

# Debian Squeeze Kernel Compilation

## ***Install linux-source***

```
sudo apt-get install linux-source-2.6.32
```

## ***Install required packages***

```
sudo apt-get install fakeroot bzip2 kernel-package libncurses-dev
```

## ***Install build dependencies***

```
sudo apt-get build-dep linux-source-2.6.32
```

## ***Add your username to src group***

```
sudo adduser `whoami` src
```

Logout and login back into your box to reflect your new group status

## ***Change directory to /usr/src***

```
cd /usr/src
```

## **Extract the source**

```
tar xjvf linux-source-2.6.32.tar.bz2
```

## **Create a symlink to the extracted linux source folder**

```
ln -s linux-source-2.6.32 linux
```

*cd linux*

## **Prepare for building linux kernel**

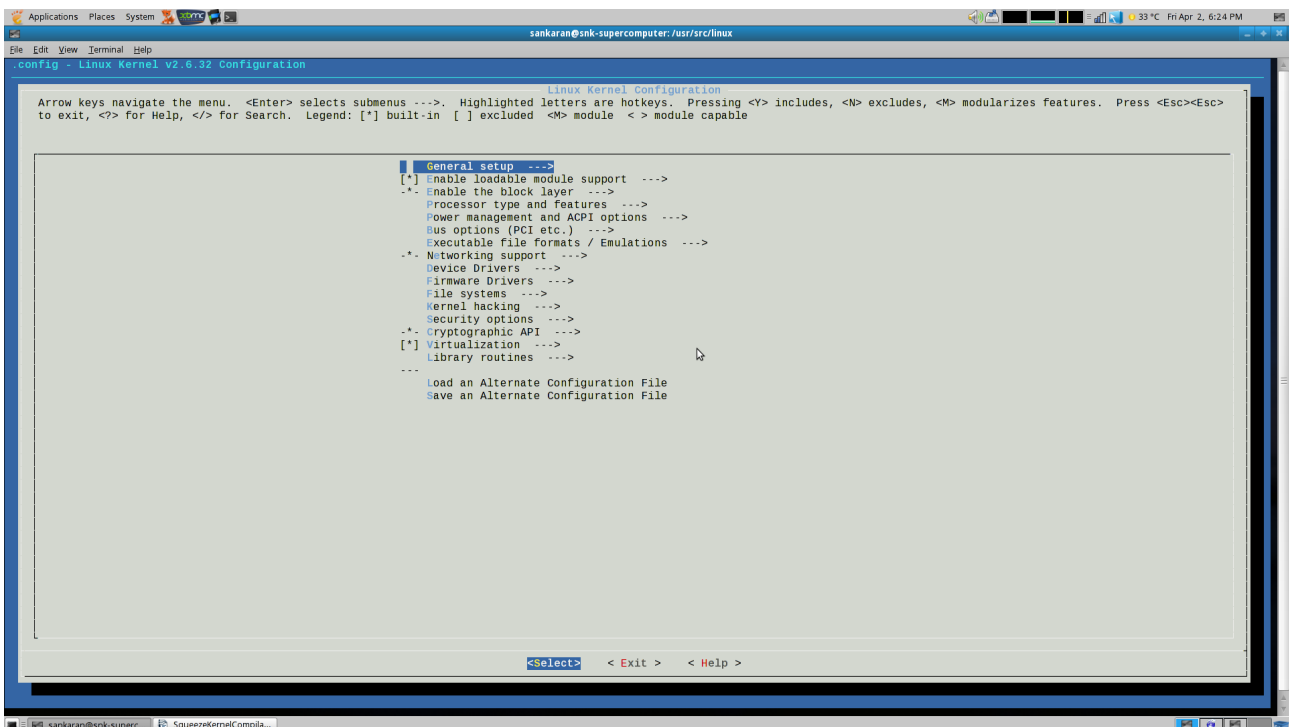
*make clean*

*make mrproper*

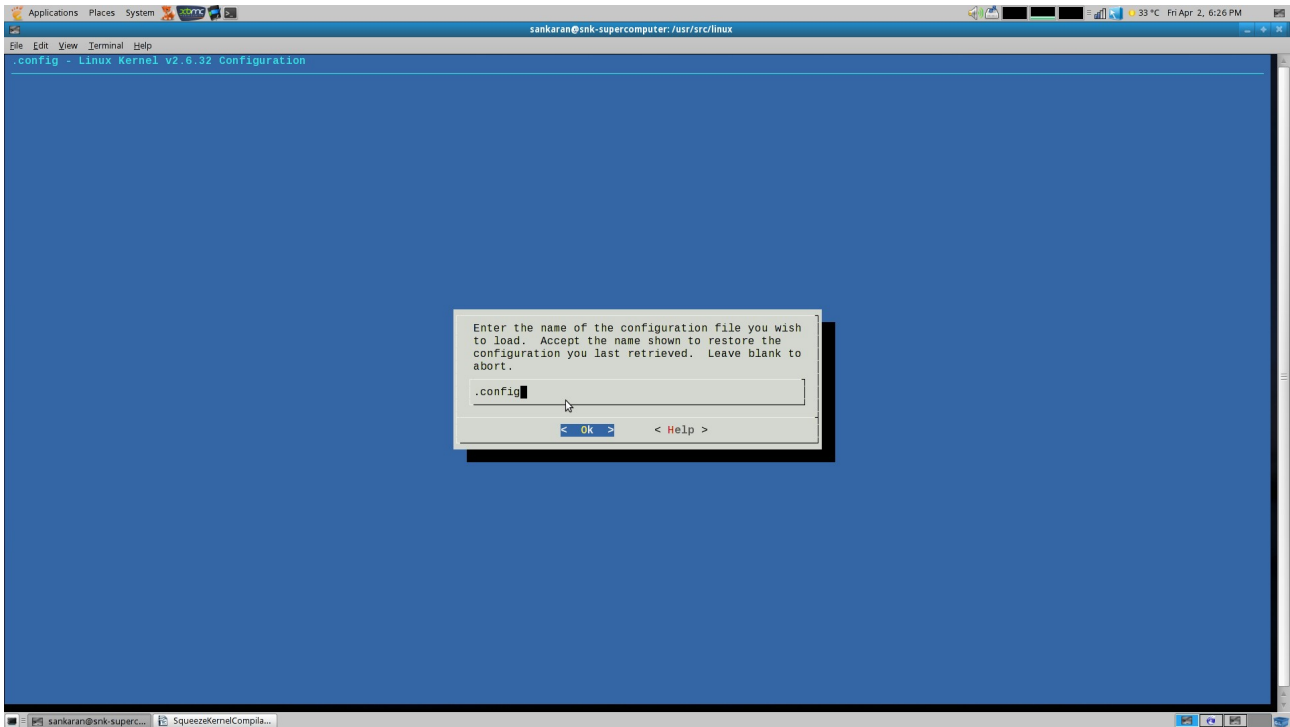
**Copy the config file from existing linux kernel installed on your system**

