# **GVT-g Testenv setup on CentOS7.3**

7/19/2017

## **Install host CentOS7.3**

Host we used is SKL Kontron server.

Use usb or DVD to install CentOS7.3 with GUI server enabled and Development tools installed.

## **Configure and setup host**

### **Set proxy for host**

1. #sed -i '$ a\\ export https\_proxy=https://proxy-prc.intel.com:911\n export http\_proxy=http://proxy-prc.intel.com:911' ~/.bashrc
2. #sed -i '$ a\\ export https\_proxy=https://proxy-prc.intel.com:911\n export http\_proxy=http://proxy-prc.intel.com:911' /home/media/.bashrc
3. #sed -i '$ a\\ proxy=https://proxy-prc.intel.com:911\n proxy=http://proxy-prc.intel.com:911' /etc/yum.conf
4. #reboot

### **Upgrade kernel of Host server**

1. **Copy PV3\_GVT package to your host user package.**

You can get it from [\\SHWDEJOINTD026\Media\_validation\GVT](file:///\\SHWDEJOINTD026\Media_validation\GVT)

1. **Switch to root user and update Kernel**
   1. $su
   2. #cd PV3\_GVT/kernel
   3. [root@s2n6c2 kernel]# ls

kernel-4.11.0+-2.x86\_64.rpm

* 1. #rpm -Uvh kernel-4.11.0+-2.x86\_64.rpm --force --nodeps
  2. #reboot

1. **After host boot up, check the kernel if is 4.11.0+**
2. [media@s2n6c2 ~]$ uname -a

Linux s2n6c2 4.11.0+ #1 SMP Wed Jun 28 04:37:09 EDT 2017 x86\_64 x86\_64 x86\_64 GNU/Linux

1. **Install needed Dependecies**
   1. # yum install -y SDL-devel.x86\_64 SDL.x86\_64 zip.x86\_64 zlib.x86\_64 zlib-devel.x86\_64 glib2-devel.x86\_64 pixman-devel.x86\_64 spice-server.x86\_64 spice-server-devel.x86\_64 spice-protocol.noarch uuid
2. **Edit Host Grub**
   1. #vim /boot/gru2/grub.cfg

### END /etc/grub.d/01\_users ###

### BEGIN /etc/grub.d/10\_linux ###

menuentry 'CentOS Linux (4.11.0+) 7 (Core)' --class centos --class gnu-linux --class gnu --class os --unrestricted $menuentry\_id\_option 'gnulinux-3.10.0-514.el7.x86\_64-advanced-02876179-379a-4d62-955d-1ab524aef498' {

load\_video

set gfxpayload=keep

insmod gzio

insmod part\_msdos

insmod xfs

set root='hd0,msdos1'

if [ x$feature\_platform\_search\_hint = xy ]; then

search --no-floppy --fs-uuid --set=root --hint-bios=hd0,msdos1 --hint-efi=hd0,msdos1 --hint-baremetal=ahci0,msdos1 --hint='hd0,msdos1' 08e23191-95cf-4439-8721-fcdb7552efc7

else

search --no-floppy --fs-uuid --set=root 08e23191-95cf-4439-8721-fcdb7552efc7

fi

linux16 /vmlinuz-4.11.0+ root=/dev/mapper/cl-root ro crashkernel=auto rd.lvm.lv=cl/root rd.lvm.lv=cl/swap rhgb quiet LANG=en\_US.UTF-8 console=ttyS0,115200n8 intel\_iommu=igfx\_off i915.enable\_gvt=1 drm.debug=0x2

initrd16 /initramfs-4.11.0+.img

}

* 1. #reboot

**NOTE:Marked yellow need to be added to grub file.**

1. **Build QEMU for KVMGT**

(as normal user)

* 1. $ git clone <https://github.com/01org/igvtg-qemu>
  2. $ cd igvtg-qemu/
  3. $ git checkout stable-2.9.0
  4. $ ./configure --prefix=/usr --enable-kvm --disable-xen --enable-debug-info --enable-debug --enable-sdl --enable-vhost-net --enable-spice --disable-debug-tcg --target-list=x86\_64-softmmu
  5. $ make -j8
  6. $sudo make install
  7. Copy bios.bin to /usr/bin
* $cd ~/PV3\_GVT/seabios
* $sudo cp bios.bin /usr/bin/
* $ sudo chmod 755 /usr/bin/ bios.bin
  1. Copy qemu-ifup and qemu-ifdown to your host /etc/

