lab2

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设计结果:

run函数:
初始化滑动窗口

```
    def run(self, env: Environment):
        while self.seqno < self.window_size :
            wait_pkt = self.new_packet(self.seqno ,self.message[self.absno])
            self.send_packet(wait_pkt)
            self.outbound.append(wait_pkt)
            self.seqno = self.seqno + 1
            self.absno = self.absno + 1
        self.timer.restart(self.timeout)
        yield self.finish_channel.get()
```

time_out函数:
重新发送缓存区的内容即可

```
    def timeout_callback(self):
        self.dprint("timeout")
        for ele in self.outbound:
            wait_pkt = self.new_packet( ele.packet_id , ele.payload)
            self.send_packet(wait_pkt)
```

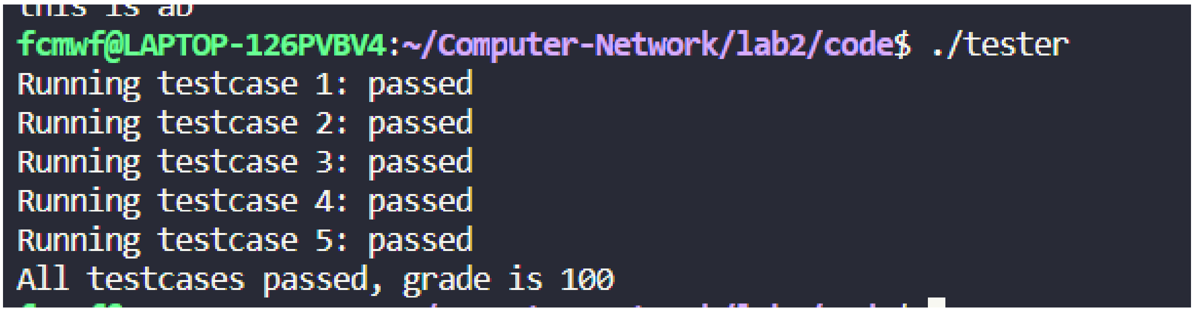
put函数:

```
    def put(self, packet: Packet):
        """从接收端收到ACK"""
        ackno = packet.packet_id
        if ackno in [pkt.packet_id for pkt in self.outbound]:
            while self.seqno_start != ackno:
                self.outbound.popleft()
                self.seqno_start = (self.seqno_start + 1) % self.seqno_range
            self.outbound.popleft()
            self.seqno_start = (self.seqno_start + 1) % self.seqno_range
        if len(self.outbound) < self.window_size  and self.absno  < len(self.message):
            wait_pkt = self.new_packet(self.seqno , self.message[self.absno])
            self.send_packet(wait_pkt)
            self.outbound.append(wait_pkt)
            self.absno = self.absno + 1
            self.seqno = ( self.seqno + 1 ) % self.seqno_range
            self.timer.restart(self.timeout)
        if len(self.outbound) == 0:
            self.finish_channel.put(True)
```

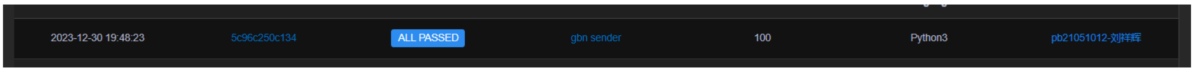
1、判断接受的ACK
2、如果缓存区有空位，发送信息
3、缓存区满时，发送结束

2和3容易做出，1时有个小trick，当recieve方发送的ack连续两条丢失时，如果只是判断`*self*.seqno_start==ackno`，可能会出现无限循环的情况，这里我们知道当发送的两条ack丢失时，前面的seqno必定被接受过了，故我们可以直接从缓冲区找到下一条ack对应的seqno即可。

实现结果：



```
this is ab
fcmwf@LAPTOP-126PVBV4:~/Computer-Network/lab2/code$ ./tester
Running testcase 1: passed
Running testcase 2: passed
Running testcase 3: passed
Running testcase 4: passed
Running testcase 5: passed
All testcases passed, grade is 100
```



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