

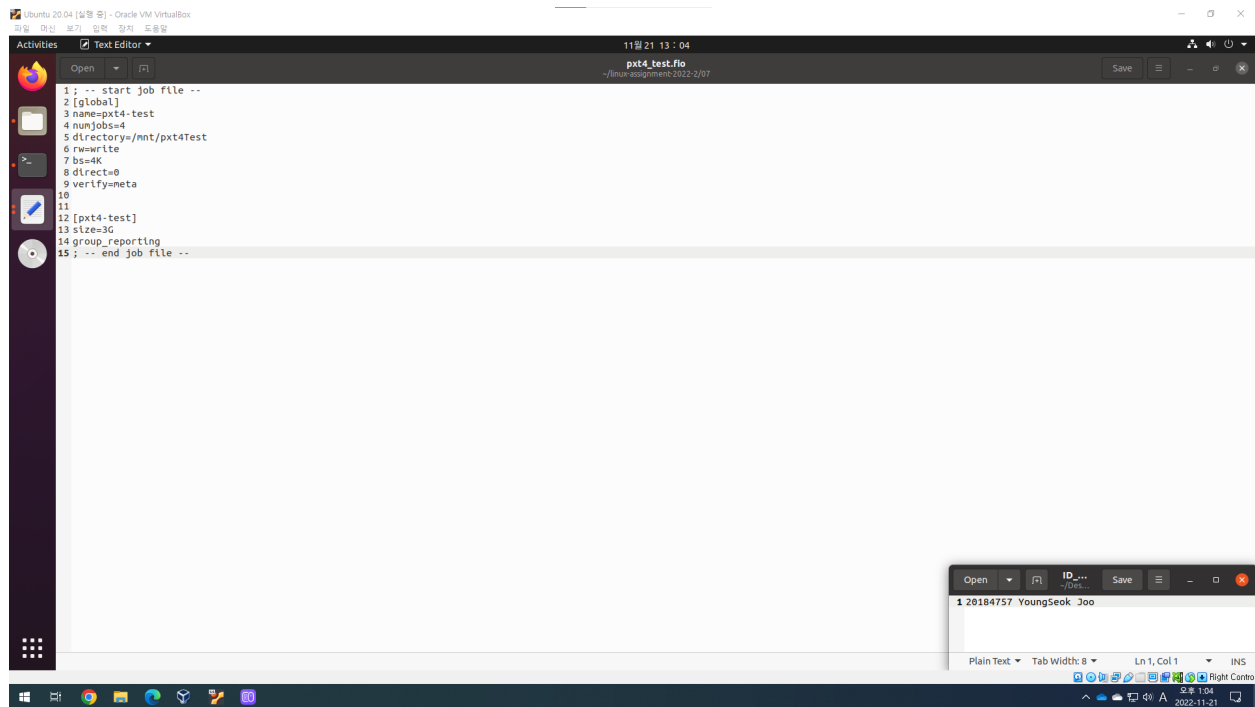


Linux System and its Applications: Assignment-7

(2022-2)