You can get from [\\SHWDEJOINTD026\Media\_validation\GVT](file:///\\SHWDEJOINTD026\Media_validation\GVT)

 

$sudo cp qemu-if\* /etc/

1. **Setup a proxy for external source download**

(as root user)

* 1. # touch /usr/bin/git-proxy
  2. # chmod 755 /usr/bin/git-proxy
  3. [root@s2n6c2 iHDV\_patch]# cat /usr/bin/git-proxy

[core]

proxy=proxy-shz.intel.com

exec socat STDIO SOCKS4:$proxy:$1:$2

* 1. # touch /home/media/.gitconfig
  2. [root@s2n6c2 media]# cat .gitconfig

[core]

gitproxy = none for intel.com

gitproxy = git-proxy

1. **Setup Bios**
   1. When restarting, press corresponding kerboard get into bios, then do following change.

chipset - system agent (SA) configuration - Graphics configuration -aperture size set from 256 to 1024 MB and GTT Size to 8MB

1. **Load GVT module**

(as normal user)

* 1. Add below command in /etc/dracut.conf under line“# additional kernel modules to the default”.

add\_drivers+="kvmgt vfio-iommu-type1 vfio-mdev"

* 1. $sudo mkinitrd /boot/initramfs-4.11.0+.img 4.11.0+ --force
  2. $sudo reboot
  3. After reboot, check the path **/sys/bus/pci/devices/0000:00:02.0/mdev\_supported\_types** if exist.

## **Install guest and configure guest**

### **Install guest**

1. Download Centos7.3 from mirrors.163.com or other source.

[**http://mirrors.163.com/centos/7.3.1611/isos/x86\_64/CentOS-7-x86\_64-DVD-1611.iso**](http://mirrors.163.com/centos/7.3.1611/isos/x86_64/CentOS-7-x86_64-DVD-1611.iso)

[**https://mirrors.aliyun.com/centos/7.3.1611/isos/x86\_64/CentOS-7-x86\_64-DVD-1611.iso**](https://mirrors.aliyun.com/centos/7.3.1611/isos/x86_64/CentOS-7-x86_64-DVD-1611.iso)

1. Use following command to install guest
2. #qemu-img create -f qcow2 test.qcow 50G
3. #/usr/bin/qemu-system-x86\_64 \

-m 2048 -smp 2 -M pc \

-name kvmgt -cpu host -hda /root/test.qcow \

-net nic -net tap,script=/etc/qemu-ifup \

-enable-kvm \

-machine kernel\_irqchip=on \

-net nic,model=e1000,macaddr=00:FE:EA:84:4F:dd \

-boot d \

-cdrom /home/media/gvt/CentOS-7-x86\_64-DVD-1611.iso

NOTE: Every GUEST should have no conflict macaddr

1. **Boot up guest and install mssdriver**
   1. **Build bridge on host**
      1. **Copy the crbr.sh to host**



You can also get it from

[\\SHWDEJOINTD026\Media\_validation\GVT](file:///\\SHWDEJOINTD026\Media_validation\GVT)

* + 1. **Build bridge**
       1. #sh crbr.sh sw0 add enp1s0f0
       2. #dhclient sw0

NOTE: The enp1s0f0 can be changed to your own machine network card. Everytime you reboot the host you need repeat the steps above.

