# SPEC® MPIL2007 Result

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## Intel Corporation

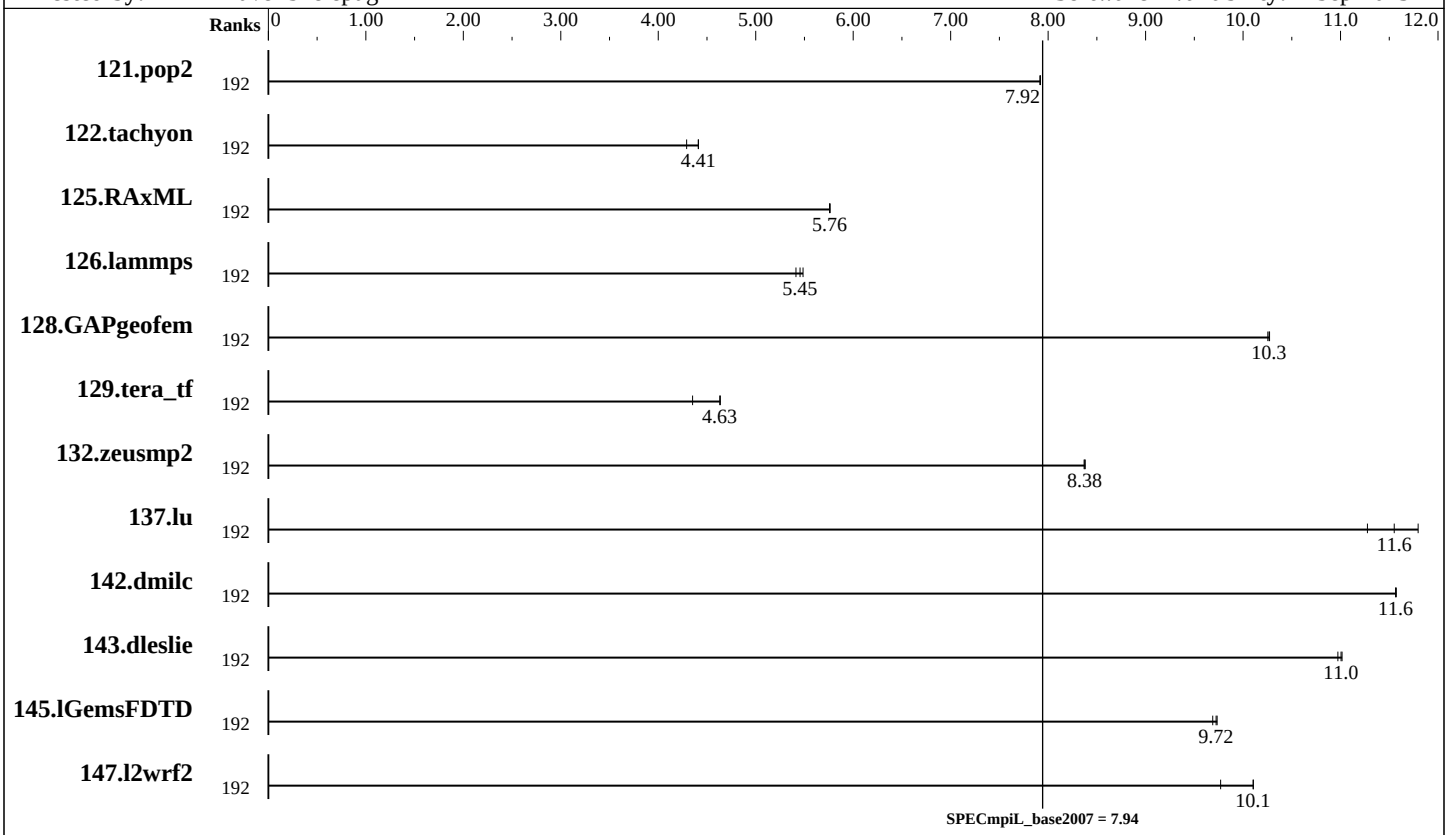
Endeavor (Intel Xeon E5-2697 v2, 2.70 GHz,
DDR3-1866 MHz, SMT on, Turbo off)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 7.94

