



HPC2002 Result

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Hewlett-Packard Company
hp server rx2600 cluster (1500MHz Itanium2)

SPECchemM2002 = 60.5

SPEC license #: HPG2116 | Tested by: Hewlett-Packard Company | Test site: Richardson, Texas | Test date: Feb-2004 | HW Avail: Oct-2003 | SW Avail: Oct-2003

Benchmark	Reference Time	Runtime	Ratio	10	20	30	40	50	60	70	
371.gamess_m	86400	1428	60.5								

Hardware

CPU: Intel Itanium 2
 CPU MHz: 1500
 FPU: Integrated
 CPU(s) enabled: 88
 CPU(s) orderable: 1 to 2 per node, up to 64 nodes
 Primary Cache: L1 Inst/Data: 16 KB, associativity = 4
 Secondary Cache: L2 Unified: 256 KB, associativity = 8
 L3 Cache: L3 Unified: 6144 KB, associativity = 24
 Other Cache: None
 Memory: 12GB (12 x 1 GB DDR 266 DIMMS per node)
 Disk Subsystem: 1x36GB 10k RPM SCSI system disk per node
 Other Hardware: See Notes section below.

Software

Parallel: MPI
 Processes-Threads: 88
 MPI Processes: 88
 OpenMP Threads: N/A
 Operating System: HP-UX 11i-TCOE B.11.23
 Compiler: HP C/ANSI C Compiler B.11.23
 HP aC++ Compiler B.11.23
 HP Fortran 90 Compiler B.11.23
 HP LIBF90 PHSS_29620
 HP F90 Compiler PHSS_29663
 HP aC++ Compiler PHSS_29655
 HP C Compiler PHSS_29656
 u2comp/be/plugin library PHSS_29657
 HP MPI 02.00.00.00 B6060B
 File System: vxfs (system), vxfs through NFS (benchmark files)
 System State: Multi-user
 Other Software: HP MPI v2.00.00

Notes/Tuning Information

CPU(s) enabled: 88 (two per node, 44 nodes)

Other Hardware:

Computation Network:

GigaBit on-board adapter for Computation, Administration and NFS
 PCI GigaBit card for NFS traffic (GigE-TX adapter A6825A)

NFS file server:

rp5470 (PA-RISC) NFS File Server
 4 PA8700 CPUs 750 MHz. 16 GB of memory
 4 internal disks 73 GB Ultra2 SCSI
 20 external disks 18 GB U160 SCSI striped with LVM across 4 SCSI controllers
 15 external disks 73 GB FibreChannel mirrored with LVM across 2 FC controllers
 which contain the NFS filesystems accessed by the benchmark. These
 NFS filesystems are optimized for security rather than performance.

File Server Network:

HP ProCurve 9308 64-port copper Gigabit Ethernet Switch
 Built-in Gigabit Ethernet Adapters (one per node)

Peak Flags: MPI

```
mpif90 +Ofast +Onodataprefetch $(DAFLAG) +Onolimit +U77
mpicc -Ae +Ofast +Onodataprefetch -DNOUNDERSCORE $(DAFLAG) +Onolimit
OPTIMIZE = -I /opt/mpi/include
DAFLAG = +DD64 +i8 +r8
CPPFLAGS = -I. -C -P
EXTRA_LIBS= +U77 $(DAFLAG) +FPD -minshared
MPILIB=/opt/mpi/lib/hpux64
```

Alternate Source used for Peak:

None



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Notes/Tuning Information (Continued)

Kernel Parameters (/stand/system):

```
maxdsiz      0x7b03a000
maxdsiz_64bit 0x4000000000
maxssiz      0x10000000
maxssiz_64bit 0x40000000
maxtsiz      1073741824
maxtsiz_64bit 4294967296
vps_pagesize 4
vps_ceiling  64
dbc_min_pct  3
dbc_max_pct  3
```

Peak User Environment:

```
use_submit_for_speed=1
submit = /home/f90pack/clust_mpirun $command
```

clust_mpirungames:

```
mpirun -TCP -f appfile
```

appfile:

```
-h rx17-gb -np 2 -e MPI_WORKDIR=$cwd $command
...
-h rx60-gb -np 2 -e MPI_WORKDIR=$cwd $command
```

environment variables in .cshrc

```
setenv MPI_ENABLED ENABLED
setenv IRCDATA ./gamess_us.irc
setenv INPUT ./gamess_us.F05
setenv PUNCH ./gamess_us.dat
setenv INTGRLS ./gamess_us.F08
setenv AOINTS ./gamess_us.F08
setenv MOINTS ./gamess_us.F09
setenv DICTNRY ./gamess_us.F10
setenv DRTFILE ./gamess_us.F11
setenv CIVECTR ./gamess_us.F12
setenv NTNFMFLA ./gamess_us.F13
setenv CIINTS ./gamess_us.F14
setenv WORK15 ./gamess_us.F15
setenv WORK16 ./gamess_us.F16
setenv CSFSAVE ./gamess_us.F17
setenv FOCKDER ./gamess_us.F18
setenv DASORT ./gamess_us.F20
setenv JKFILE ./gamess_us.F23
setenv ORDINT ./gamess_us.F24
setenv EFPIND ./gamess_us.F25
```

LSF used to initiate batch job submissions.
Appfile is generated from within the LSF run.