1) Write operation

```
[root@swancloud ~]# rados bench -p pool1 50 write --no-cleanup
 Maintaining 16 concurrent writes of 4194304 bytes for up to 50 seconds or 0 objects
 Object prefix: benchmark_data_swancloud.novalocal_98229
  sec Cur ops   started  finished  avg MB/s  cur MB/s  last lat   avg lat
   0    0       0        0         0         0         -          0
   1    16      35       19        75.9789   76        0.659728   0.513125
   2    16      50       34        67.9869   60        0.870065   0.6713
   3    16      68       52        69.3224   72        1.18346    0.769565
   4    16      77       61        60.9913   36        1.16245    0.818601
   5    16      92       76        60.7918   60        1.56775    0.933608
   6    16      98       82        54.6595   24        1.1883     0.958428
   7    16      98       82        46.851    0         -          0.958428
   8    16      98       82        40.9946   0         -          0.958428
   9    16      106      90        39.9948   10.6667   3.99442    1.23474
  10    16      125      109       43.5944   76        0.726977   1.40112
  11    16      140      124       45.0851   60        0.977684   1.34673
  12    16      152      136       45.3277   48        1.41589    1.33438
  13    16      164      148       45.5328   48        0.988901   1.3383
  14    16      173      157       44.8516   36        1.11751    1.33262
  15    16      173      157       41.8614   0         -          1.33262
  16    16      173      157       39.2452   0         -          1.33262
  17    16      173      157       36.9366   0         -          1.33262
  18    16      191      175       38.8841   18        0.626778   1.59996
  19    16      206      190       39.9951   60        1.12779    1.55399
2015-10-14 19:31:40.745462min lat: 0.0234121 max lat: 4.73398 avg lat: 1.53213
  sec Cur ops   started  finished  avg MB/s  cur MB/s  last lat   avg lat
  20    16      218      202       40.3951   48        1.13599    1.53213
  21    16      233      217       41.3284   60        1.10702    1.50936
  22    16      245      229       41.6314   48        1.22908    1.493
  23    16      248      232       40.343    12        1.42215    1.49017
  24    16      248      232       38.662    0         -          1.49017
  25    16      251      235       37.5954   6         3.45147    1.51609
  26    16      254      238       36.6109   12        4.21678    1.551
  27    16      254      238       35.255    0         -          1.551
  28    16      254      238       33.9959   0         -          1.551
  29    16      269      253       34.8923   20        0.609106   1.78669
  30    16      281      265       35.3291   48        1.17513    1.77776
  31    16      293      277       35.7376   48        1.30729    1.75461
  32    16      302      286       35.7457   36        1.2375     1.73844
  33    16      311      295       35.7533   36        1.40236    1.73168
  34    16      311      295       34.7017   0         -          1.73168
  35    16      314      298       34.0531   6         3.22691    1.74781
  36    16      329      313       34.7736   60        0.619422   1.80693
  37    16      344      328       35.4552   60        1.2757     1.77764
  38    16      356      340       35.7852   48        1.14409    1.75772
  39    16      371      355       36.4059   60        1.07176    1.73486
2015-10-14 19:32:00.747810min lat: 0.0234121 max lat: 7.09035 avg lat: 1.71405
  sec Cur ops   started  finished  avg MB/s  cur MB/s  last lat   avg lat
  40    16      383      367       36.6956   48        0.962997   1.71405
  41    16      386      370       36.0932   12        1.22002    1.71032
  42    16      386      370       35.2338   0         -          1.71032
  43    16      389      373       34.6935   6         3.72288    1.72704
  44    16      401      385       34.9958   48        3.6718     1.78922
```

45	16	413	397	35.2846	48	1.333	1.78643
46	16	422	406	35.3001	36	1.46305	1.78029
47	16	434	418	35.5702	48	1.18591	1.77123
48	16	446	430	35.829	48	1.27788	1.75932
49	16	452	436	35.5876	24	1.32821	1.75501
50	16	452	436	34.8758	0	-	1.75501
51	16	453	437	34.2704	2	3.47876	1.75895

```
 Total time run:       51.294348
Total writes made:     453
Write size:          4194304
Bandwidth (MB/sec):    35.326

Stddev Bandwidth:     25.1211
Max bandwidth (MB/sec): 76
Min bandwidth (MB/sec): 0
Average Latency:      1.80626
Stddev Latency:       1.33042
Max latency:          7.09035
Min latency:          0.0234121
```

