

**INTRODUCTION TO HARDWARE AND SOFTWARE  
MODULE ASSIGNMENT**

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## Task A.1 – INSTALLATION AND PARTITIONING OF WINDOWS 7 ENTERPRISE

When you load your Windows installation medium, whether this is a USB key, or a disc, you will be presented with the *Starting Windows* message. You will then be asked to enter language, time/currency, and keyboard preferences (as shown in Figure 1.1). When you have selected your options click **Next** to continue.

**Figure 1.1 - Preferences**



### NOTE

If you make a mistake on this section, you can remedy it when Windows has been installed.

Click **Start** and in the **Search Bar** type **intl.cpl** and click it. You can alter all region and language settings here.

After selecting your preferences, you will be prompted to install Windows (as shown in Figure 1.2). You will also be given two other options; to repair your computer, or tips on *What to know before installing Windows*. When you are ready to install, click **Install now**.

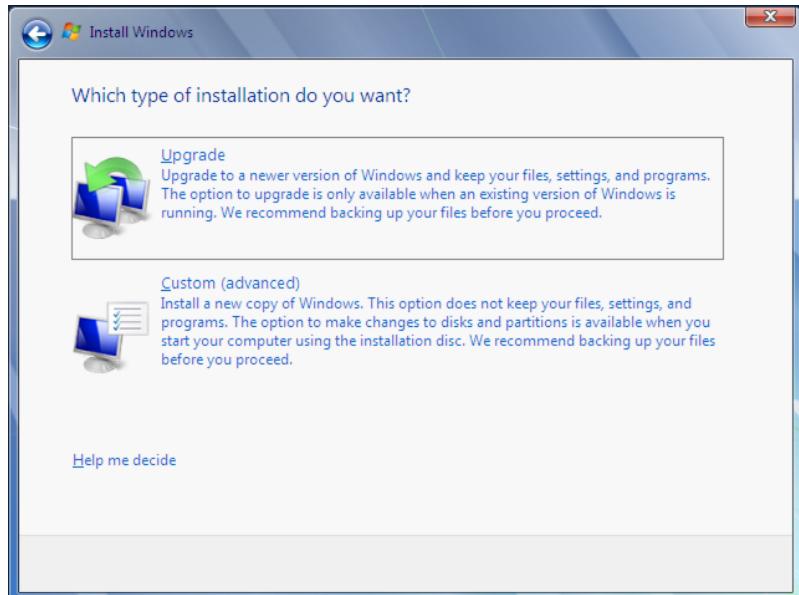
**Figure 1.2 – Installation Menu**



You will then be prompted to read the license terms. This is a circa 4500 word document which is typically never read by the vast majority of users. To continue, tick the box beside *I accept the license terms* and click **Next**.

You will be asked whether you want to upgrade Windows or to install a new copy of Windows (As shown in Figure 1.3). Select **Custom (advanced)** to install a new copy of Windows.

**Figure 1.3 – Installation Type**



#### NOTE

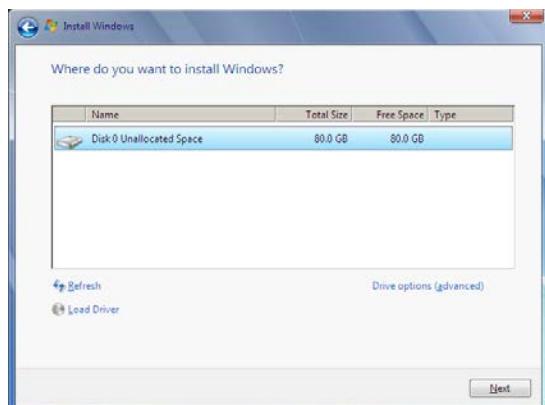
*Help me decide* will give you more information on the installation options available.

Do not choose **Upgrade** since this option is for when there is an existing version of Windows running.

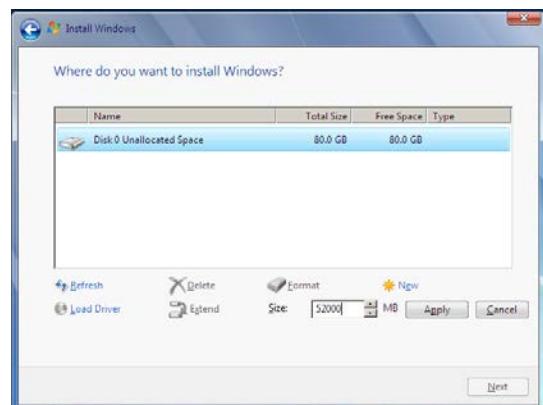
Next, you will be asked where you would like to install windows. **Figure 1.4** shows the screen that you will be presented with, which shows the 80GB hard drive. Before installing Windows the drive can be partitioned as required.

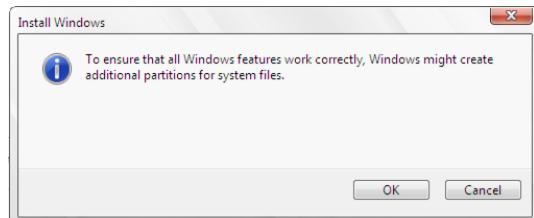
Select **Drive options (advanced)** for more options. Click the **New** option (as shown in Figure 1.5). You can now specify the size of the partition you wish to create. A partition size of 52,000 MB is specified, (which will result in an indicated drive size of 50.7 GB). Click **Apply**. A notification will pop up which informs you that Windows may create additional partitions for system files (see Figure 1.7). This is nothing to worry about. Click **OK** and the partition will be in place. Click on the unallocated drive and repeat the aforementioned steps to create a second partition to be used for the creation of user accounts etc.

**Figure 1.4 – Installation Location**



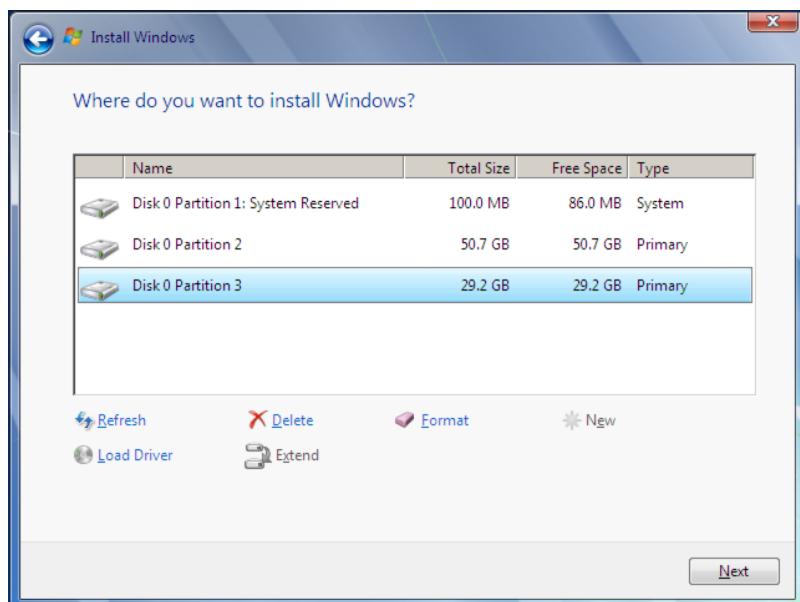
**Figure 1.5 – Partitioning the Drives**



**Figure 1.7 – System File Partition Notification****Note**

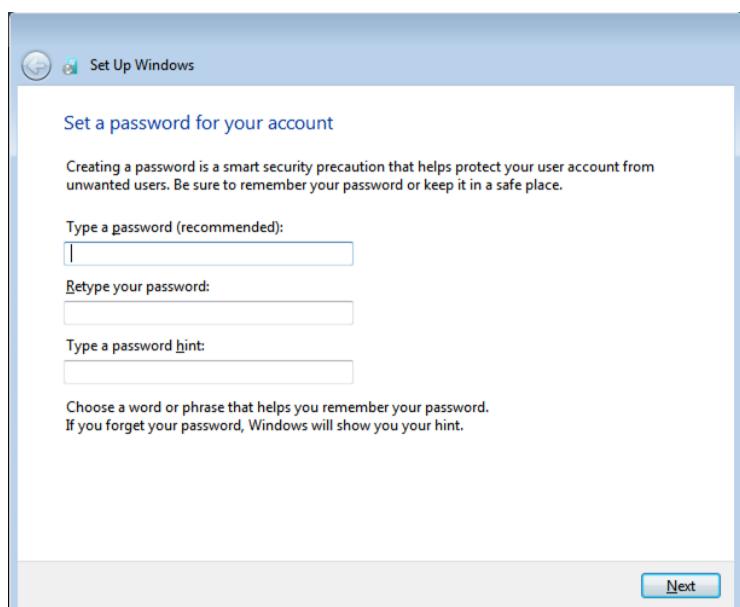
The additional partition holds the Windows Recovery Environment. [Read this article by My Digital Life Editorial Team \(2009\)](#) if you want to avoid this hidden partition.

Links will be highlighted in blue in the document; intended for PDF users

**Figure 1.8 – Partitions in Place****Partitions in Place**

The partitions you specified will now be shown, along with a system reserved partition of 100mb which Windows automatically created.

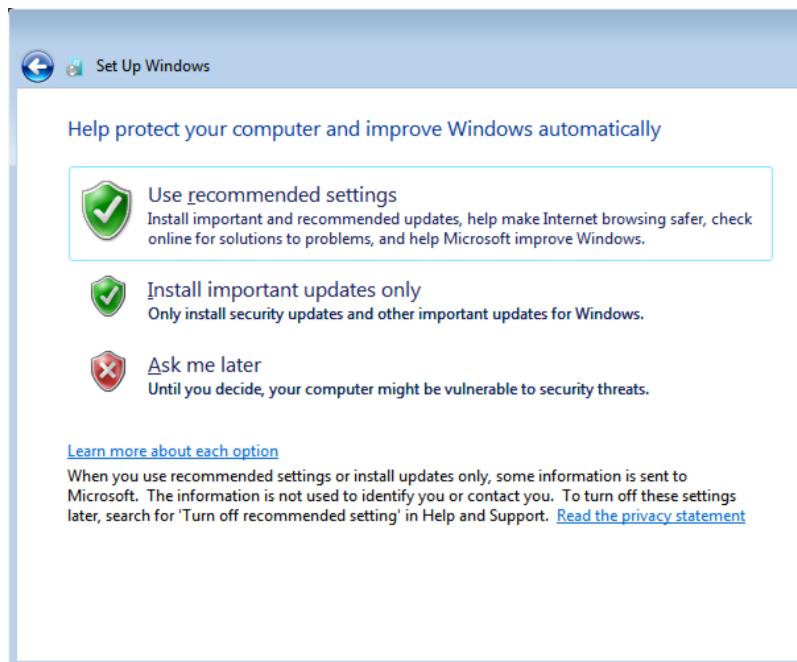
Figure 1.8 shows the partitions in place. Select Partition 2 and click **Next** to install Windows on this partition. You will now be prompted to enter a user name and a computer name. Enter the details and click **Next** to continue. Now you will be asked to enter a password to access the account you have just created (as shown in Figure 1.9).

