

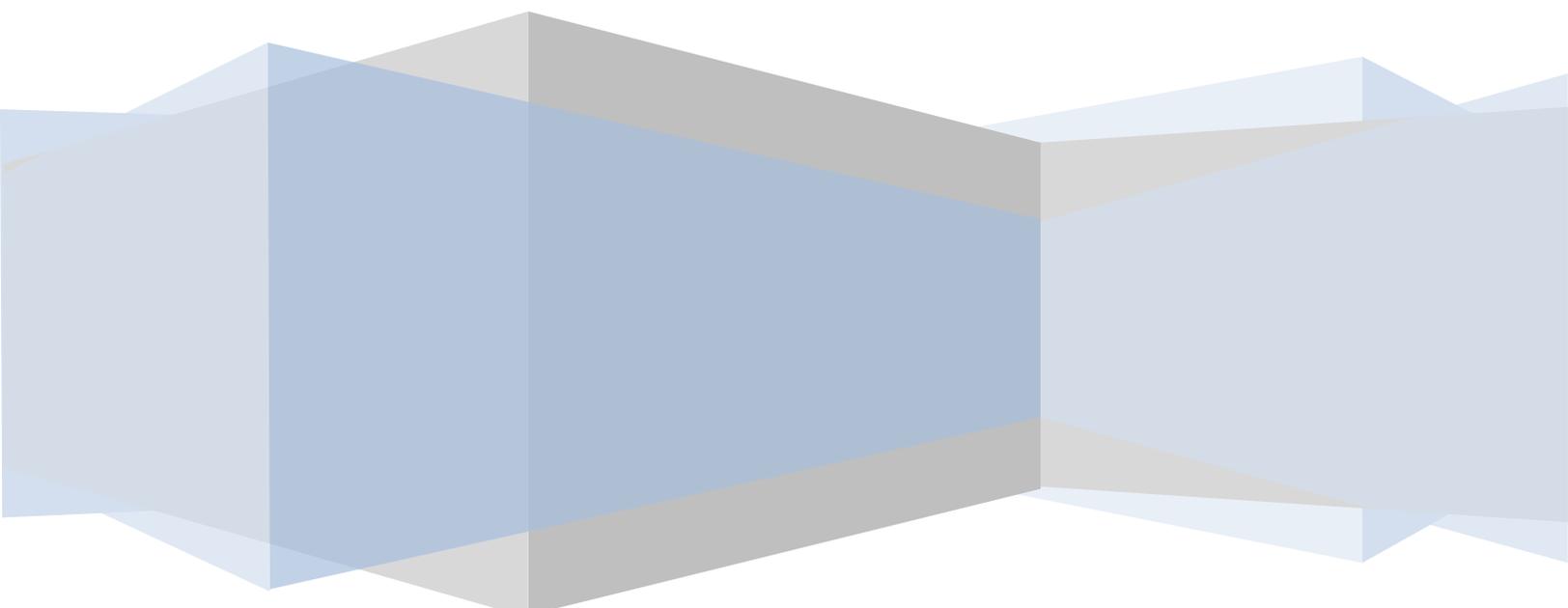
Ubuntu

11.04



Essentials

Ubuntu 11.04 Essentials



Ubuntu 11.04 Essentials – First Edition

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Chapter 1. About Ubuntu 11.04 Essentials

On April 28, 2011 Canonical Ltd. released version 11.04 of the Ubuntu Linux distribution (also referred to as the *Natty Narwhal* release). This latest version of Ubuntu proved to be one of the more significant releases for a number of years, perhaps the most significant change being the introduction of the Unity desktop environment. Whilst the classic GNOME desktop is still available, Unity clearly defines the future direction of Ubuntu in terms of appearance and usability.

The purpose of this book is to provide an overview of the essential knowledge required to use and maintain an Ubuntu 11.04 system.

After covering the basics of installation in a variety of scenarios this book provides an in depth tour of the new Unity desktop together with steps on configuring this new desktop environment to match individual user needs. Other topics covered include the implementation of wireless networking and Ubuntu One cloud synchronization through to tasks such as configuring a firewall, setting up a web server, adding disk drives and swap space, configuring KVM based virtualization and providing remote desktop access via an SSH tunnel.

Designed both as a learning tool and a reference guide, it is intended that Ubuntu 11.04 Essentials provide the reader with a sound basis of knowledge for installing, using and maintaining an Ubuntu 11.04 system.

Chapter 2. The History of Ubuntu

Ubuntu is one of a number of different flavors of the Linux operating system. The various different brands of Linux are generally known as *Linux Distributions* (usually shortened to *Linux Distros* by Linux experts). In terms of the history of Linux, Ubuntu is something of a newcomer. In the relatively short period of time that it has been available, however, Ubuntu has rapidly gained the respect of both experienced and novice Linux users throughout the world.

In this chapter we will briefly cover the history of Linux in general and the Ubuntu variant of Linux in particular.

2.1 What exactly is Linux?

Linux is an operating system in much the same way that Windows is an operating system (and there any similarities between Linux and Windows end). The term *operating system* is used to describe the software that acts as a layer between the hardware in a computer and the applications that we all run on a daily basis. When programmers write applications, they interface with the operating system to perform such tasks as writing files to the hard disk drive and displaying information on the screen.

Without an operating system, every programmer would have to write code to directly access the hardware of the system. In addition, the programmer would have to be able to support every single piece of hardware ever created to be sure the application would work on every possible hardware configuration. Because the operating system handles all of this hardware complexity, application development becomes a much easier task. Linux is just one of a number of different operating systems available today.

2.2 Who Created Linux?

The origins of Linux can be traced back to the work and philosophies of two people. At the heart of the Linux operating system is something called the *kernel*. This is the core set of functions necessary for the operating system to function. The kernel manages the system's resources and handles communication between the hardware and the applications. The Linux kernel was developed by Linus Torvalds who needed an operating system but didn't want to have to buy one. When he had finished the first version of the kernel he released it under an *open source* license that enabled anyone to download the source code and freely use and modify it without having to pay Linus any money.

Around the same time Richard Stallman at the Free Software Foundation, a strong advocate of free and open source software, was working on an open source operating system of his own. Rather than focusing initially on the kernel, Stallman decided to begin by developing all the

tools, utilities and compilers necessary to use and maintain an operating system. By the time he had finished developing this *infrastructure* it seemed like the obvious solution was to combine his work with the kernel Linus had written to create a full operating system. This combination became known as GNU/Linux. Purists insist that Linux always be referred to as GNU/Linux (in fact, at one time, Richard Stallman refused to give press interviews to publications that failed to refer to Linux as GNU/Linux). This is not unreasonable given that the GNU tools developed by the Free Software Foundation make up a significant and vital part of GNU/Linux. Unfortunately, most people and publications simply refer to Linux as Linux and this will probably always continue to be the case.

2.3 The History of Ubuntu

As mentioned previously, Ubuntu is one of a number of Linux distributions. The source code that makes up the Ubuntu distribution originates from another, much older Linux distribution known as Debian (so called because it was started by two people named Debra and Ian). Debian is still a widely respected operating system but came under criticism for infrequent updates and less than user friendly installation and maintenance (though these areas have shown improvement recently).

A South African internet mogul named Mark Shuttleworth (who made his fortune selling his company to VeriSign for around \$500 million) decided it was time for a more user friendly Linux. He took the Debian distribution and worked to make it a more human friendly distribution which he called Ubuntu. He subsequently formed a company called Canonical Ltd to promote and provide support for Ubuntu. In addition Shuttleworth has formed and funded (to the tune of \$10 million) a foundation to guarantee the future of Ubuntu.

The rest, as they say, is history. Ubuntu has since gone from strength to strength. Dell and other hardware vendors now ship computers pre-loaded with Ubuntu and Ubuntu usually tops the chart at DistroWatch.com (a web site that tracks the popularity of the various Linux distributions).

If you are new to Linux, or already use Linux and want to try a different Linux distro it is unlikely you will find a better option than Ubuntu.

2.4 What does the word "Ubuntu" Mean?

The word "Ubuntu" is an ancient Zulu and Xhosa word that means "humanity to others". Ubuntu also means "I am what I am because of who we all are". It was chosen because these sentiments precisely describe the spirit of the Ubuntu distribution.

Chapter 3. How to Download and Try Ubuntu 11.04

In order try out Ubuntu 11.04 you first need to obtain it. By far the best way to obtain Ubuntu is to download it from the Ubuntu web site, though it is also possible to purchase a CDROM containing Ubuntu if downloading is not a viable option.

There are, however, a number of options to consider in terms of the best download choice for your needs.

3.1 Ubuntu Download Options

A variety of download of options are provided on the Ubuntu web site which is accessible at <http://www.ubuntu.com>. Firstly, Ubuntu is provided in Desktop and Server editions:

- **Desktop Edition**– This edition is intended for desktop, netbook and laptop computer systems. It includes graphical desktop environments and a range of applications needed by a typical user.
- **Server Edition** – This edition is optimized for enterprise level server deployment. It contains only those packages that are essential for server systems allowing for high performance with minimal complexity and resource usage. Additional packages are then installed on an as needed basis by the system administrator.

Though this book will cover aspects of Ubuntu that are common to both editions of the operating system, the main focus will be on Ubuntu 11.04 Desktop Edition.