2) Sequential read operation

```
[root@swancloud ~]# rados bench -p pool1 50 seq
```

sec	Cur ops	started	finished	avg MB/s	cur MB/s	last lat	avg lat
0	0	0	0	0	0	-	0
1	15	448	433	1731.77	1732	0.0382319	0.0362406

```
 Total time run:       1.048970
Total reads made:      453
Read size:           4194304
Bandwidth (MB/sec):    1727.409

Average Latency:      0.0367782
Max latency:          0.0650652
Min latency:          0.00530613
```

3) Random read operation.

```
[root@swancloud ~]# rados bench -p pool1 50 rand
```

sec	Cur ops	started	finished	avg MB/s	cur MB/s	last lat	avg lat
0	1	1	0	0	0	-	0
1	16	478	462	1847.59	1848	0.0348754	0.0339901
2	16	930	914	1827.45	1808	0.0341374	0.0347062
3	15	1381	1366	1820.89	1808	0.0364235	0.0349317
4	16	1862	1846	1845.59	1920	0.0266991	0.0345495
5	15	2460	2445	1955.6	2396	0.0280014	0.0326315
6	16	3032	3016	2010.28	2284	0.0280201	0.0317576
7	15	3582	3567	2037.92	2204	0.0287014	0.0313376
8	15	4011	3996	1997.66	1716	0.0372803	0.0319605
9	16	4434	4418	1963.23	1688	0.0378059	0.032527
10	15	4975	4960	1983.67	2168	0.0273686	0.0322181
11	15	5533	5518	2006.22	2232	0.0296165	0.0318572
12	15	6085	6070	2023.01	2208	0.0301363	0.0315942
13	15	6626	6611	2033.84	2164	0.0279156	0.0314325
14	15	7192	7177	2050.26	2264	0.0288929	0.0311815

sec	Cur ops	started	finished	avg MB/s	cur MB/s	last lat	avg lat
15	15	7652	7637	2036.22	1840	0.0369566	0.0313912
16	16	8082	8066	2016.19	1716	0.0370977	0.0317035
17	15	8511	8496	1998.75	1720	0.0365232	0.0319845
18	16	8951	8935	1985.25	1756	0.0336392	0.0322059
19	15	9378	9363	1970.85	1712	0.0400492	0.0324389

2015-10-14 19:36:37.623782min lat: 0.00650516 max lat: 0.0521495 avg lat: 0.0326625

sec	Cur ops	started	finished	avg MB/s	cur MB/s	last lat	avg lat
20	15	9805	9790	1957.7	1708	0.033422	0.0326625
21	15	10269	10254	1952.83	1856	0.0339326	0.0327463
22	15	10730	10715	1947.87	1844	0.0348146	0.0328288
23	15	11205	11190	1945.78	1900	0.0341631	0.0328675
24	15	11664	11649	1941.19	1836	0.0356863	0.0329434
25	15	12118	12103	1936.15	1816	0.0340524	0.0330325
26	15	12551	12536	1928.29	1732	0.0364487	0.0331653
27	15	12981	12966	1920.57	1720	0.0379527	0.0332992
28	15	13407	13392	1912.83	1704	0.0374026	0.0334348
29	16	13830	13814	1905.07	1688	0.0340799	0.0335732
30	15	14294	14279	1903.56	1860	0.035742	0.0336004
31	15	14748	14733	1900.72	1816	0.0356741	0.0336513
32	16	15203	15187	1898.06	1816	0.0349786	0.033698
33	15	15648	15633	1894.6	1784	0.0374461	0.03376
34	16	16081	16065	1889.69	1728	0.0383952	0.0338471
35	15	16504	16489	1884.15	1696	0.0375721	0.0339484
36	15	16953	16938	1881.7	1796	0.0345443	0.0339948
37	16	17413	17397	1880.45	1836	0.0319224	0.0340178
38	16	17894	17878	1881.59	1924	0.0335153	0.033997
39	15	18362	18347	1881.44	1876	0.0340039	0.0340013

2015-10-14 19:36:57.627095min lat: 0.00650516 max lat: 0.0589415 avg lat: 0.0340448

sec	Cur ops	started	finished	avg MB/s	cur MB/s	last lat	avg lat
40	15	18808	18793	1879	1784	0.0345414	0.0340448
41	15	19261	19246	1877.36	1812	0.0374004	0.0340744
42	15	19713	19698	1875.7	1808	0.0356107	0.0341055
43	16	20167	20151	1874.21	1812	0.0353037	0.0341322
44	16	20627	20611	1873.43	1840	0.0344918	0.0341473
45	16	21084	21068	1872.41	1828	0.0346931	0.0341659
46	15	21545	21530	1871.87	1848	0.0343361	0.0341764
47	15	22007	21992	1871.36	1848	0.0336817	0.0341862
48	15	22468	22453	1870.79	1844	0.0342109	0.0341974
49	16	22930	22914	1870.24	1844	0.0344018	0.0342066
50	15	23367	23352	1867.87	1752	0.034168	0.0342468

