



测试报告

瑞萨 G2L 核心板千兆以太网速率和稳定性

Rev1.1
2022-06-06

版本记录

版本号	修改说明	修改人	修改日期
V1.0	初始文档	yuge	2022-02-06
V1.1	补充内容	yuge	2022-06-06

1、测试目的

维芯科推出的 WTB-G2LS 工控板（包含 WTC-G2LS 核心板）支持两路千兆以太网，本次测试为了评估测试千兆以太网的速率，以及长时间大数据的稳定性。

2、测试结果

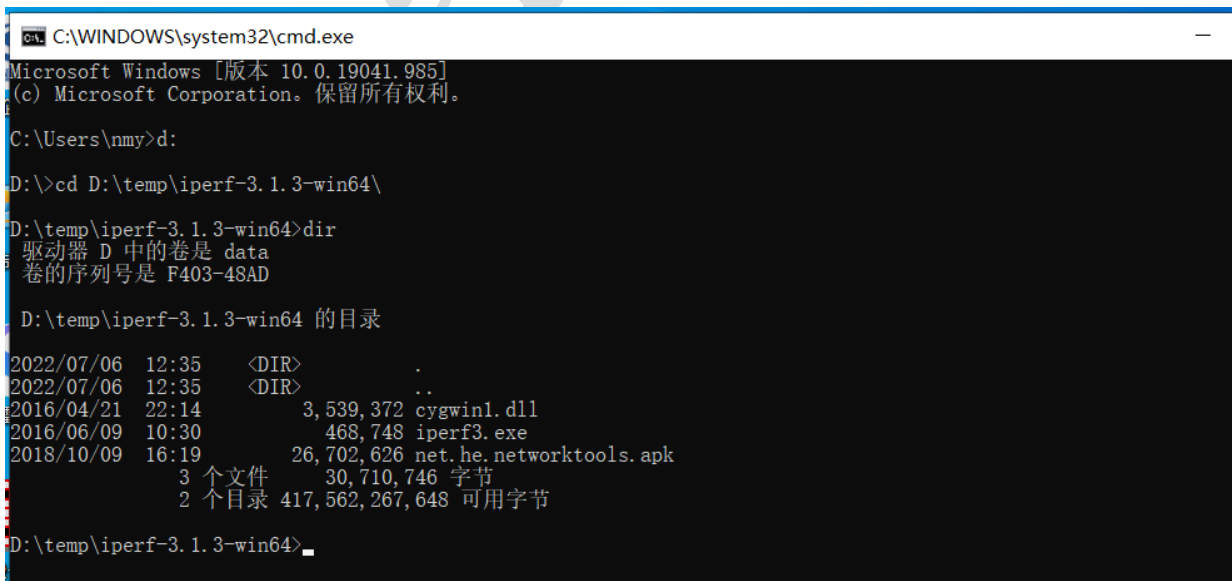
基于 WTC-G2LS 核心板的 WTB-G2LS 工控板（以下简称 G2L 工控板）测试千兆以太网速率大约 900Mbps，接近千兆以太网。另外长时间测试 24 小时没有出现数据丢失显现，稳定性很不错。

测试了裕泰微的千兆以太网 PHY 和 Realtek 的千兆以太网 PHY，速率基本一样的

3、测试工具

网口测试用 iperf 测试工具

(1) PC 端需要从网上下载 iperf-3.1.3-win64，在 PC 端打开命令行：



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [版本 10.0.19041.985]
(c) Microsoft Corporation. 保留所有权利。

C:\Users\nmy>d:
D:\>cd D:\temp\iperf-3.1.3-win64\
D:\temp\iperf-3.1.3-win64>dir
驱动器 D 中的卷是 data
卷的序列号是 F403-48AD

D:\temp\iperf-3.1.3-win64 的目录
2022/07/06 12:35 <DIR>      .
2022/07/06 12:35 <DIR>      ..
2016/04/21 22:14          3,539,372 cygwin1.dll
2016/06/09 10:30          468,748 iperf3.exe
2018/10/09 16:19          26,702,626 net.he.networktools.apk
          3 个文件          30,710,746 字节
          2 个目录 417,562,267,648 可用字节

D:\temp\iperf-3.1.3-win64>
```

(2) G2L 工控板端不需要下载移植了，默认就带了 iperf 命令

```
root@weathink:~# iperf3
iperf3: parameter error - must either be a client (-c) or server (-s)

usage: iperf3 [-s|-c host] [options]
       iperf3 [-h|--help] [-v|--version]