*cp /boot/config-`uname -r` .config*

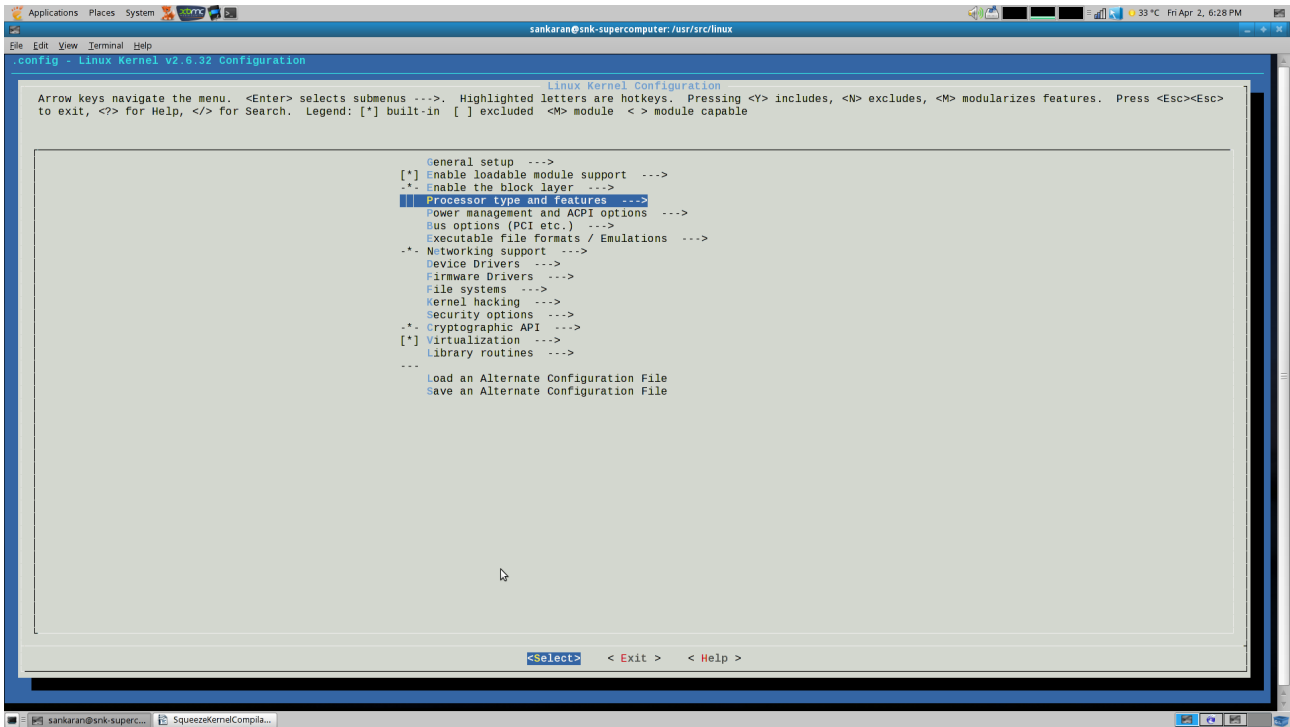
*make menuconfig*



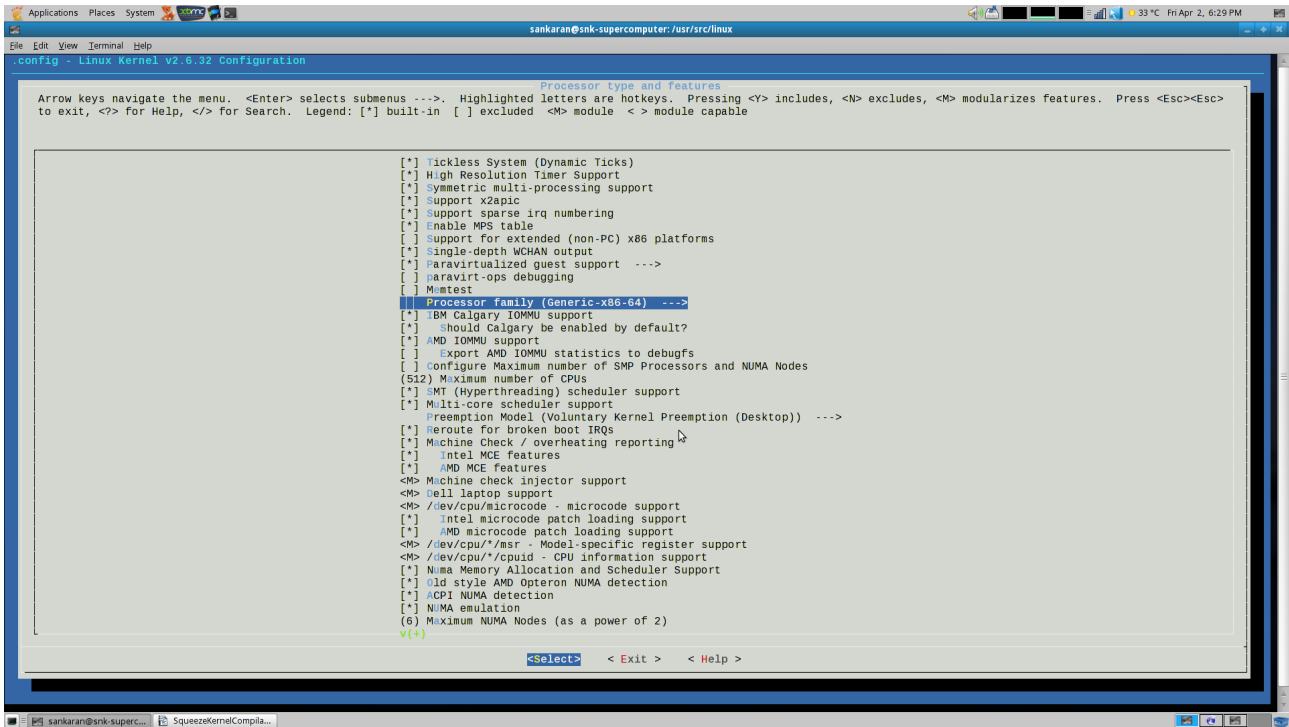
Go down to “Load an Alternate Configuration File” and load .config



