

Lab 1 for Operating Systems

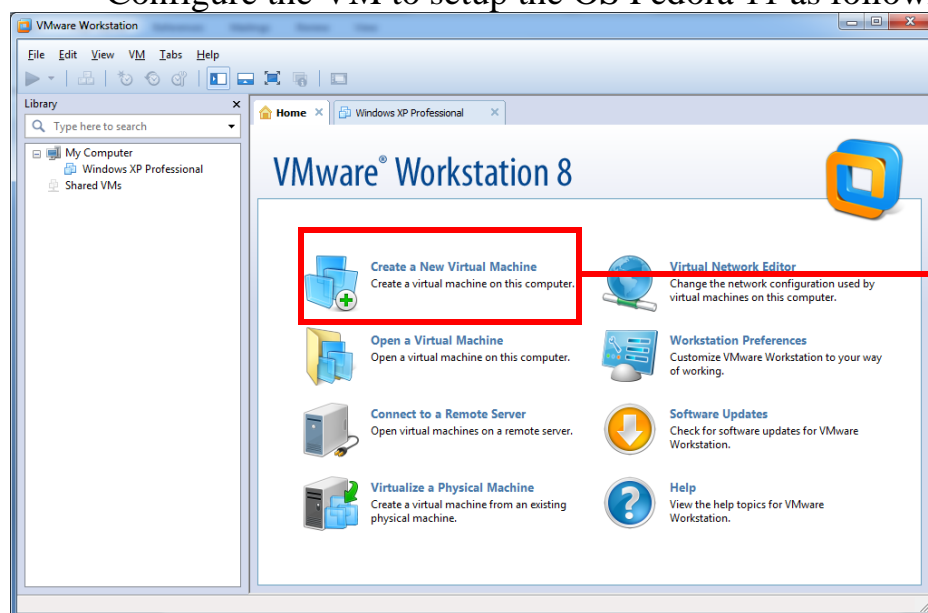
Learning outcome

Upon successful completion of this lab, you will be able

- To install the VMware-workstation and how to use it to install and test the OS software
- To setup the Fedora Core 11 (RedHat Linux) on VMWare
- To use, study, and manipulate some operations on this OS.
- To use the C and C++ compiler, then compile them to the OS concept

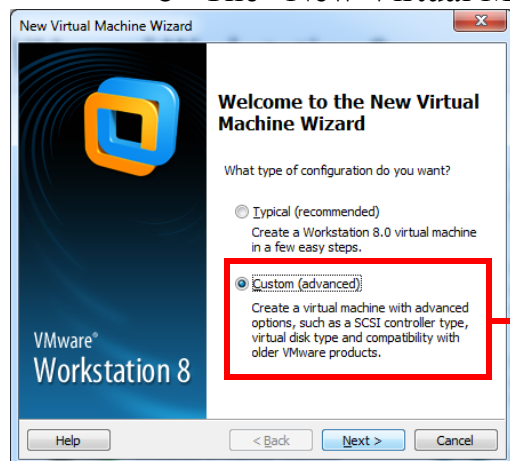
Install VMware-workstation-8.x (current version is 8.0.0)

- Requirement: setup.exe
- Configure the VM to setup the OS Fedora 11 as following steps



Click New Virtual Machine to create new virtual machine that can setup the new OS

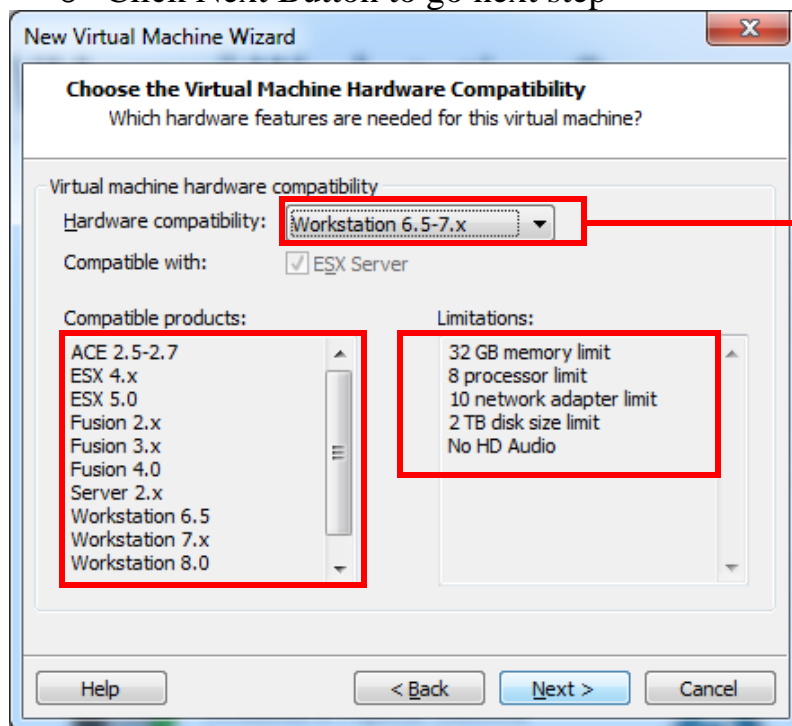
- The “New Virtual Machine Wizard” windows is appeared



Choose the Custom to configure the hardware parameters that are supported the OS as requirements

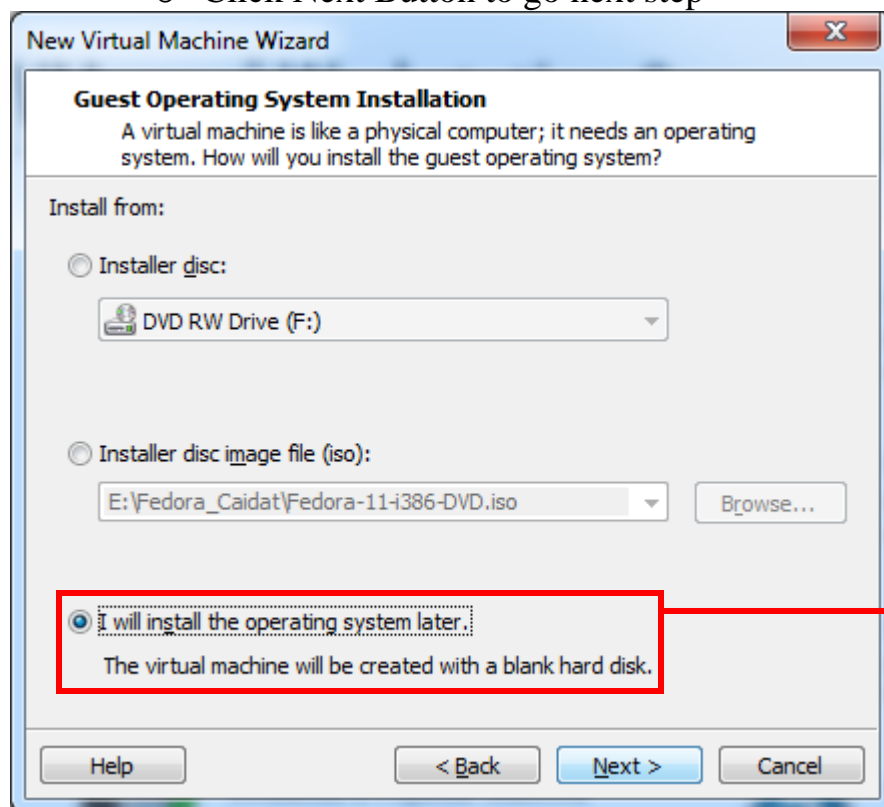
- Click Next Button to go next step

- Click Next Button to go next step



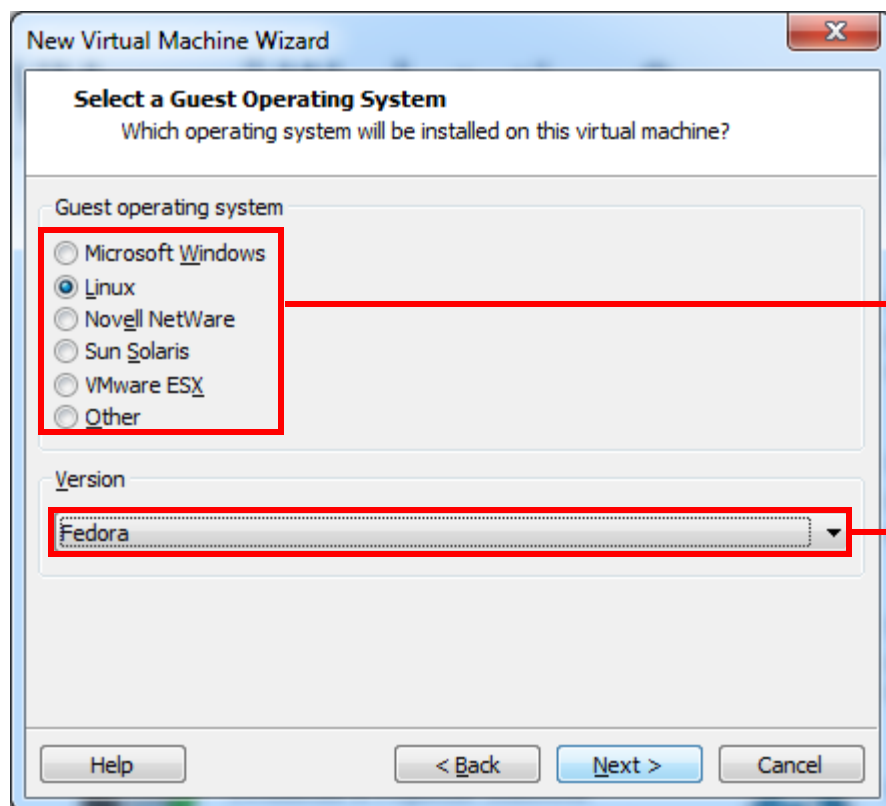
Choose “Workstation x” in the Hardware compatibility to the appropriate parameter appeared as below in “Compatible Products” and “Limitation”, then decide the chosen workstation that is corresponded

- Click Next Button to go next step



Choose the “I will install the operating system later” option to customize Fedora install (in latest WS, the program always requires the user with licenses key and setups in complexity)

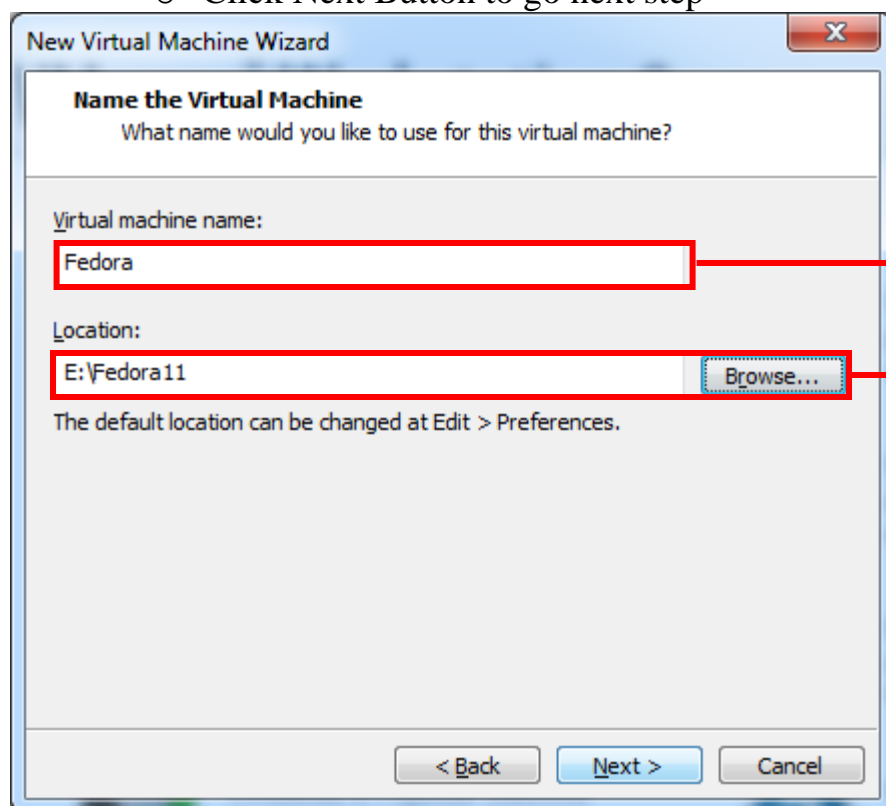
- Click Next Button to go next step



Choose the appropriate OS family that would be liked to setup (e.g. **Linux**)

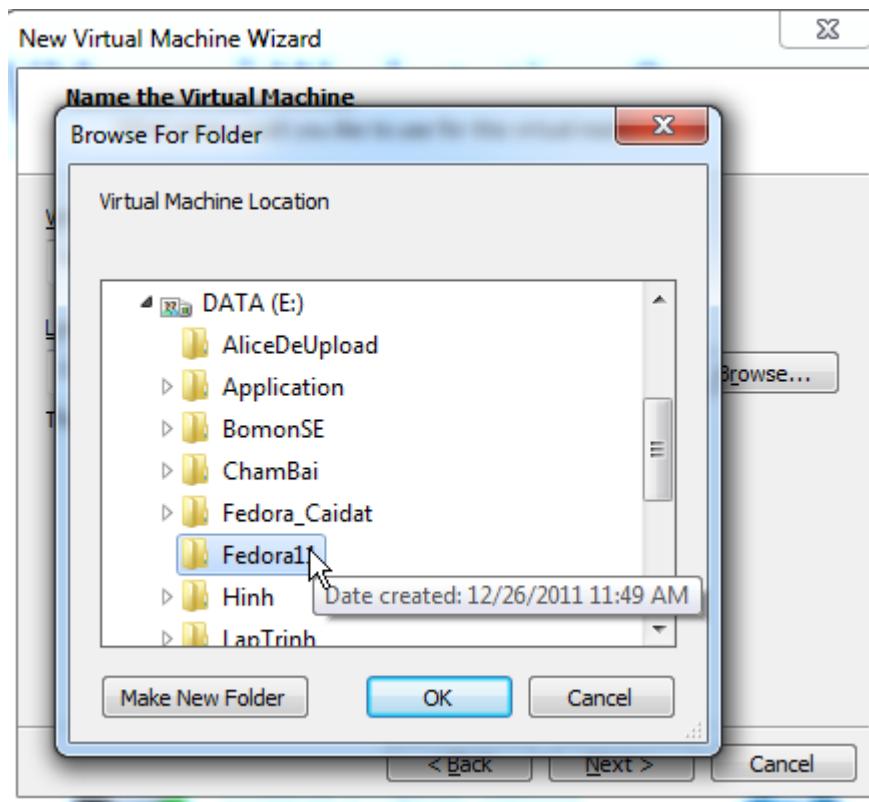
Choose the OS serial/ version exactly (e.g. **Fedora**)

- Click Next Button to go next step

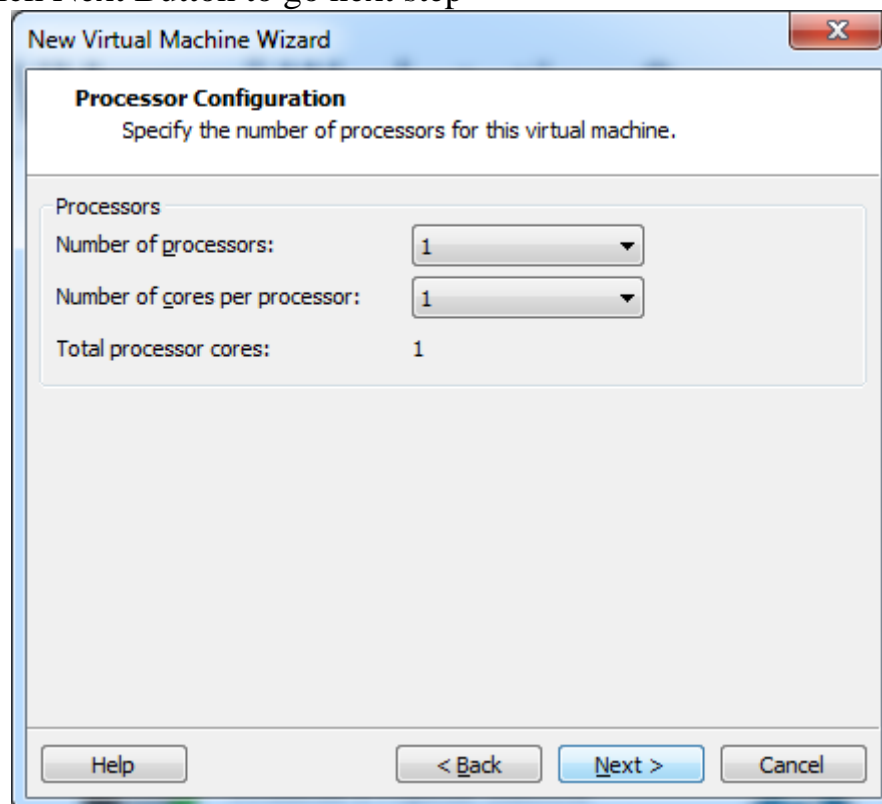


Type the name of the virtual machine (can be typed the name keeping in your mind and same name as the OS name)

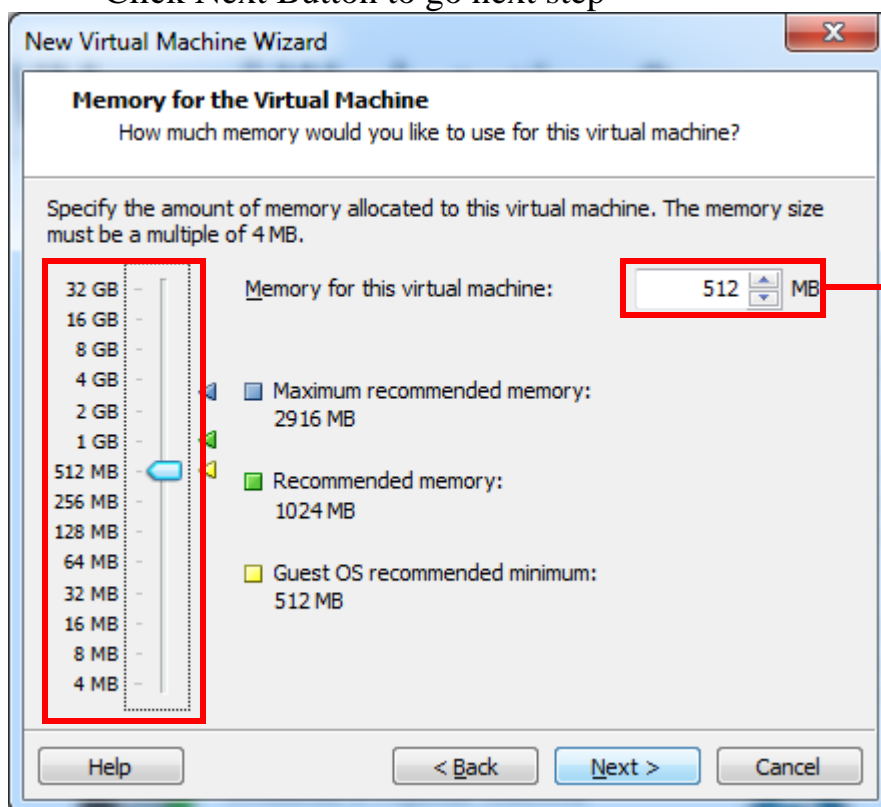
Type or Browse to the location on hard disk that is used to stored the virtual machine (The virtual machine is only one file with extenstion .vmdk that is portables and easy to maintain)



- Click Next Button to go next step



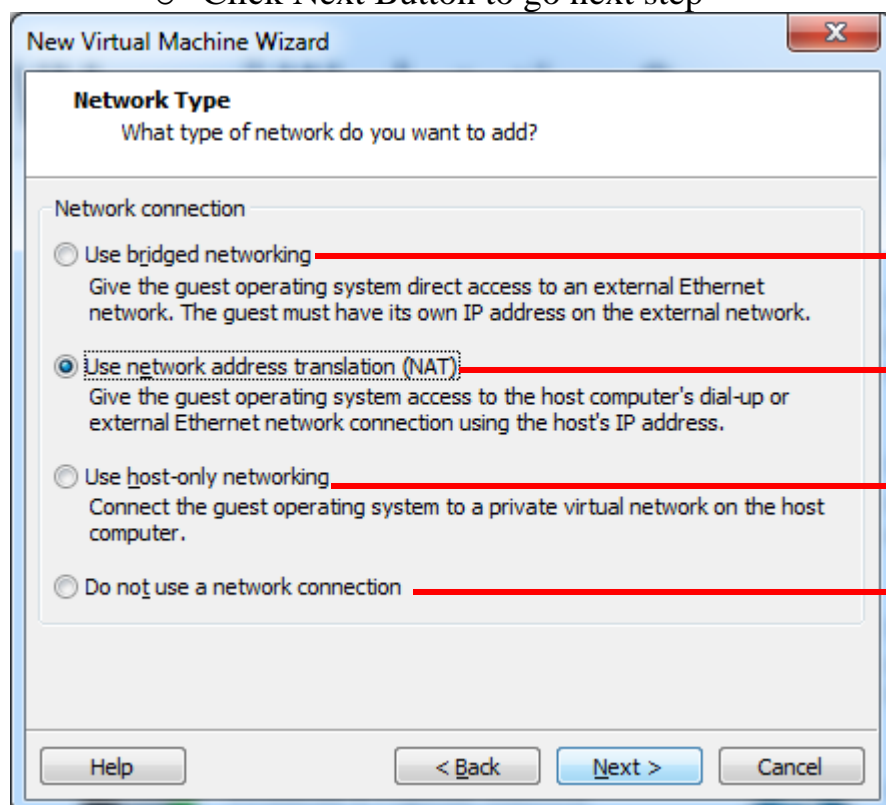
- Choose the number of processors that you need for the installed OS. Then, Click Next Button to go next step



Slide the bar or type the size of RAM that is used for the installed OS.

Notes: the Fedora Core or Redhat Linux requires the swap file partition having double size of RAM

- Click Next Button to go next step



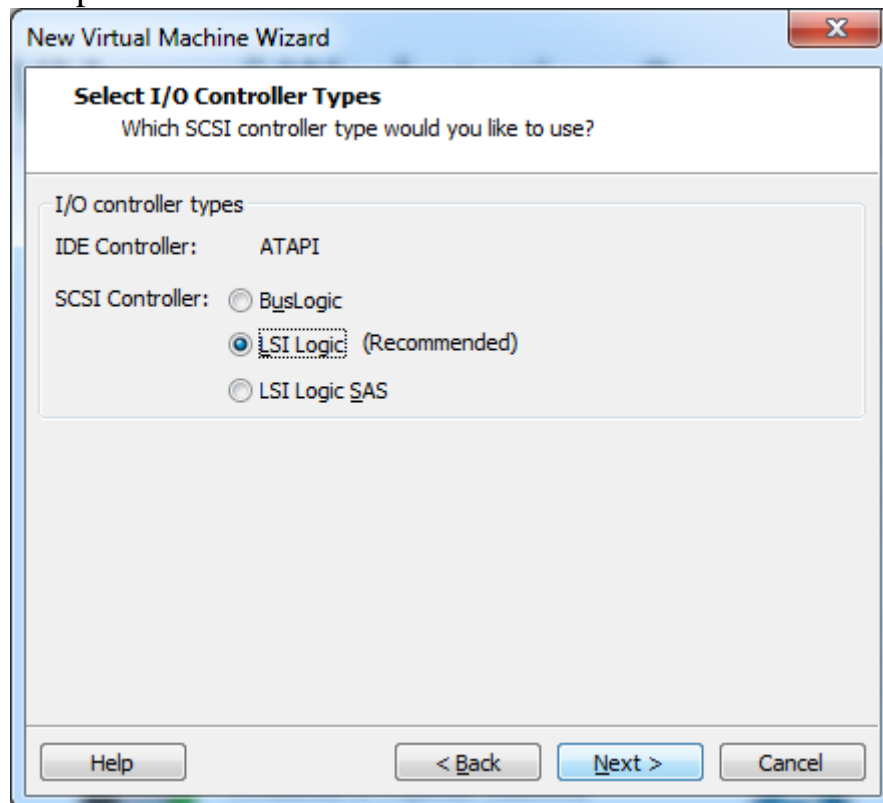
Allows the machine can directly access the Internet with particular IP different to the real machine

Allows the machine is shared Internet from the real machine (the IP is generated by the real machine)

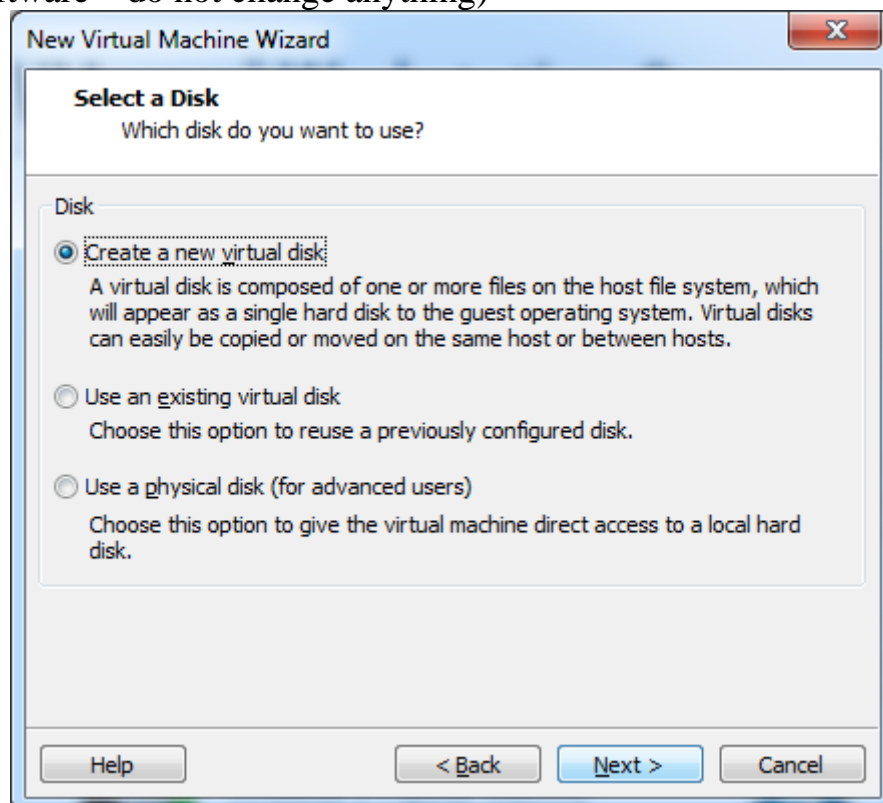
Do not allows this machine access the Internet through the real machine