Server or Client:
-p, --port # server port to listen on/connect to
-f, --format [kmgTKMG] format to report: Kbits, Mbits, Gbits, Tbits
-i, --interval # seconds between periodic throughput reports
-F, --file name xmit/rcv the specified file
-A, --affinity n/n,m set CPU affinity
-B, --bind <host> bind to the interface associated with the address <host>
-V, --verbose more detailed output
-J, --json output in JSON format
--logfile f send output to a log file
--forceflush force flushing output at every interval
-d, --debug emit debugging output
-v, --version show version information and quit
-h, --help show this message and quit

Server specific:
-s, --server run in server mode
-D, --daemon run the server as a daemon
-I, --pidfile file write PID file
-l, --one-off handle one client connection then exit
--rsa-private-key-path path to the RSA private key used to decrypt
authentication credentials
--authorized-users-path path to the configuration file containing user
credentials

Client specific:
-c, --client <host> run in client mode, connecting to <host>
-u, --udp use UDP rather than TCP
--connect-timeout # timeout for control connection setup (ms)
-b, --bitrate #[KMG]/[#] target bitrate in bits/sec (0 for unlimited)
(default 1 Mbit/sec for UDP, unlimited for TCP)
(optional slash and packet count for burst mode)
--pacing-timer #[KMG] set the timing for pacing, in microseconds (default 1000)
--fq-rate #[KMG] enable fair-queuing based socket pacing in
bits/sec (Linux only)
-t, --time # time in seconds to transmit for (default 10 secs)
-n, --bytes #[KMG] number of bytes to transmit (instead of -t)
-k, --blockcount #[KMG] number of blocks (packets) to transmit (instead of -t or -n)
-l, --length #[KMG] length of buffer to read or write
(default 128 KB for TCP, dynamic or 1460 for UDP)
```

(3) 还需要如下设备

电脑（带千兆以太网口）

USB 转 TTL 串口线

WTB-G2LS 工控板

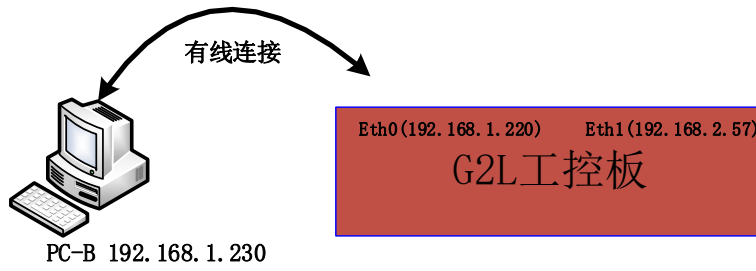
超 5 类/超 6 类网线

4、测试过程

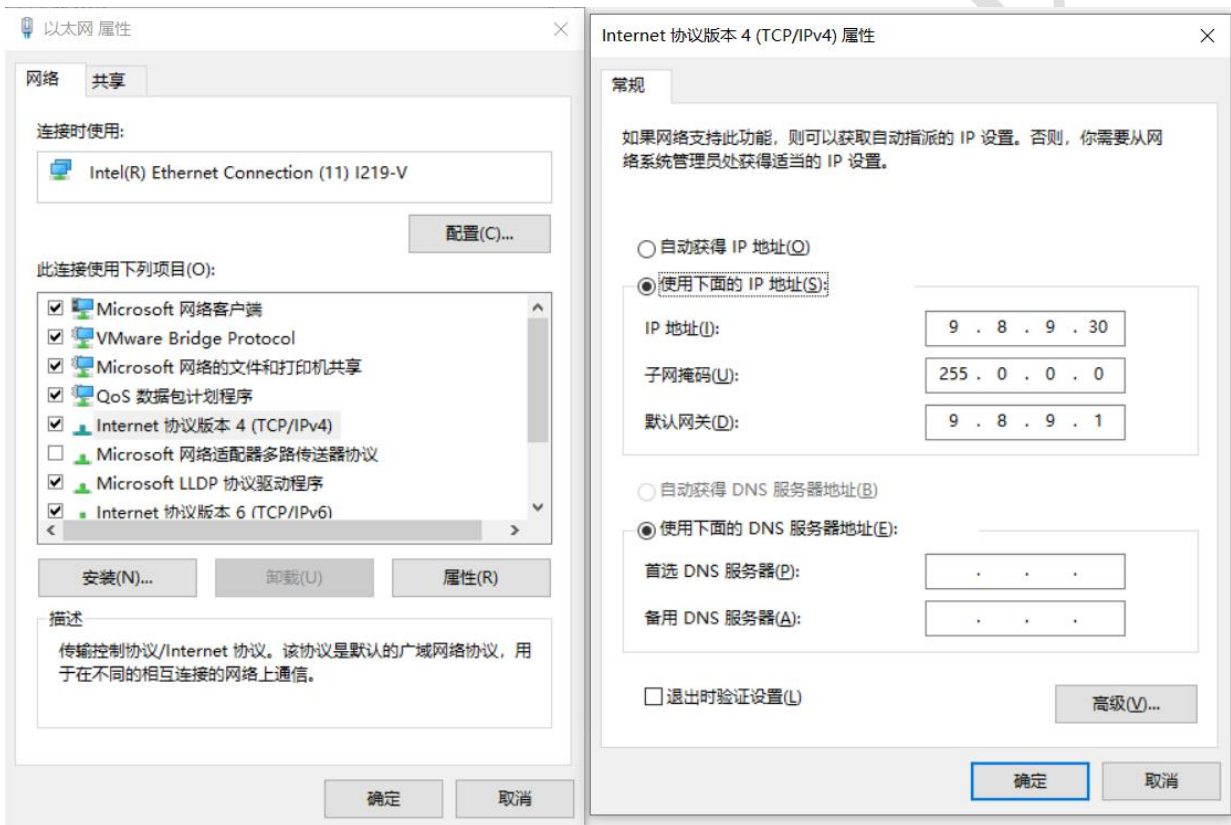
测试采用 PC 千兆网口直连 G2L 工控板的网口的测试方法，这样不通过路由器，速率不会受到影响。

(1) 将网线连接 G2L 工控板和 PC 的千兆网口

网络拓扑结构如下



(1) PC 端 IP 地址查看和设置



(2) G2L 工控板端 IP 地址查看和设置

