



SPEC® MPIM2007 Result

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AMD, QLogic Corporation, Rackable Systems, IWILL

SPECmpiM_peak2007 = Not Run

AMD Emerald Cluster: AMD Opteron CPUs,
QLogic InfiniPath/SilverStorm Interconnect

SPECmpiM_base2007 = 6.06

MPI2007 license: 0018

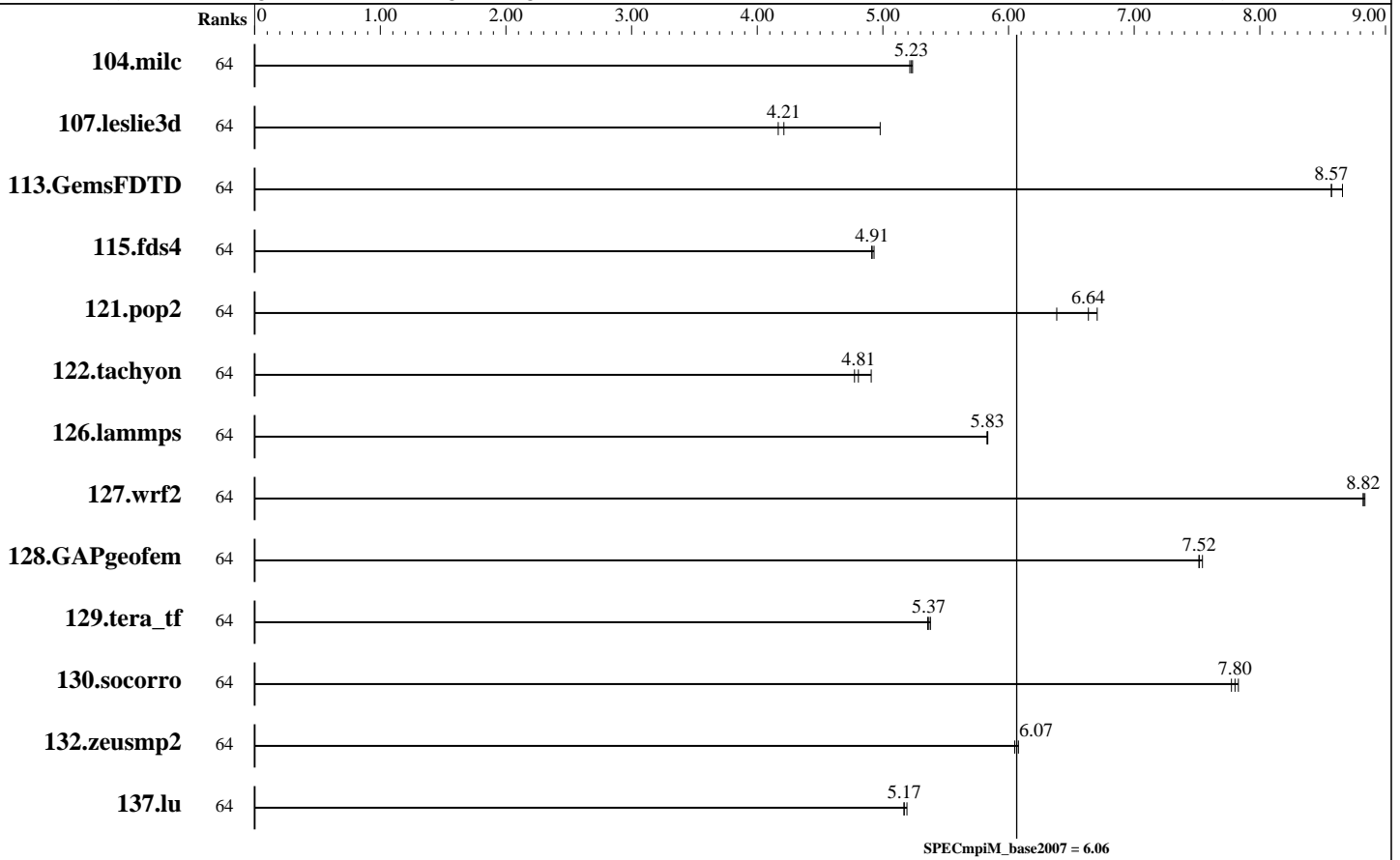
Test date: May-2007

Test sponsor: QLogic Corporation

Hardware Availability: Nov-2006

Tested by: QLogic Performance Engineering

Software Availability: Jul-2007



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	64	299	5.24	<u>299</u>	<u>5.23</u>	300	5.21							
107.leslie3d	64	1049	4.98	1253	4.17	<u>1239</u>	<u>4.21</u>							
113.GemsFDTD	64	736	8.57	729	8.66	<u>736</u>	<u>8.57</u>							
115.fds4	64	397	4.91	<u>397</u>	<u>4.91</u>	396	4.93							
121.pop2	64	616	6.71	647	6.38	<u>622</u>	<u>6.64</u>							
122.tachyon	64	<u>582</u>	<u>4.81</u>	570	4.91	586	4.77							
126.lammps	64	500	5.84	500	5.83	<u>500</u>	<u>5.83</u>							
127.wrf2	64	884	8.82	882	8.84	<u>884</u>	<u>8.82</u>							
128.GAPgeofem	64	275	7.52	<u>275</u>	<u>7.52</u>	274	7.54							
129.tera_tf	64	<u>516</u>	<u>5.37</u>	515	5.38	517	5.36							

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	491	7.77	488	7.83	489	7.80							
132.zeusmp2	64	513	6.05	510	6.08	512	6.07							
137.lu	64	711	5.17	711	5.17	708	5.19							

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

Hardware Summary

Type of System: Homogenous
 Compute Node: Rackable, IWILL, AMD
 Interconnects: QLogic InfiniBand HCAs and switches
 Broadcom NICs, Force10 switches
 File Server Node: Headnode NFS filesystem
 Head Node: Rackable, IWILL, AMD
 Other Node: Headnode NFS filesystem
 Total Compute Nodes: 16
 Total Chips: 32
 Total Cores: 64
 Total Threads: 64
 Total Memory: 128 GB
 Base Ranks Run: 64
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: QLogic PathScale C Compiler 3.0
 C++ Compiler: QLogic PathScale C++ Compiler 3.0
 Fortran Compiler: QLogic PathScale Fortran Compiler 3.0
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: QLogic InfiniPath MPI 2.1
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: Rackable, IWILL, AMD

Hardware

Number of nodes: 16
 Uses of the node: compute, head
 Vendor: Rackable Systems, IWILL, AMD
 Model: Rackable Systems C1000 chassis, IWILL DK8-HTX motherboard
 CPU Name: AMD Opteron 290
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 4
 Cores per chip: 2
 Threads per core: 1
 CPU Characteristics: --
 CPU MHz: 2800
