

# 虚拟机网络性能测试

工程实践与科技创新III-D 虚拟化与云计算 EI313

李子龙 518070910095

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## 要求

Virtualized and bare metal network performance test.

- Download QEMU 5.2.0 from <https://www.qemu.org/download/> and compile.
- Create 2 VMs with TAP mode network (e1000 and virtio-net) by QEMU.
- Connect to your VM through VNC viewer or SSH.
- Compare the network performance of your host machine and VMs.

## 1 编译 QEMU

使用 QEMU 5.2.0 (Dec 8th 2020), 为了方便后续的版本对比, 根据说明文档<sup>[1]</sup>直接克隆存储库。根据官方的 wiki 说明<sup>[2]</sup>, 需要安装一些额外包。通过下面的脚本进行下载、编译:

Listing 1: [INSTALL.sh](#)

```
1  #!/bin/bash
2
3  sudo apt-get install git
4  git clone --recurse-submodules https://git.sjtu.edu.cn/sjtug/qemu.git
5  cd qemu
6  mkdir build
7  cd build
8  sudo apt-get install glib2.0-dev libglib2.0-dev libfdt-dev libpixman-1-dev
   zlib1g-dev
9  sudo apt-get install git-email
10 sudo apt-get install libaio-dev libbluetooth-dev libbrlapi-dev libbz2-dev
11 sudo apt-get install libcap-dev libcap-ng-dev libcurl4-gnutls-dev libgtk-3-
   dev
12 sudo apt-get install libibverbs-dev libjpeg8-dev libncurses5-dev libnuma-dev
13 sudo apt-get install librbd-dev librdmacm-dev
14 sudo apt-get install libsasl2-dev libssl1.2-dev libseccomp-dev libsnappy-dev
   libssh2-1-dev
15 sudo apt-get install libvde-dev libvdeplug-dev libxen-dev liblzo2-dev
16 sudo apt-get install valgrind xfslibs-dev
17 sudo apt-get install libnfs-dev libiscsi-dev
18 sudo apt-get install ninja-build
19 sudo apt-get install libssl1.2-dev
20 ../configure --enable-kvm --enable-debug --enable-vnc --enable-werror --
   target-list="x86_64-softmmu"
21 make -j4
22 make install
```

其中 libvte-2.90-dev 包已经被废弃。编译如图 1 所示成功，安装如图 2 所示成功。

```
logcreative@ubuntu: ~/qemu-5.2.0/build
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)
[2364/2378] Compiling C object tests/qtest/qos-test.p/ac97-test.c.o
[2365/2378] Compiling C object tests/qtest/qos-test.p/nvme-test.c.o
[2366/2378] Compiling C object tests/qtest/qos-test.p/pca9552-test.c.o
[2367/2378] Compiling C object tests/qtest/qos-test.p/lpocatl232-test.c.o
[2368/2378] Compiling C object tests/qtest/qos-test.p/es1370-test.c.o
[2369/2378] Compiling C object tests/qtest/qos-test.p/virtio-blk-test.c.o
[2370/2378] Compiling C object tests/qtest/qos-test.p/virtio-9p-test.c.o
[2371/2378] Compiling C object tests/qtest/qos-test.p/pci-test.c.o
[2372/2378] Compiling C object tests/qtest/qos-test.p/virtio-rng-test.c.o
[2373/2378] Compiling C object tests/qtest/qos-test.p/pcnet-test.c.o
[2374/2378] Compiling C object tests/qtest/qos-test.p/sdhci-test.c.o
[2375/2378] Compiling C object tests/qtest/qos-test.p/vhost-user-test.c.o
[2376/2378] Compiling C object tests/qtest/qos-test.p/virtio-scsi-test.c.o
[2377/2378] Compiling C object tests/qtest/qos-test.p/e1000-test.c.o
[2378/2378] Linking target tests/qtest/qos-test
logcreative@ubuntu:~/qemu-5.2.0/build$
```

图 1: QEMU 编译

```
logcreative@ubuntu: ~/qemu-5.2.0/build
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)
Installing /home/logcreative/qemu-5.2.0/build/pc-bios/descriptors/60-edk
2-arm.json to /usr/local/share/qemu/firmware
Installing /home/logcreative/qemu-5.2.0/build/pc-bios/descriptors/60-edk
2-i386.json to /usr/local/share/qemu/firmware
Installing /home/logcreative/qemu-5.2.0/build/pc-bios/descriptors/60-edk
2-x86_64.json to /usr/local/share/qemu/firmware
Installing /home/logcreative/qemu-5.2.0/pc-bios/keymaps/sl to /usr/local
/share/qemu/keymaps
Installing /home/logcreative/qemu-5.2.0/pc-bios/keymaps/sv to /usr/local
/share/qemu/keymaps
Running custom install script '/usr/bin/python3 /home/logcreative/qemu-5
.2.0/meson/meson.py --internal gettext install --subdir=po --localedir=s
hare/locale --pkgname=qemu'
logcreative@ubuntu:~/qemu-5.2.0/build$
```

图 2: QEMU 安装

参考文献

[1] QEMU. QEMU readme[M/OL]. 2021. <https://gitlab.com/qemu-project/qemu/-/blob/master/README.rst>.

[2] QEMU. QEMU on Linux hosts[EB/OL]. 2012. [https://wiki.qemu.org/Hosts/Linux#Required\\_additional\\_packages](https://wiki.qemu.org/Hosts/Linux#Required_additional_packages).