

组会报告

徐益

2018 年 5 月 23 日

1 本周工作内容

1. 尝试扩大 DPDK 的中 mbuf
2. 实现分块传输和流量控制问题
3. 处理 makefile 相关问题

2 尝试扩大 DPDK 的中 mbuf

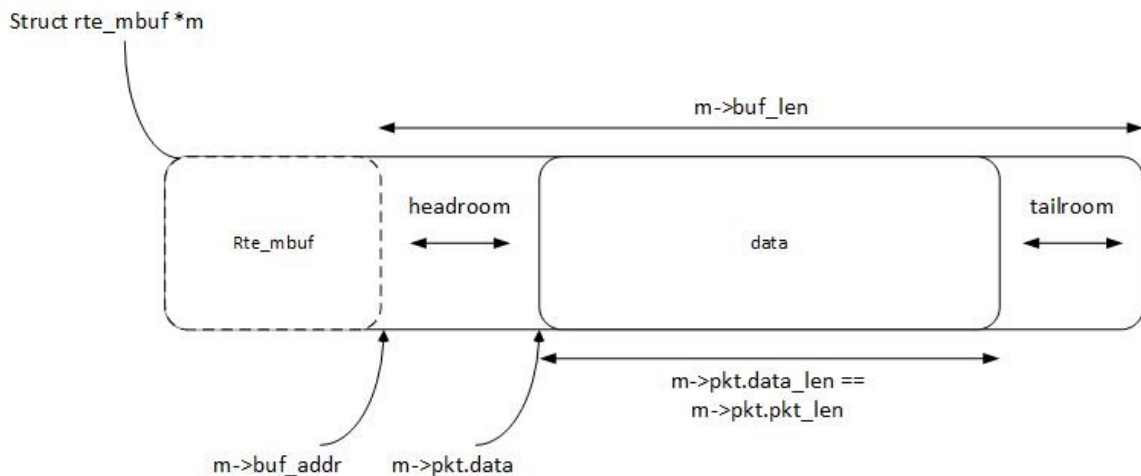


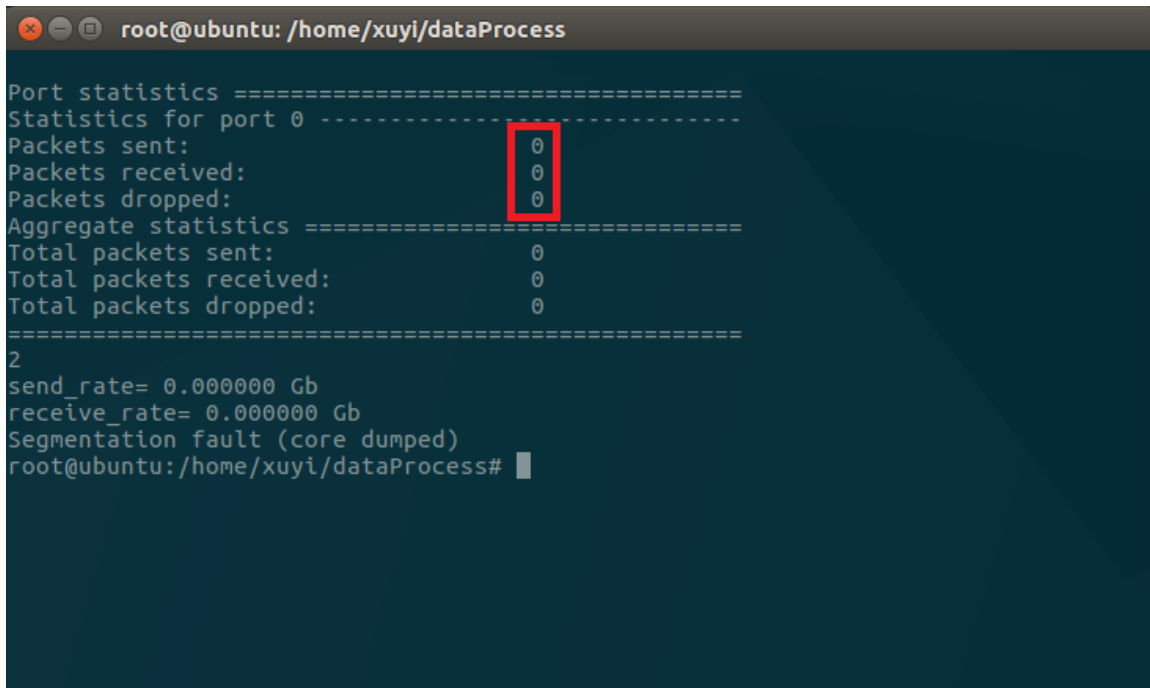
图 1: rtl_mbuf 结构

```
1 /**
2  * @param name
3  *   The name of the mbuf pool.
4  * @param n
5  *   The number of elements in the mbuf pool. The optimum size (in terms
6  *   of memory usage) for a mempool is when n is a power of two minus one:
7  *   n = (2^q - 1).
8  * @param cache_size
9  *   Size of the per-core object cache. See rte_mempool_create() for
10 *   details.
11 * @param priv_size
12 *   Size of application private are between the rte_mbuf structure
13 *   and the data buffer. This value must be aligned to RTE_MBUF_PRIV_ALIGN.
14 * @param data_room_size
15 *   Size of data buffer in each mbuf, including RTE_PKTMBUF_HEADROOM.
```

```

16 * @param socket_id
17 *   The socket identifier where the memory should be allocated. The
18 *   value can be *SOCKET_ID_ANY* if there is no NUMA constraint for the
19 *   reserved zone.
20 */
21 struct rte_mempool *
22 rte_pktmbuf_pool_create(const char *name, unsigned n,
23     unsigned cache_size, uint16_t priv_size, uint16_t data_room_size,
24     int socket_id);