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core
 L3 Cache: None
 Other Cache: None
 Memory: 8 GB (8 x 1 GB DDR400)
 Disk Subsystem: 250 GB, SATA

Software

Adapter: Intel 82541PI Gigabit Ethernet controller
 Adapter Driver: Part of Linux kernel modules
 Adapter Firmware: None
 Adapter: QLogic InfiniPath QHT7140
 Adapter Driver: InfiniPath 2.1
 Adapter Firmware: None
 Operating System: ClusterCorp Rocks 4.2.1
 (Based on RedHat Enterprise Linux 4.0 Update 4)
 Local File System: Linux ext3
 Shared File System: NFS
 System State: Multi-User
 Other Software: Sun Grid Engine 6.0

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Hardware Availability: Nov-2006

Tested by: QLogic Performance Engineering

Software Availability: Jul-2007

Node Description: Rackable, IWILL, AMD

Other Hardware:	Nodes custom-built by Rackable Systems. The Rackable C1000 chassis is half-depth with 450W, 48 VDC Power Supply. Integrated Gigabit Ethernet for admin/filesystem.
Adapter:	Intel 82541PI Gigabit Ethernet controller
Number of Adapters:	1
Slot Type:	integrated on motherboard
Data Rate:	1 Gbps Ethernet
Ports Used:	1
Interconnect Type:	Ethernet
Adapter:	QLogic InfiniPath QHT7140
Number of Adapters:	1
Slot Type:	HTX
Data Rate:	InfiniBand 4x SDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: Headnode NFS filesystem

Hardware	
Number of nodes:	1
Uses of the node:	file server, other
Vendor:	Tyan
Model:	Thunder K8QSD Pro (S4882) motherboard
CPU Name:	AMD Opteron 885
CPU(s) orderable:	1-4 chips
Chips enabled:	4
Cores enabled:	8
Cores per chip:	2
Threads per core:	1
CPU Characteristics:	--
CPU MHz:	2600
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	None
Other Cache:	None
Memory:	16 GB (16 x 1 GB DDR400 dimms)
Disk Subsystem:	250 GB, SATA, 7200 RPM
Other Hardware:	None
Adapter:	Broadcom BCM5704C
Number of Adapters:	2
Slot Type:	integrated on motherboard
Data Rate:	1 Gbps Ethernet
Ports Used:	2
Interconnect Type:	Ethernet

Software	
Adapter:	Broadcom BCM5704C
Adapter Driver:	Part of Linux kernel modules
Adapter Firmware:	None
Operating System:	ClusterCorp Rocks 4.2.1 (Based on RedHat Enterprise Linux 4.0 Update 4)
Local File System:	Linux ext3
Shared File System:	NFS
System State:	Multi-User
Other Software:	Sun Grid Engine 6.0



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General Notes

"other" purposes of this node: login, compile, job submission and queuing.
This node assembled with a 2U chassis and 700 watt ATX 12V Power Supply.

