**Ext4 ReiserFS Btrfs 等7种文件系统性能比拼**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **reclen** | **write** | **rewrite** | **read** | **reread** | **random read** | **random write** | **bkwd read** | **record rewrite** | **stride read** | **fwrite** | **frewrite** | **fread** | **freread** |
| Ext2   real 27m23.545s user 0m9.184s sys 4m40.925s | 4 | 218,554 | 218,662 | 668,245 | 245,208 | 85,235 | 175,284 | 101,864 | 1,911,579 | 74,368 | 215,014 | 217,680 | 583,169 | 244,831 |
| 8 | 216,064 | 220,489 | 618,661 | 243,444 | 146,695 | 215,002 | 176,908 | 2,314,305 | 129,333 | 215,772 | 218,571 | 605,436 | 241,144 |
| 16 | 218,874 | 219,173 | 609,563 | 242,592 | 246,442 | 220,306 | 292,114 | 2,438,520 | 218,357 | 216,497 | 219,774 | 596,211 | 244,652 |
| 32 | 219,584 | 217,859 | 611,712 | 244,445 | 372,023 | 224,151 | 442,629 | 2,423,574 | 334,999 | 218,829 | 219,553 | 606,186 | 244,346 |
| 64 | 216,320 | 219,400 | 622,218 | 243,761 | 478,747 | 227,018 | 580,960 | 2,633,117 | 439,129 | 215,956 | 220,166 | 608,210 | 243,950 |
| 128 | 219,286 | 218,318 | 614,559 | 243,862 | 579,724 | 224,346 | 690,945 | 2,467,787 | 537,440 | 219,420 | 218,330 | 607,326 | 244,337 |
| 256 | 216,027 | 220,509 | 635,633 | 245,385 | 614,120 | 227,099 | 842,220 | 2,567,169 | 614,753 | 217,744 | 219,897 | 617,728 | 243,780 |
| Ext3  real 27m26.675s user 0m9.323s sys 6m43.199s | 4 | 215,478 | 218,294 | 604,858 | 246,148 | 86,758 | 151,858 | 102,113 | 1,618,769 | 74,979 | 214,446 | 218,569 | 568,659 | 242,772 |
| 8 | 217,695 | 218,777 | 609,377 | 244,520 | 148,608 | 190,313 | 171,903 | 1,830,365 | 128,957 | 218,752 | 217,501 | 603,465 | 246,861 |
| 16 | 215,683 | 219,822 | 643,396 | 248,815 | 252,255 | 202,374 | 290,681 | 1,915,488 | 219,805 | 216,519 | 219,033 | 568,086 | 243,985 |
| 32 | 219,341 | 217,364 | 603,462 | 245,273 | 379,512 | 208,740 | 435,756 | 2,069,791 | 335,303 | 218,578 | 219,086 | 604,572 | 245,578 |
| 64 | 216,192 | 220,186 | 665,646 | 244,234 | 481,101 | 212,185 | 567,750 | 2,106,710 | 442,926 | 217,075 | 220,042 | 618,134 | 244,870 |
| 128 | 218,503 | 219,151 | 616,479 | 244,711 | 589,927 | 212,355 | 683,943 | 2,080,136 | 541,597 | 219,271 | 218,514 | 600,308 | 244,782 |
| 256 | 217,255 | 219,213 | 637,417 | 248,555 | 636,309 | 211,793 | 839,907 | 2,125,314 | 618,958 | 218,424 | 218,954 | 600,894 | 245,523 |
| Ext4   real 26m15.771s user 0m9.609s sys 5m36.096s | 4 | 225,586 | 224,616 | 532,721 | 270,174 | 82,398 | 180,231 | 102,935 | 1,683,476 | 74,990 | 224,893 | 224,186 | 277,025 | 584,868 |