Do not support (install the driver of) the network card

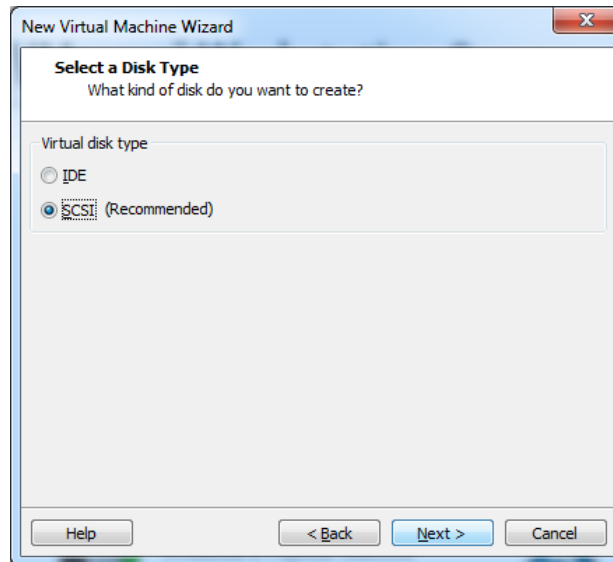
- Choose the network connection that you want. Then, Click Next Button to go next step



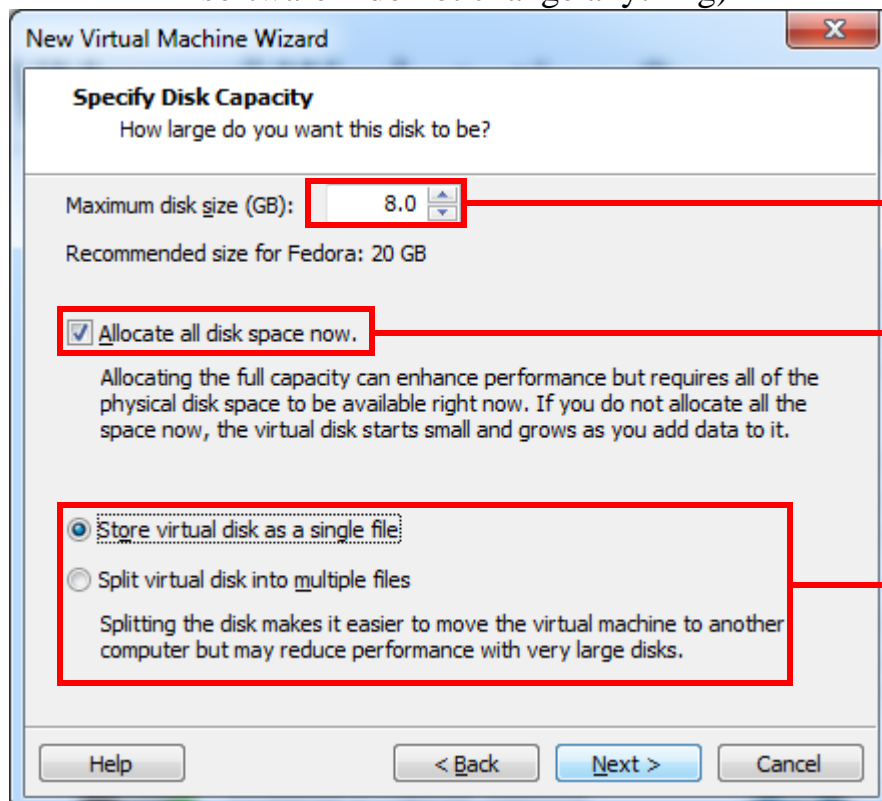
- Click Next Button to go next step (should be used the recommended of software – do not change anything)



- Choose the “Create a new virtual disk” to **create a new file on real machine** (as means that **create a new disk on the virtual machine** that is used for this machine – don’t worry about that because the disk is a virtual – not real – that is concept and remember that virtual machine is only a file on hard disk). Then, Click Next Button to go next step



- Click Next Button to go next step (should be used the recommended of software – do not change anything)

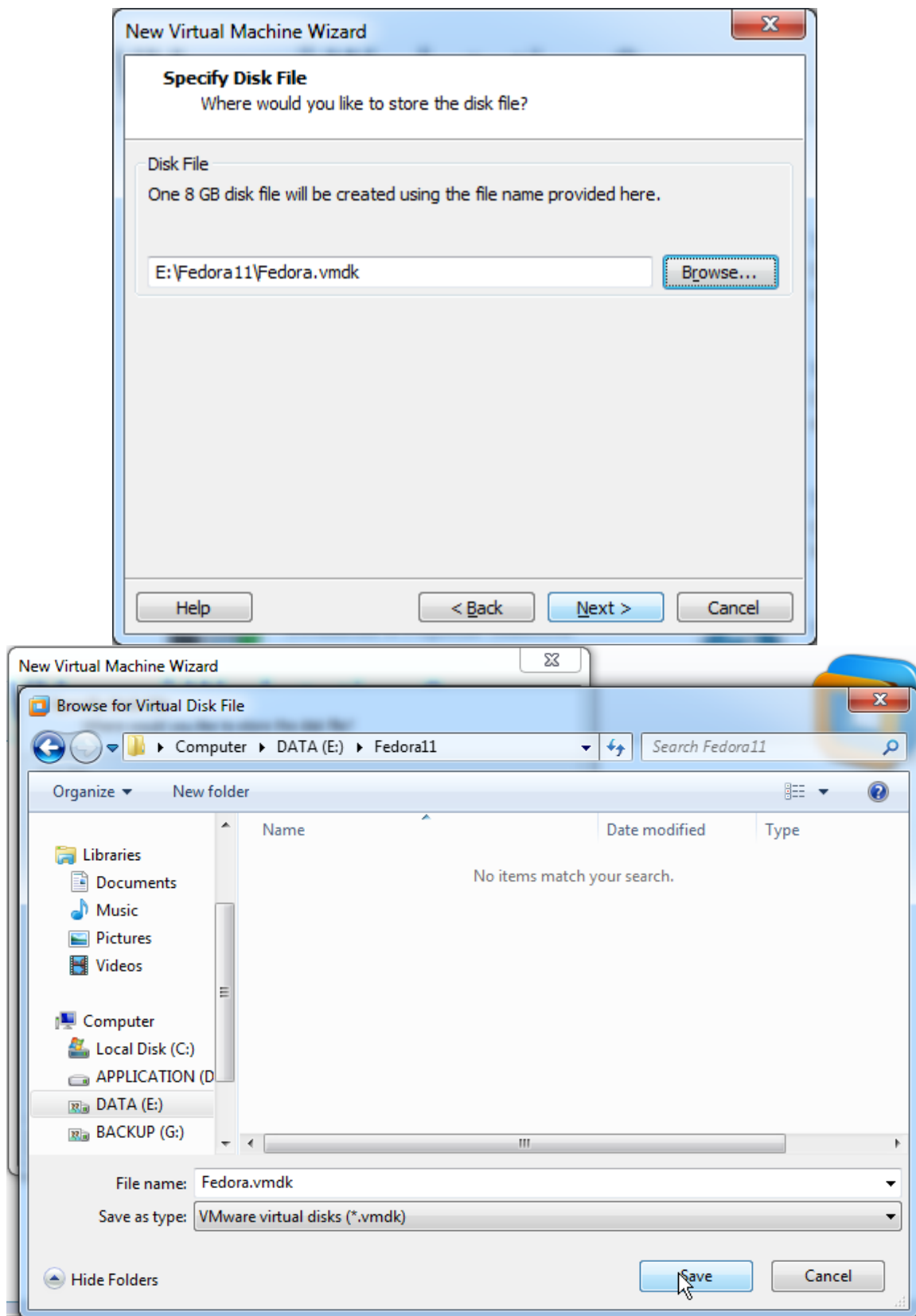


Type the size of disk (using GB) that you want to use if necessary. This means the file on real hard disk have maximum size depending your chosen size.

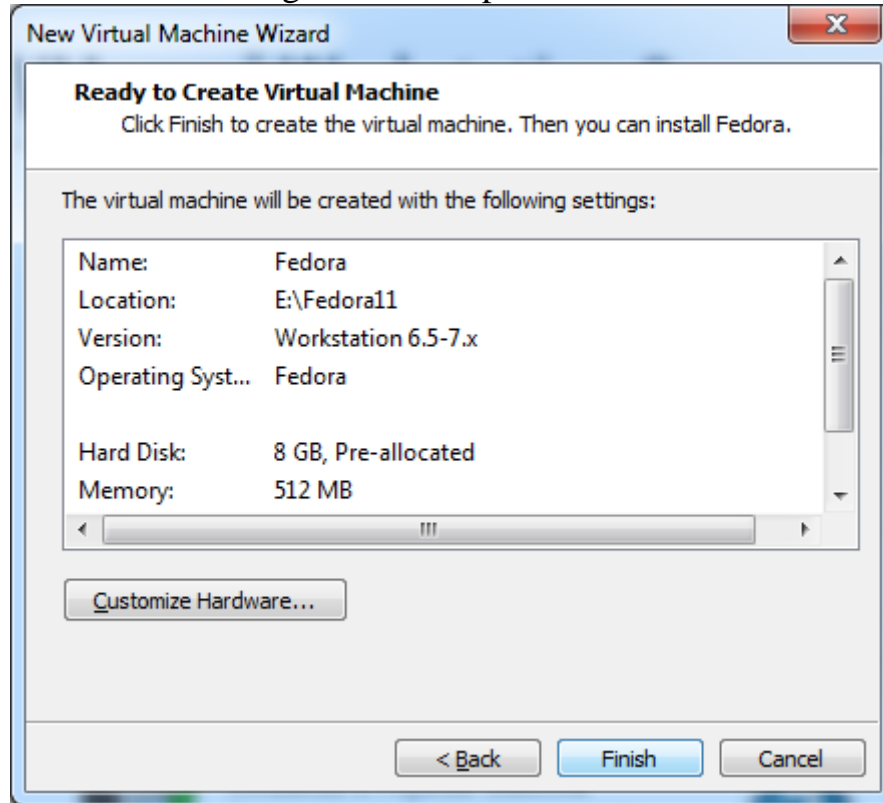
Check to preserve the disk space with setting above

The virtual machine disk space is allocated in single or multiple file depending on user's purpose

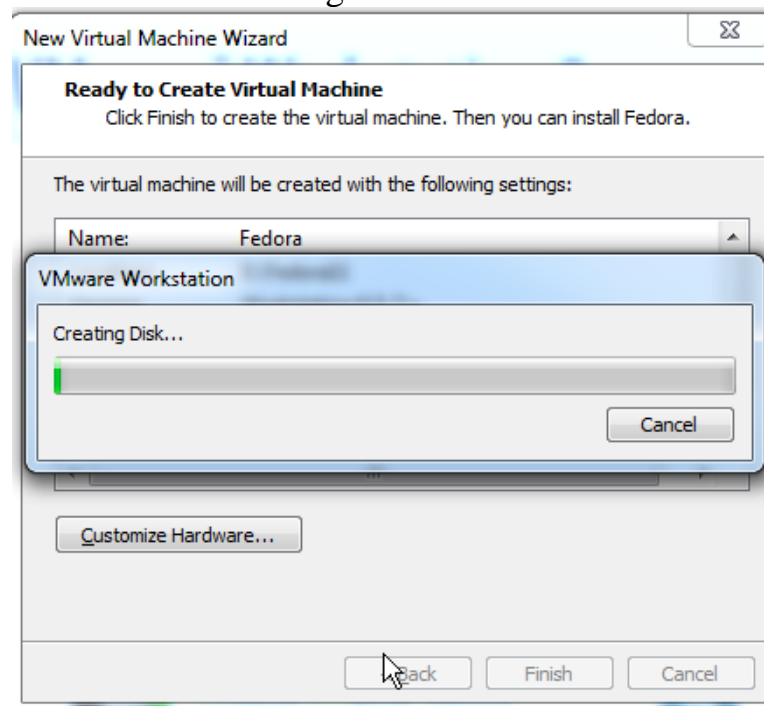
- Click Next Button to go next



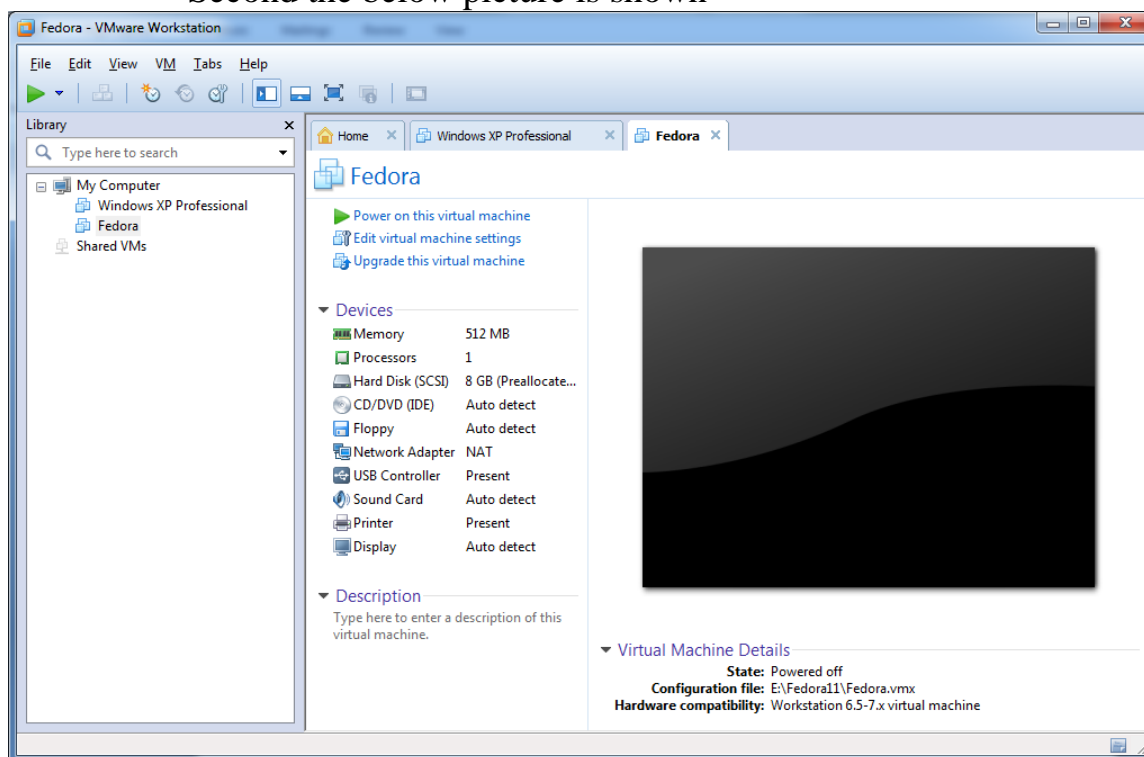
- Click Next Button to go to next step



- Click Finish Button to finish all steps creating the new machine for the purposed OS. You can see as below picture (otherwise, you have some mistakes in one of above steps – checking and do it again ☺)
 - First the WS allocating the disk file

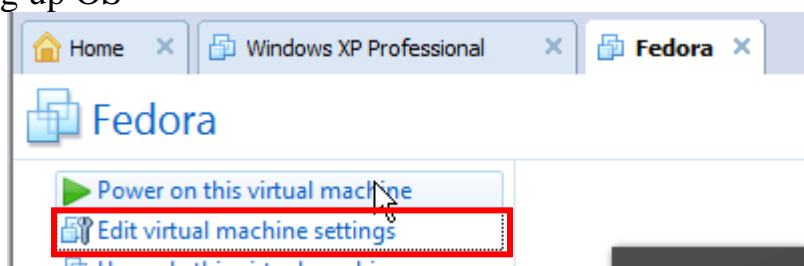


- Second the below picture is shown

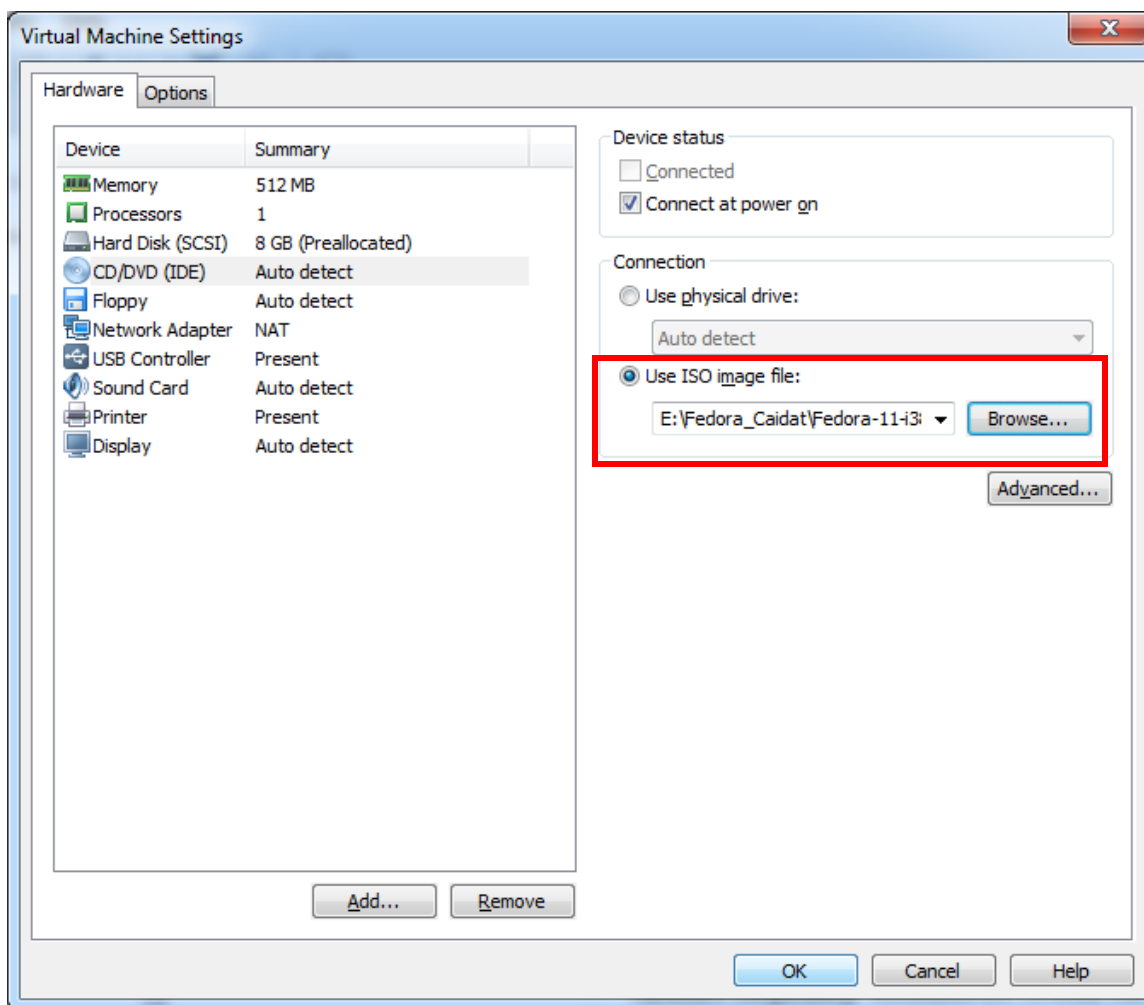


Setup the Fedora 11 OS on VMWare

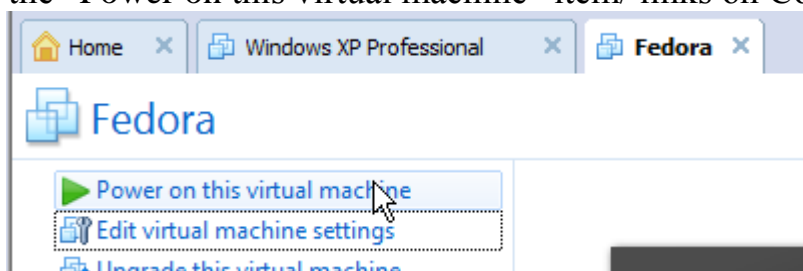
- Creating the Virtual Machine disk for setup Fedora 11 OS (as the first option in this tutorial) (**Recommended:** HDD: at least 8GB, at least RAM 512MB, the Network connection should be NAT – easy to connect internet anyway without configure the domain in the private network)
 - Click the “Edit virtual machine settings” link to configure some option in setting up OS



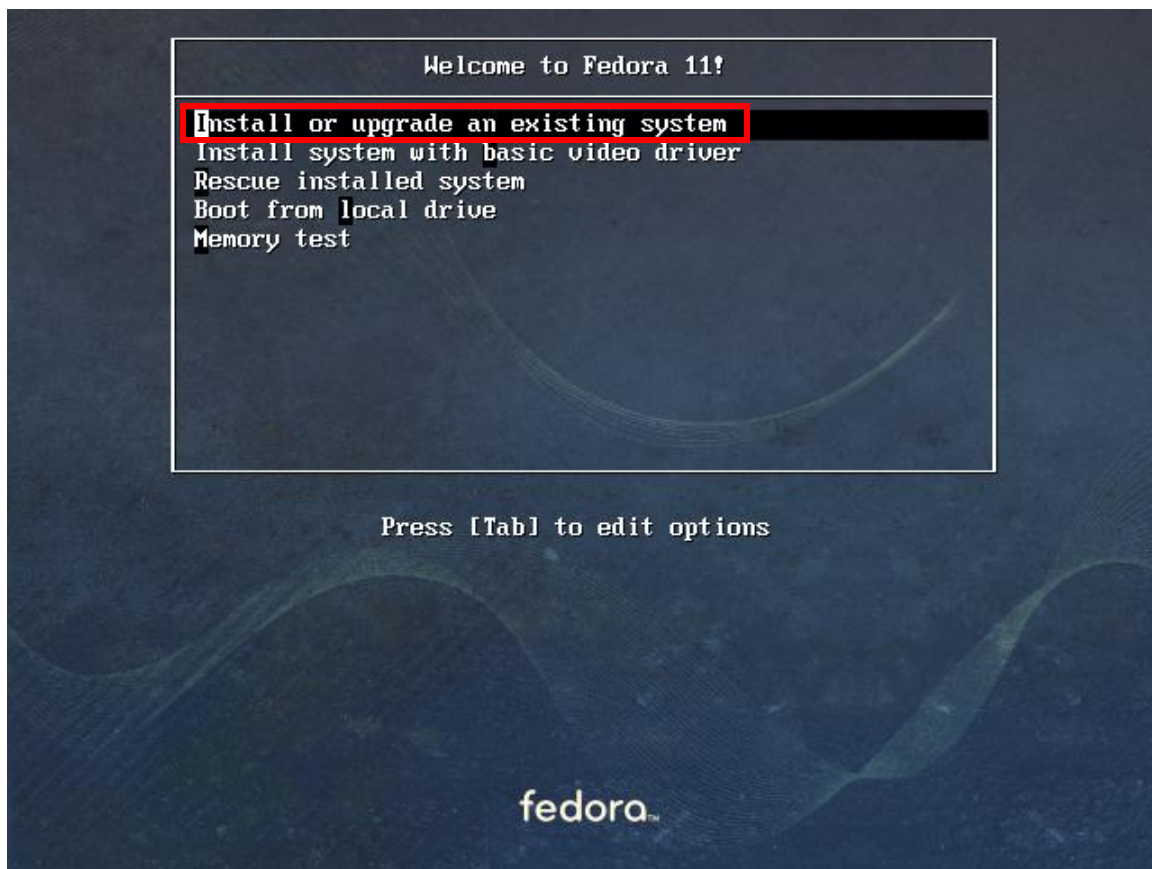
- Choose Hardware tab/ Choose CD/DVD (IDE) Auto detect
 - Choose “Use ISO image file”, the browse to iso file is used to setup fedora
 - Click OK Button to complete



- Set up the Fedora 11 is executed as following steps
 - Click the “Power on this virtual machine” item/ links on Command Panel

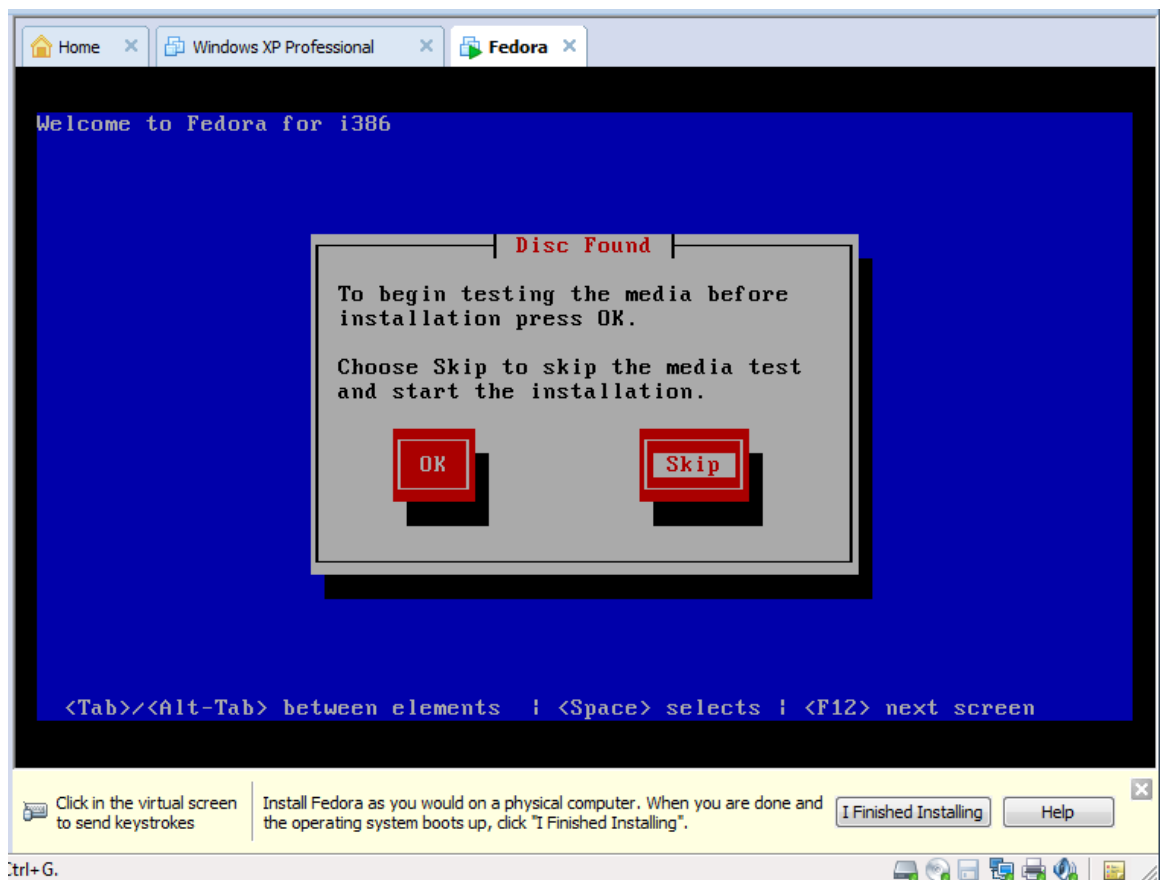


- The application (the virtual machine) is started, then you can see the screen as

