Mannual Report

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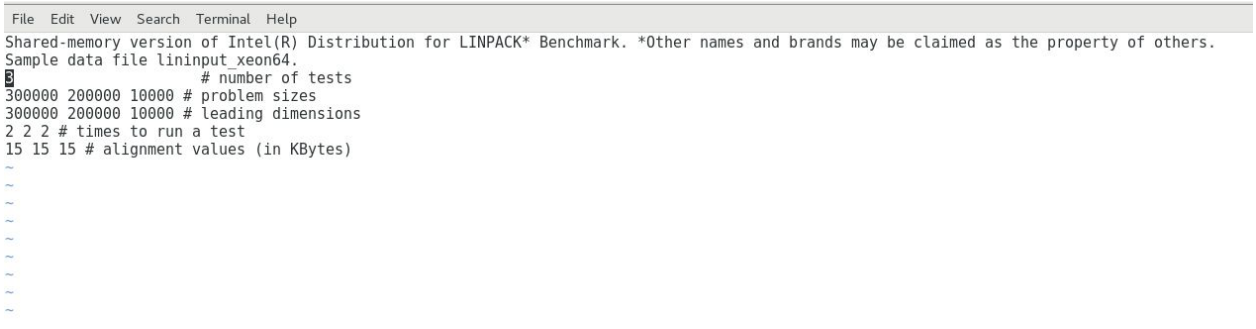
CPU Benchmarking:

1.Steps to Run CPU Benchmark :

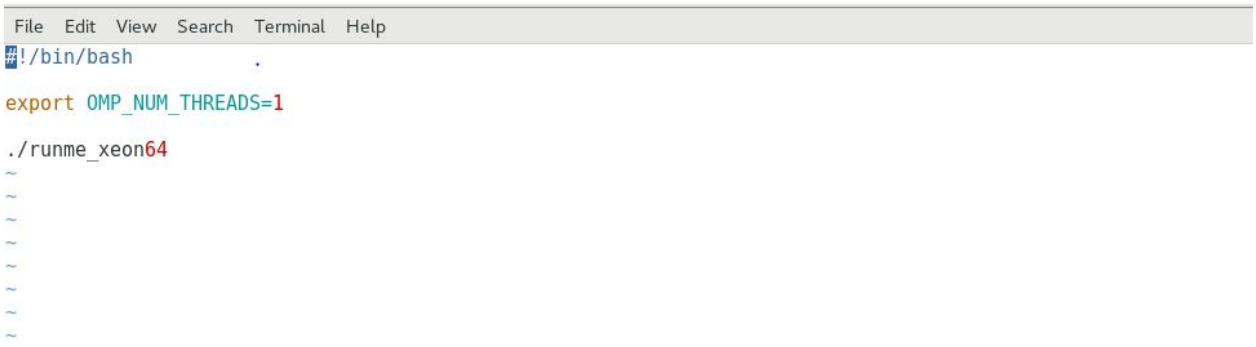
- Use Makefile to compile MyCpuBenchmark.c and name output file mybenchmark.
- Once compiled there are two scripts run1.sh and run2.sh can be used to post jobs on slurm parallelly.
- Run1.sh can be used for QP and HP operations and Run2.sh can be used for SP and DP operations. These scripts use sbatch command to run config files .
- The is individual config file for each operations and for corresponding thread. E.g config_DP_4thread.slurm
- Ech config file has #SBATCH argument and runas the executable.
- Dat file and output_cpu_benchmark.dat are used as input to the executable, Dat files has entry for each operation .
- After the execution output is written into output_cpu_benchmark.dat in formated way.

2.Steps to run Linpack:

- Extract the TAR file and open the specifed folder:
- /exports/home/psingh52/PA1/Linpack/benchmarks_2018/linux/mkl/benchmarks/linpack
- Modify lininput_xeon64 to modify no of test , problem size, and no of time to run the test



- Create a net script file to execute linpack.



- Run linpack-run.sh file.
- It generates output file in the same folder named slurm-12389.out

```
This is a SAMPLE run script for running a shared-memory version of
Intel(R) Distribution for LINPACK* Benchmark. Change it to reflect
the correct number of CPUs/threads, problem input files, etc..
*Other names and brands may be claimed as the property of others.
./runme_xeon64: 35: [: -gt: unexpected operator
Sat Mar 24 17:11:38 UTC 2018
Sample data file lininput_xeon64.

Current date/time: Sat Mar 24 17:11:38 2018

CPU frequency:    3.088 GHz
Number of CPUs: 2
Number of cores: 2
Number of threads: 1

Parameters are set to:

Number of tests: 3
Number of equations to solve (problem size) : 300000 200000 10000
Leading dimension of array                  : 300000 200000 10000
Number of trials to run                     : 2     2     2
Data alignment value (in Kbytes)            : 15    15    15

Maximum memory requested that can be used=800215360, at the size=10000

=================== Timing linear equation system solver ===================

Size   LDA    Align. Time(s)    GFlops   Residual     Residual(norm) Check
10000  10000  15     17.469     38.1740  1.041791e-10 3.673460e-02   pass
10000  10000  15     16.951     39.3409  1.041791e-10 3.673460e-02   pass

Performance Summary (GFlops)

Size   LDA    Align.  Average  Maximal
10000  10000  15      38.7574  39.3409

Residual checks PASSED

End of tests

Done: Sat Mar 24 17:12:18 UTC 2018
~
~
~
"slurm-12940.out" 41L, 1368C
```

We can take Gflops values from the output file and store it in table .

