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1. 리눅스를 설치할 때 개발환경을 꼭 설치하도록 한다. X window용 개발환경도 포함
2. 설치 후에 CUDA 드라이버 및 toolkit, SDK를 다운로드한다.
3. 먼저 run level 3로 부팅을 하기위해 /etc/inittab 파일을 수정한다

```
root@localhost:~  
[root@localhost ~]# vi /etc/inittab
```



```
root@localhost:~  
#  
# inittab          This file describes how the INIT process should set up  
#                 the system in a certain run-level.  
#  
# Author:         Miquel van Smoorenburg, <miquels@drinkel.nl.mugnet.org>  
#                 Modified for RHS Linux by Marc Ewing and Donnie Barnes  
#  
# Default runlevel. The runlevels used by RHS are:  
#  0 - halt (Do NOT set initdefault to this)  
#  1 - Single user mode  
#  2 - Multiuser, without NFS (The same as 3, if you do not have networking)  
#  3 - Full multiuser mode  
#  4 - unused  
#  5 - X11  
#  6 - reboot (Do NOT set initdefault to this)  
#  
id:3:initdefault:  
  
# System initialization.  
si::sysinit:/etc/rc.d/rc.sysinit  
  
10:0:wait:/etc/rc.d/rc 0  
"/etc/inittab" 53L, 1666C
```



- 리부팅 후 CUDA 드라이버를 설치한다 (2.2beta)
다운로드 받은 *.run 파일들을 바로 실행할 수 있도록 "chmod 777 *.run" 명령으로 mode를 바꾸어 준다
또는 "sh cudadriver_2.2_linux_64_185.18.08-beta.run" 로 실행할 수 있다

```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
[root@localhost cuda_2.2Beta]# ls -la
합계 105296
drwxr-xr-x 2 root root    4096 6월 7 00:51 .
drwxr-xr-x 4 root root    4096 6월 7 01:19 ..
-rwxrwxrwx 1 root root 22179613 6월 7 00:48 cudadriver_2.2_linux_64_185.18.08-
beta.run
-rwxrwxrwx 1 root root 55951278 6월 7 00:51 cudasdk_2.2_linux.run
-rwxrwxrwx 1 root root 29536048 6월 7 00:51 cudatoolkit_2.2_linux_64_rhel5.3.r
un
[root@localhost cuda_2.2Beta]# ./cudadriver_2.2_linux_64_185.18.08-beta.run
```

- 아래와 같이 화면이 나온다



```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (185.18.08)

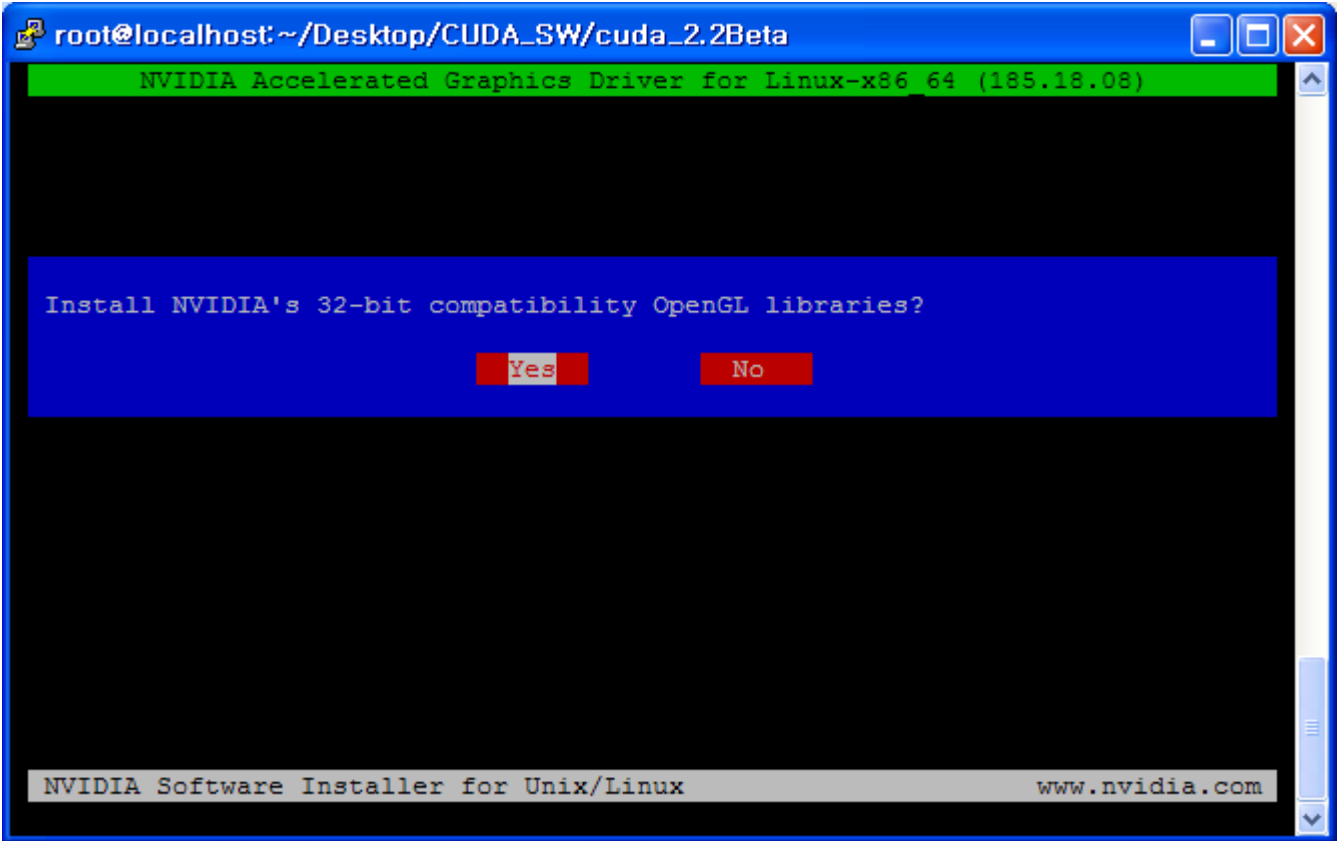
Please read the following LICENSE and then select either "Accept" to accept
the license and continue with the installation, or select "Do Not Accept" to
abort the installation.

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```