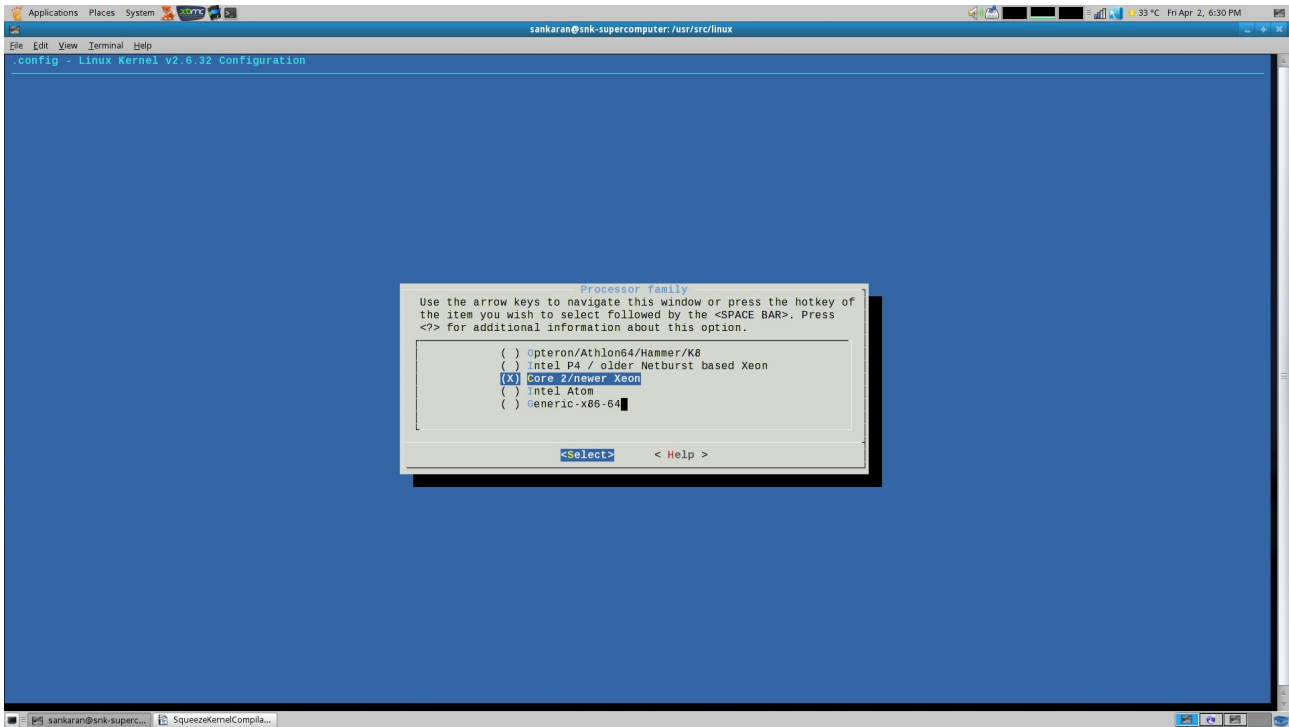
Go to “Processor type and features --->”



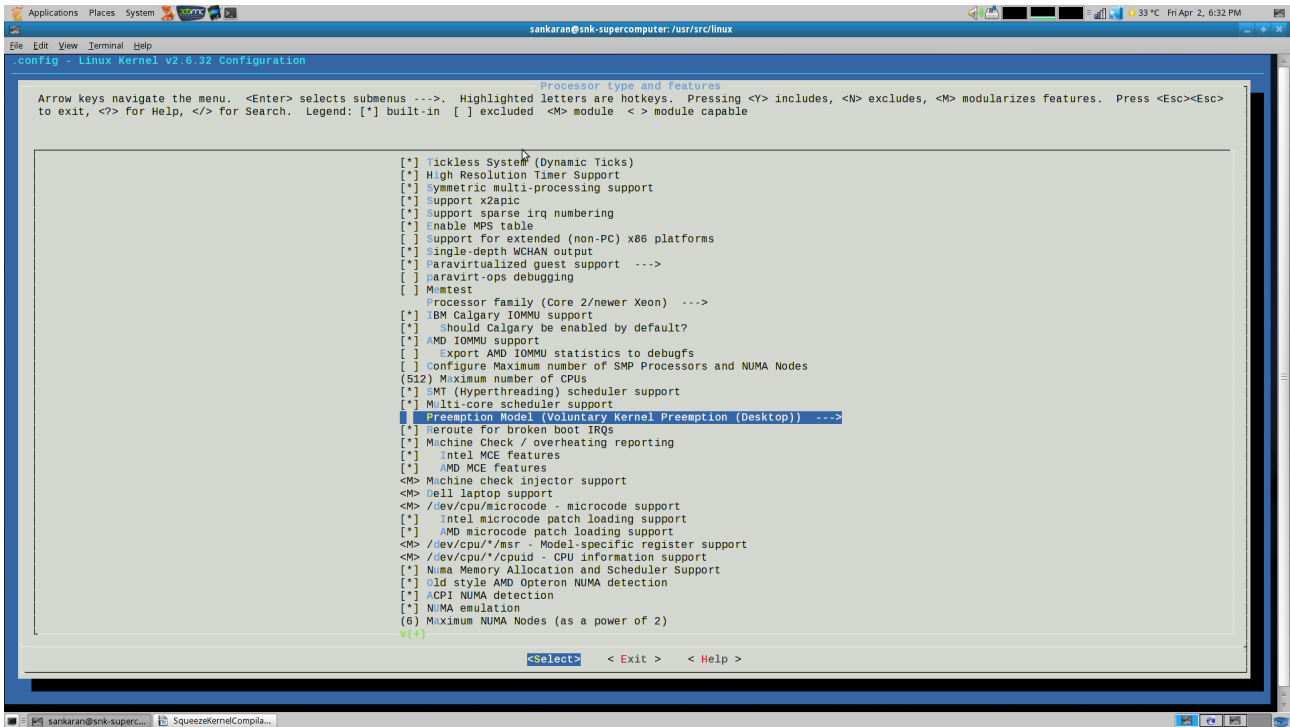
## Go into “Processor family (Generic-x86-64) --->”



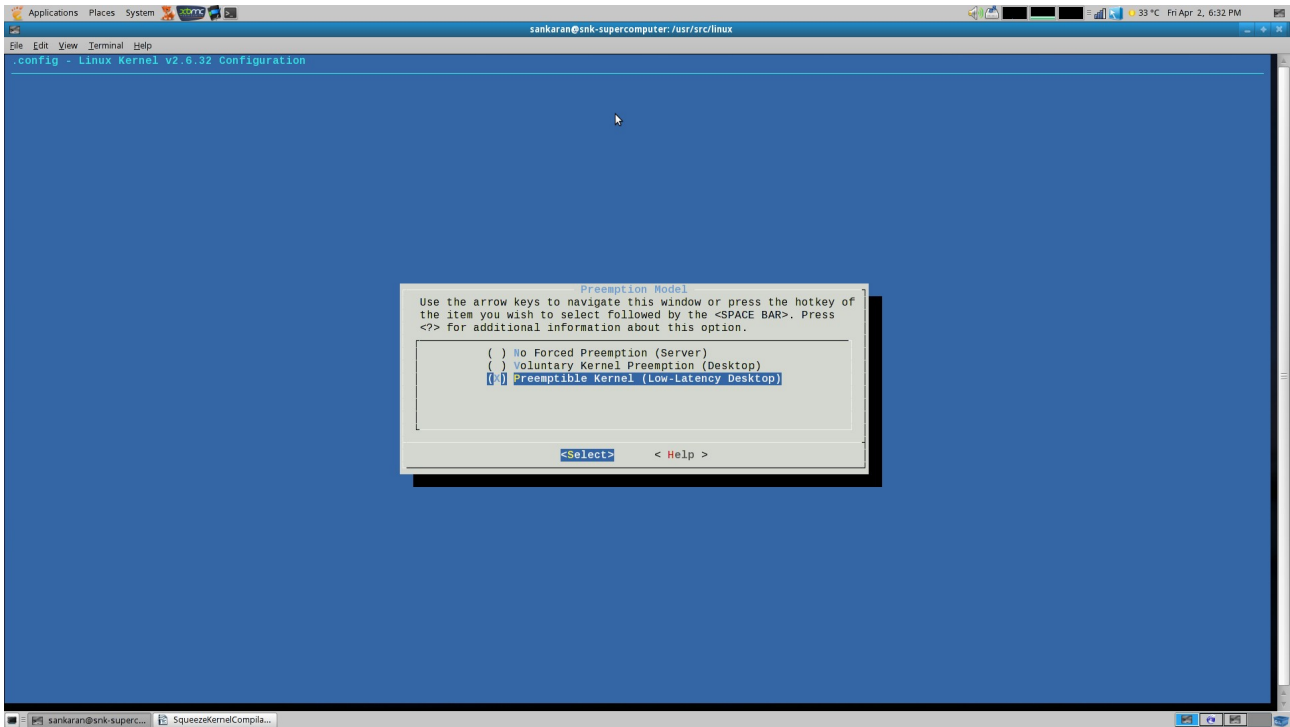
## Choose “Core 2/newer Xeon”