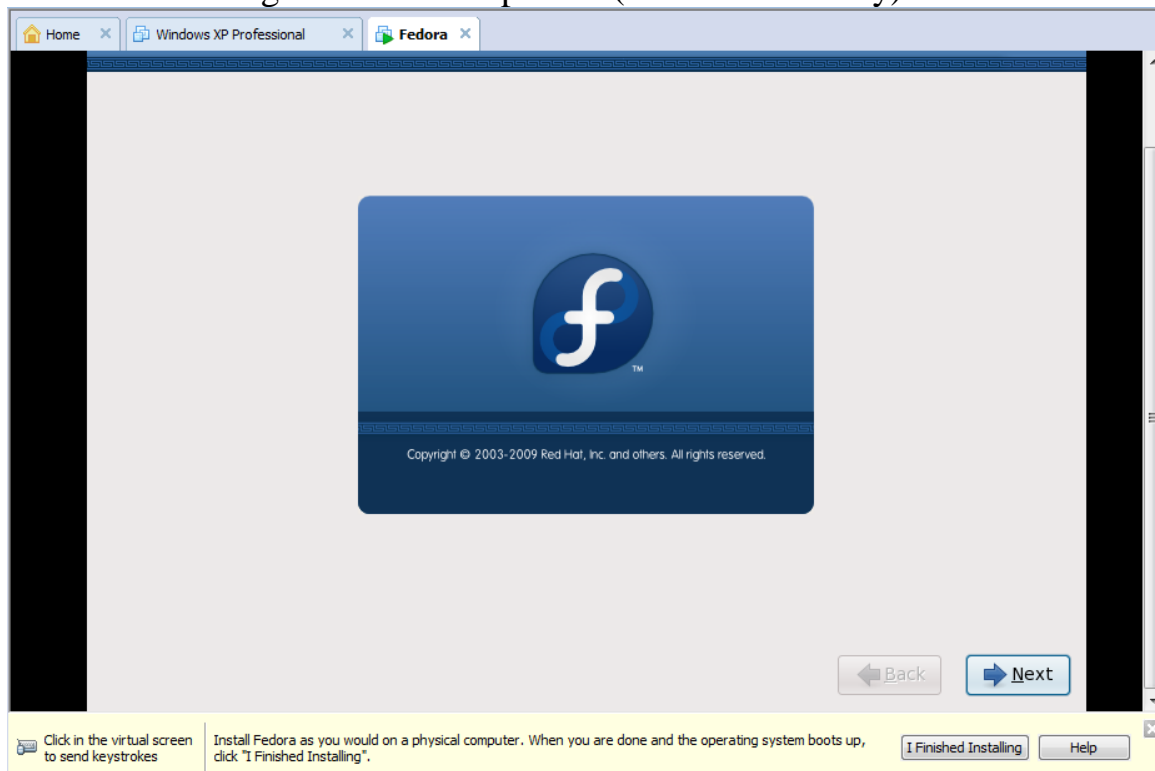


- Click (left) mouse into inside of the application, then use the arrow keys on your keyboard to choose the option that you want to execute
- Choose the first option “Install or upgrade an existing system, then press Enter

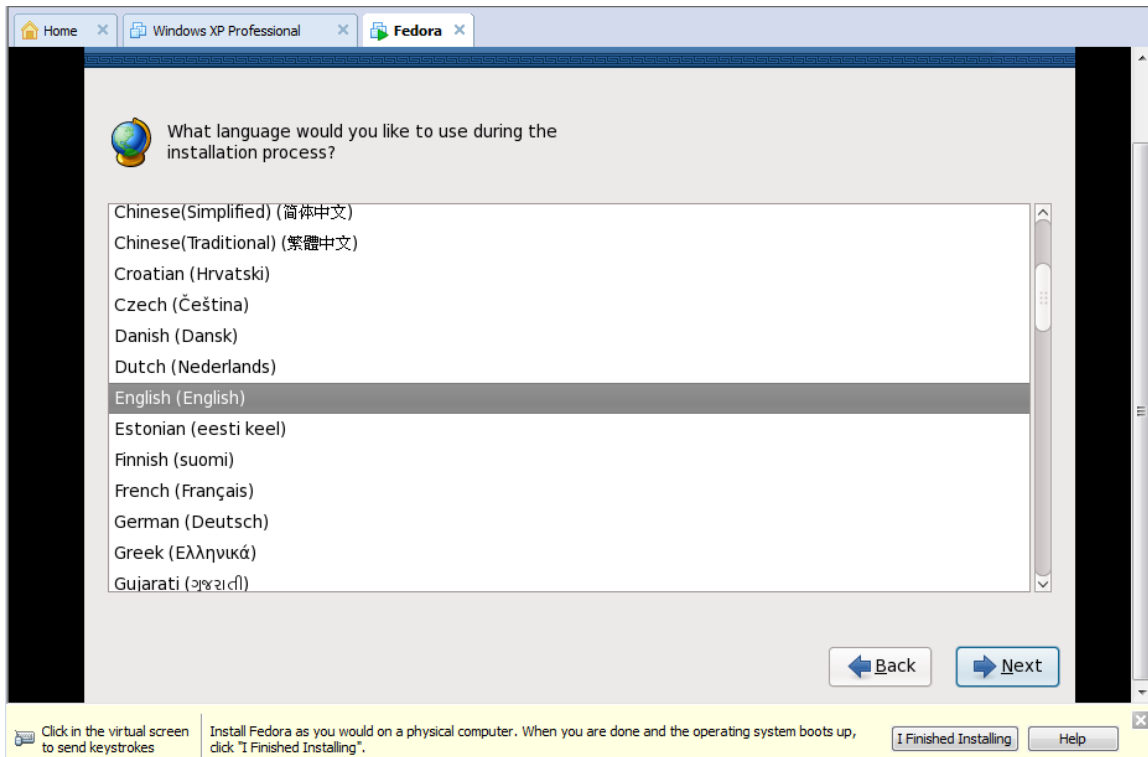
```
ehci_hcd 0000:02:03.0: USB 2.0 started, EHCI 1.00
usb usb1: New USB device found, idVendor=1d6b, idProduct=0002
usb usb1: New USB device strings: Mfr=3, Product=2, SerialNumber=1
usb usb1: Product: EHCI Host Controller
usb usb1: Manufacturer: Linux 2.6.29.4-167.fc11.i586 ehci_hcd
usb usb1: SerialNumber: 0000:02:03.0
usb usb1: configuration #1 chosen from 1 choice
hub 1-0:1.0: USB hub found
hub 1-0:1.0: 6 ports detected
ohci_hcd: USB 1.1 'Open' Host Controller (OHCI) Driver
uhci_hcd: USB Universal Host Controller Interface driver
uhci_hcd 0000:02:00.0: PCI INT A -> GSI 18 (level, low) -> IRQ 18
uhci_hcd 0000:02:00.0: UHCI Host Controller
uhci_hcd 0000:02:00.0: new USB bus registered, assigned bus number 2
uhci_hcd 0000:02:00.0: irq 18, io base 0x000020c0
usb usb2: New USB device found, idVendor=1d6b, idProduct=0001
usb usb2: New USB device strings: Mfr=3, Product=2, SerialNumber=1
usb usb2: Product: UHCI Host Controller
usb usb2: Manufacturer: Linux 2.6.29.4-167.fc11.i586 uhci_hcd
usb usb2: SerialNumber: 0000:02:00.0
usb usb2: configuration #1 chosen from 1 choice
hub 2-0:1.0: USB hub found
hub 2-0:1.0: 2 ports detected
PNP: PS/2 Controller [PNP0303:KBC,PNP0f13:MOUS] at 0x60,0x64 irq 1,12
```



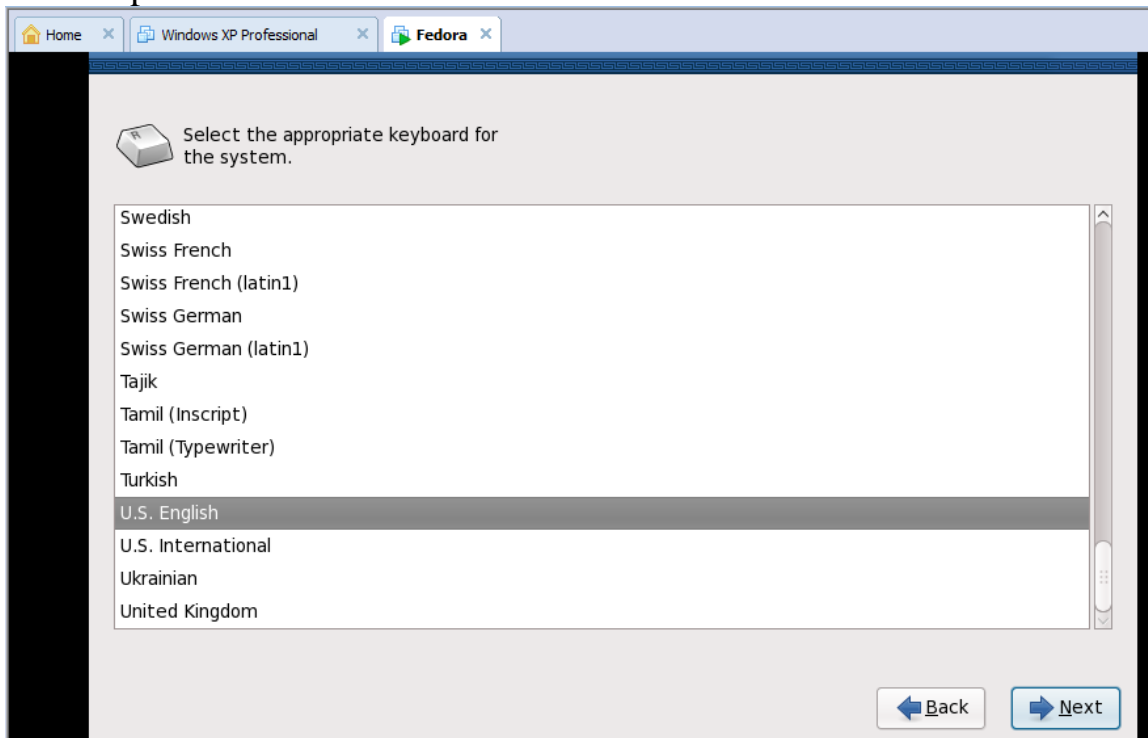
- Use the right arrow (→) to choose the skip to save time and skip checking some testing hardware component (it is not necessary)



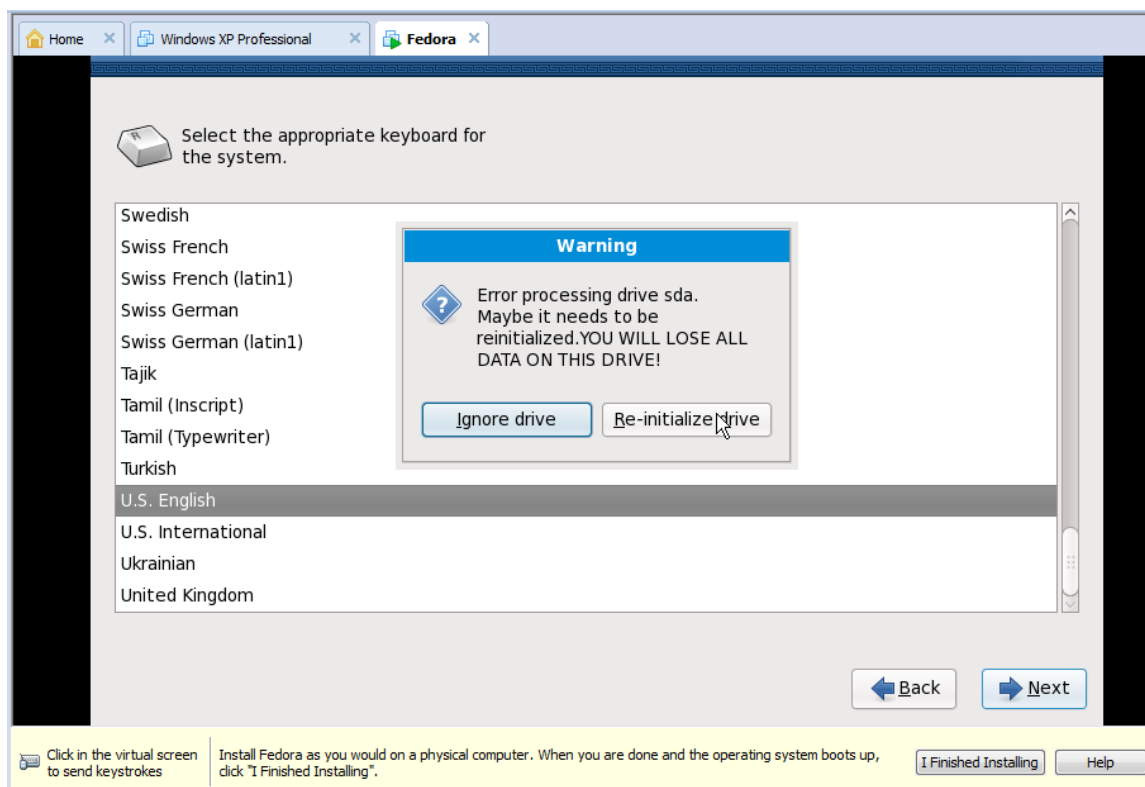
- Click Next Button to go next step



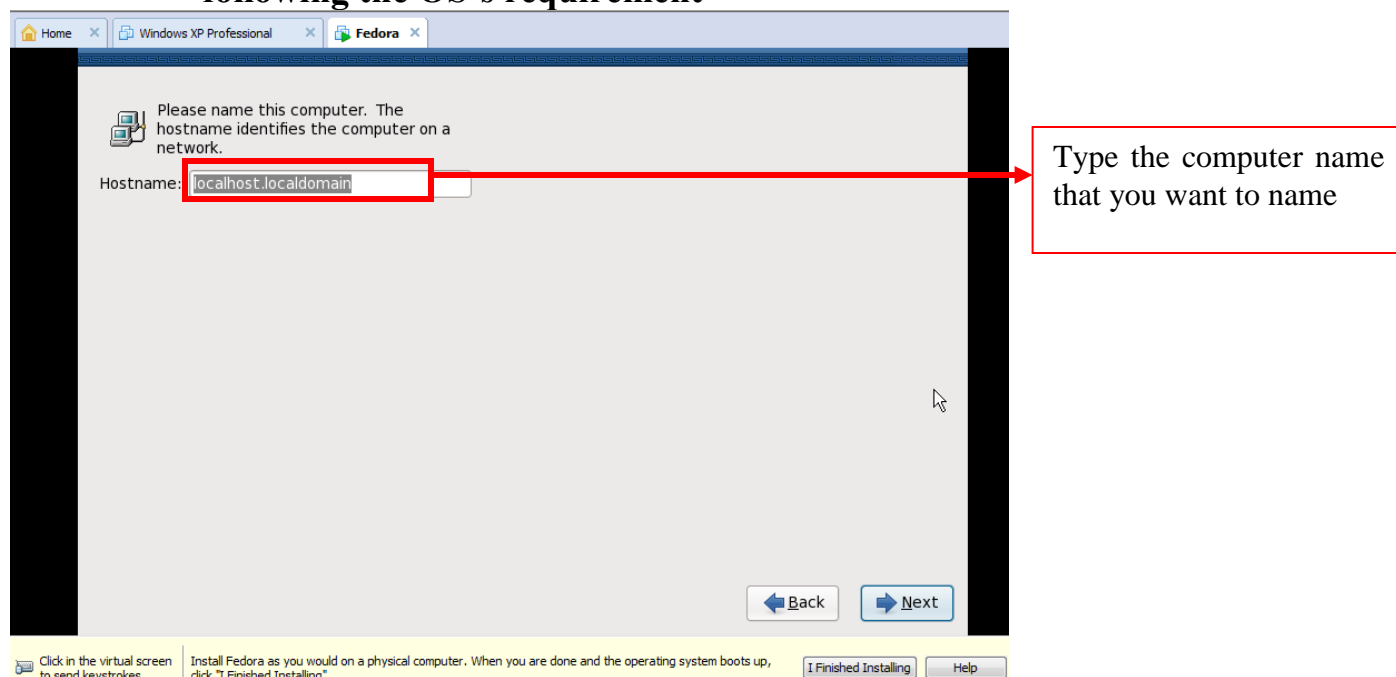
- Choose the appropriate Language using. Then, click Next Button to go next step

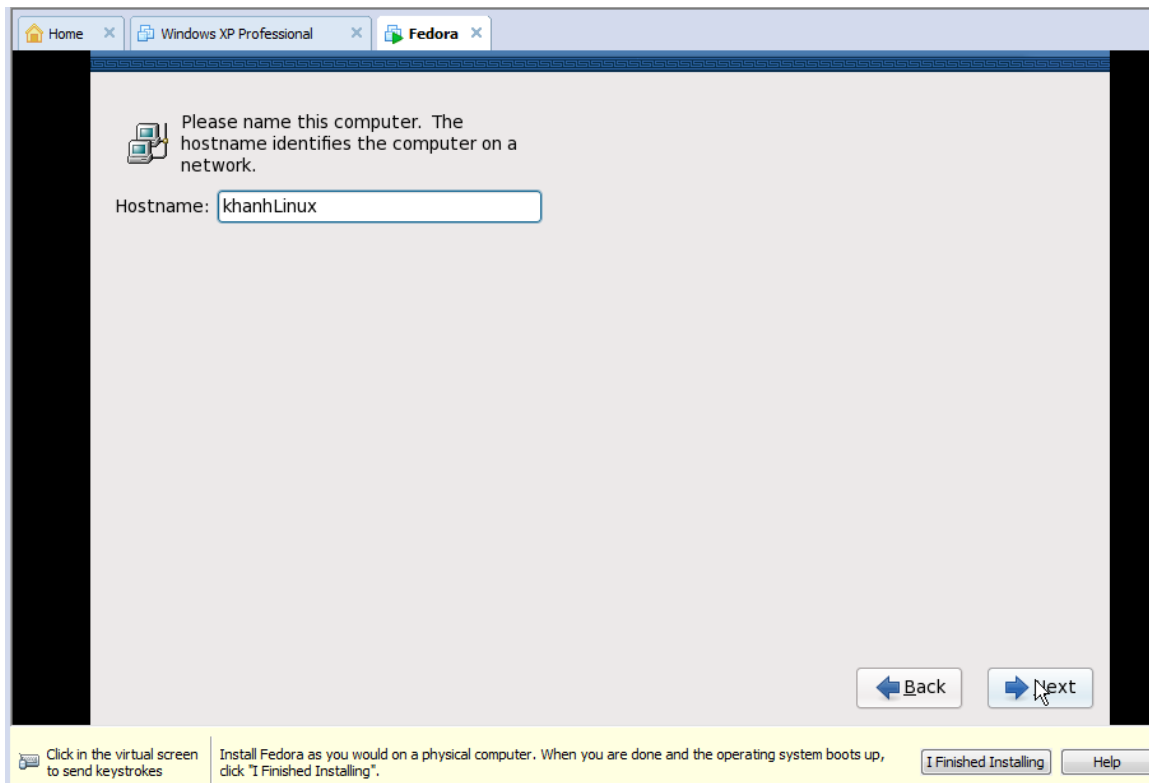


- Choose the appropriate keyboard using. Then, click Next Button to go next step. The warning dialog is appeared

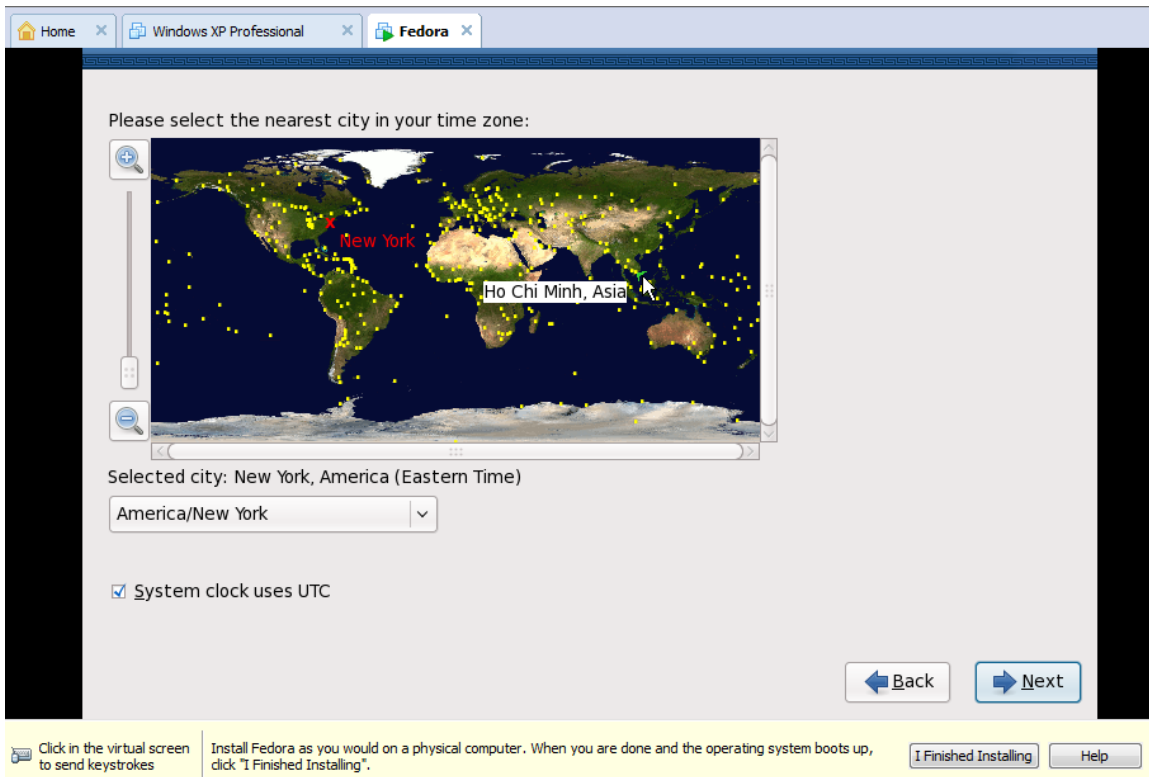


- The warning informs the virtual hard disk need to configure for setting up the OS, thus the data on disk can be lost (don't worry about that – your disk have nothing). **Click the “Re-initialize drive” to reset the default partition following the OS's requirement**

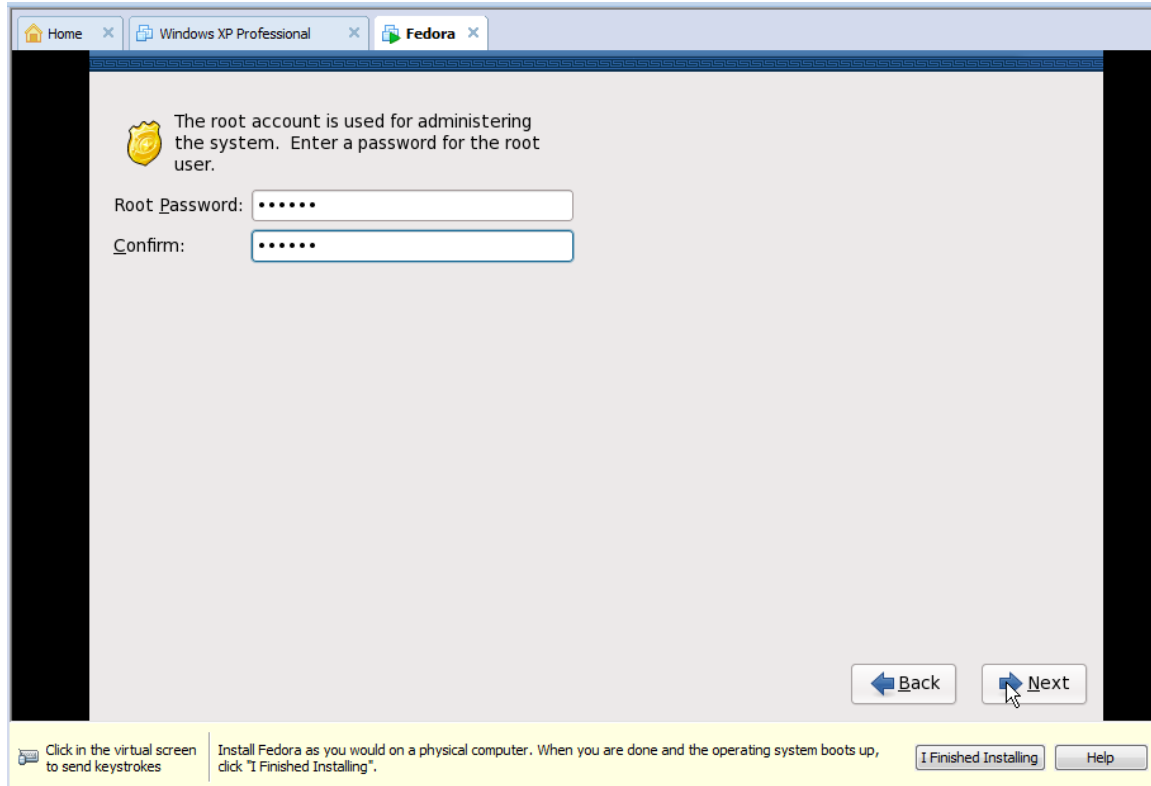
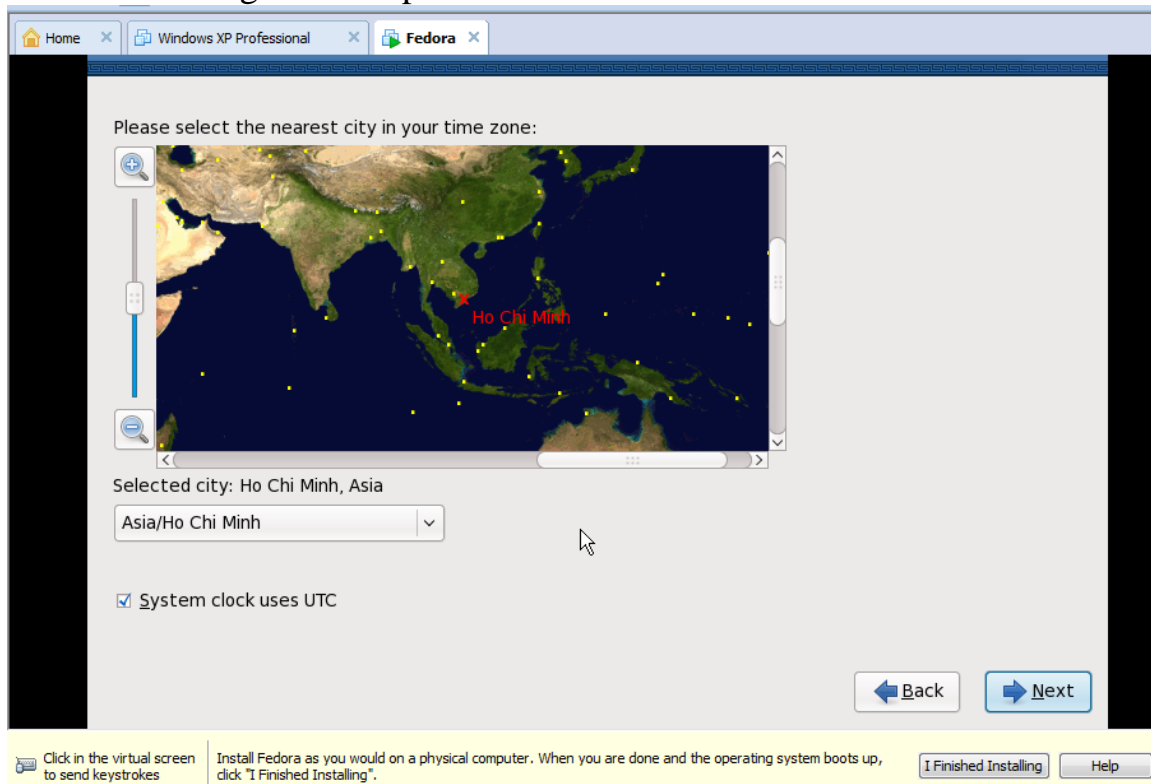