```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (185.18.08)

Installing 'NVIDIA Accelerated Graphics Driver for Linux-x86_64'
(185.18.08):

Executing: `/sbin/ldconfig` (this may take a moment...)
98%
```

NVIDIA Software Installer for Unix/Linux www.nvidia.com



```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (185.18.08)

Would you like to run the nvidia-xconfig utility to automatically update
your X configuration file so that the NVIDIA X driver will be used when you
restart X? Any pre-existing X configuration file will be backed up.

Yes No

NVIDIA Software Installer for Unix/Linux www.nvidia.com
```

```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (185.18.08)

Your X configuration file has been successfully updated. Installation of
the NVIDIA Accelerated Graphics Driver for Linux-x86_64 (version: 185.18.08)
is now complete.

OK

NVIDIA Software Installer for Unix/Linux www.nvidia.com
```



필요에 따라 run level을 5로 바꾸어준다

```
root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
#
# inittab      This file describes how the INIT process should set up
#             the system in a certain run-level.
#
# Author:     Miquel van Smoorenburg, <miquels@drinkel.nl.mugnet.org>
#             Modified for RHS Linux by Marc Ewing and Donnie Barnes
#
# Default runlevel. The runlevels used by RHS are:
#  0 - halt (Do NOT set initdefault to this)
#  1 - Single user mode
#  2 - Multiuser, without NFS (The same as 3, if you do not have networking)
#  3 - Full multiuser mode
#  4 - unused
#  5 - X11
#  6 - reboot (Do NOT set initdefault to this)
#
id:5:initdefault:

# System initialization.
si::sysinit:/etc/rc.d/rc.sysinit

l0:0:wait:/etc/rc.d/rc 0
-- INSERT --
```

CUDA toolkit 설치



```

root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
1.cpj'
`cudaprof/projects/transpose_Session2_Device_0.csv' -> `/usr/local/cuda/cudaprof/
/projects/transpose_Session2_Device_0.csv'
`cudaprof/projects/reduction.cpj' -> `/usr/local/cuda/cudaprof/projects/reductio
n.cpj'
`cudaprof/projects/reduction_kernel5_Device_0.csv' -> `/usr/local/cuda/cudaprof/
projects/reduction_kernel5_Device_0.csv'
`cudaprof/projects/eigenvalues_matrix_size_4096_Device_0.csv' -> `/usr/local/cud
a/cudaprof/projects/eigenvalues_matrix_size_4096_Device_0.csv'
`cudaprof/projects/eigenvalues_matrix_size_2048_Device_0.csv' -> `/usr/local/cud
a/cudaprof/projects/eigenvalues_matrix_size_2048_Device_0.csv'