* 1. **Boot up guest system**

# usr/bin/qemu-system-x86\_64 \

-m 2048 -smp 2 -M pc \

-name kvmgt -cpu host -hda /root/test.qcow \

-net nic -net tap,script=/etc/qemu-ifup \

-enable-kvm \

-machine kernel\_irqchip=on \

-net nic,model=e1000,macaddr=00:FE:EA:84:4F:dd \

* 1. **Copy PV3 related packages to guest**

You can get them from [\\SHWDEJOINTD026\Media\_validation\GVT\PV3\_GVT](file:///\\SHWDEJOINTD026\Media_validation\GVT\PV3_GVT)

* + 1. **Update guest kernel to 4.11.0 as root user**

$su

#cd PV3\_GVT/kernel

[root@localhost kernel]# ls

kernel-4.11.0+-2.x86\_64.rpm

#rpm -Uvh kernel-4.11.0+-2.x86\_64.rpm --force –nodeps

#reboot

* + 1. **Update Guest Grub**

#cat /boot/grub2/grub.cfg

### END /etc/grub.d/01\_users ###

### BEGIN /etc/grub.d/10\_linux ###

menuentry 'CentOS Linux (4.11.0+) 7 (Core)' --class centos --class gnu-linux --class gnu --class os --unrestricted $menuentry\_id\_option 'gnulinux-3.10.0-514.el7.x86\_64-advanced-8c8a5d64-a6fa-4e16-8862-ffae4008198a' {

load\_video

set gfxpayload=keep

insmod gzio

insmod part\_msdos

insmod xfs

set root='hd0,msdos1'

if [ x$feature\_platform\_search\_hint = xy ]; then

search --no-floppy --fs-uuid --set=root --hint-bios=hd0,msdos1 --hint-efi=hd0,msdos1 --hint-baremetal=ahci0,msdos1 --hint='hd0,msdos1' 12ebf343-ed89-478f-94aa-3641bff621f0

else

search --no-floppy --fs-uuid --set=root 12ebf343-ed89-478f-94aa-3641bff621f0

fi

linux16 /vmlinuz-4.11.0+ root=/dev/mapper/cl-root ro crashkernel=auto rd.lvm.lv=cl/root rd.lvm.lv=cl/swap rhgb LANG=en\_US.UTF-8 console=ttyS0,115200n8 ignore\_loglevel i915.enable\_hangcheck=0

initrd16 /initramfs-4.11.0+.img

}

**NOTE:Marked yellow need to be added to grub file which enable serial port, guest log output, and remove the ori parameter “quiet” in this line.**

* + 1. Install MSS driver and OPENCL

(as root user)

* + - 1. #cd /home/media/PV3\_GVT/MSS\_PV3
      2. #tar zxvf PV3.tar.gz
      3. #cd MediaServerStudioEssentials2017R3/SDK2017Production16.5.2/Generic
      4. #./install\_media.sh
      5. #tar xvf intel-opencl-cpu-r5.0-63503.x86\_64.tar.xz
      6. #tar xvf intel-opencl-r5.0-63503.x86\_64.tar.xz
      7. #tar xvf tar xvf intel-opencl-devel-r5.0-63503.x86\_64.tar.xz
      8. #cp -raf etc/\* /etc/
      9. #cp -raf opt/intel/opencl/ /opt/intel/
      10. #ldconfig
      11. Close qemu tool on host

NOTE:When execute step4, if the machine is SKL, choose y, other choose n, after the guest started normally again, the vainfo command may show uncorrect info, try command “unset DISPLAY”

1. **Create VGPU on host and boot up guest**

(as root user)

* 1. #cd cd /sys/bus/pci/devices/0000\:00\:02.0/
  2. #uuid

bb6b31ce-6cfb-11e7-adc4-00a0a597e7e0

* 1. echo “bb6b31ce-6cfb-11e7-adc4-00a0a597e7e0” > mdev\_supported\_types/i915-GVTg\_V5\_1/create
  2. boot up guest

#/usr/bin/qemu-system-x86\_64 -m 16384 -smp 2 -M pc -name kvmgt3 -cpu host -hda /root/test.qcow -net nic -net tap,script=/etc/qemu-ifup -enable-kvm -machine kernel\_irqchip=on -serial file:/home/guest.log -net nic,model=e1000,macaddr=00:FE:EA:84:4F:dc -device vfio-pci,sysfsdev=/sys/bus/pci/devices/0000:00:02.0/ bb6b31ce-6cfb-11e7-adc4-00a0a597e7e0,rombar=0