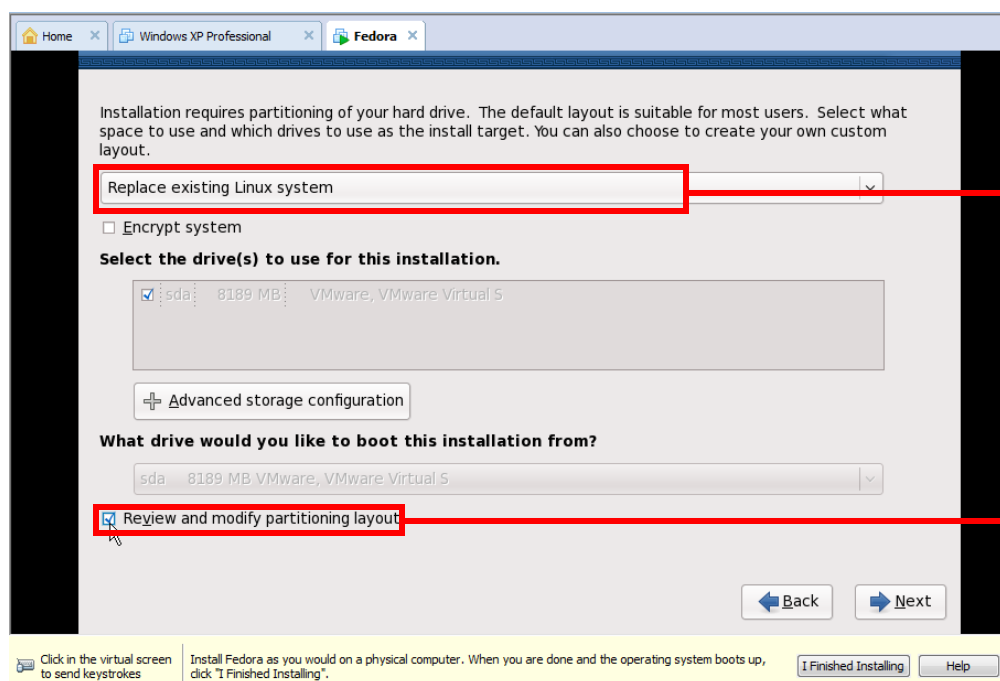
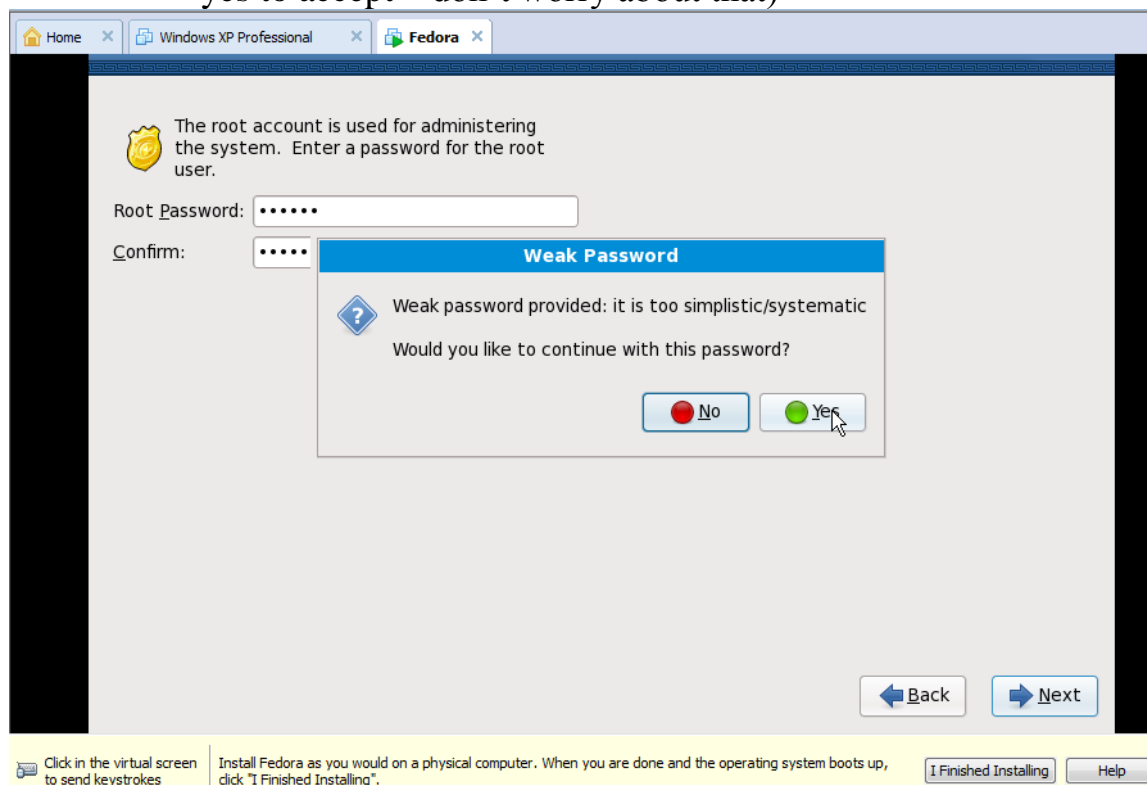
- Click Next Button to go next step



- Choose the time zone (using the graphic or the combo box). Then, click Next Button to go next step



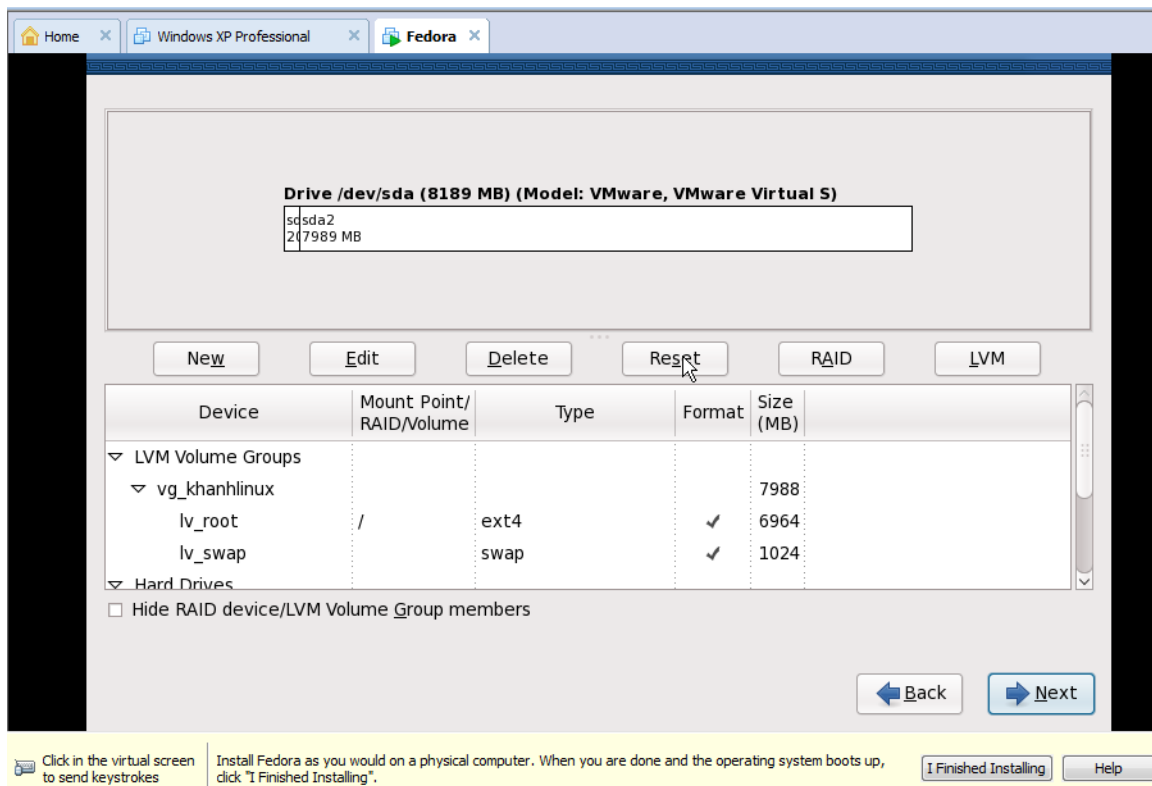
- Type the Root Password and Confirm (Notes: **do not allow the blank password in Fedora. The password is at least 6 characters and should be contained the special character mixing numeric and character**). Then, click Next Button to go next step (if the warning is appeared, you should click yes to accept – don't worry about that)



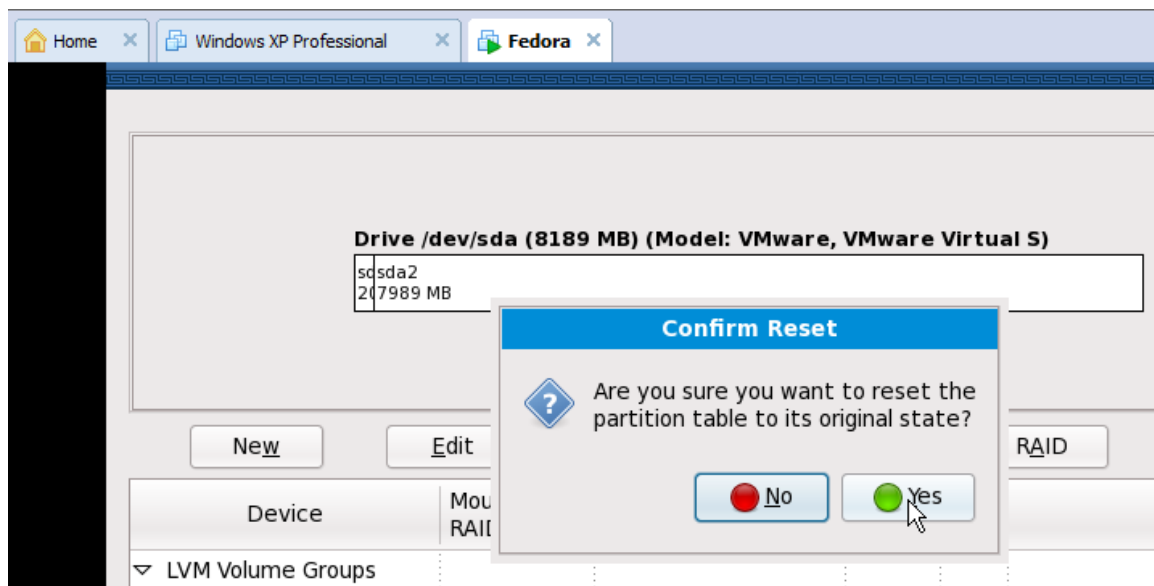
Choose “Replace existing Linux System” item to reset the default configuration

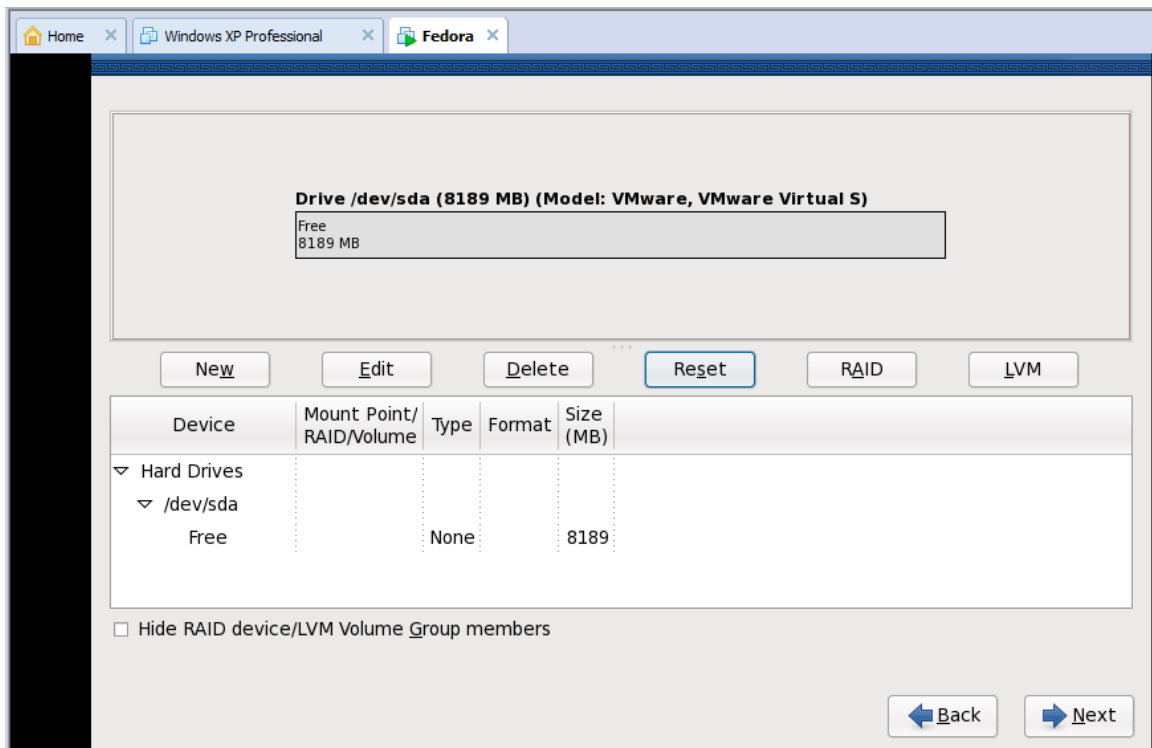
Check “Review and modify partitioning layout” to divide the hard disk following the particular purposes

- Click Next Button to go next step

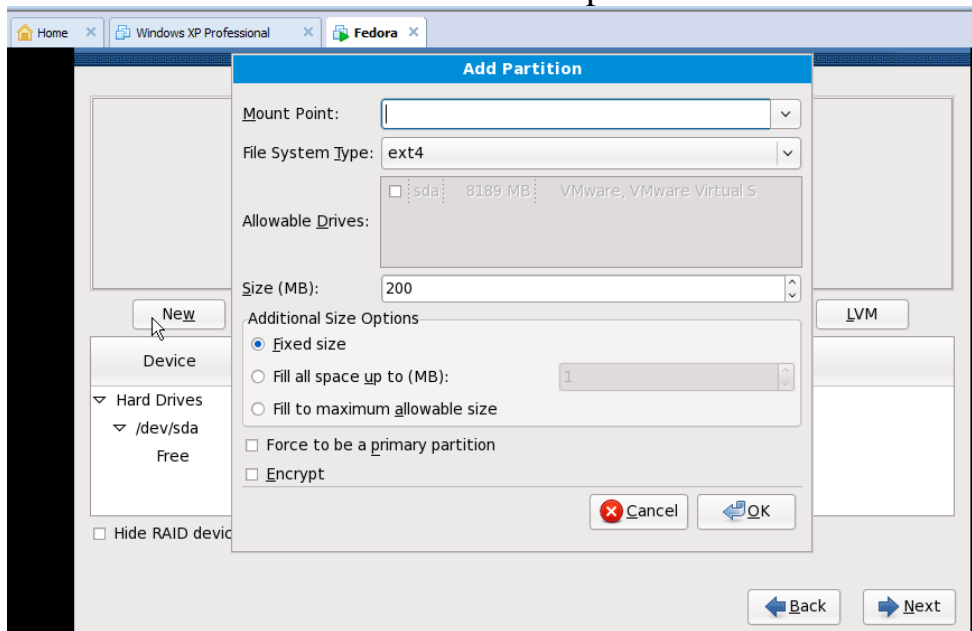


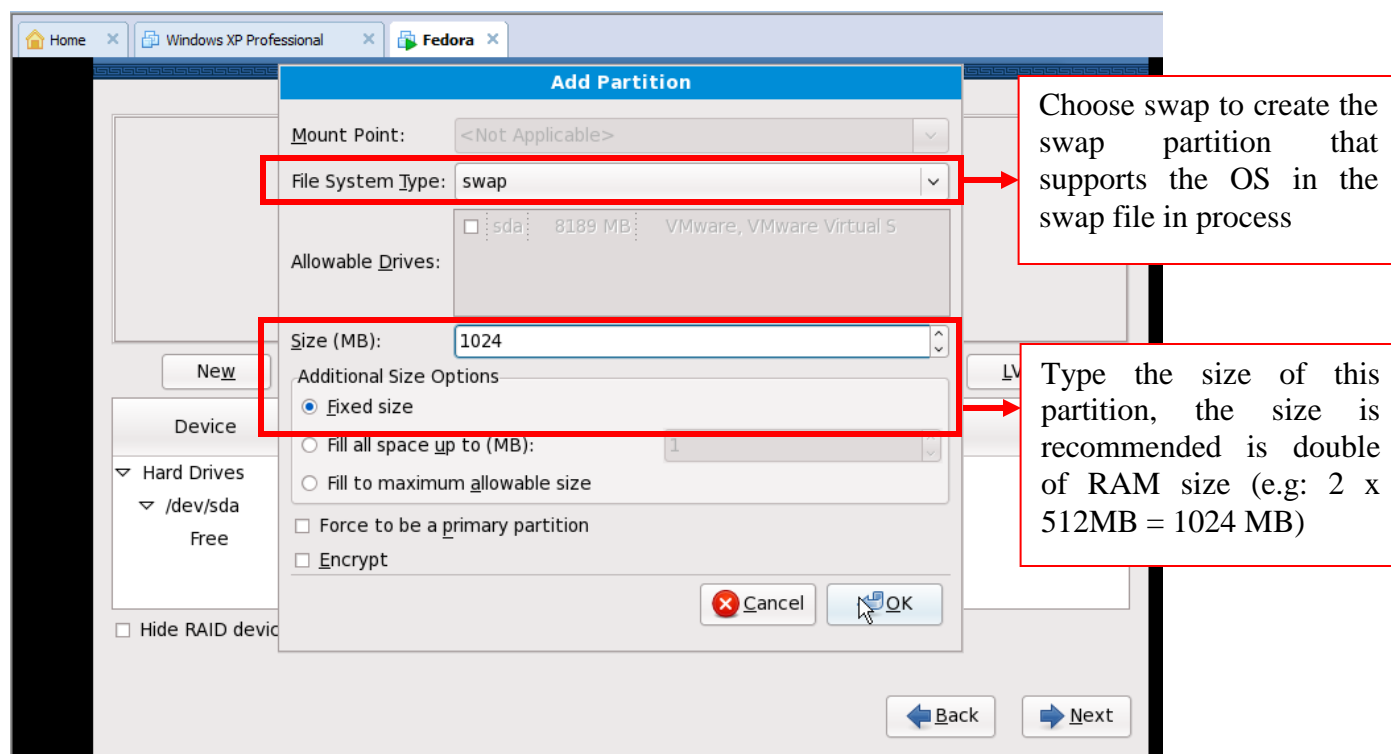
- Choose the **Reset** button to delete the available partition (Click Yes button if the warning is appeared).



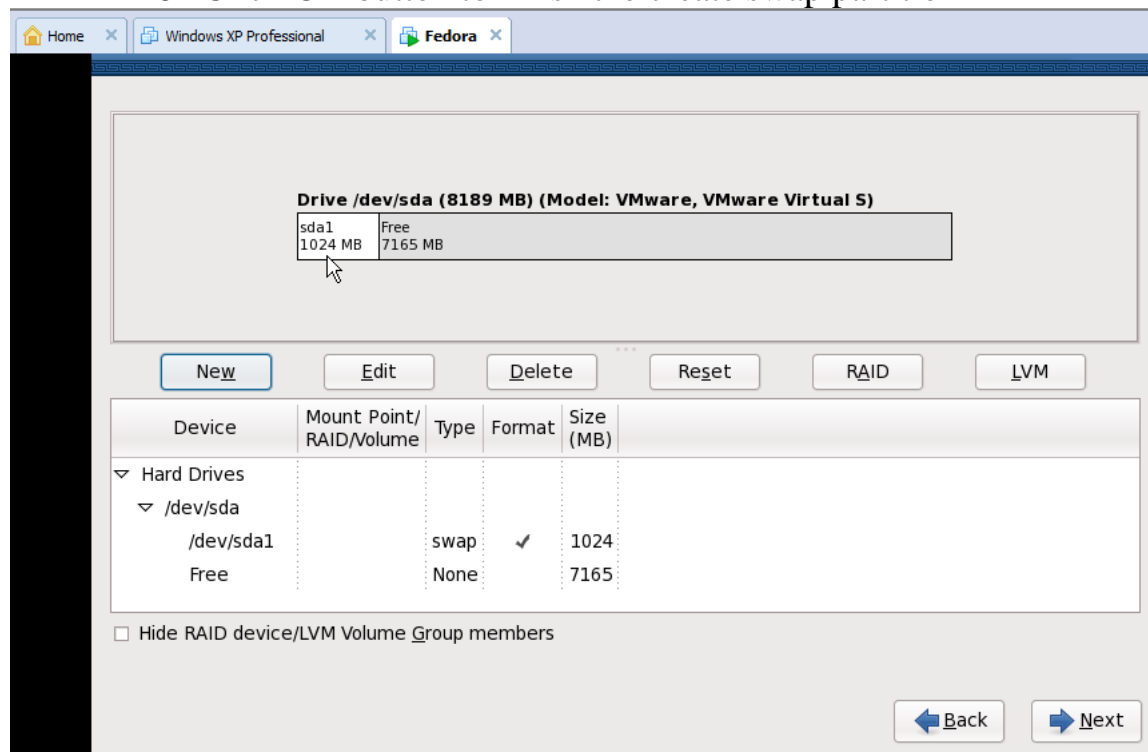


- Click New button to create new partition

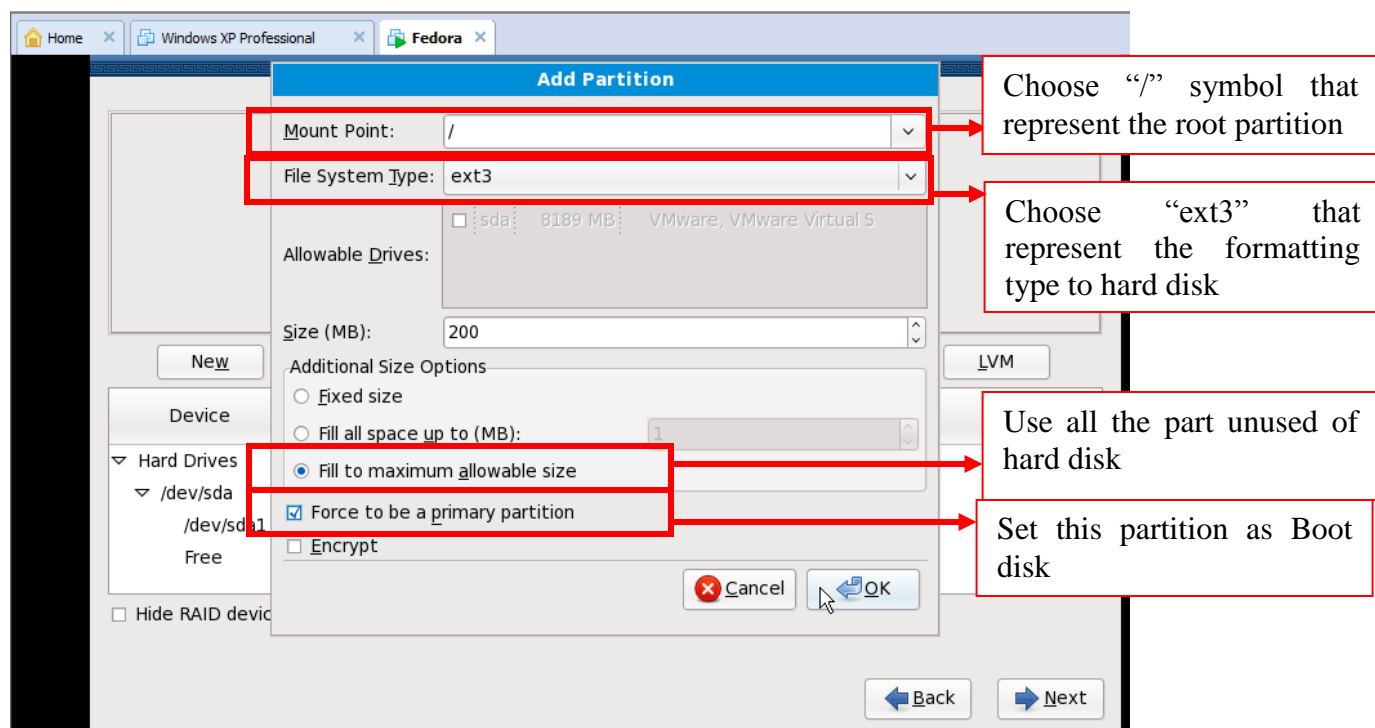




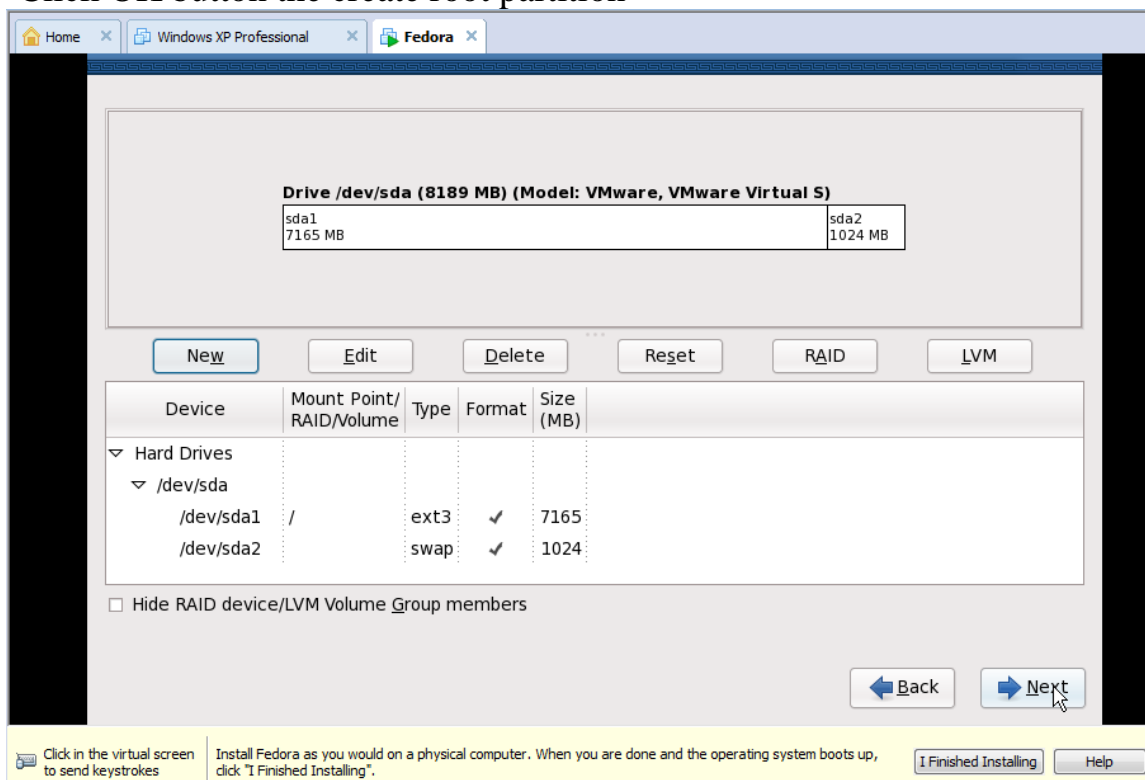
- Click OK button to finish the create swap partition