Interconnect Description: QLogic InfiniBand HCAs and switches

Hardware		Software
Vendor:	QLogic	
Model:	InfiniPath and Silverstorm	
Switch Model:	QLogic SilverStorm 9120 Fabric Director	
Number of Switches:	1	
Number of Ports:	144	
Data Rate:	InfiniBand 4x SDR and InfiniBand 4x DDR	
Firmware:	3.4.0.5.2	
Topology:	Single switch (star)	
Primary Use:	MPI traffic	

General Notes

The data rate between InifniPath HCAs and SilverStorm switches is SDR. However, DDR is used for inter-switch links.

Interconnect Description: Broadcom NICs, Force10 switches

Hardware		Software
Vendor:	Force10	
Model:	E300	
Switch Model:	Force10 E300 Gig-E switch	
Number of Switches:	1	
Number of Ports:	288	
Data Rate:	1 Gbps Ethernet	
Firmware:	N/A	
Topology:	Single switch (star)	
Primary Use:	file system traffic	

Base Compiler Invocation

C benchmarks:
/usr/bin/mpicc -cc=pathcc

C++ benchmarks:

126.lammps: /usr/bin/mpicxx -CC=pathCC

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Base Compiler Invocation (Continued)

Fortran benchmarks:

107.leslie3d: /usr/bin/mpif90 -f90=pathf90

113.GemsFDTD: /usr/bin/mpif90 -f90=pathf90

115.fds4: /usr/bin/mpif90 -f90=pathf90

129.tera_tf: /usr/bin/mpif90 -f90=pathf90

132.zeusmp2: /usr/bin/mpif90 -f90=pathf90

137.lu: /usr/bin/mpif90 -f90=pathf90

Benchmarks using both Fortran and C (except as noted below):

/usr/bin/mpicc -cc=pathcc /usr/bin/mpif90 -f90=pathf90

Base Portability Flags

104.milc: -DSPEC_MPI_LP64

121.pop2: -DSPEC_MPI_DOUBLE_UNDERSCORE -DSPEC_MPI_LP64

122.tachyon: -DSPEC_MPI_LP64

127.wrf2: -DF2CSTYLE -DSPEC_MPI_DOUBLE_UNDERSCORE -DSPEC_MPI_LINUX
-DSPEC_MPI_LP64

128.GAPgeofem: -DSPEC_MPI_LP64

130.socorro: -fno-second-underscore -DSPEC_MPI_LP64

Base Optimization Flags

C benchmarks:

-march=opteron -Ofast -OPT:malloc_alg=1

C++ benchmarks:

126.lammps: -march=opteron -O3 -OPT:Ofast -CG:local_fwd_sched=on

Fortran benchmarks:

107.leslie3d: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

113.GemsFDTD: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

115.fds4: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

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Base Optimization Flags (Continued)

129.tera_tf: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

132.zeusmp2: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

137.lu: -march=opteron -O3 -OPT:Ofast -OPT:malloc_alg=1
-LANG:copyinout=off

Benchmarks using both Fortran and C:

121.pop2: -march=opteron -Ofast -OPT:malloc_alg=1 -O3 -OPT:Ofast
-LANG:copyinout=off

127.wrf2: Same as 121.pop2

128.GAPgeofem: Same as 121.pop2

130.socorro: Same as 121.pop2

Base Other Flags

C benchmarks:

-IPA:max_jobs=4

C++ benchmarks:

126.lammps: -IPA:max_jobs=4

Fortran benchmarks:

107.leslie3d: -IPA:max_jobs=4

113.GemsFDTD: -IPA:max_jobs=4

115.fds4: -IPA:max_jobs=4

129.tera_tf: -IPA:max_jobs=4

132.zeusmp2: -IPA:max_jobs=4

137.lu: -IPA:max_jobs=4

Benchmarks using both Fortran and C (except as noted below):

-IPA:max_jobs=4



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The flags file that was used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/MPI2007_flags.20070717.01.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/MPI2007_flags.20070717.01.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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