

Performance-testing

1. Test description and environment

1.1 test instructions

Performance and stability testing is an important part of Dimension's testing process, I. E. , pressure testing, which measures the performance of Dimension's testing network and the stability of its output nodes while loading the Dimension's testing network with certain transaction pressures.

1.2 Test Environment

Using Aliyun Server, the configuration is as follows:

- MEMORY: 8 GB
- CPU: 4 Core Intel R Xeon R Platinum 8269 CY CPU@2.50 Ghz
- Bandwidth: 5 mbps fixed bandwidth

2. Testing methods and procedures

2.1 test methods

Dimension built in a Txn plug-in, can initiate bulk transfer transactions, so this pressure test also use this plug-in test, plug-in official description

2.1 test steps

- a. Create Data and configuration files

```
1 mkdir ~ /eon.data
2 cat << EOF > ~ /eon.data /logging.json
3 {
4     "includes": [],
5     "appenders": [
6         {
7             "name": "consoleout",
8             "type": "console",
9             "args": {
10                 "stream": "std_out",
11                 "level_colors": [
12                     {
13                         "level": "debug",
14                         "color": "#0000FF"
15                     },
16                     {
17                         "level": "info",
18                         "color": "#008000"
19                     },
20                     {
21                         "level": "warn",
22                         "color": "#FF8C00"
23                     },
24                     {
25                         "level": "error",
26                         "color": "#DC143C"
27                     }
28                 ]
29             }
30         }
31     ]
32 }
```

```

12         "color": "green"
13     }, {
14         "level": "warn",
15         "color": "brown"
16     }, {
17         "level": "error",
18         "color": "red"
19     }
20   ]
21 },
22 "enabled": true
23 }
24 ],
25 "loggers": [
26   {
27     "name": "default",
28     "level": "info",
29     "enabled": true,
30     "additivity": false,
31     "appenders": [
32       "consoleout"
33     ]
34   }
35 ]
36 }
37 EOF

```

b. BOOT NODE STARTS A single-node test network for block and package transactions

```

1 ~/dimension/build/programs/nodeon/nodeon -d ~/eon.data/producer_node --
config-dir ~/eon.data/producer_node -l ~/eon.data/logging.json --http-
server-address "" --p2p-listen-endpoint localhost:4444 -p eonio -e

```

C. Start a single non-block full node and load the plug-in

```

1 ~/dimension/build/programs/nodeon/nodeon -d ~/eon.data/generator_node --
config-dir ~/eon.data/generator_node -l ~/eon.data/logging.json --plugin
eosio::txn_test_gen_plugin --plugin eosio::chain_api_plugin --p2p-peer-
address localhost:4444 --p2p-listen-endpoint localhost:5555 --http-server-
address localhost:3333

```

D. Create the Wallet, import the Dimension private key, and set the bios contract

```

1 alias cleon='~/dimension/build/programs/cleon/cleon -u
http://localhost:3333'
2 cleon wallet create -n tps --to-console
3 cleon wallet import -n tps
4 cleon set contract eonio ~/dimension/build/contracts/eosio.bios

```

E. The full node begins to generate transactions, such as 20 transactions per 20ms (i. e. 1000TPS)

```
1 curl --data-binary '[{"eonio",  
2 "5KQwrPbwL6PhXujxW37FSSQZ1JiwsST4cqQzDeyXtP79zkvFD3"}'  
3 http://127.0.0.1:3333/v1/txn_test_gen/create_test_accounts  
# 创建测试帐号  
4 curl --data-binary '["", 20, 20]'  
5 http://127.0.0.1:3333/v1/txn_test_gen/start_generation
```

F. Observe the packing performance of the boot nodes

The deal reads as follows:

```
1 "transaction": {
2     "expiration": "2019-12-15T03:19:26",
3     "ref_block_num": 1430,
4     "ref_block_prefix": 1178757138,
5     "max_net_usage_words": 100,
6     "max_cpu_usage_ms": 0,
7     "delay_sec": 0,
8     "context_free_actions": [
9         {
10             "account": "eonio.null",
11             "name": "nonce",
12             "authorization": [],
13             "data": "10e30100a4a5f55d"
14         }
15     ],
16     "actions": [
17         {
18             "account": "txn.test.t",
19             "name": "transfer",
20             "authorization": [
21                 {
22                     "actor": "txn.test.a",
23                     "permission": "active"
24                 }
25             ],
26             "data": "
```

G. Adjust the parameters to increase the number of transactions, such as generating 40 transactions per 20ms (2000TPS) , and observe the packing performance of the boot node

H. Repeat step g until TPS can no longer be added

3. Test results

3.1 1000 TPS

Observing the boot node packing performance chart of step F in 2.1, it is found that TPS is stable at 1000 and the average latency is less than 50ms.

3.2 2000 TPS

Doubling the number of transactions such as generating 40 transactions per 20ms (i.e. 2000TPS) :

```
1 curl --data-binary '["", 20, 40]'

http://127.0.0.1:3333/v1/txns_test_gen/start_generation
```