Course / Class:	Linux System and its Applications Class 02
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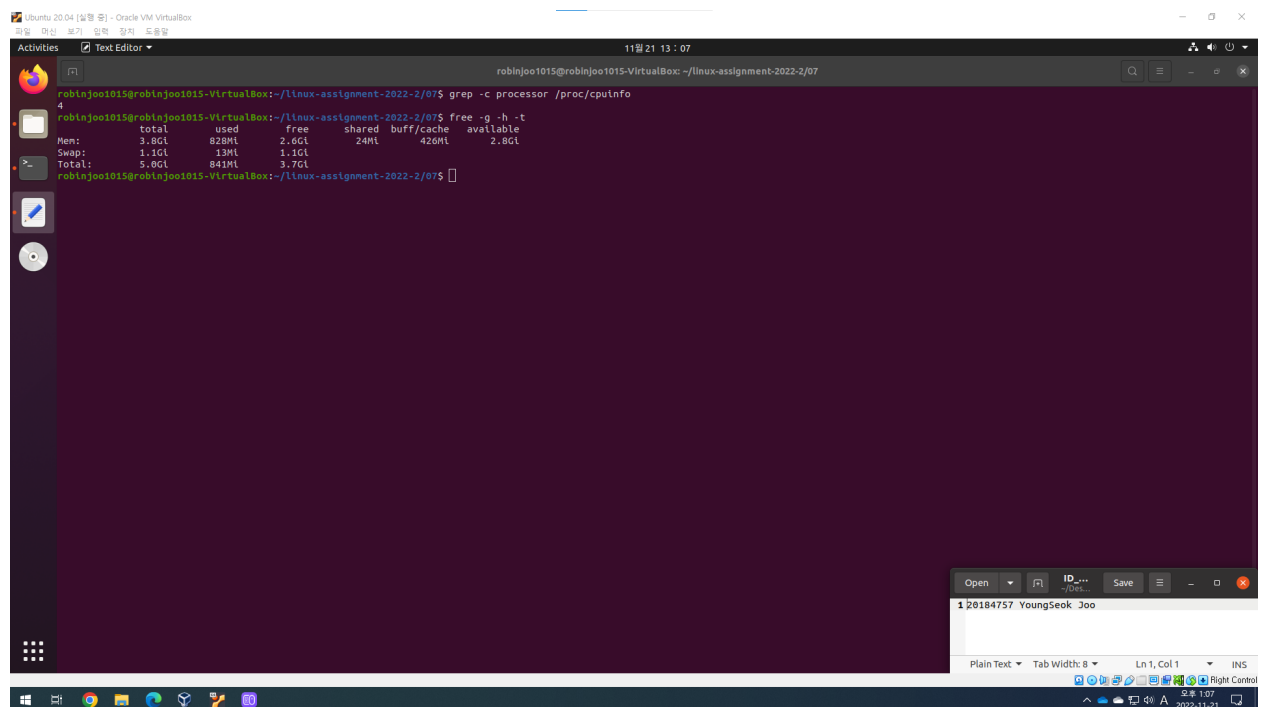
1. Fio script content used for the test



The screenshot shows a text editor window titled "pxt4_test.fio" with the following content:

```
1: -- start job file --
2: [global]
3: name=pxt4-test
4: numjobs=4
5: directory=/mnt/pxt4Test
6: rw=write
7: bs=4K
8: direct=0
9: verify=meta
10:
11:
12: [pxt4-test]
13: size=3G
14: group_reporting
15: -- end job file --
```

1.1 CPU and RAM information (4 Core CPU, 4 GB RAM)



The screenshot shows a terminal window with the following output:

```
robinjoo1015@robinjoo1015-VirtualBox: ~/linux-assignment-2022-2/07$ grep -c processor /proc/cpuinfo
4
robinjoo1015@robinjoo1015-VirtualBox: ~/linux-assignment-2022-2/07$ free -g -h -t
Mem:              total    used     free   shared  buff/cache   available
Mem:              3.8Gi  820Mi  2.6Gi  24Mi  426Mi  2.8Gi
Swap:             1.1Gi  13Mi  1.1Gi  24Mi  426Mi  2.8Gi
Total:            5.0Gi  841Mi  3.7Gi  48Mi  852Mi  5.6Gi
```

