 GHz, 8x4 core)

SPECmpiM_base2007 = 4.68

MPI2007 license: 0005

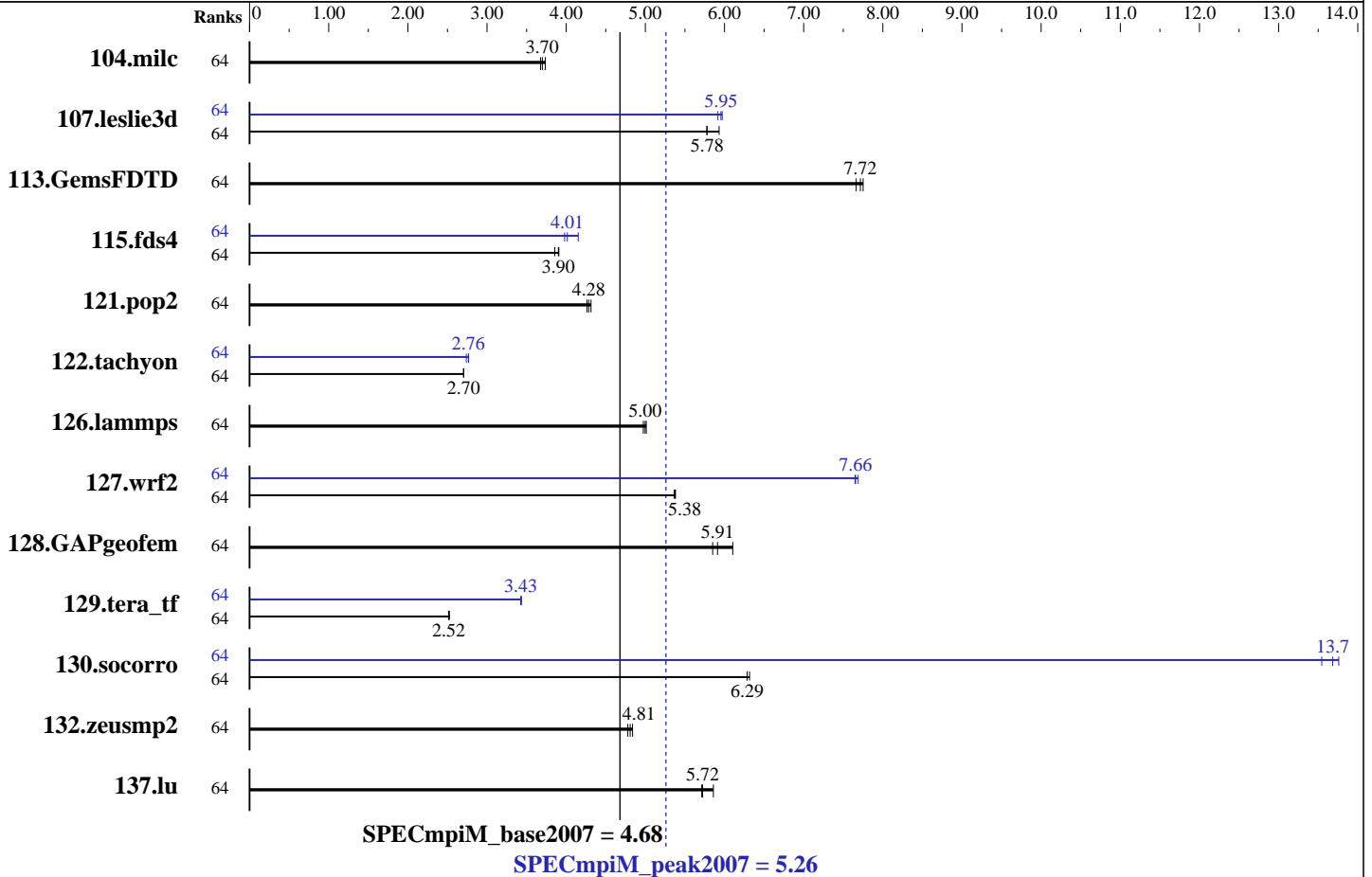
Test date: Oct-2008

Test sponsor: IBM Corporation

Hardware Availability: Nov-2008

Tested by: IBM Corporation

Software Availability: Nov-2008



Results Table

Benchmark	Ranks	Base				Peak								
		Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio					
104.milc	64	426	3.68	419	3.74	423	3.70	64	426	3.68	419	3.74	423	3.70
107.leslie3d	64	880	5.93	904	5.78	903	5.78	64	877	5.95	882	5.92	874	5.97
113.GemsFDTD	64	818	7.72	814	7.75	823	7.66	64	818	7.72	814	7.75	823	7.66
115.fds4	64	499	3.91	506	3.86	500	3.90	64	486	4.01	490	3.98	470	4.15
121.pop2	64	957	4.31	968	4.26	963	4.28	64	957	4.31	968	4.26	963	4.28
122.tachyon	64	1034	2.71	1035	2.70	1034	2.70	64	1022	2.74	1012	2.76	1011	2.77
126.lammps	64	582	5.01	583	5.00	586	4.97	64	582	5.01	583	5.00	586	4.97
127.wrf2	64	1450	5.38	1453	5.36	1449	5.38	64	1018	7.66	1014	7.69	1019	7.65
128.GAPgeofem	64	353	5.85	338	6.10	349	5.91	64	353	5.85	338	6.10	349	5.91
129.tera_tf	64	1100	2.52	1101	2.51	1096	2.52	64	808	3.43	807	3.43	806	3.43

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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Results Table (Continued)

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
130.socorro	64	604	6.32	607	6.29	607	6.29	64	282	13.5	279	13.7	277	13.8		
132.zeusmp2	64	641	4.84	649	4.78	645	4.81	64	641	4.84	649	4.78	645	4.81		
137.lu	64	642	5.72	627	5.86	644	5.71	64	642	5.72	627	5.86	644	5.71		

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

Hardware Summary

Type of System: Heterogeneous
 Compute Nodes: IBM System JS22
 IBM System JS22
 Interconnects: InfiniBand
 Ethernet
 File Server Node: IBM System JS22
 Head Node: IBM System JS22
 Total Compute Nodes: 8
 Total Chips: 16
 Total Cores: 32
 Total Threads: 64
 Total Memory: 144 GB
 Base Ranks Run: 64
 Minimum Peak Ranks: 64
 Maximum Peak Ranks: 64

Software Summary