The boot node packing performance is shown below. It is observed that TPS is still stable at 2000 and average latency is less than 100ms.

```
info 2019-12-15T03:22:33.001 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block bcb8d949d11c36e... #1865 @ 2019-12-15T03:22:33.500 signed by eno1 [txns: 0, lib: 1864, conf: 0, latency: 1 ms]
info 2019-12-15T03:22:34.001 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0384f8420d435ec... #1866 @ 2019-12-15T03:22:34.000 signed by eno1 [txns: 0, lib: 1865, conf: 0, latency: 1 ms]
info 2019-12-15T03:22:34.500 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 12ed381d1c25351... #1867 @ 2019-12-15T03:22:34.500 signed by eno1 [txns: 0, lib: 1866, conf: 0, latency: 0 ms]
info 2019-12-15T03:22:35.001 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 4d4a75d5e041485c... #1868 @ 2019-12-15T03:22:35.000 signed by eno1 [txns: 0, lib: 1867, conf: 0, latency: 0 ms]
info 2019-12-15T03:22:36.001 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block e4d13a007c938f6... #1870 @ 2019-12-15T03:22:36.000 signed by eno1 [txns: 0, lib: 1869, conf: 0, latency: 1 ms]
info 2019-12-15T03:22:36.501 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 22ed4024efc8f67e... #1871 @ 2019-12-15T03:22:36.500 signed by eno1 [txns: 0, lib: 1870, conf: 0, latency: 1 ms]
info 2019-12-15T03:22:37.001 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 2d6d5044a02824... #1872 @ 2019-12-15T03:22:37.000 signed by eno1 [txns: 0, lib: 1871, conf: 0, latency: 1 ms]
info 2019-12-15T03:22:37.501 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1873 @ 2019-12-15T03:22:37.500 signed by eno1 [txns: 0, lib: 1872, conf: 0, latency: 0 ms]
info 2019-12-15T03:22:38.000 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1874 @ 2019-12-15T03:22:38.000 signed by eno1 [txns: 0, lib: 1873, conf: 0, latency: 0 ms]
info 2019-12-15T03:22:38.502 thread=0 producer_plugin.cpp:269 start_generation [ ] Started start test plugin performing 40 transactions every 20ms
info 2019-12-15T03:22:38.532 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block bdc597c1b9d9d10... #1875 @ 2019-12-15T03:22:38.500 signed by eno1 [txns: 360, lib: 1874, conf: 0, latency: 32 ms]
info 2019-12-15T03:22:39.000 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1876 @ 2019-12-15T03:22:39.000 signed by eno1 [txns: 100, lib: 1875, conf: 0, latency: 68 ms]
info 2019-12-15T03:22:39.500 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1877 @ 2019-12-15T03:22:39.500 signed by eno1 [txns: 100, lib: 1876, conf: 0, latency: 39 ms]
info 2019-12-15T03:22:40.000 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 31ed8f2699e6c7d... #1878 @ 2019-12-15T03:22:40.000 signed by eno1 [txns: 100, lib: 1877, conf: 0, latency: 80 ms]
info 2019-12-15T03:22:40.571 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b13ed8f2699e6c7d... #1879 @ 2019-12-15T03:22:40.500 signed by eno1 [txns: 100, lib: 1878, conf: 0, latency: 71 ms]
info 2019-12-15T03:22:41.073 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block c0af855164b8d0... #1880 @ 2019-12-15T03:22:41.000 signed by eno1 [txns: 100, lib: 1879, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:41.573 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1881 @ 2019-12-15T03:22:41.500 signed by eno1 [txns: 100, lib: 1880, conf: 0, latency: 79 ms]
info 2019-12-15T03:22:42.072 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 2d6d5044a02824... #1882 @ 2019-12-15T03:22:42.000 signed by eno1 [txns: 100, lib: 1881, conf: 0, latency: 72 ms]
info 2019-12-15T03:22:42.573 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block c1136a341fb0b4... #1883 @ 2019-12-15T03:22:42.500 signed by eno1 [txns: 100, lib: 1882, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:43.082 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1884 @ 2019-12-15T03:22:43.000 signed by eno1 [txns: 100, lib: 1883, conf: 0, latency: 82 ms]
info 2019-12-15T03:22:43.572 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 4a34fd5de1286424... #1885 @ 2019-12-15T03:22:43.500 signed by eno1 [txns: 100, lib: 1884, conf: 0, latency: 72 ms]
info 2019-12-15T03:22:44.083 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1886 @ 2019-12-15T03:22:44.000 signed by eno1 [txns: 100, lib: 1885, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:44.579 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1887 @ 2019-12-15T03:22:44.500 signed by eno1 [txns: 100, lib: 1886, conf: 0, latency: 79 ms]
info 2019-12-15T03:22:45.071 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b13ed8f2699e6c7d... #1888 @ 2019-12-15T03:22:45.000 signed by eno1 [txns: 100, lib: 1887, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:45.473 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1889 @ 2019-12-15T03:22:45.400 signed by eno1 [txns: 100, lib: 1888, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:45.873 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b25f3613c1765b1... #1890 @ 2019-12-15T03:22:45.800 signed by eno1 [txns: 100, lib: 1889, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:46.273 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1891 @ 2019-12-15T03:22:46.200 signed by eno1 [txns: 100, lib: 1890, conf: 0, latency: 82 ms]
info 2019-12-15T03:22:46.582 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b0535a26139636d... #1892 @ 2019-12-15T03:22:46.500 signed by eno1 [txns: 100, lib: 1891, conf: 0, latency: 72 ms]
info 2019-12-15T03:22:47.073 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 2d44708ea43349f6... #1893 @ 2019-12-15T03:22:47.000 signed by eno1 [txns: 100, lib: 1892, conf: 0, latency: 73 ms]
info 2019-12-15T03:22:47.591 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block c57e36980a64339... #1893 @ 2019-12-15T03:22:47.500 signed by eno1 [txns: 100, lib: 1893, conf: 0, latency: 91 ms]