**MPI2007 license:** 13
**Test sponsor:** Intel Corporation
**Tested by:** Pavel Shelepugin

**Test date:** Aug-2013
**Hardware Availability:** Sep-2013
**Software Availability:** Sep-2013




## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 121.pop2 | 192 | 491 | 7.92 | **491** | **7.92** | 492 | 7.92 | | | | | | | |
| 122.tachyon | 192 | 453 | 4.29 | 441 | 4.41 | **441** | **4.41** | | | | | | | |
| 125.RAxML | 192 | 507 | 5.76 | **507** | **5.76** | 507 | 5.76 | | | | | | | |
| 126.lammps | 192 | 448 | 5.49 | 454 | 5.41 | **451** | **5.45** | | | | | | | |
| 128.GAPgeofem | 192 | **578** | **10.3** | 579 | 10.3 | 578 | 10.3 | | | | | | | |
| 129.tera_tf | 192 | **237** | **4.63** | 237 | 4.64 | 253 | 4.35 | | | | | | | |
| 132.zeusmp2 | 192 | 253 | 8.38 | 253 | 8.37 | **253** | **8.38** | | | | | | | |
| 137.lu | 192 | 373 | 11.3 | **364** | **11.6** | 356 | 11.8 | | | | | | | |
| 142.dmilc | 192 | 319 | 11.6 | 318 | 11.6 | **318** | **11.6** | | | | | | | |
| 143.dleslie | 192 | 283 | 11.0 | 281 | 11.0 | **282** | **11.0** | | | | | | | |
| 145.lGemsFDTD | 192 | 453 | 9.73 | 455 | 9.69 | **454** | **9.72** | | | | | | | |
| 147.l2wrf2 | 192 | 812 | 10.1 | **812** | **10.1** | 840 | 9.77 | | | | | | | |

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: | Endeavor Node |
| Interconnects: | IB Switch<br>Gigabit Ethernet |
| File Server Node: | NFS |
| Total Compute Nodes: | 8 |
| Total Chips: | 16 |
| Total Cores: | 192 |
| Total Threads: | 384 |
| Total Memory: | 512 GB |
| Base Ranks Run: | 192 |
| Minimum Peak Ranks: | -- |
| Maximum Peak Ranks: | -- |

### Software Summary

| | |
|---|---|
| C Compiler: | Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728 |
| C++ Compiler: | Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728 |
| Fortran Compiler: | Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728 |
| Base Pointers: | 64-bit |
| Peak Pointers: | 64-bit |
| MPI Library: | Intel MPI Library 4.1.1.036 for Linux |
| Other MPI Info: | None |
| Pre-processors: | No |
| Other Software: | None |

## Node Description: Endeavor Node

### Hardware

| | |
|---|---|
| Number of nodes: | 8 |
| Uses of the node: | compute |
| Vendor: | Intel |
| Model: | R2208GZ4GC |
| CPU Name: | Intel Xeon E5-2697 v2 |
| CPU(s) orderable: | 1-2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 24 |
| Cores per chip: | 12 |
| Threads per core: | 2 |
| CPU Characteristics: | Intel Turbo Boost Technology disabled, 8.0 GT/s QPI, Hyper-Threading enabled |
| CPU MHz: | 2700 |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |
| L3 Cache: | 30 MB I+D on chip per chip, 30 MB shared / 12 cores |
| Other Cache: | None |
| Memory: | 64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC) |
| Disk Subsystem: | Seagate 600 GB SSD ST9600205SS |
| Other Hardware: | None |
| Adapter: | Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller |
| Number of Adapters: | 1 |
| Slot Type: | PCI-Express x8 |
| Data Rate: | 1Gbps Ethernet |
| Ports Used: | 2 |
| Interconnect Type: | Ethernet |
| Adapter: | Mellanox MCX353A-FCAT ConnectX-3 |
| Number of Adapters: | 1 |
| Slot Type: | PCIe x8 Gen3 |
| Data Rate: | InfiniBand 4x FDR |
| Ports Used: | 1 |
| Interconnect Type: | InfiniBand |

### Software

| | |
|---|---|
| Adapter: | Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller |
| Adapter Driver: | e1000 |
| Adapter Firmware: | None |
| Adapter: | Mellanox MCX353A-FCAT ConnectX-3 |
| Adapter Driver: | OFED 1.5.3.1 |
| Adapter Firmware: | 2.10.0 |
| Operating System: | Red Hat EL 6.1, kernel 2.6.32-131 |
| Local File System: | Linux/ext2 |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | Platform LSF 8.0 |