C Compiler: IBM XL C/C++ Enterprise Edition V9 for AIX
 Updated with the September 2008 Fix level
 C++ Compiler: IBM XL C/C++ Enterprise Edition V9 for AIX
 Updated with the September 2008 Fix level
 Fortran Compiler: IBM XL Fortran Enterprise Edition V11.1 for AIX
 Updated with the September 2008 Fix level
 Base Pointers: 32-bit
 Peak Pointers: 32/64-bit
 MPI Library: IBM Parallel Environment for AIX, Version 5
 Release 1
 Other MPI Info: None
 Pre-processors: None
 Other Software: IBM Engineering and Scientific Subroutine Library
 (ESSL) for AIX Version 4 Release 3 Updated with
 PTF Set 3

Node Description: IBM System JS22

Hardware

Number of nodes: 1
 Uses of the node: compute, head, filesaver
 Vendor: IBM Corporation
 Model: IBM System JS22
 CPU Name: POWER6
 CPU(s) orderable: 4 cores per blade
 Chips enabled: 2
 Cores enabled: 4
 Cores per chip: 2
 Threads per core: 2
 CPU Characteristics:
 CPU MHz: 4000
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 4 MB I+D on chip per core
 L3 Cache: None
 Other Cache: None
 Memory: 32 GB (4x8 GB) DDR2 500 MHz
 Disk Subsystem: 1x146 GB SAS 15K RPM
 Other Hardware: BladeCenter-H chassis
 Voltaire 4X InfiniBand Pass-thru Module (P/N
 43W4419)

Software

Adapter: 4X InfiniBand DDR Expansion Card (CFFh) for IBM
 BladeCenter (P/N 43W4423)
 Adapter Driver: devices.pciex.b3157862.rte 6.1.2.0
 Adapter Firmware: 2.3.0
 Operating System: IBM AIX V6.1 with the 6100-02 Technology Level
 Local File System: AIX/JFS2
 Shared File System: NFSv3
 System State: Multi-user
 Other Software: None

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Hardware Availability: Nov-2008

Tested by: IBM Corporation

Software Availability: Nov-2008

Node Description: IBM System JS22

Adapter:	4X InfiniBand DDR Expansion Card (CFH) for IBM BladeCenter (P/N 43W4423)
Number of Adapters:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	4x DDR 20Gbps
Ports Used:	1
Interconnect Type:	InfiniBand