info 2019-12-15T03:22:47.973 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1894 @ 2019-12-15T03:22:48.000 signed by eno1 [txns: 100, lib: 1893, conf: 0, latency: 75 ms]
info 2019-12-15T03:22:48.373 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1895 @ 2019-12-15T03:22:48.300 signed by eno1 [txns: 100, lib: 1894, conf: 0, latency: 75 ms]
info 2019-12-15T03:22:48.773 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1896 @ 2019-12-15T03:22:48.700 signed by eno1 [txns: 100, lib: 1895, conf: 0, latency: 89 ms]
info 2019-12-15T03:22:49.083 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1897 @ 2019-12-15T03:22:49.000 signed by eno1 [txns: 100, lib: 1895, conf: 0, latency: 89 ms]
info 2019-12-15T03:22:49.576 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1898 @ 2019-12-15T03:22:49.500 signed by eno1 [txns: 100, lib: 1896, conf: 0, latency: 76 ms]
info 2019-12-15T03:22:50.088 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 1fc6f5cf74f61b0d8... #1898 @ 2019-12-15T03:22:49.500 signed by eno1 [txns: 100, lib: 1897, conf: 0, latency: 88 ms]
info 2019-12-15T03:22:50.488 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1899 @ 2019-12-15T03:22:50.000 signed by eno1 [txns: 100, lib: 1898, conf: 0, latency: 87 ms]
info 2019-12-15T03:22:51.088 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1900 @ 2019-12-15T03:22:51.000 signed by eno1 [txns: 100, lib: 1899, conf: 0, latency: 79 ms]
info 2019-12-15T03:22:51.579 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 5bd36d32a415bc... #1901 @ 2019-12-15T03:22:51.500 signed by eno1 [txns: 100, lib: 1900, conf: 0, latency: 79 ms]
info 2019-12-15T03:22:52.099 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block c16ef4997c1c1... #1902 @ 2019-12-15T03:22:52.000 signed by eno1 [txns: 100, lib: 1901, conf: 0, latency: 99 ms]
info 2019-12-15T03:22:52.588 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a2835f1279d228... #1903 @ 2019-12-15T03:22:52.500 signed by eno1 [txns: 100, lib: 1902, conf: 0, latency: 80 ms]
info 2019-12-15T03:22:53.088 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1904 @ 2019-12-15T03:22:53.000 signed by eno1 [txns: 100, lib: 1903, conf: 0, latency: 88 ms]
info 2019-12-15T03:22:53.588 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b0d455c5cb94a0a... #1905 @ 2019-12-15T03:22:53.500 signed by eno1 [txns: 100, lib: 1904, conf: 0, latency: 88 ms]
info 2019-12-15T03:22:54.089 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b0f1553d1c6871... #1907 @ 2019-12-15T03:22:54.000 signed by eno1 [txns: 100, lib: 1905, conf: 0, latency: 89 ms]
info 2019-12-15T03:22:54.589 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1908 @ 2019-12-15T03:22:54.500 signed by eno1 [txns: 100, lib: 1906, conf: 0, latency: 99 ms]
info 2019-12-15T03:22:55.089 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1909 @ 2019-12-15T03:22:55.000 signed by eno1 [txns: 100, lib: 1907, conf: 0, latency: 99 ms]
info 2019-12-15T03:22:55.589 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1910 @ 2019-12-15T03:22:55.500 signed by eno1 [txns: 100, lib: 1908, conf: 0, latency: 99 ms]
info 2019-12-15T03:22:56.088 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1911 @ 2019-12-15T03:22:56.000 signed by eno1 [txns: 100, lib: 1909, conf: 0, latency: 88 ms]
info 2019-12-15T03:22:56.588 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block b0d43d6338c3429... #1911 @ 2019-12-15T03:22:56.500 signed by eno1 [txns: 100, lib: 1910, conf: 0, latency: 100 ms]
info 2019-12-15T03:22:57.088 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1912 @ 2019-12-15T03:22:57.000 signed by eno1 [txns: 100, lib: 1911, conf: 0, latency: 88 ms]
info 2019-12-15T03:22:57.578 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1913 @ 2019-12-15T03:22:57.500 signed by eno1 [txns: 100, lib: 1912, conf: 0, latency: 78 ms]
info 2019-12-15T03:22:58.078 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1914 @ 2019-12-15T03:22:58.000 signed by eno1 [txns: 100, lib: 1913, conf: 0, latency: 78 ms]
info 2019-12-15T03:22:58.578 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1915 @ 2019-12-15T03:22:58.500 signed by eno1 [txns: 100, lib: 1914, conf: 0, latency: 89 ms]
info 2019-12-15T03:22:59.078 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1916 @ 2019-12-15T03:22:59.000 signed by eno1 [txns: 100, lib: 1915, conf: 0, latency: 86 ms]
info 2019-12-15T03:22:59.578 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1917 @ 2019-12-15T03:22:59.500 signed by eno1 [txns: 100, lib: 1916, conf: 0, latency: 86 ms]
info 2019-12-15T03:23:00.078 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1918 @ 2019-12-15T03:23:00.000 signed by eno1 [txns: 100, lib: 1917, conf: 0, latency: 82 ms]
info 2019-12-15T03:23:01.101 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1919 @ 2019-12-15T03:23:01.000 signed by eno1 [txns: 100, lib: 1918, conf: 0, latency: 101 ms]
info 2019-12-15T03:23:01.578 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 5d3d90a1c18239... #1920 @ 2019-12-15T03:23:01.500 signed by eno1 [txns: 100, lib: 1919, conf: 0, latency: 78 ms]
info 2019-12-15T03:23:01.678 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block a2227e8cc7f0d2f... #1920 @ 2019-12-15T03:23:02.000 signed by eno1 [txns: 100, lib: 1920, conf: 0, latency: 76 ms]
info 2019-12-15T03:23:01.899 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1921 @ 2019-12-15T03:23:02.500 signed by eno1 [txns: 100, lib: 1921, conf: 0, latency: 83 ms]
info 2019-12-15T03:23:03.089 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1922 @ 2019-12-15T03:23:03.500 signed by eno1 [txns: 100, lib: 1922, conf: 0, latency: 83 ms]
info 2019-12-15T03:23:03.899 thread=0 producer_plugin.cpp:343 on_incoming_block [ ] Received block 0a0a0a0a0a0a0a0a... #1923 @ 2019-12-15T03:23:03.800 signed by eno1 [txns: 100, lib: 1923, conf: 0, latency: 89 ms]
```