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**Test date:** Aug-2013
**Hardware Availability:** Sep-2013
**Software Availability:** Sep-2013

## Node Description: NFS

### Hardware

| | |
|---|---|
| Number of nodes: | 1 |
| Uses of the node: | fileserver |
| Vendor: | Intel |
| Model: | S7000FC4UR |
| CPU Name: | Intel Xeon CPU |
| CPU(s) orderable: | 1-4 chips |
| Chips enabled: | 4 |
| Cores enabled: | 16 |
| Cores per chip: | 4 |
| Threads per core: | 2 |
| CPU Characteristics: | -- |
| CPU MHz: | 2926 |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 8 MB I+D on chip per chip, 4 MB shared / 2 cores |
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 64 GB |
| Disk Subsystem: | 8 disks, 500GB/disk, 2.7TB total |
| Other Hardware: | None |
| Adapter: | Intel 82563GB Dual-Port Gigabit Ethernet Controller |
| Number of Adapters: | 1 |
| Slot Type: | PCI-Express x8 |
| Data Rate: | 1Gbps Ethernet |
| Ports Used: | 1 |
| Interconnect Type: | Ethernet |

### Software

| | |
|---|---|
| Adapter: | Intel 82563GB Dual-Port Gigabit Ethernet Controller |
| Adapter Driver: | e1000e |
| Adapter Firmware: | N/A |
| Operating System: | RedHat EL 5 Update 4 |
| Local File System: | None |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | None |

## Interconnect Description: IB Switch

### Hardware

| | |
|---|---|
| Vendor: | Mellanox |
| Model: | Mellanox MSX6025F-1BFR |
| Switch Model: | Mellanox MSX6025F-1BFR |
| Number of Switches: | 46 |
| Number of Ports: | 36 |
| Data Rate: | InfiniBand 4x FDR |
| Firmware: | 7.2.0 |
| Topology: | Fat tree |
| Primary Use: | MPI traffic |

### Software

## Interconnect Description: Gigabit Ethernet

| Hardware | | Software |
|---|---|---|
| Vendor: | Force10 Networks | |
| Model: | Force10 S50, Force10 C300 | |
| Switch Model: | Force10 S50, Force10 C300 | |
| Number of Switches: | 15 | |
| Number of Ports: | 48 | |
| Data Rate: | 1Gbps Ethernet, 10Gbps Ethernet | |
| Firmware: | 8.2.1.0 | |
| Topology: | Fat tree | |
| Primary Use: | Cluster File System | |

## Submit Notes

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

## General Notes

```
MPI startup command:
  mpiexec.hydra command was used to start MPI jobs.

BIOS settings:
  Intel Hyper-Threading Technology (SMT): Enabled (default is Enabled)
  Intel Turbo Boost Technology (Turbo)  : Disabled (default is Enabled)

RAM configuration:
  Compute nodes have 2x8-GB RDIMM on each memory channel.

Network:
  Forty six 36-port switches: 18 core switches and 28 leaf switches.
  Each leaf has one link to each core. Remaining 18 ports on 25 of 28 leafs
  are used for compute nodes. On the remaining 3 leafs the ports are used
  for FS nodes and other peripherals.

Job placement:
  Each MPI job was assigned to a topologically compact set of nodes, i.e.
  the minimal needed number of leaf switches was used for each job: 1 switch
  for 24/48/96/192/384 ranks, 2 switches for 768 ranks, 4 switches for 1536 ranks,
  8 switches for 3072 ranks.

Platform LSF was used for job submission. It has no impact on performance.
  Information can be found at: http://www.platform.com
```

# Base Compiler Invocation

C benchmarks:
mpiicc

Continued on next page

## Base Compiler Invocation (Continued)

C++ benchmarks:

126.lammps: `mpiicpc`

Fortran benchmarks:
`mpiifort`

Benchmarks using both Fortran and C:
`mpiicc mpiifort`

## Base Portability Flags

121.pop2: `-DSPEC_MPI_CASE_FLAG`
126.lammps: `-DMPICH_IGNORE_CXX_SEEK`

## Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX-I -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xCORE-AVX-I -no-prec-div`

Fortran benchmarks:
`-O3 -xCORE-AVX-I -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -xCORE-AVX-I -no-prec-div`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_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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