

RocksDB Festival

Supported by IITP, StarLab.

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박경미, 황예진

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BGR

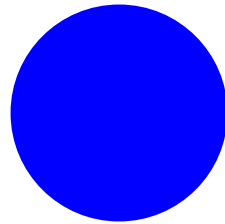
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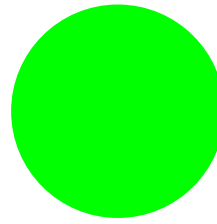
RocksDB Festival

■ Introduce BGR team

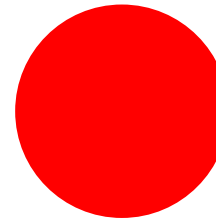
- ✓ 하계 방학 RocksDB 분석 스터디 참여



Big data



Guru

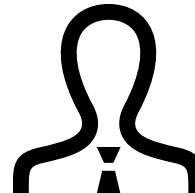


RocksDB



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RocksDB Festival

■ RocksDB db_bench 설치

- ✓ https://github.com/DKU-StarLab/RocksDB_Explorer을 참고하여 RocksDB db_bench 설치 완료.

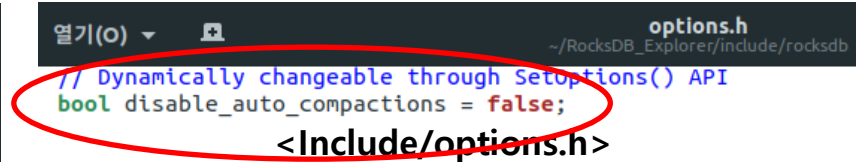
```
yejin@yejin-VirtualBox:~/RocksDB_Explorer$ ls
AUTHORS                                appveyor.yml                make_config.mk
CMakeLists.txt                        buckifier                   memory
CODE_OF_CONDUCT.md                   build_tools                 mentable
CONTRIBUTING.md                     cache                       monitoring
COPYING                              cmake                      options
DEFAULT_OPTIONS_HISTORY.md           coverage                   parsing_csv
DUMP_FORMAT.md                       db                          plugin
HISTORY.md                           db_bench                   port
INSTALL.md                           db_stress_tool             python_parser
LANGUAGE-BINDINGS.md                 defs.bzl                   result_txt
LICENSE.Apache                       docs                        src.mk
LICENSE.leveldb                      env                         table
Makefile                             examples                   test_util
PLUGINS.md                           file                       third-party
README.md                            fuzz                       thirdparty.inc
ROCKSDB_LITE.md                      hdfs                       tools
RocksDB_explorer_sh                  include                    trace_replay
TARGETS                              issue_template.md          util
USERS.md                             java                       utilities
Vagrantfile                          librocksdb_debug.a
WINDOWS_PORT.md                      logging
```

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■ db_bench 테스트 결과

```
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
RocksDB: version 6.21
Date: Sun Jul 18 15:20:23 2021
CPU: 1 * Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz
CPU Cache: 6144 KB
Keys: 16 bytes each (+ 0 bytes user-defined timestamp)
Values: 100 bytes each (50 bytes after compression)
Entries: 1000000
Prefix: 0 bytes
Keys per prefix: 0
RawSize: 110.6 MB (estimated)
FileSize: 62.9 MB (estimated)
Write rate: 0 bytes/second
Read rate: 0 ops/second
Compression: Snappy
Compression sampling rate: 0
Memtable rep: skip_list
Perf Level: 1
WARNING: Assertions are enabled; benchmarks unnecessarily slow
-----
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
DB path: [/tmp/rocksdbtest-1000/dbbench]
fillseq : 8.735 micros/op 114478 ops/sec; 12.7 MB/s
Please disable_auto_compactions in FillDeterministic benchmark
```

<./db_bench>



```
options.h
~/RocksDB_Explorer/include/rocksdb
// Dynamically changeable through SetOptions() API
bool disable_auto_compactions = false;
<Include/options.h>
```

