工程实践与科技创新 III-D 作业 3
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要求:

(1) 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.

内容简介
Libvirt 是用于管理虚拟化平台的开源的 API，后台程序和管理工具。它可以用于管理 KVM、Xen、VMware ESX，QEMU 和其他虚拟化技术。这些 API 在云计算的解决方案中广泛使用。

-----百度百科

一. Libvirt 的安装
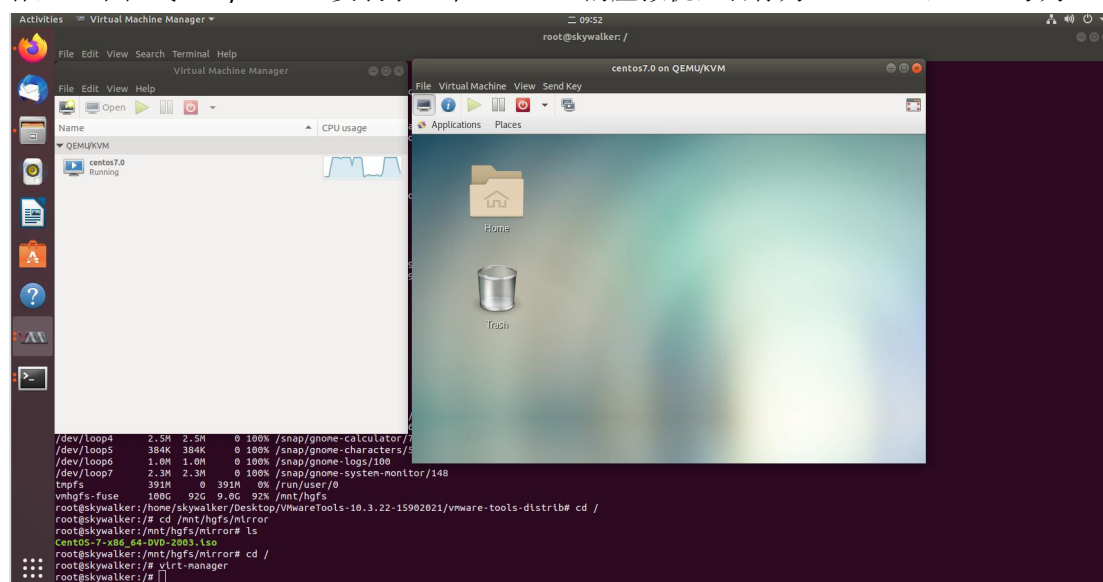输入源安装指令 apt-get install libvirt-bin 发现 libvirt 已经完成了安装,这是由于在作业二中使用 QEMU 开启虚拟机时已经安装过了 libvirt

输入 libvirtd --version 也可以看到 libvirt 已经安装，并且版本为 4.0.0

二. 写 python 脚本文件调用 Libvirt 的 API 获取虚拟机号，名称，最大存储空间，虚拟 CPU 的数量
作业二中在 QEMU/KVM 上安装了一个 CentOS7 的虚拟机，名称为 centos7.0，dom 号为 1

编写的 Python 脚本如下:

```python
#!/usr/bin/env python
import libvirt
import sys
def createConnection():
  conn=libvirt.openReadOnly(None)
  if conn==None:
   print 'Failed to open connection to QEMU/KVM'
   sys.exit(1)
  else:
   print '-----Connection is created successfully -----'
  return conn

def closeConnection(conn):
  print ''
  try:
    conn.close()
  except:
    print 'Failed to close the connection '
    return 1
```

```python
  print 'Connection is closed '


def getDomInfoByName(conn,name):
  print ''
  print '----- get domain info by name -----'
  try:
   myDom=conn.lookupByName(name)
  except:
   print 'Failed to find the domain with name "%s"' % name
   return 1
  print "Dom id: %d name: %s" % (myDom.ID(),myDom.name())
  print "Dom state: %s" % myDom.state (0)
  print "Dom info: %s" % myDom.info()
  print "memory: %d MB" % (myDom.maxMemory()/1024)
  print "vCPUs: %d" % myDom.maxVcpus ()

def getDomInfoByID(conn,id):
  print ''
```

```
    print '-----------get domain info by ID----------'
    try:
        myDom=conn.lookupByID(id)
    except:
        print 'Failed to find the domain with ID "%d"' % id
        return 1
    print "Dom id: %d  name: %s" % (myDom.ID(), myDom.name())
    print "Dom state: %s" % myDom.state (0)
    print "Dom info: %s" % myDom.info()
    print "memory: %d MB" % (myDom.maxMemory()/1024)
    print "vCPUs: %d" % myDom.maxVcpus ()

if __name__=='__main__':
    name1 = "centos7.0"
    name2 = "skywalker"
    id1=1
    id2=9999
    print "---Get domain info via libvirt python API ---"
    conn=createConnection()

    getDomInfoByName(conn,name1)
    getDomInfoByName(conn,name2)
    getDomInfoByID(conn,id1)
    getDomInfoByID(conn,id2)
    closeConnection(conn)
```

脚本文件的输入是两个虚拟机名称(centos7.0, skywalker)和两个 id 号(1,9999)。

运行脚本文件，结果截图如下。可以看到脚本正确输出了虚拟机号(Dom id)，名称(name)，最大存储空间(memory)，虚拟 CPU 的数量(vCPUs)。对于不存在的虚拟机名称或 id，脚本返回"Domain not found"说明结果达到了预期效果。

```
root@skywalker:/# python libvirt_pythontest.py
---Get domain info via libvirt python API ---
-----Connection is created successfully -----

----- get domain info by name -----
Dom id: 1 name: centos7.0
Dom state: [1, 5]
Dom info: [1, 1048576L, 1048576L, 1, 632870000000L]
memory: 1024 MB
vCPUs: 1

----- get domain info by name -----
libvirt: QEMU Driver error : Domain not found: no domain with matching name 'skywalker'
Failed to find the domain with name "skywalker"

-----------get domain info by ID-----------
Dom id: 1  name: centos7.0
Dom state: [1, 5]
Dom info: [1, 1048576L, 1048576L, 1, 632870000000L]
memory: 1024 MB
vCPUs: 1

-----------get domain info by ID-----------
libvirt: QEMU Driver error : Domain not found: no domain with matching id 9999
Failed to find the domain with ID "9999"

Connection is closed
root@skywalker:/#
```