Memory Benchmark:

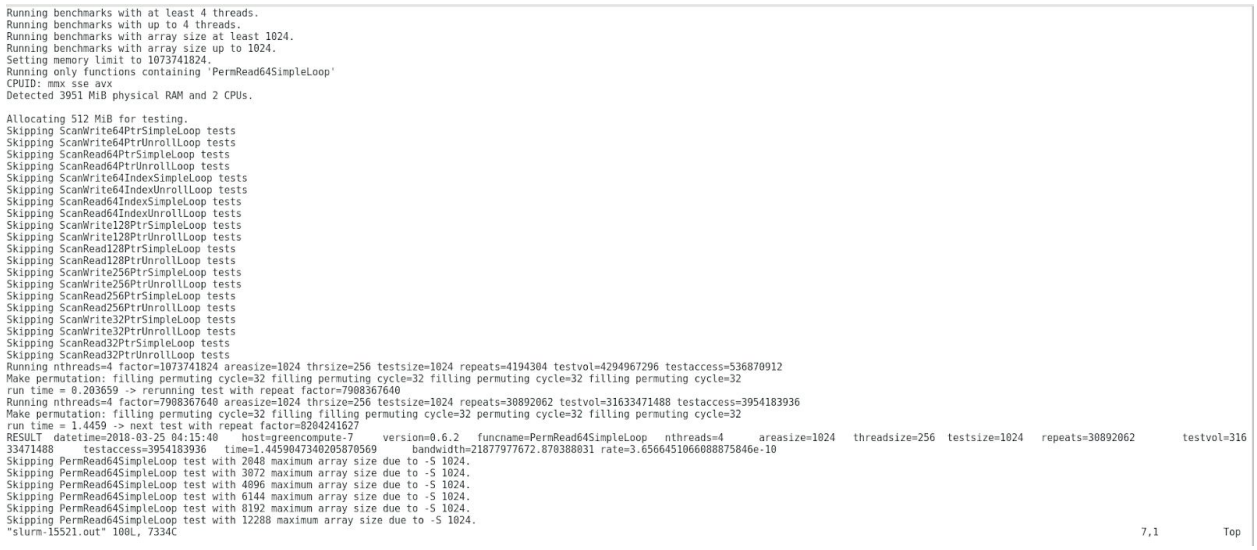
1. Steps to execute Mem Benchmark:

- Use Makefile to compile MyMemBenchmark.c and name output file mymembenchmark.
- Once compiled there are two scripts run1.sh, run2.sh and run3.sh can be used to post jobs on slurm parallelly. Run ach script individually one at a time for RWRand RWS
- These scripts use sbatch command to run config files.
- The is individual config file for each operations and for corresponding thread. E.g config_RWR_1000_1thread.slurm this can be created usinf mem-config-creator.sh
- Each config file has #SBATCH argument and runs the executable.
- Dat file and output_mem_benchmark.dat are used as input to the executable, Dat files has entry for each operation .
- After the execution output is written into output_mem_benchmark.dat in formated way.

2. Steps to execute Pmbw:

- Create a script to execute pmbw name pmbw1.sh

- Execute the script it runs the pmbw for all the parameter listed -s for size and -p for threads Permread32Simpleloop is for random read.
- Pmbw creates output file in same folder named as e.g slurm-15343.slurm.



This file provide bandwidth value in bytes/sec convert to GB/sec

Disk Benchmark:

1. Steps to execute Disk Benchmark:

- Use Makefile to compile MyDiskBenchmark.c and name output file mydiskbenchmark.
- Once compiled there are five scripts run1.sh, run2.sh, run3.sh, run4.sh and run5.sh can be used to post jobs on slurm parallelly. Run ach script individually one at a time for RR, RS, WS, WR operations.
- Run6.sh can be used to trigger jobs for measuring latency i.e RR and WR with 1KB data.
- These scripts use sbatch command to run config files.
- The is individual config file for each operations and for corresponding thread. E.g config_RR_1000_1thread.slurm this can be created using disk-config-creator.sh and disk-config-creator-latency.sh
- Each config file has #SBATCH argument and runs the executable.
- Dat file and output_disk_Latency.dat and output_disk_throughput.dat are used as input to the executable, Dat files has entry for each operation .
- After the execution output is written into output_disk_latency.dat and output_disk_latency.dat in formated way.

- Steps to execute IOZONE:
- Create script to execute iozone named IOzone.sh
- Sevelat parameters can be used to execute -s indicates file size, -r blocksize, -i for type or operations .

Network Benchmark:

1.Steps to execute Network benchmark:

- Use Makefile to compile MynetbenchTCP.c and MynetbenchUDP.c name output file mynetbenchtcp and netbenchudp.
- Once compiled there are three scripts run1.sh, run2.sh, run3.sh can be used to post jobs on slurm parallelly. Run ach script individually one at a time to run TCP and UDP both operations.
- Run3.sh can be used to trigger jobs for measuring latency on 1B data.
- These scripts use sbatch command to run config files.
- The is individual config file for each operations and for corresponding thread. E.g config_TCP_1000_1thread.slurm this can be created using TCP-config-creator.sh and UDP-config-creator.sh.
- Each config file uses tcp-run.sh and udp-run.sh to execute the executables.
- Each config file has #SBATCH argument and runs the executable.
- Dat file and output_net_throughput.dat are used as input to the executable, Dat files has entry for each operation .
- After the execution output is written into output_net_throughput.dat in formated way.

2.Steps to execute Iperf:

- Create iperf-run.sh and iperf-config.slurm
- Iperf-config.slurm uses iperf-run.sh to execute to iperf in server and client mode both.

```
#!/bin/bash

name=$(echo $1 | cut -d '-' -f1 -)
node1=$(echo $1 | cut -d '-' -f2 - | tr -d '[')
node2=$(echo $1 | cut -d '-' -f3 - | tr -d ']')
if [ "$(hostname)" == "$name-$node1" ]
then
        iperf3 -s
else
        sleep 20
        iperf3 -c $name-$node1 -P 2
fi
~
~
~
~
```

And

```
File  Edit  View  Search  Terminal  Help
#!/bin/bash
#SBATCH --nodes=2
#SBATCH --ntasks=2
#SBATCH --output=output-2.out
#SBATCH --wait-all-nodes=1
srun iperf-tcp-2run.sh $SLURM_JOB_NODELIST
~
~
~
~
~
~
~
~
```

This creates output file in same folder

File Edit View Search Terminal Help

```
[  6]   1.00-2.00   sec  75.0 MBytes   629 Mbits/sec   42    257 KBytes
[SUM]   1.00-2.00   sec   165 MBytes  1.39 Gbits/sec   46
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   2.00-3.00   sec  84.2 MBytes   706 Mbits/sec    3    255 KBytes
[  6]   2.00-3.00   sec  85.1 MBytes   714 Mbits/sec    5    361 KBytes
[SUM]   2.00-3.00   sec   169 MBytes  1.42 Gbits/sec    8
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   3.00-4.00   sec  73.1 MBytes   613 Mbits/sec   20    252 KBytes
[  6]   3.00-4.00   sec  97.3 MBytes   816 Mbits/sec    3    438 KBytes
[SUM]   3.00-4.00   sec   170 MBytes  1.43 Gbits/sec   23
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   4.00-5.00   sec  80.4 MBytes   674 Mbits/sec   18    334 KBytes
[  6]   4.00-5.00   sec  90.3 MBytes   757 Mbits/sec   39    283 KBytes
[SUM]   4.00-5.00   sec   171 MBytes  1.43 Gbits/sec   57
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   5.00-6.00   sec   102 MBytes   853 Mbits/sec    7    298 KBytes
[  6]   5.00-6.00   sec  68.1 MBytes   572 Mbits/sec    4    315 KBytes
[SUM]   5.00-6.00   sec   170 MBytes  1.42 Gbits/sec   11
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   6.00-7.00   sec  61.7 MBytes   518 Mbits/sec   23    242 KBytes
[  6]   6.00-7.00   sec   110 MBytes   924 Mbits/sec   22    404 KBytes
[SUM]   6.00-7.00   sec   172 MBytes  1.44 Gbits/sec   45
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   7.00-8.00   sec  52.5 MBytes   441 Mbits/sec   12    281 KBytes
[  6]   7.00-8.00   sec   113 MBytes   950 Mbits/sec   44    324 KBytes
[SUM]   7.00-8.00   sec   166 MBytes  1.39 Gbits/sec   56
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   8.00-9.00   sec  78.4 MBytes   657 Mbits/sec   31    358 KBytes
[  6]   8.00-9.00   sec  86.4 MBytes   725 Mbits/sec   19    307 KBytes
[SUM]   8.00-9.00   sec   165 MBytes  1.38 Gbits/sec   50
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]   9.00-10.00  sec  90.2 MBytes   757 Mbits/sec   37    304 KBytes
[  6]   9.00-10.00  sec  77.9 MBytes   653 Mbits/sec   12    211 KBytes
[SUM]   9.00-10.00  sec   168 MBytes  1.41 Gbits/sec   49
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retr
[  4]   0.00-10.00  sec   799 MBytes   670 Mbits/sec  209             sender
[  4]   0.00-10.00  sec   797 MBytes   669 Mbits/sec                  receiver
[  6]   0.00-10.00  sec   881 MBytes   739 Mbits/sec  237             sender
[  6]   0.00-10.00  sec   879 MBytes   737 Mbits/sec                  receiver
[SUM]   0.00-10.00  sec  1.64 GBytes  1.41 Gbits/sec  446             sender
[SUM]   0.00-10.00  sec  1.64 GBytes  1.41 Gbits/sec                  receiver

iperf Done.
```