The next choice involves a decision about the architecture of the operating system. This can take the form of either a 32-bit or 64-bit version of Ubuntu. If your computer contains a 32-bit processor then you must use the 32-bit edition of Ubuntu. Alternatively, if you have a 64-bit processor you can use either the 32-bit or 64-bit version of Ubuntu, though Canonical recommends that the 64-bit edition of the operating system be installed on 64-bit hardware.

Another option is also available to use the *Ubuntu Windows Installer* to install Ubuntu within an existing Windows installation. Details of this installation process are covered later in this book in the chapter entitled [Installing Ubuntu 11.04 on a Windows Disk with Wubi](#).

Having made an appropriate architecture choice the download may be initiated by clicking on the *Start download* button. The download will take the form of a single ISO image file which may then be burned onto a CDROM, written to a USB flash drive, or used as an image for a network based or virtual machine installation.

Check the documentation for your preferred CD writing software or current operating system for steps on how to write an ISO image file to a CD if you do not already know how to do this.

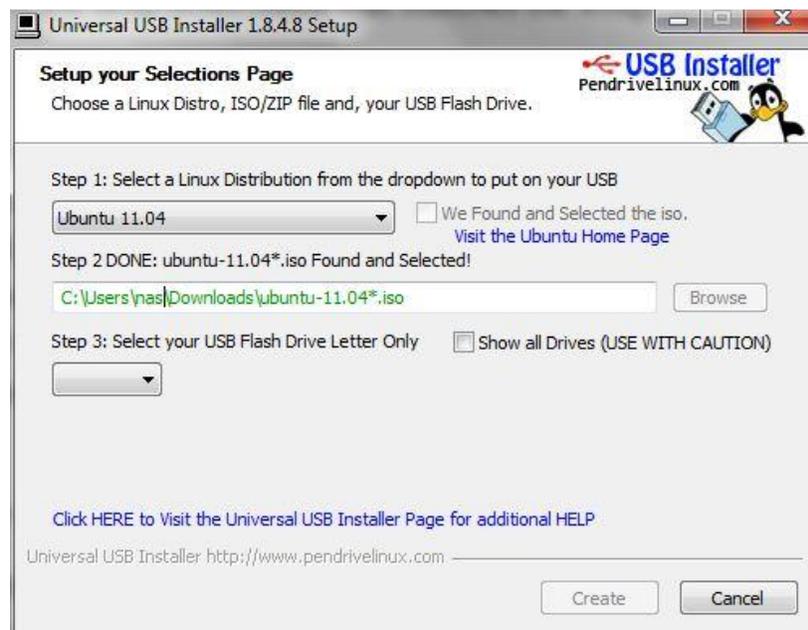
3.2 Writing the Ubuntu Image to a USB Flash Drive

As previously mentioned an alternative to booting from a CDROM is to write the Ubuntu image to a USB flash drive and then boot from that. This has the advantage that the Ubuntu distribution will boot and run in live mode much faster from a USB flash drive than from a CDROM drive.

In order to write the Ubuntu image to a USB drive, the Pendrive Linux Universal USB Installer is required. This tool is currently only available for Windows XP, Windows Vista and Windows 7 and can be downloaded from the Pendrive Linux web site at:

<http://www.pendrivelinux.com/universal-usb-installer-easy-as-1-2-3/>

Once the Pendrive installer has been downloaded and launched, and the license agreement accepted, the main screen should appear. From within this window, select the version of Ubuntu from the drop down menu that matches the image previously downloaded:



After selecting the Ubuntu distribution, the tool will scan the system in an attempt to locate the downloaded Ubuntu installation ISO image. If the scan is successful the “Step 2” section of the dialog will indicate “DONE” and the text box will be pre-populated with the path to the corresponding ISO image file. If the tool is unable to locate the image, use the *Browse* button to navigate to the location of the Ubuntu 11.04 ISO image. Insert a USB flash drive (at least 2GB is recommended) into a spare USB port of the computer and then select the corresponding drive

letter from the menu located in Step 3. If the USB device is not listed, try enabling the *Show all Drives* option. Once the target drive has been selected, choose the option to format the USB drive as part of the image creation process (the assumption is made here that any data already on the drive is expendable).

Finally, select the amount of space on the USB drive to be allocated to store any user files created from within the running Ubuntu system. The amount of persistent storage space to allocate will depend on the capacity of the USB drive and the amount of data you feel you will be likely to need to store on the drive whilst using Ubuntu from this boot device.

Clicking the *Create* button will begin the process of writing the image to the USB drive.

Once the Ubuntu ISO image is either burned to a CDROM or written to a flash drive it is time to move on to the next step.

3.3 Try Ubuntu without Installing it

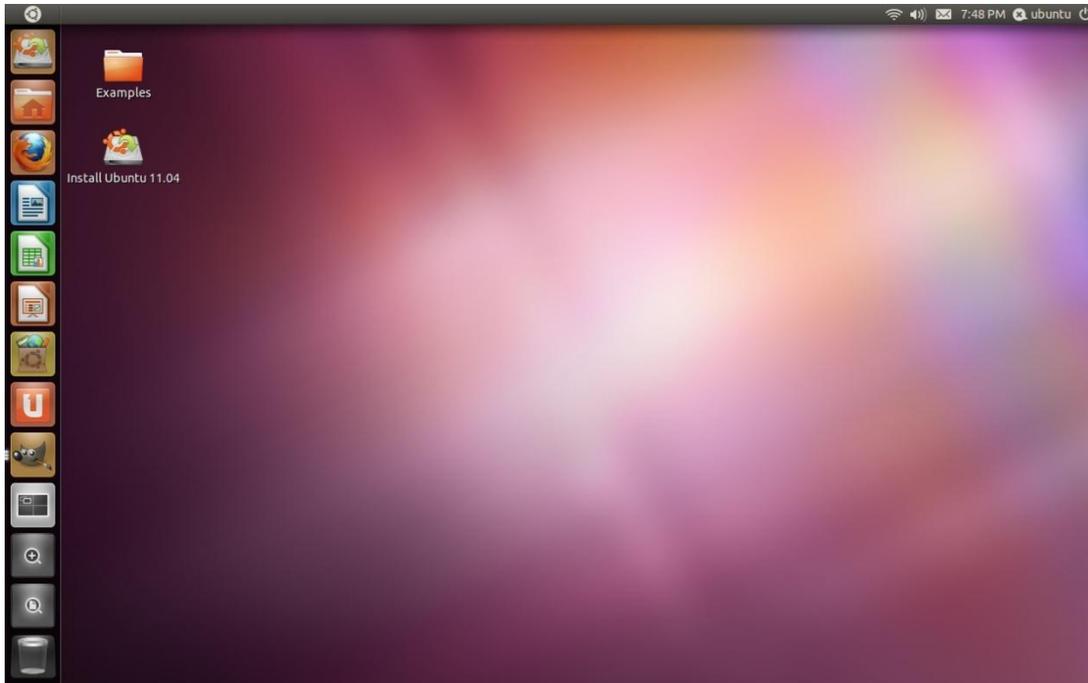
There is a good chance you already own a PC which is probably running Microsoft Windows. If this is the case and you are new to Linux then there is also a good chance you don't want to install Ubuntu until you've had a chance to try it out for a few hours, days or even weeks. If you'd like to try Ubuntu without having to install you can easily do so. The Ubuntu image you now (hopefully) have in your possession is able to run as a *Live Image*. This essentially means that the operating system can be run from a CD or USB flash drive without having to be installed on your hard disk drive.

To run Ubuntu from the CD or USB flash drive, simply insert the media into your computer and reboot your system. If your system reboots once again as Windows then it is likely you will need to change the boot order in your system BIOS. To achieve this, restart your system and watch closely as the system boots. Early in the boot process the BIOS will display instructions to enter BIOS Setup (which often, but not always, involves pressing DEL or a function key). Press whichever key you are instructed to press and you should find yourself in the BIOS setup menu. Find the setting for the boot sequence and, if it shows your hard disk as being the first device to boot from, change this so that either your CD/DVD drive or USB device appears as the first device in the boot order. Note that the BIOS firmware in some older systems does not support booting from a USB connected device.

