Linux WiNRADiO (Linradio) Source Code Upgrade Plan and Requests
From Yuri Muzyka and Vladimir (Walter) Gorkavenko
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WR-G315 driver, api and demo source code (wrg315-1.0.3.tar.gz)

The source code to be modified for inclusion of wxWidgets version 2.8 through to 3.x as Fedora 21 only supports version 2.8 and above. The Linux kernel version is now 3.x.x on Fedora 21 and some changes to the source code is needed there also. Fedora 22 (Alpha) is reporting that its Linux Kernel version is now 4.0.

QUESTION 1: Can you please change "ioctl" to "unlocked_ioctl" in wrg315-1.0.3/driver/wrg315.c ?

In newer Linux Kernel versions "ioctl" has changed to "compat_ioctl" and finally to "unlocked_ioctl"

From the "stackoverflow" Internet forum...

> In the fops structure change
>
> `ioctl` to `unlocked_ioctl`
>
> and in the ioctl function in your driver, do not pass the `inode` pointer. That is all, the rest of the code can remain the same.

See...
http://stackoverflow.com/questions/21218125/error-unknown-field-compat-ioctl-specified-in-initializer-while-creating

Implementing an ioctl call (for kernel versions above 2.6.39)

See...

http://tuxthink.blogspot.in/2012/12/implementing-ioctl-call-for-kernel.html

In the file wrg315-1.0.3/driver/wrg315.c I have changed...

```
static struct file_operations WRG3_File_Operations=
{
    .open=WRG3_Open,
    .release=WRG3_Release,
    .unlocked_ioctl=WRG3_Ioctl,
#ifdef CONFIG_COMPAT
    .compat_ioctl   = WRG3_Compat_Ioctl
#endif
};
```

QUESTION 2: Can you please change remove the 2x kernel_lock() and 2x kernel_unlock() functions in wrg315-1.0.3/driver/wrg315.c ?

```
...
if(!Dev->Opened)
    {
        /* lock_kernel(); */

        usb_set_intfdata(interface,NULL);

        usb_put_dev(Dev->USB.USBDevice);

        /* unlock_kernel(); */

        WRG3_UNLOCK(Dev->Ioctl_Lock);

        WRG3_DESTROY_MUTEX(Dev->Ioctl_Lock);

        kfree(Dev);
    }
    else
    {
        Dev->Connected=0;

        WRG3_UNLOCK(Dev->Ioctl_Lock);
    }
…

          else
            {
                /* lock_kernel(); */

                usb_set_intfdata(Dev->USB.USBInterface,NULL);
                usb_put_dev(Dev->USB.USBDevice);

                /* unlock_kernel(); */

                WRG3_UNLOCK(Dev->Ioctl_Lock);

                WRG3_DESTROY_MUTEX(Dev->Ioctl_Lock);

                kfree(Dev);
            }
...
```

QUESTION 3: Can you please check if the the ioctl lock and ioctl unlock functions need changing in wrg315-1.0.3/driver/wrg315.c ?

With the changes to the newer Linux kernel versions will the ioctl lock and ioctl unlock functions in this source file need correcting also?

I am wondering if with the removal of kernel_lock() and kernel_unlock() in the new Linux Kernel versions does this also mean that the ioctl lock and unlock functions have been elminated?

What changes in the source file can you make to correct for this?

This is where I have become completely stuck in progressing further in modifying this source file to a successful compile to execution testing. Maybe your development team can look at this also?

QUESTION 4: Can you please modify the structure "WRG3_Class" in wrg315-1.0.3/driver/wrg315.c ?

I followed advice from...

http://stackoverflow.com/questions/21863594/replacing-deprecated-dev-attrs-attribute-with-dev-groups

In my "hack" I have commented out one line "dev_attrs" in file wrg315-1.0.3/driver/wrg315.c and replace it with "dev_groups".

This is also in wrg315-1.0.3/driver/wrg315.c ...

```
static struct class WRG3_Class=
{
    .name=WRG3_NAME,
    .dev_release=WRG3ReleaseCD,
    /* .dev_attrs=NULL, */
    .dev_groups=NULL,
};
```

QUESTION 5: Can you please remove use of the smp_lock.h file in wrg315-1.0.3/driver/wrg315.c ?

The newer kernel versions no longer use the smp_lock.h file.

This part of the source file wrg315-1.0.3/driver/wrg315.c needs changing...

```
#if LINUX_VERSION_CODE < KERNEL_VERSION(2,6,27)
#include <asm/semaphore.h>
#else
    #include <linux/smp_lock.h>
#endif
```

The overall source works only up to kernel version 2.6.x (I think to actually 2.6.38) because it is stated in one of the weblinks that the missing include file smp_lock.h was removed from kernel version 2.6.39 and higher.

We are now in the 3.x.x versions of kernel these days with our newer Linux versions.

I did try to comment out the "#include smp_lock.h" line but there were still further other "kernel lock" and kernel unlock" compiler errors.