=====

* Please make sure your PATH includes /usr/local/cuda/bin
* Please make sure your LD_LIBRARY_PATH includes /usr/local/cuda/lib
*   or add /usr/local/cuda/lib to /etc/ld.so.conf and run ldconfig as root

* Please read the release notes in /usr/local/cuda/doc/

* To uninstall CUDA, delete /usr/local/cuda
* Installation Complete

[root@localhost cuda_2.2Beta]#

```

CUDA SDK설치

```

root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
[root@localhost cuda_2.2Beta]# ls -la
합계 105296
drwxr-xr-x 2 root root    4096 6월 7 00:51 .
drwxr-xr-x 4 root root    4096 6월 7 01:19 ..
-rwxrwxrwx 1 root root 22179613 6월 7 00:48 cudadriver_2.2_linux_64_185.18.08-
beta.run
-rwxrwxrwx 1 root root 55951278 6월 7 00:51 cudasdk_2.2_linux.run
-rwxrwxrwx 1 root root 29536048 6월 7 00:51 cudatoolkit_2.2_linux_64_rhel5.3.r
un
[root@localhost cuda_2.2Beta]# ./cudasdk_2.2_linux.run

```

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System & Solution



```

root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
[root@localhost cuda_2.2Beta]# ls -la
합계 105296
drwxr-xr-x 2 root root 4096 6월 7 00:51 .
drwxr-xr-x 4 root root 4096 6월 7 01:19 ..
-rwxrwxrwx 1 root root 22179613 6월 7 00:48 cudadrivere_2.2_linux_64_185.18.08-
beta.run
-rwxrwxrwx 1 root root 55951278 6월 7 00:51 cudasdk_2.2_linux.run
-rwxrwxrwx 1 root root 29536048 6월 7 00:51 cudatoolkit_2.2_linux_64_rhel5.3.r
un
[root@localhost cuda_2.2Beta]# ./cudasdk_2.2_linux.run
Verifying archive integrity... All good.
Uncompressing NVIDIA CUDA SDK.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
Enter install path (default ~/NVIDIA_CUDA_SDK): █

```

```

root@localhost:~/Desktop/CUDA_SW/cuda_2.2Beta
esData/GEFGTX200_2D_wte.gif'
`sdk/releaseNotesData/GEF9_2D_wte.gif' -> `/root/NVIDIA_CUDA_SDK/releaseNotesDat
a/GEF9_2D_wte.gif'
`sdk/releaseNotesData/NVSphere.ico' -> `/root/NVIDIA_CUDA_SDK/releaseNotesData/N
VSphere.ico'
`sdk/tools' -> `/root/NVIDIA_CUDA_SDK/tools'
`sdk/tools/CUDA_Occupancy_calculator.xls' -> `/root/NVIDIA_CUDA_SDK/tools/CUDA_O
ccupancy_calculator.xls'

=====
Configuring SDK Makefile (/root/NVIDIA_CUDA_SDK/common/common.mk) ...

=====
* Please make sure your PATH includes /usr/local/cuda/bin
* Please make sure your LD_LIBRARY_PATH includes /usr/local/cuda/lib

* To uninstall the NVIDIA CUDA SDK, please delete /root/NVIDIA_CUDA_SDK
* Installation Complete

[root@localhost cuda_2.2Beta]#
[root@localhost cuda_2.2Beta]# █

```



PATH 추가 -> .bash_profile 의 PATH에 /usr/local/cuda/bin 과 LD_LIBRARY_PATH에 /usr/local/cuda/lib 추가

```

root@localhost:~
[root@localhost ~]# pwd
/root
[root@localhost ~]# vi .bash_profile
  
```

원본 .bash_profile

```

root@localhost:~
.vi .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH:$HOME/bin

export PATH
unset USERNAME

~
~
~
~
~
~
~
~
~
~

".bash_profile" 13L, 191C
  
```



수정 후

```

root@localhost:~
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH:$HOME/bin:/usr/local/cuda/bin

export PATH

LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/cuda/lib
export LD_LIBRARY_PATH

unset USERNAME
~
~
~
".bash_profile" 18L, 290C written

```

위와 같이 .profile 내용을 변경하였다면 ". .bash_profile" 혹은 "source .bash_profile" 명령으로 내용을 업데이트한다. 또는 로그아웃 후 다시 로그인한다.

deviceQuery를 make 한 후 NVIDIA_CUDA_SDK/bin/linux/release 디렉터리에 가보면 deviceQuery 바이너리 파일이 있다 이것을 실행하여 본다.