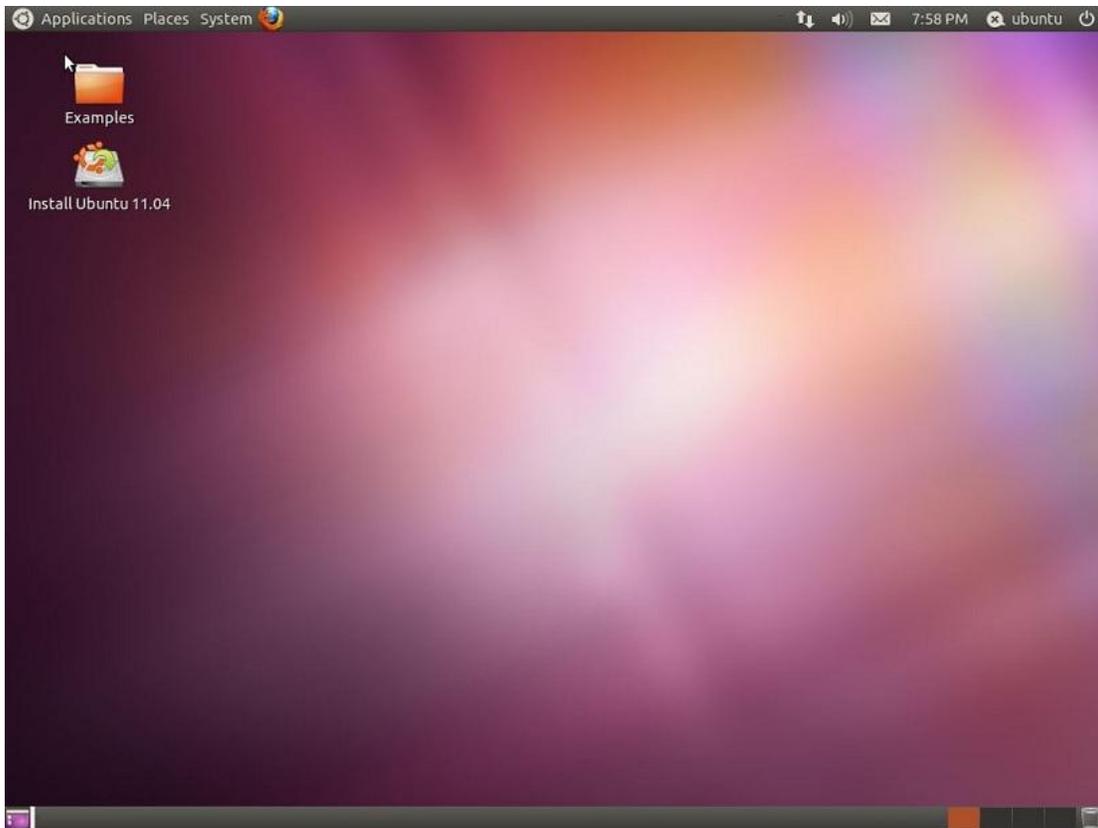
Select the "Save and Exit" option from the BIOS main menu and allow the system to boot. As long as the Ubuntu CD or USB drive is still inserted, you should find that Ubuntu boots instead of Windows. Once loaded, Ubuntu will provide the option to try out Ubuntu without installing, or to perform an installation to a hard drive:



In order to try Ubuntu without installing, click on the *Try Ubuntu* button. The live Ubuntu image will subsequently load and display the desktop environment ready for use. Ubuntu 11.04 supports two variations of the desktop. These are the new Unity desktop and older Classic GNOME desktop. By default the Unity desktop should appear as illustrated in the following figure:



The Unity desktop requires that the system on which Ubuntu is running contain a graphics adaptor with a graphics processing unit (GPU) containing 3D acceleration and support for OpenGL version 1.4 or later. If the graphics adaptor in the system on which Ubuntu is being installed is not adequate to support Unity, the classic version of the desktop will appear as illustrated in the following figure:



In order to experience many of the benefits of the Unity desktop environment on systems lacking appropriate display hardware, it is possible to install the Unity 2D desktop. Unity 2D provides much of the same functionality as Unity but without some of the more advanced visual effects. Details on installing the Unity 2D environment and how to test your system for compatibility with Unity are covered in the chapter entitled [Performing a Clean Ubuntu 11.04 Installation](#).

There are a few minor downsides to using the live image booted from a CDROM as opposed to a USB flash drive. The first is that performance will be slow if using a CDROM. This is because Ubuntu needs to load software from the CD drive which is orders of magnitude slower than a hard disk drive (though the USB flash drive option should be fast). Secondly, any files you may create or any changes you make to the system during a live session will be lost when the system shuts down or reboots. One advantage of this, however, is that you also can't break anything, so feel free to experiment as much as you like.

3.4 Installing Ubuntu on a Disk Drive Containing Microsoft Windows

If you already have Windows installed on your PC you can install Ubuntu onto the same disk drive and boot from either operating system (a configuration known as *dual booting*). During the installation process Ubuntu will resize the Windows partition on your hard disk to make

room for the Ubuntu installation (you will be asked how much of your disk drive you wish to use for Linux) and set up a special boot manager that will allow you to choose whether to boot Linux or Windows each time you power up your system. All of this is non-destructive, in that your Windows partition and all the applications and data therein will be kept intact. All that will happen is that the Windows part of the disk will be smaller than it was originally.

Another useful feature of a Windows/Ubuntu dual-boot configuration is that your Windows logical drives (C:, D: etc) will be accessible from Ubuntu, so you will be able to access your Windows data files from Linux. This means, for example, that you will be able to access your Microsoft Word and Excel files using the Linux version of LibreOffice included with Ubuntu.

For detailed steps on creating a Windows/Ubuntu dual boot environment see [Installing Ubuntu 11.04 on a Windows System \(Dual booting\)](#).

3.5 Installing Ubuntu Inside a Windows Installation

Ubuntu also provides the ability to install Ubuntu onto the file system of an existing Windows installation. This is similar to the dual booting approach outlined above with the exception that the hard disk does not need to be repartitioned to create Linux partitions for the Ubuntu installation. Instead, all the files which make up Ubuntu are installed in a new folder on the Windows disk just like any other files. All that is required is enough disk space on a Windows disk drive to accommodate the Ubuntu installation (around 8GB is recommended).

This type of installation is achieved using technology called the Ubuntu Windows Installer, or *Wubi* for short. The process involves downloading and running the Wubi installation executable, selecting a target disk drive, providing a user name and password for accessing the Ubuntu installation and clicking an *Install* button. Wubi will then download the Ubuntu distribution and perform the installation into a folder on the chosen Windows disk drive. When the system is subsequently rebooted, the user is given the option to boot either Windows or Ubuntu.

Refer to [Installing Ubuntu 11.04 on a Windows Disk with Wubi](#) for more details on this installation option.

3.6 Performing a Clean Ubuntu Installation

If you are installing Ubuntu on a clean hard disk drive, or plan to overwrite the existing Windows or other operating system installation on the drive then installing Ubuntu is straightforward. Simply follow the steps in [Performing a Clean Ubuntu 11.04 Installation](#) to install Ubuntu on the entire disk drive.

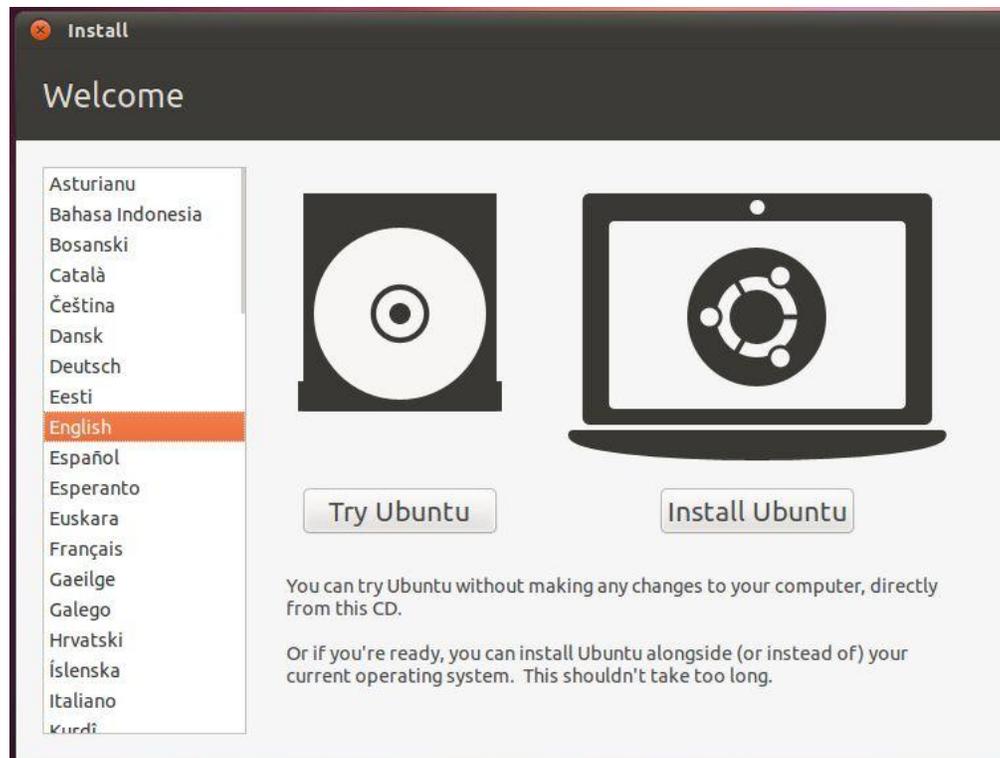
Chapter 4. Performing a Clean Ubuntu 11.04 Installation

In this chapter of *Ubuntu 11.04 Essentials* we will cover the steps necessary to install Ubuntu 11.04 on either a new system with no current operating installed, or a system containing an existing operating system (such as Windows) which you plan to delete and overwrite with Ubuntu. The steps outlined in this chapter also apply if you plan to install Ubuntu 11.04 on a virtual disk as a guest inside a virtualization environment such as VirtualBox. If you already have Windows installed on your hard disk drive and do not wish to overwrite it with Ubuntu you should read [Installing Ubuntu 11.04 on a Windows System \(Dual booting\)](#) and [Installing Ubuntu 11.04 on a Windows Disk with Wubi](#) prior to starting the installation process.

This chapter assumes you already have the Ubuntu ISO image burned to a CDROM or written to a USB flash drive. If you do not yet have this, first refer to [How to Download and Try Ubuntu 11.04](#) for instructions and then return here to begin the installation process.

