

组会报告

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1 工作内容

1. 完善原 5G NR 单线程测试程序;
2. 设计基于子载波分割的系统结果。
3. 实现基于子载波分割的单线程系统。

2 完善原 5G NR 单线程测试程序

```
1 # test_tb_sgl_thrd
2
3 version 1.2
4
5 Build and Execution Instructions
6 =====
7
8 ### Build:
9 > make
10
11 ### Execution:
12 > ./main [-f filename]
13
14 ### Clean:
15 > make clean
16
17 Change Log for Releases
18 =====
19 ## version 1.2
20     * 支持文件读取配置信息
21     * 选择mkl的随机数生产函数
22     * 使用fread代替原先的channel信息读取函数
23
24 ## version 1.1
25     * 修复了基于Base Graph 2的编码器异常问题
26     * 选择更灵活的导频初始化方案
27     * 实现有效子载波数的变化
28
29 ## version 1.0
30     * 实现了基于AVX2的5G LDPC编码器
```

- 31 * 实现了基于AVX2的High-Throughput OMS及NMS译码器
- 32 * 实现了基于AVX2的Low-Latency OMS及NMS译码器
- 33 * 搭建了AWGN信道的5G LDPC编译码性能测试平台

3 基于子载波分割的系统结果

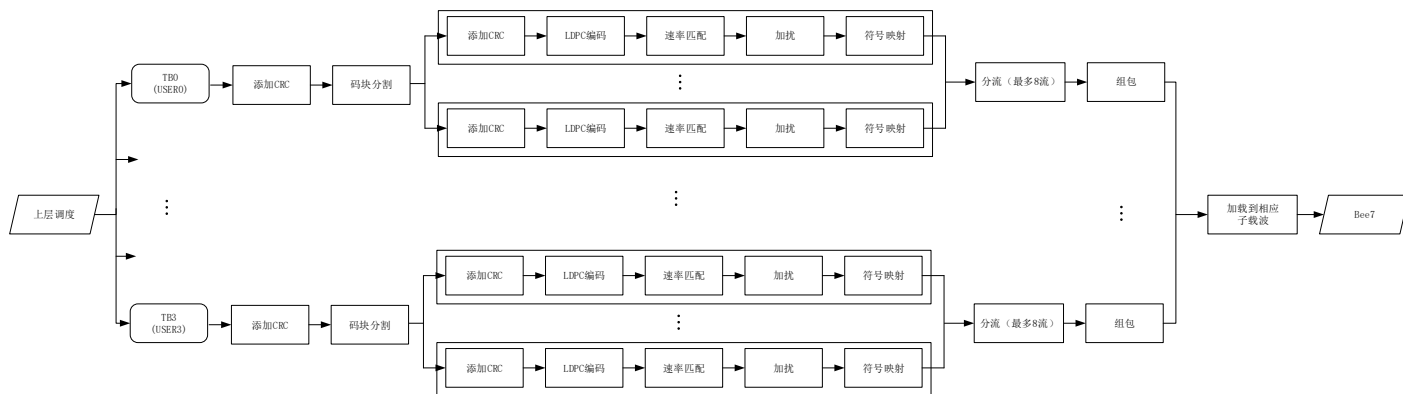


图 1: Tx 端系统结构

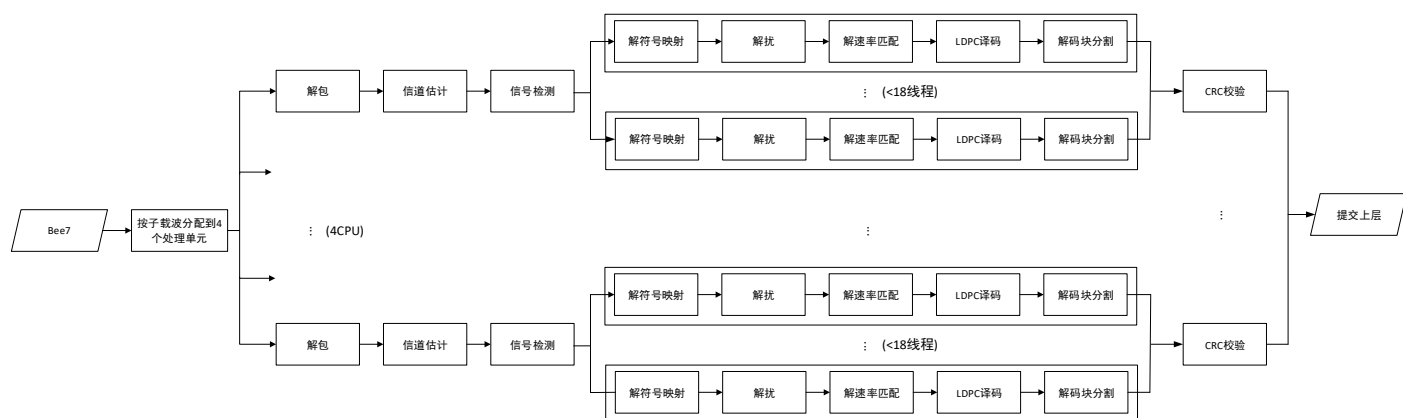


图 2: Rx 端系统结构

4 测试结果

```

1  ===== Test No. 1 =====
2  SNR:      30.00
3  Subframe: 1000
4  ----- USER 0 -----
5  CQI:      28(Q = 6, R = 948)
6  Stream: 1
7  ----- Throughput -----
8  tx_time:      0.2110s
9  rx_time:      0.5880s
10 tx_throughput: 86.7473Mbps
11 rx_throughput: 31.1282Mbps