**NOTE:sometimes the uuid maynot created successfully, it shows erros as “no space left on device…”, you can restart the host, after login to host Desktop, open a terminal and switch to root user, enter** /sys/bus/pci/devices/0000:00:02.0/ , **lock then unlock the screen, repeat steps b to c, then update new uuid to the bootup script. The mem value can adjust from your host mem, it makes sure guest has enough resource to use.**

1. **Replace the guest iHD\_drv\_video.so**
   1. #cd /home/media/ PV3\_GVT/iHDV\_patch/
   2. #cp iHD\_drv\_video.so /opt/intel/mediasdk/lib64/
2. **Install perl, third party tool on guest**

(as root user)

* 1. Copy autoinstall scripts to the guest

You can get from

\\SHWDEJOINTD026\Media\_validation\CGSS\MSDK Test Enviornment install script\msdkenv\_autoinstall

* 1. #cd msdkenv\_autoinstall
  2. comment out from “#prepare test\_system” to the last line.
  3. #./install\_all.sh
  4. #reboot

NOTE:Because we have limited space on guest, we need mount the test system from host machine.After execute install\_all.sh, you need mannuly check if the tools are correctly installed from install\_version.log

### **Mount test system on host and run case**

1. **Setup on host**

(as root user)

* 1. #yum install nfs-utils -y
  2. #vim /etc/exports

/home/media/test\_system \*(rw,sync,no\_root\_squash)

* 1. # systemctl enable rpcbind.service
  2. #systemctl enable nfs-server.service
  3. #systemctl start rpcbind.service
  4. #systemctl start nfs-server.service
  5. #iptables -X
  6. #iptables -F

(as normal user)

* 1. $cd /home/media/ PV3\_GVT/
  2. $ unzip test\_system.zip -d /home/media/test\_system
  3. $chmod 775 -R /home/media/test\_system
  4. Copy sample app to test\_system
     1. $cd ~/PV3\_GVT/MSS\_PV3/MediaServerStudioEssentials2017R3/MediaSamples\_Linux\_2017R3\_b698/samples/\_bin/x64
     2. $sudo cp \*.so ocl\_rotate.cl sample\_\* /home/media/test\_system/build/lin\_x64/bin
  5. Copy 6.0 tool to test\_system

You can get from [\\SHWDEJOINTD026\Media\_validation\validation\_tools\6.0](file:///\\SHWDEJOINTD026\Media_validation\validation_tools\6.0)

$sudo cp -r 6.0 /home/media/test\_system

**NOTE: Everytime you reboot your host, you need repeat step g and h, or you will not find the mountserver.**

1. **Setup on guest**

(as normal user)

* 1. $mkdir -p /home/media/ws/msdk\_validation/mediasdk\_streams
  2. $mkdir -p /home/media/ws/msdk\_validation/test\_system
  3. $chmod 775 -R /home/media/ws
  4. $showmont -e HOST\_IP

Export list for HOST\_IP:

/home/media/test\_system \*

(as root user)

* 1. #mount -t nfs -o nolock,nfsvers=3,vers=3 -o proto=tcp  HOST\_IP:/home/media/test\_system /home/media/ws/msdk\_validation/test\_system/
  2. #mount -t nfs -o vers=3 10.67.116.91:/datadisk/streams /home/media/ws/msdk\_validation/mediasdk\_streams

1. **Run msdk case on guest**
   1. Enter the test\_system package on guest

#cd /home/media/ws/msdk\_validation/test\_system

* 1. #export MEDIASDK\_STREAMS=/home/media/ws/msdk\_validation/mediasdk\_streams
  2. #export MEDIASDK\_ROOT=/home/media/ws/msdk\_validation/test\_system
  3. #export LD\_LIBRARY\_PATH=./:/user/local/lib:/usr/lib64:/opt/intel/mediasdk/lib64:/opt/intel/common/mdf/lib64:/opt/intel/opencl:/home/media/ws/msdk\_validation/test\_system/build/lin\_x64/bin
  4. #perl test\_driver.pl -s h264d\_common -p c7.3\_skl\_64\_server --copy\_missed\_streams