```

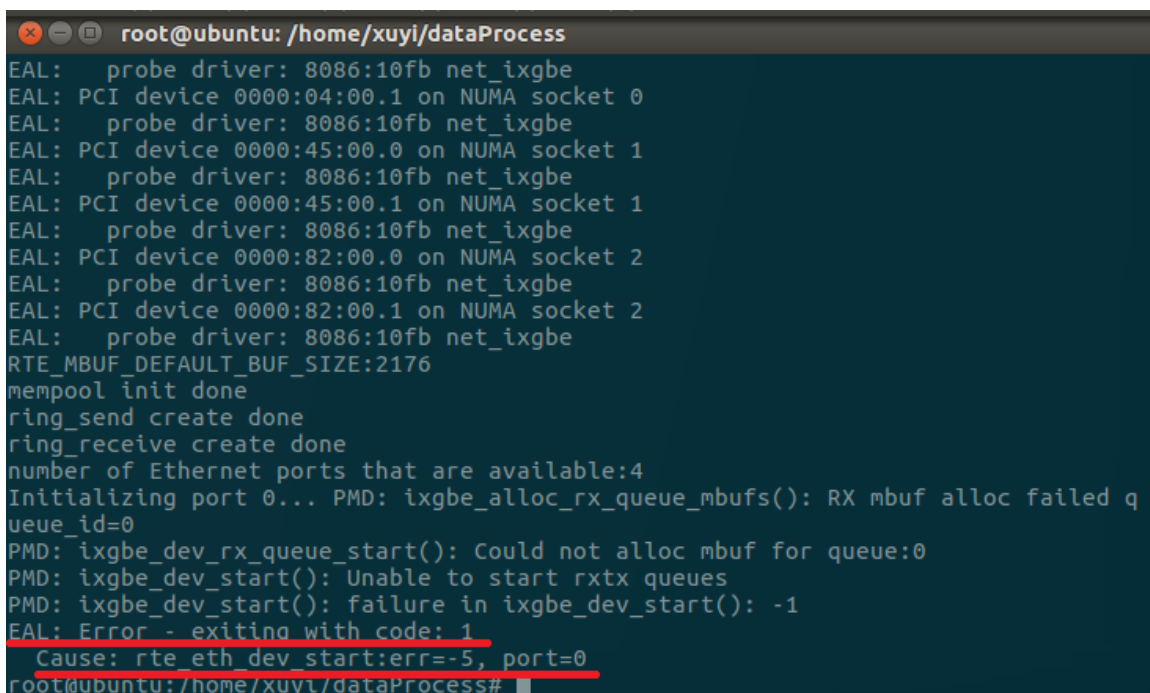


```

root@ubuntu: /home/xuyi/dataProcess
Port statistics =====
Statistics for port 0 -----
Packets sent:          0
Packets received:      0
Packets dropped:       0
Aggregate statistics =====
Total packets sent:    0
Total packets received: 0
Total packets dropped: 0
=====
2
send_rate= 0.000000 Gb
receive_rate= 0.000000 Gb
Segmentation fault (core dumped)
root@ubuntu: /home/xuyi/dataProcess#

