# SPEC® MPIL2007 Result

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## SGI

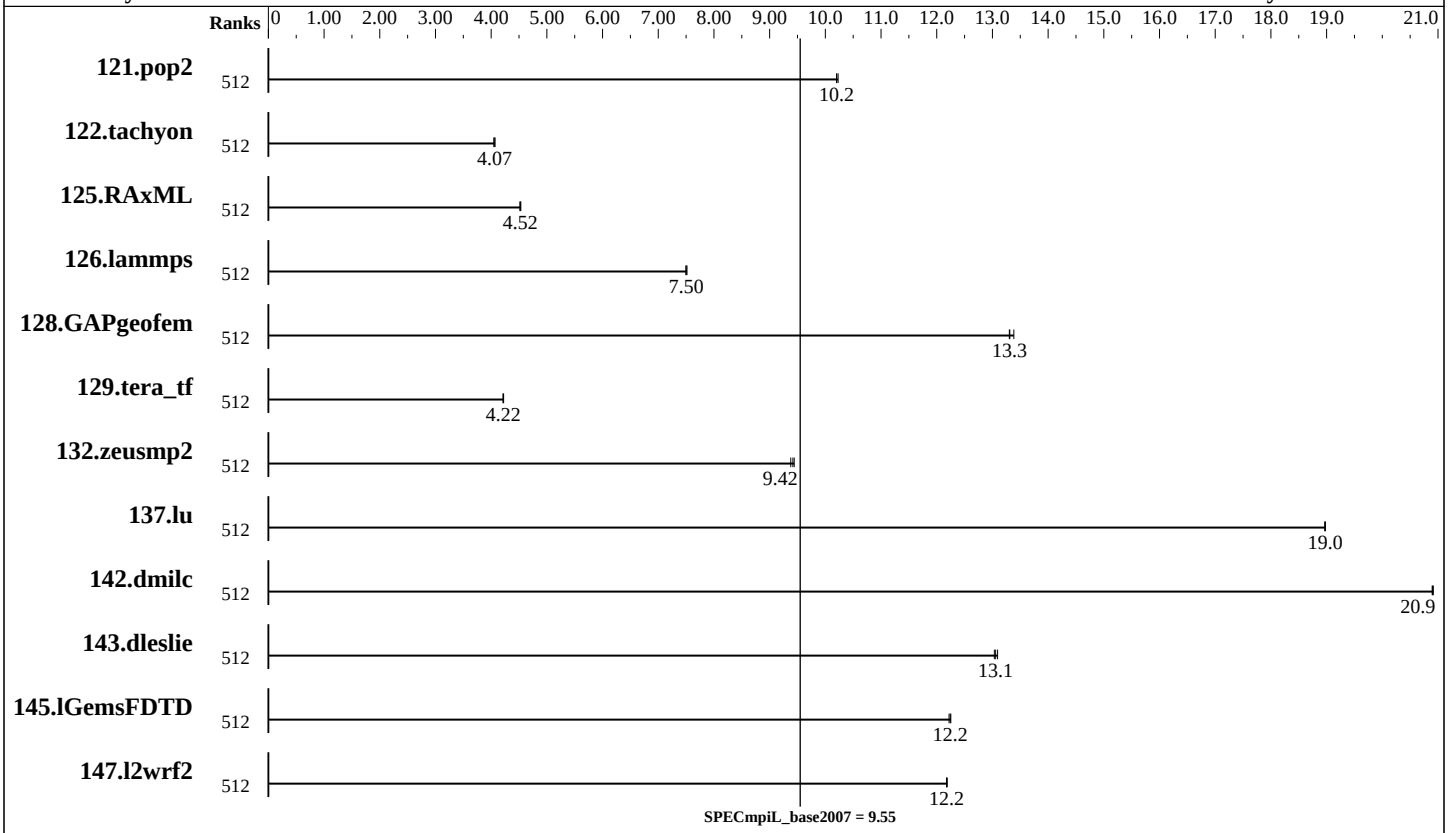
SGI Altix ICE 8400EX
(AMD Opteron 6282 SE, 2.6GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 9.55