**Figure 1.9 – Password****Password Security**

It is best to choose a password that is not easily guessed by others. A mixture of letters, numbers, and symbols is hardest to guess or to crack.

After entering your password information, click **Next** to continue. You will now be given three options to continue with the installation (see Figure 1.10). Click *Use recommended settings* to continue.

**Figure 1.10 – Update Installation Options**

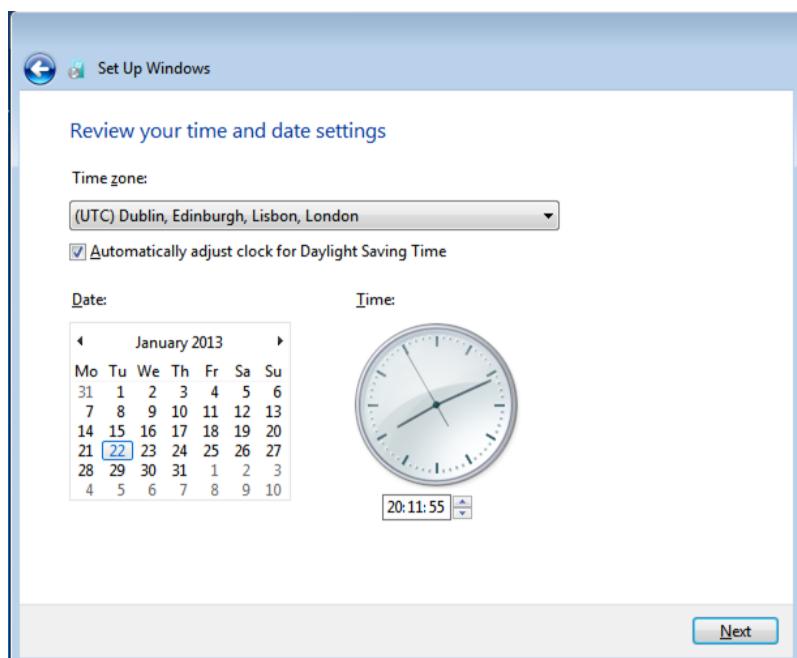


### Initial Update Options

You will be encouraged to choose **Use recommended settings**. If you are confident that you can manage updates yourself you may choose another option.

The next window will ask you to confirm that the time and date settings are correct for your location (Figure 1.11). Once you are satisfied with the settings, click **Next** to continue.

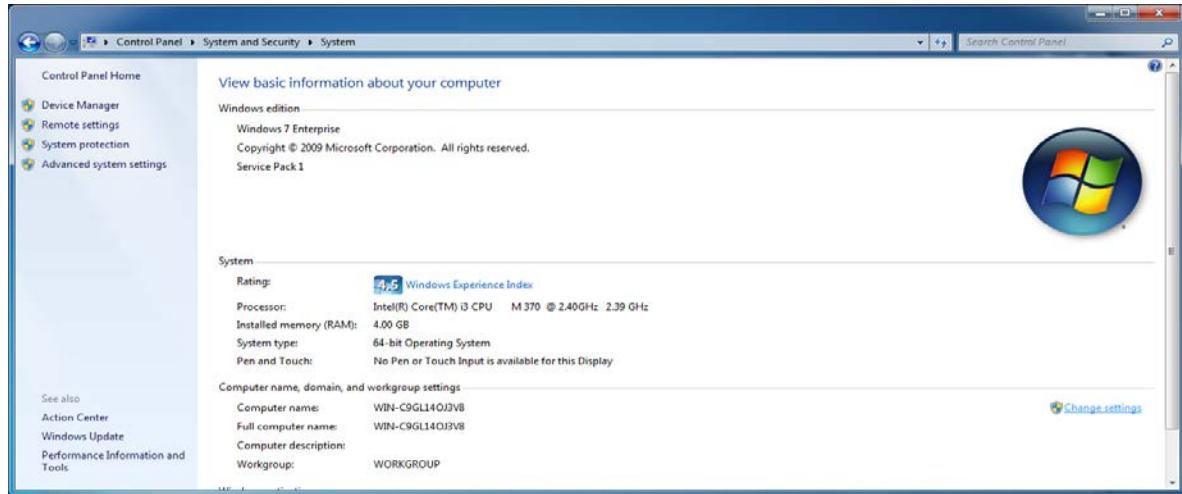
**Figure 1.11 – Time and date settings**



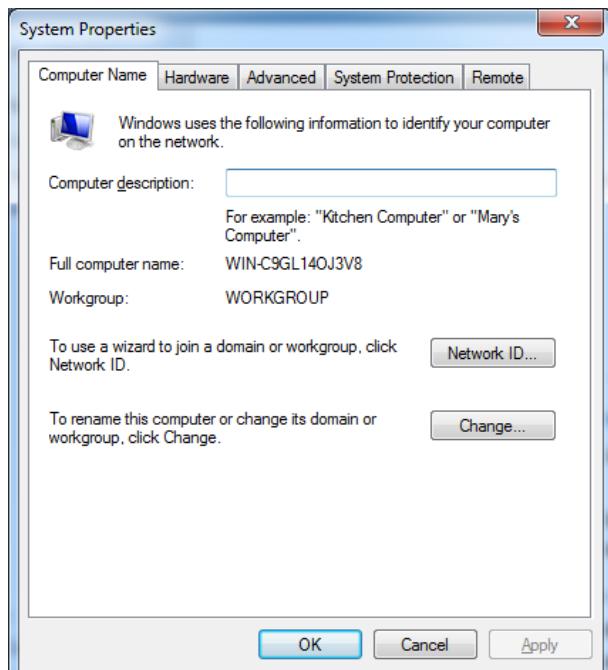
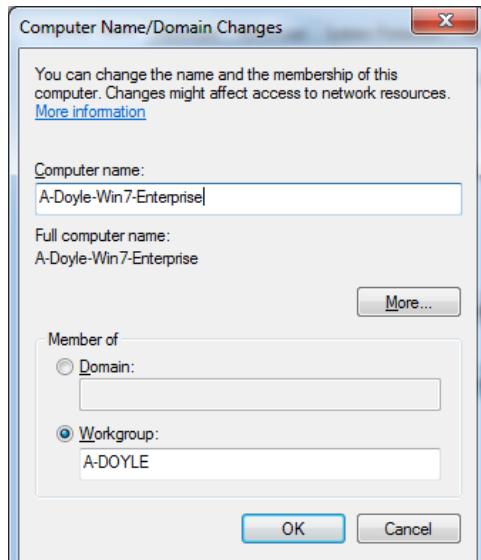
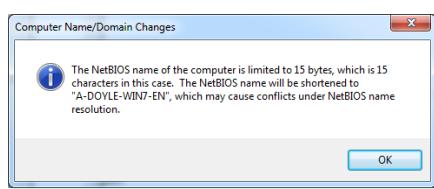
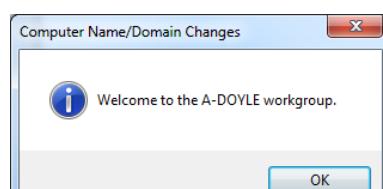
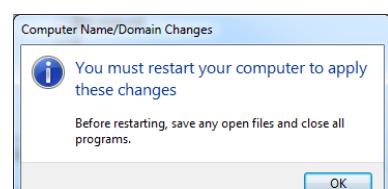
### Time and Date Settings

If you make a mistake here, once windows has been installed you can change the time and date settings by clicking on the time/date in the bottom right hand corner of your toolbar and selecting **Change date and time settings...**

Once Windows has been installed (this may take approximately 15 minutes), you can assign the machine to a workgroup. To access the WorkGroup set-up window click **Start**, then right click **Computer**, and select **Properties**. Under **Computer name, domain, and workgroup settings**, select **Change Settings** (as shown in Figure 1.12).

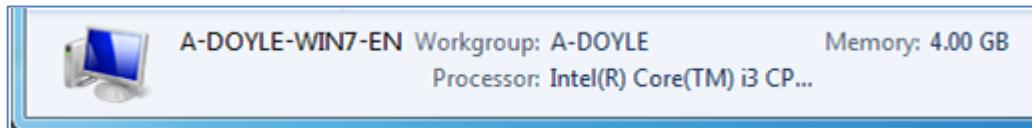
**Figure 1.12 – Workgroup settings**

You will now be in the **Computer Name** tab of **System Properties** (see Figure 1.13). Select **Change**. You can now rename the computer and the Workgroup (Figure 1.14). Click **OK** when you have finished. Note that the computer name is limited to 15 characters (see Figure 1.15). Windows will welcome you to the workgroup (Figure 1.16) and prompt you to restart your computer (Figure 1.17); click **OK** on all steps to proceed.

**Figure 1.13 – System Properties****Figure 1.14 – Computer/WorkGroup Name Changes****Figure 1.15 – 15 Characters****Figure 1.16 – Welcome****Figure 1.16a – Restart**

To confirm that your changes have been successful, you can check by clicking **Start**, and selecting **Computer**. At the bottom of the window you will see your new computer details (as shown in Figure 1.16).