```

图 2: 仅扩大 MBUF_SIZE



```

root@ubuntu: /home/xuyi/dataProcess
EAL: probe driver: 8086:10fb net_ixgbe
EAL: PCI device 0000:04:00.1 on NUMA socket 0
EAL: probe driver: 8086:10fb net_ixgbe
EAL: PCI device 0000:45:00.0 on NUMA socket 1
EAL: probe driver: 8086:10fb net_ixgbe
EAL: PCI device 0000:45:00.1 on NUMA socket 1
EAL: probe driver: 8086:10fb net_ixgbe
EAL: PCI device 0000:82:00.0 on NUMA socket 2
EAL: probe driver: 8086:10fb net_ixgbe
EAL: PCI device 0000:82:00.1 on NUMA socket 2
EAL: probe driver: 8086:10fb net_ixgbe
RTE_MBUF_DEFAULT_BUF_SIZE:2176
mempool init done
ring_send create done
ring_receive create done
number of Ethernet ports that are available:4
Initializing port 0... PMD: ixgbe_alloc_rx_queue_mbufs(): RX mbuf alloc failed q
ueue_id=0
PMD: ixgbe_dev_rx_queue_start(): Could not alloc mbuf for queue:0
PMD: ixgbe_dev_start(): Unable to start rxtx queues
PMD: ixgbe_dev_start(): failure in ixgbe_dev_start(): -1
EAL: Error - exiting with code: 1
Cause: rte_eth_dev_start:err=-5, port=0
root@ubuntu: /home/xuyi/dataProcess#