**MPI2007 license:** 4
**Test sponsor:** SGI
**Tested by:** SGI

**Test date:** Jan-2012
**Hardware Availability:** Nov-2011
**Software Availability:** Nov-2011




## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 121.pop2 | 512 | 380 | 10.2 | **381** | **10.2** | 381 | 10.2 | | | | | | | |
| 122.tachyon | 512 | 480 | 4.05 | **478** | **4.07** | 478 | 4.07 | | | | | | | |
| 125.RAxML | 512 | 644 | 4.53 | **646** | **4.52** | 646 | 4.52 | | | | | | | |
| 126.lammps | 512 | 327 | 7.52 | **328** | **7.50** | 328 | 7.50 | | | | | | | |
| 128.GAPgeofem | 512 | 443 | 13.4 | **446** | **13.3** | 446 | 13.3 | | | | | | | |
| 129.tera_tf | 512 | 260 | 4.22 | **261** | **4.22** | 261 | 4.21 | | | | | | | |
| 132.zeusmp2 | 512 | 225 | 9.44 | **225** | **9.42** | 226 | 9.38 | | | | | | | |
| 137.lu | 512 | 222 | 19.0 | **221** | **19.0** | 221 | 19.0 | | | | | | | |
| 142.dmilc | 512 | 176 | 20.9 | **176** | **20.9** | 176 | 20.9 | | | | | | | |
| 143.dleslie | 512 | 237 | 13.1 | **237** | **13.1** | 238 | 13.0 | | | | | | | |
| 145.lGemsFDTD | 512 | 360 | 12.3 | **360** | **12.2** | 361 | 12.2 | | | | | | | |
| 147.l2wrf2 | 512 | 674 | 12.2 | 673 | 12.2 | **674** | **12.2** | | | | | | | |

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

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### Hardware Summary

| | |
|---|---|
| Type of System: | Homogeneous |
| Compute Node: | SGI Altix ICE 8400EX Compute Node |
| Interconnect: | InfiniBand (MPI and I/O) |
| File Server Node: | SGI InfiniteStorage 4000 |
| Total Compute Nodes: | 16 |
| Total Chips: | 32 |
| Total Cores: | 512 |
| Total Threads: | 512 |
| Total Memory: | 2 TB |
| Base Ranks Run: | 512 |
| Minimum Peak Ranks: | -- |
| Maximum Peak Ranks: | -- |

### Software Summary

| | |
|---|---|
| C Compiler: | Intel C++ Composer XE 2011 for Linux, Version 12.1.1.256 Build 20111011 |
| C++ Compiler: | Intel C++ Composer XE 2011 for Linux, Version 12.1.1.256 Build 20111011 |
| Fortran Compiler: | Intel Fortran Composer XE 2011 for Linux, Version 12.1.1.256 Build 20111011 |
| Base Pointers: | 64-bit |
| Peak Pointers: | 64-bit |
| MPI Library: | SGI MPT 2.05 |
| Other MPI Info: | OFED 1.5.2 |
| Pre-processors: | None |
| Other Software: | None |

## Node Description: SGI Altix ICE 8400EX Compute Node

### Hardware

| | |
|---|---|
| Number of nodes: | 16 |
| Uses of the node: | compute |
| Vendor: | SGI |
| Model: | SGI Altix ICE 8400EX (AMD Opteron 6282 SE, 2.6GHz) |
| CPU Name: | AMD Opteron 6282 SE |
| CPU(s) orderable: | 1-2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 32 |
| Cores per chip: | 16 |
| Threads per core: | 1 |
| CPU Characteristics: | 16 cores/chip, 2.6 GHz<br>AMD Turbo CORE technology up to 3.30 GHz |
| CPU MHz: | 2600 |
| Primary Cache: | 512 KB I on chip per chip,<br>64 KB I shared / 2 cores;<br>16 KB D on chip per core |
| Secondary Cache: | 16 MB I+D on chip per chip, 2 MB I+D on chip per core |
| L3 Cache: | 16 MB I+D on chip per chip, 8 MB shared / 8 cores |
| Other Cache: | None |
| Memory: | 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC) |
| Disk Subsystem: | None |
| Other Hardware: | None |
| Adapter: | Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s) |
| Number of Adapters: | 1 |
| Slot Type: | PCIe x8 Gen2 |
| Data Rate: | InfiniBand 4x QDR |
| Ports Used: | 2 |
| Interconnect Type: | InfiniBand |

### Software

| | |
|---|---|
| Adapter: | Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s) |
| Adapter Driver: | OFED-1.5.2 |
| Adapter Firmware: | 2.7.0 |
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (x86_64)<br>Kernel 2.6.32.46-0.3-default #1 SMP |
| Local File System: | NFSv3 |
| Shared File System: | NFSv3 IPoIB |
| System State: | Run level 3 (Multi-User) |
| Other Software: | SGI Performance Suite 1.3,<br>Build 705rp8.sles11-1111092106<br>SGI Tempo Compute Node 2.5,<br>Build 705r10.sles11-1110192111 |