**Figure 1.16b – Confirming Computer/Workgroup name changes**

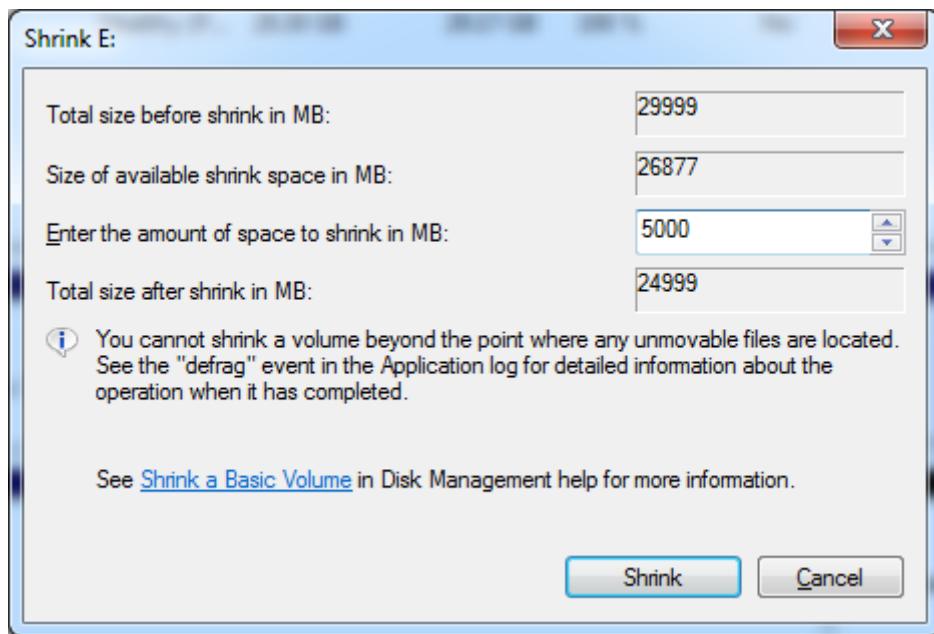


## FAT32 Partition

A FAT32 partition was not created during the installation process to allow the use of MS-DOS based utilities for diagnostics purposes. As discussed by Gookin (1998), many of the best diagnostics programs run on MS-DOS. It provides raw access to the hardware, unlike the protected environment of an operating system.

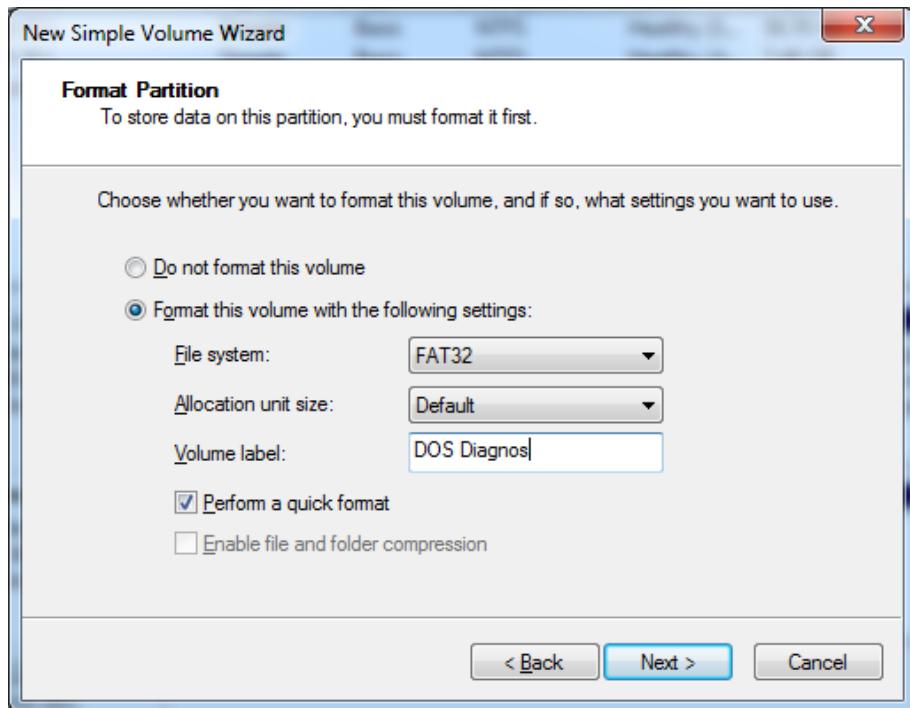
To add a FAT32 partition, type **Disk Management** in the search bar. Right-click the Users Drive, and select **Shrink Volume**. Beside **Enter the amount of space to shrink in MB**, enter a number, the drive will be shrunk by the number specified (i.e. 5000mb in Figure 1.17). Click **Shrink**.

**Figure 1.17 – Shrinking a Drive**

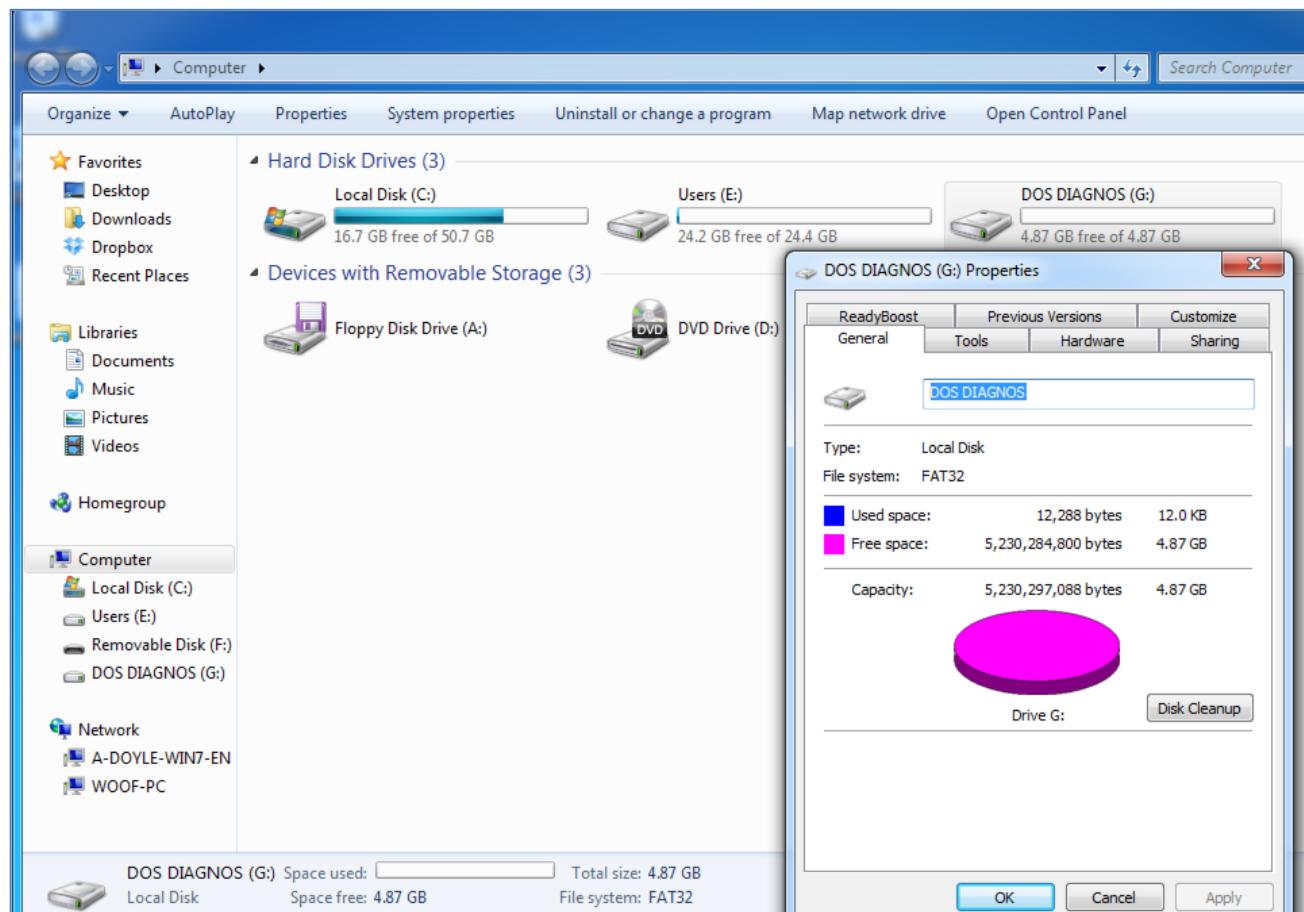


You will now have unallocated space. Right-click the unallocated space and select **New Simple Volume**. Select **Next** in the wizard.

Specify the volume size and click **Next**. Assign a drive letter and select **Next**. As per Figure 1.18, specify a FAT32 file system, and select **Next** to proceed.

**Figure 1.18 – Specify file system type**

In the next window, select **Finish**, and your partition will be created. To check, navigate to your **Computer**, right-click the drive, and select properties (Figure 1.19).

**Figure 1.19 – Checking File Properties**

## Task A.2 – UPDATES & ANTIVIRUS

When Windows has been installed, a balloon type message might appear from the system tray informing you that updates are available (see Figure 2.1). You can click this to proceed to install updates. This message will only appear temporarily.

To access Windows Update without being prompted, you can simply search for “update” in the search bar (see Figure 2.2). Select **Windows Update** under **Programs** to continue. You can also easily access Windows Update in the Control Panel Icon view.

As shown in Figure 2.3, you will be informed of updates that are currently available. Windows will automatically select important updates, which are typically service packs or security updates. To install the selected updates click **Install Updates**.

From the Windows Update window you can also manually check for updates, change update settings, view update history, restore hidden updates or view a list of Frequently Asked Questions in relation to updates.

To the left of the Install Updates option, you can click on the important or optional updates available, whereby you can choose exactly which updates you wish to install.

It is probable that Windows Action Center will inform you of security risks on your system. Windows Action Center can be located in the system tray (with an icon as shown in Figure 2.5).

