

??????????

V11+KVM+Libvirt+WebVirtCloud +OpenStack??

[] ##### V10 Kylin V10 #####

- KVM##### CPU#####
- Libvirt#####
- WebVirtCloud[] Web[]
- OpenStack[] #####

[] yum [] dnf [] ##### Kylin V10 x86_64 / aarch64

? ???????

1. ??CPU???????

```
egrep -c '(vmx|svm)' /proc/cpuinfo
```

[] > 0 []

2. ???????KVM

```
lsmod | grep kvm
```

#####

```
modprobe kvm  
modprobe kvm_intel # Intel  
modprobe kvm_amd # AMD
```

3. ?????????????????????

□□□□□□

/etc/sysconfig/network-scripts/ifcfg-br0 □

```
DEVICE=br0
TYPE=Bridge
BOOTPROTO=static
IPADDR=192.168.3.15
NETMASK=255.255.255.0
GATEWAY=192.168.3.1
DNS1=202.96.209.5
ONBOOT=yes
```

□□□□□□

ifcfg-eno2 □□

```
DEVICE=ens33
TYPE=Ethernet
BOOTPROTO=none
ONBOOT=yes
BRIDGE=br0

□□□□□
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=eui64
NAME=eno2
UUID=5d9b10e9-49eb-4742-875a-0a6cbc268e9b
DEVICE=eno2
ONBOOT=yes
BRIDGE=br0
#IPADDR=192.168.3.15
#PREFIX=24
```

```
#GATEWAY=192.168.3.1
#DNS1=202.96.209.5
```

□□□□

```
systemctl restart network
□□□□□□□□reboot□□□□
```

? ????KVM + Libvirt + QEMU

```
yum install -y qemu-kvm qemu-img virt-manager libvirt python3-libvirt libvirt-client bridge-
utils virt-install
```

□□□□

```
systemctl enable libvirtd --now
systemctl status libvirtd
```

□□

```
virsh list --all
```

□□□□□□□□

□□□ EPEL □□

```
cp /etc/yum.repos.d/kylin-extra.repo /etc/yum.repos.d/kylin-extra.repo.bak
vi /etc/yum.repos.d/kylin-extra.repo
```

```
[epel]
name=EPEL for Kylin 11 (RHEL8 compatible)
baseurl=https://mirrors.aliyun.com/epel/8/Everything/x86_64/
enabled=1
gpgcheck=0
```

```
[powertools]
name=PowerTools for Kylin 11
baseurl=https://mirrors.aliyun.com/centos/8/PowerTools/x86_64/os/
enabled=1
```



```
git config --global http.lowSpeedLimit 0
git config --global http.lowSpeedTime 999999
git config --global core.compression 0
```

3. ??Python??

```
yum install libvirt-devel gcc python3-devel openldap-devel

pip3 install -r conf/requirements.txt
```

4. ??????????

```
cp webvirtcloud/settings.py.template webvirtcloud/settings.py

python3 -c "from django.core.management.utils import get_random_secret_key;
print(get_random_secret_key())"
# c*&2pu%e=m7&r*^r*zp3p*wr!(8w3a$-l^rq@*w5#7ekrwmtpd
vi webvirtcloud/settings.py
# SECRET_KEY
SECRET_KEY = 'c*&2pu%e=m7&r*^r*zp3p*wr!(8w3a$-l^rq@*w5#7ekrwmtpd'

python3 manage.py migrate
python3 manage.py createsuperuser #
#web
# shuncom 8108@shuncom.com sh_clighting
```

5. ?????

?? A?Gunicorn ?? - - daemon

```
python3 manage.py runserver 0.0.0.0:8000

#
# gunicorn
pip3 install gunicorn

# WebVirtCloud
```

```
gunicorn --workers 3 --bind 0.0.0.0:8000 --daemon webvirtcloud.wsgi:application
```

```
# vim:ft=conf
gunicorn.log --access-logfile /var/log/webvirtcloud_access.log --error-logfile /var/log/webvirtcloud_error.log
gunicorn --workers 3 --bind 0.0.0.0:8000 \
  --daemon \
  --access-logfile /var/log/webvirtcloud_access.log \
  --error-logfile /var/log/webvirtcloud_error.log \
  webvirtcloud.wsgi:application
```

?? B??? systemd ?? WebVirtCloud

```
vim /etc/systemd/system/webvirtcloud.service
```

```
[Unit]
Description=WebVirtCloud Django service
After=network.target

[Service]
User=root
Group=root
WorkingDirectory=/opt/webvirtcloud
ExecStart=/usr/local/bin/gunicorn --workers 3 --bind 0.0.0.0:8000
webvirtcloud.wsgi:application
Restart=always

[Install]
WantedBy=multi-user.target
```

```
vim
```

```
systemctl daemon-reload
systemctl enable --now webvirtcloud
systemctl status webvirtcloud

# vim:ft=conf
firewall-cmd --add-port=8000/tcp --permanent
firewall-cmd --add-port=80/tcp --permanent
firewall-cmd --reload
firewall-cmd --list-all
```

```
⌨ http://[IP]:8000 [ ]
```