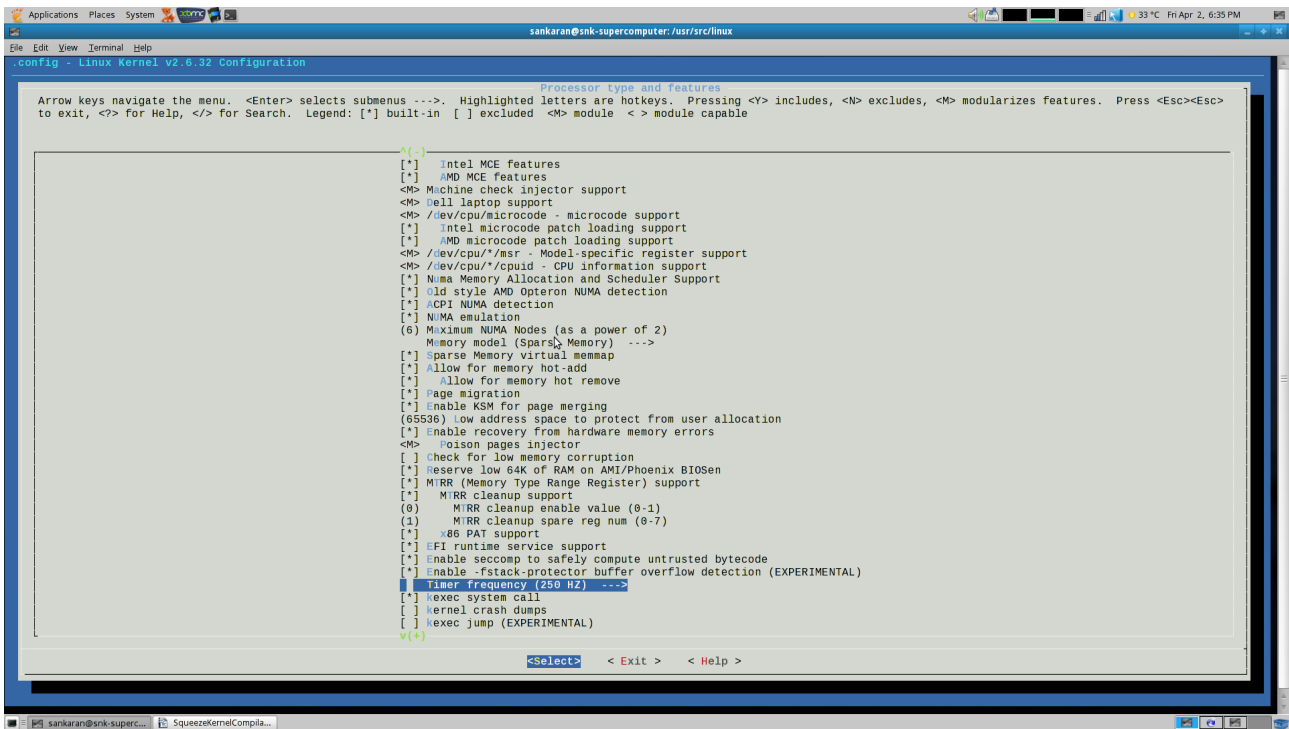
Choose “Preemption Model (Voluntary Kernel Preemption (Desktop)) --->”



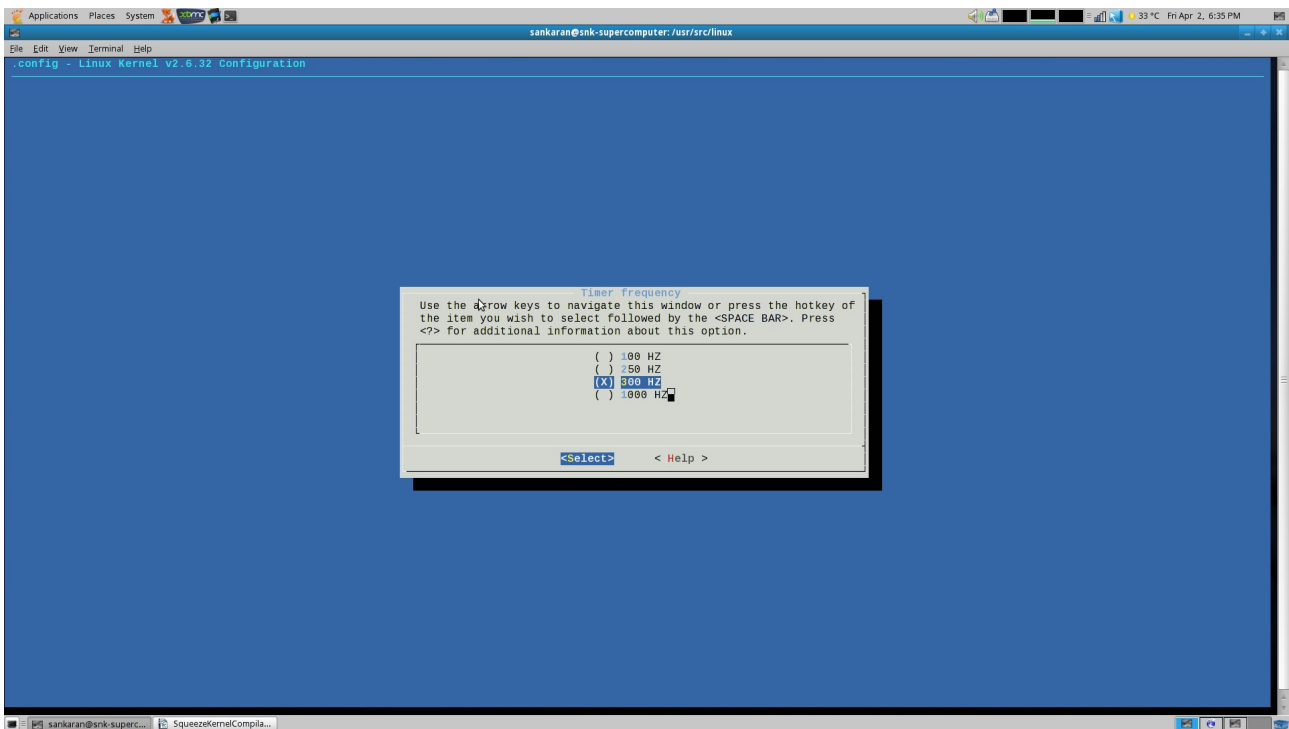
Choose “Preemptible Kernel (Low-Latency Desktop)”