4.1 Beginning the Ubuntu Installation

To start the installation, place the Ubuntu CD into the CD-ROM or DVD drive or insert the USB flash drive and reboot your computer system. If the system loads the old operating system, or indicates that it cannot find an operating system to load you will need to change the boot order in the system BIOS. To do this reboot again. Early in the boot process the BIOS will display a message indicating which key should be pressed to enter Setup. Press the key indicated so that the BIOS Setup menu appears. Navigate the menu system until you find the setting indicating the boot order used by the BIOS. Change the order so that either the drive containing the Ubuntu CDROM or the USB flash drive device is listed before the hard disk drive, then exit and save the settings. Reboot once more and you should find that Ubuntu loads. Once Ubuntu has loaded you will be presented with the following screen:

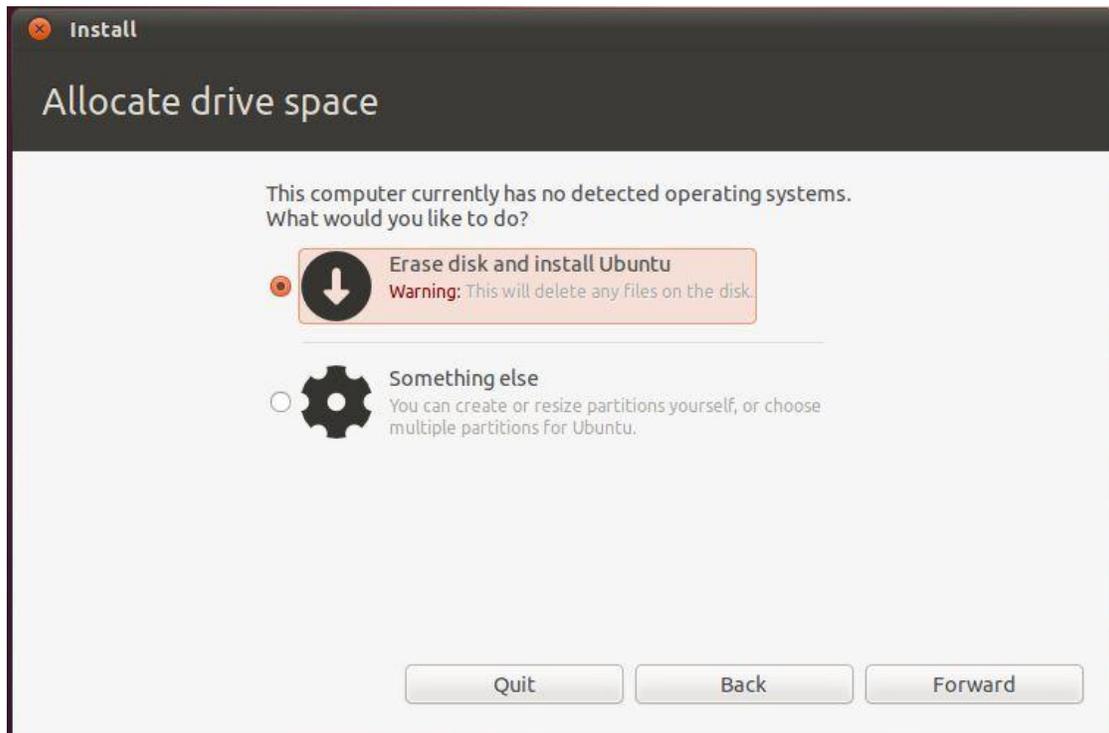


To begin the installation, click on the "Install Ubuntu" button. The installer makes recommendations relating the hardware of the system and then asks a couple of questions relating to the installation process. The first question provides the option to update the software packages that comprise the Ubuntu distribution during the installation. Ubuntu, as with most actively supported operating systems, continues to be updated with bug fixes and security patches long after it has been released to the public. If this option is selected, the installer will download any updates issued since the Ubuntu installation image was released and applies them to the system during installation. If you choose not to perform this update during the installation process these updates may still be applied at any time after the installation completes.

The second option provides the choice of whether to install 3rd party non-open source software to support the playback of MP3 files on the system. Some users object fervently to using any software which is not published under a public license. If you are one of those people then do not select this option. If, on the other hand, you just want the best experience from your Ubuntu installation then this option is recommended.

Having made appropriate selections, click the *Forward* button to proceed to the disk allocation screen. Assuming that this is a new disk on which an existing operating system is not present, the installer will provide the option to erase the entire disk and use it for Ubuntu (in which case

the installer will calculate and implement a typical and recommended partition layout), or to manually configure the partition layout:



For the purposes of this chapter, and assuming any data on the disk is expendable, simply select the option to erase the entire disk then click on the *Forward* button to proceed. The installer will then display a graphical layout indicating the area of the disk that will be used to accommodate the Ubuntu installation. Review this information and click on *Install Now* to begin the installation.

Whilst the installation is in progress, the installer will ask for information about your geographical location in order to configure time zone settings, your keyboard language configuration, and a user name and password for the first account on the system. The account configuration screen also provides the option to encrypt your home folder to increase the security of your files and data:

The option is also provided to dictate whether the password must be specified each time the user wishes to log into the system. By default, each time Ubuntu starts a login screen will be presented seeking username and password credentials. If you are the sole user of the system and would like to bypass this screen and be logged in automatically each time the system boots, be sure to set the *Log in automatically* checkbox before proceeding.

Once all the questions have been answered, the installer will simply proceed with the installation. Depending on the speed of your system, and whether or not you opted to download updates during the installation, this process can take some time. Unless you feel compelled to sit and watch the progress bar now is good time to find something else to do for a while. For a more detailed view of the steps being performed by the installer, click on the status title located above the progress bar:

When the installation is complete, a dialog will appear to inform you the system is ready to be restarted.

does not meet the requirements to run Unity. The options at this point are either to continue using the classic desktop environment, or to install and use the Unity 2D desktop environment. Unity 2D provides much of the functionality of the full Unity environment, but without the graphics effects that require the presence more advanced display hardware. Before doing so, however, it is worth running a test to confirm that the hardware is incompatible with Unity.

4.3 Testing Hardware for Unity Compatibility

As previously discussed, the Ubuntu Unity desktop environment imposes certain requirements in terms of the display adaptor and corresponding Graphics Processing Unit (GPU). If the Unity desktop fails to run then hardware limitations are almost certainly the cause. In order to verify this, and gain a better understanding of the missing display features, the following command may be run within a Terminal window (accessed within the classic desktop via the *Applications -> Accessories -> Terminal* menu option or by pressing Ctrl-Alt-T):

```
/usr/lib/nux/unity_support_test -p
```

Typical output from this command on a system lacking suitable display hardware is as follows:

```
OpenGL vendor string:  Humper
OpenGL renderer string: Chromium
OpenGL version string:  1.1 Chromium 1.9

Not software rendered:    yes
Not blacklisted:         yes
GLX fbconfig:            yes
GLX texture from pixmap: yes
GL npot or rect textures: no
GL vertex program:       no
GL fragment program:     no
GL vertex buffer object: no
GL framebuffer object:   no
GL version is 1.4+:      no

Unity supported:         no
```

Conversely, the following output was generated on a system with Unity compatible display hardware:

```
OpenGL vendor string:  Humper
OpenGL renderer string: Chromium
OpenGL version string:  2.1 Chromium 1.9

Not software rendered:  yes
Not blacklisted:       yes
GLX fbconfig:         yes
GLX texture from pixmap: yes
GL npot or rect textures: yes
GL vertex program:    yes
GL fragment program:  yes
GL vertex buffer object: yes
GL framebuffer object: yes
GL version is 1.4+:   yes

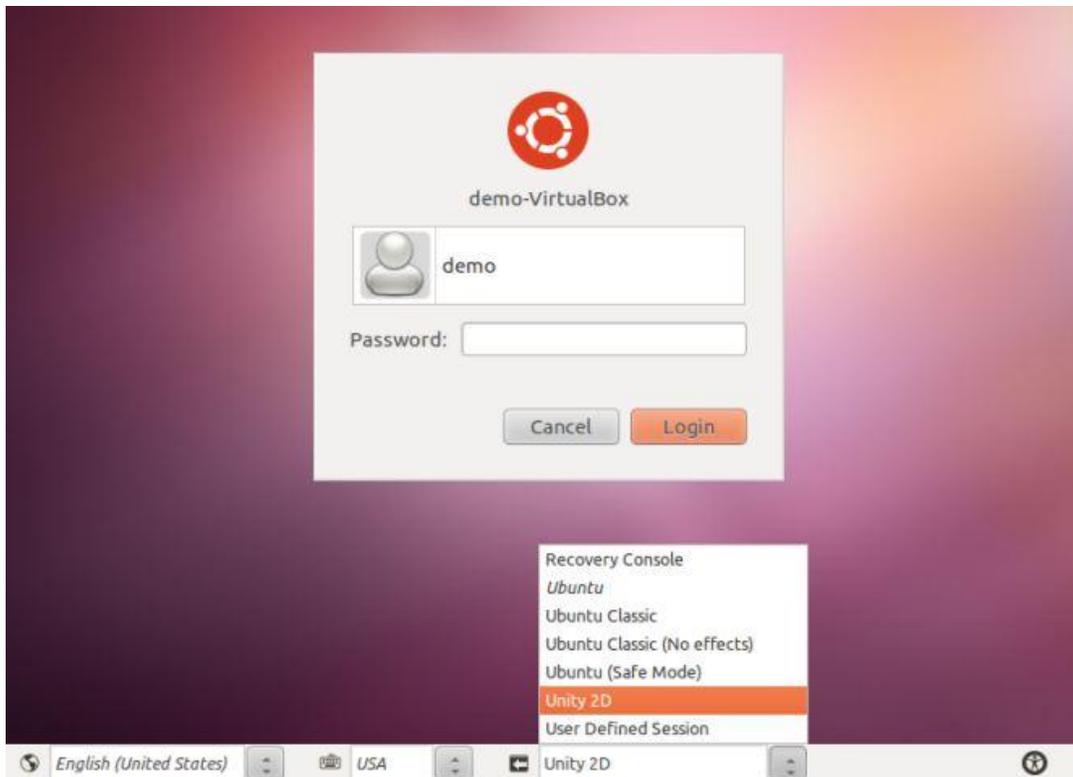
Unity supported:      yes
```