### Are Updates and Anti-virus necessary?

[Broida \(2011\) discusses how it is not a good idea to ignore Windows updates.](#)

[An interesting article by McMillan \(2012\), discusses the necessity of anti-virus software.](#)

Figure 2.1 – Update Message

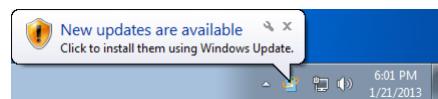


Figure 2.2 – Finding Windows Update

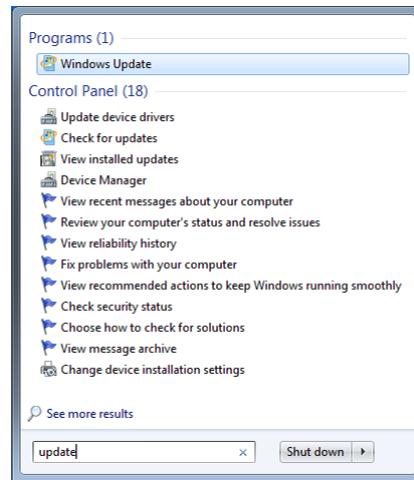
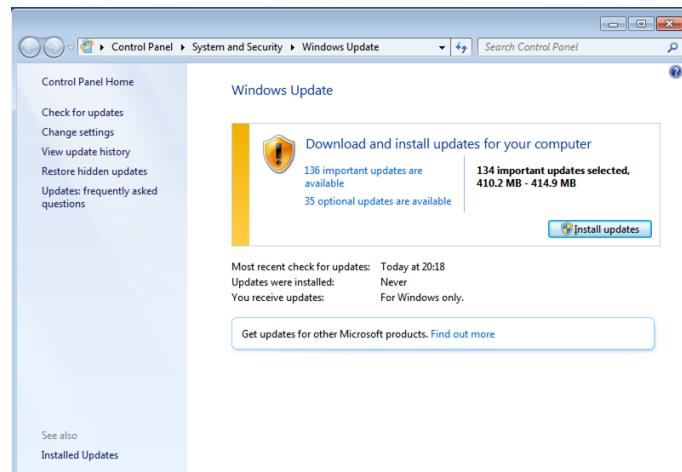


Figure 2.3 – Updates Available

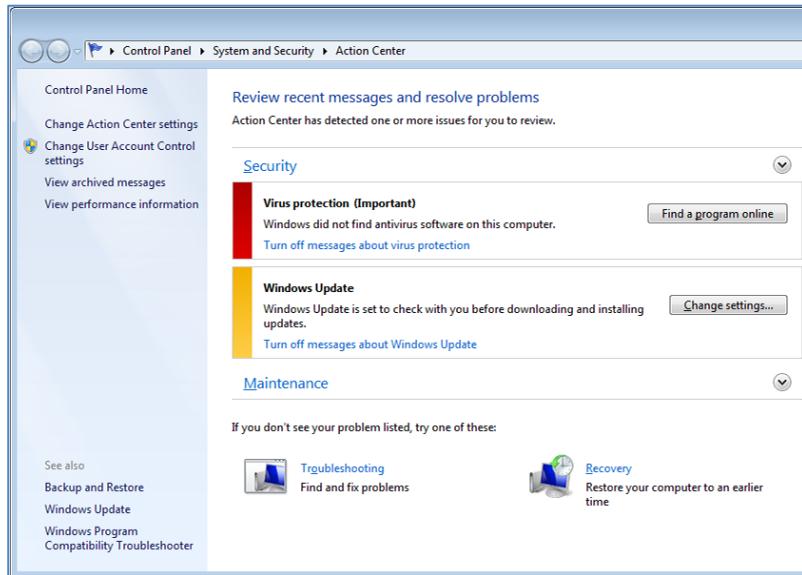


**Figure 2.5 – Security Warning**

Clicking on this Icon will bring up the Action Center Window (as shown in Figure 2.6). Action Center will provide messages and warnings regarding security, maintenance, and updates.

In Figure 2.6 Action Center warns that no virus protection has been detected on the system.

Microsoft provides a free anti-virus program called *Microsoft Security Essentials*.

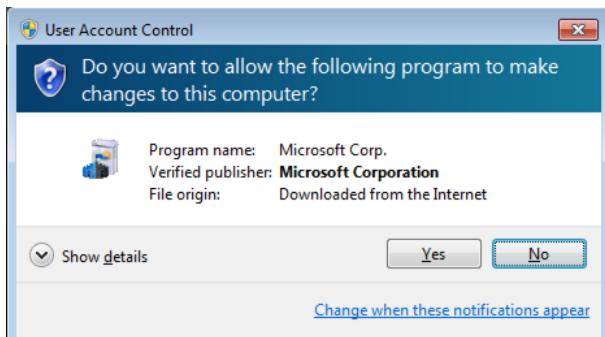
**Figure 2.6 – Virus Protection Warning**

To install this program, open your browser and search for “Microsoft Security Essentials”. The first result is likely to direct you to the Microsoft download page for the program (as shown in Figure 2.7). Select download and then you can either click **run** or **save**. Click **run** to install the program immediately or click **save** to save the installation file in your chosen directory where you can install it later at your convenience.

**Figure 2.7 – Microsoft Security Essentials Download Page**

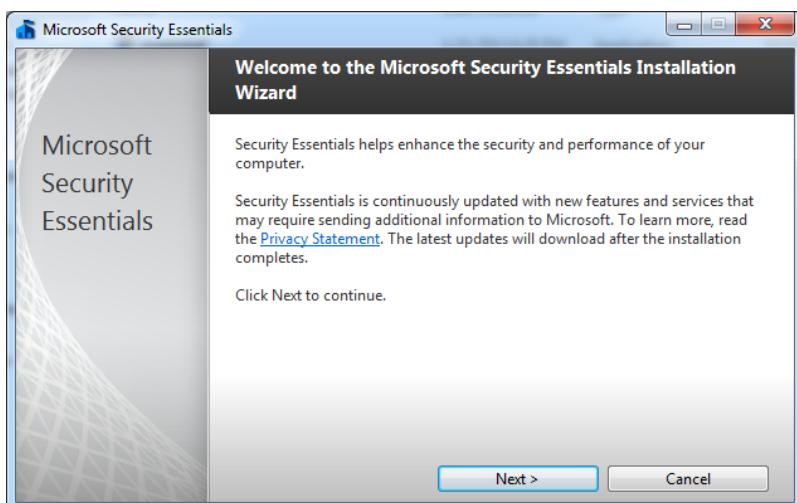
Do you want to run or save **mseinstall.exe** (12.9 MB) from **mse.dlservice.microsoft.com**?

**Run** **Save** **Cancel**

**Figure 2.8 – Windows Installation Confirmation****Windows Installation Confirmation**

Windows will ask you to confirm that you wish to continue with the installation. This is nothing to be concerned about; click **Yes** to continue.

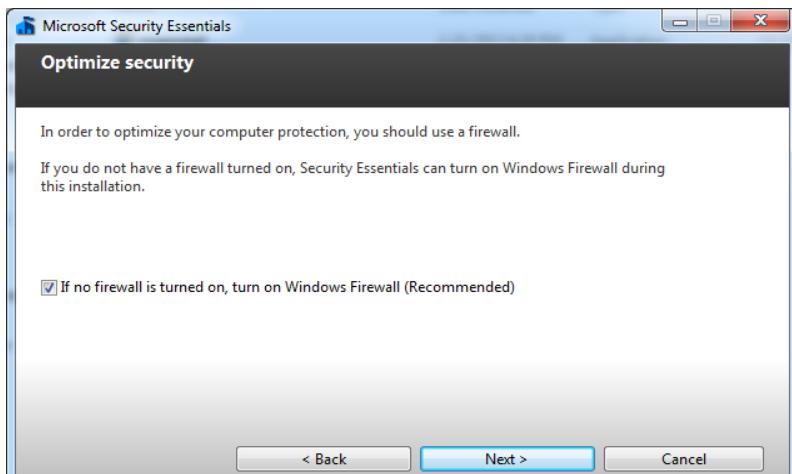
If warnings like this are an annoyance to you, you can change the relevant settings by clicking **Change when these notifications appear**.

**Figure 2.9 – Microsoft Security Essentials Installation Wizard****Security Essentials Installation Wizard**

You will be welcomed with the installation wizard. You may read the privacy statement if you wish. Click **Next** to continue with the installation.

After selecting **Next** (as per Figure 2.9), you will be presented with the software license terms. You can read or even print the license terms from this window. You must accept the licensing terms to continue with the installation, therefore select **I accept** to continue with the installation.

You will then be asked whether you want to join the customer improvement program. This is typical of many software installations, where the vendor will collect information such as software/hardware configurations, how the program is used, problems encountered, etc. Select **Join the Customer Experience Improvement Program** if you wish to participate or **I do not want to join the program at this time** if you do not wish to participate. Click **Next** to continue.

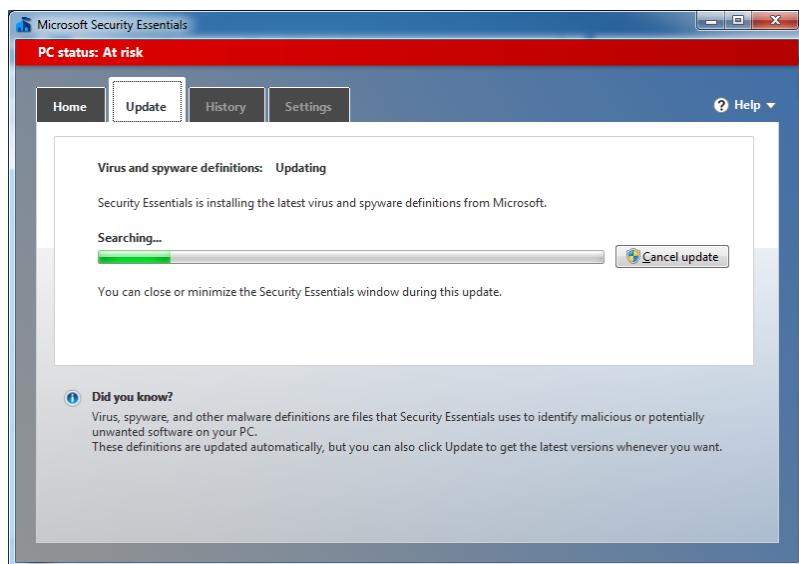
**Figure 2.9a – Microsoft Security Essentials Installation Wizard****Firewall Prompt**

You will be prompted to use a firewall. Select **If no firewall is turned on, turn on Windows Firewall (Recommended)**.