For Linux Kernel 3.x and the missing/omitted smp_lock.h include file please see...

```
http://comments.gmane.org/gmane.linux.alsa.user/35970

http://ubuntuforums.org/showthread.php?t=1859800

http://unix.stackexchange.com/questions/46540/fatal-error-linux-smp-lock-h-no-
such-file-or-directory

http://en.wikipedia.org/wiki/Giant_lock

https://lists.ubuntu.com/archives/ubuntu-uk/2011-August/031144.html

http://lxr.free-electrons.com/source/include/linux/smp_lock.h?v=2.6.32
```

QUESTION 6: Can you please check if digital signing is indeed required for the WRG315 compiled and installed "module"? (As the new Linux Kernels are using digital signature technology, according to a Linux Fedora 21 forum).

Have found out what the likely reason for the error in dmesg about module wrg315...

```
See...

http://stackoverflow.com/questions/24975377/kvm-module-verification-failed-
signature-and-or-required-key-missing-taintin

http://www.linuxquestions.org/questions/linux-newbie-8/module-verification-
failed-signature-and-or-required-key-missing-tainting-kernel-4175476456/
```

The second link has someone advising to have #include <linux/init.h> in the module source file. I have checked driver/wrg315.c and it already has that include in there.

The first weblink has some command lines to try to solve the digital signature signing problem for a custom kernel module.

QUESTION 7: Can you please add the extra include file in the wrg315-1.0.3/demo/src/u_receiverdialog.h source file?

To get rid of all the wxWidgets related compile errors I fixed that by simply adding an extra #include line in the wrg315-1.0.3/demo/src/u_receiverdialog.h file...

```
#include <wx/wx.h>
#include <wx/listctrl.h>
#include "wrg315api.h"
```

QUESTION 8: Can you please add "-ldl" in the wrg315-1.0.3/demo/src/Makefile ?

This relates to...

Undefined reference to symbol 'dlopen@@GLIBC_2.1'

When I got the following compile error...

```
...
/usr/bin/ld: wrg315api.o: undefined reference to symbol
'dlopen@@GLIBC_2.1'
/lib/libdl.so.2: error adding symbols: DSO missing from command line
collect2: error: ld returned 1 exit status
Makefile:12: recipe for target 'wrg315demo' failed
make[1]: *** [wrg315demo] Error 1
make[1]: Leaving directory '/root/0-LiNRADiO-For-The-
Makefile:2: recipe for target 'all' failed
make: *** [all] Error 2
```

After some further Google searching found this solution that works!...

To fix that I added a "-ldl" entry in the wrg315-1.0.3/demo/src/Makefile

```
...
wrg315demo: $(OBJS)
        $(CXX)  -o $@ $(OBJS) $(LDFLAGS) -ldl
```

QUESTION 9: Can you please modify the ProcessEvent() function call in wrg315-1.0.3/demo/src/u_freqedit.cpp for the newer wxWidgets GUI library versions?

The ProcessEvent() function call has changed in wxWidgets 2.8 and higher.

```
[root@localhost demo]# make clean
(cd src && make clean)
make[1]: Entering directory '/root/wrg315-1.0.3/demo/src'
rm -f *.o
rm -f wrg315demo
rm -f *.d
make[1]: Leaving directory '/root/wrg315-1.0.3/demo/src'
[root@localhost demo]# make
(cd src && make all)
make[1]: Entering directory '/root/wrg315-1.0.3/demo/src'
g++ -c -o u_freqedit.o -MMD -I/usr/local/lib/wx/include/
In file included from /usr/local/include/wx-3.0/wx/
        from u_freqedit.h:11,
        from u_freqedit.cpp:7:
/usr/local/include/wx-3.0/wx/
/usr/local/include/wx-3.0/wx/
    virtual bool ProcessEvent(wxEvent& event);
                 ^
u_freqedit.cpp:251:40: error: within this context
        GetParent()->ProcessEvent(

Makefile:15: recipe for target 'u_freqedit.o' failed
make[1]: *** [u_freqedit.o] Error 1
make[1]: Leaving directory '/root/wrg315-1.0.3/demo/src'
Makefile:2: recipe for target 'all' failed
make: *** [all] Error 2
```

In the file wrg315-1.0.3/demo/src/u_freqedit.cpp the following modification corrects this error...

```
...
    /* GetParent()->ProcessEvent(Event); */
        GetParent()->GetEventHandler()->ProcessEvent(Event);
```

The /* ... */ line is the original code commented out and the line below it is my version of that line. I got the suggestion from the wxWidgets official website from their changelog page. A changelog is a software author's summary notes of all the changes they have made to the latest version of that software (and can include down to the original first version). It's a handy place to look when having compile problems of other people's software.

QUESTION 10: Can you please check if you also get the same error with the module: "A problem in the kernel package has been detected" ?

I installed wrg315demo successfully with a couple of warnings but when I try to launch application I get:

```
[root@localhost ~]# cd wrg315-1.0.3
[root@localhost wrg315-1.0.3]# cd demo
[root@localhost demo]# modprobe wrg315
[root@localhost demo]# lsmod | grep wrg315
wrg315                 31094  0
[root@localhost demo]# cd src
[root@localhost src]# ./wrg315demo
Killed
[root@localhost src]#
and system message:    A problem in the kernel package has been detected.
```

Also I got...

```
[root@localhost ~]# modprobe wrg315
[root@localhost ~]#
[root@localhost ~]# dmesg | grep wrg315
[   13.305926] wrg315: module verification failed: signature and/or  required key
missing - tainting kernel
[   13.306385] usbcore: registered new interface driver wrg315
[root@localhost ~]#
```