Total time run: 50.030907
Total reads made: 23367
Read size: 4194304
Bandwidth (MB/sec):   1868.205

Average Latency: 0.0342492
Max latency: 0.0589415
Min latency: 0.00650516

4) Sequential read operation (10)

```
[root@swancloud ~]# rados bench -p pool1 10 seq
  sec Cur ops  started  finished  avg MB/s  cur MB/s  last lat  avg lat
   0    1      1        0         0         0         -         0
```

 Total time run: 0.970286
Total reads made: 425
Read size: 4194304
Bandwidth (MB/sec):   1752.060

Average Latency: 0.0363265
Max latency: 0.068168
Min latency: 0.00592239

5) Random read operation (10)

```
[root@swancloud ~]# rados bench -p pool1 10 rand
  sec Cur ops   started  finished  avg MB/s  cur MB/s  last lat    avg lat
   0    1       1        0        0         0         -          0
   1   16       455      439    1755.61    1756   0.0388162  0.0356987
   2   15       911      896    1791.65    1828   0.0388266  0.0353851
   3   16      1395     1379    1838.3     1932   0.0407589  0.0345615
   4   15      1802     1787    1786.68    1632   0.0382464  0.0356441
   5   15      2214     2199    1758.89    1648   0.0399048  0.0362412
   6   16      2634     2618    1745.04    1676   0.0390581  0.0365522
   7   16      3109     3093    1767.14    1900   0.0328712  0.0361261
   8   16      3595     3579    1789.21    1944   0.0336504  0.0356899
   9   15      4082     4067    1807.26    1952   0.0332372  0.0353451
  10   16      4577     4561    1824.11    1976   0.031427   0.03502
```

 Total time run: 10.029614
Total reads made: 4577
Read size: 4194304
Bandwidth (MB/sec):   1825.394

Average Latency: 0.0350297
Max latency: 0.0575722
Min latency: 0.00637411

	50 Seq. read op	50 Random read	10 Seq. read op	10 Random read
B.W. (Mb/sec)	1727.409	1868.205	1752.060	1825.394
Avg. Latency	0.0367782	0.0342492	0.0363265	0.0350297
Total time run	1.048970	50.030907	0.970286	10.029614
Total reads made	453	23367	425	4577

10/19/2015   Environment benchmarks

1) Local disk benchmark

Always use the oflag=direct in order to use direct I/O. Because the system maintains a page cache to improve I/O performance. Every single write operations to the storage system are considered completed after the data has been copied to the page cache. The page cache is copied to permanent storage (hard drive disk) using the system call fsync(2).

[root@swancloud my-cluster]# dd if=/dev/zero of=here bs=1G count=1 oflag=direct
1+0 records in
1+0 records out
1073741824 bytes (1.1 GB) copied, 11.3945 s, 94.2 MB/s
[root@swancloud my-cluster]#

2)

[root@swancloud ~]# sudo bonnie++ -s 8192 -r 4096 -u root -d /mnt/ -m BenchClient
Using uid:0, gid:0.
Writing a byte at a time...done
Writing intelligently...done
Rewriting...done
Reading a byte at a time...done
Reading intelligently...done
start 'em...done...done...done...done...done...
Create files in sequential order...done.
Stat files in sequential order...done.
Delete files in sequential order...done.
Create files in random order...done.
Stat files in random order...done.
Delete files in random order...done.
Version 1.96   ------Sequential Output------ --Sequential Input- --Random-
Concurrency   1   -Per Chr- --Block-- -Rewrite- -Per Chr- --Block-- --Seeks--
Machine   Size K/sec %CP K/sec %CP K/sec %CP K/sec %CP K/sec %CP /sec %CP
BenchClient   8G 1988 98 109317 6 111792 4 4244 99 7245719 99 3876 19
Latency   4072us   111us   179us   2063us   244us   2393us
Version 1.96   ------Sequential Create------ --------Random Create--------
BenchClient   -Create-- --Read--- -Delete-- -Create-- --Read--- -Delete--
            files /sec %CP /sec %CP /sec %CP /sec %CP /sec %CP /sec %CP
              16 23410 26 +++++ +++ 31123 28 19735 22 +++++ +++ 27677 29
Latency   341us   61us   613us   4723us   29us   318ms
1.96,1.96,BenchClient,1,1445254220,8G,,1988,98,109317,6,111792,4,4244,99,7245719,99,3876,19,16,,,,,2
3410
,26,+++++,+++,31123,28,19735,22,+++++,+++,27677,29,4072us,111us,179us,2063us,244us,2393us,341us,
61us,613   us,4723us,29us,318ms