?? ????Nginx????????

```
⌨ /etc/nginx/conf.d/webvirtcloud.conf [ ]
```

```
⌨ yum install -y nginx
```

```
server {  
    listen 80;  
    server_name _;  
  
    location / {  
        proxy_pass http://127.0.0.1:8000;  
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;  
        proxy_set_header Host $host;  
        proxy_redirect off;  
    }  
}
```

```
⌨
```

```
systemctl enable nginx --now
```

? ????Supervisor??WebVirtCloud

```
⌨ /etc/supervisord.conf [ ]
```

```
sudo vi /etc/supervisord.conf
```

```
⌨
```

```
[unix_http_server]  
file=/tmp/supervisor.sock ; UNIX socket [ ]  
  
[supervisord]  
logfile=/var/log/supervisord.log  
pidfile=/tmp/supervisord.pid
```

```
childlogdir=/var/log

[rpcinterface:supervisor]
supervisor.rpcinterface_factory = supervisor.rpcinterface:make_main_rpcinterface

[supervisorctl]
serverurl=unix:///tmp/supervisor.sock

[include]
files = /etc/supervisord.d/*.ini
```

```
mkdir -p /etc/supervisord.d
```

```
vi /etc/supervisord.d/webvirtcloud.ini
```

```
[program:webvirtcloud]
command=/usr/bin/python3 /opt/webvirtcloud/manage.py runserver 0.0.0.0:8000
directory=/opt/webvirtcloud
autostart=true
autorestart=true
stderr_logfile=/var/log/webvirtcloud.err.log
stdout_logfile=/var/log/webvirtcloud.out.log
user=root
```

```
|||||
```

```
systemctl enable supervisord --now

supervisorctl restart webvirtcloud
```

```
|||
```

```
supervisorctl status
```

? ????WebVirtCloud??KVM??

1. ||| WebVirtCloud||| `http://<|||IP>` |||
2. "Compute > Add Connection"
3. |||
 - **Label:** KVM-Host

• **Hostname/IP:** 127.0.0.1

• **Connection type:** SSH

• **Login user:** root

4. root SSH

```
ssh-keygen -t rsa  
ssh-copy-id root@127.0.0.1
```

5. Web

?? ?????????? OpenStack ??????????

“ ” OpenStack All-in-One

1. ?? DevStack???????

```
cd /opt  
git clone https://opendev.org/openstack/devstack  
cd devstack
```

local.conf

```
[[local|localrc]]  
ADMIN_PASSWORD=admin  
DATABASE_PASSWORD=admin  
RABBIT_PASSWORD=admin  
SERVICE_PASSWORD=admin  
HOST_IP=192.168.1.100
```

```
./stack.sh
```

```
http://192.168.1.100/dashboard
```

admin admin

? ????????

??????????

```
virsh list
```

??libvirt??????

```
virsh net-list  
virsh pool-list
```

???????

```
systemctl status libvirtd  
systemctl status nginx  
systemctl status supervisord
```

? ??????

□□	□□	□□□	□□□
KVM	□□□□□□	-	□□□ /Libvirt
Libvirt	□□□□□□	16509	virsh/virt-manager
WebVirtCloud	Web□□□□□	80/8000	□□□
OpenStack	□□□□□□	80/5000/8774 □	Web□□□ Horizon

? ????????

□□	□□□
□□□□□□	KVM + Virt-Manager
Web□□□□□	WebVirtCloud

OS	Storage
CentOS	OpenStack on KVM
CentOS	OpenStack + Ceph

CentOS Kylin V10 Shell CentOS
 Nginx+WebVirtCloud+Libvirt CentOS

WebVirtCloud CentOS

You haven't defined any storage pools

Libvirt CentOS WebVirtCloud CentOS

1?? ????????

CentOS

```
sudo virsh pool-list --all
```

CentOS

Name	State	Autostart
default	inactive	no

CentOS inactive CentOS

2?? ??????????????????

```
sudo virsh pool-start default
sudo virsh pool-autostart default
```

3?? ??????????????????

CentOS /var/lib/libvirt/images CentOS

```
sudo mkdir -p /var/lib/libvirt/images
```

```
sudo virsh pool-define-as default dir - - - - "/var/lib/libvirt/images"
```

```
sudo virsh pool-build default
```

```
sudo virsh pool-start default
```

```
sudo virsh pool-autostart default
```

“ ”

- pool-define-as default dir ... "/var/lib/libvirt/images"

XXXXXXXXXX

- pool-build XXXX

- pool-start XXXX

- pool-autostart XXXXXX

4?? ? WebVirtCloud ??

