

Libvirt

工程实践与科技创新III-D 虚拟化与云计算 EI313

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1 要求

Install Libvirt, then write python or C script with Libvirt Python or C API to get virtual machine ID, name, max memory, and the number of virtual CPUs.

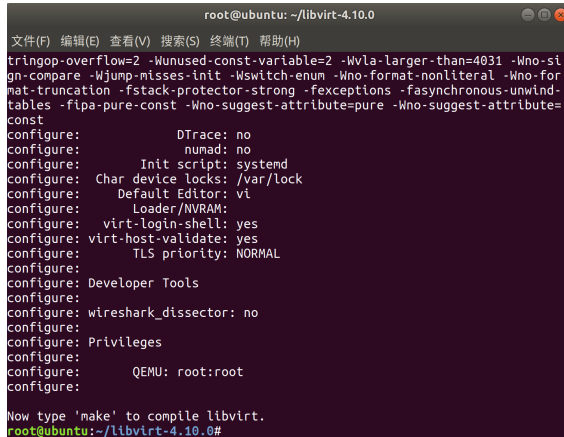
2 编译并安装 libvirt

改良教程^[1]的方法，安装 Ubuntu 版本的依赖包，下载 libvirt 4.10.0 源文件配置（如图 1）并编译（如图 2）。

Listing 1: [INSTALL.sh](#)

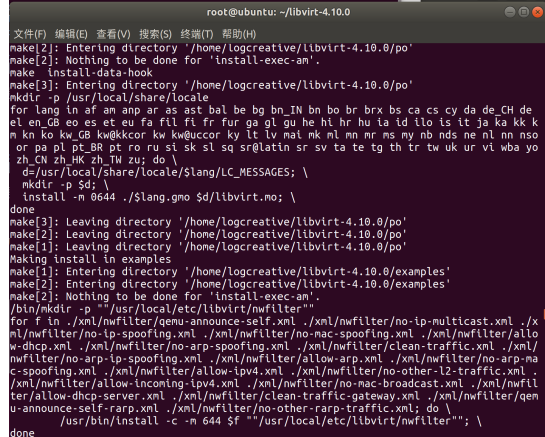
```
1  #!/bin/bash
2
3  sudo -s
4
5  apt-get install virt-manager
6
7  # Install Dependencies
8  apt-get install pkg-config libxml2-dev libgnutls28-dev libdevmapper-dev libnl
   -3-dev libnl-route-3-dev libpciaccess-dev libyajl-dev xsltproc
9
10 # Compile and install libvirt
11 wget https://libvirt.org/sources/libvirt-4.10.0.tar.xz
12 tar -xvf libvirt-4.10.0.tar.xz
13 cd libvirt-4.10.0
14 ./autogen.sh
15 make -j4
16 make install
17 ldconfig # refresh dynamic link library
```

```
18 ln -s /var/run/libvirt/libvirt-sock /usr/local/var/run/libvirt/libvirt-sock #  
manual link
```



```
root@ubuntu: ~/libvirt-4.10.0  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
tringop-overflow=2 -Wunused-const-variable=2 -Wvla-larger-than=4031 -Wno-si  
gn-compare -Wjump-misses-init -Wswitch-enum -Wno-format-nonliteral -Wno-for  
mat-truncation -fstack-protector-strong -fexceptions -fasynchronous-unwind  
tables -fipa-pure-const -Wno-suggest-attribute-pure -Wno-suggest-attribute=  
const  
configure: DTrace: no  
configure: numad: no  
configure: Init script: systemd  
configure: Char device locks: /var/lock  
configure: Default Editor: vi  
configure: Loader/NVRAM:  
configure: virt-login-shell: yes  
configure: virt-host-validate: yes  
configure: TLS priority: NORMAL  
configure: Developer Tools  
configure: wireshark dissector: no  
configure: Privileges  
configure: QEMU: root:root  
configure:  
Now type 'make' to compile libvirt.  
root@ubuntu:~/libvirt-4.10.0#
```