4.4 Installing Unity 2D

Assuming that the *unity_support_test* tool has confirmed the absence of adequate graphics hardware to run Unity, then the next step is to install the Unity 2D package. To install Unity 2D simply open a Terminal window (Ctrl-Alt-T) and run the following command at the prompt:

```
sudo apt-get install unity-2d
```

Enter your password when prompted and proceed with the installation. Once Unity 2D and any package dependencies have been installed, log out of the classic desktop by clicking on the power button located in the top right hand corner of the screen and selecting the *Log out...* menu option. When the login screen reappears, select your user name so that the settings bar appears along the bottom edge of the screen. Change the session setting from *Ubuntu* (which is used to represent the full Unity environment) to *Unity 2D*:



Having selected the Unity 2D session, enter your password and log into the Unity 2D desktop.

4.5 Running Unity within a VirtualBox Virtual Machine

In the event that you have installed Ubuntu 11.04 within a VirtualBox guest virtual machine it is important to note that in order to support the Unity desktop environment it will be necessary to enable 3D acceleration within the virtual machine's display settings and install the Ubuntu VirtualBox guest utilities on the guest Ubuntu system. Assuming that Ubuntu has already been installed as a VirtualBox guest system:

1. Shut down the Ubuntu guest system.
2. Select "Settings" for the guest system in the VirtualBox main window.
3. Select the "Display" settings category and set the checkbox next to *Enable 3D Acceleration*.
4. Start the Ubuntu virtual machine and, once running, open a Terminal session (*Applications -> Accessories -> Terminal*) and execute the following commands at the prompt:

```
sudo apt-get upgrade
sudo apt-get install virtualbox-guest-utils
```

Once the update and installation is complete, restart the Ubuntu system and log into the desktop once again. It is important to note that the 3D version of Unity will only run within

VirtualBox if the host system on which the virtual machine is running has a graphics adapter capable of supporting the required 3D acceleration features. If the Unity desktop does not appear after installing the guest utilities, the first step is to verify that the host's graphics adapter is supported by Unity by reviewing the requirements at:

<https://wiki.ubuntu.com/DesktopExperienceTeam/UnityHardwareRequirements>

If the host system does not support Unity then the best option is to install and use Unity 2D as outlined in the previous section of this chapter.

4.6 Installing Updates

As with most operating systems today, each particular release of the Ubuntu distribution continues to evolve after it has been released to the public. This generally takes the form of bug fixes and security updates and, occasionally, new features that may be downloaded over the internet and installed on your system.

Best practices dictate that the first step after installing Ubuntu is to make sure any available updates are applied to the system. This can be achieved either through the desktop environment or via the command-line prompt in a Terminal window.

To check for updates using the graphical *Update Manager* tool, press `Alt+F2`, type *update-manager* into the *Run a command* box and press *Enter*. Once invoked, the tool will provide a list of the available updates together with references to more detailed information on each one under the *Description of update* heading:



Clicking the *Install Updates* button will begin the update process which consists of resolving package dependencies, downloading and installation of the updates. The duration of the update process will depend on the number and size of updates available combined with the speed of the internet connection to which the Ubuntu system is connected.

The update process may be configured by clicking on the *Settings...* button located in the bottom left hand corner of the update manager window. This dialog provides a range of options including the frequency with which the system checks to see if new updates are available and whether updates should be installed automatically and without administrator privileges.

The latest updates may also be applied from within a Terminal window (*Applications -> System Tools -> Terminal*) using the *apt-get* command:

```
sudo apt-get upgrade
```

Upon execution, the *apt-get* tool will provide a list of packages that are available for update and prompt to perform the update.

Once the update is complete the installation is essentially finished and Ubuntu is ready for use.

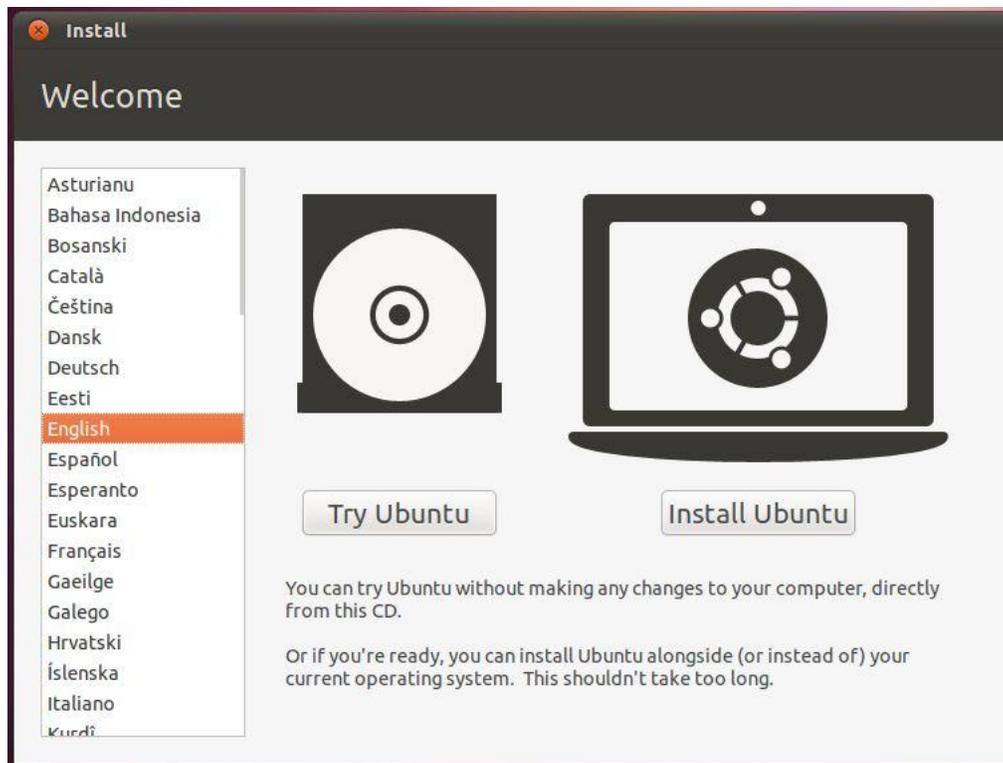
Chapter 5. Installing Ubuntu 11.04 on a Windows System (Dual booting)

Ubuntu, just like most Linux distributions, will happily co-exist on a hard disk drive with just about any version of Windows. This is a concept known as *dual-booting*. Essentially, when you power up your PC you will be presented with a menu providing the option to boot either Ubuntu or Windows. Obviously you can only run one operating system at a time, but it is worth noting that the files on the Windows partition of your disk drive will be available to you from Ubuntu regardless of whether your Windows partition was formatted using NTFS, FAT16 or FAT32.

During the installation process the Ubuntu installer will detect the Windows installation on the drive and provide the option of deleting it and using the entire disk for Ubuntu, or sharing the disk with Windows. In the latter case you will be able to specify the percentage of the disk to be used for Ubuntu. According to the Ubuntu documentation, a minimum of 5 GB of disk space is required for a full Ubuntu Desktop Edition installation, and more space to store any files you may subsequently create. Ideally, however, at least 8 GB of disk space should be allocated to the Ubuntu installation to avoid later problems. Once the disk space for Ubuntu has been selected, the installer will resize the Windows partition (without destroying any data) and use the remainder of the disk for Ubuntu.