1. XX WebVirtCloud
2. XX **Host → Storage Pools**
3. XXXXXXXXXXXXXXXX
4. XXXXXXXXXXXXXXXX

XX XXXX

- XXXX XXXX **WebVirtCloud** XXXXXXXX
- XXXX root XX libvirt XXXX WebVirtCloud

XX XX XXXX WebVirtCloud XXXXXXXX

XX “XX ISO XXXXXXXX CD-ROM”XXXXXXXXXXXX

WebVirtCloud

XXXXXXXXXXXX

? ??????????????

XXXXXXXXXXXXXXXXXXXX

1?? ? ISO ??????????????

□□□□

```
<input type='keyboard' bus='ps2' />
```

4. □□□□

```
<input type='tablet' bus='default' />
```

□□□□

```
<input type='tablet' bus='usb' />
```

5. □□□□□□□□

```
virsh define /tmp/vm.xml
```

6. □□□□□□

```
virsh start <□□□□>
```

? ??

□□□	□□□□
<code><input type='keyboard' bus='default' /></code>	<code><input type='keyboard' bus='ps2' /></code>
<code><input type='tablet' bus='default' /></code>	<code><input type='tablet' bus='usb' /></code>

□□□□□□

```
virsh capabilities | grep input -A2
```

```

□□□  ps2 □  usb □□□□□□□□□□□□□□□□
□□□□  XML □□□□□□□□□□□□□□□□□□□□
unknown input bus type 'default' □□□

```

?????????xrdp

```

□□□□□□□□  Kylin V10/V11□□□  RHEL8□ □□□□□□□□□□□□□□
□□□  xorgxrdp □□□□□□□□  Xorg ABI □□□□□□□□□□□□□□□□
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```



```
##### `novncd` ##### `/opt/webvirtcloud/console/novncd`
```

??????? systemd ????????

```
### #####
```

```
#### █ 1##### novncd #####
```

```
```bash
```

```
#####
```

```
ls -la /opt/webvirtcloud/console/novncd
```

```
#####
```

```
sudo chmod +x /opt/webvirtcloud/console/novncd
```

```
Python
```

```
file /opt/webvirtcloud/console/novncd
```

```
head -n 5 /opt/webvirtcloud/console/novncd
```

```
```
```

```
#### █ 2##### systemd #####
```

```
#####
```

```
```bash
```

```
sudo vi /etc/systemd/system/novncd.service
```

```
```
```

```
#####
```

```
```ini
```

```
[Unit]
```

```
Description=WebVirtCloud NoVNC Proxy Server
```

```
After=network.target
```

```
[Service]
```

```
Type=simple
```

```
User=root
```

```
Group=root
```

```
WorkingDirectory=/opt/webvirtcloud
```

```
ExecStart=/opt/webvirtcloud/console/novncd
```

```
Restart=always
```

```
RestartSec=3
```

```
StandardOutput=journal
StandardError=journal
```

```
[Install]
```

```
WantedBy=multi-user.target
...
```

```
3##### novncd []
```

```
```bash
```

```
# [] systemd []
```

```
sudo systemctl daemon-reload
```

```
# [] novncd []
```

```
sudo systemctl start novncd
```

```
# []
```

```
sudo systemctl enable novncd
```

```
# []
```

```
sudo systemctl status novncd
```

```
...
```

```
##### 4#####
```

```
```bash
```

```
[]
```

```
ps aux | grep novncd
```

```
novncd [] 6080 []
```

```
netstat -tlnp | grep 6080
```

```
ss -tlnp | grep 6080
```

```
[]
```

```
sudo journalctl -u novncd -f
```

```
...
```

```

```

```
#####
```

```
[]
```

```
```bash
```

```
# [] Python []
```

```
cd /opt/webvirtcloud
```

```
python3 -c "import django; print('Django OK!')"
```

```
python3 -c "from console import novnc; print('novnc module OK')"
```

```
# [] requirements
if [ -f "/opt/webvirtcloud/requirements.txt" ]; then
    echo "[] ..."
    pip3 list | grep -E "(websockify|django)"
fi
\`\`\`
```

```
#### [] novncd
```

```
\`\`\`bash
```

```
# []
```

```
cd /opt/webvirtcloud
```

```
# [] novncd []
```

```
/opt/webvirtcloud/console/novncd
```

```
# []
```

```
/opt/webvirtcloud/console/novncd &
```

```
\`\`\`
```

```
#### []
```

```
\`\`\`bash
```

```
# []
```

```
sudo pip3 install websockify
```

```
# [] requirements
```

```
if [ -f "/opt/webvirtcloud/requirements.txt" ]; then
```

```
    sudo pip3 install -r /opt/webvirtcloud/requirements.txt
```

```
fi
```

```
\`\`\`
```

```
---
```

```
#### [] WebVirtCloud
```

```
[] WebVirtCloud [] novncd[]
```

```
[] WebVirtCloud []
```

```
\`\`\`bash
```

```
# []
```

```
find /opt/webvirtcloud -name "settings.py" -o -name "*.conf" | grep -v __pycache__
```

```
# [REDACTED]
ls -la /opt/webvirtcloud/webvirtcloud/
...
```

```
[REDACTED]
```

```
```python
[REDACTED] settings.py [REDACTED]
NOVNC_HOST = 'localhost' # [REDACTED] IP
NOVNC_PORT = 6080
...
```

```

```

```
[REDACTED]
```

```
[REDACTED] novncd [REDACTED]
```

```
```bash
# [REDACTED]
curl -I http://localhost:6080/
```

```
# [REDACTED] telnet [REDACTED]
telnet localhost 6080
```

```
# [REDACTED] nc
nc -zv localhost 6080
...
```

```
---
```

```
### [REDACTED]
```

```
[REDACTED]
```

```
```bash
1. [REDACTED]
sudo pkill -f novncd

2. [REDACTED]
sudo pip3 install websockify

3. [REDACTED]
sudo chmod +x /opt/webvirtcloud/console/novncd

4. [REDACTED]
cd /opt/webvirtcloud
```



```
[[VNC []]
```

```
```bash
```

```
# [ ] firewallld[ ]
```

```
sudo firewall-cmd --list-all
```

```
# [ ]
```

```
sudo firewall-cmd --add-port=6080/tcp --permanent
```

```
sudo firewall-cmd --add-port=5900-5959/tcp --permanent
```

```
sudo firewall-cmd --reload
```

```
# [ ] iptables[ ]
```

```
sudo iptables -L -n | grep -E "(6080|5900)"
```

```
```
```

```
[] 3[] VNC[]
```

```
```bash
```

```
# [ ] VNC[ ] :0 [ ] 5900[ ]
```

```
netstat -tlnp | grep 5900
```

```
# [ ]
```

```
telnet localhost 5900
```

```
# [ ] 5900[ ]
```

```
netstat -tlnp | grep -E ":(59[0-9][0-9])"
```

```
```
```

```
[] 4[] WebVirtCloud[]
```

```
[] WebVirtCloud[] novncd[]
```

```
```bash
```

```
# [ ] WebVirtCloud[ ]
```

```
find /opt/webvirtcloud -name "settings.py" -o -name "*.py" | xargs grep -l "NOVNC\|novnc" | grep -v __pycache__
```

```
# [ ]
```

```
ls -la /opt/webvirtcloud/webvirtcloud/settings.py
```

```
```
```

```
[]
```

```
```python
```

```
NOVNC_HOST = 'localhost' # [ ] IP
```

```
NOVNC_PORT = 6080
```

```
```
```

```
5 novncd VNC
```

```
```bash
```

```
# websocat novncd
```

```
curl -I http://localhost:6080/
```

```
# wget
```

```
wget -O- http://localhost:6080/ 2>&1 | head -20
```

```
```
```

```
6 SELinux
```

```
```bash
```

```
# SELinux
```

```
getenforce
```

```
# Enforcing
```

```
sudo setenforce 0
```

```
# VNC SELinux
```

```
```
```

```

```

```
###
```

```
#####
```

```
```bash
```

```
# 1. VNC
```

```
virsh dumpxml 11 | grep -A 10 "<graphics"
```

```
# 2. 5900
```

```
netstat -tlnp | grep 5900
```

```
# 3.
```

```
sudo firewall-cmd --list-all 2>/dev/null || sudo iptables -L -n | head -20
```

```
# 4. novncd
```

```
curl -s http://localhost:6080/ | head -5
```

```
# 5. SELinux
```

```
getenforce
```

```
```
```

```

```

```
[redacted]
```

```
[redacted]
```

```
```bash
```

```
# [redacted] novncd[redacted]
```

```
sudo systemctl restart novncd
```

```
# [redacted] WebVirtCloud[redacted]
```

```
sudo systemctl restart webvirtcloud # [redacted] gunicorn[redacted] nginx[redacted]
```

```
# [redacted] libvirtd[redacted]
```

```
sudo systemctl restart libvirtd
```

```
```
```

```
[redacted] `novncd` [redacted]
```

```
1. **[redacted] VNC[redacted] **[redacted] listen[redacted]
```

```
2. **[redacted] **
```

```
3. **WebVirtCloud[redacted] **[redacted] novncd[redacted]
```

```
4. **SELinux[redacted] **
```

```
[redacted]
```

---

Revision #31

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