3.3 3000 TPS

Continue to increase the number of transactions such as 60 transactions per 20ms (i.e. 3000TPS) :

```
1 curl --data-binary '["", 20, 60]'

http://127.0.0.1:3333/v1/txns_test_gen/start_generation
```

The performance of BOOT node packing is shown in the figure below. It is observed that TPS fluctuates between 800–3700, and latency also fluctuates between 60–400ms with the fluctuation of block trading volume.

```
info [2019-12-15T07:27:51.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4944e0a8452e6249... [2500] # 2019-12-15T07:27:51.000 signed by enoic [txns: 0, lib: 2499, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:51.501+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4911e9152e6249... [2501] # 2019-12-15T07:27:51.500 signed by enoic [txns: 0, lib: 2500, conf: 0, latency: 1 ms]
info [2019-12-15T07:27:52.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block f7ef0b484749d05... [2502] # 2019-12-15T07:27:52.000 signed by enoic [txns: 0, lib: 2501, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:52.501+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block c9ed96d027f583c... [2503] # 2019-12-15T07:27:52.500 signed by enoic [txns: 0, lib: 2502, conf: 0, latency: 1 ms]
info [2019-12-15T07:27:53.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 25345d42a8231c... [2504] # 2019-12-15T07:27:53.000 signed by enoic [txns: 0, lib: 2503, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:54.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 085f1ca959f26e0... [2505] # 2019-12-15T07:27:54.000 signed by enoic [txns: 0, lib: 2504, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:55.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block b49339ac9e197c... [2506] # 2019-12-15T07:27:55.000 signed by enoic [txns: 0, lib: 2505, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:56.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 0b79522b07e5049... [2507] # 2019-12-15T07:27:56.000 signed by enoic [txns: 0, lib: 2506, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:57.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 5b474e7326f665... [2510] # 2019-12-15T07:27:57.000 signed by enoic [txns: 0, lib: 2509, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:58.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 6674a52cc612d1... [2511] # 2019-12-15T07:27:58.000 signed by enoic [txns: 0, lib: 2510, conf: 0, latency: 0 ms]
info [2019-12-15T07:27:59.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 427209e367e761... [2512] # 2019-12-15T07:27:59.000 signed by enoic [txns: 0, lib: 2511, conf: 0, latency: 0 ms]
Started transaction test plugin: performing 68 transactions every 20ms
info [2019-12-15T07:27:57.467+00:00] [txns_gen_plugin.cpp:269] start_generation
info [2019-12-15T07:27:57.467+00:00] [txns_gen_plugin.cpp:269] end_generation
info [2019-12-15T07:28:01.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 7d1e8f92f5257... [2514] # 2019-12-15T07:28:01.000 signed by enoic [txns: 1580, lib: 2513, conf: 0, latency: 137 ms]
info [2019-12-15T07:28:01.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block b49036933f5c62d... [2515] # 2019-12-15T07:28:01.500 signed by enoic [txns: 832, lib: 2514, conf: 0, latency: 69 ms]
info [2019-12-15T07:28:02.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block fe3470f091364a... [2516] # 2019-12-15T07:28:02.000 signed by enoic [txns: 1839, lib: 2515, conf: 0, latency: 176 ms]
info [2019-12-15T07:28:02.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block e0459719f519f... [2517] # 2019-12-15T07:28:02.500 signed by enoic [txns: 885, lib: 2516, conf: 0, latency: 95 ms]
info [2019-12-15T07:28:03.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 0a0593a23333f... [2518] # 2019-12-15T07:28:03.000 signed by enoic [txns: 1131, lib: 2517, conf: 0, latency: 114 ms]
info [2019-12-15T07:28:03.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 60a6fc32678831... [2519] # 2019-12-15T07:28:03.500 signed by enoic [txns: 1344, lib: 2518, conf: 0, latency: 116 ms]
info [2019-12-15T07:28:04.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block f355694d73c5820... [2520] # 2019-12-15T07:28:04.000 signed by enoic [txns: 1583, lib: 2519, conf: 0, latency: 142 ms]
info [2019-12-15T07:28:04.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block e05b03264757b0... [2521] # 2019-12-15T07:28:04.500 signed by enoic [txns: 1471, lib: 2520, conf: 0, latency: 123 ms]
info [2019-12-15T07:28:05.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 2b7619e4dc3142... [2522] # 2019-12-15T07:28:05.000 signed by enoic [txns: 1724, lib: 2521, conf: 0, latency: 123 ms]
info [2019-12-15T07:28:05.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 0a0593a23333f... [2523] # 2019-12-15T07:28:05.500 signed by enoic [txns: 1292, lib: 2522, conf: 0, latency: 123 ms]
info [2019-12-15T07:28:06.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block ebf827826a26c... [2524] # 2019-12-15T07:28:06.000 signed by enoic [txns: 529, lib: 2523, conf: 0, latency: 78 ms]
info [2019-12-15T07:28:06.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 46f049e36350a... [2525] # 2019-12-15T07:28:06.500 signed by enoic [txns: 1815, lib: 2524, conf: 0, latency: 385 ms]