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**Test sponsor:** SGI
**Tested by:** SGI

**Test date:** Jan-2012
**Hardware Availability:** Nov-2011
**Software Availability:** Nov-2011

## Node Description: SGI InfiniteStorage 4000

### Hardware

| | |
|---|---|
| Number of nodes: | 1 |
| Uses of the node: | fileserver |
| Vendor: | SGI |
| Model: | SGI Altix 450 (Intel Itanium 2, 1.6GHz) |
| CPU Name: | Intel Itanium 2 9030 |
| CPU(s) orderable: | 2-38 chips |
| Chips enabled: | 2 |
| Cores enabled: | 4 |
| Cores per chip: | 2 |
| Threads per core: | 1 |
| CPU Characteristics: | 1.6GHz/8MB, 533MHz FSB |
| CPU MHz: | 1600 |
| Primary Cache: | 16 KB I + 16 KB D on chip per core |
| Secondary Cache: | 1 MB I + 256 KB D on chip per core |
| L3 Cache: | 4 MB I+D on chip per core |
| Other Cache: | None |
| Memory: | 24 GB (12 x 2 GB, 2Rx4 PC2-3200-3, ECC) |
| Disk Subsystem: | 16 TB RAID 5<br>32 x 500 GB SATA (Seagate Barracuda 7.2K) |
| Other Hardware: | None |
| Adapter: | Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s) |
| Number of Adapters: | 2 |
| Slot Type: | PCIe x8 Gen1 |
| Data Rate: | InfiniBand 4x DDR |
| Ports Used: | 2 |
| Interconnect Type: | InfiniBand |

### Software

| | |
|---|---|
| Adapter: | Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s) |
| Adapter Driver: | OFED-1.4.2 |
| Adapter Firmware: | 5.3.0 |
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (ia64)<br>Kernel 2.6.32.12-0.7-default |
| Local File System: | xfs |
| Shared File System: | -- |
| System State: | Run Level 3 (Multi-User) |
| Other Software: | SGI ProPack 7SP1 for Linux, Build 701r2.sles11-1005242307 |

## Interconnect Description: InfiniBand (MPI and I/O)

### Hardware

| | |
|---|---|
| Vendor: | Mellanox Technologies and SGI |
| Model: | None |
| Switch Model: | SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV) |
| Number of Switches: | 4 |
| Number of Ports: | 36 |
| Data Rate: | InfiniBand 4x QDR |
| Firmware: | 5040005 |
| Topology: | Enhanced Hypercube |
| Primary Use: | MPI and I/O traffic |

### Software

## Submit Notes

```
The config file option 'submit' was used.
```

## General Notes

```
Software environment:
  export MPI_REQUEST_MAX=65536
  export MPI_TYPE_MAX=32768
  export MPI_BUFS_THRESHOLD=1
  export MPI_IB_RAILS=2
  ulimit -s unlimited

BIOS settings:
  AMI BIOS version 2.0

Job Placement:
  In the base run, each MPI job is assigned to a topologically compact
  set of nodes, i.e. the minimal needed number of switches was
  used for each job: 2 switch for up to 256 ranks, 4 switches
  for 512 ranks, 8 switches for 1024 ranks.

Additional notes regarding interconnect:
  The Infiniband network consists of two independent planes,
  with half the switches in the system allocated to each plane.
  I/O traffic is restricted to one plane, while MPI traffic can
  use both planes.

  SGI manufactures its own switch blades using unmodified Mellanox
  switch ASICs. The test system has SGI QDR_1.5_HYPR_2454 switch
  with Mellanox 36-port QDR Infiniband switch Device 48438
  (InfiniScale IV).
```

# Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:

126.lammps: `icpc`

Fortran benchmarks:
`ifort`

Benchmarks using both Fortran and C:
`icc ifort`

## Base Portability Flags

121.pop2: `-DSPEC_MPI_CASE_FLAG`

## Base Optimization Flags

C benchmarks:
`-O3 -xSSE2 -ipo -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xSSE2 -ipo -no-prec-div -ansi-alias`

Fortran benchmarks:
`-O3 -xSSE2 -ipo -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -xSSE2 -ipo -no-prec-div`

## Base Other Flags

C benchmarks:
`-lmpi`

C++ benchmarks:

126.lammps: `-lmpi`

Fortran benchmarks:
`-lmpi`

Benchmarks using both Fortran and C:
`-lmpi`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_flags.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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