Select **Next** to continue. You will now be warned that any existing antivirus programs may conflict with Security Essentials. If you have no such programs on your computer, select **Install** to continue.

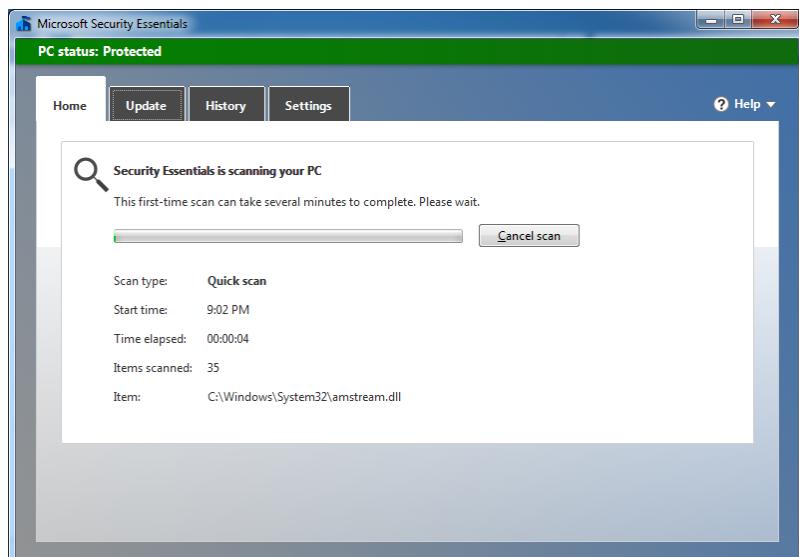
**Figure 2.10 – Microsoft Security Essentials Installation Complete****Installation Complete**

Click **Finish** to get the latest updates and have an initial computer scan afterwards. You may also receive an update warning from the Action Center in the System Tray.

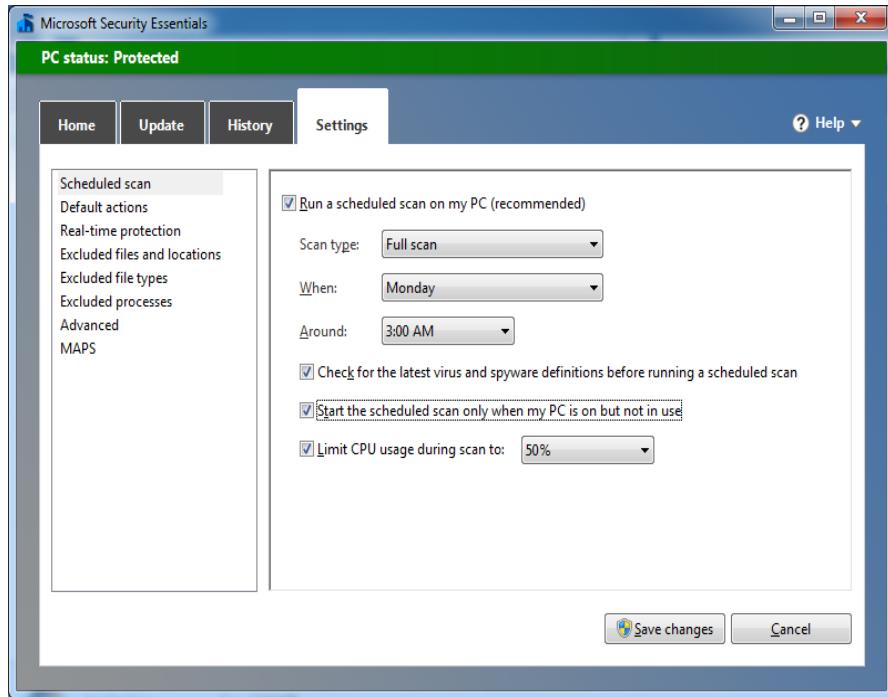
**Figure 2.11 – Action Center****Figure 2.12 – Microsoft Security Essentials Updates****Update Process**

It may take several minutes for the updates to download and install. A slow broadband connection may affect the speed of the updates.

You can minimize the update window and carry out other tasks; perhaps tidy your desk or make yourself a cup of tea or coffee.

**Figure 2.13 – Initial Scan****Initial Scan**

It may take several minutes for the initial scan to complete. As before, you may minimize the update window and carry out other tasks.

**Figure 2.14 – Schedule a Scan****Schedule a Scan**

Click on the **Settings** tab. Ensure that the box is ticked beside **Run a scheduled scan on my PC (recommended)**.

You can choose the scan type, date, time, and other characteristics of the scan. In Figure 2.14, the scan is scheduled for 3am every Monday. Updates are checked before the scan, the scan only occurs when the system is on and not in use, and CPU usage is limited to 50% during the scan.

Click **Save changes** to confirm the schedule.

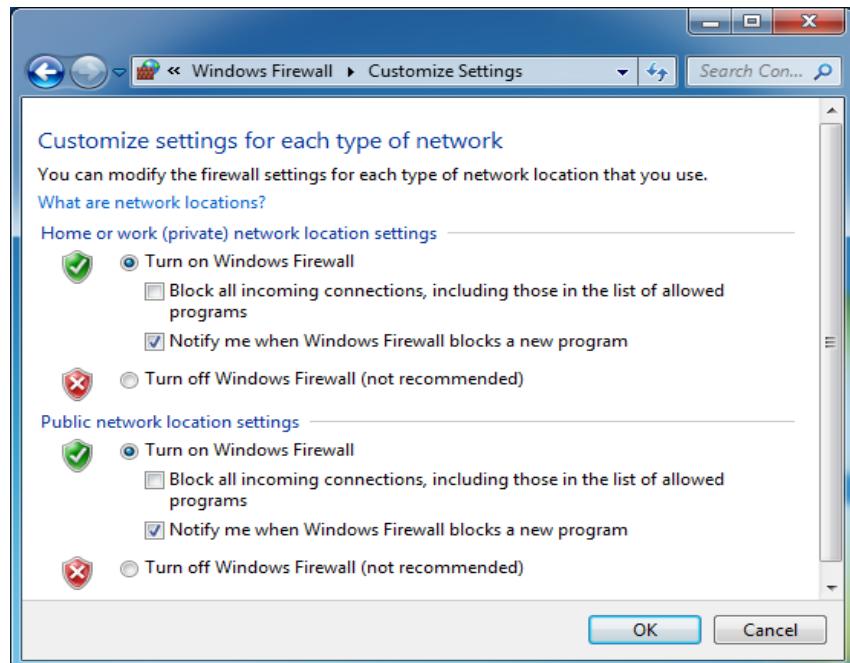
Windows will ask you to confirm to make changes again; click **Yes** to continue. You may now be prompted to download Internet Explorer 9 with SmartScreen Filter.

**Figure 2.15 – Windows Firewall****Windows Firewall**

To access Windows Firewall, select **Start**, **Control Panel**, and then **Windows Firewall** (in icon view).

In the navigation pane on the left, select **Turn Windows Firewall on or off**.

[Microsoft \(n.d.\) discusses the need to use anti-virus software in conjunction with Window Firewall to protect ones computer.](#)

**Figure 2.16 – Turn Windows Firewall on or off****Turn Windows Firewall on or off**

To enable the Firewall, ensure that you select Turn on Windows Firewall for both Home/Work and Public Locations.

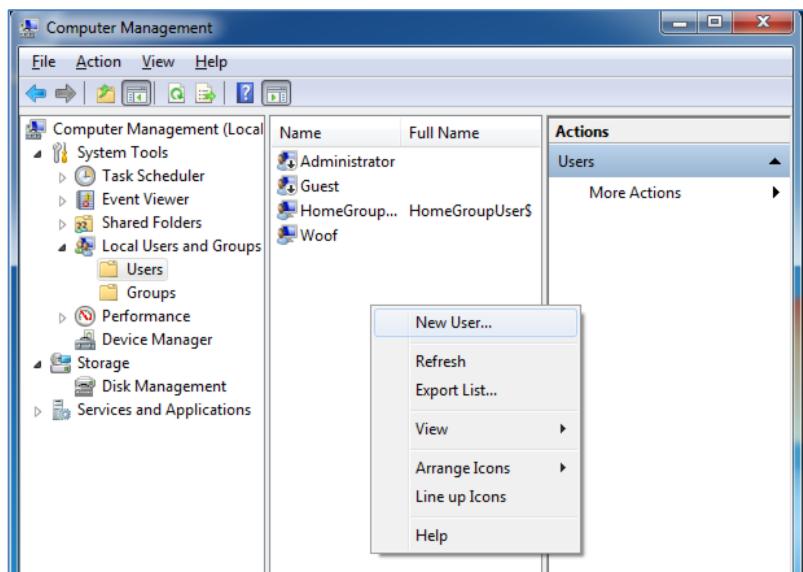
## Task A.3 – USERS, GROUPS & SECURITY

---

### Creating Users

To create a new **User**, click **Start**, right-click **Computer** and choose **Manage**. This brings you to the Computer Management Utility. In the left-hand navigation bar, select **Local Users and Groups** and select **Users**. As shown in Figure 3.1, right-click in the blank space below existing users and select **New User**.

**Figure 3.1 – Computer Management Utility**

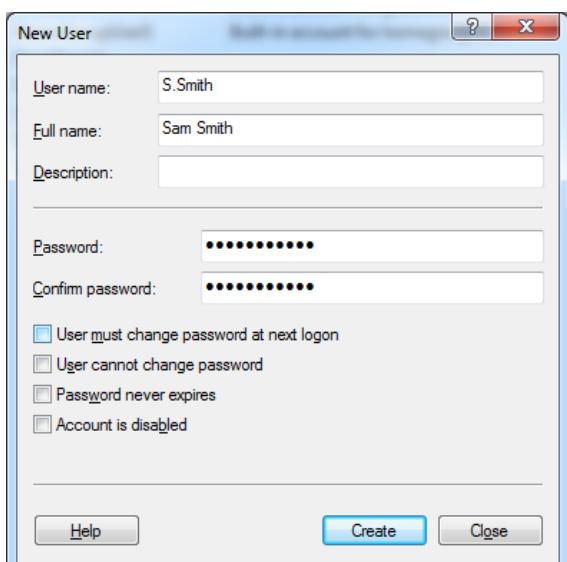


#### Note

[Read this article by Microsoft \(n.d.\)](#) for more information on User Accounts.