info [2019-12-15T07:28:07.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block d8b287816f658... [2526] # 2019-12-15T07:28:07.000 signed by enoic [txns: 1864, lib: 2525, conf: 0, latency: 179 ms]
info [2019-12-15T07:28:07.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 5cf7d77ff965363... [2527] # 2019-12-15T07:28:07.500 signed by enoic [txns: 916, lib: 2526, conf: 0, latency: 93 ms]
info [2019-12-15T07:28:08.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 5387a032625a... [2528] # 2019-12-15T07:28:08.000 signed by enoic [txns: 1040, lib: 2527, conf: 0, latency: 93 ms]
info [2019-12-15T07:28:08.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block fef46d745f6540... [2529] # 2019-12-15T07:28:08.500 signed by enoic [txns: 464, lib: 2528, conf: 0, latency: 71 ms]
info [2019-12-15T07:28:09.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 6286c6829c9bc... [2530] # 2019-12-15T07:28:09.000 signed by enoic [txns: 1682, lib: 2529, conf: 0, latency: 137 ms]
info [2019-12-15T07:28:09.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 2234a7974ca47c... [2531] # 2019-12-15T07:28:09.500 signed by enoic [txns: 1735, lib: 2530, conf: 0, latency: 476 ms]
info [2019-12-15T07:28:10.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block d22e059603b1... [2532] # 2019-12-15T07:28:10.000 signed by enoic [txns: 1833, lib: 2531, conf: 0, latency: 395 ms]
info [2019-12-15T07:28:10.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 9483633139a4f... [2534] # 2019-12-15T07:28:10.500 signed by enoic [txns: 1779, lib: 2532, conf: 0, latency: 189 ms]
info [2019-12-15T07:28:11.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 318988597261... [2535] # 2019-12-15T07:28:11.000 signed by enoic [txns: 432, lib: 2534, conf: 0, latency: 72 ms]
info [2019-12-15T07:28:11.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 507e75d9456323... [2536] # 2019-12-15T07:28:11.500 signed by enoic [txns: 496, lib: 2535, conf: 0, latency: 73 ms]
info [2019-12-15T07:28:12.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 37e6177e674... [2537] # 2019-12-15T07:28:12.000 signed by enoic [txns: 189, lib: 2536, conf: 0, latency: 64 ms]
info [2019-12-15T07:28:12.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 431be97e38516... [2538] # 2019-12-15T07:28:12.500 signed by enoic [txns: 1772, lib: 2537, conf: 0, latency: 145 ms]
info [2019-12-15T07:28:13.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block b2d216272c0bbcb... [2539] # 2019-12-15T07:28:13.000 signed by enoic [txns: 1718, lib: 2538, conf: 0, latency: 356 ms]
info [2019-12-15T07:28:13.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 9fca961261f6ec... [2541] # 2019-12-15T07:28:13.500 signed by enoic [txns: 1826, lib: 2539, conf: 0, latency: 349 ms]
info [2019-12-15T07:28:14.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4529674327316... [2542] # 2019-12-15T07:28:14.000 signed by enoic [txns: 1848, lib: 2540, conf: 0, latency: 359 ms]
info [2019-12-15T07:28:14.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 8386c4979b8e0... [2544] # 2019-12-15T07:28:14.500 signed by enoic [txns: 1771, lib: 2541, conf: 0, latency: 378 ms]
info [2019-12-15T07:28:15.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4527796109a9e... [2545] # 2019-12-15T07:28:15.000 signed by enoic [txns: 1661, lib: 2544, conf: 0, latency: 302 ms]
info [2019-12-15T07:28:15.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block fe56e669120... [2546] # 2019-12-15T07:28:15.500 signed by enoic [txns: 409, lib: 2545, conf: 0, latency: 73 ms]
info [2019-12-15T07:28:16.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 5e2d9678015a... [2547] # 2019-12-15T07:28:16.000 signed by enoic [txns: 464, lib: 2546, conf: 0, latency: 88 ms]
info [2019-12-15T07:28:16.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4527796109a9e... [2548] # 2019-12-15T07:28:16.500 signed by enoic [txns: 448, lib: 2547, conf: 0, latency: 64 ms]
info [2019-12-15T07:28:17.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block b38472c8898... [2549] # 2019-12-15T07:28:17.000 signed by enoic [txns: 1452, lib: 2548, conf: 0, latency: 134 ms]
info [2019-12-15T07:28:17.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 3286d05b3b... [2551] # 2019-12-15T07:28:17.500 signed by enoic [txns: 1745, lib: 2549, conf: 0, latency: 375 ms]
info [2019-12-15T07:28:18.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 636309267950... [2552] # 2019-12-15T07:28:18.000 signed by enoic [txns: 1812, lib: 2550, conf: 0, latency: 375 ms]
info [2019-12-15T07:28:18.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 4f443d4ff6deee... [2554] # 2019-12-15T07:28:18.500 signed by enoic [txns: 1812, lib: 2553, conf: 0, latency: 482 ms]
info [2019-12-15T07:28:19.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 22275737fe682... [2555] # 2019-12-15T07:28:19.000 signed by enoic [txns: 1978, lib: 2554, conf: 0, latency: 378 ms]
info [2019-12-15T07:28:19.500+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 0f88af5b147349... [2556] # 2019-12-15T07:28:19.500 signed by enoic [txns: 1972, lib: 2555, conf: 0, latency: 679 ms]
info [2019-12-15T07:28:20.000+00:00] [producer_plugin.cpp:343] on_incoming_block J Received block 31d4b7589fd07f0... [2559] # 2019-12-15T07:28:20.000 signed by enoic [txns: 1698, lib: 2558, conf: 0, latency: 331 ms]
```

