SPEC® MPIM2007 Result

AMD, QLogic Corporation, Rackable Systems, IWILL

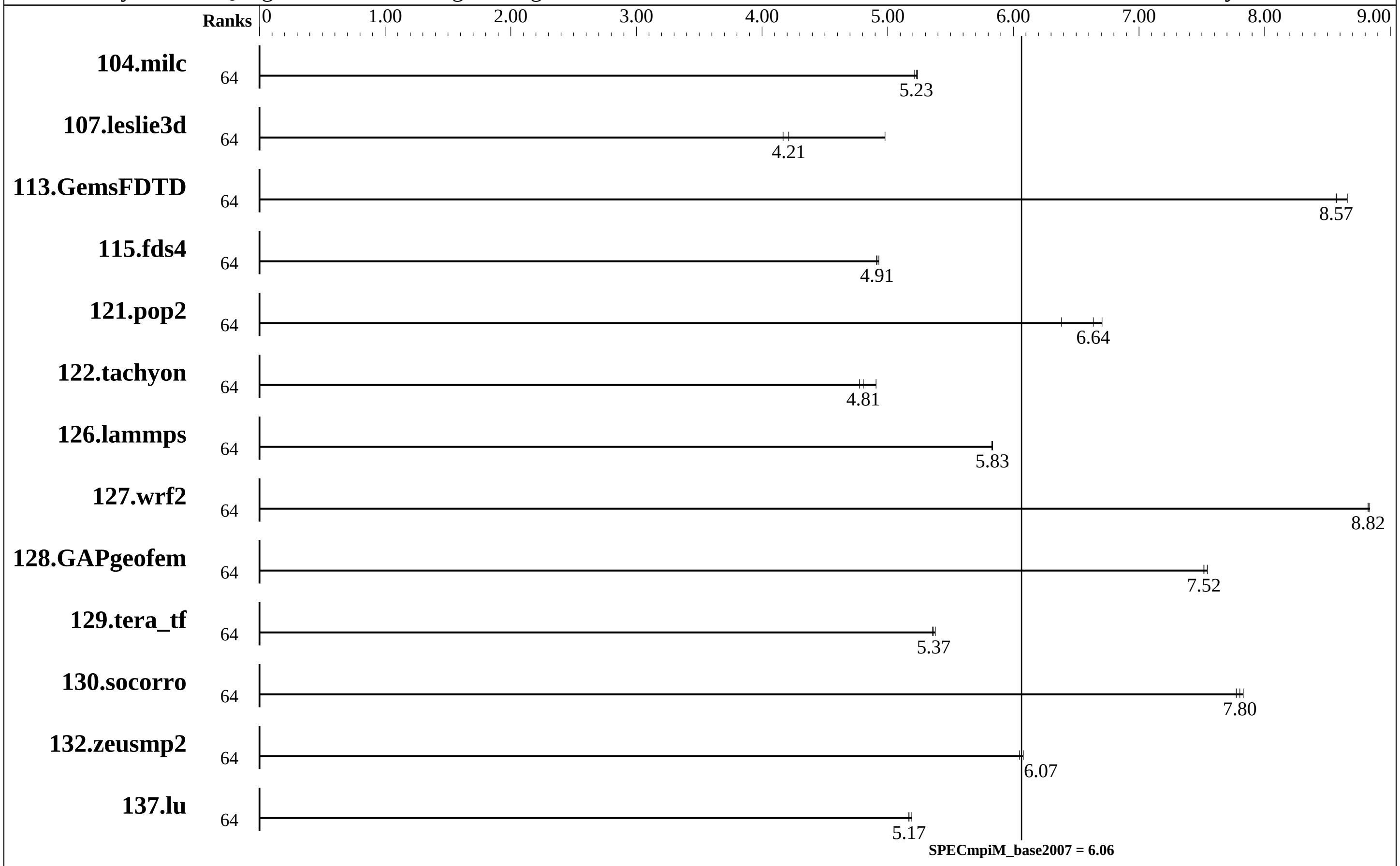
AMD Emerald Cluster: AMD Opteron CPUs,
QLogic InfiniPath/SilverStorm Interconnect

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 6.06

MPI2007 license: 0018
Test sponsor: QLogic Corporation
Tested by: QLogic Performance Engineering

Test date: May-2007
Hardware Availability: Nov-2006
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	**299**	**5.23**	300	5.21							
107.leslie3d	64	1049	4.98	1253	4.17	**1239**	**4.21**							
113.GemsFDTD	64	736	8.57	729	8.66	**736**	**8.57**							
115.fds4	64	397	4.91	**397**	**4.91**	396	4.93							
121.pop2	64	616	6.71	647	6.38	**622**	**6.64**							
122.tachyon	64	**582**	**4.81**	570	4.91	586	4.77							
126.lammps	64	500	5.84	500	5.83	**500**	**5.83**							
127.wrf2	64	884	8.82	882	8.84	**884**	**8.82**							
128.GAPgeofem	64	275	7.52	**275**	**7.52**	274	7.54							
129.tera_tf	64	**516**	**5.37**	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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AMD Emerald Cluster: AMD Opteron CPUs, QLogic InfiniPath/SilverStorm Interconnect

SPECmpiM_peak2007 = Not Run

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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 (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

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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

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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Test sponsor:	QLogic Corporation	**Hardware Availability:**	Nov-2006
Tested by:	QLogic Performance Engineering	**Software Availability:**	Jul-2007

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

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

Software

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

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

Software

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`

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

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

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