```

图 3: 扩大 MBUF_SIZE 的同时缩小 NB_MBUF

3 分段传输方案

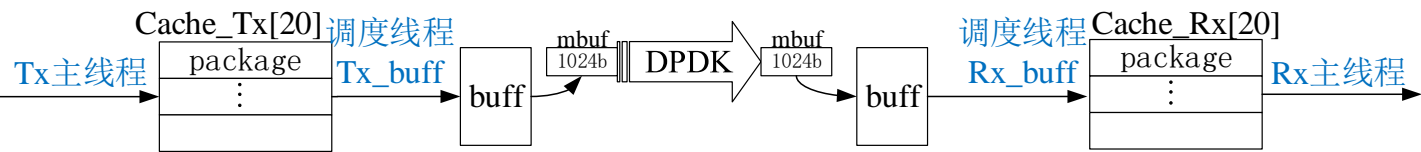


图 4: 分段传输方案系统结构

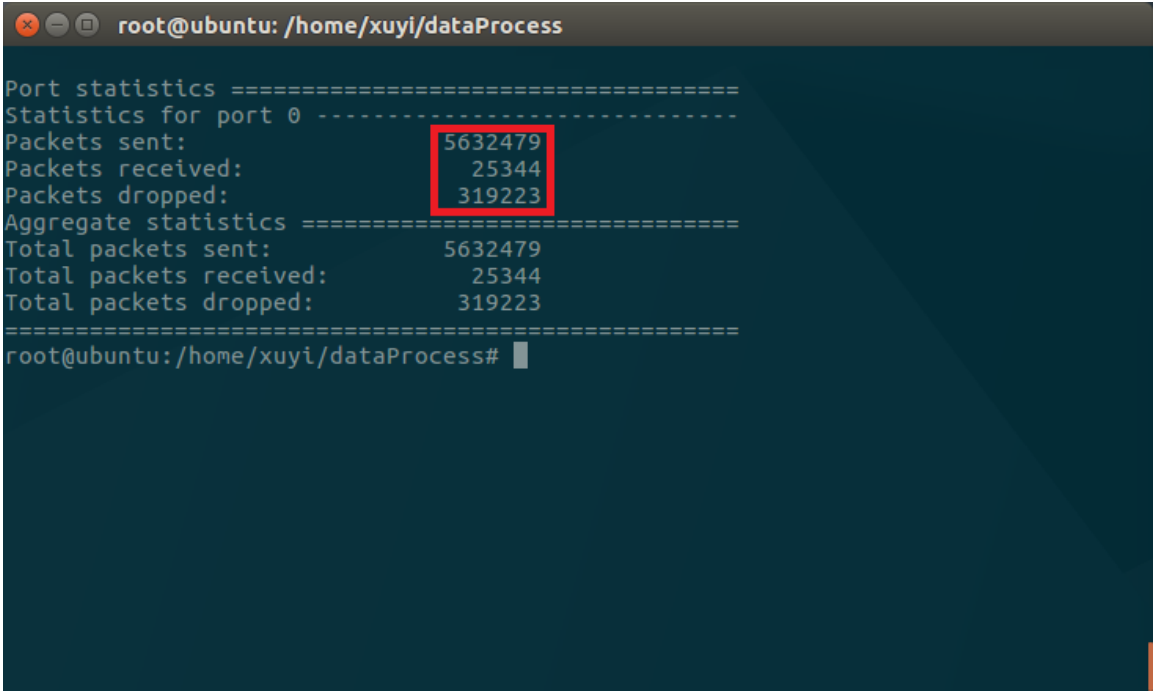


图 5: 未进行流量控制

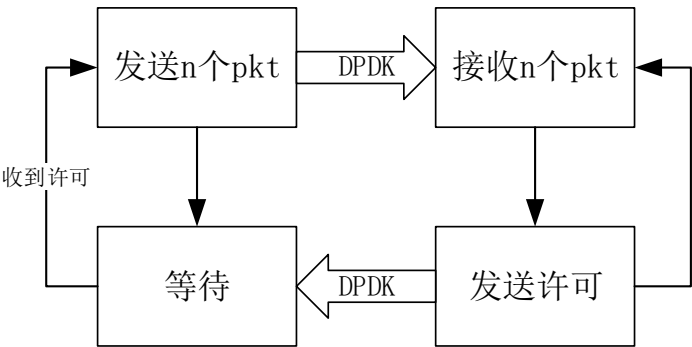


图 6: 流量控制方案

```
root@ubuntu: /home/xuyi/traffic_control/dataProcess_send

Port statistics =====
Statistics for port 0 -----
Packets sent:          78471
Packets received:      78471
Packets dropped:        0
Aggregate statistics =====
Total packets sent:    78471
Total packets received: 78471
Total packets dropped: 0
=====
root@ubuntu: /home/xuyi/traffic_control/dataProcess_send#

root@ubuntu: /home/xuyi/traffic_control/dataProcess_receive

Port statistics =====
Statistics for port 0 -----
Packets sent:          78471
Packets received:      78471
Packets dropped:        0
Aggregate statistics =====
Total packets sent:    78471
Total packets received: 78471
Total packets dropped: 0
=====
root@ubuntu: /home/xuyi/traffic_control/dataProcess_receive#
```