3.4 4000 TPS

Continue to increase the number of transactions such as generating 80 transactions per 20ms (i.e. 4000TPS) :

```
curl --data-binary '[[], 20, 80]'  
http://127.0.0.1:3333/v1/txn_test_gen/start_generation
```

The boot node packaging performance is shown in the following figure. It is observed that after the last step of 3000tps testing is stopped, the node is still packaging a large number of transactions. Therefore, it can be inferred that these transactions are unprocessed transactions accumulated in the previous step, when the TPS fluctuates between 3500 and 3700, latency is relatively stable and fluctuates between 300–600ms. After the test of 4000tps was started, the result of TPS was consistent with the performance after stop test. After 11 seconds, TPS dropped to about 700, latency stabilized at about 70ms. It is assumed that 4000tps has reached the bottleneck, stop test and retest 4000tps after stabilization.

```
Info 2019-12-15T08:29:35.381Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 4117407e1509892. [2714] * 2019-12-15T08:29:38.500 signed by entity [trxs: 1855, lib: 273, conf: 0, latency: 351 ms]
Info 2019-12-15T08:29:38.840Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 703919593886. [2715] * 2019-12-15T08:29:38.500 signed by entity [trxs: 1844, lib: 273, conf: 0, latency: 340 ms]
Info 2019-12-15T08:29:40.046Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 404494647055. [2716] * 2019-12-15T08:29:40.000 signed by entity [trxs: 1860, lib: 273, conf: 0, latency: 346 ms]
Info 2019-12-15T08:29:40.463Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 8ea7c400555f5d. [2718] * 2019-12-15T08:29:40.000 signed by entity [trxs: 1863, lib: 273, conf: 0, latency: 341 ms]
Info 2019-12-15T08:29:40.832Z 1min-thread <txn_test_gen_plugin>.ppm:353 [stop_generation] Stopping transaction generation test. [2719] * 2019-12-15T08:29:40.500 signed by entity [trxs: 1772, lib: 273, conf: 0, latency: 452 ms]
Info 2019-12-15T08:29:41.048Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 038de505b5c51b. [2720] * 2019-12-15T08:29:41.000 signed by entity [trxs: 1854, lib: 272, conf: 0, latency: 396 ms]
Info 2019-12-15T08:29:42.006Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 27232929379464. [2722] * 2019-12-15T08:29:42.000 signed by entity [trxs: 1973, lib: 272, conf: 0, latency: 422 ms]
Info 2019-12-15T08:29:42.857Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 030de505b5c51b. [2723] * 2019-12-15T08:29:42.900 signed by entity [trxs: 1854, lib: 272, conf: 0, latency: 357 ms]
Info 2019-12-15T08:29:43.349Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 383c732e2c1c. [2724] * 2019-12-15T08:29:43.000 signed by entity [trxs: 1679, lib: 273, conf: 0, latency: 327 ms]
Info 2019-12-15T08:29:43.944Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 4242bcff94fdd4d. [2726] * 2019-12-15T08:29:44.000 signed by entity [trxs: 1876, lib: 275, conf: 0, latency: 346 ms]
Info 2019-12-15T08:29:44.848Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 14d026ec70c5d. [2727] * 2019-12-15T08:29:44.500 signed by entity [trxs: 1651, lib: 276, conf: 0, latency: 340 ms]
Info 2019-12-15T08:29:45.959Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block d51e14565f607a. [2728] * 2019-12-15T08:29:45.900 signed by entity [trxs: 1763, lib: 277, conf: 0, latency: 981 ms]
Info 2019-12-15T08:29:46.485Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 25254f5a7054. [2729] * 2019-12-15T08:29:46.000 signed by entity [trxs: 1867, lib: 278, conf: 0, latency: 600 ms]
Info 2019-12-15T08:29:46.980Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 25254f5a7054. [2730] * 2019-12-15T08:29:46.000 signed by entity [trxs: 1790, lib: 279, conf: 0, latency: 405 ms]
Info 2019-12-15T08:29:47.049Z 1min-thread <txn_test_gen_plugin>.ppm:269 [start_generation] Starting transaction test plugin: performing 88 transactions every 20ms. [2731] * 2019-12-15T08:29:47.000 signed by entity [trxs: 1790, lib: 279, conf: 0, latency: 400 ms]
Info 2019-12-15T08:29:47.138Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 25254f5a7054. [2732] * 2019-12-15T08:29:47.000 signed by entity [trxs: 1818, lib: 279, conf: 0, latency: 328 ms]
Info 2019-12-15T08:29:47.231Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 25254f5a7054. [2733] * 2019-12-15T08:29:47.000 signed by entity [trxs: 1768, lib: 279, conf: 0, latency: 371 ms]
Info 2019-12-15T08:29:47.371Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block b635be5101401. [2735] * 2019-12-15T08:29:48.000 signed by entity [trxs: 1854, lib: 274, conf: 0, latency: 379 ms]
Info 2019-12-15T08:29:47.489Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2736] * 2019-12-15T08:29:48.000 signed by entity [trxs: 1741, lib: 275, conf: 0, latency: 332 ms]
Info 2019-12-15T08:29:47.532Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2737] * 2019-12-15T08:29:48.000 signed by entity [trxs: 1743, lib: 275, conf: 0, latency: 332 ms]
Info 2019-12-15T08:29:47.563Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2738] * 2019-12-15T08:29:48.000 signed by entity [trxs: 1889, lib: 275, conf: 0, latency: 332 ms]
Info 2019-12-15T08:29:47.583Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2739] * 2019-12-15T08:29:48.000 signed by entity [trxs: 1669, lib: 276, conf: 0, latency: 323 ms]
Info 2019-12-15T08:29:47.591Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 3440b78135e44b. [2740] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1726, lib: 279, conf: 0, latency: 1771 ms]