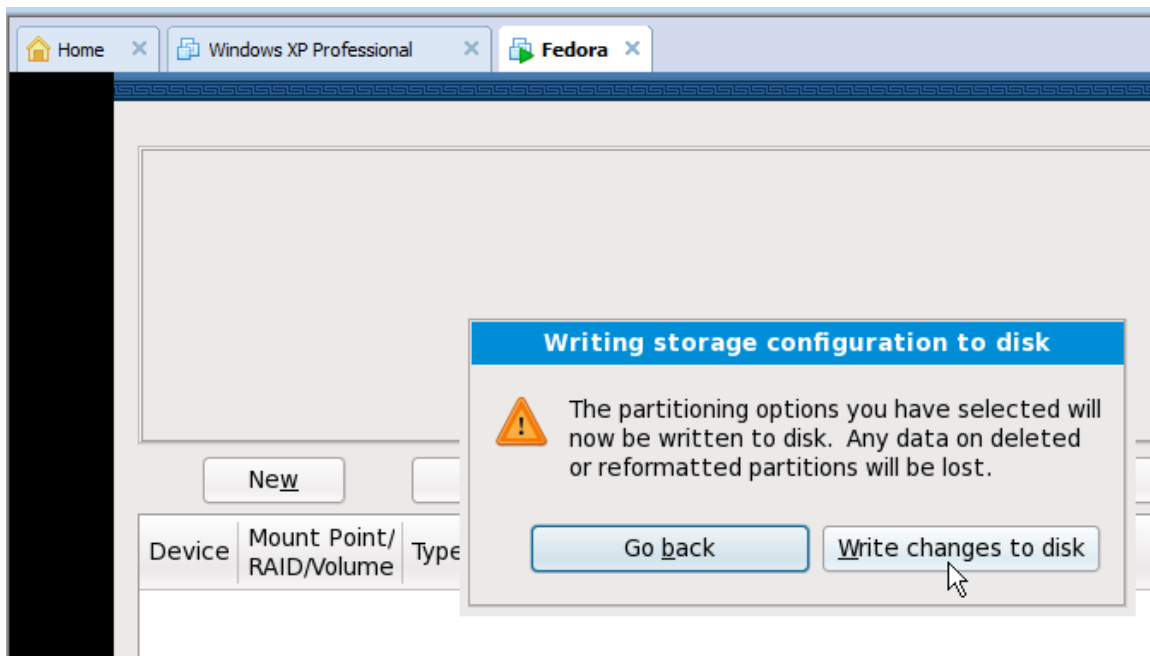
- Click New button again to create the root partition



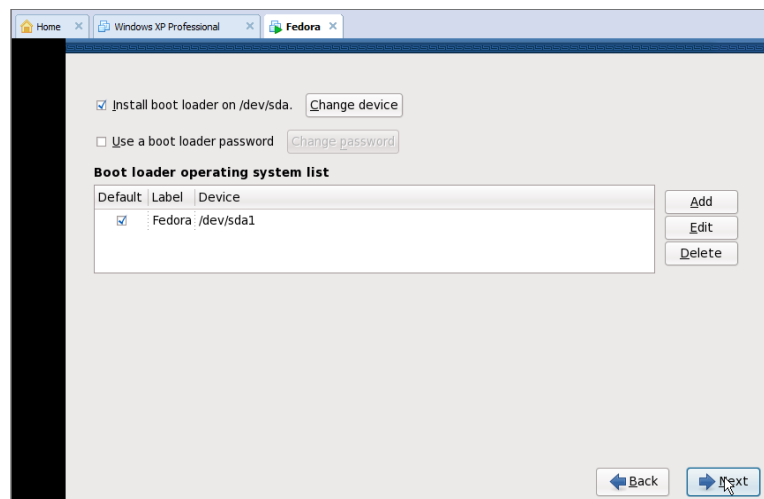
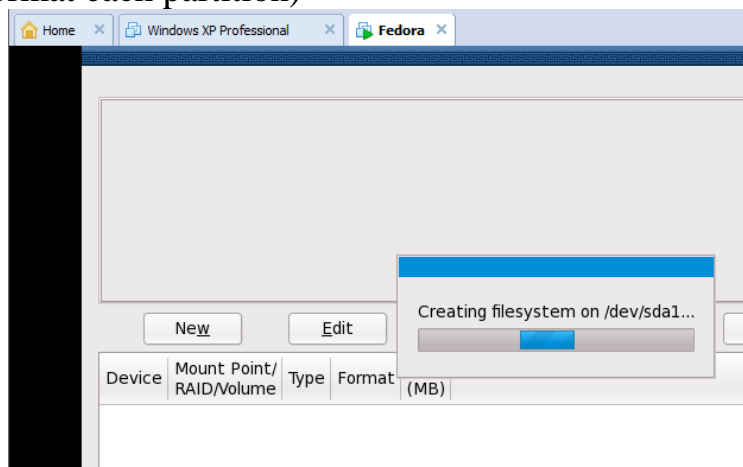
- Click OK button the create root partition

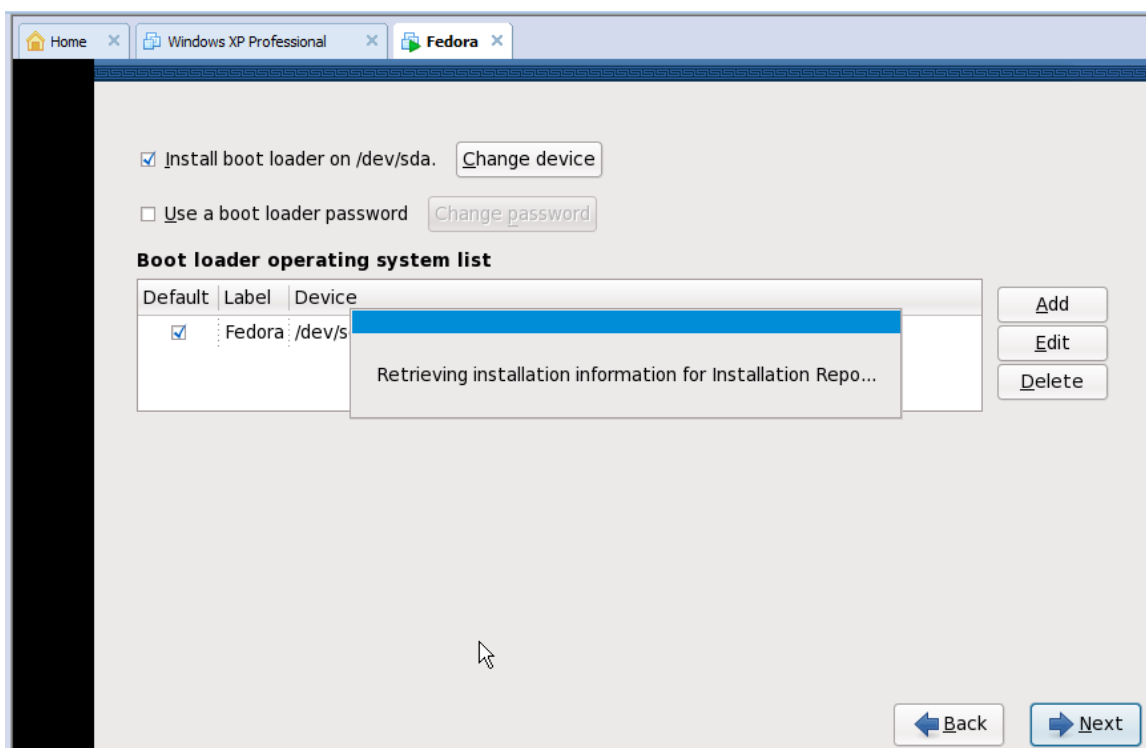


- Click Next Button

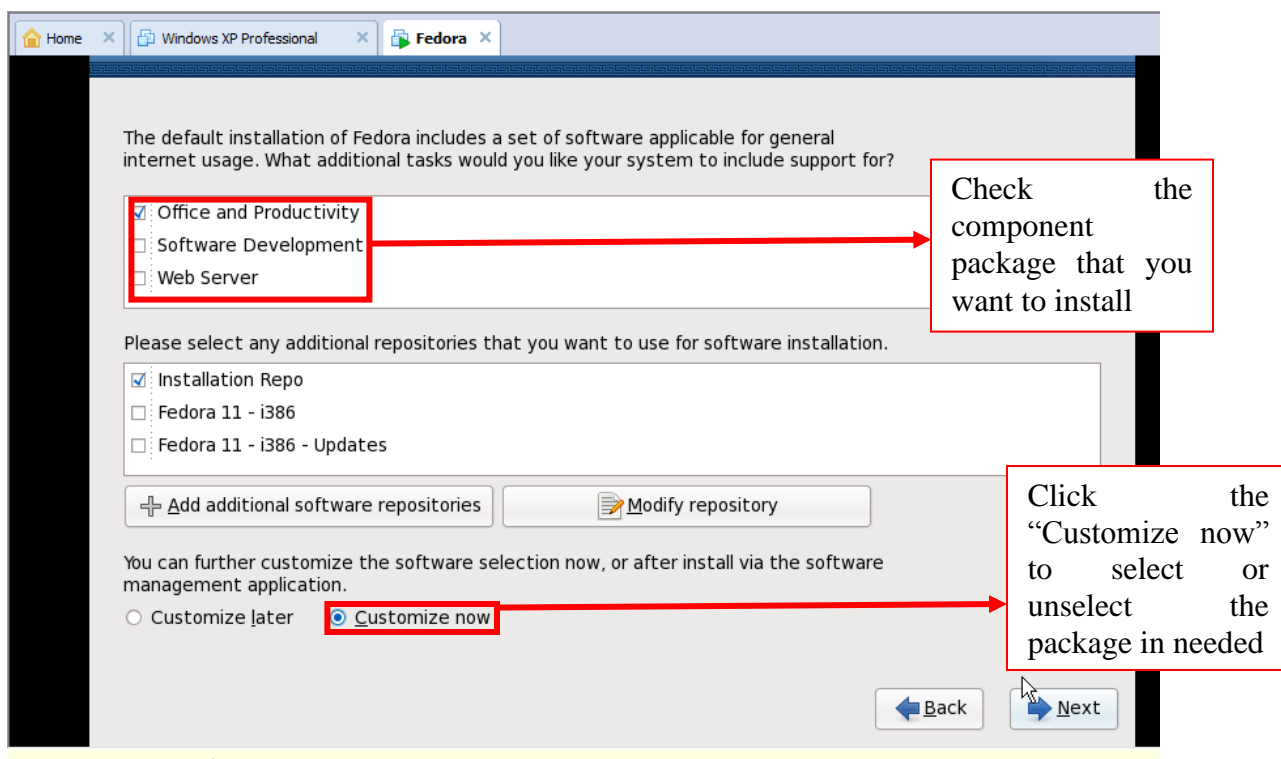


- Click “Write changes to disk” to valid the changing (same as partition and format each partition)

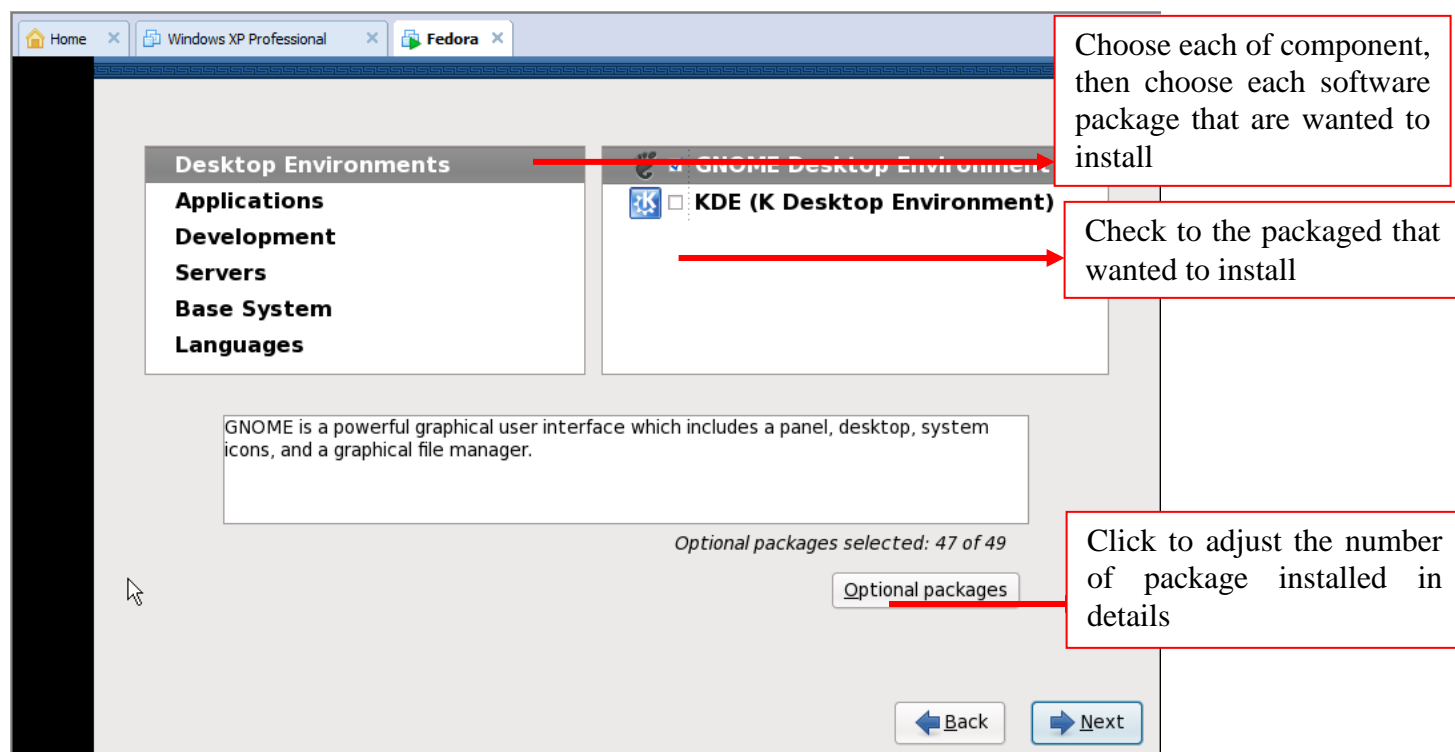




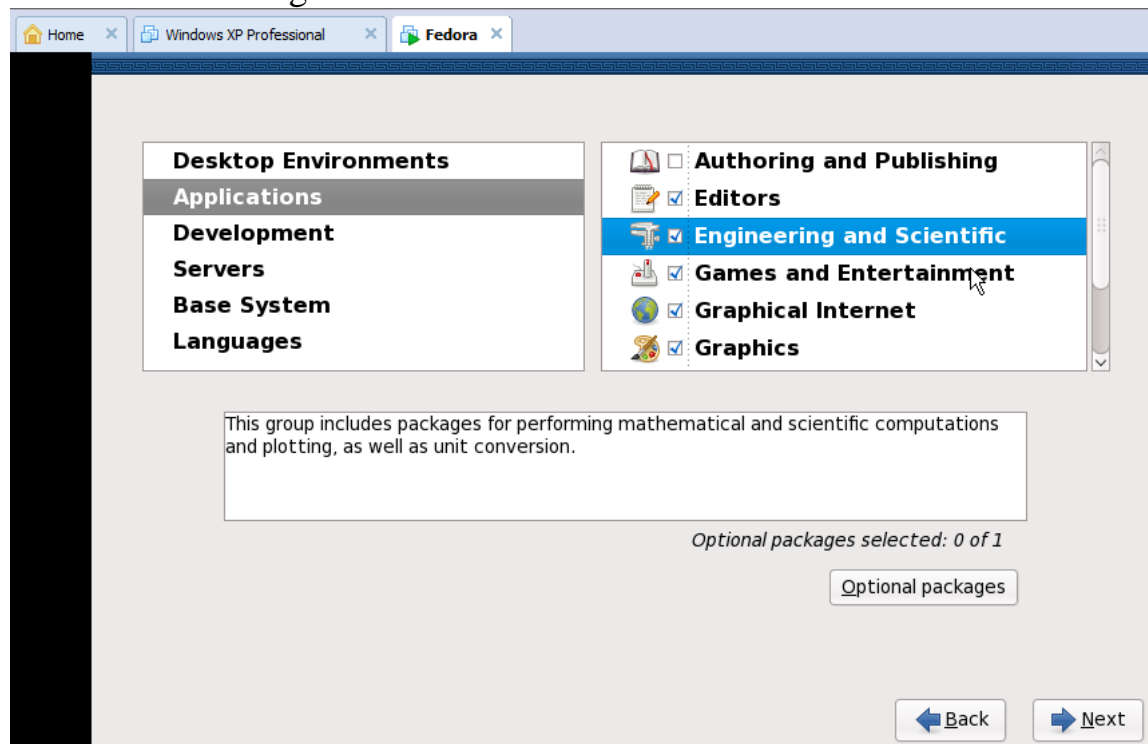
- Click Next Button to choose the software/component installed

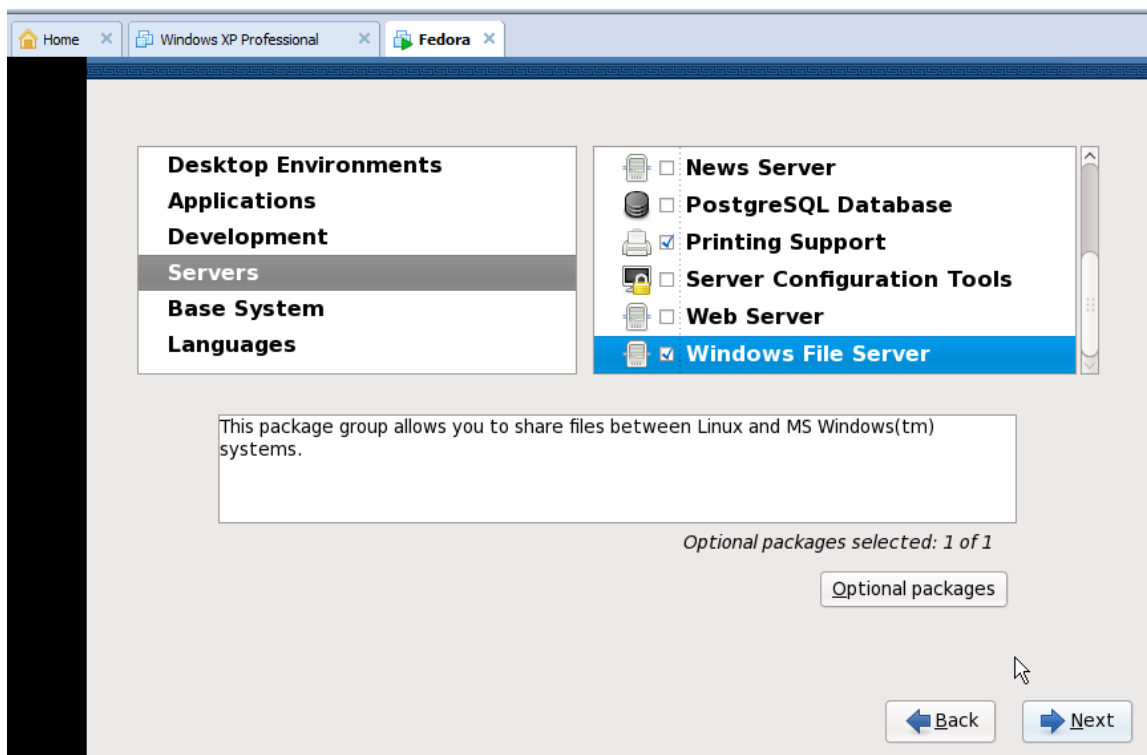
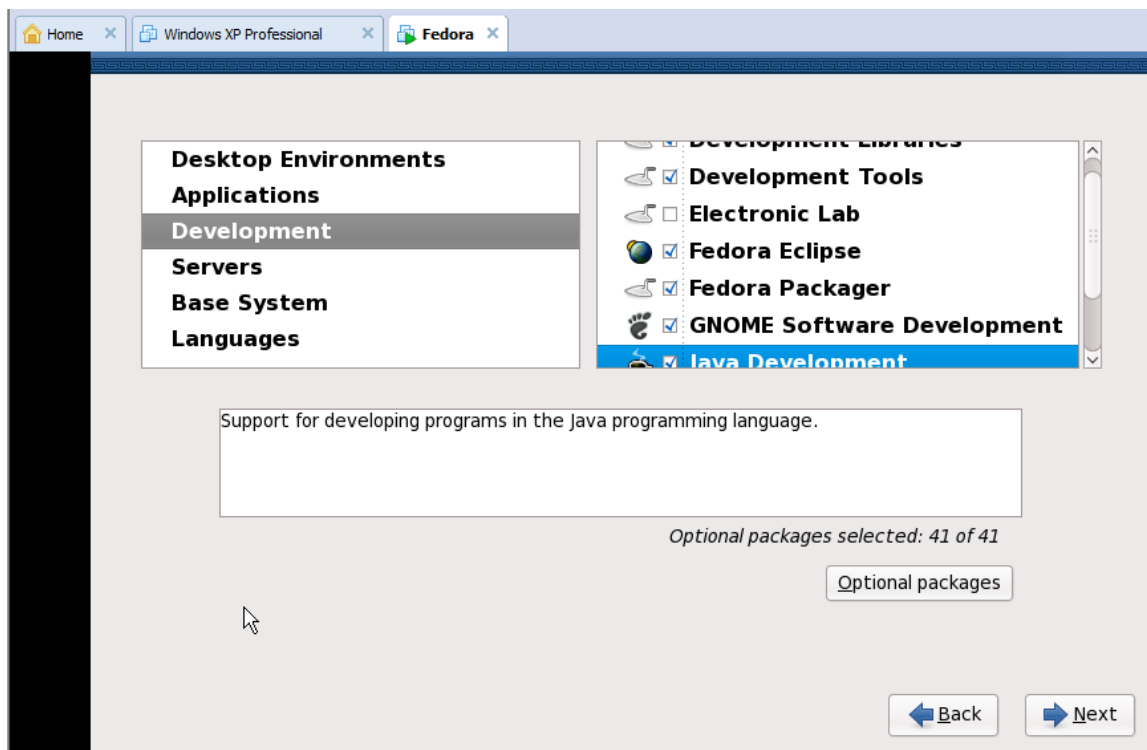


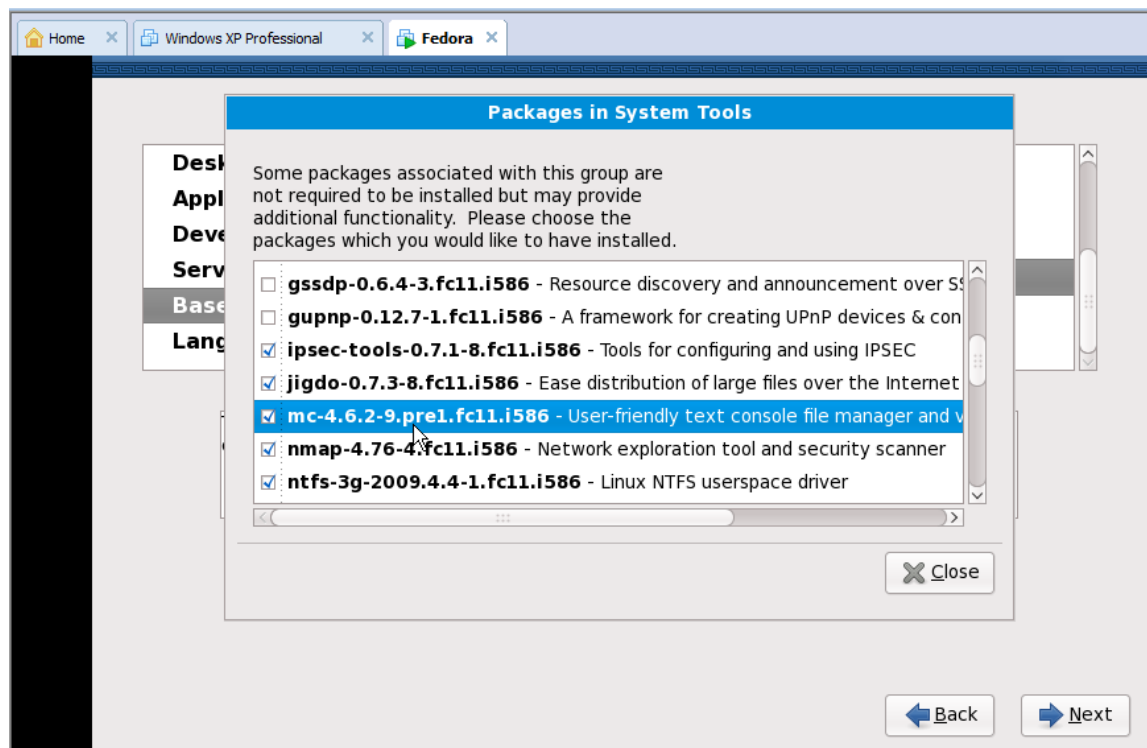
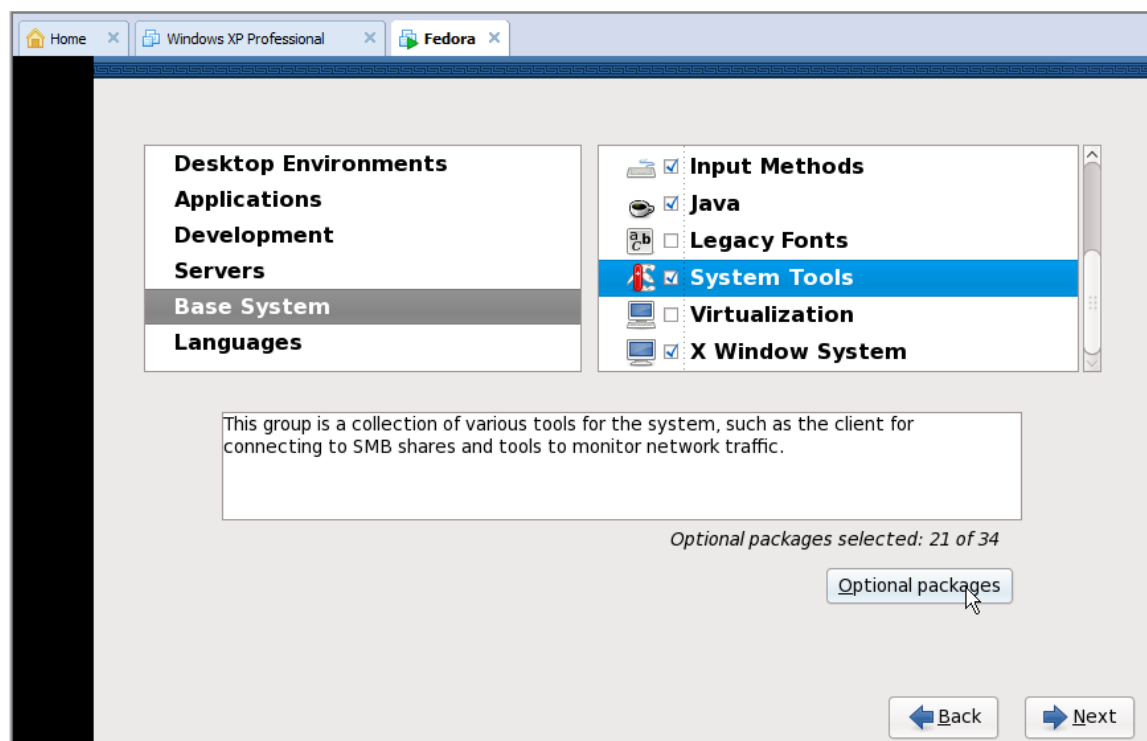
- Click Next Button to process

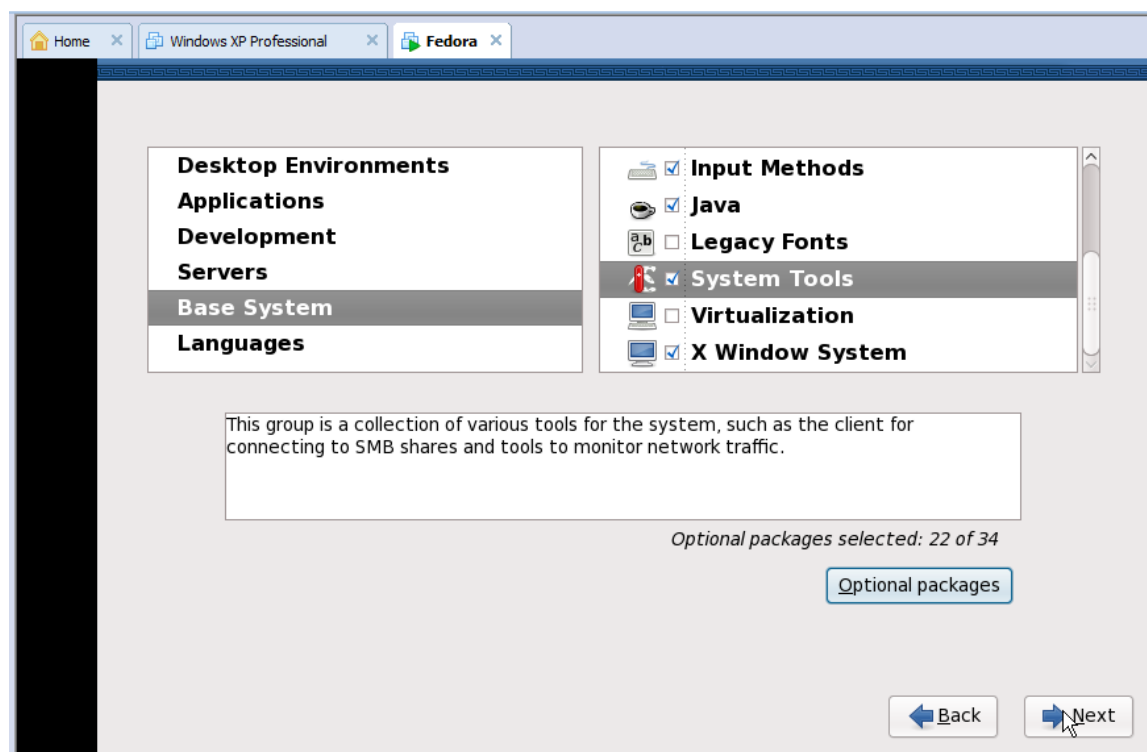


- Click Next Button to process
- **Notes:** must choose the **package mc****** in **System Tools** to install the midnight commander

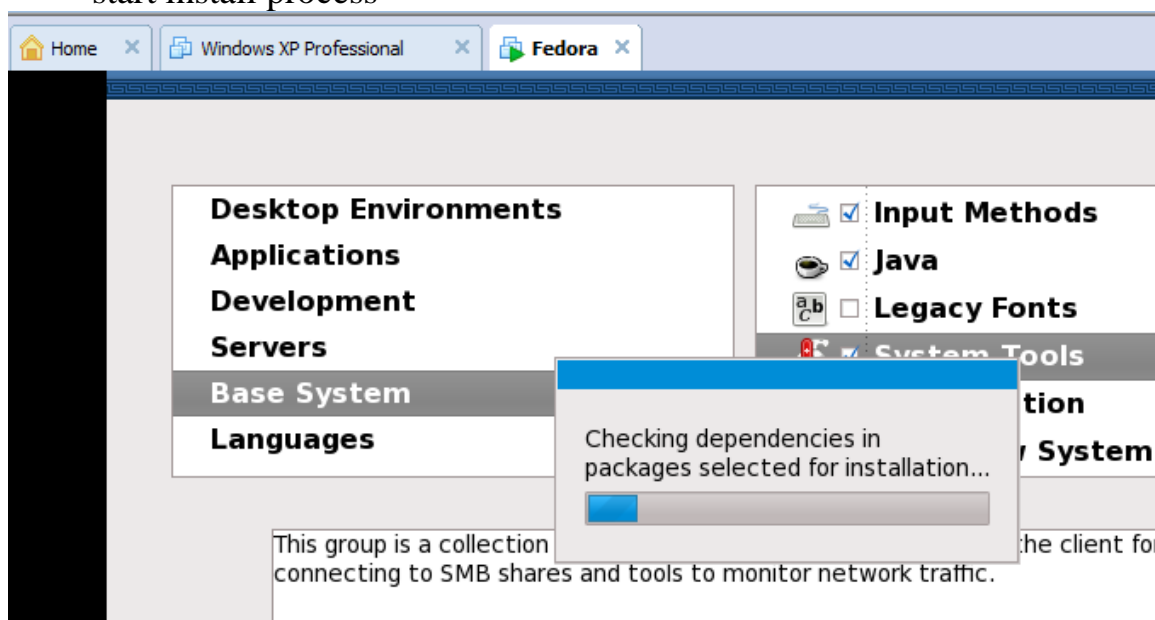


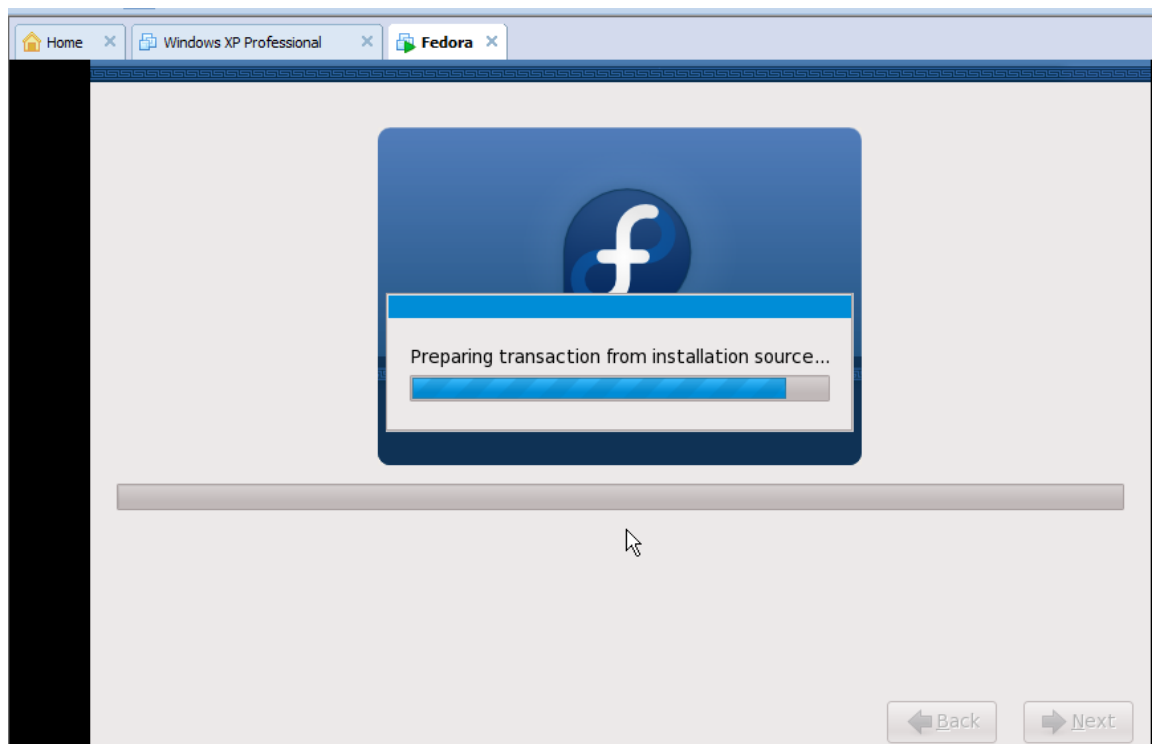
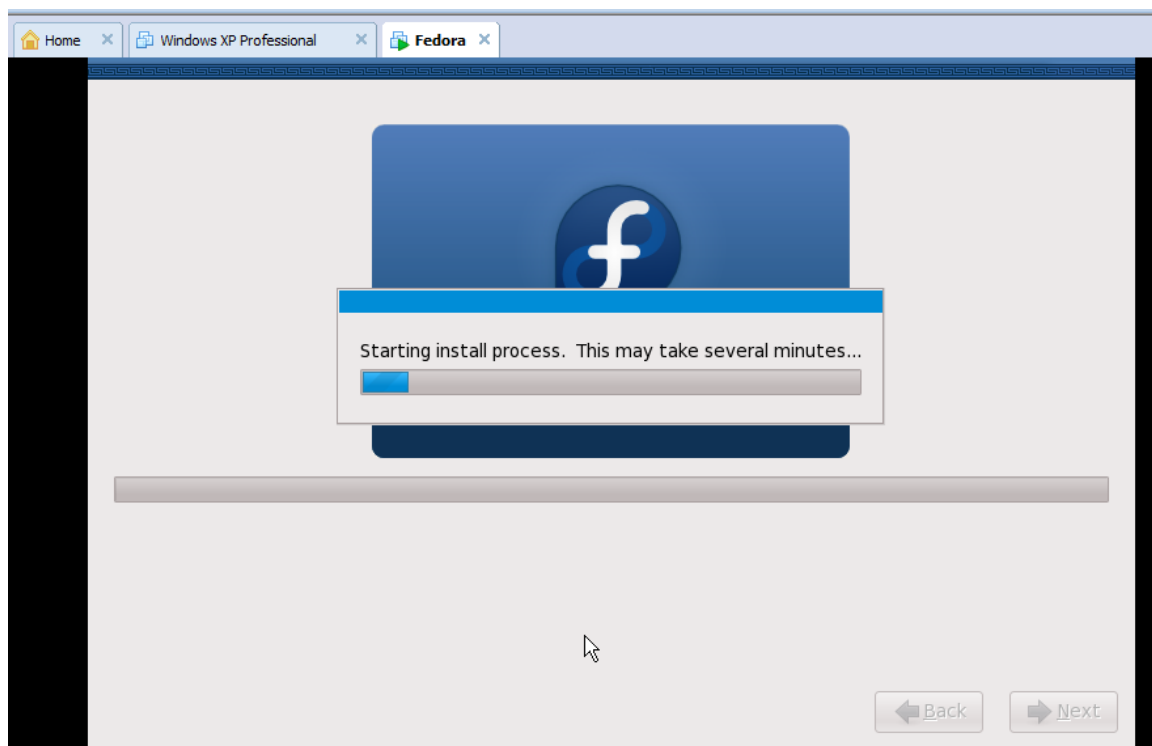


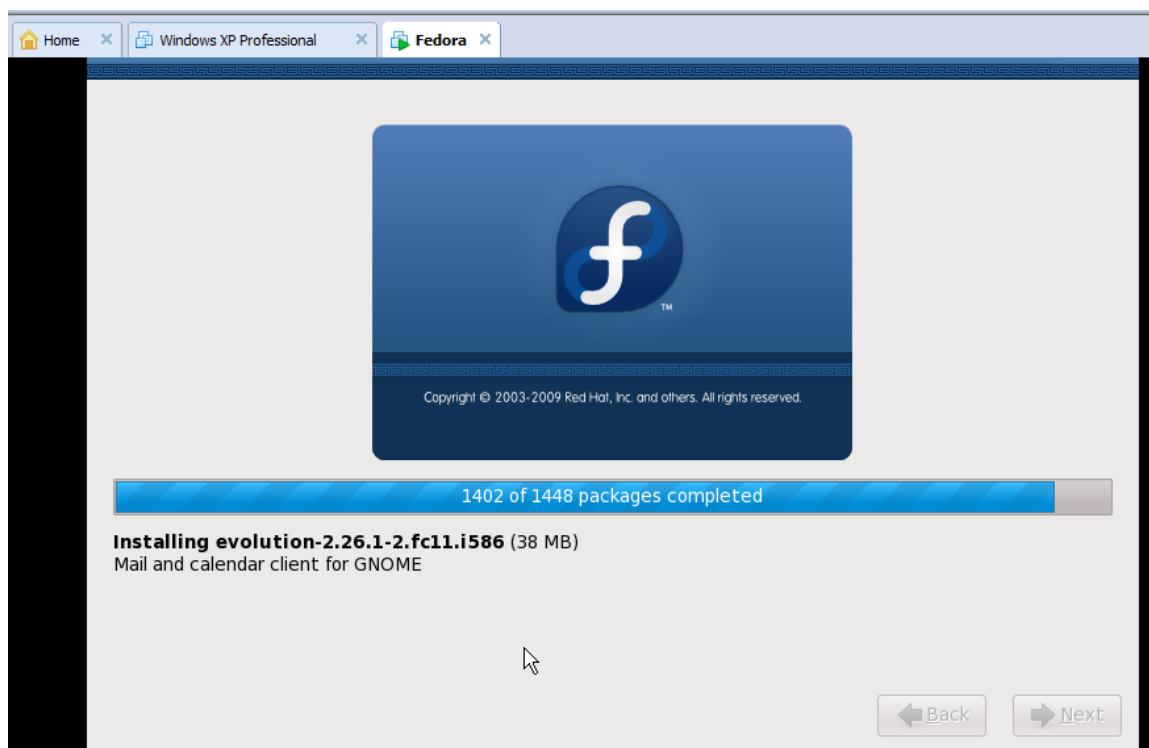
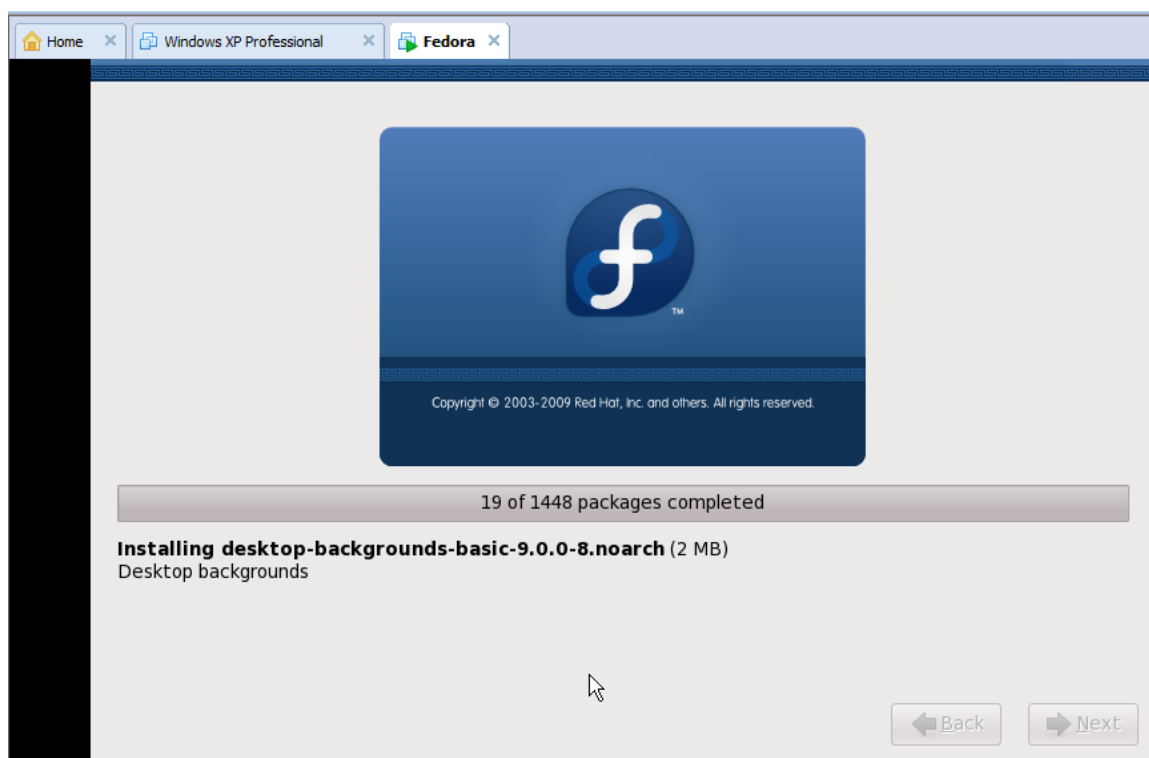


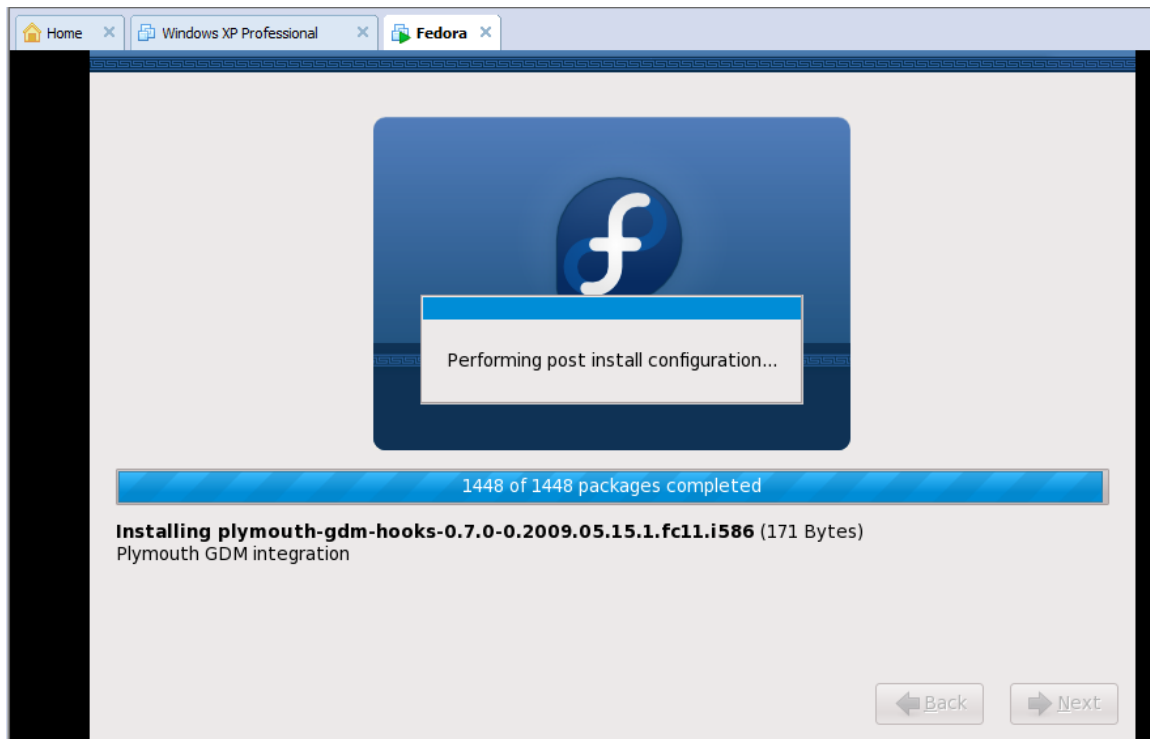


- **Recommended:** should be choose the “Office and Produce” and “Software Development”. Then, read carefully the appropriate software package to choose installing. In the “System Tools” package of “Base Systems” Component, add the “mc” – midnight commander. Click Next Button to start install process





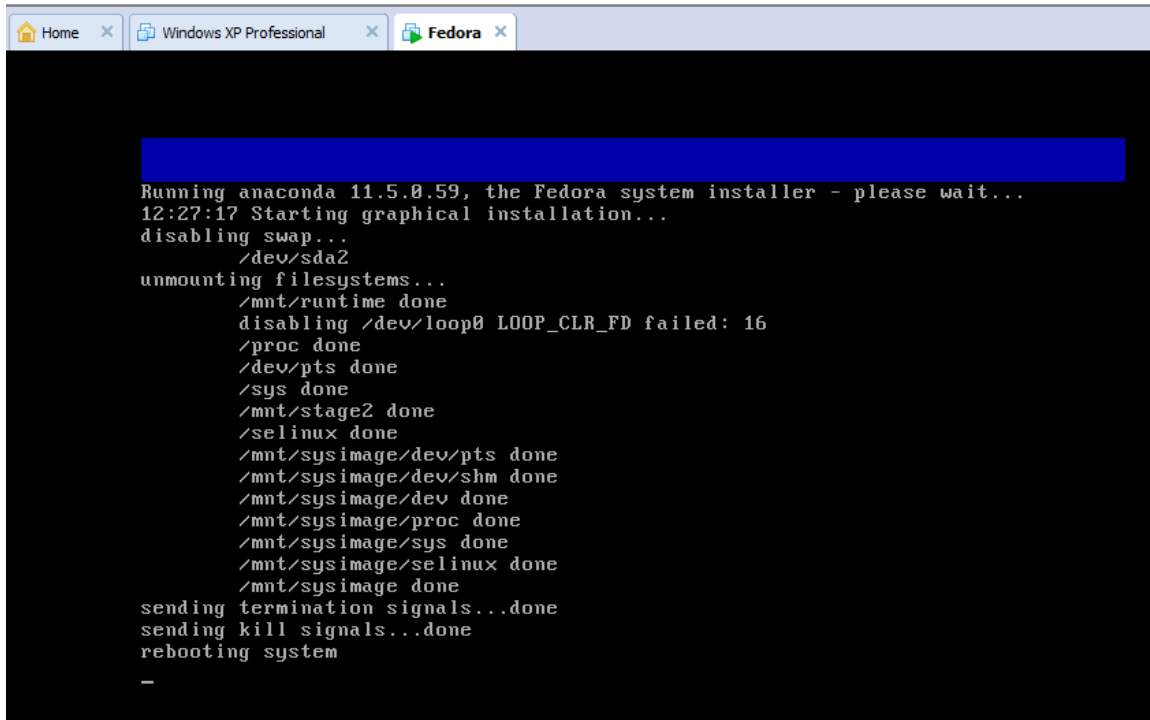




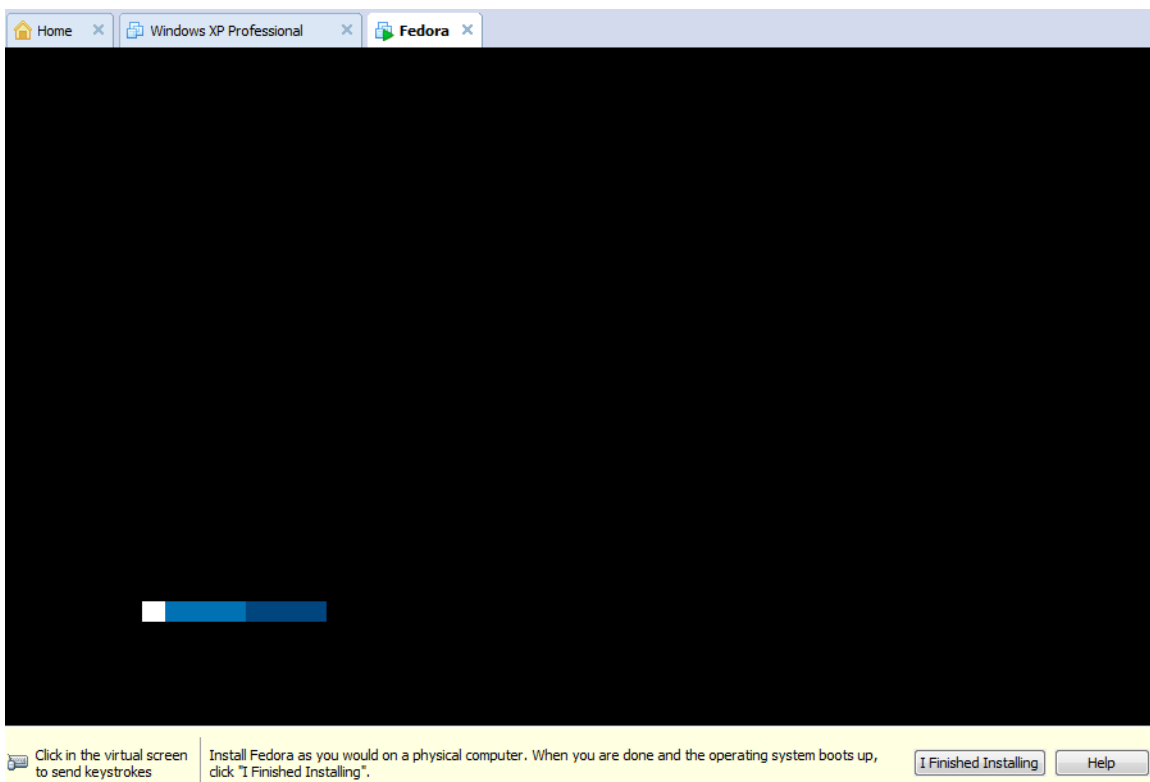
- Click Reboot Button to finish the Installation OS and start the OS first time

