ATI R200 + XFree86 4.x mini−HOWTO

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Alternative 2 updated, minor errors corrected.		
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Aternative 2 no longer deprecated. Several updates to this alternative.		
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Initial release		

This HOWTO is for anyone who owns an ATI Radeon 8xxx graphics card and wants it to function in a certain way or, in general, properly with XFree86, the X Window System. It describes the procedure of making XFree 4.x run on an ATI R200 (Radeon 8xxx series). There are several ways of doing this, with various results (further described below). If you know of any other ways (maybe better as well) of achieving the goal of this document, please let me know.

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Chapter 1. Copyright & License

Chapter 2. System Requirements

For this HOWTO to apply to you, you'll need the following hardware/software up and running:

Hardware

- ATI R200 (Radeon 8xxx) based AGP card

Software

- Linux kernel 2.4.x (check with **`uname -r`**)
- Glibc 2.2 (check with **`/lib/libc.so.X`** where X is a decimal number)
- XFree86 4.2.x for alternative 1 (check with **`X -version`**)
- XFree86 4.1.x for alternatives 2, 3 and 5 (check with **`X -version`**)
- XFree86 4.x for alternative 4 (check with **`X -version`**)

If you run XFree86 4.1.x/4.0.x on your computer, you can NOT use alternative 1, as shown above. Of course you can try it, but it won't work (or at least it didn't for me). Also, if you read The XFree86 Project's release notes for XFree 4.1.x, you'll see that the R200 chipset is not listed as a supported chipset for the `radeon_drv.o` driver, which means that the Radeon 8xxx is NOT supported. However, if you read the release notes for XFree 4.2.x, you'll see that the chipset IS supported by the same driver.

Once you have met the system requirements, it's time to decide which of the available alternatives to choose.

Chapter 3. The alternatives

As you could see in Chapter 2, the alternatives you can choose may be limited by the XFree86 version you are running. It is very important that you check the dependencies first. If you don't meet the requirements, this HOWTO will not apply to you, and you may and probably will suffer a system crash if proceeding.

The various alternatives of this HOWTO will give variable results. I haven't tested every possible use of the card, but I have had a few experiences, and the drivers also provide some information.

3.1. Experiences with XFree86's driver

This alternative is by far the simplest and safest way to set up your Radeon if you use XFree86. The bad news is that this driver only supports 2D (meaning DRI won't work).

3.2. Experiences with ATI's own driver

This alternative uses ATIs own drivers for the Linux operating system. The drivers are developed by 3rd party Linux developers for ATI. The driver supports some 3D acceleration, and works almost "out of the box".

3.3. Experiences with DRI's driver

This alternative seemed like a good idea after running tired on the DRI problems with both previous driver alternatives. DRI is the 3D part of XFree86, and is an independent project, releasing it's own drivers. XFree86 has DRI implemented, but the drivers aren't the same. In fact, DRI has developed their own driver specifically for the R200 chipset, meaning it is a driver that supports 3D and works fine with X. Still, the driver supports hardly any of the later GL extensions, meaning more recent games like UT2003 won't run with it.

3.4. Experiences with the GATOS project's driver

This alternative is a 3rd party alternative, meaning it can result in a much more unstable (and possibly damaged) system. I found this alternative to work rather well. The 3D support was equivalent with that of DRI (at least when I tried it), meaning this and the DRI alternative are almost equivalent.

3.5. Thoughts on Schneider Digital's driver

This alternative is another 3rd party alternative, but this one's rather good. Schneider Digital provides drivers for various cards, among them ATI R200/R300. The drivers are made for XFree 4.1+, and seem rather well developed. Note though that I haven't yet tried these drivers myself, but I still thinkt they look like a very decent alternative.

3.6. Still Haven't Chosen One?

I'd recommend you to use the DRI driver. I've had great experiences with this driver, although its GL support is somewhat narrow. If a more worthy 3D system is what you want, I'd recommend you to make the upgrades necesseary and go for Schneider Digitals driver or XFree86's own driver, but please give me some feedback if you do.