General Notes

Blade[1] runs the following commands to compose the cluster:

```

mkdev -c management -s infiniband -t icm
/usr/sbin/mkiba -a 192.1.10.1 -m 255.255.255.0 -i ib0 -A iba0 -p 1 -P 0xFFFF -M 65532 -q 4000 -k off -Q 0x1E -S up
startsrc -s ctcas
preprnode mpibladel
mkrpdomain mpiblares mpiblade1 mpiblade2 mpiblade3 mpiblade4 mpiblade5 mpiblade6 mpiblade7 mpiblade8
starttrpdomain mpiblares
cd /usr/lpp/ppe.poe/samples/nrt
make
chmod 4755 nrt_api
shutdown -rF
su spec
cd mpiblares.64ranks.load
../nrt_api -l

```

Node Description: IBM System JS22

Hardware	
Number of nodes:	7
Uses of the node:	compute
Vendor:	IBM Corporation
Model:	IBM System JS22
CPU Name:	POWER6
CPU(s) orderable:	4 cores per blade
Chips enabled:	2
Cores enabled:	4
Cores per chip:	2
Threads per core:	2
CPU Characteristics:	
CPU MHz:	4000
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per core
L3 Cache:	None
Other Cache:	None
Memory:	16 GB (4x4 GB) DDR2 667 MHz
Disk Subsystem:	1x146 GB SAS 15K RPM

Software	
Adapter:	4X InfiniBand DDR Expansion Card (CFH) for IBM BladeCenter (P/N 43W4423)
Adapter Driver:	devices.pciex.b3157862.rte 6.1.2.0
Adapter Firmware:	2.3.0
Operating System:	IBM AIX V6.1 with the 6100-02 Technology Level
Local File System:	AIX/JFS2
Shared File System:	NFSv3
System State:	Multi-user
Other Software:	None

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Test sponsor: IBM Corporation

Hardware Availability: Nov-2008

Tested by: IBM Corporation

Software Availability: Nov-2008

Node Description: IBM System JS22

Other Hardware:	BladeCenter-H chassis Voltaire 4X InfiniBand Pass-thru Module (P/N 43W4419)
Adapter:	4X InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter (P/N 43W4423)
Number of Adapters:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	4x DDR 20Gbps
Ports Used:	1
Interconnect Type:	InfiniBand

General Notes

Each blade runs the following commands to compose the cluster, where \$CLUSTER_INDEX is 2-8 for Blade[2]-Blade[8]:

```

mkdev -c management -s infiniband -t icm
/usr/sbin/mkiba -a 192.1.10.$CLUSTER_INDEX -m 255.255.255.0 -i ib0 -A iba0 -p 1 -P 0xFFFF -M 65532 -q 4000 -k off -Q 0x1E -S up
startsrc -s ctcas
preprnode mpibladel
cd /usr/lpp/ppe.poe/samples/nrt
make
chmod 4755 nrt_api
shutdown -rF
su spec
cd mpiblades.64ranks.load
../nrt_api -l

```

Interconnect Description: InfiniBand

	Hardware	Software
Vendor:	IBM Corporation	
Model:	4x DDR InfiniBand	
Switch Model:	QLogic SilverStorm 9024	
Number of Switches:	1	
Number of Ports:	24	
Data Rate:	4x DDR 20Gbps	
Firmware:	4.2.1.1.1	
Topology:	single switch	
Primary Use:	MPI Communication	

Interconnect Description: Ethernet

	Hardware	Software
Vendor:	IBM Corporation	
Model:	4-port Gigabit Ethernet	

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Software Availability: Nov-2008

Interconnect Description: Ethernet

Switch Model:	IBM BladeCenter 4-port Gigabit Ethernet switch module (P/N 26K6483)
Number of Switches:	1
Number of Ports:	18
Data Rate:	1Gbps
Firmware:	1.08
Topology:	single switch
Primary Use:	File system

Compiler Invocation Notes

Blade[1], with 32GB of memory and 32GB of paging space, was used to compile the benchmarks.

Submit Notes

The config file option 'submit' was used.

```
submit = poe task_stride.2level.32+64rank 4 2 8 $ranks $command -procs $ranks -hostfile /spec/MapFiles/ib0hosts.8x.1-8
```

General Notes

Environment settings:

```

All ulimits set to unlimited
ranks                = 64
CWD                  = /spec/mpi2007
MEMORY_AFFINITY     = MCM
XLFRT_OPTS          = intrinths=1
MP_PGMMODEL         = spmd
MP_MSG_API           = mpi
MP_DEVTYPE           = ib
MP_CLOCK_SOURCE     = AIX
MP_STDINMODE        = none
MP_SHARED_MEMORY    = yes
MP_SINGLE_THREAD    = yes
MP_EUILIB           = us
NRT_WINDOW_COUNT    = 1
MP_RESD              = no
MP_PULSE             = 0
ADAPTER_USE         = shared
EUIDevice           = sn_single
MP_CSS_INTERRUPT    = no
MP_BUFFER_MEM       = 67108864
MP_USE_BULK_XFER    = yes
MP_BULK_MIN_MSG_SIZE = 8192
MP_EAGER_LIMIT      = 65536
MP_WAIT_MODE        = yield
MP_INFOLEVEL        = 0
MP_LABELIO          = no