| 8 | 226,896 | 221,965 | 274,314 | 629,603 | 239,913 | 219,223 | 156,964 | 2,026,184 | 127,553 | 226,382 | 227,019 | 292,566 | 593,154 |
| 16 | 222,929 | 229,392 | 272,022 | 599,360 | 390,533 | 223,951 | 256,831 | 2,114,002 | 212,773 | 227,728 | 225,332 | 602,317 | 269,289 |
| 32 | 223,703 | 221,025 | 566,981 | 262,980 | 380,787 | 227,198 | 435,774 | 2,157,610 | 338,629 | 226,208 | 225,816 | 591,102 | 268,725 |
| 64 | 222,236 | 223,813 | 593,481 | 268,002 | 522,365 | 227,268 | 582,830 | 2,216,225 | 457,252 | 228,294 | 223,269 | 614,376 | 269,657 |
| 128 | 221,681 | 222,859 | 285,304 | 623,990 | 915,430 | 231,380 | 663,383 | 2,276,039 | 573,624 | 226,616 | 224,477 | 583,965 | 271,159 |
| 256 | 220,129 | 221,608 | 279,101 | 657,815 | 889,963 | 232,256 | 770,220 | 2,212,083 | 610,074 | 225,877 | 224,642 | 288,852 | 603,933 |
| XFS   real 28m43.957s user 0m9.899s sys 6m4.268s | 4 | 217,459 | 214,348 | 244,600 | 239,647 | 78,424 | 161,673 | 107,643 | 1,711,976 | 74,828 | 218,638 | 216,903 | 227,675 | 240,492 |
| 8 | 220,514 | 219,994 | 241,854 | 951,125 | 248,623 | 207,750 | 161,175 | 2,214,681 | 127,363 | 218,892 | 211,613 | 219,749 | 240,286 |
| 16 | 220,776 | 220,740 | 226,186 | 242,746 | 224,486 | 219,963 | 318,503 | 2,480,826 | 223,664 | 221,106 | 221,694 | 669,693 | 262,346 |
| 32 | 218,481 | 216,919 | 255,232 | 799,715 | 593,083 | 225,213 | 408,816 | 2,278,034 | 337,026 | 222,153 | 213,330 | 226,093 | 241,351 |
| 64 | 216,921 | 210,031 | 228,877 | 244,161 | 430,479 | 225,432 | 612,872 | 2,568,460 | 448,155 | 224,650 | 209,745 | 221,768 | 239,888 |
| 128 | 216,341 | 218,284 | 232,550 | 242,283 | 559,400 | 227,915 | 768,251 | 2,545,859 | 568,945 | 222,605 | 216,060 | 714,911 | 258,397 |
| 256 | 221,444 | 220,462 | 469,309 | 321,275 | 757,895 | 225,641 | 806,251 | 2,689,152 | 609,077 | 219,703 | 219,815 | 226,021 | 240,108 |
| JFS  real 26m53.990s user 0m9.096s sys 4m39.691s | 4 | 196,819 | 218,121 | 455,194 | 258,062 | 85,910 | 169,163 | 142,814 | 1,949,282 | 92,246 | 212,270 | 217,272 | 450,996 | 258,928 |
| 8 | 211,794 | 215,030 | 445,452 | 258,082 | 147,556 | 208,623 | 236,197 | 2,214,516 | 159,402 | 213,076 | 218,146 | 451,013 | 258,767 |
| 16 | 209,028 | 214,714 | 455,795 | 257,989 | 248,145 | 218,747 | 399,935 | 2,587,176 | 269,527 | 214,271 | 215,626 | 439,736 | 258,830 |
| 32 | 210,454 | 218,204 | 448,067 | 258,568 | 380,325 | 220,682 | 591,781 | 2,379,845 | 409,061 | 213,292 | 217,683 | 439,114 | 259,160 |
| 64 | 214,862 | 215,636 | 450,430 | 258,413 | 487,982 | 222,660 | 750,139 | 2,613,574 | 522,050 | 216,365 | 217,830 | 444,546 | 259,553 |