```

```

12 ----- Error Rate -----
13 BER:      0.00e+00(0/18304000)
14 FER:      0.00e+00(0/1000)
15 -----
16 ----- USER 1 -----
17 CQI:      27(Q = 6, R = 910)
18 Stream: 1
19 ----- Throughput -----
20 tx_time:      0.2019s
21 rx_time:      0.5822s
22 tx_throughput: 87.0252Mbps
23 rx_throughput: 30.1751Mbps
24 ----- Error Rate -----
25 BER:      0.00e+00(0/17568000)
26 FER:      0.00e+00(0/1000)
27 -----
28 ----- USER 2 -----
29 CQI:      26(Q = 6, R = 873)
30 Stream: 1
31 ----- Throughput -----
32 tx_time:      0.1999s
33 rx_time:      0.5902s
34 tx_throughput: 84.3236Mbps
35 rx_throughput: 28.5615Mbps
36 ----- Error Rate -----
37 BER:      0.00e+00(0/16856000)
38 FER:      0.00e+00(0/1000)
39 -----
40 ----- USER 3 -----
41 CQI:      25(Q = 6, R = 822)
42 Stream: 1
43 ----- Throughput -----
44 tx_time:      0.2020s
45 rx_time:      0.6006s
46 tx_throughput: 78.5387Mbps
47 rx_throughput: 26.4139Mbps
48 ----- Error Rate -----
49 BER:      0.00e+00(0/15864000)
50 FER:      0.00e+00(0/1000)
51 -----
52 =====
53
54 ===== Test No. 2 =====
55 SNR:      30.00
56 Subframe: 1000
57 ----- USER 0 -----
58 CQI:      28(Q = 6, R = 948)
59 Stream: 8

