Check2 实验报告

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1. Structure and Design

使用另写的 send_msg_with 来发送新的报文段，进行代码复用，提高可读性，方便调试。

使用 map 来储存已发送的报文段，时间复杂度较低。

另写一个 timer 来计时，提高可读性。

代码无法处理只 ack 一半的报文段。

无法同时发送已发送的信息和未发送的信息。

2. Implementation Challenges

本次实验需按照要求，储存已发送的报文段，而非储存已发送的字符。

同时需注意包含 SYN 的空报文段需及时发送。

3. Remaining Bugs

没有剩余的 bug。

4. Experimental results and performance

完成截图如下：

```
        Start 21: recv_connect
20/36 Test #21: recv_connect ..................... Passed    0.01 sec
        Start 22: recv_transmit
21/36 Test #22: recv_transmit ................... Passed    0.18 sec
        Start 23: recv_window
22/36 Test #23: recv_window ..................... Passed    0.01 sec
        Start 24: recv_reorder
23/36 Test #24: recv_reorder .................... Passed    0.01 sec
        Start 25: recv_reorder_more
24/36 Test #25: recv_reorder_more ............... Passed    0.66 sec
        Start 26: recv_close
25/36 Test #26: recv_close ...................... Passed    0.01 sec
        Start 27: recv_special
26/36 Test #27: recv_special .................... Passed    0.02 sec
        Start 28: send_connect
27/36 Test #28: send_connect .................... Passed    0.01 sec
        Start 29: send_transmit
28/36 Test #29: send_transmit ................... Passed    0.28 sec
        Start 30: send_retx
29/36 Test #30: send_retx ....................... Passed    0.01 sec
        Start 31: send_window
30/36 Test #31: send_window ..................... Passed    0.06 sec
        Start 32: send_ack
31/36 Test #32: send_ack ........................ Passed    0.01 sec
        Start 33: send_close
32/36 Test #33: send_close ...................... Passed    0.01 sec
        Start 34: send_extra
33/36 Test #34: send_extra ...................... Passed    0.03 sec
        Start 37: compile with optimization
34/36 Test #37: compile with optimization ....... Passed    0.09 sec
        Start 38: byte_stream_speed_test
            ByteStream throughput: 5.00 Gbit/s
35/36 Test #38: byte_stream_speed_test .......... Passed    0.09 sec
        Start 39: reassembler_speed_test
            Reassembler throughput: 11.53 Gbit/s
36/36 Test #39: reassembler_speed_test .......... Passed    0.13 sec

100% tests passed, 0 tests failed out of 36

Total Test time (real) =   3.28 sec
Built target check3
wexther@wxh:~/minnow$
```