Info 2019-12-15T08:29:47.608Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 706078d782d82e2. [2741] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1974, lib: 279, conf: 0, latency: 1771 ms]
Info 2019-12-15T08:29:47.624Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 706078d782d82e2. [2742] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1726, lib: 279, conf: 0, latency: 1771 ms]
Info 2019-12-15T08:29:47.634Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 706078d782d82e2. [2743] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1675, lib: 279, conf: 0, latency: 134 ms]
Info 2019-12-15T08:29:47.645Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 706078d782d82e2. [2744] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1768, lib: 279, conf: 0, latency: 352 ms]
Info 2019-12-15T08:29:47.656Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 6df0f5167565d5. [2744] * 2019-12-15T08:29:50.100 signed by entity [trxs: 1768, lib: 279, conf: 0, latency: 352 ms]
Info 2019-12-15T08:29:47.667Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block e027a31ef02b. [2745] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1665, lib: 279, conf: 0, latency: 350 ms]
Info 2019-12-15T08:29:47.677Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2746] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1727, lib: 279, conf: 0, latency: 332 ms]
Info 2019-12-15T08:29:47.688Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2747] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1889, lib: 279, conf: 0, latency: 332 ms]
Info 2019-12-15T08:29:47.698Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2748] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1722, lib: 279, conf: 0, latency: 315 ms]
Info 2019-12-15T08:29:47.708Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2749] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1711, lib: 279, conf: 0, latency: 375 ms]
Info 2019-12-15T08:29:47.718Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2750] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1895, lib: 279, conf: 0, latency: 345 ms]
Info 2019-12-15T08:29:47.728Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 694874045e58981. [2751] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1721, lib: 279, conf: 0, latency: 361 ms]
Info 2019-12-15T08:29:47.736Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 7277f0f61651. [2752] * 2019-12-15T08:29:50.300 signed by entity [trxs: 1722, lib: 279, conf: 0, latency: 793 ms]
Info 2019-12-15T08:29:47.757Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 1797462d3871. [2753] * 2019-12-15T08:29:51.500 signed by entity [trxs: 1839, lib: 275, conf: 0, latency: 200 ms]
Info 2019-12-15T08:29:47.767Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block f62524d28457b. [2754] * 2019-12-15T08:29:51.500 signed by entity [trxs: 1768, lib: 275, conf: 0, latency: 110 ms]
Info 2019-12-15T08:29:47.777Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 365524707178e. [2755] * 2019-12-15T08:29:51.500 signed by entity [trxs: 1655, lib: 275, conf: 0, latency: 78 ms]
Info 2019-12-15T08:29:47.787Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block f5525683d3e9b. [2756] * 2019-12-15T08:29:51.500 signed by entity [trxs: 1721, lib: 275, conf: 0, latency: 71 ms]
Info 2019-12-15T08:29:47.797Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 3d8116313f5d. [2758] * 2019-12-15T08:30:00.500 signed by entity [trxs: 1352, lib: 276, conf: 0, latency: 73 ms]
Info 2019-12-15T08:29:47.807Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block f634d54e2d3c83. [2761] * 2019-12-15T08:30:01.500 signed by entity [trxs: 1354, lib: 276, conf: 0, latency: 63 ms]
Info 2019-12-15T08:29:47.817Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block f634d54e2d3c83. [2762] * 2019-12-15T08:30:02.500 signed by entity [trxs: 1336, lib: 276, conf: 0, latency: 70 ms]
Info 2019-12-15T08:29:48.070Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 1919625016692. [2763] * 2019-12-15T08:30:02.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 70 ms]
Info 2019-12-15T08:29:48.078Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 1919625016692. [2764] * 2019-12-15T08:30:02.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 67 ms]
Info 2019-12-15T08:29:48.087Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 1919625016692. [2765] * 2019-12-15T08:30:02.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 78 ms]
Info 2019-12-15T08:29:48.096Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 697677299913d4. [2767] * 2019-12-15T08:30:04.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 79 ms]
Info 2019-12-15T08:29:48.105Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 405c6160b1964c. [2768] * 2019-12-15T08:30:04.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 77 ms]
Info 2019-12-15T08:29:48.114Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 405c6160b1964c. [2769] * 2019-12-15T08:30:04.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 63 ms]
Info 2019-12-15T08:29:48.123Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 95786241404503. [2770] * 2019-12-15T08:30:06.500 signed by entity [trxs: 352, lib: 276, conf: 0, latency: 59 ms]
Info 2019-12-15T08:29:48.132Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block 19468842bd25b2. [2771] * 2019-12-15T08:30:06.500 signed by entity [trxs: 352, lib: 277, conf: 0, latency: 62 ms]
Info 2019-12-15T08:29:48.141Z 1min-thread <producer>.plugin.cpp:343 [on_incoming_block] Received block d3193db0857c5. [2772] * 2019-12-15T08:30:07.500 signed by entity [trxs: 352, lib: 277, conf: 0, latency: 69 ms]
```

