SPEC® MPIM2007 Result
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Dell, QLogic, ClusterVision,

U. of Cambridge HPC Cluster Darwin,
QLogic InfiniBand Interconnect

SPECmpiM_peak2007 =   Not Run

SPECmpiM_base2007 =   NC

MPI2007 license: 0018	**Test date:** May-2007
Test sponsor: QLogic Corporation	**Hardware Availability:** Jul-2006
Tested by: QLogic Performance Engineering	**Software Availability:** Feb-2007

Ranks

104.milc |

107.leslie3d |

113.GemsFDTD |

115.fds4 |

121.pop2 |

122.tachyon |

126.lammps |

127.wrf2 |

128.GAPgeofem |

129.tera_tf |

130.socorro |

132.zeusmp2 |

137.lu |

Non-Compliant

Results Table

Benchmark	Ranks	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	64	NC	NC	NC	NC	NC	NC							
107.leslie3d	64	NC	NC	NC	NC	NC	NC							
113.GemsFDTD	64	NC	NC	NC	NC	NC	NC							
115.fds4	64	NC	NC	NC	NC	NC	NC							
121.pop2	64	NC	NC	NC	NC	NC	NC							
122.tachyon	64	NC	NC	NC	NC	NC	NC							
126.lammps	64	NC	NC	NC	NC	NC	NC							
127.wrf2	64	NC	NC	NC	NC	NC	NC							
128.GAPgeofem	64	NC	NC	NC	NC	NC	NC							

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	Ranks	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Ranks	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
129.tera_tf	64	NC	NC	NC	NC	NC	NC							
130.socorro	64	NC	NC	NC	NC	NC	NC							
132.zeusmp2	64	NC	NC	NC	NC	NC	NC							
137.lu	64	NC	NC	NC	NC	NC	NC							

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

Hardware Summary

Type of System: Homogeneous
Compute Node: Dell PowerEdge 1950
Interconnects: QLogic InfiniBand HCAs and switches
Ethernet Network for File Server Access
File Server Node: Dell PowerVault MD1000
Head Node: Dell PowerEdge 1950
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 2.0
Other MPI Info: None
Pre-processors: No
Other Software: None

Node Description: Dell PowerEdge 1950

Hardware

Number of nodes: 16
Uses of the node: compute, head
Vendor: Dell
Model: Dell PowerEdge 1950
CPU Name: Intel Xeon 5160
CPU(s) orderable: 2 chips
Chips enabled: 2
Cores enabled: 4
Cores per chip: 2
Threads per core: 1
CPU Characteristics: 1333 MHz system bus
CPU MHz: 3000
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 4 MB I+D on chip per chip
L3 Cache: None
Other Cache: None
Memory: 8 GB (8 x 1 GB PC2-5300F)
Disk Subsystem: SAS, 73 GB, 15000 RPM
Other Hardware: None
Adapter: QLogic InfiniPath QLE7140

Software

Adapter: QLogic InfiniPath QLE7140
Adapter Driver: InfiniPath 2.0
Adapter Firmware: None
Operating System: ClusterVisionOS 2.1
Based on Scientific Linux SL release 4.3
(Beryllium)
Local File System: Linux/ext3
Shared File System: NFS
System State: Multi-User
Other Software: Torque 2.1.2

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

Node Description: Dell PowerEdge 1950

Number of Adapters:	1
Slot Type:	PCIe x8
Data Rate:	InfiniBand 4x SDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: Dell PowerVault MD1000

Hardware

Number of nodes:	1
Uses of the node:	file server
Vendor:	Dell
Model:	Dell PowerEdge 1950
CPU Name:	Intel Xeon 5160
CPU(s) orderable:	1-2 chip
Chips enabled:	2
Cores enabled:	4
Cores per chip:	2
Threads per core:	1
CPU Characteristics:	1333 MHz system bus
CPU MHz:	3000
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per chip
L3 Cache:	None
Other Cache:	None
Memory:	4 GB (4 x 1 GB PC2-5300F)
Disk Subsystem:	13.5 TB: 3 x 15 x 300 GB SAS, 10000 RPM 3 Dell PowerVault MD1000 Disk Arrays, each one has 15 disks.
Other Hardware:	None
Adapter:	Chelsio T310 10GBASE-SR RNIC (rev 3)
Number of Adapters:	1
Slot Type:	PCIe x8 MSI-X
Data Rate:	10 Gbps Ethernet
Ports Used:	1
Interconnect Type:	Ethernet