This will bring up the **New User** window, as shown in Figure 3.2. You enter the relevant details and choose a password that conforms to best practice. A combination of letters, numbers, and symbols is advisable since it is harder to guess. Un-tick **Users must change password at next logon**. Select **Create** and the user will be created. The **New User** window will refresh and you can add another user; when you are finished creating users select **Close**. This will bring you back to Computer Management where you can see that the users have been created (Figure 3.3).

**Figure 3.2 – New User**



#### New User

Be sure to un-tick all boxes as shown, unless you have a valid reason to do otherwise

**Figure 3.3 – New Users Created**

Name	Full Name	Description
A.Doyle	Andrew Doyle	Administrator
Administrator		Built-in account for administering...
F.Brown	Francis Brown	HR
Guest		Built-in account for guest access t...
HomeGroup...	HomeGroupUser\$	Built-in account for homegroup a...
P.Daniels	Paul Daniels	Finance
R.Mathews	Rachael Matthews	IS
S.Brown	Stephanie Brown	HR
S.Grace	Samantha Grace	IS (also administrator)
S.Smith	Sam Smith	Finance

## Creating Groups

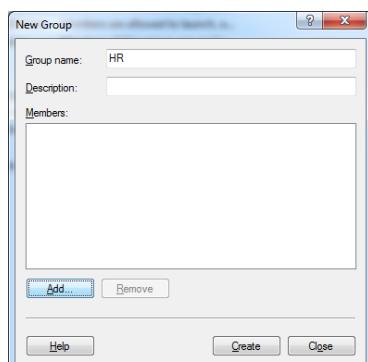
To create a group, click on **Groups** under **Local Users and Groups** in **Computer Management**. Right-click in the blank space after the standard users, and select **New Group**.

**Figure 3.4 – Group Management**

Name	Description
Administrators	Administrators have complete an...
Backup Operators	Backup Operators can override se...
Cryptographic Operators	Members are authorized to perfor...
Distributed COM Users	Members are allowed to launch, a...
Event Log Readers	Members of this group can read e...
Guests	Guests have the same access as m...
IIS_IUSRS	Built-in group used by Internet Inf...
Network Configuration Operators	Members in this group can have s...
Performance Log Users	Members of this group may sche...
Performance Monitor Users	Members of this group can access...
Power Users	Power Users are included for back...
Remote Desktop Users	Members in this group are grant...
Replicator	Supports file replication in a dom...
Users	Users are prevented from making ...
HomeUsers	HomeUsers Security Group

## Group Management

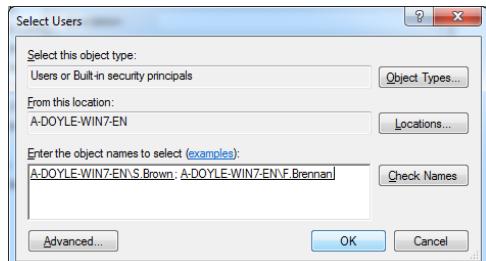
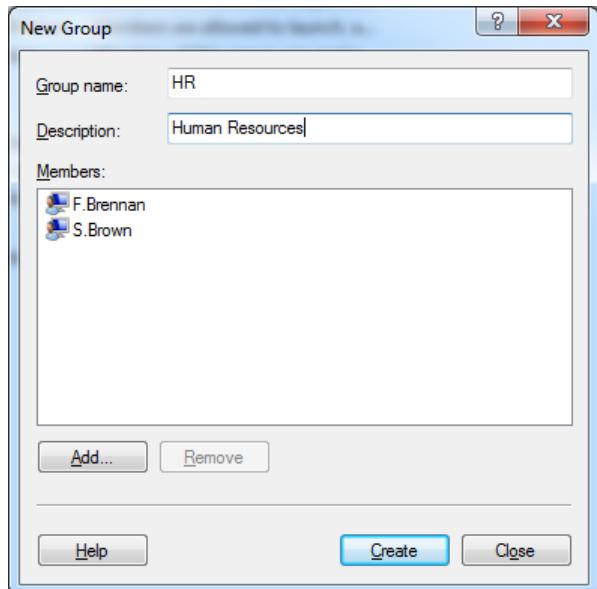
Don't be put off by the number of groups already set up by Windows 7 Enterprise. It is relatively straightforward to create your own simple group structure.

**Figure 3.5 – New Group Window**

### Creating a Group

To create a group, enter the group name and click **Add** to add members (Figure 3.5).

Type the user name in the white area and select **Check Names** to confirm the user name (Figure 3.6). Click **OK** to go back to the **New Group** window (Figure 3.7).

**Figure 3.6 – Selecting Users****Figure 3.7 – Group with Users Assigned****Finalising Group**

You may also add a description to the group, which is shown in the main **Computer Management** window.

Once you are happy with the group name, and members, click **Create**; your group is now created.

You can create more groups or click **Close** to go back to the **Computer Management** window (see Figure 3.8).

**Figure 3.8 – Group with Users Assigned**

Name	Description
Administrators	Administrators have complete control over the system.
Backup Operators	Backup Operators can override normal security settings.
Cryptographic Operators	Members are authorized to perform cryptographic operations.
Distributed COM Users	Members are allowed to launch objects from other computers.
Event Log Readers	Members of this group can read event logs.
Guests	Guests have the same access as the public user.
IIS_IUSRS	Built-in group used by Internet Information Services.
Network Configuration Operators	Members in this group can change network configuration.
Performance Log Users	Members of this group may write performance data.
Performance Monitor Users	Members of this group can use the Performance Monitor.
Power Users	Power Users are included for compatibility with previous versions.
Remote Desktop Users	Members in this group are granted remote desktop access.
Replicator	Supports file replication in a distributed environment.
Users	Users are prevented from making changes to system files.
Finance	HomeUsers Security Group.
HomeUsers	Human Resources
HR	Insurance

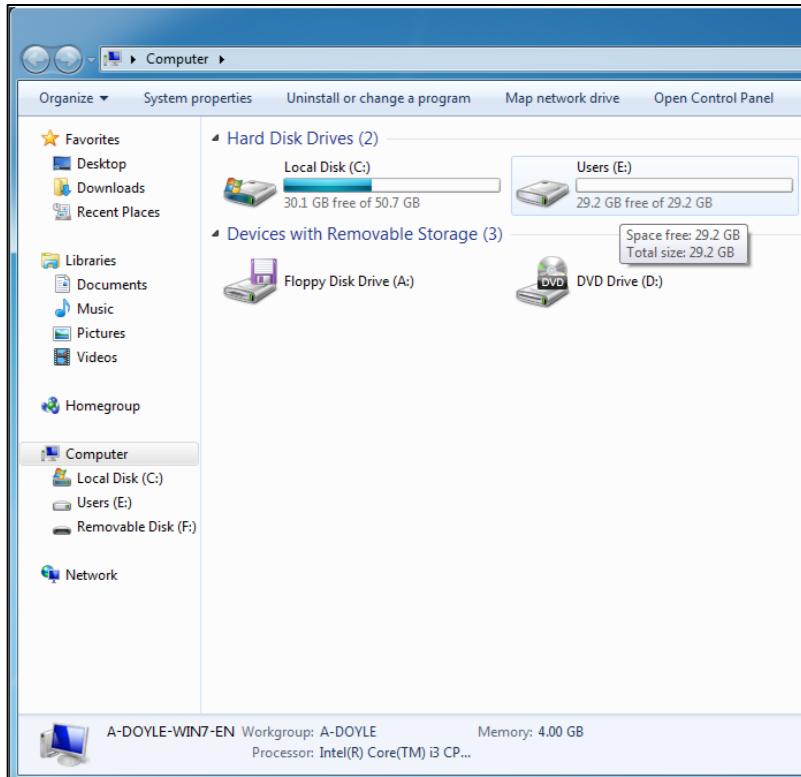
**Groups Created**

You can delete and rename groups in **Computer Management**. Simply right-click on the relevant group.

## Security and Folders

It is important to separate department files not only for security reasons, but for convenience reasons. To create the department folders, click **Start**, **Computer** and then double-click on the Users drive (Figure 3.9).

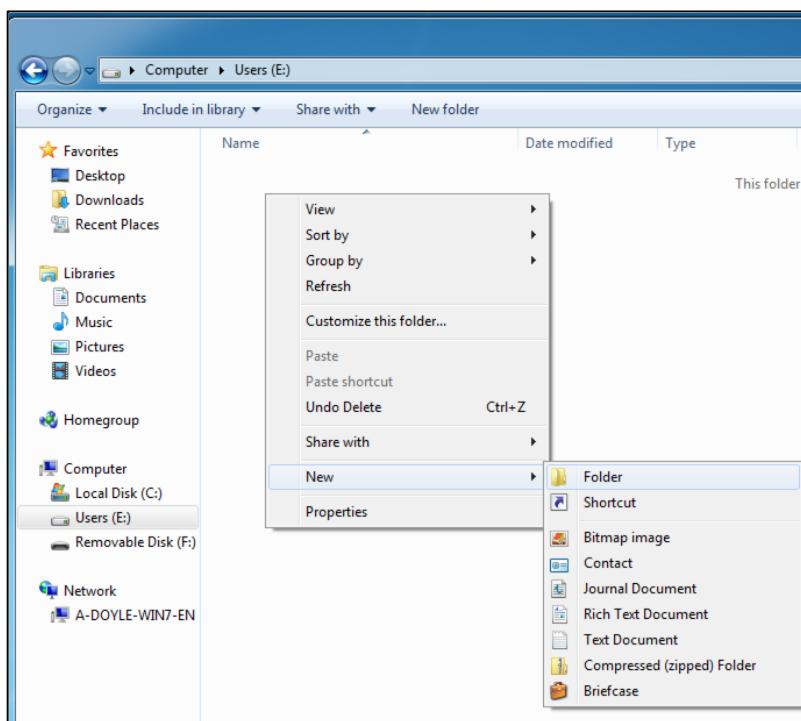
**Figure 3.9 – Selecting Correct Drive**



### Selecting Correct Drive

The operating system and files are stored on the Local Disk. The Users (E:) drive is being used for the creation of user accounts.

