How to get mate 3D working in RHEL7.7 Ken Satyshur, November, 2020 v1.0

NOTE: This is a dated document. Although it applies to legacy systems, operating systems can change and this document may change in the future. To the best of my knowledge, this info is accurate and I take no responsibility for the implementation of this process on your computer. This info is based upon my experience with Linux and Nvidia 3D Vision hardware to get 3D gaming equipment working in linux. Windows systems are more DirectX user, and are easier to install, but are not covered here. Please send me any problems or concerns or corrections to my e-mail [satyshur@wisc.edu](mailto:satyshur@wisc.edu) and I will incorporate them.

Problem: 3D hardware 'stereo in a window' (SIW) does not work in the Gnome desktop, only ‘stereo in the desktop’ (SID).

Solution: 3D Nvidia hardware SIW DOES work in the Mate desktop with 'composite-disable' in xorg.conf. But only in the Centos7 system (Linux 3.10) and not Centos8 (Or RHEL8, Linux 4.5). Why? The gaming industry is turning to virtual reality (VR)and augmented reality (AR) for gaming. Nvidia has also dropped support for 3D Vision, after a ten year run (2009 – 2019). Also, the Mate Desktop is no longer supported by Centos/RHEL 8, only Gnome, which does SID. So when you switch to 3D stereo in Gnome, the whole desktop and not just the one window goes into stereo, and switching windows causes the system to freeze, which necessitates a reboot.

Here are some steps I took to get Nvidia 3D vision working in the Centos 7 system.

1. OS system drivers for Nvidia.

First you need to remove the nouveau driver from the OS.

You can find some info here:

For RedHat customers:

<https://access.redhat.com/solutions/1155663> ( you must be a user).

For Centos7

<https://www.advancedclustering.com/act_kb/installing-nvidia-drivers-rhel-centos-7/>

or many other sites. This involves blacklisting the nouveau driver, and adding this to the “GRUB\_CMDLINE\_LINUX”

mv /boot/initramfs-$(uname -r).img /boot/initramfs-$(uname -r)-nouveau.img  
dracut /boot/initramfs-$(uname -r).img $(uname -r)

Have the sysop do this if you are unfamiliar with generating a new kernel.

2. Must deactivate the composite disable extension. This is in the file /etc/X11/xorg.conf

#Section "Extensions"

# Option "Composite" "Disable"

#EndSection

This may not be in your xorg.conf file if you were installing centos7 fresh.

This option will mess up the Gnome desktop and display manager and lead to no login screen.

3. yum update

Do this and install all the updates from 7.6 to 7.7. Make sure 'epel' is in the yum repository so that Extended Packages for Enterprise Level will be installed. That is where MATE comes from. Here is an example of /etc/yum.repos.d/

adobe-linux-x86\_64.repo google-chrome.repo rpmfusion-free-updates-testing.repo

epel.repo redhat.repo rpmfusion-nonfree-updates.repo

epel-testing.repo rpmfusion-free-updates.repo rpmfusion-nonfree-updates-testing.repo

any file with 'repo' on the end will be searched for updates. To deactivate that repo, add the extension .save on the end of the file. If you just change the name and not the extension, it is still read as a repo.

The Mate desktop is found in the epel (extended packages for enterprise linux). Do a Mate installation.

sudo um install mate

Google ‘how ti install mate desktop centos7’ and you will get several hits.

https://blog.khmersite.net/2018/06/install-mate-desktop-on-centos-7/

4. Once the xorg.conf has composite disable removed, all users are Gnome, and updates are done. It is time to reboot. However, the 'default.target' has to be set in the directory

/etc/systemd/system

first cd to this directory and list the default target:

cd /etc/systemd/system

ls -ltr

lrwxrwxrwx. 1 root root 40 Jul 17 16:05 default.target -> /usr/lib/systemd/system/graphical.target

That means that the reboot will go to graphical display manager when booted. If this display manager is busted, you will get a busted screen, either no screen or an awesome error message 'oops. something went wrong'. To prevent this loss of control, change the default target to 'multi-user' which will default to a terminal and you can login as root and fix things.

(Note that even if there is no graphical screen for login, you can still log into the computer with another computer (Mac or linux) using ssh

i.e ssh -X -l root mycomputer.wisc.edu)

[root@dingo system]# systemctl get-default

graphical.target

[root@dingo system]# systemctl set-default multi-user.target

Removed symlink /etc/systemd/system/default.target.

Created symlink from /etc/systemd/system/default.target to /usr/lib/systemd/system/multi-user.target.

[root@dingo system]# systemctl get-default

multi-user.target

5: While in multi-user mode, run the nvidia installer for your nvidia graphics card. example:

/home/satyshur/nvidia/NVIDIA-Linux-x86\_64-340.108.run

for legacy FX4800 Quadro graphics cards. Find the nvidia drivers here:

<https://www.nvidia.com/Download/index.aspx?lang=en-us>

When done, the terminal comes up again and issue the init command for graphical: init 5

This will give the splash screen login, hopefully the Gnome display screen.

6. If you have the MATE desktop installed, this uses the 'Lightdm' display manager to give the login screen.

display-manager.service -> /usr/lib/systemd/system/lightdm.service

This is also set in the /etc/systemd/system directory

Change it back to the Gnome display manager gdm

[root@dingo system]# systemctl disable lightdm.service

Removed symlink /etc/systemd/system/display-manager.service.

