

## 560 SFP+ 网卡进行传输速率压力测试达不到理论数据10GB/s

VMware 白春明 2017-05-18 发表

硬件:

560SFP+网卡

操作系统:

VMware ESXi 6.0

背景:

网卡网口在ESXi下做哈希算法绑定,网卡工作模式:全双工

使用压力测试软件对网卡传输速度进行压力测试,单进程测试传输速度为5GB/s左右,双进程测试速度为7GB/s左右;当网卡在压力测试达到最大值时1号处理器使用率会上升到100%,2号处理器无变化

日志及系统中网卡工作正常,没有报警及断线提示

Ping包测试无丢包现象

网卡驱动更新官网最新后无效

网卡驱动版本信息如下:

固件信息如下:

| Location     | Product Name                            | Part Number | Serial Number | Source                 | Firmware Version |
|--------------|-----------------------------------------|-------------|---------------|------------------------|------------------|
| PCI-E Slot 1 | HP Ethernet 10Gb 2-port 560SFP+ Adapter | 665249-B21  | MYI61606D6    | FRU 80000897, 1.1200.0 | 0x               |
| PCI-E Slot 2 | HP Ethernet 10Gb 2-port 560SFP+ Adapter | 665249-B21  | MYI6190CK8    | FRU 80000897, 1.1200.0 | 0x               |

网卡绑定状态下,单进程网卡传输速度如下:

| ID   | Interval     | Transfer   | Bandwidth      |
|------|--------------|------------|----------------|
| [ 3] | 0.0- 1.0 sec | 631 MBytes | 5.29 Gbits/sec |
| [ 3] | 1.0- 2.0 sec | 642 MBytes | 5.39 Gbits/sec |
| [ 3] | 2.0- 3.0 sec | 642 MBytes | 5.38 Gbits/sec |
| [ 3] | 3.0- 4.0 sec | 642 MBytes | 5.38 Gbits/sec |
| [ 3] | 4.0- 5.0 sec | 650 MBytes | 5.45 Gbits/sec |
| [ 3] | 5.0- 6.0 sec | 654 MBytes | 5.48 Gbits/sec |
| [ 3] | 6.0- 7.0 sec | 645 MBytes | 5.41 Gbits/sec |
| [ 3] | 7.0- 8.0 sec | 638 MBytes | 5.35 Gbits/sec |
| [ 3] | 8.0- 9.0 sec | 628 MBytes | 5.27 Gbits/sec |

解除绑定后单个进程测试网卡传输速度如下:

| [ ID] | Interval     | Transfer   | Bandwidth      |
|-------|--------------|------------|----------------|
| [ 3]  | 0.0- 1.0 sec | 835 MBytes | 7.00 Gbits/sec |
| [ 3]  | 1.0- 2.0 sec | 838 MBytes | 7.03 Gbits/sec |
| [ 3]  | 2.0- 3.0 sec | 836 MBytes | 7.01 Gbits/sec |
| [ 3]  | 3.0- 4.0 sec | 826 MBytes | 6.93 Gbits/sec |
| [ 3]  | 4.0- 5.0 sec | 842 MBytes | 7.06 Gbits/sec |
| [ 3]  | 5.0- 6.0 sec | 841 MBytes | 7.05 Gbits/sec |
| [ 3]  | 6.0- 7.0 sec | 839 MBytes | 7.04 Gbits/sec |
| [ 3]  | 7.0- 8.0 sec | 837 MBytes | 7.02 Gbits/sec |
| [ 3]  | 8.0- 9.0 sec | 837 MBytes | 7.02 Gbits/sec |

560SFP+网卡资料描述如下:

TCP/IP Stateless Offloading

TCP, IP, UDP checksum offload, Large Send Offload (LSO), TCP, Segmentation Offload (TSO).

These features optimize host efficiency, leaving the CPU available for other duties.

The HPE 560SFP+ Adapter powered by Intel® 82599 controller offers TCP/IP stateless intelligent offloading capability.

通过这段描述可以看出,网卡的部分功能会影响到CPU的性能

VMware官方网站对于TSO LSO设置信息如下:

[https://kb.vmware.com/selfservice/microsites/search.do?language=en\\_US&cmd=displayKC&externalId=2055140](https://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=2055140)

通过这个链接中的信息我们可以看到,系统层面是有TSO和LSO的开启/关闭命令的,0—关闭 1—开启

In an ESX/ESXi Shell on the host, set the /Net/UseHwTSO advanced parameter to **1 to enable** TSO, or to **0 to disable** TSO by running a console command:

On ESX/ESXi 4.x hosts:

```
esxcfg-advcfg -s 1 /Net/UseHwTSO
```

```
esxcfg-advcfg -s 0 /Net/UseHwTSO
```

On ESXi 5.0 hosts and later:

```
esxcli system settings advanced set -o /Net/UseHwTSO -i 1
```

```
esxcli system settings advanced set -o /Net/UseHwTSO -i 0
```

根据VMware官方指导文档对网卡进行设置LSO及TSO后没有解决用户问题

intel官方网站对于10GB网卡可以调优的性能及高级驱动设置文档中如下:

Tuning Throughput Performance for Intel® Ethernet Adapters

<http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000005811.html>

Intel® Ethernet 10 Gigabit Server Adapters Advanced Driver Settings

<http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000005783.html>

参照Intel 官方指导文档内容对网卡可以调优设置信息进行更改,

修改了网卡的RSS(Receive Side Scaling)和LRO(Large Receive Offload)后网卡压力测试正常

网卡传输速度可以达到9GB/S以上,无限接近理论标称值10GB/s

针对10GB/S网卡传输问题,如果与理论值偏差很多,可以通过以下几个方面进行排查:

- 1.驱动版本
- 2.固件版本
- 3.网卡是否有做绑定
- 4.工作模式是否全双工
- 5.网卡调优模式设置
- 6.外部交换机设置