```

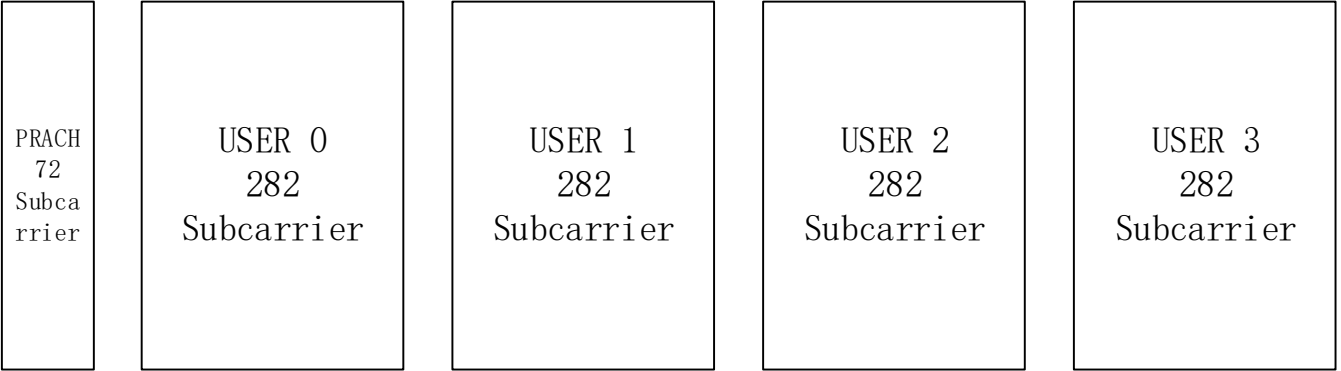
```

60 ----- Throughput -----
61 tx_time:          1.1928s
62 rx_time:          6.1965s
63 tx_throughput: 122.9147Mbps
64 rx_throughput:  23.6609Mbps
65 ----- Error Rate -----
66 BER:      8.38e-02(12284381/146616000)
67 FER:      1.00e+00(1000/1000)
68 -----
69 ----- USER 1 -----
70 CQI:      27(Q = 6, R = 910)
71 Stream: 7
72 ----- Throughput -----
73 tx_time:          0.9922s
74 rx_time:          5.2682s
75 tx_throughput: 124.1132Mbps
76 rx_throughput:  23.3748Mbps
77 ----- Error Rate -----
78 BER:      0.00e+00(0/123144000)
79 FER:      0.00e+00(0/1000)
80 -----
81 ----- USER 2 -----
82 CQI:      26(Q = 6, R = 873)
83 Stream: 6
84 ----- Throughput -----
85 tx_time:          0.8729s
86 rx_time:          4.5764s
87 tx_throughput: 115.9995Mbps
88 rx_throughput:  22.1259Mbps
89 ----- Error Rate -----
90 BER:      0.00e+00(0/101256000)
91 FER:      0.00e+00(0/1000)
92 -----
93 ----- USER 3 -----
94 CQI:      25(Q = 6, R = 822)
95 Stream: 5
96 ----- Throughput -----
97 tx_time:          0.7178s
98 rx_time:          3.8162s
99 tx_throughput: 110.6650Mbps
100 rx_throughput:  20.8166Mbps
101 ----- Error Rate -----
102 BER:      0.00e+00(0/79440000)
103 FER:      0.00e+00(0/1000)
104 -----
105 =====

```

5 有 PRACH 情况下的资源分配问题

方法一：



方法二：

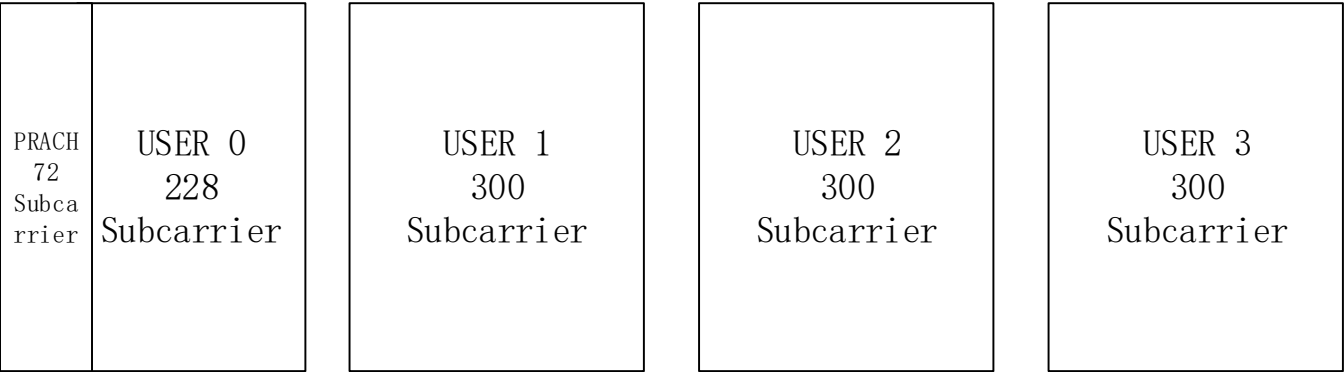


图 3: 两种方案