```
root@weathink:~# ifconfig eth0 9.8.9.20
root@weathink:~#
root@weathink:~# ifconfig
eth0      Link encap:Ethernet  HWaddr D6:87:44:CE:3B:7C
          inet addr:9.8.9.20  Bcast:9.8.9.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:298 errors:0 dropped:93 overruns:0 frame:0
          TX packets:39 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:92491 (90.3 KiB)  TX bytes:9458 (9.2 KiB)
          Interrupt:136

eth1      Link encap:Ethernet  HWaddr C6:1C:8D:6F:62:85
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:139

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:104 errors:0 dropped:0 overruns:0 frame:0
          TX packets:104 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7366 (7.1 KiB)  TX bytes:7366 (7.1 KiB)

root@weathink:~# █
```

(3) PC 作为 iperf 服务端

```
.\iperf3.exe -s
```

-s 表示作为服务端

```
D:\temp\iperf-3.1.3-win64>. \iperf3.exe -s
-----
Server listening on 5201
-----
```

(4) G2L 工控板作为 iperf 服务端

```
iperf3 -c 9.8.9.30 -t 86400
```

如下所示

```
root@weathink:~# iperf3 -c 192.168.1.230 -t 86400
Connecting to host 192.168.1.230, port 5201
[ 5] local 192.168.1.220 port 56754 connected to 192.168.1.230 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[ 5]  0.00-1.00   sec    104 MBytes    870 Mb/s         41   212 KBytes
```

(5) 查看测试速率，运行的时候能够看到

```
Connecting to host 9.8.9.30, port 5201
[ 5] local 9.8.9.20 port 55260 connected to 9.8.9.30 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[ 5]  0.00-1.00   sec    92.7 MBytes    776 Mb/s         321   212 KBytes
```



```
[ 5]  0.00-86400.00 sec  8.85 TBytes  901 Mbits/sec  132  sender
[ 5]  0.00-86400.00 sec  8.85 TBytes  901 Mbits/sec  receiver
```

```
iperf Done.
```

测试 G2L 工控板千兆以太网速度可达 901Mbits/sec 左右，减去协议开销，基本接近 1Gbps 速率，测试通过。