```

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General Notes (Continued)

MP_STDOUTMODE = unordered
MP_PMDLOG = no
NRT_JOB_KEY = 64

Compiler Invocation

C benchmarks:
/usr/bin/mpcc_r

C++ benchmarks:

126.lammps: /usr/bin/mpCC_r

Fortran benchmarks:

/usr/bin/mpxlf95_r

Benchmarks using both Fortran and C:

/usr/bin/mpcc_r /usr/bin/mpxlf95_r

Portability Flags

107.leslie3d: -qfixed
115.fds4: -DSPEC_MPI_LC_NO_TRAILING_UNDERSCORE -qfixed
121.pop2: -DSPEC_MPI_AIX
127.wrf2: -DNOUNDERSCORE -DSPEC_MPI_AIX
130.socorro: -DSPEC_NO_UNDERSCORE -qcpluscmt
132.zeusmp2: -qfixed -DSPEC_SINGLE_UNDERSCORE
137.lu: -qfixed

Base Optimization Flags

C benchmarks:
-bmaxdata:0x80000000 -O5 -D_ILS_MACROS -bdatapsize:64K
-bstacksize:64K -btextpsize:64K

C++ benchmarks:

126.lammps: -bmaxdata:0x80000000 -O5

Fortran benchmarks:

-bmaxdata:0x80000000 -O4 -qstrict -qalias=nostd -qhot=level=0 -qsave
-bdatapsize:64K -bstacksize:64K -btextpsize:64K

Benchmarks using both Fortran and C:

-bmaxdata:0x80000000 -O5 -D_ILS_MACROS -bdatapsize:64K
-bstacksize:64K -btextpsize:64K -O4 -qstrict -qalias=nostd
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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

-qhot=level=0 -qsave

Peak Optimization Flags

C benchmarks:

104.milc: basepeak = yes

122.tachyon: -O5 -lessl -D_ILS_MACROS -bdatapsize:64K -bstacksize:64K
-btextpsize:64K -q64

C++ benchmarks:

126.lammps: basepeak = yes

Fortran benchmarks:

107.leslie3d: -O5 -bdatapsize:64K -bstacksize:64K -btextpsize:64K
-bmaxdata:0x70000000

113.GemsFDTD: basepeak = yes

129.tera_tf: -O5 -qessl -lessl -bdatapsize:64K -bstacksize:64K
-btextpsize:64K

137.lu: basepeak = yes

Benchmarks using both Fortran and C:

115.fds4: -O5 -lessl -D_ILS_MACROS -bdatapsize:64K -bstacksize:64K
-btextpsize:64K -qstrict -qalias=nostd -qhot=level=0
-qsave -q64

121.pop2: basepeak = yes

127.wrf2: -O5 -bmaxdata:0x80000000

128.GAPgeofem: basepeak = yes

130.socorro: -O5 -lessl -D_ILS_MACROS -bdatapsize:64K -bstacksize:64K
-btextpsize:64K -qessl -bmaxdata:0x80000000

132.zeusmp2: basepeak = yes



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Other Flags

C benchmarks:

`-w -qsuppress=1500-036 -qipa=noobject -qipa=threads`

C++ benchmarks:

`126.lammps: -w -qsuppress=1500-036 -qipa=noobject -qipa=threads`

Fortran benchmarks:

`-w -qsuppress=1500-036 -qsuppress=cmpmsg -qspillsize=32648`

Benchmarks using both Fortran and C:

`-w -qsuppress=1500-036 -qipa=noobject -qipa=threads -qsuppress=cmpmsg
-qspillsize=32648`

The flags files that were used to format this result can be browsed at

http://www.spec.org/mpi2007/results/flags/MPI2007_flags.20100413.html

<http://www.spec.org/mpi2007/results/flags/IBM-XL.html>

<http://www.spec.org/mpi2007/results/flags/IBM-AIX.html>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/mpi2007/results/flags/MPI2007_flags.20100413.xml

<http://www.spec.org/mpi2007/results/flags/IBM-XL.xml>

<http://www.spec.org/mpi2007/results/flags/IBM-AIX.xml>

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

Tested with SPEC MPI2007 v1.1.

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