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

1. **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

1. **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

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

1. **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

1. **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]#

[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,,,,,23410 ,26,+++++,+++,31123,28,19735,22,+++++,+++,27677,29,4072us,111us,179us,2063us,244us,2393us,341us,61us,613 us,4723us,29us,318ms