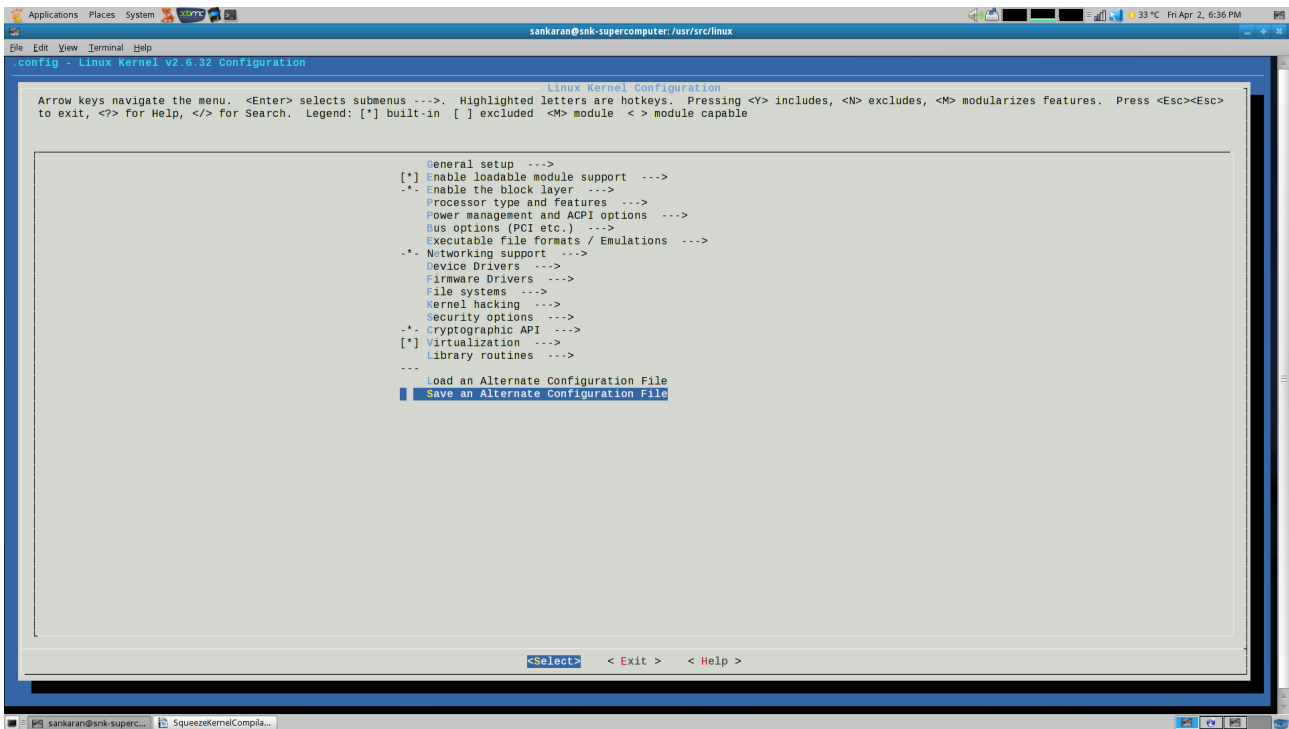
Choose “Timer frequency (250 HZ) --->”



Change frequency to “300 HZ”



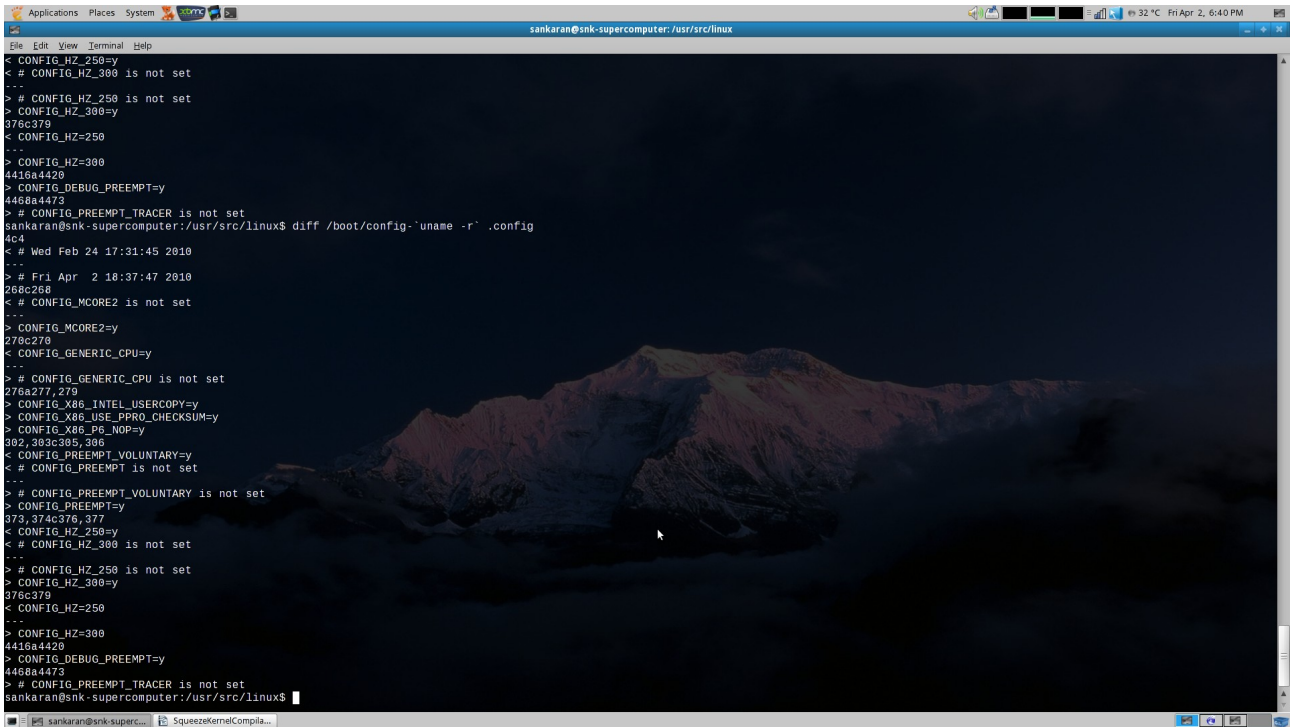
Exit out of this screen and “**Select an Alternative Configuration File**”