Software

Adapter:	Chelsio T310 10GBASE-SR RNIC (rev 3)
Adapter Driver:	cxgb3 1.0.078
Adapter Firmware:	T 3.3.0
Operating System:	ClusterVisionOS 2.1 Based on Scientific Linux SL release 4.3 (Beryllium)
Local File System:	Linux/ext3
Shared File System:	NFS
System State:	Multi-User
Other Software:	None

General Notes

A separate node handling login and resouces management
is not listed as it is not performance related.

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QLogic InfiniBand Interconnect

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

Interconnect Description: QLogic InfiniBand HCAs and switches

Hardware

Vendor:	QLogic
Model:	InfiniPath adapters and Silverstorm switches
Switch Model:	QLogic SilverStorm 9080 Fabric Director (InfiniBand switch)
Number of Switches:	1
Number of Ports:	96
Data Rate:	InfiniBand 4x SDR and InfiniBand 4x DDR
Firmware:	3.4.0.1.3
Topology:	Full Bisectional Bandwidth, Fat-Tree, Max 3 swith-chip hops.
Primary Use:	MPI traffic

Software

General Notes

```
The 16 nodes used are from one CU (Computational Unit, 65 nodes)
of the 9 CUs in the Darwin Cluster. Jobs within one CU
use one SilverStorm 9080 switch.
The data rate between InifniPath HCAs and SilverStorm switches
is SDR. However, DDR is used for inter-switch links.
```

Interconnect Description: Ethernet Network for File Server Access

Hardware

Vendor:	Chelsio, Nortel
Model:	Chelsio T310 adapter and Nortel 5530 5510 8610 switches
Switch Model:	Nortel Ethernet Routing Switch 5510-24T
Number of Switches:	1
Number of Ports:	24
Data Rate:	1 Gbps Ethernet
Firmware:	1.0.0.16
Switch Model:	Nortel Ethernet Routing Switch 5510-48T
Number of Switches:	3
Number of Ports:	48
Data Rate:	1 Gbps Ethernet
Firmware:	1.0.0.16
Switch Model:	Nortel Ethernet Routing Switch 5530-24TFD
Number of Switches:	2
Number of Ports:	26
Data Rate:	1 Gbps Ethernet (24 ports) and 10 Gbps Ethernet (2 ports)
Firmware:	4.2.0.12
Switch Model:	Nortel Passport 8610 switch 4.1.0.0
Number of Switches:	1
Number of Ports:	24

Software

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MPI2007 license:	0018	**Test date:**	May-2007
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Tested by:	QLogic Performance Engineering	**Software Availability:**	Feb-2007

Interconnect Description: Ethernet Network for File Server Access

Data Rate: 10 Gbps Ethernet
Firmware: Optivity Switch Manager version 4.1
Topology: Three CUs are connected with six Ethernet Routing switches 5530-24TFD, 5510-24T and 5510-48T as a ring. Each of two 5530-24TFD switches is connected to the Nortel Passport 8610 switch through two 10Gbit ports. See Slide 10 of NortelEthernetSwitchDiagram.pdf for a network diagram.
Primary Use: file system traffic

Base Compiler Invocation

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

C++ benchmarks:

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

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

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Base Portability Flags (Continued)

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

Base Optimization Flags

C benchmarks:
    -march=core -Ofast -OPT:malloc_alg=1

C++ benchmarks:

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

Fortran benchmarks:

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

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

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

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

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

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

Benchmarks using both Fortran and C:

    121.pop2: -march=core -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

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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.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/MPI2007_flags.20070717.xml

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