5.1 Beginning the Ubuntu Installation

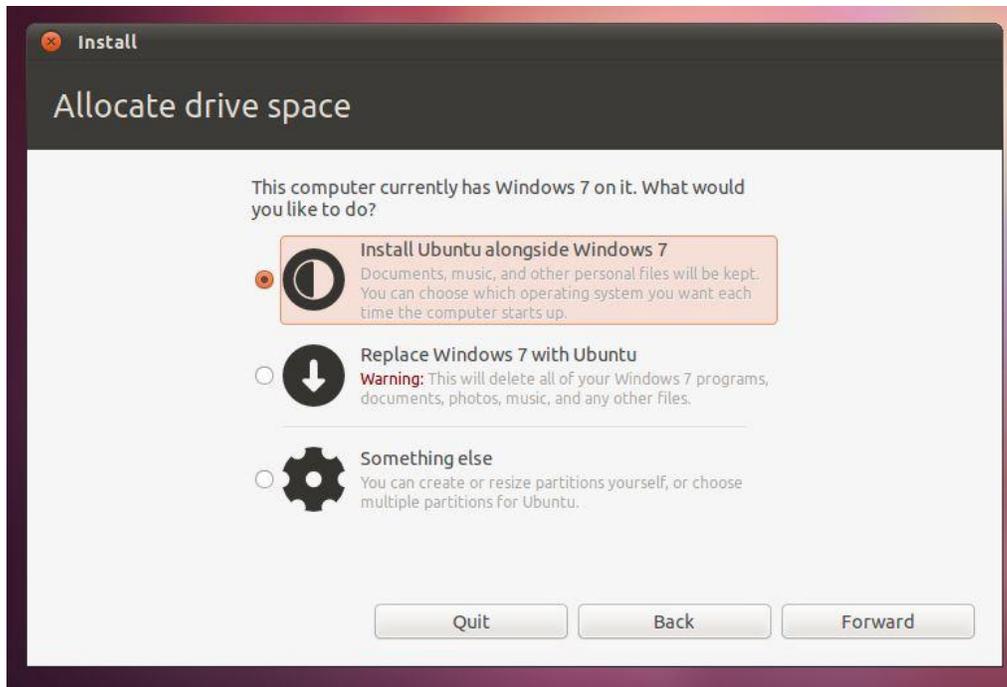
To start the installation, place the Ubuntu CD into the CD-ROM or DVD drive, or insert the USB flash drive and reboot your computer system. If the system loads Windows again you will need to change the boot order in your system BIOS so that the CD or DVD drive or USB device is checked for bootable media before the primary hard disk drive. To do this reboot again. Early in the boot process the BIOS will display a message indicating which key should be pressed to enter Setup mode. Press the key indicated so that the BIOS Setup menu appears. Navigate the menu system until you find the setting that indicates the boot order used by the BIOS. Change the order so that the drive containing the Ubuntu CDRom or USB drive is listed before the hard disk drive, then exit and save the settings. Reboot once more and you should find that Ubuntu loads. Once Ubuntu has loaded you will be presented with the following screen:



To begin the installation, click on the "Install Ubuntu" button. The installer will ask a couple of questions relating to the installation process. One option provides the choice of whether to install 3rd party non-open source software to support the playback of MP3 files on the system. If you don't feel strongly about using software that is not openly licensed and you just want the best experience from your Ubuntu installation then this option is recommended.

Secondly, an option is provided to update the software packages that comprise the Ubuntu distribution during the installation. Ubuntu, just like most other operating systems, continues to be updated with bug fixes and security patches long after it has been released to the public. If this option is selected, the installer will download any updates issued since the Ubuntu installation image was released and applies them to the system. If you choose not to perform this update during the installation process these updates can still be applied at any time after the installation completes.

Having made appropriate selections, click the *Forward* button to proceed to the disk allocation screen. At this point, the installer will have detected the presence of an existing operating system on the target disk drive and will provide a number of options in terms of how the disk should be used to accommodate the Ubuntu installation:



Given that it is our intention to configure a dual boot system, the option to *Install Ubuntu alongside* Windows is the desired choice. With this option selected, click the *Forward* button to proceed. The subsequent screen allows the amount of disk space allocated to each operating system (in this case Windows and Ubuntu) to be configured:



At this point it is necessary to decide how much of your Windows partition you wish to donate to the Ubuntu installation. Move the slider (positioned between the Windows and Ubuntu partitions in the diagram) until the Ubuntu partition allocation is a size you are comfortable with. As mentioned previously, at least 8 GB should be allocated to Ubuntu if possible.

When you have selected the size of the Ubuntu partition, click the *Install Now* button to proceed with the installation. When the warning dialog appears read it carefully and click *Continue* if you are sure you wish to proceed.

5.2 Configuring Time Zone, User and Keyboard Information

Whilst the installation is in progress, the installer will ask for information about your geographic location in order to configure Timezone settings, your keyboard language configuration, and a user name and password for the first account on the system. The account configuration screen also provides the option to encrypt your home folder to increase the security of your files and data:



The screenshot shows the 'Install' window titled 'Who are you?'. It contains the following fields and options:

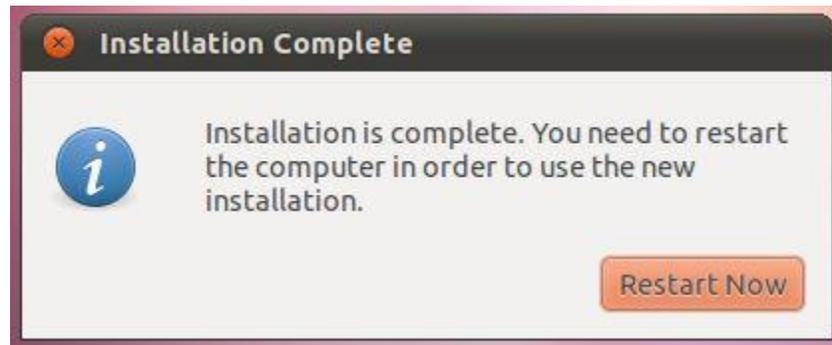
- Your name: [Text input field]
- Your computer's name: [Text input field] (The name it uses when it talks to other computers.)
- Pick a username: [Text input field with 'Username' placeholder]
- Choose a password: [Text input field with 'Password' placeholder]
- Confirm your password: [Text input field with 'Confirm password' placeholder]
- Log in automatically
- Require my password to log in
- Encrypt my home folder

At the bottom right are 'Back' and 'Forward' buttons. At the bottom left, a progress bar shows '▶ Copying files...'.

The option is also provided to dictate whether the password must be specified each time the user wishes to log into the system. By default, each time Ubuntu starts a login screen will be presented seeking username and password credentials. If you are the sole user of the system and would like to bypass this screen and be logged in automatically each time the system boots, be sure to set the *Log in automatically* checkbox before proceeding.

Once all the questions have been answered, the installer will simply proceed with the installation. Depending on the speed of your system this process can take some time.

When the installation is complete, the following dialog will appear to inform you the system is ready to be restarted.



When you are ready to reboot, press the *Restart Now* button. The system will take a few moments to shut down. The installer will prompt you to remove the installation media. At this point remove the CDROM or USB flash drive (depending on which you used to perform the installation) and press the *Enter* key to proceed.

5.3 Booting Ubuntu for the First Time

When the system reboots a screen similar to the one illustrated below will appear providing the option to boot either Windows or Ubuntu:

```

GNU GRUB  version 1.99~rc1-13ubuntu3

Ubuntu, with Linux 2.6.38-8-generic
Ubuntu, with Linux 2.6.38-8-generic (recovery mode)
Memory test (memtest86+)
Memory test (memtest86+, serial console 115200)
Windows 7 (loader) (on /dev/sda1)

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.

The highlighted entry will be executed automatically in 9s.

```

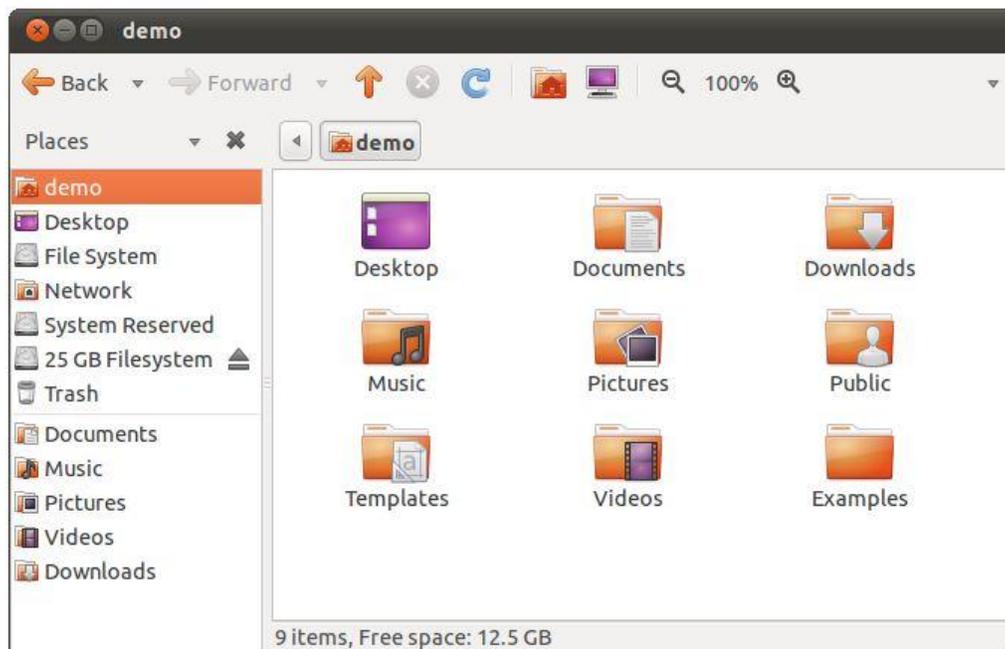
Press *Enter* to boot Ubuntu. If you wish to boot Windows use the keyboard arrow keys to select the Windows option. If you choose to boot Ubuntu the operating system will load and the Ubuntu login screen will appear (unless the automatic login option was selected). Enter the user name and password you set up during the installation process and you will be logged into the Ubuntu Desktop environment. Refer to [Performing a Clean Ubuntu 11.04 Installation](#) for details on installing the Unity 2D desktop environment if your graphics hardware is unable to support the standard Unity environment.