and press ok. Now exit out of the menuconfig

Cross verify the changes you did to .config file using diff

*diff /boot/config-`uname -r` .config*



## ***Building Kernel***

### **Compilation speedup tips**

If you have a core2duo or quad core, increase the concurrency level to 2 or 4

Here I use an i7 so I set the concurrency level to 8

***export CONCURRENCY\_LEVEL=8***

### **Clean**

***make-kpkg clean***



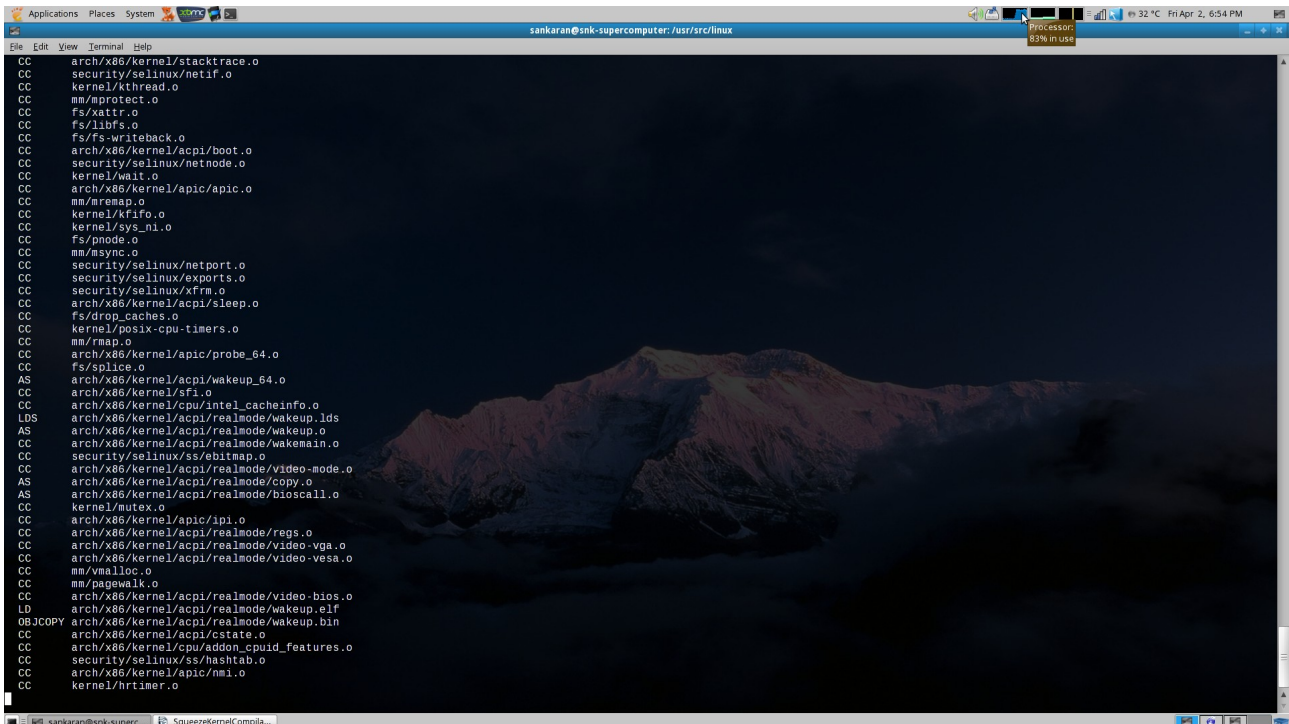
## Build the kernel

```
fakeroot make-kpkg --append-to-version "<-suffix>" --revision "<revision#>"  
--us --uc --initrd kernel_image kernel_headers
```

replace **<-suffix>** with a meaningful suffix and **<revision#>** with a meaningful revision number

here I gave

```
fakeroot make-kpkg --append-to-version "-core2" --revision "1" --us --uc  
--initrd kernel_image kernel_headers
```

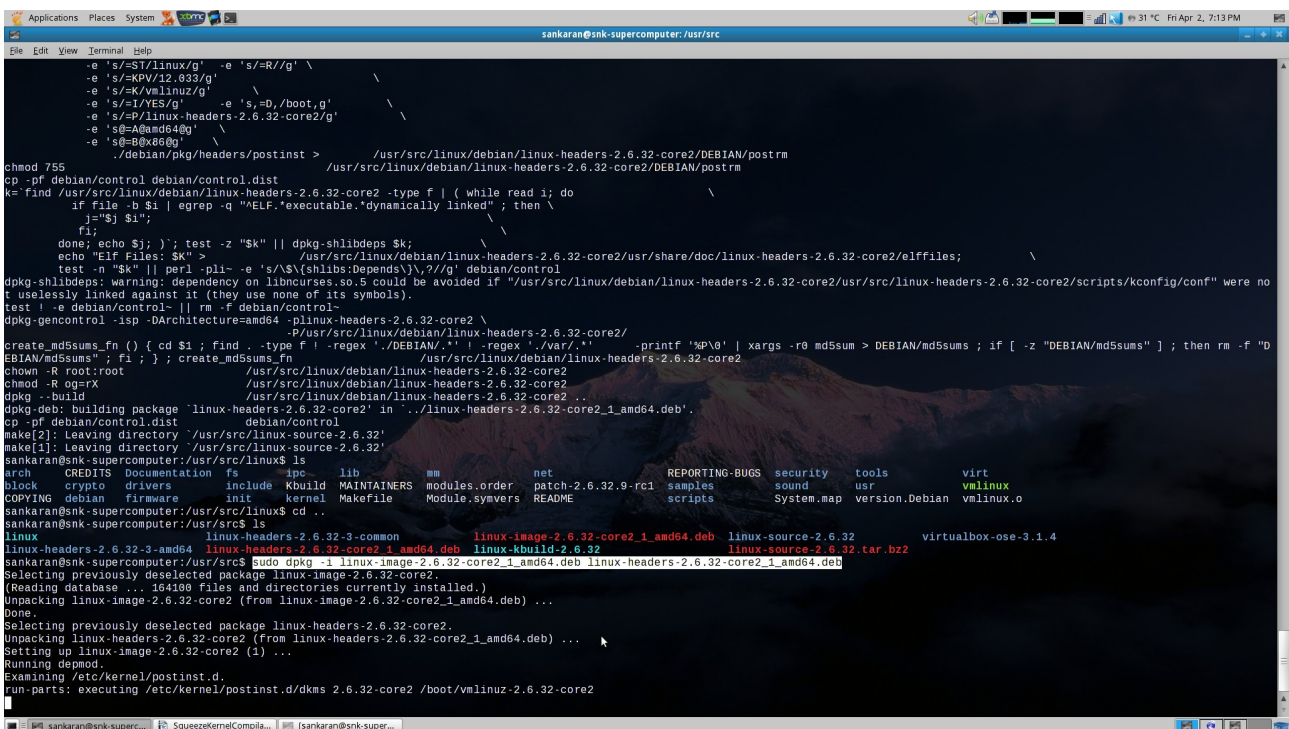


```
Applications Places System | Processor: 83% in use | 32 °C Fri Apr 2, 6:54 PM  
sankaran@snk-supercomputer: /usr/src/linux  
File Edit View Terminal Help  
CC arch/x86/kernel/stacktrace.o  
CC security/selinux/netif.o  
CC kernel/xtread.o  
CC mm/protect.o  
CC fs/xattr.o  
CC fs/libfs.o  
CC fs/fs-writeback.o  
CC arch/x86/kernel/acpi/boot.o  
CC security/selinux/netnode.o  
CC kernel/wait.o  
CC arch/x86/kernel/apic/apic.o  
CC mm/mremap.o  
CC kernel/kfifo.o  
CC kernel/sys_ni.o  
CC fs/pnode.o  
CC mm/msync.o  
CC security/selinux/netport.o  
CC security/selinux/exports.o  
CC security/selinux/xfrm.o  
CC arch/x86/kernel/acpi/sleep.o  
CC fs/drop_caches.o  
CC kernel/posix-cpu-timers.o  
CC mm/rmap.o  
CC arch/x86/kernel/apic/probe_64.o  
CC fs/splice.o  
AS arch/x86/kernel/acpi/wakeup_64.o  
CC arch/x86/kernel/sfi.o  
CC arch/x86/kernel/cpu/intel_cacheinfo.o  
LDS arch/x86/kernel/acpi/realmode/wakeup.lds  
AS arch/x86/kernel/acpi/realmode/wakeup.o  
CC arch/x86/kernel/acpi/realmode/wakemain.o  
CC security/selinux/ss/featmap.o  
CC arch/x86/kernel/acpi/realmode/video-mode.o  
AS arch/x86/kernel/acpi/realmode/copy.o  
AS arch/x86/kernel/acpi/realmode/bioscall.o  
CC kernel/mutex.o  
CC arch/x86/kernel/acpi/apic/apic.o  
CC arch/x86/kernel/acpi/realmode/regs.o  
CC arch/x86/kernel/acpi/realmode/video-vga.o  
CC arch/x86/kernel/acpi/realmode/video-vesa.o  
CC mm/vmalloc.o  
CC mm/pagewalk.o  
CC arch/x86/kernel/acpi/realmode/video-bios.o  
LD arch/x86/kernel/acpi/realmode/wakeup.elf  
OBJCOPY arch/x86/kernel/acpi/realmode/wakeup.bin  
CC arch/x86/kernel/acpi/cstate.o  
CC arch/x86/kernel/cpu/atom_cpuid_features.o  
CC security/selinux/ss/hashtab.o  
CC arch/x86/kernel/apic/nmi.o  
CC kernel/hrtimer.o
```