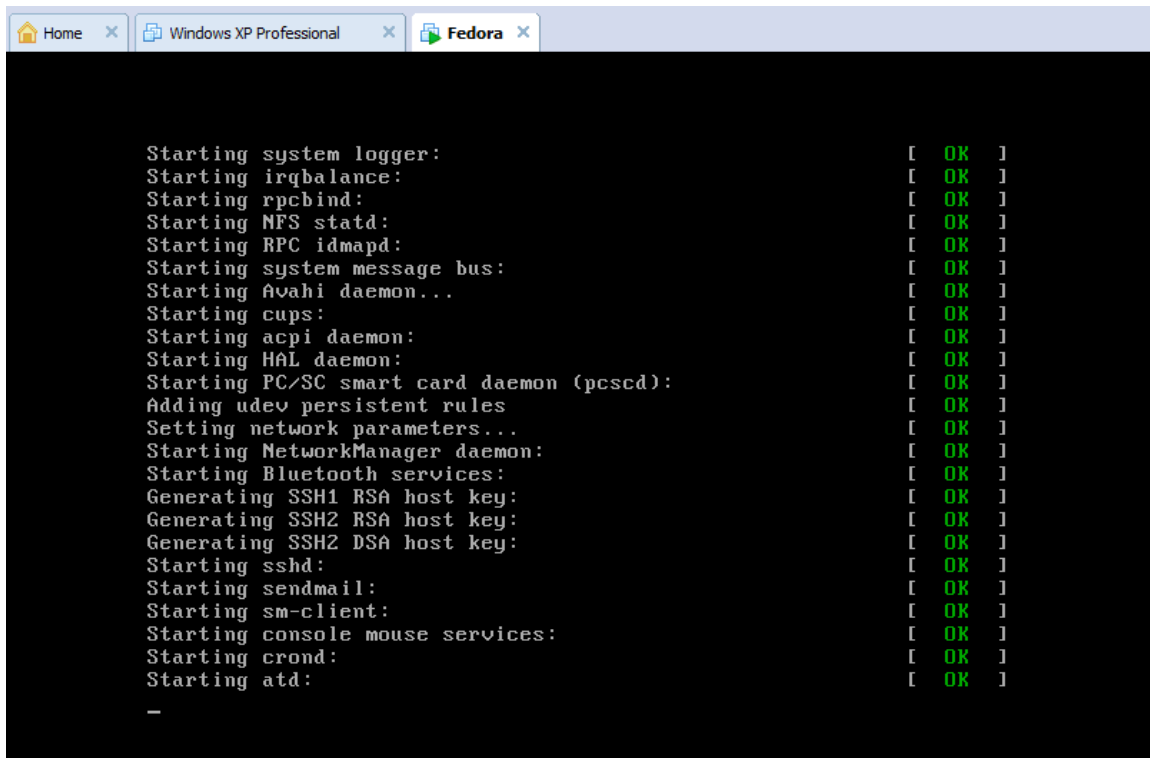
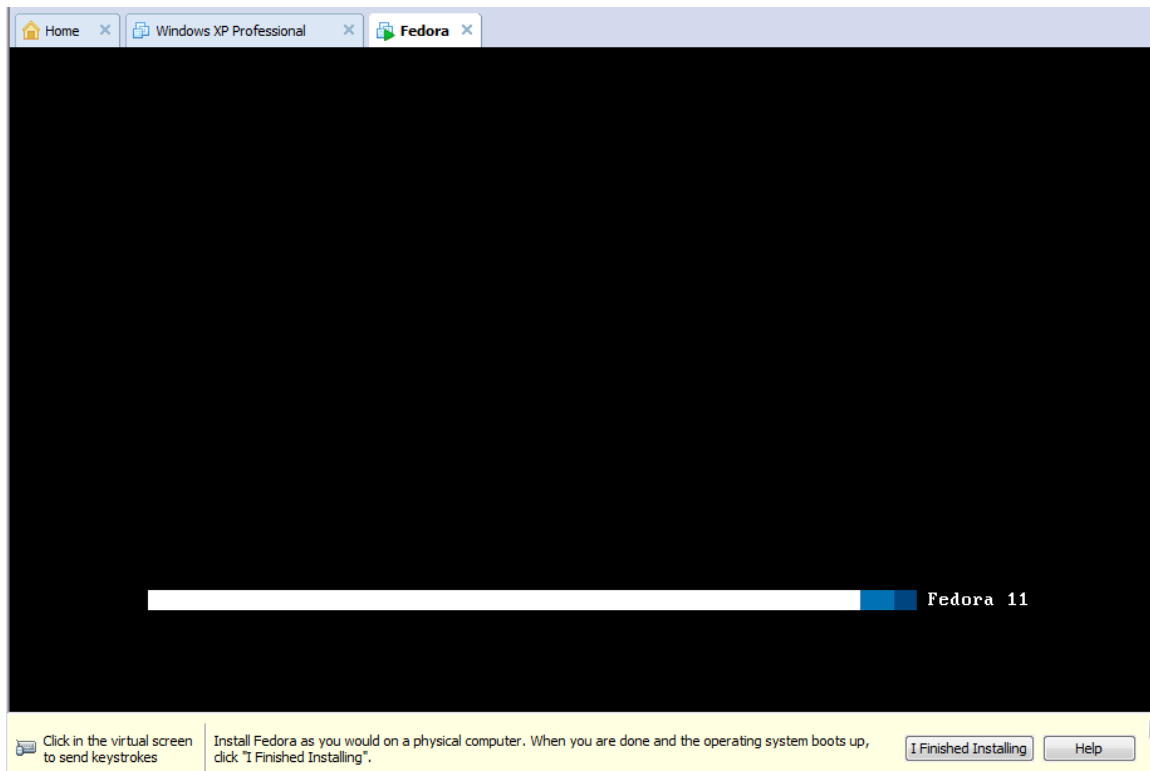
How to use the Fedora OS

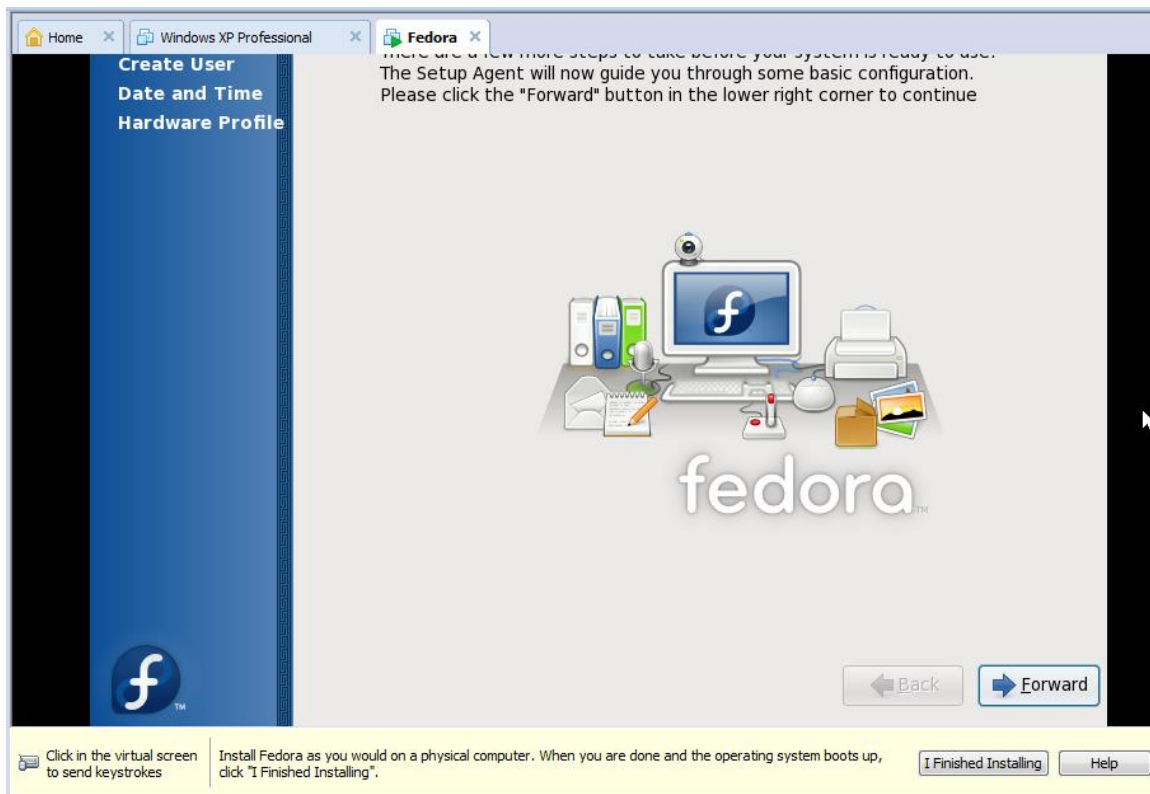
- Starting the OS in first time



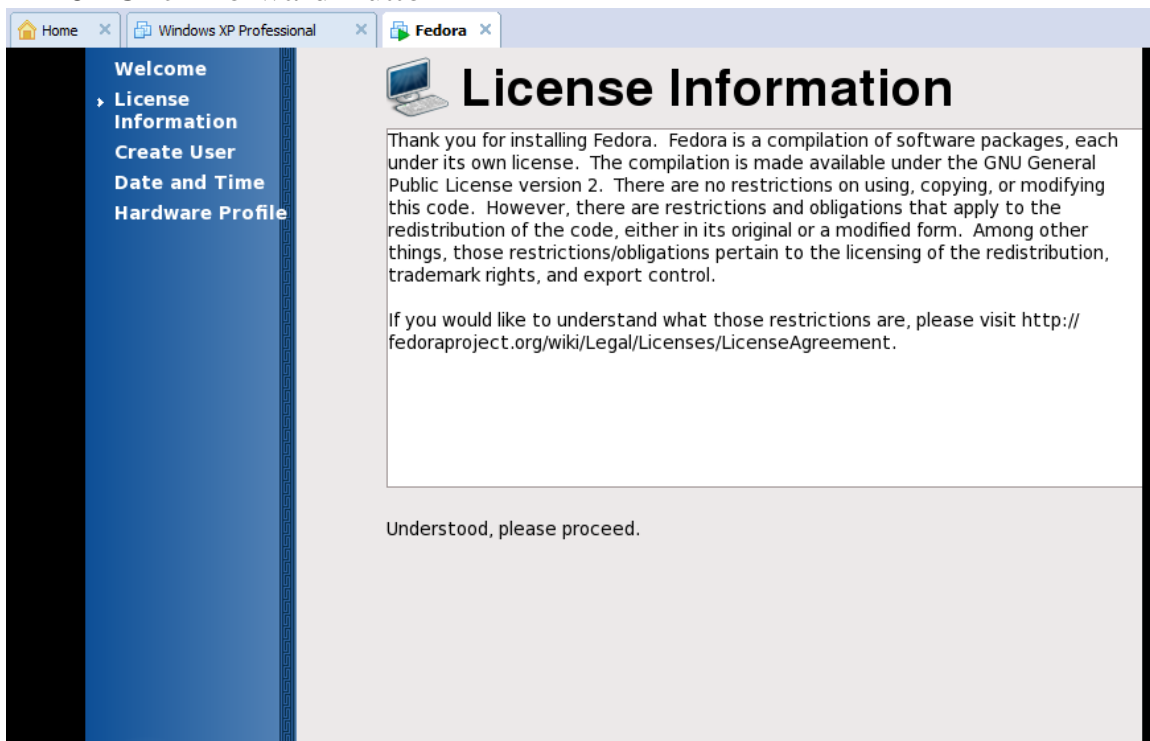
```
Running anaconda 11.5.0.59, the Fedora system installer - please wait...
12:27:17 Starting graphical installation...
disabling swap...
/dev/sda2
unmounting filesystems...
/mnt/runtime done
disabling /dev/loop0 LOOP_CLR_FD failed: 16
/proc done
/dev/pts done
/sys done
/mnt/stage2 done
/selinux done
/mnt/sysimage/dev/pts done
/mnt/sysimage/dev/shm done
/mnt/sysimage/dev done
/mnt/sysimage/proc done
/mnt/sysimage/sys done
/mnt/sysimage/selinux done
/mnt/sysimage done
sending termination signals...done
sending kill signals...done
rebooting system
—
```



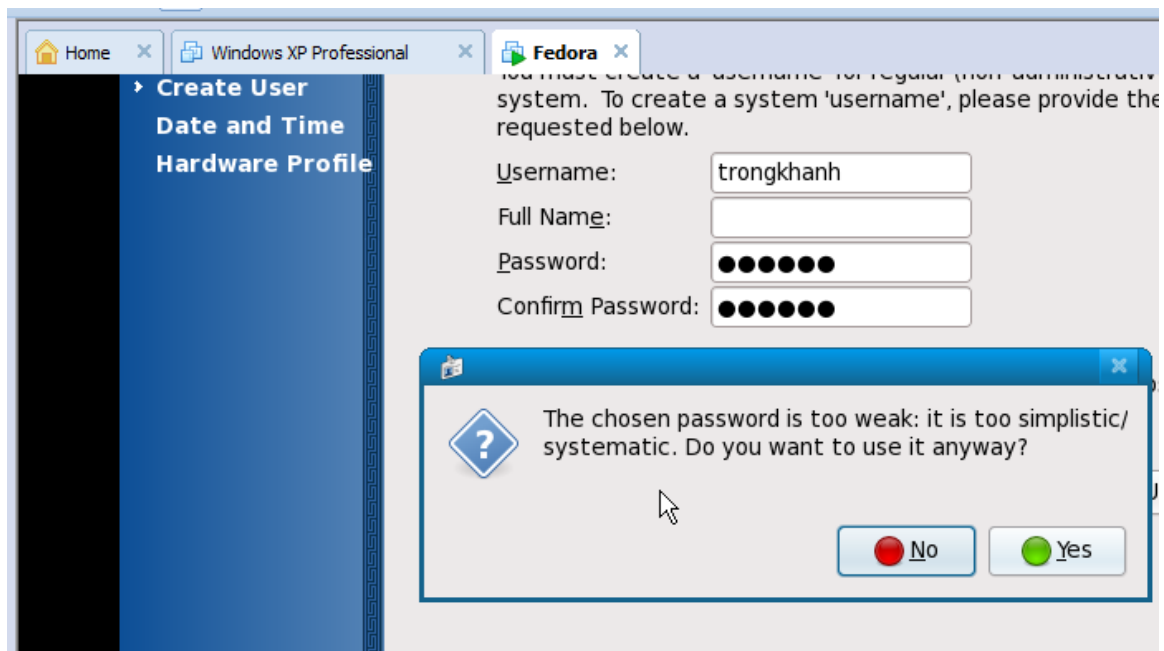




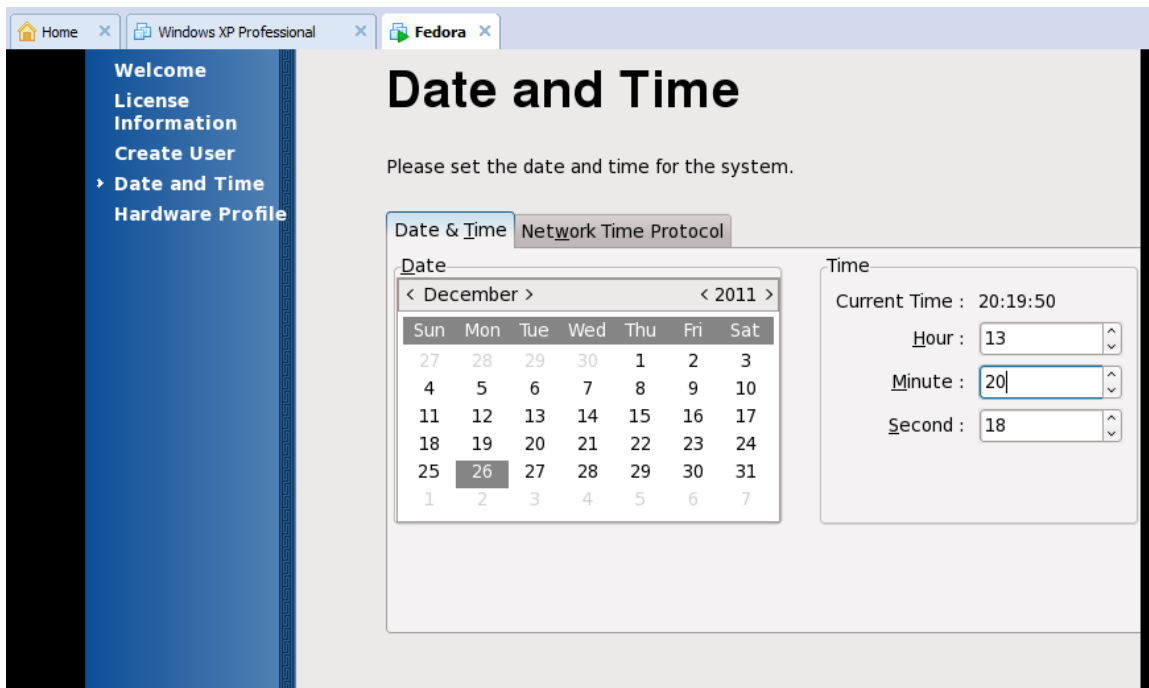
- Click Forward Button



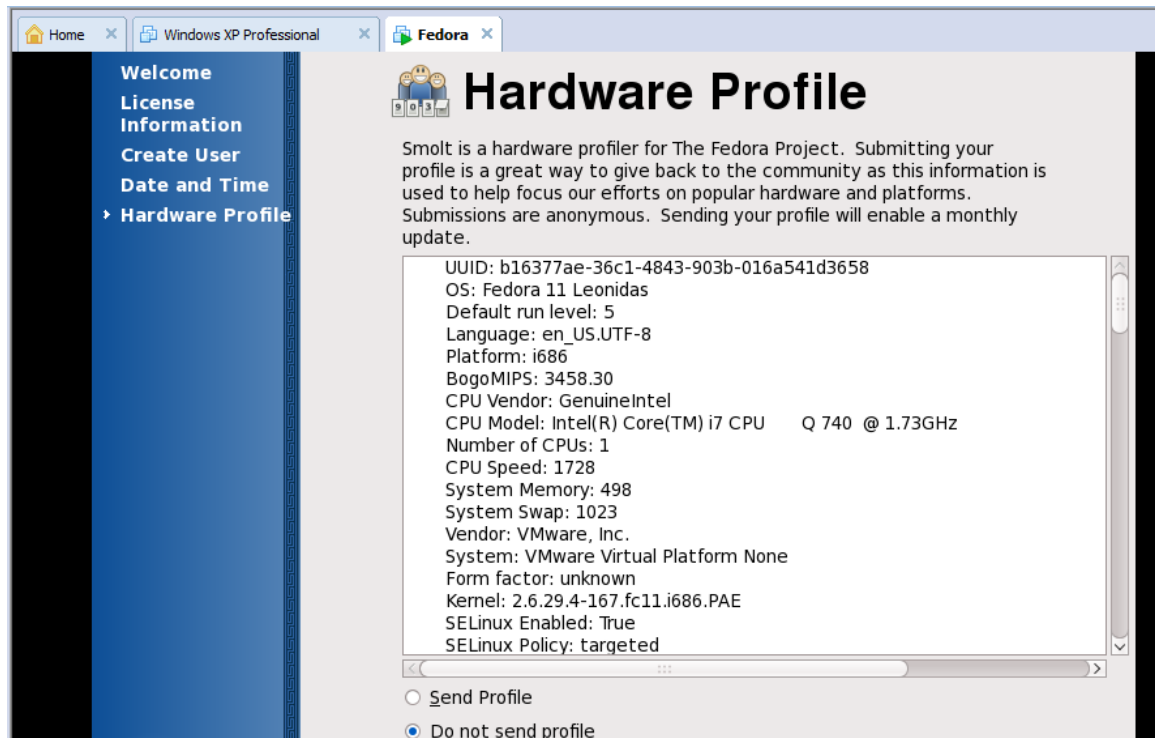
- Click Forward Again to create the user that can access the OS

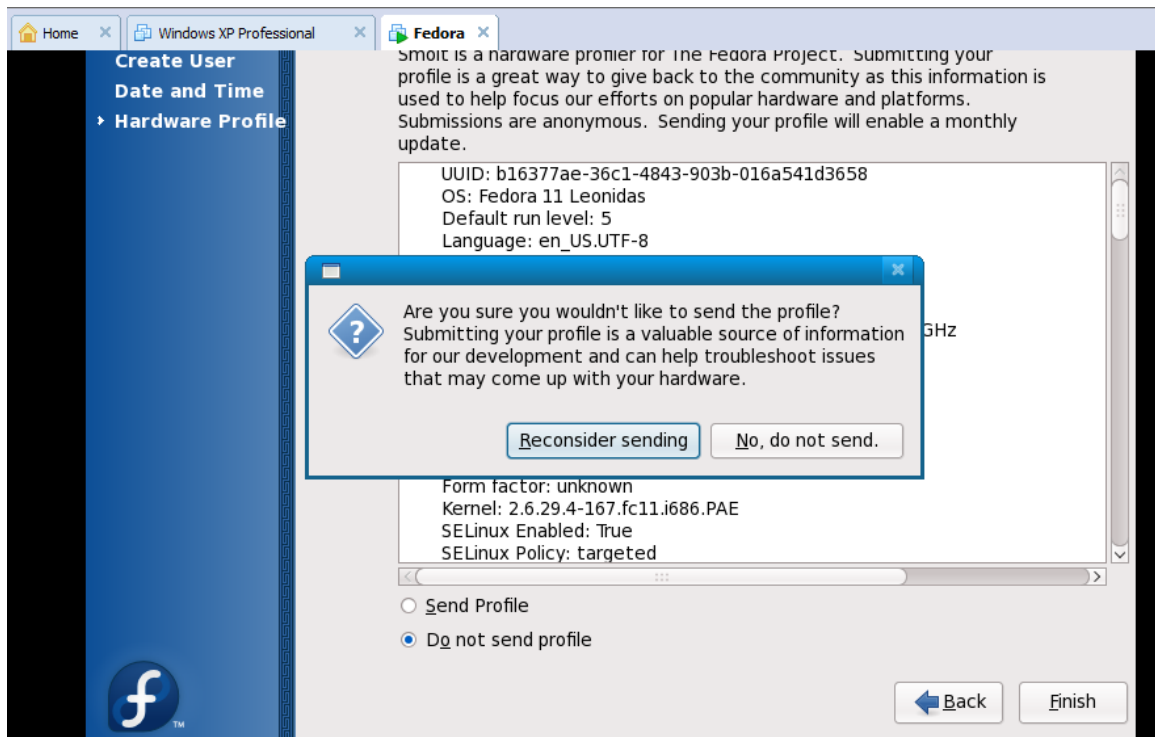


- Fill the Username, Full Name, Password, Confirm password. Then click Forward Button to setup the time