1.2 Fio result screen

```

Fio-3.16
Starting 4 processes
pxt4-test: Laying out IO file (1 file / 3072MiB)
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pxt4-test: Laying out IO file (1 file / 3072MiB)
Jobs: 1 (f=1): [(9).V(1)][99.7%][r=01.4MiB/s][r=15.7% TOPS][eta 00m:05s]
pxt4-test: (groupid=0, jobs=4): err= 0: pid=19150: Mon Nov 21 12:43:44 2022
read: IOPS=6426, BW=25.1MiB/s (26.3MB/s)(12.0GiB/489516msec)
   clat (nsec): min=347, max=613619K, avg=579458.77, stdev=8636763.47
   lat (nsec): min=361, max=613619K, avg=579487.09, stdev=8636763.15
   clat percentiles (nsec):
   | 1.00th=[   398],  5.00th=[   422], 10.00th=[   438],
   | 20.00th=[   470], 30.00th=[   498], 40.00th=[   532],
   | 50.00th=[   564], 60.00th=[   620], 70.00th=[   708],
   | 80.00th=[  1048], 90.00th=[  2664], 95.00th=[  2352],
   | 99.00th=[ 4358144], 99.50th=[ 37486592], 99.90th=[115867648],
   | 99.95th=[60432128], 99.99th=[358612992]
write: IOPS=12.1k, BW=47.2MiB/s (49.5MB/s)(12.0GiB/260125msec): 0 zone resets
   clat (nsec): min=1528, max=572363K, avg=320911.87, stdev=3928020.37
   lat (usec): min=2, max=572378, avg=328.42, stdev=3928.08
   clat percentiles (nsec):
   | 1.00th=[  1640],  5.00th=[  1672], 10.00th=[  1704],
   | 20.00th=[ 1768], 30.00th=[ 1832], 40.00th=[ 1912],
   | 50.00th=[ 2024], 60.00th=[ 2160], 70.00th=[ 2480],
   | 80.00th=[ 3200], 90.00th=[ 14400], 95.00th=[ 18048],
   | 99.00th=[19791872], 99.50th=[23980176], 99.90th=[35389440],
   | 99.95th=[39583744], 99.99th=[51118080]
bw ( KIB/s): min= 3710, max=603605, per=99.50%, avg=48159.48, stdev=8103.54, samples=2069
lgps       : min=  925, max=126900, avg=12038.83, stdev=2025.68, samples=2069
lat (nsec)  : 500=15.13%, 750=21.07%, 1000=3.48%
lat (usec)  : 2=28.93%, 4=21.95%, 10=2.71%, 20=4.01%, 50=0.74%
lat (usec)  : 100=0.31%, 250=0.22%, 500=0.04%, 750=0.01%, 1000=0.01%
lat (msec)  : 2=0.01%, 4=0.25%, 10=0.12%, 20=0.15%, 50=0.65%
lat (msec)  : 100=0.11%, 250=0.06%, 500=0.01%, 750=0.01%
cpu         : usr=0.34%, sys=1.38%, ctx=122330, maj=0, min=73867
io depths   : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
subutil     : 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 rwts: total=3145728,3145728,0,0 short=0,0,0 dropped=0,0,0
latency     : target=0, window=0, percentile=100.00%, depth=1

Run status group 0 (all jobs):
READ: bw=25.1MiB/s (26.3MB/s), 25.1MiB/s-25.1MiB/s (26.3MB/s-26.3MB/s), io=12.0GiB (12.9GB), run=489516-489516msec
WRITE: bw=47.2MiB/s (49.5MB/s), 47.2MiB/s-47.2MiB/s (49.5MB/s-49.5MB/s), io=12.0GiB (12.9GB), run=260125-260125msec

Disk stats (read/write):
sdb: ios=49105/13099, merge=8/748, ticks=3025649/4571937, in_queue=8074124, util=100.00%
robinjoo1015@robinjoo1015-VirtualBox: ~/linux-assignment-2022-2/07
```