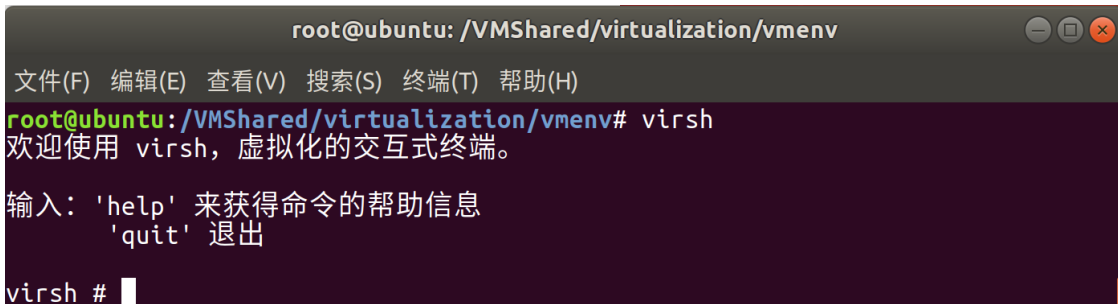
图 1: 配置 libvirt



```
root@ubuntu: ~/libvirt-4.10.0  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
make[2]: Entering directory '/home/logcreative/libvirt-4.10.0/po'  
make[2]: Nothing to be done for 'install-exec-am'.  
make[3]: Entering directory '/home/logcreative/libvirt-4.10.0/po'  
mkdir -p /usr/local/share/locale  
for lang in af an ap ar as ast bal be bg bn bn_TN bn bo br brx bs ca cs cy da de el en_GB et eu fa fi fr fur ga gl gu he hi hr hu ta id ilo is it ja ka kk k  
m kn ko kw_GB kw_KKcor kw_KWuccor ky it lv mai mk ml mn mr ms my nb nds ne nl nn nso  
or pa pl pt_BR pt ro ru si sk sl sq sr@Latin sr sv ta te tg th tr tw uk ur vi wba yo  
zh_CN zh_HK zh_TW zu; do \  
do /usr/local/share/locale/$lang/LC_MESSAGES; \  
mkdir -p $d; \  
install -m 0644 ./lang.gmo $d/libvirt.mo; \  
done  
make[3]: Leaving directory '/home/logcreative/libvirt-4.10.0/po'  
make[2]: Leaving directory '/home/logcreative/libvirt-4.10.0/po'  
make[1]: Leaving directory '/home/logcreative/libvirt-4.10.0/po'  
Making install in examples  
make[1]: Entering directory '/home/logcreative/libvirt-4.10.0/examples'  
make[2]: Entering directory '/home/logcreative/libvirt-4.10.0/examples'  
make[2]: Nothing to be done for 'install-exec-am'.  
/bin/mkdir -p "/usr/local/etc/libvirt/nwfilter"  
for f in ./xml/nwfilter/gemu-announce-self.xml ./xml/nwfilter/no-ip-multicast.xml ./x  
ml/nwfilter/no-ip-spoofing.xml ./xml/nwfilter/no-mac-spoofing.xml ./xml/nwfilter/allo  
w-dhcp.xml ./xml/nwfilter/no-arp-spoofing.xml ./xml/nwfilter/clean-traffic.xml ./xml/  
nwfilter/no-arp-ip-spoofing.xml ./xml/nwfilter/allow-arp.xml ./xml/nwfilter/no-arp-ma  
c-spoofing.xml ./xml/nwfilter/allow-ipv4.xml ./xml/nwfilter/no-other-l2-traffic.xml .  
/xml/nwfilter/allow-incoming-ipv4.xml ./xml/nwfilter/no-mac-broadcast.xml ./xml/nwfil  
ter/allow-dhcp-server.xml ./xml/nwfilter/clean-traffic-gateway.xml ./xml/nwfilter/gen  
u-announce-self-rarp.xml ./xml/nwfilter/no-other-rarp-traffic.xml; do \  
/usr/bin/install -c -m 644 $f "/usr/local/etc/libvirt/nwfilter"; \  
done
```

图 2: 编译 libvirt

安装完成后，验证 virsh 能够正常启动。之后重启系统以让系统完成一些刷新操作¹。



```
root@ubuntu: /VMShared/virtualization/vmenv  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
root@ubuntu: /VMShared/virtualization/vmenv# virsh  
欢迎使用 virsh，虚拟化的交互式终端。  
  
输入: 'help' 来获得命令的帮助信息  
      'quit' 退出  
  
virsh #
```

图 3: 运行 virsh 命令

3 注册虚拟机

前一次的作业已经使用 QEMU 制作完成了一个虚拟机 ubuntu.img，使用 virt-install 命令安装之（其中 --import 参数用于指定导入现有的磁盘映像），如图 4 所示。

Listing 2: attachvm.sh

```
1 #!/bin/bash  
2 sudo -s
```

¹不重启系统会导致意想不到的错误。

```
3 # Install the vm1
4 virt-install --connect qemu:///system -n vm1 -r 1024 --vcpus=1 --disk path=/
  VMShared/virtualization/vmenv/ubuntu.img,size=10 --vnc --noautoconsole --
  os-variant linux --accelerate --hvm --import
5 # Start the virt-manager
6 virt-manager
```



```
root@ubuntu: /VMShared/virtualization/vmenv
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)
root@ubuntu:/VMShared/virtualization/vmenv# virt-install --connect qemu:///system -n vm1 -r 1024 --vcpus=1 --disk path=/VMShared/virtualization/vmenv/ubuntu.img,size=10 --vnc --noautoconsole --os-variant linux --accelerate --hvm --import
WARNING 未检测到操作系统，虚拟机性能可能会受到影响。使用 --os-variant 选项指定操作系统以获得最佳性能。

开始安装.....
域创建完成。
root@ubuntu:/VMShared/virtualization/vmenv#
```

