# RocksDB Festival

Supported by IITP, StarLab.

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BGR

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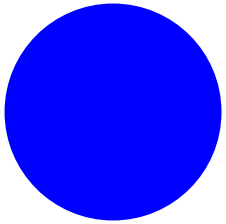
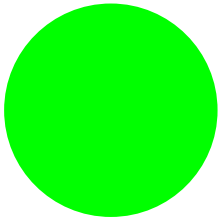
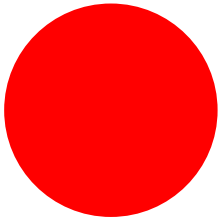
- Introduce BGR team
  - ✓ 하계 방학 RocksDB 분석 스터디 참여



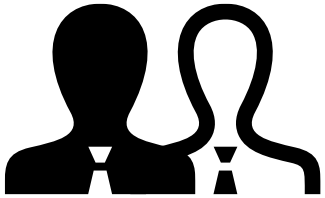
**Big data**



**Guru**



**RocksDB**



**박경미 황예진**

**소프트웨어학과 19학번**

# 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          memtable
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
```

# RocksDB Festival

- 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
CPUCache:   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
Memtablerep: 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>

열기(O)  options.h
~/RocksDB_Explorer/include/rocksdb

```
// Dynamically changeable through SetOptions() API
bool disable_auto_compactions = false;
```

<Include/options.h>

# RocksDB Festival

- 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=50000 -range_tombstone_w
idth=50000 -max_num_range_tombstones=1000 -num=50000000
Initializing RocksDB Options from the specified file
Initializing RocksDB Options from command-line flags
RocksDB:    version 6.21
Date:       Sun Jul 18 15:52:20 2021
CPU:        1 * Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz
CPUCache:   6144 KB
Keys:       16 bytes each (+ 0 bytes user-defined timestamp)
Values:     100 bytes each (50 bytes after compression)
Entries:    50000000
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
Memtablerep: 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]
fillrandom   :      26.935 micros/op 37126 ops/sec;    4.1 MB/s
```

**<./db_bench + options>**

# RocksDB Festival

- db_bench 테스트 결과
  - ✓ https://github.com/facebook/rocksdb/pull/1801 참고

```
yejin@yejin-VirtualBox:~/RocksDB_Explorer$ ./db_bench -benchmarks=readrandom -re
adonly -use_existing_db=true -open_files=10000 -num=50000000 -reads=1000000 -cac
he_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
CPUCache:   6144 KB
Keys:       16 bytes each (+ 0 bytes user-defined timestamp)
Values:     100 bytes each (50 bytes after compression)
Entries:    50000000
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 100000
0 found)
```

**<./db_bench + options>**

# RocksDB Festival

- Topic: Interface Related
  - ✓ 내부 구조와 함께 인터페이스 측면에서 RocksDB를 분석하기 위해

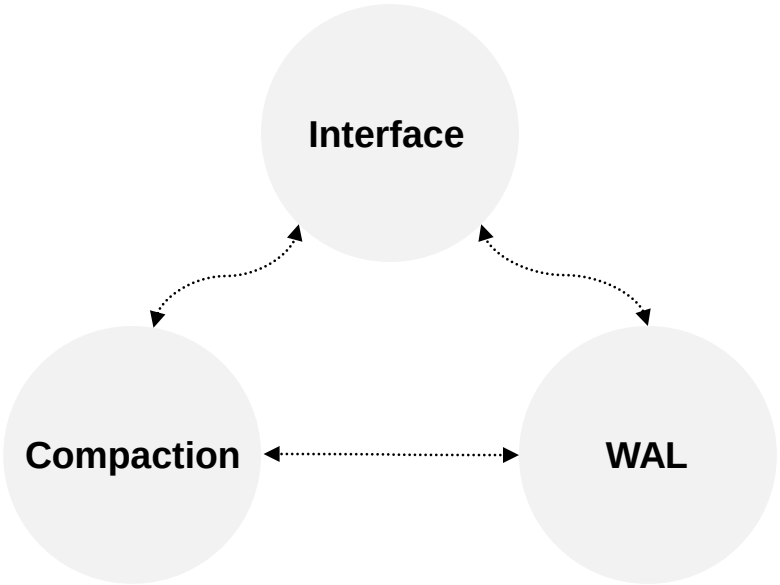
**RocksDB**

**MyRock**


**MongoDB**


**LedisDB**

- 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