2. Profiling result

```

[ 10.285583] audit: type=1400 audit(1668995235.996:6): apparmor="STATUS" operation="profile_load" profile="unconfined" name="/usr/lib/cups/backend/cups-pdf" pid=537 comm="apparmor_parser"
[ 10.285585] audit: type=1400 audit(1668995236.004:7): apparmor="STATUS" operation="profile_load" profile="unconfined" name="/usr/sbin/cupsd" pid=537 comm="apparmor_parser"
[ 10.285587] audit: type=1400 audit(1668995236.004:8): apparmor="STATUS" operation="profile_load" profile="unconfined" name="/usr/sbin/cupsd/tlsdparty" pid=537 comm="apparmor_parser"
[ 10.287852] audit: type=1400 audit(1668995236.004:9): apparmor="STATUS" operation="profile_load" profile="unconfined" name="/usr/bin/nan" pid=541 comm="apparmor_parser"
[ 10.287854] audit: type=1400 audit(1668995236.004:10): apparmor="STATUS" operation="profile_load" profile="unconfined" name="nan_filter" pid=541 comm="apparmor_parser"
[ 10.287855] audit: type=1400 audit(1668995236.004:11): apparmor="STATUS" operation="profile_load" profile="unconfined" name="nan_groff" pid=541 comm="apparmor_parser"
[ 10.587872] snd_intel800 0000:05:05:0: white list rate for 1028:0377 is 48000
[ 11.089676] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 11.409317] vboxvdi: Loading version 6.1.38 r153438
[ 11.537279] 01:47:17.336026 main VBoxService 6.1.38 r153438 (verbosity: 0) Linux.and64 (Sep 1 2022 15:42:08) release log
[ 11.537340] 01:47:17.336029 main Log opened 2022-11-21T01:47:17.336020000Z
[ 11.537340] 01:47:17.336111 main OS Product: Linux
[ 11.537431] 01:47:17.336200 main OS Release: 5.4.21520184757_YoungSeok_Joo
[ 11.537485] 01:47:17.336251 main OS Version: #2 SMP Sat Oct 8 00:34:35 KST 2022
[ 11.537485] 01:47:17.336251 main Executable: /opt/VBoxGuestAdditions-6.1.38/sbin/VBoxService
[ 11.539521] 01:47:17.336252 main Process ID: 935
[ 11.539521] 01:47:17.336252 main Package type: LINUX_64BITS_GENERIC
[ 11.544254] 01:47:17.343015 main 6.1.38 r153438 started. Verbose level = 0
[ 11.703961] ISO 9660 Extensions: Microsoft Truncated Offset Support: Supported (#1)
[ 12.123554] ISO 9660 Extensions: RRIP-1991A
[ 15.928556] rtkl1: input handler disabled
[ 207.425284] SGX XFS with ACLs, security attributes, realtime, no debug enabled
[ 207.504262] JFS: nTxLock = 6192, nXLock = 6536
[ 207.509665] ntfs: driver 2.1.32 [Flags: R/O MODULE].
[ 207.679172] QNX4 filesystem 0.2.3 registered.
[ 207.815340] raid6: sse2x4 gen() 16499 MB/s
[ 207.803320] raid6: sse2x4 xor() 11166 MB/s
[ 207.952925] raid6: sse2x2 gen() 14877 MB/s
[ 208.018984] raid6: sse2x2 xor() 10700 MB/s
[ 208.008601] raid6: sse2x1 gen() 11960 MB/s
[ 208.154962] raid6: sse2x1 xor() 9161 MB/s
[ 208.154957] raid6: using algorithm sse2x4 gen() 16499 MB/s
[ 208.154958] raid6: .... xor() 11166 MB/s, rwm enabled
[ 208.154959] raid6: using sse3x2 recovery algorithm
[ 208.200356] xor: measuring software checksum speed
[ 208.238929] prefetch64-sse: 34703.000 MB/sec
[ 208.279626] generic_sse: 22301.000 MB/sec
[ 208.279626] xor: using functions: prefetch64-sse (34703.000 MB/sec)
[ 208.543263] Btrfs loaded, crc32ccrc32c-Intel
[ 247.388211] e1000: enp0s3 NIC Link is Down
[ 251.417815] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 2786.037353] e1000: enp0s3 NIC Link is Down
[ 2790.051796] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 6026.370633] Pxt4-fs: Unable to register as ext3 (-16)
[ 6030.039063] Pxt4-fs: (root) mounted Filesystem with ordered data mode. Opt: (null)
[ 6100.510853] file_write_iter is called 3,145,728 times, time interval 1,018,375,755,824 ns (100%)
robinjoo1015@robinjoo1015-VirtualBox: ~/linux-assignment-2022-2/07/pxt4/jbd3
```