Now that you've been given the information you need to choose a driver, choose one and move on!

Chapter 4. Step−by−step instructions

4.1. Alternative 1: Using XFree86's Radeon driver

This alternative requires XFree 4.2 or later, and the installation or upgrade to this version is beyond the scope of this HOWTO (visit The XFree86 Project for further information on how to upgrade or install XFree86). When XFree is installed and/or upgraded to the correct version, all you need to do is configure it. There are two ways of doing this that apply to all Linux distributions. You can either run **xf86onfig**, which is XFree86's own text−based configuration tool, or you can edit the configuration file by hand. Keep in mind that this HOWTO only describes how to configure the Radeon card, and XFree86 needs a lot more configuration than that to work.

If you choose to run **xf86config**, you will sooner or later come to the question, "Do you want to look at the card database? (y/n)". Answer **`y`** (yes), and press **`ENTER`**. Choose one of the cards that use the `ati` driver by keying in the number to its left and then pressing **`ENTER`**. Which card you choose does not matter, as long as you choose a card that runs the `ati` driver. You will then be asked to give an identifier string for your card. You can type anything you want, but I recommend you type something descriptive, such as "Radeon card". Finish the configuration process.

If you want to edit the configuration file manually, locate it (usually `/etc/X11/XF86Config`), and open it in your favorite editor. Find the place that says `Section "Device"`. In this section, there should be a line saying `Driver "somedrivername"`. Edit this line so it says `Driver "ati"`. Comment out all other lines in the Device section (add a # in front of them). Your device section should now look like this:

```
Section "Driver"
Identifier "some_identifier" (the identifier is your choice, but if you edit it,
make sure you update  every reference to it in the config file).
Driver "ati"

# ...
# ...
```

You are now ready to run!

Configure the rest of XFree86, and you're ready to run!

4.2. Alternative 2: Using ATI's own R200 Driver

ATI's R200 driver comes in three distributions − one for XFree4.1, one for XFree4.2 and one for XFree4.3. You can download ATIs driver from here. Sadly, for those of us who do not use a RedHat−based or other RPM−supporting distribution, the package is only available in RPM format. For those of us who do not have RPM support, `alien` is the program to use. Alien converts between various package formats. To convert the ATI driver package to a `.deb` package, use **alien −−to−deb packagename.rpm**. To convert it to a `.tgz` package, use **alien −−to−tgz packagename.rpm**.

You are now ready to install the driver. To install it, use:

- **rpm −i −−force /path/to/packagename.rpm**, if you are installing the rpm package
- **dpkg −i −−force−overwrite /path/to/packagename.deb**, if you made a .deb package
- **cd / && tar zxvf /path/to/packagename.tgz**, if you made a .tgz package.

You are now ready to configure the driver. To install it, issue the following commands as root:

```
cd /lib/modules/fglr200/build_mod/
./make.sh
cd /lib/modules/fglr200/
./make_install.sh
```

The driver is now ready for use.

The driver will not load unless you tell your Linux system to load it every time at startup. To do this, you must find out where to tell your Linux which modules to load at startup. In Debian, you must add the followng line to `/etc/modules`:

```
fglr200
```

Add the line to the end of the file. You are now ready to configure XFree86.

XFree86 can be configured in two ways: either by running **fglrxconfig** (supplied by the ATI driver), or by editing the `XF86Config` file manually.

If you choose to run **fglrxconfig**, the process is similar to a regular **xf86config** run, except for the choice of which screen card driver to use (which will automatically be set to the ATI Radeon driver).

If you want to edit the configuration file manually, locate it (usually `/etc/X11/XF86Config`), and open it in your favorite editor. Find the place saying `Section "Device"`. In this section, there should be a line saying `Driver "somedrivername"`. Edit this line so it says `Driver "fglr200"` and add the following lines right below that line:

```
Option "no_accel" "no"
Option "no_dri" "no"
Option "overlay" "off"
```

Comment out all other lines in the Device section (add a # in front of them). Your device section should now look like this:

```
Section "Driver"
Identifier "some_identifier" (the identifier is your choice, but if you edit it,
make sure you update every reference to it in the config file).
Driver "fglr200"
Option "no_accel" "no"
Option "no_dri" "no"
Option "overlay" "no"

# ...
# ...
```

You are now ready to run!

4.3. Alternative 3: Using DRI's Latest Radeon Driver

The first thing you must do is to download the driver. You can download it from here (make sure you download the `r200−XXXXXXXX−i386.tar.bz2` package). After you have downloaded the driver, go to the directory you saved it in and type **tar jxvf packagename.tar.bz2**. Go to the new directory, (**cd dripkg/**), and type **./install.sh**. This will install the driver for you. You are now ready to configure XFree86, either by running **xf86config** or by editing the config file manually. The configuration process is exactly the same as in Section 4.1, so just follow the configuration steps there.

You are now ready to run XFree86!

4.4. Alternative 4: Using the GATOS Project's Latest Driver

The GATOS project is an independent developer team. They develop drivers and utilities for ATI cards. To install their driver with DRI−support, you need to download it from here. Download the `ati.2` file for your appropriate XFree86 version. You also need a set of files to enable dri support. These files are called the drm−kernel module. They can only be downloaded from CVS. To download them, issue the following commands:

```
cvs −d:pserver:anonymous@cvs.gatos.sourceforge.net:/cvsroot/gatos login
cvs −z3 −d:pserver:anonymous@cvs.gatos.sourceforge.net:/cvsroot/gatos co drm−kernel
```

You are now ready to install the driver. Type the following commands to install it:

```
cd drm−kernel/
make −f Makefile.linux
cp radeon.o /lib/modules/`uname −r`/kernel/drivers/video/gatosdrm.o
modprobe gatosdrm
```

You now need to make Linux load the module gatosdrm each time at startup. To do this, find out where your Linux distribution keeps the list of modules to load at startup and add the line `gatosdrm` to the end of that file (in Debian, the file is `/etc/modules`).

You are now ready to install the GATOS driver for the Radeon card. To do so, type the following commands:

```
cd /usr
tar zxvf /path/to/name−of−ati.2−package.tar.gz
```

The driver is now installed.

You are now ready to configure XFree86. This can be done by running **xf86config**, or by editing the XFree86 configuration file manually. The configuration process is the same as for XFree86's own driver in Section 4.1, so go back to that point and follow the XFree86 configuration process described there.

You are now ready to run XFree86!

4.5. Alternative 5: Using Schneider Digital's drivers

Schneider Digital's driver is the one driver I haven't tried myself, but it seems like a serious attempt on making a decent ATI Radeon driver for Linux. Well, enough chatting, let's get down to business.

First, download the driver file for either XFree86 4.1.x, XFree86 4.2.x or XFree86 4.3.x..

The installation instructions for this driver are exactly the same as for Section 4.2, so follow those.

Congratulations, you are now up and running! Please let me know about your experiences with this driver, as I didn't try it myself.

Chapter 5. Links

- http://mirror.ati.com/support/drivers/linux/radeon−linux.html − ATIs R200 driver for XFree86 4.1.x/4.2.x
- http://gatos.sf.net/ − The GATOS Projects homepage − ATI drivers and utilities
- http://gatos.sourceforge.net/project/showfiles.php?group_id=12629 − The download section of the GATOS project's website.
- http://dri.sf.net/ − The DRI Project, the Direct Rendering Infrastructure for XFree86. 3D Support, drivers and documentation.
- http://dri.sourceforge.net/download.phtml − The download section of the DRI's website.
- http://www.cloudchaser.net/projects/ati−howto/ − The homepage of the HOWTO
- http://www.schneider−digital.de/Schneider Digital's website

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