| 128 | 213,152 | 218,084 | 449,185 | 258,775 | 592,912 | 148,064 | 933,583 | 2,728,229 | 667,878 | 219,155 | 213,461 | 466,396 | 262,608 |
| 256 | 213,119 | 213,514 | 477,804 | 258,508 | 631,376 | 129,060 | 1,055,205 | 2,727,762 | 717,814 | 213,771 | 217,569 | 463,931 | 258,291 |
| ReiserFS   real 28m16.075s user 0m10.134s sys 7m38.726s | 4 | 208,422 | 217,932 | 190,459 | 223,684 | 72,142 | 175,210 | 99,820 | 1,726,654 | 74,081 | 211,433 | 216,255 | 540,847 | 239,091 |
| 8 | 214,840 | 218,917 | 610,592 | 240,376 | 146,908 | 210,703 | 176,295 | 2,180,046 | 128,114 | 215,368 | 218,950 | 580,334 | 240,261 |
| 16 | 216,886 | 217,827 | 651,240 | 243,800 | 249,478 | 219,967 | 288,457 | 2,444,958 | 213,780 | 217,438 | 219,510 | 592,932 | 239,510 |
| 32 | 214,217 | 219,178 | 645,366 | 240,227 | 369,030 | 224,795 | 434,556 | 2,372,823 | 329,006 | 217,055 | 217,110 | 554,072 | 240,046 |
| 64 | 217,160 | 219,013 | 623,512 | 239,875 | 470,435 | 224,619 | 560,790 | 2,429,552 | 421,615 | 218,043 | 218,734 | 587,074 | 239,802 |
| 128 | 215,163 | 219,348 | 624,117 | 240,364 | 572,926 | 226,463 | 683,686 | 2,530,721 | 530,024 | 215,932 | 218,157 | 577,617 | 240,975 |
| 256 | 217,058 | 218,839 | 643,857 | 240,141 | 615,875 | 224,530 | 825,364 | 2,631,201 | 590,909 | 217,256 | 218,942 | 567,422 | 240,061 |
| Btrfs   real 59m41.974s user 0m10.382s sys 18m40.804s | 4 | 214,203 | 215,879 | 265,389 | 280,244 | 65,367 | 10,520 | 16,032 | 773,644 | 34,260 | 94,105 | 194,357 | 269,380 | 268,254 |
| 8 | 218,318 | 215,978 | 270,100 | 275,160 | 109,687 | 26,015 | 40,447 | 1,366,911 | 89,489 | 141,760 | 214,990 | 273,446 | 271,531 |
| 16 | 219,477 | 215,738 | 284,876 | 282,111 | 178,662 | 47,881 | 72,623 | 1,864,106 | 150,255 | 177,508 | 219,348 | 264,935 | 273,140 |
| 32 | 218,835 | 220,886 | 281,550 | 277,054 | 246,933 | 130,288 | 181,774 | 2,573,279 | 250,936 | 204,491 | 219,736 | 281,894 | 268,989 |
| 64 | 216,758 | 218,890 | 282,026 | 275,127 | 312,803 | 195,963 | 299,685 | 3,270,521 | 354,200 | 202,362 | 220,928 | 281,331 | 271,676 |
| 128 | 216,509 | 220,235 | 279,353 | 274,813 | 368,053 | 215,445 | 343,696 | 3,739,759 | 414,950 | 216,029 | 219,711 | 276,973 | 272,569 |
| 256 | 220,333 | 216,113 | 277,920 | 273,271 | 405,215 | 215,495 | 393,731 | 4,015,851 | 474,052 | 213,849 | 220,372 | 283,035 | 277,594 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | **Kbytes/sec** |

本次测试所使用的 Linux kernel 版本为 2.6.29-rc3，文件系统性能测试工具为 IOzone 3.318。  
  
从测试结果可以看出，Ext4 的综合性能位居现有文件系统之首，JFS、ReiserFS 在读性能方面亦有不俗表现。Btrfs 的小块数据读写性能与平均水平相差甚远，是导致其本次测试总时间超出平均时间两倍的主要原因。较之其它成熟的文件系统，Btrfs 投入生产系统运作可能尚需时日。