

Checkpoint 0 Writeup

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This lab took me about [3] hours to do. I [did] attend the lab session.

1. Program Structure and Design:

创建了一个TCPSocket，通过host和service --"http"构建Address，通过socket1向服务器发送http请求报文。利用while循环，一直输出从服务器里收到的所有内容。

code:

```
9 void get_URL( const string& host, const string& path )
10 {
11     //cerr << "Function called: get_URL(" << host << ", " << path << ")\n";
12     //cerr << "Warning: get_URL() has not been implemented yet.\n";
13     TCPSocket socket1;
14     socket1.connect(Address(host,"http"));
15     string url = "GET "+path+ " HTTP/1.1\r\n"
16                 + "Host: " + host +"\r\n"
17                 + "Connection: close\r\n\r\n";
18     socket1.write(url);
19     string answer,chunk;
20     while(true)
21     {
22         socket1.read(chunk);
23         if(chunk.empty())
24             break;
25         answer+=chunk;
26     }
27     cout << answer;
28     socket1.close();
29 }
```

outcome1:

```
wx@wx-virtual-machine:~/Desktop/CN_lab/minnow$ cmake --build build --target
t check_webget
Test project /home/wx/Desktop/CN_lab/minnow/build
  Start 1: compile with bug-checkers
1/2 Test #1: compile with bug-checkers ..... Passed    2.31 sec
  Start 2: t_webget
2/2 Test #2: t_webget ..... Passed    1.52 sec

100% tests passed, 0 tests failed out of 2

Total Test time (real) =  3.85 sec
Built target check_webget
```

capacity表示最大容量，error_表示是否发生错误，close表示ByteStream是否关闭，buffer_是存储数据的地方，bytes_pushed_表示写入了多少数据，bytes_popped表示读取了多少数据。

code:

```

24 protected:
25 // Please add any additional state to the ByteStream here, and not to the Writer and Reader interfaces.
26 uint64_t capacity_;
27 bool error_ {};
28 bool closed_ {false};
29 string buffer_;
30 uint64_t bytes_pushed_ {0};
31 uint64_t bytes_popped_ {0};
32 };
33
15 void Writer::push( string data )
16 {
17     if (closed_) return;
18
19     uint64_t available_space = available_capacity();
20     uint64_t to_push = min(available_space, static_cast<uint64_t>(data.size()));
21
22     for (uint64_t i = 0; i < to_push; ++i) {
23         buffer_.push_back(data[i]);
24     }
25
26     bytes_pushed_ += to_push;
27     return;
28 }
29
61 void Reader::pop( uint64_t len )
62 {
63     if (buffer_.empty() && closed_) return;
64     uint64_t to_pop = min(len, static_cast<uint64_t>(buffer_.size()));
65     buffer_.erase(buffer_.begin(), buffer_.begin() + to_pop);
66     bytes_popped_ += to_pop;
67 }
68

```

outcome2:

```

wx@wx-virtual-machine:~/Desktop/CN_lab/minnow$ cmake --build build --target check0
Test project /home/wx/Desktop/CN_lab/minnow/build
  Start 1: compile with bug-checkers
1/10 Test #1: compile with bug-checkers ..... Passed    2.42 sec
  Start 2: t_webget
2/10 Test #2: t_webget ..... Passed    1.25 sec
  Start 3: byte_stream_basics
3/10 Test #3: byte_stream_basics ..... Passed    0.02 sec
  Start 4: byte_stream_capacity
4/10 Test #4: byte_stream_capacity ..... Passed    0.02 sec
  Start 5: byte_stream_one_write
5/10 Test #5: byte_stream_one_write ..... Passed    0.02 sec
  Start 6: byte_stream_two_writes
6/10 Test #6: byte_stream_two_writes ..... Passed    0.02 sec
  Start 7: byte_stream_many_writes
7/10 Test #7: byte_stream_many_writes ..... Passed    0.08 sec
  Start 8: byte_stream_stress_test
8/10 Test #8: byte_stream_stress_test ..... Passed    0.03 sec
  Start 37: compile with optimization
9/10 Test #37: compile with optimization ..... Passed    8.32 sec
  Start 38: byte_stream_speed_test
        ByteStream throughput: 1.64 Gbit/s
10/10 Test #38: byte_stream_speed_test ..... Passed    0.27 sec

100% tests passed, 0 tests failed out of 10

```

2. Implementation Challenges 在配置环境中出现了问题，导致实现这句命令行时"Cmake --build build"一直在报错，问了助教后发现是因为g++和gcc的版本太低，升级了以后就解决了。