图 4: 注册虚拟机

然后使用已经安装好的 `virt-manager` 查看虚拟机状态，如图 5。

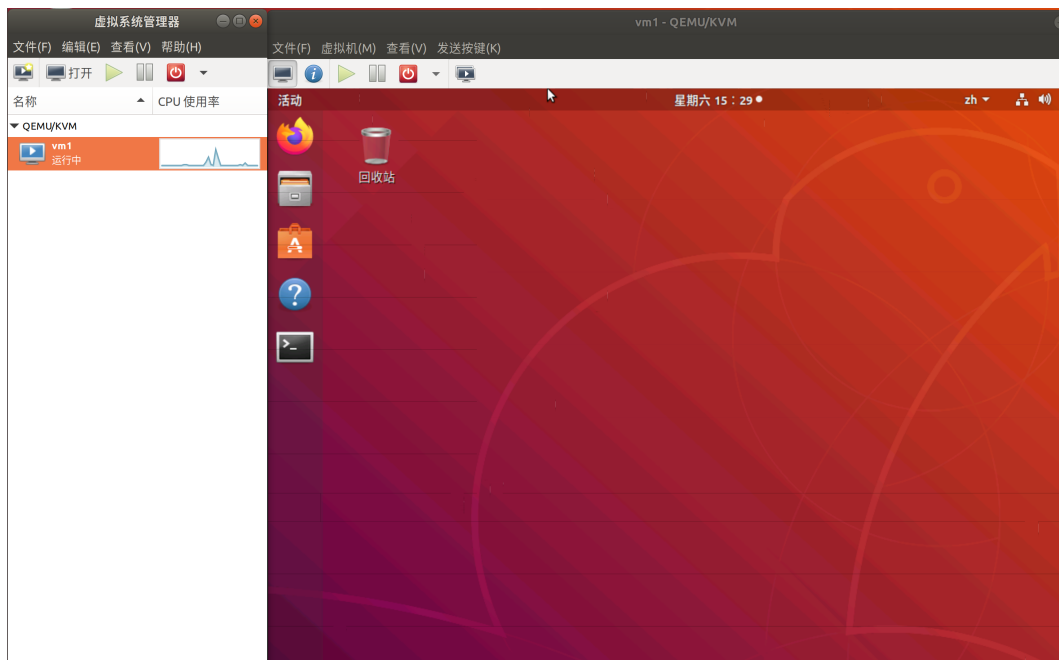


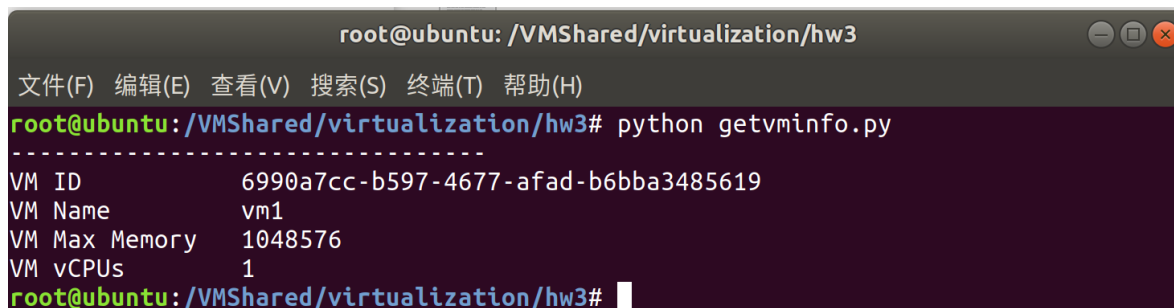
图 5: 打开虚拟系统管理器

4 获取虚拟机信息

通过 libvirt API^[1]，编写下面的 python 脚本获取虚拟机信息。获取结果如图 6 所示。

Listing 3: `getvminfo.py`

```
1 import libvirt
2 conn = libvirt.open("qemu:///system")
3 for id in conn.listDomainsID():
4     domain = conn.lookupByID(id)
5     print("-----")
6     print("VM ID\t\t%s" % domain.UUIDString())
7     print("VM Name\t\t%s" % domain.name())
8     print("VM Max Memory\t%d" % domain.maxMemory())
9     print("VM vCPUs\t%d" % domain.maxVcpus())
10 conn.close()
```



```
root@ubuntu: /VMShared/virtualization/hw3
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)
root@ubuntu: /VMShared/virtualization/hw3# python getvminfo.py
-----
VM ID          6990a7cc-b597-4677-afad-b6bba3485619
VM Name        vm1
VM Max Memory  1048576
VM vCPUs       1
root@ubuntu: /VMShared/virtualization/hw3#
```

图 6: 虚拟机信息

参考文献

- [1] SUKYSUN125. Libvirt 4.10.0编译安装[EB/OL]. 2019. <https://blog.csdn.net/sukysun125/article/details/89402782>.
- [2] KKUDEHAN. Python libvirt 模块接口使用[EB/OL]. 2021. <https://www.cnblogs.com/FutureHolmes/p/14576459.html>.