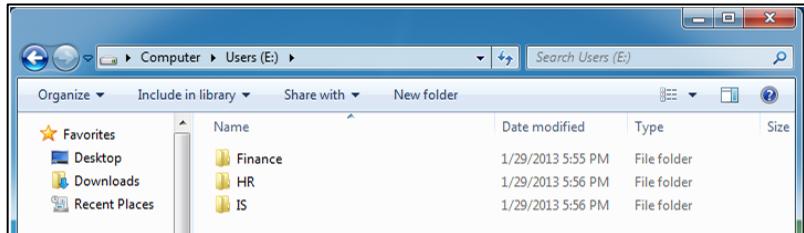
**Figure 3.10 – Creating New Folder**



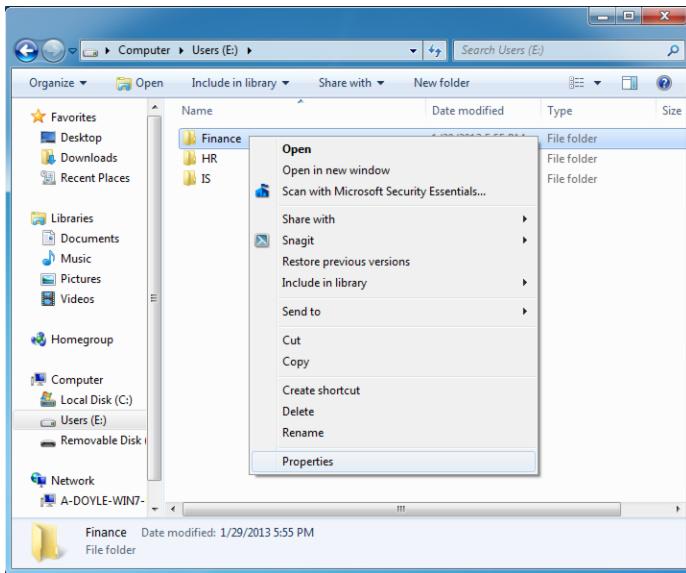
### Creating New Folder

To create a folder, right-click in the blank space as shown, select **New** and then **Folder**.

The folder will be automatically called “**New Folder**” and the characters will be highlighted - you may immediately type any name you wish.

**Figure 3.11 – Folders Created**

Folders are now in place as per Figure 3.11. To implement security and permissions on these folders, right-click the relevant folder and select **Properties** (as per Figure 3.12).

**Figure 3.12 – Selecting Folder Properties**

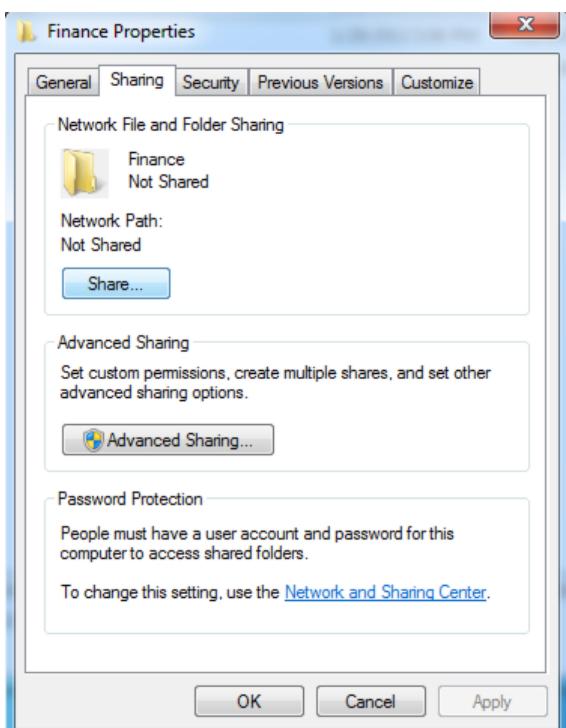
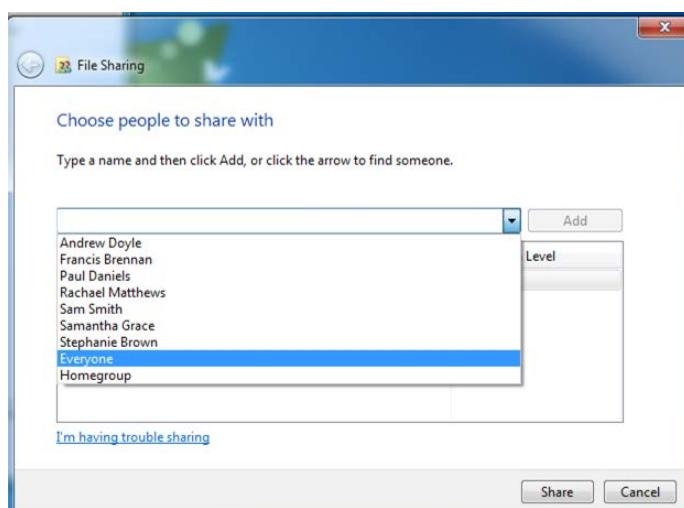
### Sharing Folders

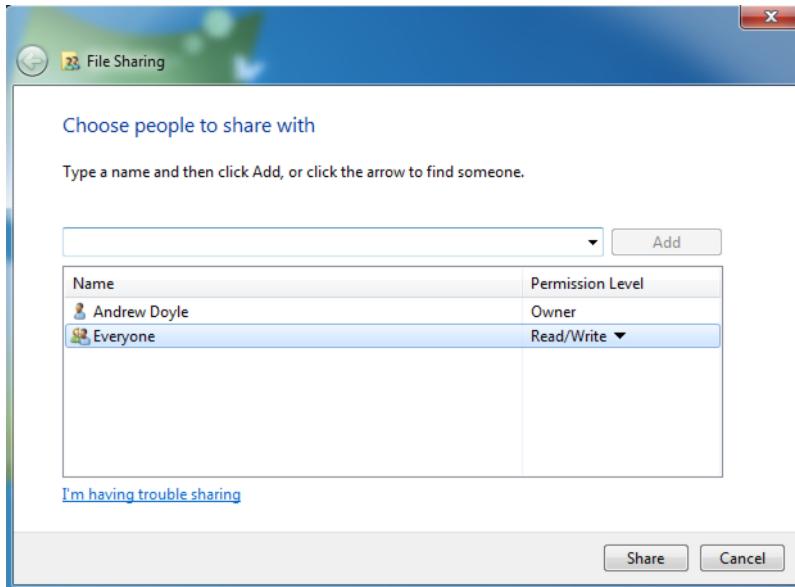
Once you are in the Folder **Properties** window, select the **Sharing** tab (Figure 3.13).

Click **Share** and you will be brought to the **File Sharing** window (Figure 3.14). Click the drop-down menu as shown and select **Everyone**.

Now, you must choose the sharing permissions level (see Figure 3.15).

It is best practice to share out full control and restrict access using NTFS permissions.

**Figure 3.13 – Folder Properties – Sharing Tab****Figure 3.14 – Choosing People to share with**

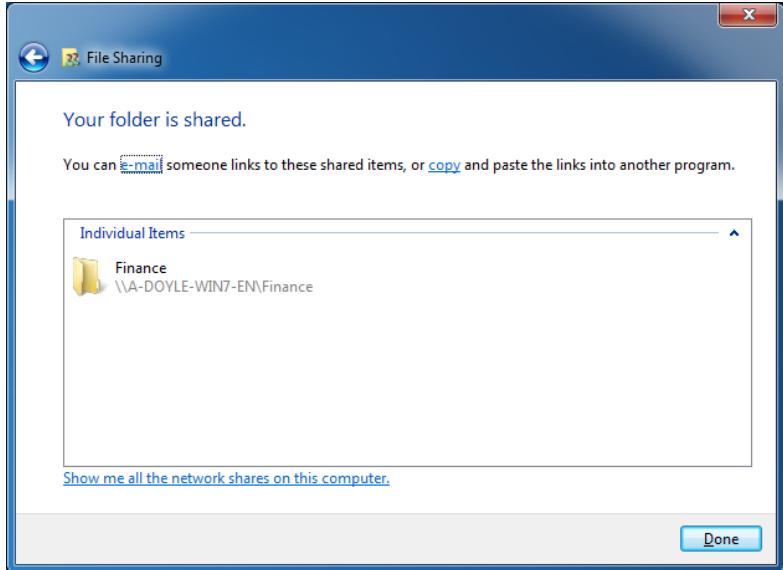
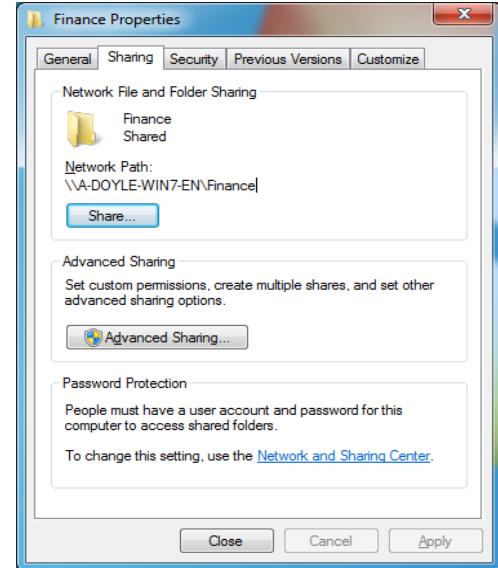
**Figure 3.15 – Setting Sharing Permissions**

### Setting Sharing Permissions

Under Permission Level, by clicking the down arrow opposite, in this case, **Everyone**, you can set the permission level.

Click **Share** to share the folder and a message will appear:  
***Sharing items...This may take a few minutes.***

If successful, you will be met with a window like that shown in Figure 3.16. Click **Done** to exit. For further confirmation that you have shared the folder, you can right-click on the folder, select **Properties**, and under the sharing tab “**Shared**” will appear under the folder name (see Figure 3.17).