[root@dingo system]# systemctl enable gdm

Created symlink from /etc/systemd/system/display-manager.service to /usr/lib/systemd/system/gdm.service.

[root@dingo system]# ls -ltr display-manager.service

lrwxrwxrwx. 1 root root 35 Aug 21 11:02 display-manager.service -> /usr/lib/systemd/system/gdm.service

[root@dingo system]# pwd

/etc/systemd/system

You are now ready to reboot.

7. Reboot. You should get the terminal on the screen. Login as root and use init command to get graphics.

init 5

You should see the gnome login screen.

Select GNOME as desktop, and login as a user. This should give the Gnome desktop and not the MATE desktop. Gnome 3D stereo should work as hardware stereo option, but it will switch every desktop and graphical display to stereo, or not be recognized as stereo in other programs. Multiple pymols can be run in different desktops and the stereo is already on for pymol so they will be independent stereo view. However, coot and other legacy 3D stereo programs will not go into hardware stereo. Under the Mate desktop, all will go into stereo.

8. Make sure all users are not selecting the MATE desktop on the gdm splash screen. Do this selecting the desktop options and picking a Gnome desktop type and not Mate. If you don't have a selection list in gdm, then your desktop is only Gnome. That means that MATE was never installed. Do this later

after the updates from RH are done. Then you can get stereo in a window and not just stereo in a desktop as feed to you from the Gnome desktop.

9. We need to switch back to lightdm, Mate desktop, and composite-disable in xorg.conf.

First logout of the Gnome desktop and get the GDM login screen. Then select MATE as Desktop and log back in. You should see mate desktop.

[root@dingo Desktop]# systemctl disable gdm

Removed symlink /etc/systemd/system/display-manager.service.

[root@dingo Desktop]# systemctl enable lightdm.service

Created symlink from /etc/systemd/system/display-manager.service to /usr/lib/systemd/system/lightdm.service.

10. now you must reboot. This will initiate the lightdm login screen. (All users have been switched to MATE desktop. If not then go back to gdm and switch them.)

You should now see the lightdm login and not the Gnome login screen. The lightdm does not allow you to select Gnome of MATE as a desktop, only gdm. However, stereo will not work still because we need to add 'composite-disable' to the xorg.conf file.

[root@dingo Desktop]# cd /etc/X11

[root@dingo X11]# ls -ltr

total 36

-rw-r--r--. 1 root root 493 Aug 25 2017 Xresources

-rw-r--r--. 1 root root 547 Aug 25 2017 Xmodmap

drwxr-xr-x. 2 root root 6 Dec 14 2017 applnk

-rw-r--r--. 1 root root 1543 Sep 3 2018 xorg.conf.nvidia

drwxr-xr-x. 2 root root 26 Sep 19 2018 mwm

-rw-r--r--. 1 root root 1500 Sep 19 2018 xorg.conf.save5

drwxr-xr-x. 5 root root 142 Feb 7 2019 xinit

-rw-r--r--. 1 root root 1617 Mar 15 11:00 xorg.conf.composite-disable

drwxr-xr-x. 2 root root 30 Jul 15 07:11 xorg.conf.d

-rw-r--r--. 1 root root 1617 Aug 21 10:26 xorg.conf.21Aug2019

-rw-r--r--. 1 root root 1542 Aug 21 10:27 xorg.conf.no-compositedisable

drwxr-xr-x. 2 root root 243 Aug 21 10:48 fontpath.d

-rw-r--r--. 1 root root 1543 Aug 21 11:29 xorg.conf.backup

-rw-r--r--. 1 root root 1543 Aug 21 11:29 xorg.conf

[root@dingo X11]# cp xorg.conf.composite-disable xorg.conf

cp: overwrite \xorg.conf\? y

Now logout to stop X11 and log back in. Now ALL stereo capable programs will run stereo in a window.

Test that run in 3D stereo on mate desktop and composite-disable in xorg.conf

pymol, coot, sybyl, Chimera

Maybe in the future, someone will give us back our 'stereo in a window' with the Gnome desktop.

11. Problem you may encounter:

My screen is blank after I reboot and I cannot login from the screen.

You may have ‘composite disable’ in your xorg.conf file. The GDM will not display any login screen if this is present. Also, your systemctl default is graphical and not multiuser. If multiuser, it the computer will boot into the terminal mode an you can login as root and fix this. If there is no login screen you can still login remotely using ssh and fix the systemctl set-default multi-user.

I don’t get a desktop for my login as Mate, only the upper and lower bar with commands.

You need to set up the desktop with Gnome for the FIRST login. Then logout and pick Mate desktop and you will see the mate desktop with icons on it for the second login.

I have Mate installed and login works but I don’t get 3D hardware stereo when in pymol.

Check the emitter box. It glows bright green when there is a stereo signal being sent to the glasses. It will be light green when the nvidia driver is installed correctly. If red, driver is not installed. Pymol will turn the emitter bright green as soon as pymol runs. You may have forgotten to add the ‘composite disable’ to the xorg.conf file. Add it and logout to invoke a new X11 with a new login.

I run the Nvidia driver install for my video card but it says I still have nouveau installed.

Make sure it is blacklisted and a new dracut is run to get the new kernel. You may have to yum remove nouveau to clean it out.

Does Mate desktop work in Centos8? No. but you can recompile it with instructions here from Tyler’s Guides..

<https://tylersguides.com/guides/install-mate-on-centos-8/>

but good luck.

Kas