5.4 Accessing the Windows Partition from Ubuntu

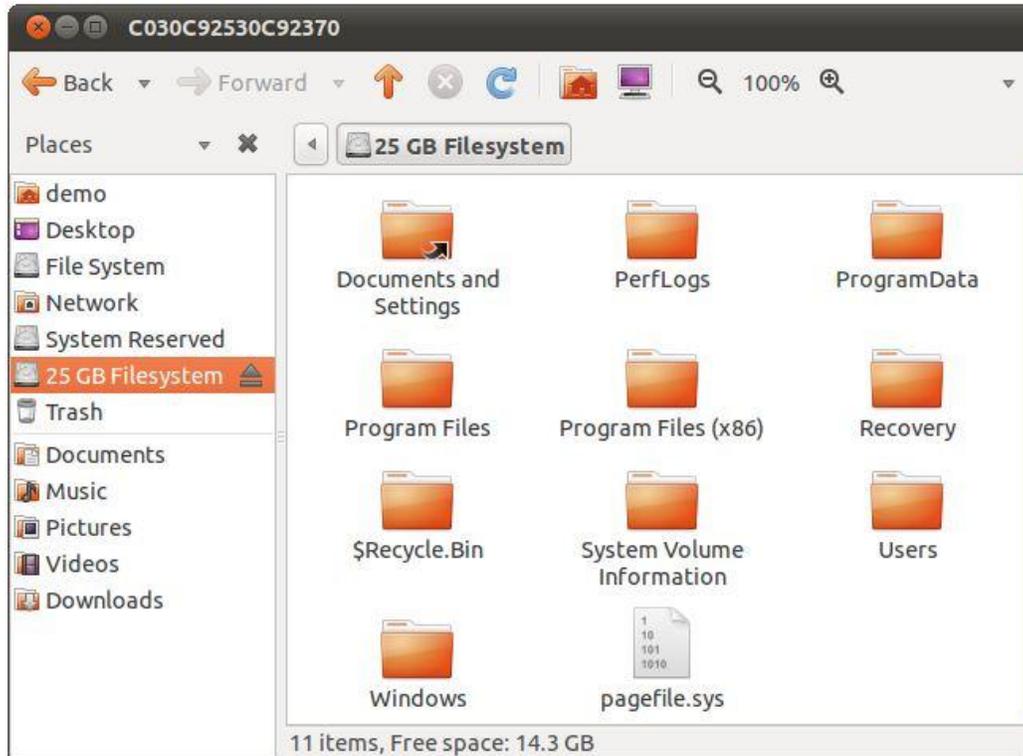
As previously mentioned, Ubuntu provides access to the files and folders stored on the Windows partition of a dual boot configuration. These may be accessed in a number of ways. Firstly, the Windows file system will automatically be mounted on the Ubuntu system and will appear as a disk drive icon on the desktop as illustrated in the following figure:



Alternatively, the Windows file system may be accessed from within the File Manager. Access to the file manager may be gained by selecting the *Home Folder* icon at the top of the task management panel located on the left hand edge of the screen. Once launched, the contents of the current user's home folder will be displayed:



The *Places* panel located on the left hand side of the file manager window shows an entry for the *File System*. This is the filesystem created on the disk drive to hold Ubuntu. The Windows partition in this instance is represented by the *25GB File System* entry which, when selected, will provide access to the contents of the Windows partition:



In order to provide access to the Windows partition, Ubuntu has essentially *mounted* it as a Linux folder. In order to unmount this filesystem when you have finished accessing the Windows files you needed, simply click on the eject style button next to the filesystem in the left hand pane of the file manager window, or right click on the desktop icon and select *Unmount* from the resulting menu.

Chapter 6. Installing Ubuntu 11.04 on a Windows Disk with Wubi

As described in [How to Download and Try Ubuntu 11.04](#), there are a number of ways to run Ubuntu, including two options for running Ubuntu alongside a pre-existing Windows installation.

One such option is to repartition the disk containing Windows to make room for Ubuntu in a dual boot environment (as outlined in the chapter entitled [Installing Ubuntu 11.04 on a Windows System \(Dual booting\)](#)). A second option, and the topic of this chapter, is to use the Windows-based Ubuntu Installer (Wubi) to install the Ubuntu distribution within a folder on a Windows disk from where it may subsequently be started using a dual boot configuration.

6.1 What is Wubi?

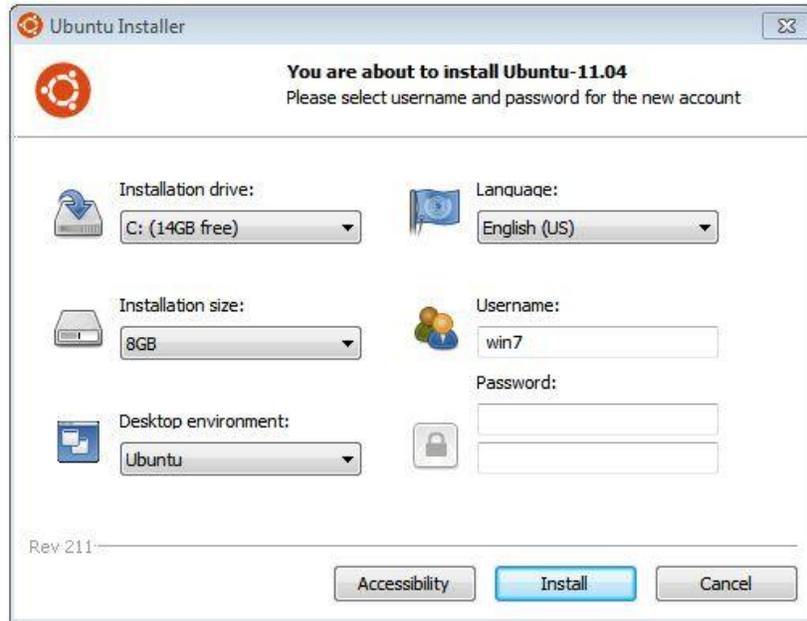
The Windows-based Ubuntu Installer (Wubi) allows Ubuntu to be installed within a folder of a Windows file system. An option to boot Ubuntu is then added to the Windows boot menu giving the user the ability to boot either into Windows or Ubuntu when the system starts up. In essence, Wubi allows a Windows/Ubuntu dual boot configuration to be set up without the need to reduce the size of a Windows partition and create new Linux partitions to accommodate the Ubuntu installation.

6.2 Downloading Wubi

Wubi consists of a small installer executable which must be downloaded onto the target Windows system. This file can be downloaded from the download page of the Ubuntu web site and may be listed as *Windows Installer* or *Windows Installer for Ubuntu*, or accessed by selecting the *Run it with Windows* option.

6.3 Starting the Wubi Installer

Once the Wubi installer has been downloaded, navigate to the location to which it was downloaded and double click on it to run it. Once invoked, the initial screen will appear providing access to a number of installation options. Select the *Install inside Windows* option to display the Wubi installation configuration screen:



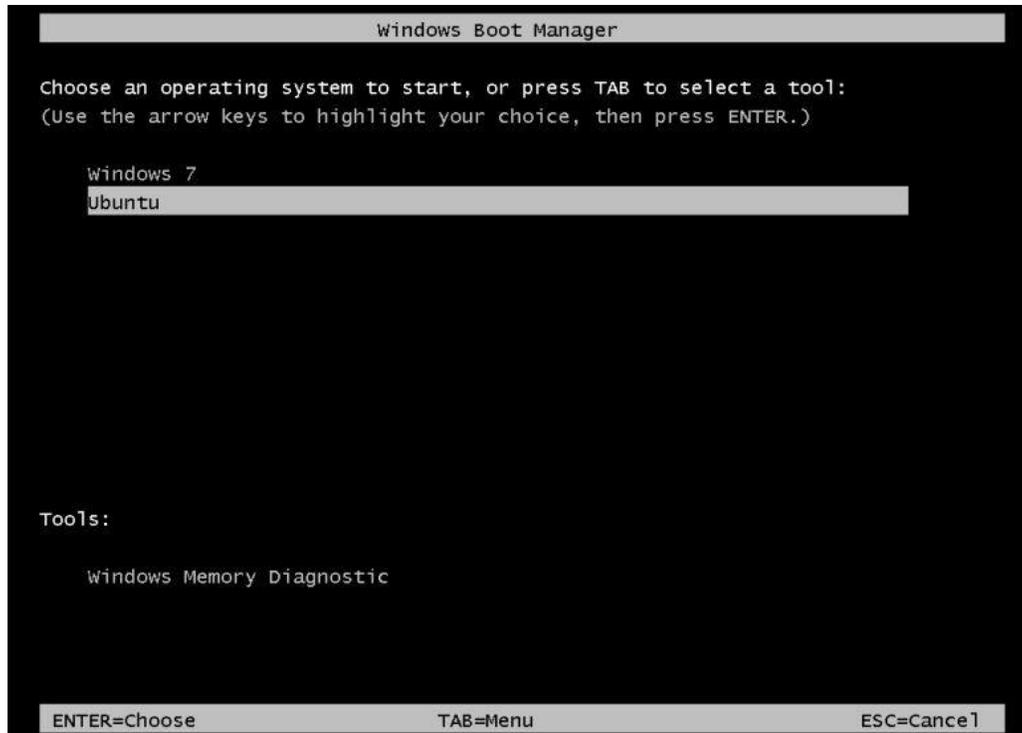
From this screen, select the destination Windows disk drive, the amount of disk space on that drive to be allocated to Ubuntu (a minimum of 8GB is recommended), and a suitable user name and password to be used to gain access to Ubuntu once the installation is complete. In addition, specify a language other than English if necessary and choose a desktop environment (unless you have any objection to the default Unity desktop, which is covered in this book, this option should be left unchanged).