图 7: 进行流量控制后

4 makefile 相关问题

```
Makefile
35 RTE_SDK ?= $(HOME)/dpdk
36
37 # Default target, can be overridden by command line or environment
38 RTE_TARGET ?= x86_64-native-linuxapp-gcc
39
40 include $(RTE_SDK)/mk/rte.vars.mk
41
42 # binary name
43 APP = l2fwd
44
45 # all source are stored in SRCS-y
46 SRCS-y := main.c
47
48 CFLAGS += -O3
49 CFLAGS += $(WERROR_FLAGS)
50
51 include $(RTE_SDK)/mk/rte.extapp.mk
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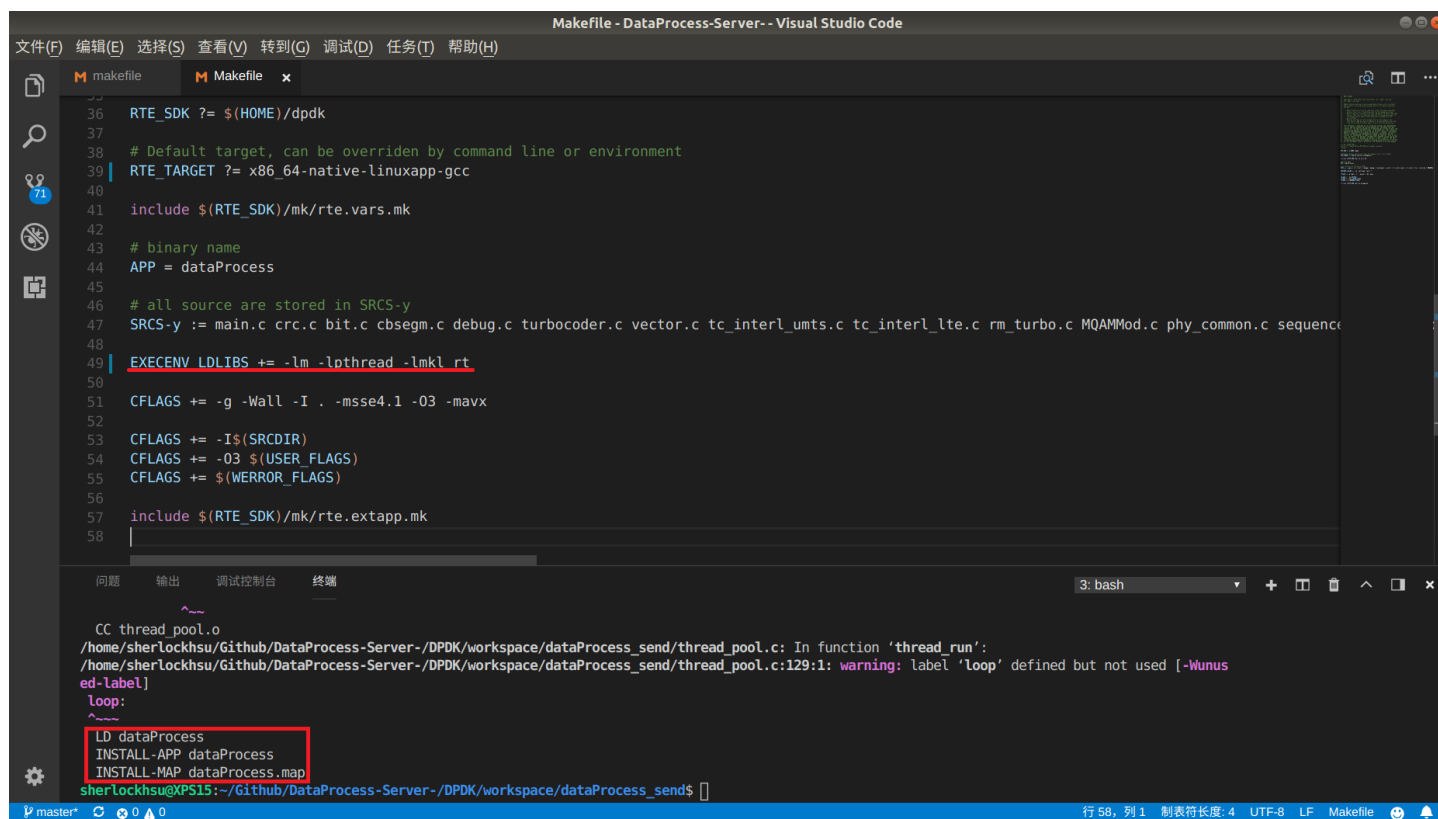
```

```
23 # A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT
24 # OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
25 # SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT
26 # LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
27 # DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
28 # THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
29 # (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE
30 # OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
31
32 # ifeq ($(RTE_SDK),)
33 # $(error "Please define RTE_SDK environment variable")
34 # endif
35
36 RTE_SDK ?= $(HOME)/dpdk
37
38 # Default target, can be overridden by command line or environment
39 RTE_TARGET ?= x86_64-native-linuxapp-gcc
40
41 include $(RTE_SDK)/mk/rte.vars.mk
42
43 # binary name
44 APP = dataProcess
45
46 # all source are stored in SRCS-y
47 SRCS-y := main.c crc.c bit.c cbsegm.c debug.c turbocoder.c vector.c tc_interl_ums.c tc_interl_lte.c rm_turbo.c MQAMMod.c phy_common.c sequence.c turbodecoder.c turbodecoder_gen.c turbodecod
48
49 LTB += -lm -lpthread -lmkl_rt -msse4.1 -fopenmp
50 CFLAGS += -g -Wall -I. -msse4.1 -O3 -maxx
51
52 CFLAGS += -I$(SRCDIR)
53 CFLAGS += -O3 $(USER_FLAGS)
54 CFLAGS += $(WERROR_FLAGS)
55
56 include $(RTE_SDK)/mk/rte.extapp.mk
57
```