## Install newly built kernel packages

cd ..

**sudo dpkg -i linux-image-2.6.32-core2\_1\_amd64.deb linux-headers-2.6.32-core2\_1\_amd64.deb**

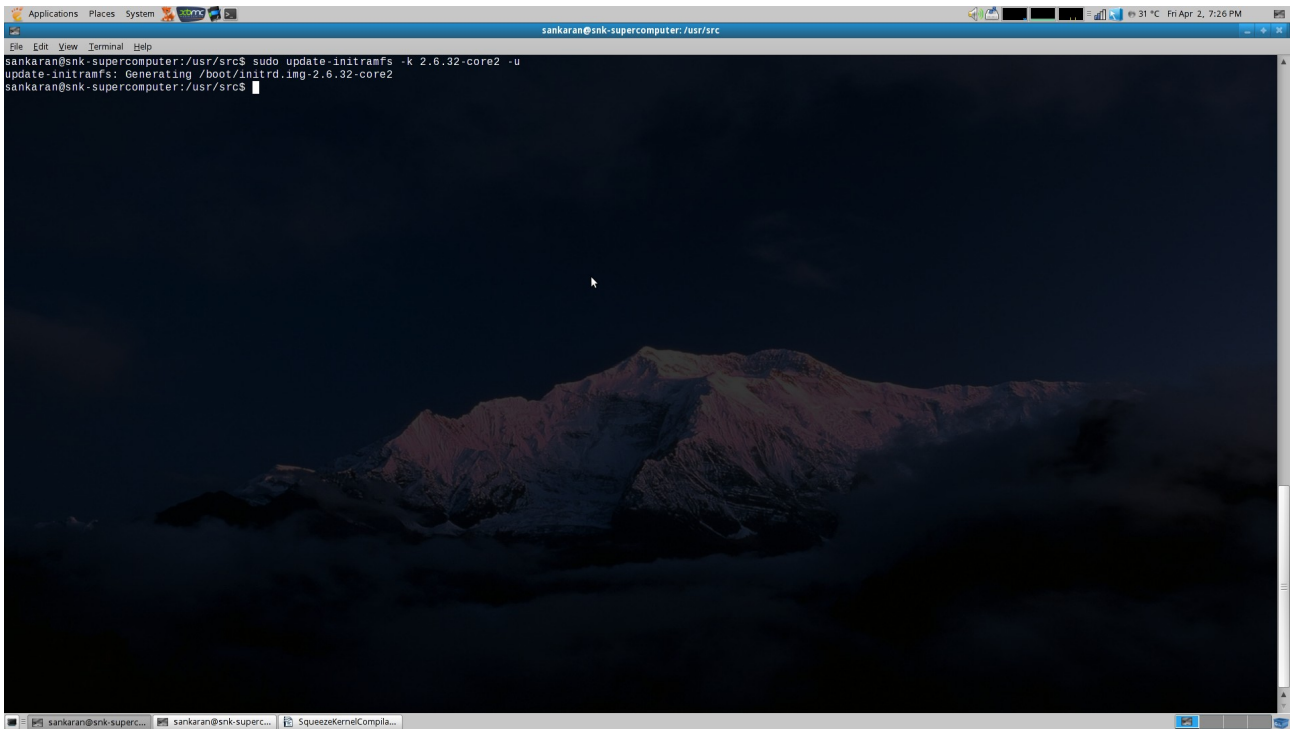


```
-e 's=/ST/linux/g' -e 's=/R/g' \
-e 's=/KPV/12.033/g' \
-e 's=/K/vmlinuz/g' \
-e 's=/I/YES/g' -e 's=D,/boot,g' \
-e 's=/P/linux-headers-2.6.32-core2/g' \
-e 's=@amd64/g' \
-e 's=@x66/g'
./debian/pkg/headers/postinst > /usr/src/linux/debian/linux-headers-2.6.32-core2/DEBIAN/postm
chmod 755 /usr/src/linux/debian/linux-headers-2.6.32-core2/DEBIAN/postm
cp -pf debian/control debian/control.dist
k= find /usr/src/linux/debian/linux-headers-2.6.32-core2 -type f | ( while read i; do
if file -b $i | egrep -q "ELF.*executable.*dynamically linked" ; then \
j="$j $i" ;
fi;
done; echo $j ; ); test -z "$k" || dpkg-shlibdeps $k;
echo "Elf files: $k" > /usr/src/linux/debian/linux-headers-2.6.32-core2/usr/share/doc/linux-headers-2.6.32-core2/elffiles;
test -n "$k" || perl -pi -e 's/^\s*(shlibs:Depends)\s*,?/ /g' debian/control
dpkg-shlibdeps: warning: dependency on libcurses.so.6 could be avoided if "/usr/src/linux/debian/linux-headers-2.6.32-core2/usr/src/linux-headers-2.6.32-core2/scripts/kconfig/conf" were no
t uselessly linked against it (they use none of its symbols).
test ! -e debian/control || rm -f debian/control
dpkg-gencontrol -isp -DArchitecture=amd64 -plinux-headers-2.6.32-core2 \
create_md5sums_fn () { cd $1; find -P /usr/src/linux/debian/linux-headers-2.6.32-core2/
EBIAN/md5sums" ; fi ; } ; create_md5sums_fn /usr/src/linux/debian/linux-headers-2.6.32-core2
chown -R root:root /usr/src/linux/debian/linux-headers-2.6.32-core2
chmod -R og=rX /usr/src/linux/debian/linux-headers-2.6.32-core2
dpkg --build /usr/src/linux/debian/linux-headers-2.6.32-core2
dpkg-deb: building package 'linux-headers-2.6.32-core2_1_amd64.deb' in ../linux-headers-2.6.32-core2_1_amd64.deb.
cp -pf debian/control.dist debian/control
make[2]: Leaving directory '/usr/src/linux-source-2.6.32'
make[1]: Leaving directory '/usr/src/linux-source-2.6.32'
sankaran@snk-supercomputer:~/src/linux$ ls
arch CREDITS Documentation fs inc lib net REPORTING-BUGS security tools virt
block crypto drivers include Kbuild MAINTAINERS modules.order patch-2.6.32.9-rc1 samples sound usr vmlinux
COPYING debian firmware init kernel Makefile Module.symvers README scripts System.map version.Debian vmlinux.o
sankaran@snk-supercomputer:~/src/linux$ cd ..
sankaran@snk-supercomputer:~/src$ ls
linux linux-headers-2.6.32-3-common linux-image-2.6.32-core2_1_amd64.deb linux-source-2.6.32 virtualbox-ose-3.1.4
linux-headers-2.6.32-3-amd64 linux-headers-2.6.32-core2_1_amd64.deb linux-kbuild-2.6.32 linux-source-2.6.32.tar.bz2
sankaran@snk-supercomputer:~/src$ sudo dpkg -i linux-image-2.6.32-core2_1_amd64.deb linux-headers-2.6.32-core2_1_amd64.deb
Selecting previously deselected package linux-image-2.6.32-core2.
(Reading database ... 16490 files and directories currently installed.)
Unpacking linux-image-2.6.32-core2 (from linux-image-2.6.32-core2_1_amd64.deb) ...
Done.
Selecting previously deselected package linux-headers-2.6.32-core2.
Unpacking linux-headers-2.6.32-core2 (from linux-headers-2.6.32-core2_1_amd64.deb) ...
Setting up linux-image-2.6.32-core2 (1) ...
Running dpkgdeb.
Examining /etc/kernel/postinst.d.
run-parts: executing /etc/kernel/postinst.d/dkms 2.6.32-core2 /boot/vmlinuz-2.6.32-core2
```