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■ db_bench 테스트 결과

✓ <https://github.com/facebook/rocksdb/pull/1801> 참고

```
yejin@yejin-VirtualBox:~/RocksDB_Explorer$ ./db_bench -benchmarks=fillrandom -wr
ite_buffer_size=67108864 -level0_file_num_compaction_trigger=4 -max_background_c
ompactions=32 -level0_slowdown_writes_trigger=8 -level0_stop_writes_trigger=12
num_levels=4 -min_level_to_compress=2 -compression_type=zlib -compression_ratio=
0.5 -block_size=16384 -open_files=10000 -target_file_size_base=67108864 -max_byt
es_for_level_base=268435456 -writes_per_range_tombstone=5000
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
RocksDB: version 6.21
Date: Sun Jul 18 15:20:23 2021
CPU: 1 * Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz
CPU Cache: 6144 KB
Keys: 16 bytes each (+ 0 bytes user-defined timestamp)
Values: 100 bytes each (50 bytes after compression)
Entries: 10000000
Prefix: 0 bytes
Keys per prefix: 0
RawSize: 5531.3 MB (estimated)
FileSize: 3147.1 MB (estimated)
Write rate: 0 bytes/second
Read rate: 0 ops/second
Compression: Zlib
Compression sampling rate: 0
Memtable rep: skip_list
Perf Level: 1
WARNING: Assertions are enabled; benchmarks unnecessarily slow
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
RocksDB: version 6.21
Date: Sun Jul 18 15:20:23 2021
CPU: 1 * Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz
CPU Cache: 6144 KB
Keys: 16 bytes each (+ 0 bytes user-defined timestamp)
Values: 100 bytes each (50 bytes after compression)
Entries: 10000000
Prefix: 0 bytes
Keys per prefix: 0
RawSize: 110.0 MB (estimated)
FileSize: 62.9 MB (estimated)
Write rate: 0 bytes/second
Read rate: 0 ops/second
Compression: Snappy
Compression sampling rate: 0
Memtable rep: skip_list
Perf Level: 1
WARNING: Assertions are enabled; benchmarks unnecessarily slow
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
DB path: [/tmp/rocksdbtest-1000/dbbench]
fillseq : 8.735 micros/op 114478 ops/sec; 12.7 MB/s
fillrandom : 26.935 micros/op 37126 ops/sec; 4.1 MB/s
Please disable auto_compactions in FillDeterministic benchmark
```

<./db_bench + options>

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■ db_bench 테스트 결과

- ✓ <https://github.com/facebook/rocksdb/pull/1801> 참고

```
yejin@yejin-VirtualBox:~/RocksDB_Explorer$ ./db_bench -benchmarks=readrandom -readonly -use_existing_db=true -open_files=10000 -num=500000000 -reads=1000000 -cache_size=1073741824 -threads=32
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
RocksDB: version 6.21
Date: Sun Jul 18 17:18:20 2021
CPU: 1 * Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz
CPU Cache: 6144 KB
Keys: 16 bytes each (+ 0 bytes user-defined timestamp)
Values: 100 bytes each (50 bytes after compression)
Entries: 500000000
Prefix: 0 bytes
Keys per prefix: 0
RawSize: 5531.3 MB (estimated)
FileSize: 3147.1 MB (estimated)
Write rate: 0 bytes/second
Read rate: 0 ops/second
Compression: Snappy
Compression sampling rate: 0
Memtablerep: skip_list
Perf Level: 1
WARNING: Assertions are enabled; benchmarks unnecessarily slow
-----
DB path: [/tmp/rocksdbtest-1000/dbbench]
readrandom : 4940.502 micros/op 6466 ops/sec; 0.3 MB/s (430012 of 1000000 found)
```

<./db_bench + options>

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■ Topic: Interface Related

- ✓ 내부 구조와 함께 인터페이스 측면에서 RocksDB를 분석하기 위해



RocksDB



MyRock



MongoDB

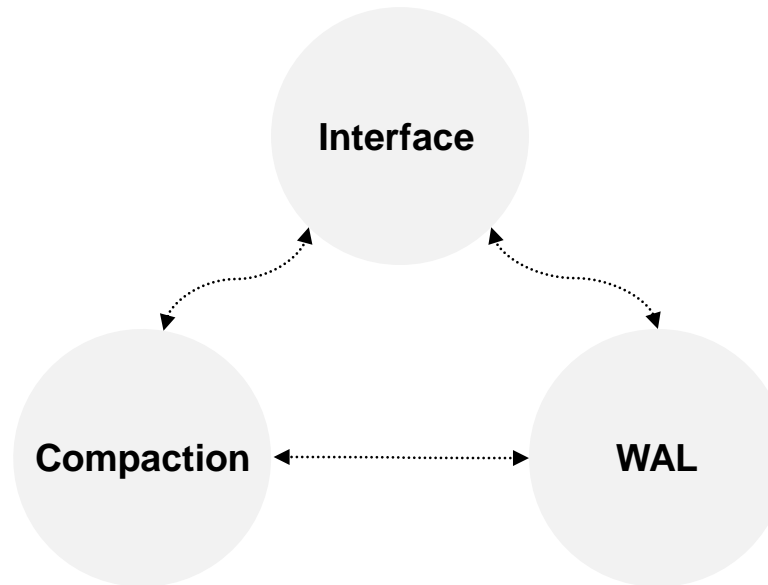


LedisDB

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■ 기대 결과

- ✓ 다양한 DB 중에서도 **RocksDB**만의 뛰어난 성능을 확인하여 표나 그래프 등의 결과로 나타낸다.
- ✓ 추가적으로 단순한 성능 비교를 넘어 **RocksDB**의 내부 구조가 어떻게 동작하는지도 분석한다.



Discussion