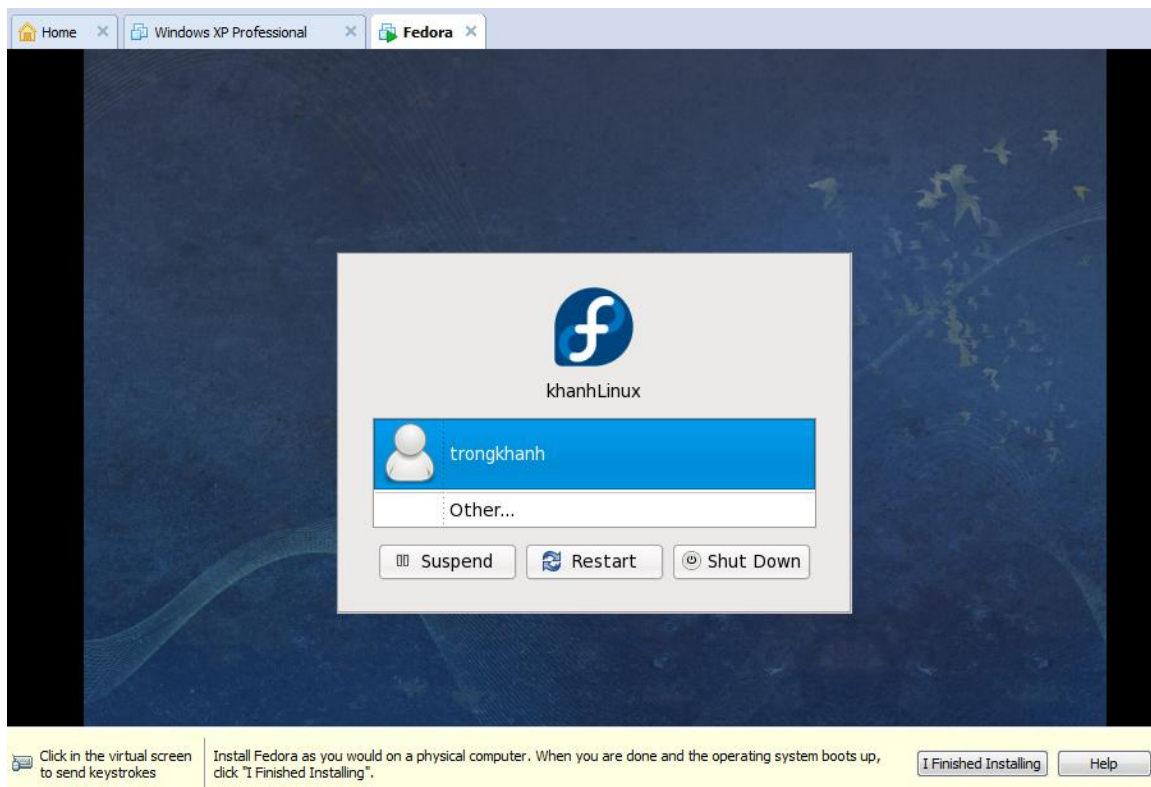


- Choose the correctly time. Then, click Forward Button

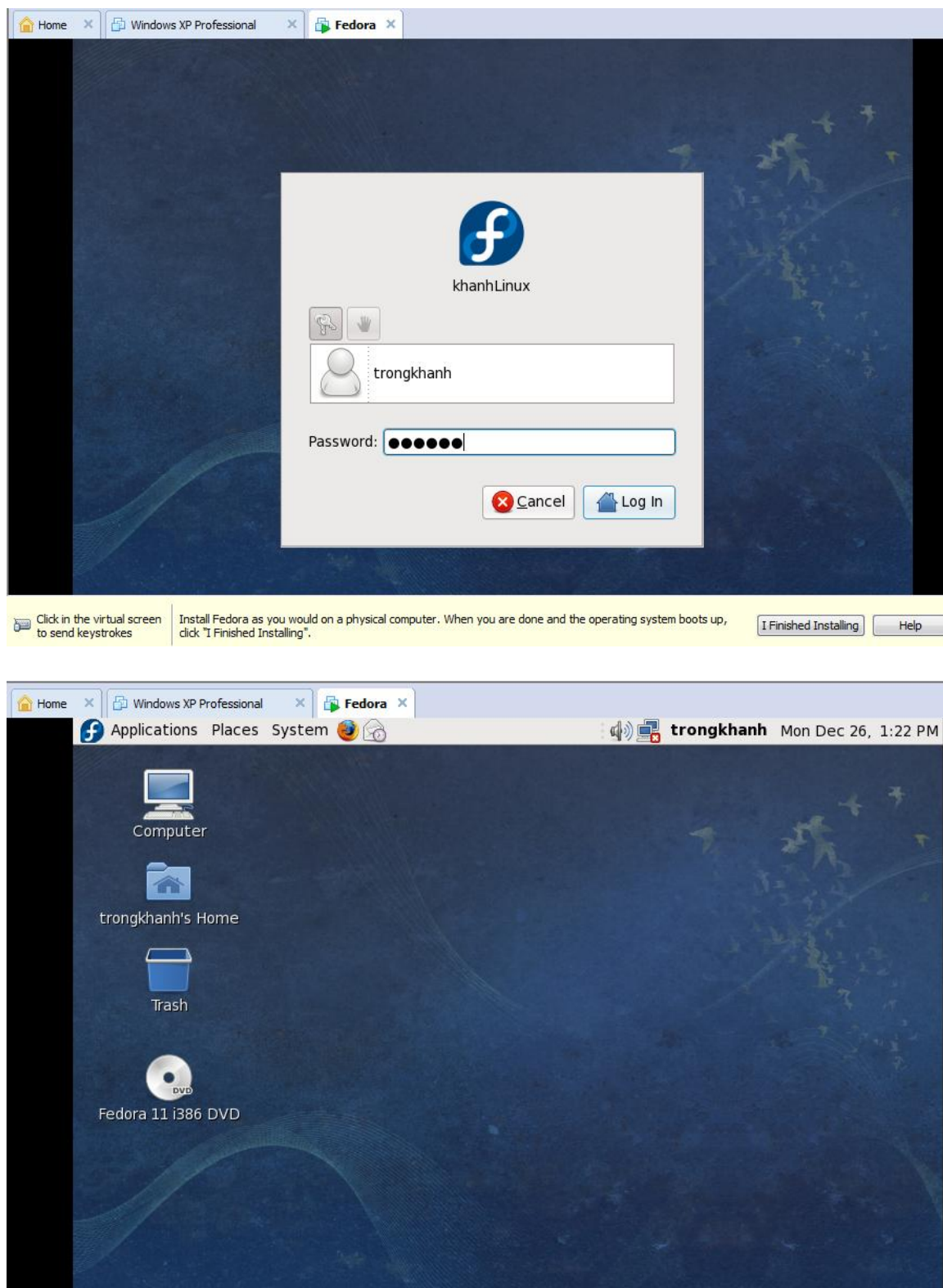




- Click Finish



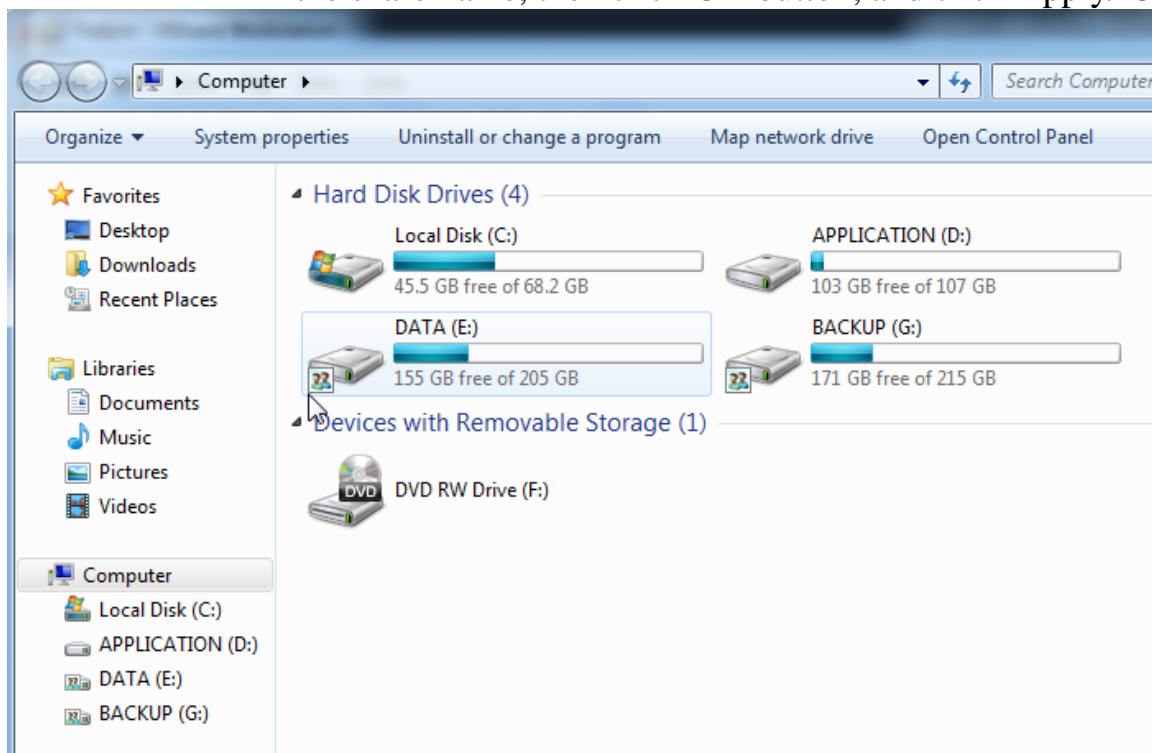
- Click the account, then type the password (press Enter or click Login) to access the OS

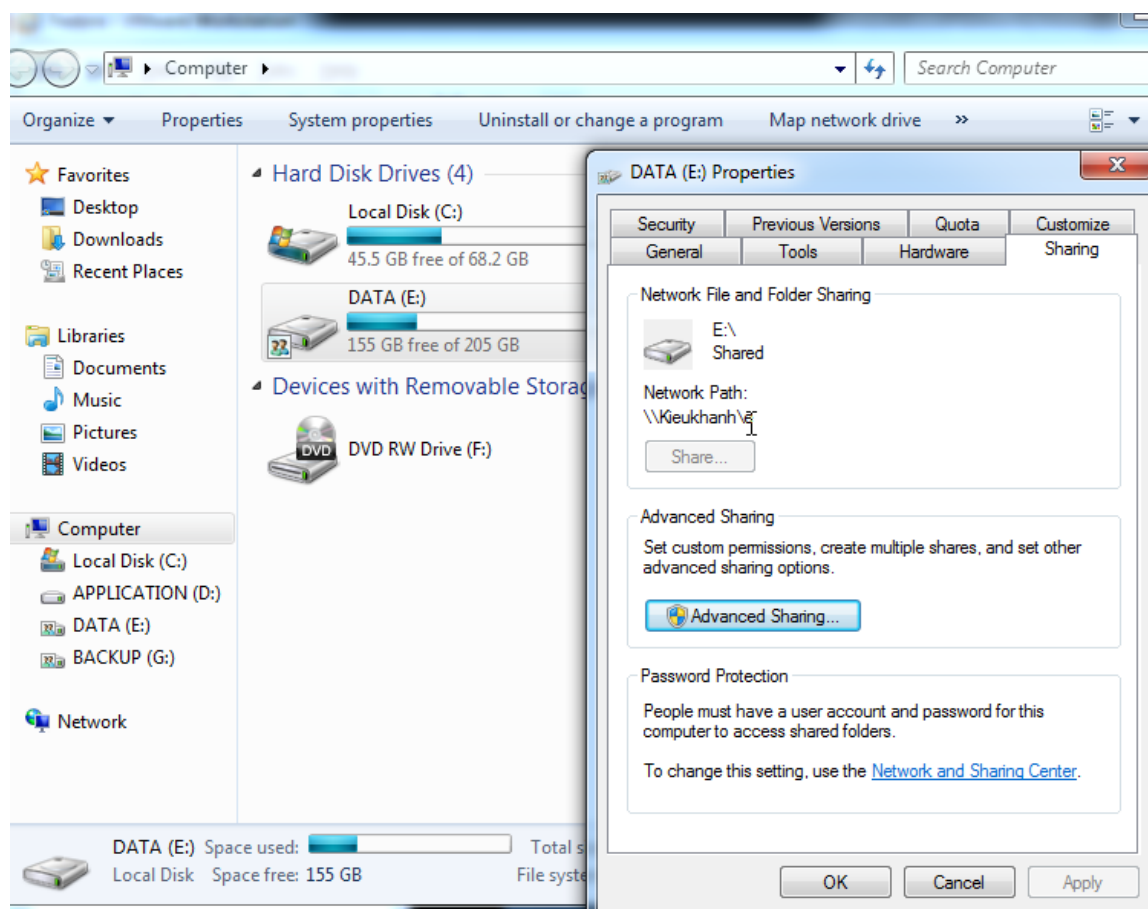


- Try to use it (depend on the Windows OS experiments)

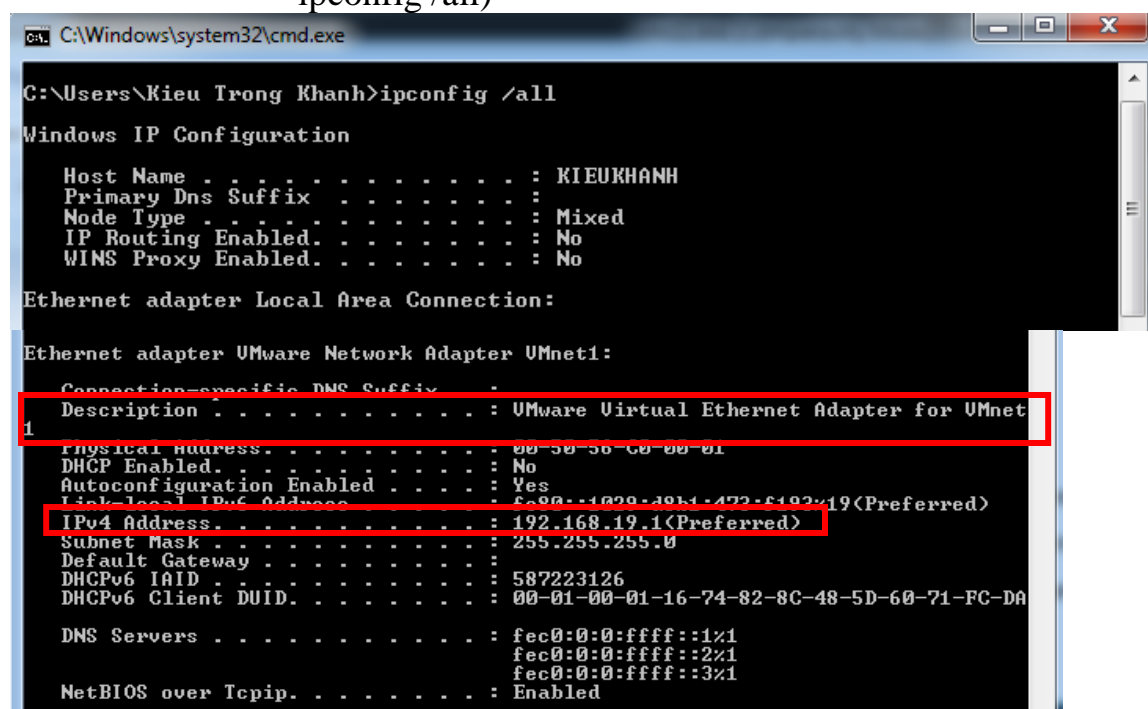
Learning to use the mc, terminal in Fedora OS, and setting up the addition program, networking ... for OS

- Connect to real machine to access the shared hard disk
 - In windows,
 - Set password to the Administrator account (using Administrative Tools/ Computer Management/ Choose Local Users and Groups/ Choose Users/ Right click on Administrator, then choose Set Password ...)
 - Create the shared disk or folder with alias name (right click on disk or folder/ Click Properties/ Choose the Sharing tab/ Click Advanced Sharing Button/ check the “Share this folder” checkbox – notes take the share name, then click OK button, and click Apply/ OK)





- Get the IP config of the VMnet1 that is used to type the “Server” Item of “Connect to Server” in Fedora (using cmd, then type ipconfig /all)



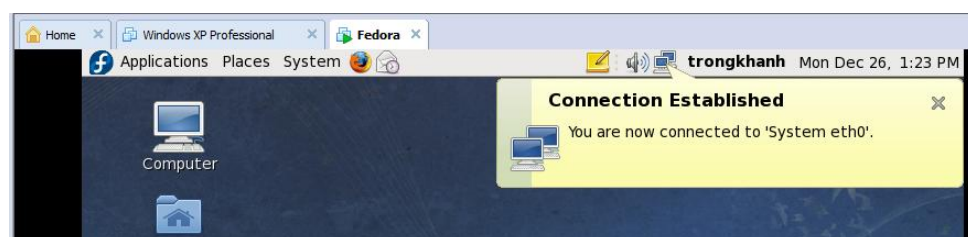

```
Ethernet adapter VMware Network Adapter VMnet8:
Connection-specific DNS Suffix . : 
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet
8
Physical Address. . . . . : 00-50-56-C0-00-08
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::1900:2282:9c3c:4c61%20<Preferred>
IPv4 Address. . . . . : 192.168.189.1<Preferred>
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 
DHCPv6 IAID . . . . . : 604000342
DHCPv6 Client DUID. . . . . : 00-01-00-01-16-74-82-8C-48-5D-60-71-FC-DA

DNS Servers . . . . . : fec0:0:0:ffff::1%1
                       fec0:0:0:ffff::2%1
                       fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled

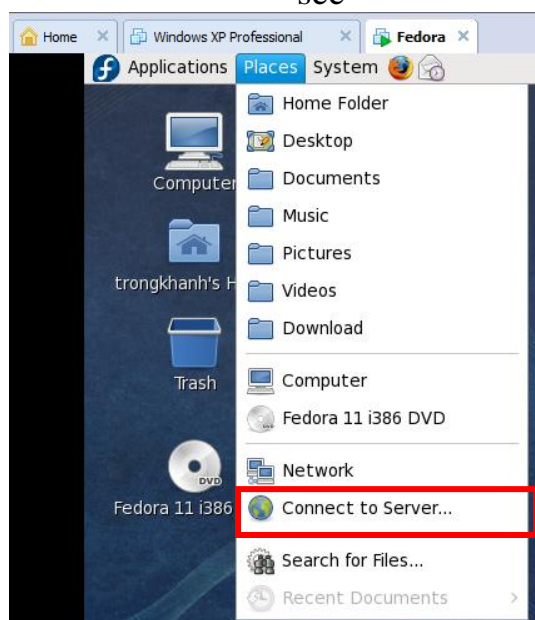
Tunnel adapter isatap.{9E593E4D-44E1-4344-B9FC-633479684855}:

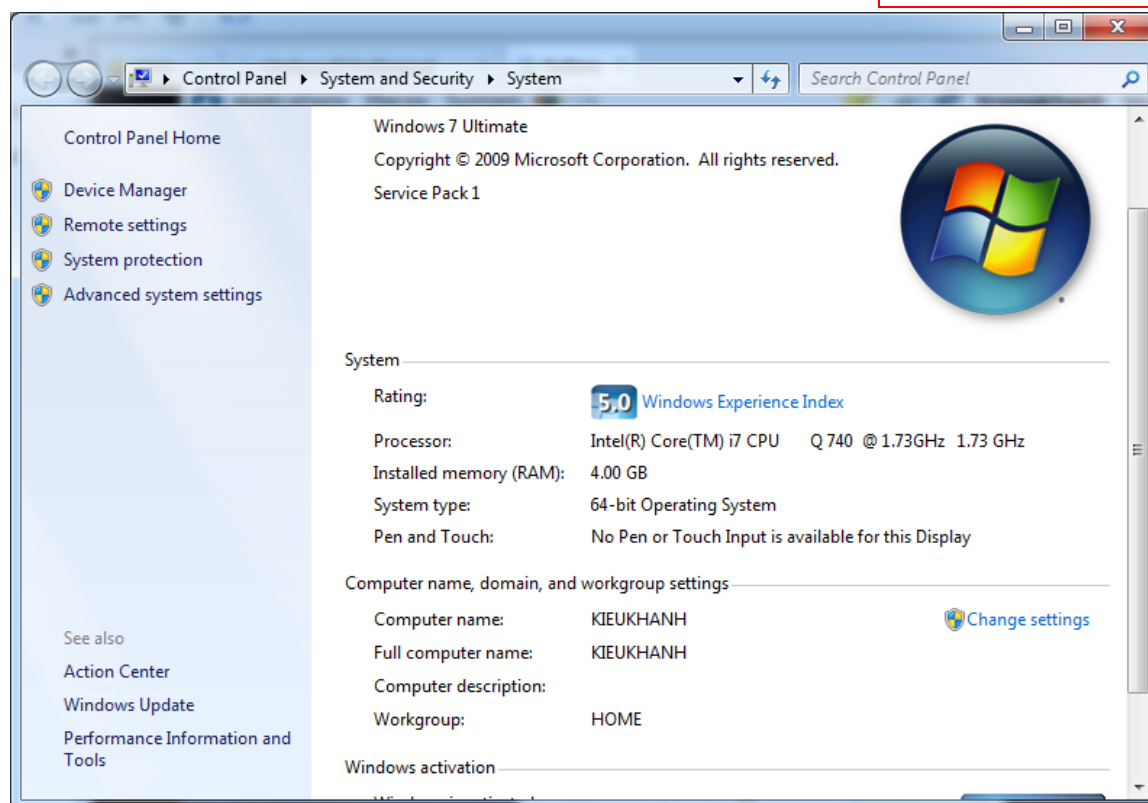
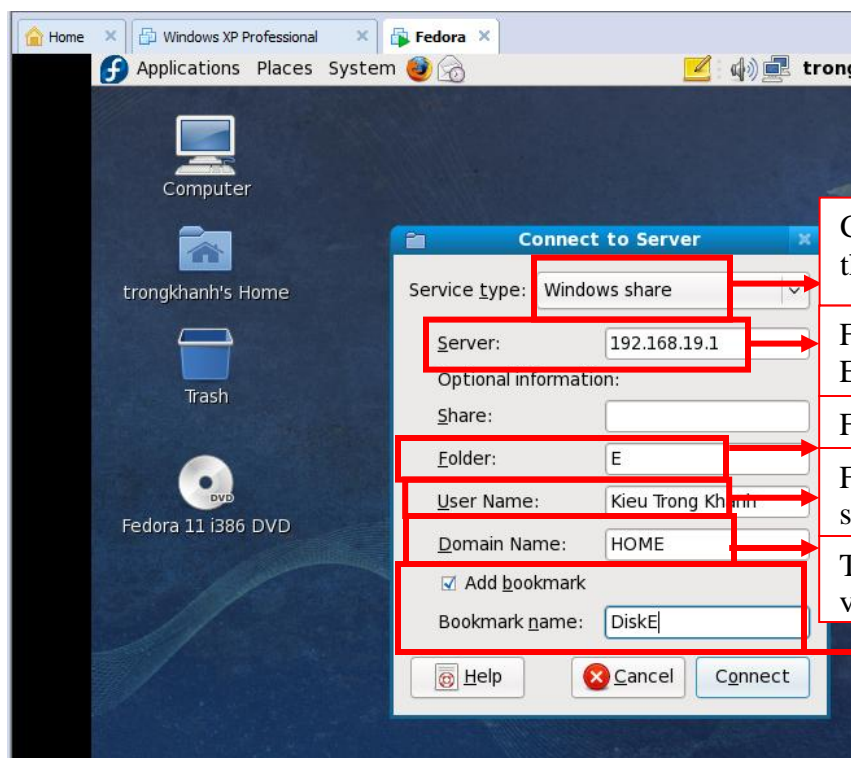
```

- In the Fedora, access the shared disk or folder as following
 - Connect or active the connection

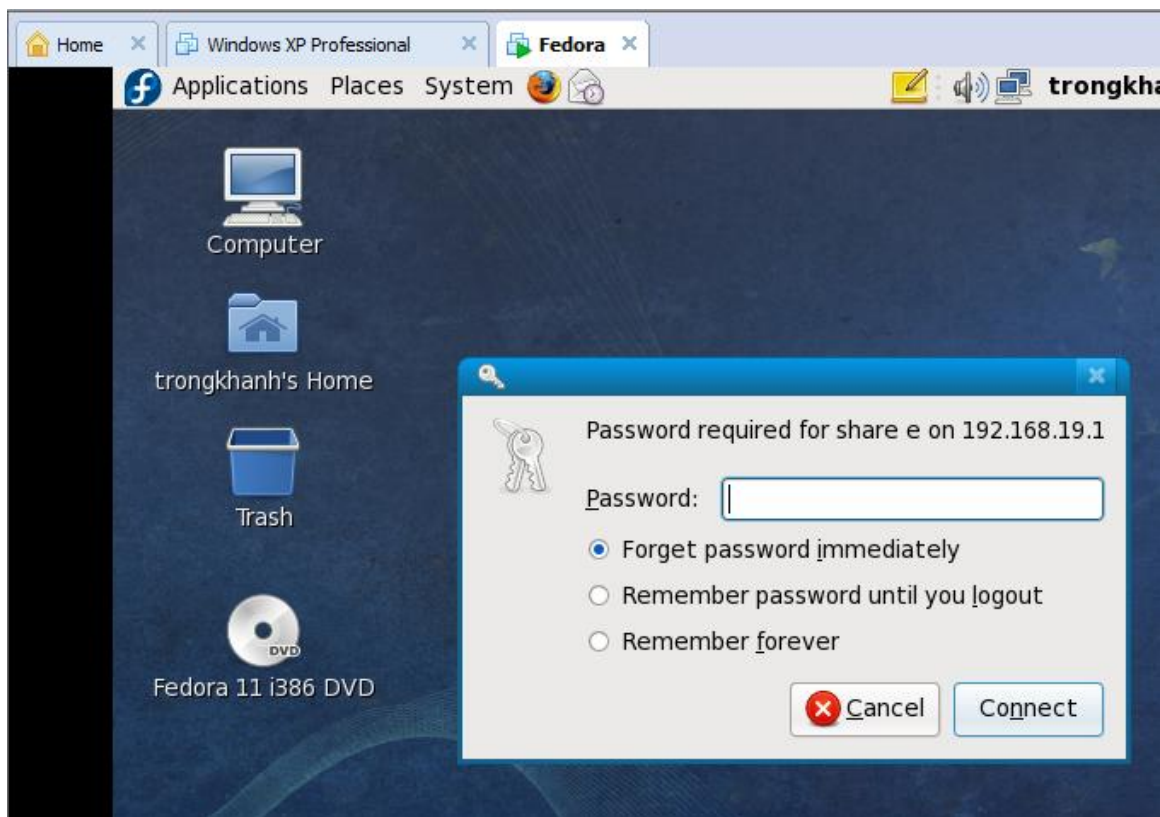


- Choose Place in taskbar, click the “Connect to Server” item, we can see

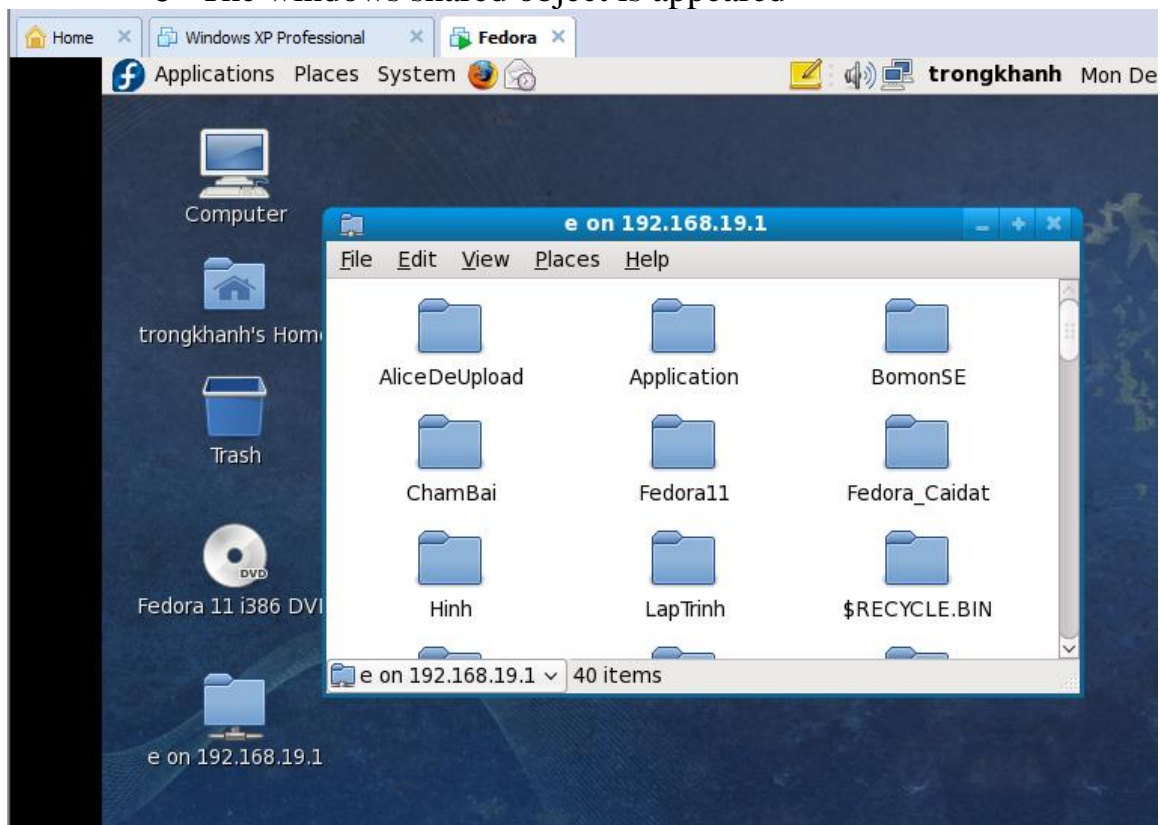




- Click Connect Button
- Typing the password of username can be access the shared object, press Enter key



- The windows shared object is appeared



- Using the command prompt of Fedora
 - Choose the “Application” menu on the taskbar

- `-o` option represent to place output in file filedestination, the default is to put an executable file in out extension (*.out)
- `-c` option represent to compile or assemble the source files, but do not link
- `-g` option represent to produce debugging information in the operating system following the native format (stabs, COFF, XCOFF, or DWARF 2)
- `-Wall`: warning
- Using the Fedora Eclipse to create the C/C++ project, compile and build
 - The Fedora Eclipse is a tool that is same as the Visual Studio of Microsoft supporting the coding tool with Java and C/C++ language
 - **Hint:** to compile, we should create the “makefile” before the building project as
 - Right click mouse on the project, choose New, click File
 - Type the file name as makefile
 - Typing the content of this file as

clean:

`rm main.o hello.exe`

hello.exe: main.o

`g++ -g -o hello main.o`

main.o:

`g++ -c -g main.cpp`

Submission

Upload **the word or pdf file** to cms describes some questions as

- Capture the terminal screen when using the `ifconfig` command in Fedora and the `ipconfig` command in command prompt in Windows
- Capture the shared windows when connecting to the windows OS's shared folder/disk in your machine (using the **File Browser with Bookmark**). The shared folder must have data files and sub folders
- Capture the **mc screen** and give your explanation about the **F7 function** in mc
- Submit **the C/C++ files and objects (*.c and *.o)** as the below content then capture the result of the program, **give your explanation** the result of this program

```
main.cpp X
|
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>

int main(){
    pid_t pChild;
    printf("The main processID is %d\n", getpid());
    pChild = fork();
    if(pChild!=0){
        printf("The parent ID of new is %d\n", getpid());
        printf("The new child ID is %d\n", pChild);
    } else {
        printf("The child Id is %d\n", getpid());
    }
}
```

Requirement

All the capture must be combination with full the windows **including your accounts on the windows and the Linux OS (if it is not, you will be taken 0 mark)**. Should be use the capture in windows with jpg format to reduce the file size with your submitting

END