图 9: 尝试合并的 makefile

```
root@ubuntu: /home/xuyi/dataProcess_send
/home/xuyi/dataProcess_send/ChannelEstimator.c:413: undefined reference to `Dfti
ComputeBackward'
/home/xuyi/dataProcess_send/ChannelEstimator.c:414: undefined reference to `Dfti
ComputeBackward'
/home/xuyi/dataProcess_send/ChannelEstimator.c:415: undefined reference to `Dfti
FreeDescriptor'
ChannelEstimator_LS.o: In function `Cal_DCT_FFT':
/home/xuyi/dataProcess_send/ChannelEstimator_LS.c:224: undefined reference to `D
ftiCreateDescriptor_s_1d'
/home/xuyi/dataProcess_send/ChannelEstimator_LS.c:225: undefined reference to `D
ftiCommitDescriptor'
/home/xuyi/dataProcess_send/ChannelEstimator_LS.c:246: undefined reference to `D
ftiComputeForward'
/home/xuyi/dataProcess_send/ChannelEstimator_LS.c:247: undefined reference to `D
ftiComputeForward'
/home/xuyi/dataProcess_send/ChannelEstimator_LS.c:256: undefined reference to `D
ftiFreeDescriptor'
TaskScheduler.o: In function `TaskScheduler_tx':
/home/xuyi/dataProcess_send/TaskScheduler.c:579: undefined reference to `cblas_c
gemm'
collect2: 错误: ld 返回 1
make[1]: *** [dataProcess] Error 1
make: *** [all] Error 2
root@ubuntu: /home/xuyi/dataProcess_send#
```

图 10: 编译报错



```
36 RTE_SDK ?= $(HOME)/dpdk
37
38 # Default target, can be overridden by command line or environment
39 RTE_TARGET ?= x86_64-native-linuxapp-gcc
40
41 include $(RTE_SDK)/mk/rte.vars.mk
42
43 # binary name
44 APP = dataProcess
45
46 # all source are stored in SRCS-y
47 SRCS-y := main.c crc.c bit.c cbsegm.c debug.c turbocoder.c vector.c tc_interl_ums.c tc_interl_lte.c rm_turbo.c MQAMMod.c phy_common.c sequence
48
49 EXECENV LDLIBS += -lm -lpthread -lmkl_rt
50
51 CFLAGS += -g -Wall -I . -msse4.1 -O3 -mavx
52
53 CFLAGS += -I$(SRCDIR)
54 CFLAGS += -O3 $(USER_FLAGS)
55 CFLAGS += $(WERROR_FLAGS)
56
57 include $(RTE_SDK)/mk/rte.extapp.mk
58 |
```

```
CC thread_pool.o
/home/sherlockhsu/Github/DataProcess-Server-/DPDK/workspace/dataProcess_send/thread_pool.c: In function 'thread_run':
/home/sherlockhsu/Github/DataProcess-Server-/DPDK/workspace/dataProcess_send/thread_pool.c:129:1: warning: label 'loop' defined but not used [-Wunus
ed-label]
  129: loop:
      ~~~~
LD dataProcess
INSTALL_APP dataProcess
INSTALL_MAP dataProcess.map
sherlockhsu@XPS15:~/Github/DataProcess-Server-/DPDK/workspace/dataProcess_send$
```

图 11: 最终解决

5 其他改进方向

1. 选择更大的 DPDK 发送页。
2. 选择更优的流量控制策略。

6 下周计划

1. 继续完成数据处理 +DPDK 系统
2. 学习 LDPC 相关内容