Once the settings are configured, click on *Install* to initiate the installation process. During the installation process, Wubi will install a number of Ubuntu distribution files in the `\ubuntu` folder of the designated Windows disk drive together with two additional files named `wubldr` and `wubldr.mbr`.

Once the download is complete, the setup program will report that the system needs to be rebooted to complete the Ubuntu installation. This may be performed either now or at a later and more convenient time.

6.4 Completing the Ubuntu Installation

Once the initial Wubi installation process is complete and the system is restarted, Windows will present a boot menu providing the option to boot into either the original Windows system or the Ubuntu system installed by Wubi. A typical boot menu is illustrated in the following figure:



Selecting *Ubuntu* from the menu and pressing the Enter key will start the Ubuntu boot process. If this is the first time that the Ubuntu installation has been started the system will perform a number of tasks to complete the operating system installation process. This process may take some time depending on system performance, but is only necessary the first time the Ubuntu system is started. Subsequent start up times will be significantly reduced. Once the installation is complete, Ubuntu will reboot the system.

6.5 Starting the Ubuntu System

Once the installation is complete, restart the computer and select *Ubuntu* from the boot menu. Once Ubuntu has started, log into the desktop environment using the user name and password specified during the initial Wubi setup configuration.

6.6 Removing Ubuntu

The Ubuntu installation can be removed at any time by booting Windows, navigating to the `\ubuntu` folder on the disk drive onto which Ubuntu was installed and double clicking on the `uninstall-wubi` executable. The uninstaller will launch and seek confirmation that Ubuntu is to be removed from the system as illustrated below:



Clicking on the *Uninstall* button will initiate the removal process.

Chapter 7. Allocating an Existing Windows Partition to Ubuntu 11.04

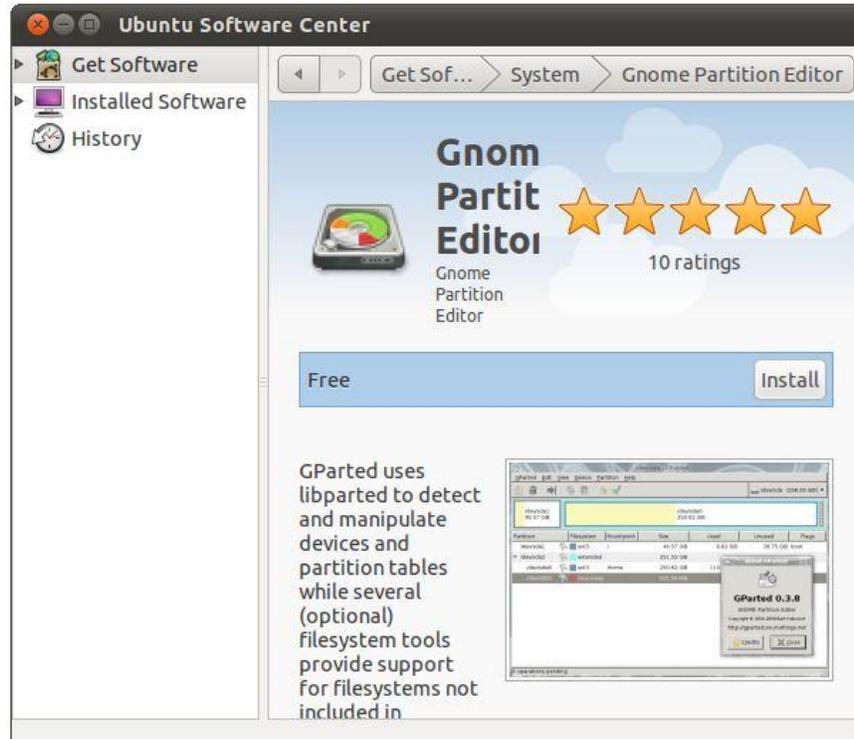
One of the most common configurations for a new Ubuntu installation involves reducing the size of the pre-existing Windows partition on the disk drive and using the resulting space to install Ubuntu. This so called "dual boot" configuration allows the user to have both operating systems installed on the disk drive with the option to boot one or the other when the system is powered on. Performing this type of installation was covered in [Installing Ubuntu 11.04 on a Windows System \(Dual booting\)](#).

This chapter is intended for users who took this particular approach and have decided they like Ubuntu enough to delete Windows entirely from the disk, and use the resulting space for Linux. In this chapter, therefore, we will work through this process step by step.

7.1 Deleting the Windows Partition from the Disk

The first step in freeing up the Windows partition for use by Linux is to delete it. The Ubuntu distribution includes a tool called *GParted* which is a graphical disk partitioning tool. This tool is not, however, typically installed by default. The tool may be installed either from the command prompt in a terminal window or using the *Ubuntu Software Center*.

To install using the Ubuntu Software Center, click on the Applications button on the launcher panel (the magnifying glass containing the + sign) and enter *gparted* into the *Search Applications* field of the resulting panel. If the *GNU Partition Editor* is shown in the *Apps Available for download* section it will need to be installed on the system. Click on the icon and wait for the software center to load and update with the GParted package information:



Click on the *Install* button to initiate the installation process, enter your password if prompted to do so, and wait for the installation to complete. Once the *GParted* tool is installed, exit from the software center application.

An alternative to installing applications and packages using the software center tool is to use the *apt-get* command-line tool. These commands may be issued from within a *Terminal* session. To open a terminal window, press *Ctrl-Alt-T*. The terminal window will appear and present a prompt at which commands may be entered. Since the installation of software requires administrative privileges, the command to install the *GParted* tool must be pre-fixed with the *sudo* command as follows:

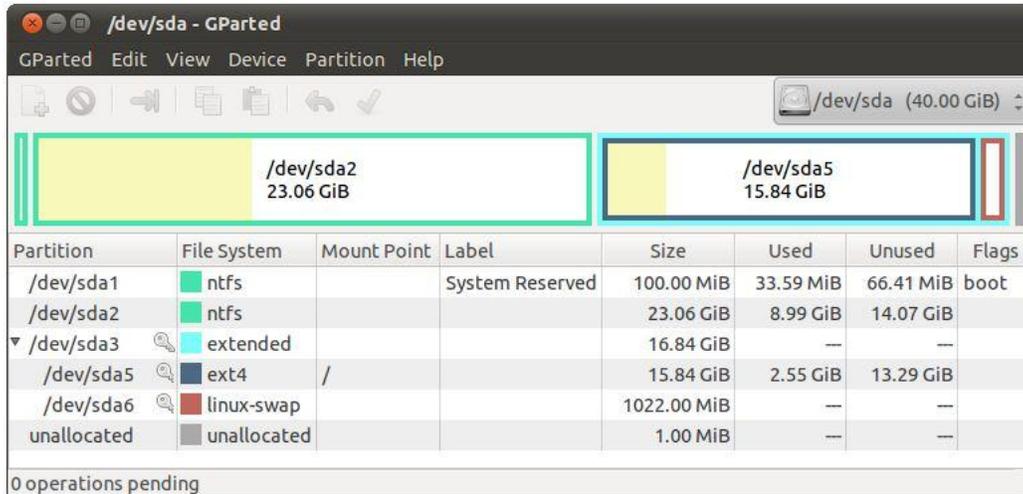
```
sudo apt-get install gparted
```

The *apt-get* tool will check to see that a package matching the name specified is available, identify any package dependencies and then prompt for confirmation that the installation is to be performed. Enter *Y* to initiate the installation.

To invoke the partition tool open a terminal window (*Ctrl-Alt-T*) and enter the following command:

```
sudo gparted
```

Enter your password if prompted to do so and wait for the GParted application to load:



The Windows partitions can be identified by the file system type. In this case the file systems are of type NTFS (which corresponds to /dev/sda1 and /dev/sda2). A FAT or FAT32 file system also indicates a Windows partition. The *ext4* (/dev/sda5) and *linux-swap* (/dev/sda6) partitions are our current Linux partition and operating system swap space respectively. We are now going to delete the Windows partitions, but first need to unmount them. To do so, right click on the Windows partitions (in this example the partition represented by /dev/sda1 and /dev/sda2), either in the list or in the graphical representation of the partitions and select *unmount*. If the unmount option is not selectable then the partition is not currently mounted.

The next step is to delete the partitions. Once again, right click on each partition in the list and select *Delete* from the resulting menu. The deletion tasks will be listed as *Pending*. To commit the changes, click on the button displaying the green check mark in the *GParted* toolbar.

Once the deletion is complete the former Windows partitions will be listed as *unallocated*. This space is now ready for us to use as a Linux partition.

7.2 Formatting the Unallocated Disk Partition

The next step is to format the partition so that it can be used by Linux. By default the current version of Ubuntu uses the *ext4* file system format. This is a powerful file system format that supports features such as disk journaling which is useful for restoring damaged data.

To format the unallocated partition, right click on the partition and select *New* from the menu to display the *Create new partition* window: