

CSE2005L - Operating Systems Lab

Lab 5 - Sequential and Random I/O Test

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Using dd command

```
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=1M  
count=100
```

```
100+0 records in
```

```
100+0 records out
```

```
104857600 bytes (105 MB, 100 MiB) copied, 0.0513191 s, 2.0  
GB/s
```

```
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=1M  
count=100 conv=fdatasync
```

```
100+0 records in
```

```
100+0 records out
```

```
104857600 bytes (105 MB, 100 MiB) copied, 0.0915472 s, 1.1  
GB/s
```

```
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=64k  
count=3200 conv=fdatasync
```

```
3200+0 records in
```

```
3200+0 records out
```

```
209715200 bytes (210 MB, 200 MiB) copied, 0.351692 s, 596  
MB/s
```

```
pranavchendur@ubuntu:~$ dd if=speedtest of=/dev/null bs=64k  
count=24000
```

```
3200+0 records in
```

```
3200+0 records out
```

```
209715200 bytes (210 MB, 200 MiB) copied, 0.0302544 s, 6.9  
GB/s
```

```
Terminal
pranavchendur@ubuntu:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents  examples.desktop  Pictures  Templates
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=1M count=100
100+0 records in
100+0 records out
104857600 bytes (105 MB, 100 MiB) copied, 0.0513191 s, 2.0 GB/s
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=1M count=100 conv=fdatasync
100+0 records in
100+0 records out
104857600 bytes (105 MB, 100 MiB) copied, 0.0915472 s, 1.1 GB/s
pranavchendur@ubuntu:~$ dd if=/dev/zero of=speedtest bs=64k count=3200 conv=fdatasync
3200+0 records in
3200+0 records out
209715200 bytes (210 MB, 200 MiB) copied, 0.351692 s, 596 MB/s
pranavchendur@ubuntu:~$ tune2fs -l /dev/sda1
tune2fs 1.42.13 (17-May-2015)
tune2fs: Permission denied while trying to open /dev/sda1
Couldn't find valid filesystem superblock.
pranavchendur@ubuntu:~$ sudo tune2fs -l /dev/sda1
[sudo] password for pranavchendur:
Sorry, try again.
[sudo] password for pranavchendur:
tune2fs 1.42.13 (17-May-2015)
invalidates1
pranavchendur@ubuntu:~$ fio random-read-test.fio
^C
pranavchendur@ubuntu:~$
```

```
pranavchendur@ubuntu:~$ sudo tune2fs -l /dev/sda1
[sudo] password for pranavchendur:
Sorry, try again.
[sudo] password for pranavchendur:
tune2fs 1.42.13 (17-May-2015)
Filesystem volume name:      <none>
Last mounted on:             /
Filesystem UUID:
4430cccb-9d3a-4c89-a274-4243e9c845aa
Filesystem magic number:     0xEF53
Filesystem revision #:       1 (dynamic)
Filesystem features:         has_journal ext_attr resize_inode
dir_index filetype needs_recovery extent flex_bg sparse_super
large_file huge_file uninit_bg dir_nlink extra_isize
Filesystem flags:            signed_directory_hash
Default mount options:       user_xattr acl
Filesystem state:            clean
Errors behavior:             Continue
```

Filesystem OS type: Linux
Inode count: 1048576
Block count: 4194048
Reserved block count: 209702
Free blocks: 3179232
Free inodes: 861685
First block: 0
Block size: 4096
Fragment size: 4096
Reserved GDT blocks: 1023
Blocks per group: 32768
Fragments per group: 32768
Inodes per group: 8192
Inode blocks per group: 512
Flex block group size: 16
Filesystem created: Thu Mar 23 11:15:01 2017
Last mount time: Thu Mar 23 05:49:46 2017
Last write time: Thu Mar 23 05:49:44 2017
Mount count: 2
Maximum mount count: -1
Last checked: Thu Mar 23 11:15:01 2017
Check interval: 0 (<none>)
Lifetime writes: 4965 MB
Reserved blocks uid: 0 (user root)
Reserved blocks gid: 0 (group root)
First inode: 11
Inode size: 256
Required extra isize: 28
Desired extra isize: 28
Journal inode: 8
First orphan inode: 658546
Default directory hash: half_md4
Directory Hash Seed:
c223ba2d-ca03-481a-8c2a-192d44ef682c
Journal backup: inode blocks

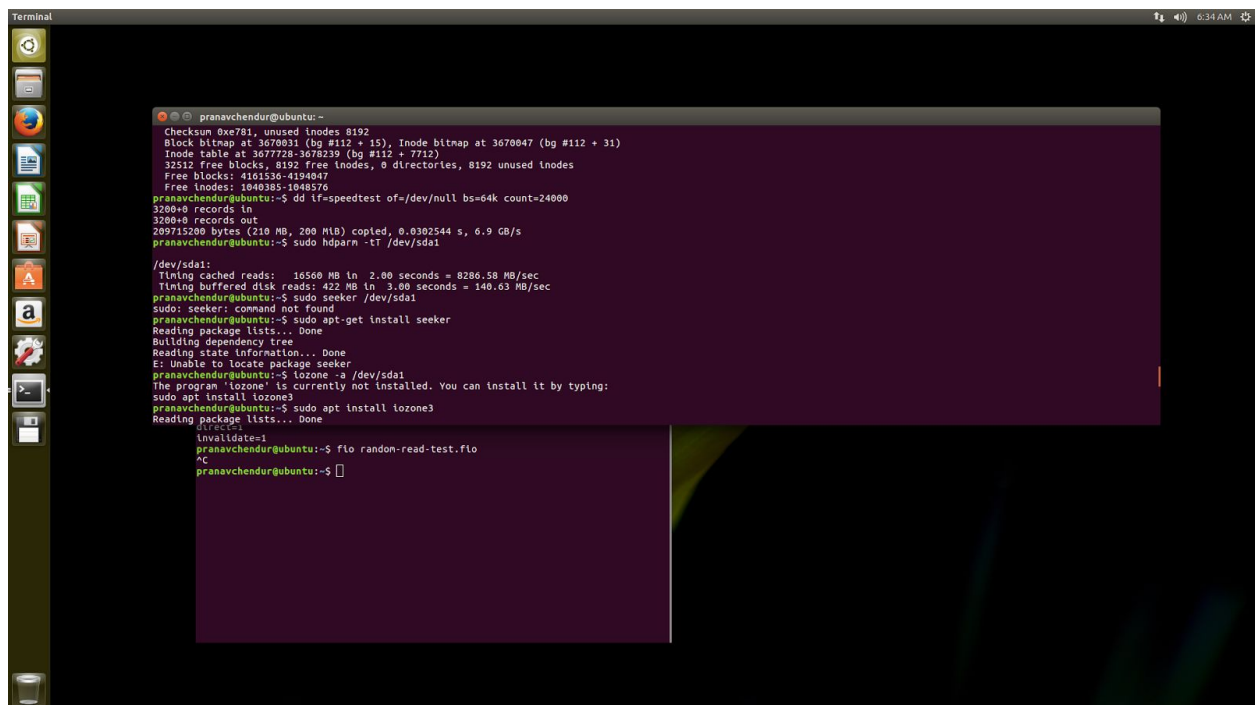
Using HDPARM

```
pranavchendur@ubuntu:~$ sudo hdparm -tT /dev/sda1
```

```
/dev/sda1:
```

```
Timing cached reads:    16560 MB in  2.00 seconds = 8286.58 MB/sec
```

```
Timing buffered disk reads: 422 MB in  3.00 seconds = 140.63 MB/sec
```

A screenshot of a Linux terminal window. The terminal shows the output of the 'hdparm' command, which reports disk performance metrics for /dev/sda1. It also shows the user attempting to install the 'seeker' package using 'apt-get', which fails because the package is not found. The user then attempts to install 'iozone3' using 'apt-get', which also fails. The terminal output includes details about disk checks, block bitmaps, and free space, as well as the results of the 'dd' and 'hdparm' commands. The user's prompt is 'pranavchendur@ubuntu:~\$'.

Read Write Benchmark Test using iotzone

```
pranavchendur@ubuntu:~$ iotzone -a /dev/sda1
```

```
Iozone: Performance Test of File I/O
```

```
Version $Revision: 3.429 $
```

```
Compiled for 64 bit mode.
```

```
Build: linux-AMD64
```

Contributors:William Norcott, Don Capps, Isom Crawford,
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Gavin Brebner,

Jean-Marc Zucconi, Jeff Blomberg, Benny
Halevy, Dave Boone,

Erik Habbinga, Kris Strecker, Walter Wong,
Joshua Root,

Fabrice Bacchella, Zhenghua Xue, Qin Li,
Darren Sawyer,

Vangel Bojaxhi, Ben England, Vikentsi Lapa.

Run began: Thu Mar 23 06:20:41 2017

Auto Mode

Command line used: iotest -a /dev/sda1

Output is in kBytes/sec

Time Resolution = 0.000001 seconds.

Processor cache size set to 1024 kBytes.

Processor cache line size set to 32 bytes.

File stride size set to 17 * record size.

```
Terminal File Edit View Search Terminal Help
Preparing to unpack .../lozone3.429-3 and 64.deb ...
Unpacking lozone3 (429-3) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up lozone3 (429-3) ...
pranavchendur@ubuntu:~$ lozone -a /dev/sda1
lozone: Performance Test of File I/O
Version Revision: 3.429 5
Compiled for 64 bit mode.
Build: Linux-AMD64

Contributors:William Norcott, Don Capps, Isom Crawford, Kirby Collins
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Jean-Marc Zucconi, Jeff Blomberg, Benny Halevy, Dave Boone,
Erik Hobbings, Kris Strecker, Welter Hong, Joshua Root,
Fabrice Bacchella, Zhenghua Xue, Qin Li, Darren Sawyer,
Vangel Bojaxhi, Ben England, Vikentsi Lapa.

Run began: Thu Mar 23 06:20:41 2017

Auto Mode
Command line used: lozone -a /dev/sda1
Output is in kBBytes/sec
Time Resolution = 0.000001 seconds.
Processor cache size set to 1024 Kbytes.
Processor cache line size set to 32 bytes.
File stride size set to 17 * record size.

kB reclen write rewrite read reread random random bkwrd record stride
write read reread read write read write read write fwrite frewrite fread freread
64 4 576282 2467108 2772930 7100397 7293312 2298136 4988978 1452528 5389653 1526887 2283800 3165299 5868307
64 8 1165356 2892445 7940539 9318832 7046539 1870725 6421025 2806158 5735102 2467108 3057153 7940539 12902017
64 16 998622 2283800 4897948 5389653 5868307 1083249 3822727 983980 6421025 1526887 2283800 3958892 7946539
64 32 1163636 2652169 10482178 10821524 10821524 2067979 1780008 2133730 6271021 2278628 2467108 7180397 15972885
64 64 1124074 1991276 9886179 12962017 10821524 2278628 1780397 1791156 6421025 2067979 2283800 9686179 15972885
128 4 1471662 1888829 7176872 7882197 6406138 2098744 5847894 2571150 5843808 1684086 1684086 6727225 8548124
128 8 1111981 1359835 4487681 2058589 1802755 1492113 3853774 3388677 9977956 1939522 2409592 8414153 11470204
128 16 1561553 2558895 8548124 9129573 8548124 2558895 6727225 2673584 3388677 2511022 2727923 8414153 11470204
128 32 1579934 2727923 9795896 9977956 9977956 2727923 4267461 2905956 4717434 3536566 2928861 9795896 12842051
128 64 1663139 2666335 9795896 11720614 10779307 2688629 9129573 2286447 8036304 231529 2066432 7176872 12542043
128 128 581781 1584659 9795896 5325799 9795896 1705404 8036304 3560017 9129573 1561553 3193660 7582312 9129573
256 4 1248819 2038593 6249745 6249745 6107540 2557711 548265 3511189 6554972 2842047 2783115 2911402 4496299
256 8 1286714 1260547 5217259 6249745 8271916 2118645 5971678 3935921 7735574 2371308 2392442 5455847 5087020
256 16 1942349 3865082 8288677 7518908 8888172 3605511 7518908 4496299 10651598 2588541 3785840 8534922 11695808
256 32 2049885 2943325 3865082 6719046 5328671 2582316 3123186 3275543 5540388 2539563 4117018 9114515 12812277
256 64 1122215 3879845 8534922 9114515 9778562 4264168 8815202 4734192 10245071 3326279 2458168 8534922 4197489
256 128 1610276 2719671 4496299 7965107 9868433 3511189 7314033 2533571 5717301 2223962 2170027 7873132 9114515
256 256 1763685 2225451 9114515 12228612 10651598 3275543 6390720 1985448 478536 2325894 2880164 3236856 5569035
512 4 1144020 2486072 5384786 5495916 6472112 958758 5453155 335278 3527371 294541 2880557 6818636 4494470
512 8 2873249 738777 4262523 3822466 3228553 2107844 4571003 2725905 5624545 3201349 2265742 5566231 6821616
512 16 1546280 3384088 5684895 5822884 7871843 3934520 7334159 4838792 8109658 1710197 3653390 4411377 7647578
512 32 1947931 2560168 6246213 6818636 7647578 2750343 6736026 2728892 11138071 3768799 3659616 5278002 6031721
512 64 2116152 3628697 6395818 5760329 7211022 2557119 5278892 3628697 10235583 3628697 4131319 8140399 8956998
512 128 2225810 2782414 7115451 7540170 11374040 3086326 5867142 1999881 8394979 3684733 3527371 7513788 8808176
512 256 2285929 3941742 8140399 8808176 10044089 4262523 3710197 4784885 6726026 3201349 1127402 6571132 8791110
512 512 2063289 3684733 5227492 12215897 10235583 3372274 5566231 3415178 3366987 1450212 758612 5227492 8808176
1024 4 1761188 2226749 5885883 4949226 6208343 2343383 3586651 3335105 3631168 2514903 2729032 3200886 4854136
1024 8 1917562 2875184 6182490 6441187 6918376 7291652 5699162 4594582 5813392 2503178 3355185 4689294 5885883
1024 16 2295784 4914717 6059442 5983467 8391792 3251778 5983467 5071963 6059442 1272162 2934110 3469823 6918376
1024 32 2392998 3941039 6733974 3130886 4339202 2820430 6059442 3603747 5479632 1718120 3618930 2432298 5728477
1024 64 2111788 3311959 3597824 5194651 7257394 4147479 6163794 4249053 12288350 3438508 1267398 6288943 6137371
1024 128 2211841 2738767 7113161 5885983 9226512 4339202 6825439 4162573 7066349 3722435 2781567 4654248 7269678
```

Using FIO for I/O Test

Test 1

```
pranavchendur@ubuntu:~$ cat io-test-1.fio
; -- start job file --
[random-writers]
rw=randrw
size=50m
numjobs=1
; -- end job file --

pranavchendur@ubuntu:~$ fio io-test-1.fio
random-writers: (g=0): rw=randrw, bs=4K-4K/4K-4K/4K-4K, ioengine=sync, iodepth=1
fio-2.2.10
Starting 1 process
random-writers: Laying out IO file(s) (1 file(s) / 50MB)
random-writers: (groupid=0, jobs=1): err= 0: pid=6539: Thu Mar 23 06:38:04 2017
    read : io=25660KB, bw=693476B/s, iops=169, runt= 37890msec
        clat (usec): min=218, max=88075, avg=5871.29, stdev=6134.10
        lat (usec): min=218, max=88075, avg=5871.75, stdev=6134.08
        clat percentiles (usec):
            | 1.00th=[ 438], 5.00th=[ 588], 10.00th=[ 692], 20.00th=[ 828],
            | 30.00th=[ 916], 40.00th=[ 2832], 50.00th=[ 5216], 60.00th=[ 7008],
            | 70.00th=[ 8512], 80.00th=[ 9920], 90.00th=[11840], 95.00th=[13376],
```

```
Run status group 0 (all jobs):
```

Disk stats (read/write):

```
pranavchendur@ubuntu:~$ cat io-test-1.flo
# -- start job file --
[random-writers]
rwr=ndrw
size=50m
numJobs=1
# -- end job file --
pranavchendur@ubuntu:~$ fio io-test-1.flo
random-writers: (w=0): rwr=ndrw, bs=4K-4K/4K-4K, loengne=sync, iodepth=1
Start:2.2.10
Starting 1 process
random-writers: laying out io files(s) (4 files(s) / 50MB)
Jobs: 1 (f=1): [m=1] [7.4% done] [651KB/595KB/0KB /s] [162/148/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [9.3% done] [598KB/479KB/0KB /s]
[149/119/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [11.9% done] [650KB/705KB/0KB /s] [162/176/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [14.
0% done] [660KB/762KB/0KB /s] [162/159/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [17.3% done] [658KB/520KB/0KB /s] [164/131/0 iops] [eta 0
0mJobs: 1 (f=1): [m=1] [20.0% done] [714KB/654KB/0KB /s] [178/163/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [24.8% done] [603KB/655KB/0KB /s]
[165/162/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [26.8% done] [635KB/555KB/0KB /s] [158/139/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [29
.3% done] [622KB/705KB/0KB /s] [155/176/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [31.7% done] [630KB/700KB/0KB /s] [157/176/0 iops] [eta
00mJobs: 1 (f=1): [m=1] [34.4% done] [711KB/607KB/0KB /s] [177/166/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [36.0% done] [627KB/611KB/0KB /s]
[156/152/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [39.0% done] [630KB/546KB/0KB /s] [157/136/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [4
1.5% done] [606KB/746KB/0KB /s] [151/186/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [43.9% done] [603KB/715KB/0KB /s] [150/178/0 iops] [eta
00mJobs: 1 (f=1): [m=1] [46.3% done] [760KB/610KB/0KB /s] [176/153/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [50.0% done] [691KB/670KB/0K
B /s] [172/169/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [51.2% done] [471KB/491KB/0KB /s] [117/122/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [53.7% done] [578KB/570KB/0KB /s] [144/142/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [56.1% done] [729KB/741KB/0KB /s] [182/185/0 iops] [et
a 00mJobs: 1 (f=1): [m=1] [58.5% done] [642KB/654KB/0KB /s] [160/163/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [61.0% done] [578KB/554KB/0
KB /s] [144/189/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [65.0% done] [660KB/742KB/0KB /s] [160/185/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [65.9% done] [614KB/594KB/0KB /s] [153/148/0 iops] [eta 00mJobs: 1 (f=1): [m=1] [70.0% done] [678KB/678KB/0KB /s] [169/169/0 iops]
Jobs: 1 (f=1): [m=1] [97.4% done] [1133KB/1063KB/0KB /s] [283/266/0 iops] [eta 00m:01s]
random-writers: (grouped, jobs=1): err=0: pld=039s: Thu Mar 23 06:38:04 2017
read : io=2560KB, bw=693476B/s, iops=169, runt= 37890msec
clat (usec): min=218, max=88075, avg=5871.29, stdev=6134.10
lat (usec): min=218, max=88075, avg=5871.75, stdev=6134.08
clat percentiles (usec):
| 1.00th=[ 438], 5.00th=[ 588], 10.00th=[ 692], 20.00th=[ 828],
| 30.00th=[ 916], 40.00th=[ 2812], 50.00th=[ 7608], 60.00th=[ 7608],
| 70.00th=[ 8512], 80.00th=[ 9920], 90.00th=[11840], 95.00th=[13376],
| 99.00th=[29568], 99.50th=[35072], 99.90th=[61184], 99.95th=[66648],
| 99.99th=[88576]
bw (KB /s): min= 215, max= 1373, per=98.33%, avg=665.08, stdev=154.74
write: io=25540KB, bw=690233B/s, iops=168, runt= 37890msec
clat (usec): min=1, max=1392, avg=22.42, stdev=30.97
lat (usec): min=1, max=1392, avg=22.99, stdev=31.23
```

Test 2

```
pranavchendur@ubuntu:~$ cat random-read-test.fio
; random read of 128mb of data
```

```
[random-read]
rw=randread
size=128m
directory=/home/
```

```
pranavchendur@ubuntu:~$ sudo fio random-read-test.fio
[sudo] password for pranavchendur:
random-read: (g=0): rw=randread, bs=4K-4K/4K-4K/4K-4K, ioengine=sync, iodepth=1
fio-2.2.10
Starting 1 process
random-read: Laying out IO file(s) (1 file(s) / 128MB)
```

```
random-read: (groupid=0, jobs=1): err= 0: pid=6593: Thu Mar 23 06:44:36 2017
read : io=131072KB, bw=570847B/s, iops=139, runt=235120msec
  clat (usec): min=127, max=235469, avg=7165.86, stdev=6560.45
    lat (usec): min=127, max=235469, avg=7166.48, stdev=6560.47
  clat percentiles (usec):
    | 1.00th=[ 454], 5.00th=[ 628], 10.00th=[ 796], 20.00th=[ 2448],
    | 30.00th=[ 4192], 40.00th=[ 5344], 50.00th=[ 6496], 60.00th=[ 7712],
    | 70.00th=[ 8896], 80.00th=[10048], 90.00th=[11328], 95.00th=[16064],
    | 99.00th=[33536], 99.50th=[37120], 99.90th=[61184], 99.95th=[71168],
    | 99.99th=[95744]
  bw (KB /s): min= 119, max= 2506, per=99.39%, avg=553.59, stdev=178.40
  lat (usec) : 250=0.32%, 500=1.35%, 750=6.86%, 1000=9.56%
  lat (msec) : 2=1.61%, 4=9.05%, 10=51.14%, 20=16.66%, 50=3.24%
  lat (msec) : 100=0.20%, 250=0.01%
  cpu          : usr=0.02%, sys=2.61%, ctx=32795, majf=0, minf=10
  IO depths    : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%
    submit     : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
    complete   : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
    issued    : total=r=32768/w=0/d=0, short=r=0/w=0/d=0, drop=r=0/w=0/d=0
    latency   : target=0, window=0, percentile=100.00%, depth=1
```

```
Run status group 0 (all jobs):
```

```
  READ: io=131072KB, aggrb=557KB/s, minb=557KB/s, maxb=557KB/s,
mint=235120msec, maxt=235120msec
```

```
Disk stats (read/write):
```

```
  sda: ios=32765/157, merge=0/182, ticks=237944/136, in_queue=238080,
util=99.46%
```



```
pranavchendur@ubuntu:~$  
[r11] [56.6% done] [351KB/OKB/OKB /s] [87/0/0 tops] [eta 01m:48sJobs: 1 (f=1): [r11] [57.3% done] [562KB/OKB/OKB /s] [140/0/0 tops] [eta 01m:40Jobs: 1 (f=1): [r11] [57.7% done] [558KB/OKB/OKB /s] [139/0/0 tops] [eta 01m:45Jobs: 1 (f=1): [r11] [57.8% done] [455KB/OKB/OKB /s] [113/0/0 tops] [eta 01m:45Jobs: 1 (f=1): [r11] [58.2% done] [315KB/OKB/OKB /s] [78/0/0 tops] [eta 01m:44sJobs: 1 (f=1): [r11] [58.4% done] [175KB/OKB/OKB /s] [43/0/0 tops] [eta 01m:44sJobs: 1 (f=1): [r11] [58.3% done] [151KB/OKB/OKB /s] [37/0/0 tops] [eta 01m:45sJobs: 1 (f=1): [r11] [58.7% done] [495KB/OKB/OKB /s] [123/0/0 tops] [eta 01m:44Jobs: 1 (f=1): [r11] [59.4% done] [610KB/OKB/OKB /s] [152/0/0 tops] [eta 01m:42Jobs: 1 (f=1): [r11] [59.5% done] [471KB/OKB/OKB /s] [117/0/0 tops] [eta 01m:42Jobs: 1 (f=1): [r11] [60.2% done] [547KB/OKB/OKB /s] [136/0/0 tops] [eta 01m:40Jobs: 1 (f=1): [r11] [60.6% done] [627KB/OKB/OKB /s] [156/0/0 tops] [eta 01m:39Jobs: 1 (f=1): [r11] [61.0% done] [586KB/OKB/OKB /s] [146/0/0 tops] [eta 01m:38Jobs: 1 (f=1): [r11] [61.4% done] [562KB/OKB/OKB /s] [140/0/0 tops] [eta 01m:37Jobs: 1 (f=1): [r11] [61.8% done] [567KB/OKB/OKB /s] [144/0/0 tops] [eta 01m:36Jobs: 1 (f=1): [r11] [62.4% done] [574KB/OKB/OKB /s] [143/0/0 tops] [eta 01m:34Jobs: 1 (f=1): [r11] [62.8% done] [558KB/OKB/OKB /s] [139/0/0 tops] [eta 01m:33Jobs: 1 (f=1): [r11] [62.9% done] [431KB/OKB/OKB /s] [107/0/0 tops] [eta 01m:33Jobs: 1 (f=1): [r11] [63.3% done] [343KB/OKB/OKB /s] [85/0/0 tops] [eta 01m:32sJobs: 1 (f=1): [r11] [63.7% done] [562KB/OKB/OKB /s] [140/0/0 tops] [eta 01m:31Jobs: 1 (f=1): [r11] [64.1% done] [387KB/OKB/OKB /s] [136/0/0 tops] [eta 01m:30sJobs: 1 (f=1): [r11] [64.5% done] [538KB/OKB/OKB /s] [134/0/0 tops] [eta 01m:28Jobs: 1 (f=1): [r11] [64.9% done] [538KB/OKB/OKB /s] [134/0/0 tops] [eta 01m:28Jobs: 1 (f=1): [r11] [65.3% done] [490KB/OKB/OKB /s] [124/0/0 tops] [eta 01m:27Jobs: 1 (f=1): [r11] [65.5% done] [330KB/OKB/OKB /s] [84/0/0 tops] [eta 01m:27Jobs: 1 (f=1): [r11] [65.9% done] [571KB/OKB/OKB /s] [117/0/0 tops] [eta 01m:26Jobs: 1 (f=1): [r11] [66.3% done] [502KB/OKB/OKB /s] [125/0/0 tops] [eta 01m:25Jobs: 1 (f=1): [r11] [66.7% done] [558KB/OKB/OKB /s] [139/0/0 tops] [eta 01m:24Jobs: 1 (f=1): [r11] [67.3% done] [654KB/OKB/OKB /s] [163/0/0 tops] [eta 01m:22Jobs: 1 (f=1): [r11] [67.7% done] [522KB/OKB/OKB /s] [138/0/0 tops] [eta 01m:21Jobs: 1 (f=1): [r11] [68.1% done] [534KB/OKB/OKB /s] [133/0/0 tops] [eta 01m:20Jobs: 1 (f=1): [r11] [68.5% done] [554KB/OKB/OKB /s] [138/0/0 tops] [eta 01m:19Jobs: 1 (f=1): [r11] [68.9% done] [518KB/OKB/OKB /s] [122/0/0 tops] [eta 01m:18Jobs: 1 (f=1): [r11] [69.3% done] [574KB/OKB/OKB /s] [143/0/0 tops] [eta 01m:17Jobs: 1 (f=1): [r11] [69.7% done] [443KB/OKB/OKB /s] [110/0/0 tops] [eta 01m:16Jobs: 1 (f=1): [r11] [70.1% done] [526KB/OKB/OKB /s] [131/0/0 tops] [eta 01m:15Jobs: 1 (f=1): [r11] [70.5% done] [594KB/OKB/OKB /s] [148/0/0 tops] [eta 01m:14Jobs: 1 (f=1): [r11] [70.9% done] [518KB/OKB/OKB /s] [122/0/0 tops] [eta 01m:13Jobs: 1 (f=1): [r11] [71.3% done] [522KB/OKB/OKB /s] [130/0/0 tops] [eta 01m:12Jobs: 1 (f=1): [r11] [71.7% done] [518KB/OKB/OKB /s] [122/0/0 tops] [eta 01m:11Jobs: 1 (f=1): [r11] [72.1% done] [551KB/OKB/OKB /s] [137/0/0 tops] [eta 01m:10Jobs: 1 (f=1): [r11] [72.5% done] [614KB/OKB/OKB /s] [153/0/0 tops] [eta 01m:09Jobs: 1 (f=1): [r11] [73.2% done] [587KB/OKB/OKB /s] [140/0/0 tops] [eta 01m:07Jobs: 1 (f=1): [r11] [73.6% done] [547KB/OKB/OKB /s] [136/0/0 tops] [eta 01m:06Jobs: 1 (f=1): [r11] [73.7% done] [355KB/OKB/OKB /s] [88/0/0 tops] [eta 01m:06sJobs: 1 (f=1): [r11] [74.1% done] [571KB/OKB/OKB /s] [142/0/0 tops] [eta 01m:05Jobs: 1 (f=1): [r11] [74.4% done] [630KB/OKB/OKB /s] [157/0/0 tops] [eta 01m:03Jobs: 1 (f=1): [r11] [75.2% done] [615KB/OKB/OKB /s] [153/0/0 tops] [eta 01m:02Jobs: 1 (f=1): [r11] [75.6% done] [580KB/OKB/OKB /s] [146/0/0 tops] [eta 01m:01Jobs: 1 (f=1): [r11] [76.0% done] [560KB/OKB/OKB /s] [141/0/0 tops] [eta 01m:00Jobs: 1 (f=1): [r11] [76.4% done] [583KB/OKB/OKB /s] [145/0/0 tops] [eta 00m:59Jobs: 1 (f=1): [r11] [77.1% done] [606KB/OKB/OKB /s] [151/0/0 tops] [eta 00m:57Jobs: 1 (f=1): [r11] [77.5% done] [590KB/OKB/OKB /s] [147/0/0 tops] [eta 00m:56Jobs: 1 (f=1): [r11] [77.9% done] [542KB/OKB/OKB /s] [135/0/0 tops] [eta 00m:55Jobs: 1 (f=1): [r11] [78.6% done] [387KB/OKB/OKB /s] [71/0/0 tops] [eta 00m:55sJobs: 1 (f=1): [r11] [78.4% done] [403KB/OKB/OKB /s] [108/0/0 tops] [eta 00m:54Jobs: 1 (f=1): [r11] [78.8% done] [638KB/OKB/OKB /s] [159/0/0 tops] [eta 00m:52Jobs: 1 (f=1): [r11] [79.2% done] [582KB/OKB/OKB /s] [145/0/0 tops] [eta 00m:52Jobs: 1 (f=1): [r11] [79.6% done] [634KB/OKB/OKB /s] [148/0/0 tops] [eta 00m:51Jobs: 1 (f=1): [r11] [80.3% done] [642KB/OKB/OKB /s] [160/0/0 tops] [eta 00m:49Jobs: 1 (f=1): [r11] [80.7% done] [427KB/OKB/OKB /s] [106/0/0 tops] [eta 00m:48Jobs: 1 (f=1): [r11] [81.1% done] [519KB/OKB/OKB/OKB /s] [159KB/OKB/OKB /s] [146/0/0 tops] [eta 00m:47Jobs: 1 (f=1): [r11] [81.5% done] [519KB/OKB/OKB/OKB /s] [146/0/0 tops] [eta 00m:46Jobs: 1 (f=1): [r11] [85.1% done] [547KB/OKB/OKB /s] [136/0/0 tops] [eta 00m:37sJobs: 1 (f=1): [r11] [85.9% done] [515KB/OKB/OKB /s] [128/0/0 tops] [eta 00m:35Jobs: 1 (f=1): [r11] [86.3% done] [590KB/OKB/OKB /s] [147/0/0 tops] [eta 00m:34Jobs: 1 (f=1): [r11] [86.7% done] [622KB/OKB/OKB /s] [155/0/0 tops] [eta 00m:33Jobs: 1 (f=1): [r11] [87.1% done] [530KB/OKB/OKB /s] [132/0/0 tops] [eta 00m:32Jobs: 1 (f=1): [r11] [87.5% done] [682KB/OKB/OKB /s] [170/0/0 tops] [eta 00m:31Jobs: 1 (f=1): [r11] [87.9% done] [586KB/OKB/OKB /s] [146/0/0 tops] [eta 00m:30Jobs: 1 (f=1): [r11] [88.7% done] [654KB/OKB/OKB /s] [163/0/0 tops] [eta 00m:28Jobs: 1 (f=1): [r11] [89.1% done] [435KB/OKB/OKB /s] [140/0/0 tops] [eta 00m:27Jobs: 1 (f=1): [r11] [89.1% done] [393KB/OKB/OKB /s] [75/0/0 tops] [eta 00m:27sJobs: 1 (f=1): [r11] [89.5% done] [411KB/OKB/OKB /s] [102/0/0 tops] [eta 00m:26Jobs: 1 (f=1): [r11] [89.9% done] [682KB/OKB/OKB /s] [170/0/0 tops] [eta 00m:25Jobs: 1 (f=1): [r11] [90.3% done] [674KB/OKB/OKB /s] [168/0/0 tops] [eta 00m:24Jobs: 1 (f=1): [r11] [91.1% done] [638KB/OKB/OKB /s] [159/0/0 tops] [eta 00m:22Jobs: 1 (f=1): [r11] [91.5% done] [620KB/OKB/OKB /s] [156/0/0 tops] [eta 00m:22Jobs: 1 (f=1): [r11] [91.9% done] [702KB/OKB/OKB /s] [175/0/0 tops] [eta 00m:20Jobs: 1 (f=1): [r11] [92.7% done] [774KB/OKB/OKB /s] [193/0/0 tops] [eta 00m:18Jobs: 1 (f=1): [r11] [93.1% done] [777KB/OKB/OKB /s] [194/0/0 tops] [eta 00m:17Jobs: 1 (f=1): [r11] [93.9% done] [999KB/OKB/OKB /s] [249/0/0 tops] [eta 00m:15Jobs: 1 (f=1): [r11] [94.7% done] [979KB/OKB/OKB /s] [244/0/0 tops] [eta 00m:13Jobs: 1 (f=1): [r11] [95.5% done] [831KB/OKB/OKB /s] [207/0/0 tops] [eta 00m:11Jobs: 1 (f=1): [r11] [95.9% done] [958KB/OKB/OKB /s] [239/0/0 tops] [eta 00m:09Jobs: 1 (f=1): [r11] [97.1% done] [1854KB/OKB/OKB /s] [463/0/0 tops] [eta 00m:03s] [eta 00m:03s] ]  
random-read: groupId=0, jobs=1; err=0; pld=4593; thw Mar 23 06:44:36 2017  
read : io=131072KB, bws=570847B/s, tops=139, runt=235120msec  
clat (usec): min=127, max=235469, avg=7165.86, stdev=6560.45  
lat (usec): min=127, max=235469, avg=7166.48, stdev=6560.47  
clat percentiles (usec):  
| 1.00th= 454, 5.00th= 628, 10.00th= 790, 20.00th= 2448,  
| 30.00th= 4192, 40.00th= 5344, 50.00th= 6496, 60.00th= 7712,  
| 70.00th= 8896, 80.00th=10048, 90.00th=11328, 95.00th=10064,  
| 99.00th=33536, 99.50th=37120, 99.90th=61184, 99.95th=71168,  
| 99.99th=85744  
bw (KB /s): min= 119, max= 2586, per=99.39%, avg=553.59, stdev=170.40  
lat (usec): 250=0.32%, 500=1.35%, 750=6.86%, 1000=9.56%  
lat (msec): 2=1.61%, 4=9.85%, 10=51.14%, 20=16.66%, 50=3.24%  
lat (msec): 100=0.20%, 250=0.01%  
cpu : usr=0.02%, sys=2.61%, ctx=32795, majf=0, minf=10  
io depths : i=100.0%, z=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%  
subitt : 8=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%  
complete : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%  
issued : total=32768/w/d=0, shortt=r=0/w=0/d=0, drop=r=0/w=0/d=0  
latency : target=0, window=0, percentile=100.00%, depth=1  
Run status group 0 (all jobs):  
READ: io=131072KB, aggrb=557KB/s, minb=557KB/s, maxb=557KB/s, mint=235120msec, maxt=235120msec  
sdss 165-32765/157, merge=0/102, ticks=237944/136, ln_queue=230800, uttl=99.46%  
pranavchendur@ubuntu:~$
```