```

root@localhost:~/NVIDIA_CUDA_SDK/bin/linux/release
[root@localhost release]# ./deviceQuery
CUDA Device Query (Runtime API) version (CUDA static linking)
There is 1 device supporting CUDA

Device 0: "Quadro FX 5600"
  CUDA Capability Major revision number:      1
  CUDA Capability Minor revision number:      0
  Total amount of global memory:              1609891840 bytes
  Number of multiprocessors:                  16
  Number of cores:                            128
  Total amount of constant memory:            65536 bytes
  Total amount of shared memory per block:    16384 bytes
  Total number of registers available per block: 8192
  Warp size:                                  32
  Maximum number of threads per block:        512
  Maximum sizes of each dimension of a block: 512 x 512 x 64
  Maximum sizes of each dimension of a grid:  65535 x 65535 x 1
  Maximum memory pitch:                       262144 bytes
  Texture alignment:                          256 bytes
  Clock rate:                                  1.35 GHz
  Concurrent copy and execution:              No
  Run time limit on kernels:                   Yes
  Integrated:                                  No
  Support host page-locked memory mapping:    No
  Compute mode:                               Default (multiple host threads
can use this device simultaneously)

Test PASSED

Press ENTER to exit...

```

freeglut의 설치

SDK top 디렉터리에서 make 를 치면 하위 디렉터리의 모든 project가 빌드 되는데 glut에러가 난다. 이를 위해 yum install로 freeglut을 설치한다

```
root@localhost:~/NVIDIA_CUDA_SDK
[root@localhost NVIDIA_CUDA_SDK]# yum install freeglut-devel
```

```
root@localhost:~/NVIDIA_CUDA_SDK
--> Running transaction check
--> Package mesa-libGLU.i386 0:6.5.1-7.7.e15 set to be updated
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                Arch             Version          Repository      Size
=====
Installing:
freeglut-devel         i386             2.4.0-7.1.e15   base            98 k
freeglut-devel         x86_64          2.4.0-7.1.e15   base            111 k
Installing for dependencies:
freeglut               x86_64          2.4.0-7.1.e15   base            150 k
freeglut               i386            2.4.0-7.1.e15   base            142 k
mesa-libGLU            i386            6.5.1-7.7.e15   base            227 k
=====

Transaction Summary
-----
Install      5 Package(s)
Update      0 Package(s)
Remove      0 Package(s)

Total download size: 728 k
Is this ok [y/N]: y
```



```
root@localhost:~/NVIDIA_CUDA_SDK
Remove          0 Package(s)

Total download size: 728 k
Is this ok [y/N]: y
Downloading Packages:
(1/5): freeglut-devel-2.4.0-7.1.el5.i386.rpm | 98 kB 00:00
(2/5): freeglut-devel-2.4.0-7.1.el5.x86_64.rpm | 111 kB 00:00
(3/5): freeglut-2.4.0-7.1.el5.i386.rpm | 142 kB 00:00
(4/5): freeglut-2.4.0-7.1.el5.x86_64.rpm | 150 kB 00:00
(5/5): mesa-libGLU-6.5.1-7.7.el5.i386.rpm | 227 kB 00:00
-----
Total                               1.2 MB/s | 728 kB 00:00
경고: rpmts_HdrFromFdno: Header V3 DSA signature: NOKEY, key ID e8562897
Importing GPG key 0xE8562897 "CentOS-5 Key (CentOS 5 Official Signing Key) <centos-5-key@centos.org>" from /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-5
Is this ok [y/N]: █
```




설치 완료 후 화면

```
root@localhost:~/NVIDIA_CUDA_SDK
Importing GPG key 0xE8562897 "CentOS-5 Key (CentOS 5 Official Signing Key) <centos-5-key@centos.org>" from /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-5
Is this ok [y/N]: y
Running rpm_check_debug
Running Transaction Test
Finished Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing      : freeglut                               [1/5]
  Installing      : mesa-libGLU                           [2/5]
  Installing      : freeglut-devel                         [3/5]
  Installing      : freeglut                               [4/5]
  Installing      : freeglut-devel                         [5/5]

Installed: freeglut-devel.i386 0:2.4.0-7.1.e15 freeglut-devel.x86_64 0:2.4.0-7.1.e15
Dependency Installed: freeglut.x86_64 0:2.4.0-7.1.e15 freeglut.i386 0:2.4.0-7.1.e15 mesa-libGLU.i386 0:6.5.1-7.7.e15
Complete!
[root@localhost NVIDIA_CUDA_SDK]#
```

이후 SDK top dir에서 make clean; make 를 치면 모든 프로젝트가 성공적으로 build 된다.