

1) how to build unit test (googletest) using makefile

+ step 1: clean all with command line as follow:

make clean

+ step 2: build eventmanager test with command line as follow:

make eventmanager_test

+ step 3: build iobuffer test with command line as follow:

make iobuffer_test

+ step 4: build tcp test with command line as follow:

make tcp_test

2) how to run unit test (googletest) and memory leak (valgrind) using makefile

+ step 1: run eventmanager test with command line as follow:

make eventmanager_valgrind

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quang@ubuntu: ~/Desktop/coccoc_edit/homework/final/homework_assignment
File Edit View Search Terminal Help
-----] 11 tests from EventManagerTest
RUN      ] EventManagerTest.StartStop
OK      ] EventManagerTest.StartStop (3 ms)
RUN      ] EventManagerTest.NotificationDelayedRaise
OK      ] EventManagerTest.NotificationDelayedRaise (2 ms)
RUN      ] EventManagerTest.NotificationPreDelayRaise
OK      ] EventManagerTest.NotificationPreDelayRaise (1 ms)
RUN      ] EventManagerTest.StartEnqueueStop
OK      ] EventManagerTest.StartEnqueueStop (2 ms)
RUN      ] EventManagerTest.StartEnqueueStop2
OK      ] EventManagerTest.StartEnqueueStop2 (2 ms)
RUN      ] EventManagerTest.StartEnqueueStop3
OK      ] EventManagerTest.StartEnqueueStop3 (6 ms)
RUN      ] EventManagerTest.StartEnqueueStop4
OK      ] EventManagerTest.StartEnqueueStop4 (6 ms)
RUN      ] EventManagerTest.CallMethodsFromWorkerThread
OK      ] EventManagerTest.CallMethodsFromWorkerThread (3 ms)
RUN      ] EventManagerTest.WatchFdAndRemoveFdFromWorker
OK      ] EventManagerTest.WatchFdAndRemoveFdFromWorker (5 ms)
RUN      ] EventManagerTest.WatchFdConcurrentReadWrite
OK      ] EventManagerTest.WatchFdConcurrentReadWrite (4 ms)
RUN      ] EventManagerTest.TestCancel
OK      ] EventManagerTest.TestCancel (2 ms)
-----] 11 tests from EventManagerTest (45 ms total)

-----] Global test environment tear-down
=====] 11 tests from 1 test case ran. (48 ms total)
[PASSED] 11 tests.
==22202==
==22202== HEAP SUMMARY:
==22202==    in use at exit: 0 bytes in 0 blocks
==22202==   total heap usage: 16,984 allocs, 16,984 frees, 1,715,749 bytes allocated
==22202==
==22202== All heap blocks were freed -- no leaks are possible
==22202==
==22202== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
==22202== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
quang@ubuntu:~/Desktop/coccoc_edit/homework/final/homework_assignment$
```

+ step 2: run iobuffer test with command line as follow:
make iobuffer_valgrind

```
quang@ubuntu: ~/Desktop/coccoc_edit/homework/final/homework_assignment
File Edit View Search Terminal Help
[=====] Running 2 tests from 1 test case.
[-----] Global test environment set-up.
[-----] 2 tests from IOBufferTest
RUN      OK ] IOBufferTest.AppendBytes
RUN      OK ] IOBufferTest.AppendBytes (1 ms)
RUN      OK ] IOBufferTest.ConsumeBeforePullDown
RUN      OK ] IOBufferTest.ConsumeBeforePullDown (1 ms)
[-----] 2 tests from IOBufferTest (3 ms total)

[-----] Global test environment tear-down
[=====] 2 tests from 1 test case ran. (5 ms total)
[PASSED] 2 tests.

Repeating all tests (iteration 100) . . .

[=====] Running 2 tests from 1 test case.
[-----] Global test environment set-up.
[-----] 2 tests from IOBufferTest
RUN      OK ] IOBufferTest.AppendBytes
RUN      OK ] IOBufferTest.AppendBytes (1 ms)
RUN      OK ] IOBufferTest.ConsumeBeforePullDown
RUN      OK ] IOBufferTest.ConsumeBeforePullDown (1 ms)
[-----] 2 tests from IOBufferTest (3 ms total)

[-----] Global test environment tear-down
[=====] 2 tests from 1 test case ran. (5 ms total)
[PASSED] 2 tests.
--24494-- REDIR: 0x56939c0 (libc.so.6:free) redirected to 0x4c30cd0 (free)
==24494==
==24494== HEAP SUMMARY:
==24494==   in use at exit: 0 bytes in 0 blocks
==24494==   total heap usage: 3,096 allocs, 3,096 frees, 721,459 bytes allocated
==24494==
==24494== All heap blocks were freed -- no leaks are possible
==24494==
==24494== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
==24494== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
quang@ubuntu:~/Desktop/coccoc_edit/homework/final/homework_assignment$
```

+ step 3: run tcp test with command line as follow:
make tcp_valgrind

```
quang@ubuntu: ~/Desktop/coccoc_edit/homework/final/homework_assignment
File Edit View Search Terminal Help
[=====] 7 tests from 1 test case ran. (174 ms total)
[PASSED] 7 tests.

Repeating all tests (iteration 100) . . .

[=====] Running 7 tests from 1 test case.
[-----] Global test environment set-up.
[-----] 7 tests from TCPTest
RUN      OK ] TCPTest.ListenTest
RUN      OK ] TCPTest.ListenTest (3 ms)
RUN      OK ] TCPTest.ListenConnectTest
RUN      OK ] TCPTest.ListenConnectTest (2 ms)
RUN      OK ] TCPTest.ListenConnectSendDataTest
RUN      OK ] TCPTest.ListenConnectSendDataTest (14 ms)
RUN      OK ] TCPTest.ListenConnectDisconnectTest
RUN      OK ] TCPTest.ListenConnectDisconnectTest (8 ms)
RUN      OK ] TCPTest.WriteBeforeStartedClient
I0915 23:34:03.229988 24701 tcp_test.cpp:173] Print 0
RUN      OK ] TCPTest.WriteBeforeStartedClient (11 ms)
RUN      OK ] TCPTest.FillWriteBuffer
RUN      OK ] TCPTest.FillWriteBuffer (108 ms)
RUN      OK ] TCPTest.WriteAfterDisconnect
RUN      OK ] TCPTest.WriteAfterDisconnect (13 ms)
[-----] 7 tests from TCPTest (162 ms total)

[-----] Global test environment tear-down
[=====] 7 tests from 1 test case ran. (164 ms total)
[PASSED] 7 tests.

==24701==
==24701== HEAP SUMMARY:
==24701==   in use at exit: 0 bytes in 0 blocks
==24701==   total heap usage: 52,978 allocs, 52,978 frees, 611,497,624 bytes allocated
==24701==
==24701== All heap blocks were freed -- no leaks are possible
==24701==
==24701== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
==24701== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
quang@ubuntu:~/Desktop/coccoc_edit/homework/final/homework_assignment$
```