The retest results are as follows. It is observed that 4000tps has reached the bottleneck, triggering the node protection mechanism, resulting in only a part of the transactions being processed, remaining around 700tps, and the remaining transactions will pile up until the request resumes normal.

3.5 5000 TPS

To ensure the integrity of the test, continue to increase the number of transactions such as 100 transactions per 20ms (i.e. 5000TPS) :

```
1 curl --data-binary '["", 20, 100]'  
http://127.0.0.1:3333/v1/txn_test_gen/start_generation
```

The boot node packs the same performance as the 4000tps shown below, so the test stop condition is considered satisfied.

```

info 2019-12-15T03:33:51.001 thread=0 producer_plugin.cpp:343 on_incoming_block ] Received block 989fec2650d57945... #3220 @ 2019-12-15T03:33:51.000 signed by eno10 [trs: 0, lib: 3219, conf: 0, latency: 1 ms]
info 2019-12-15T03:33:51.508 thread=0 producer_plugin.cpp:343 on_incoming_block ] Received block 4ad4eefaa8202308... #3221 @ 2019-12-15T03:33:51.508 signed by eno10 [trs: 0, lib: 3220, conf: 0, latency: 0 ms]
info 2019-12-15T03:33:52.000 thread=0 producer_plugin.cpp:343 on_incoming_block ] Received block 635f695d579be3f9... #3222 @ 2019-12-15T03:33:52.000 signed by eno10 [trs: 0, lib: 3221, conf: 0, latency: 0 ms]
info 2019-12-15T03:33:52.500 thread=0 producer_plugin.cpp:343 on_incoming_block ] Received block 4c81594095303... #3223 @ 2019-12-15T03:33:52.500 signed by eno10 [trs: 0, lib: 3222, conf: 0, latency: 0 ms]
info 2019-12-15T03:33:53.008 thread=0 producer_plugin.cpp:343 on_incoming_block ] Received block 55ed1a4d5c650... #3224 @ 2019-12-15T03:33:53.008 signed by eno10 [trs: 0, lib: 3223, conf: 0, latency: 0 ms]
info 2019-12-15T03:33:53.508 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 55ed1a4d5c650... #3224 @ 2019-12-15T03:33:53.508 signed by eno10 [trs: 0, lib: 3224, conf: 0, latency: 0 ms]
info 2019-12-15T03:33:54.568 thread=0 xtn_test_gen_plugin.cpp:269 start_generation
[ Started transaction test plugin, performing 100 transactions every 20s
info 2019-12-15T03:33:54.568 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 244a1156223599... #3225 @ 2019-12-15T03:33:54.500 signed by eno10 [trs: 244, lib: 3225, conf: 0, latency: 57 ms]
info 2019-12-15T03:33:54.568 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 14ad4eefaa8202309... #3226 @ 2019-12-15T03:33:54.500 signed by eno10 [trs: 244, lib: 3226, conf: 0, latency: 66 ms]
info 2019-12-15T03:33:54.568 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 925f4a07a70e5b2... #3226 @ 2019-12-15T03:33:54.500 signed by eno10 [trs: 300, lib: 3227, conf: 0, latency: 57 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block de109a093f3c533... #3228 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3228, conf: 0, latency: 52 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block a9831594095303... #3228 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3229, conf: 0, latency: 70 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4f831594095303... #3230 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 320, lib: 3230, conf: 0, latency: 64 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4f831594095303... #3230 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 320, lib: 3231, conf: 0, latency: 53 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4f831594095303... #3231 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3232, conf: 0, latency: 61 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block c372934cc0e07799... #3231 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3232, conf: 0, latency: 61 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 5576c23657f27515... #3234 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 288, lib: 3233, conf: 0, latency: 52 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block e1175cc8e095303... #3235 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3234, conf: 0, latency: 69 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4f831594095303... #3235 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3236, conf: 0, latency: 59 ms]
info 2019-12-15T03:33:55.000 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 2d5d62a1275a07c7... #3236 @ 2019-12-15T03:33:55.000 signed by eno10 [trs: 304, lib: 3236, conf: 0, latency: 73 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4f831594095303... #3238 @ 2019-12-15T03:34:00.000 signed by eno10 [trs: 304, lib: 3237, conf: 0, latency: 74 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block d159d635e782b2b... #3239 @ 2019-12-15T03:34:00.000 signed by eno10 [trs: 304, lib: 3238, conf: 0, latency: 66 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3240 @ 2019-12-15T03:34:00.000 signed by eno10 [trs: 288, lib: 3239, conf: 0, latency: 58 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3240 @ 2019-12-15T03:34:00.000 signed by eno10 [trs: 288, lib: 3240, conf: 0, latency: 59 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3241 @ 2019-12-15T03:34:00.000 signed by eno10 [trs: 288, lib: 3241, conf: 0, latency: 58 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3242 @ 2019-12-15T03:34:02.000 signed by eno10 [trs: 288, lib: 3242, conf: 0, latency: 59 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3243 @ 2019-12-15T03:34:02.000 signed by eno10 [trs: 288, lib: 3243, conf: 0, latency: 72 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3245 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 288, lib: 3244, conf: 0, latency: 58 ms]
info 2019-12-15T03:34:00.074 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3246 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 288, lib: 3245, conf: 0, latency: 55 ms]
info 2019-12-15T03:34:00.074 thread=0 xtn_gen_plugin.cpp:353 stop_generation
[ Stopping transaction generation test
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 3e22e00433c00404... #3250 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1586, lib: 3246, conf: 0, latency: 131 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 22ee2201d634904... #3248 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1731, lib: 3247, conf: 0, latency: 368 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3249 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1966, lib: 3249, conf: 0, latency: 422 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3251 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1955, lib: 3250, conf: 0, latency: 944 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 2328161e824d7895... #3252 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 1915, lib: 3251, conf: 0, latency: 603 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 77652d4073e97... #3253 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 1982, lib: 3252, conf: 0, latency: 353 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3254 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 1986, lib: 3254, conf: 0, latency: 349 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3255 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 1987, lib: 3254, conf: 0, latency: 628 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3256 @ 2019-12-15T03:34:04.000 signed by eno10 [trs: 1849, lib: 3255, conf: 0, latency: 425 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 2244371941e7c21... #3257 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1782, lib: 3256, conf: 0, latency: 340 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3258 @ 2019-12-15T03:34:04.500 signed by eno10 [trs: 1792, lib: 3257, conf: 0, latency: 543 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 41f58a459d52b0f... #3260 @ 2019-12-15T03:34:11.000 signed by eno10 [trs: 1983, lib: 3259, conf: 0, latency: 397 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4b0d56f4e18a1555... #3261 @ 2019-12-15T03:34:11.000 signed by eno10 [trs: 1880, lib: 3260, conf: 0, latency: 479 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4d3d1b0412729c9... #3262 @ 2019-12-15T03:34:11.000 signed by eno10 [trs: 1988, lib: 3261, conf: 0, latency: 392 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3263 @ 2019-12-15T03:34:11.000 signed by eno10 [trs: 1989, lib: 3263, conf: 0, latency: 390 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3264 @ 2019-12-15T03:34:13.000 signed by eno10 [trs: 1740, lib: 3265, conf: 0, latency: 376 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 677c838b7184d5... #3265 @ 2019-12-15T03:34:13.000 signed by eno10 [trs: 578, lib: 3264, conf: 0, latency: 58 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3266 @ 2019-12-15T03:34:14.000 signed by eno10 [trs: 3265, conf: 0, latency: 19 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3267 @ 2019-12-15T03:34:14.000 signed by eno10 [trs: 3266, conf: 0, latency: 19 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3268 @ 2019-12-15T03:34:14.000 signed by eno10 [trs: 3267, conf: 0, latency: 9 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3269 @ 2019-12-15T03:34:14.000 signed by eno10 [trs: 3268, conf: 0, latency: 6 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3270 @ 2019-12-15T03:34:16.000 signed by eno10 [trs: 3269, conf: 0, latency: 1 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 32e1b55224414b... #3271 @ 2019-12-15T03:34:16.000 signed by eno10 [trs: 3270, conf: 0, latency: 2 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3272 @ 2019-12-15T03:34:17.500 signed by eno10 [trs: 3271, conf: 0, latency: 2 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3273 @ 2019-12-15T03:34:18.000 signed by eno10 [trs: 3272, conf: 0, latency: 0 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3274 @ 2019-12-15T03:34:18.000 signed by eno10 [trs: 3273, conf: 0, latency: 1 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3275 @ 2019-12-15T03:34:19.000 signed by eno10 [trs: 3274, conf: 0, latency: 1 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3276 @ 2019-12-15T03:34:20.000 signed by eno10 [trs: 3275, conf: 0, latency: 1 ms]
info 2019-12-15T03:34:04.631 thread=0 producer_plugin.cpp:343 on_incoming.block ] Received block 4e4cc49314c2d2... #3278 @ 2019-12-15T03:34:20.000 signed by eno10 [trs: 3277, conf: 0, latency: 1 ms]

```

3.6 final results

To sum up, in a single-node Cloud Server (8 GB of memory, 4-core Intel r Xeon R Platinum 8269 CY CPU@2.50 GHZ) test environment, the maximum TPS that can be achieved by invoking the simplest permission check transaction (an average CPU cost of 100 per transaction and a net average cost of 20) is 3900, which is consistent with the Eos main network.

In addition, the actual TPS may be lower than 3900, considering the network delay between nodes. However, the performance of the whole network depends on the transaction packaging performance of nodes to a great extent, so tps of the network can be effectively improved when the performance of the node machine (mainly CPU) is improved. Machine performance in test environment is not high, so from this point of view can actually improve machine performance to offset the impact of transmission delay.