## Update initramfs before rebooting into new kernel

**sudo update-initramfs -c -k 2.6.32-core2**

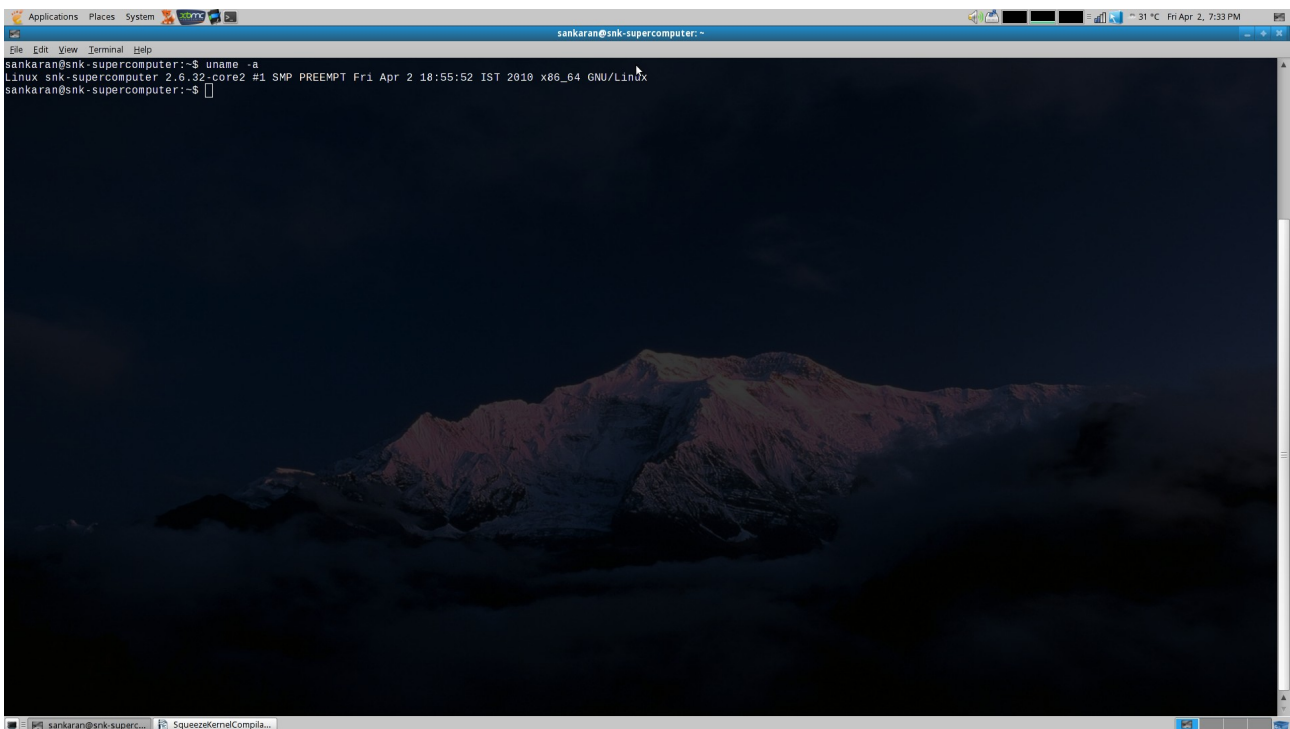
the version along with version you appended earlier (here it is core2 since I appended it earlier)



```
sankaran@snk-supercomputer:~/usr/src$ sudo update-initramfs -k 2.6.32-core2 -u
update-initramfs: Generating /boot/initrd.img-2.6.32-core2
sankaran@snk-supercomputer:~/usr/src$
```

***Check if you are running new kernel after rebooting using uname***

***uname -a***



```
sankaran@snk-supercomputer:~$ uname -a
Linux snk-supercomputer 2.6.32-core2 #1 SMP PREEMPT Fri Apr 2 18:55:52 IST 2010 x86_64 GNU/Linux
sankaran@snk-supercomputer:~$
```

***Since this kernel is compiled for core2 and with preemption, it should feel more responsive***

## **References**

<http://linuxsaga.com/guide/compiling-a-new-kernel-in-debian>

<http://technowizah.com/2005/12/debian-how-to-custom-kernel-compile.html>

<http://kernel-handbook.alioth.debian.org/ch-common-tasks.html>

<http://newbiedoc.sourceforge.net/system/kernel-pkg.html#INSTALL-KERNEL-PKG>

[http://www.howtoforge.com/kernel\\_compilation\\_debian\\_etch](http://www.howtoforge.com/kernel_compilation_debian_etch)