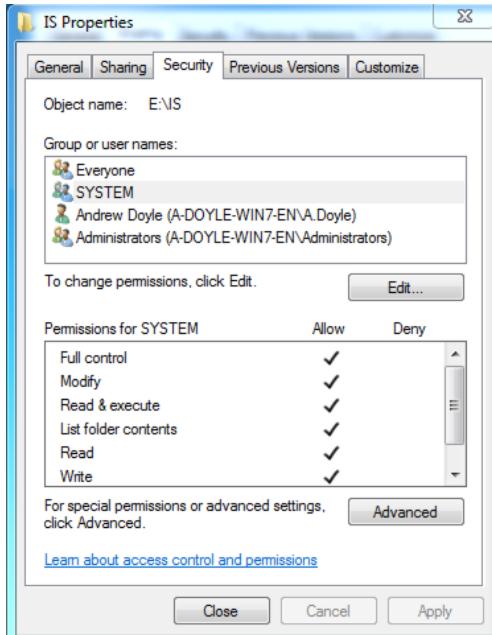
**Figure 3.16 – Folder Shared****Figure 3.17 – Double-check**

The above steps can be repeated for the IS and HR folders. The next step is to implement NTFS permissions. NTFS is an acronym for **New Technology File System**. Read more about NTFS at [www.ntfs.com](http://www.ntfs.com).

If you open the **Security** tab in the **Properties** of a folder you can view the groups or user names associated with the folder. In Figure 3.18, you can see that Everyone, SYSTEM, Andrew Doyle, and Administrators have full access to the files. Later, you will remove surplus groups, but first, click on the **Advanced Tab** to enable special permissions (this will allow you to specify particular permissions for various users).

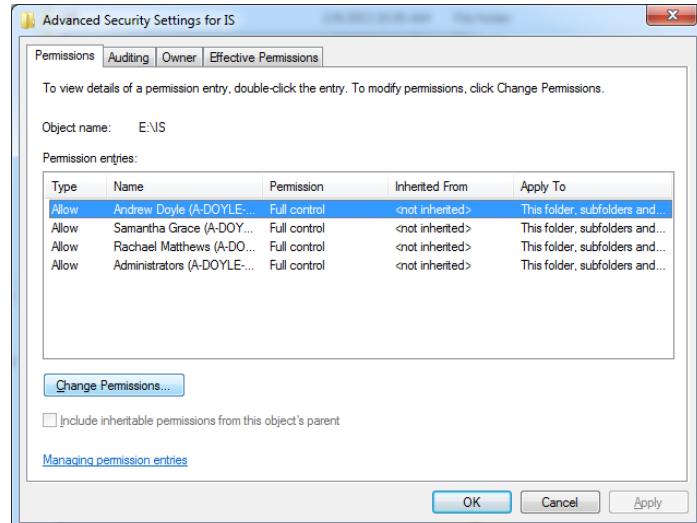
In the **Advanced Security Settings**, under the **Permissions** tab, click **Change Permissions** (Figure 3.19). You will now have options as shown in Figure 3.20. Un-tick the box marked **Include inheritable permissions from this object's parent**. You will get a warning message as shown in Figure 3.21; click **Add** to proceed.

**Figure 3.18 – Folder Properties (Security)**

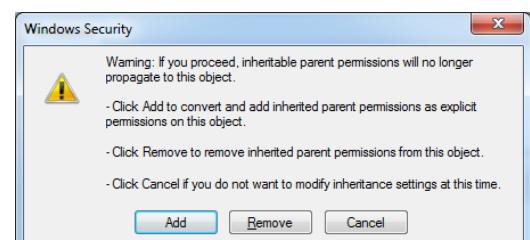
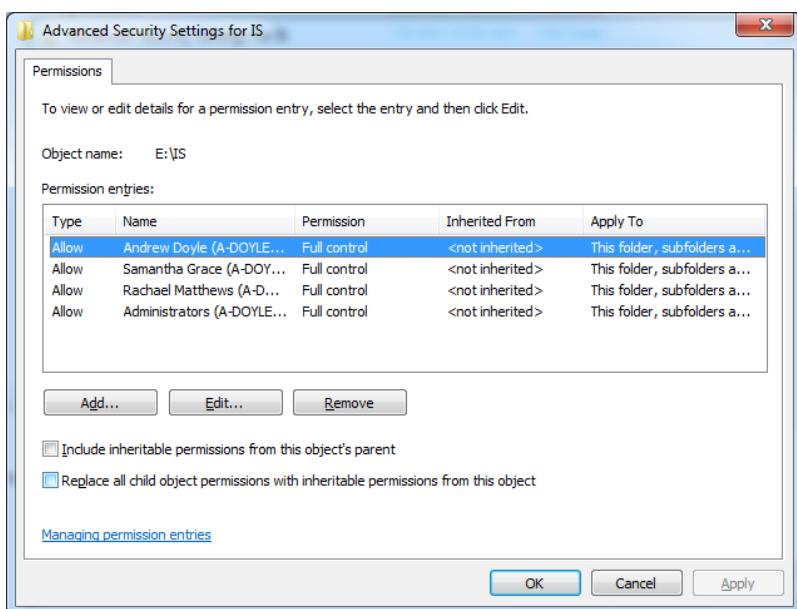


**Figure 3.20 - Inherit permissions setting**

**Figure 3.19 – Advanced Permission Settings**



**Figure 3.21 – Confirmation**



Now you will have full control over permissions. Back in the **Security** tab of the folder **Properties**, select **Edit** in order to change which users/groups are associated with the folder. You will be brought to the permissions window as shown in Figure 3.22. Here, when compared to Figure 3.18, you can see that Everyone, SYSTEM, and Andrew Doyle have been removed. It is best to have the minimum amount of listings required; to avoid confusion.

To remove a user/group, simply highlight the relevant entry, and select **Remove** and then select **Apply**. Figure 3.22 also shows a new user added to the group IS. Samantha Grace's membership of IS is covered

under the administrators groups (since Samantha is also assigned to the administrators group). Note that when accessing the folder in her account for the first time, Samantha will be prompted to enter her credentials (she would not be asked if her username was explicitly specified).

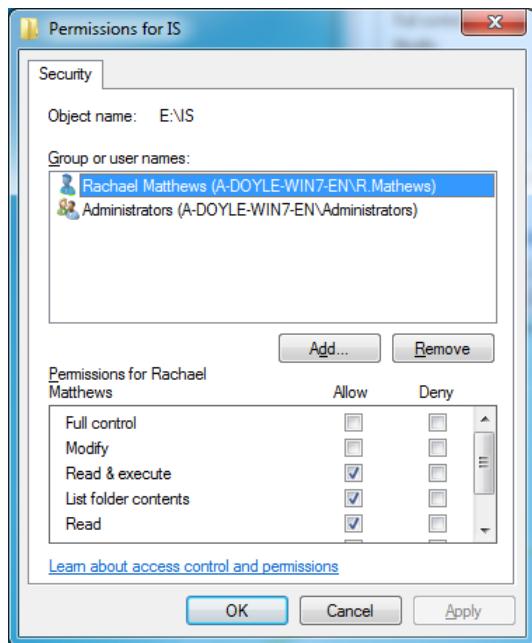
To add a user to a group, select **Add**, and you will be brought to a screen as shown in Figure 3.23. In the white box area you can type in the usernames you wish to add to the group (separated by a semi colon). Then select **Check Names**. If you have spelt the username correctly, windows will show the usernames, preceded by the computer name. When you are happy with the selection select **OK**.

As shown in Figure 3.22, you can select **Allow** or **Deny** permissions, with the following categories:

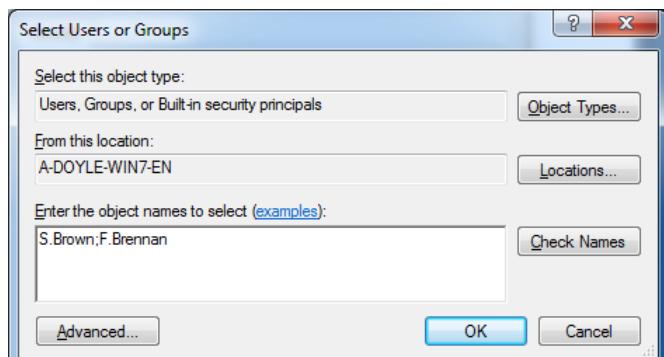
1. Full Control
2. Modify
3. Read & execute
4. List folder contents
5. Read
6. Write
7. Special Permissions

For Further reading regarding permissions, read the following article by Technet (2003): [http://technet.microsoft.com/en-us/library/cc783530\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/cc783530(v=ws.10).aspx).

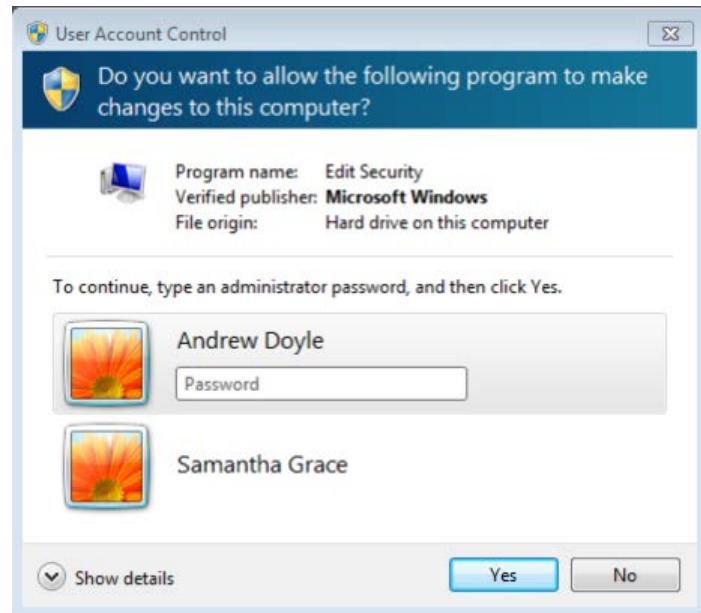
**Figure 3.22 - Permissions**



**Figure 3.23 – Confirmation**



If a user attempts to access a folder that they are restricted from, they will receive a message as per Figure 3.24. Should they choose **Continue**, they will be prompted to login as an administrator (Figure 3.25).

**Figure 3.24 – Access Denied****Figure 3.25 – Log on as administrator**

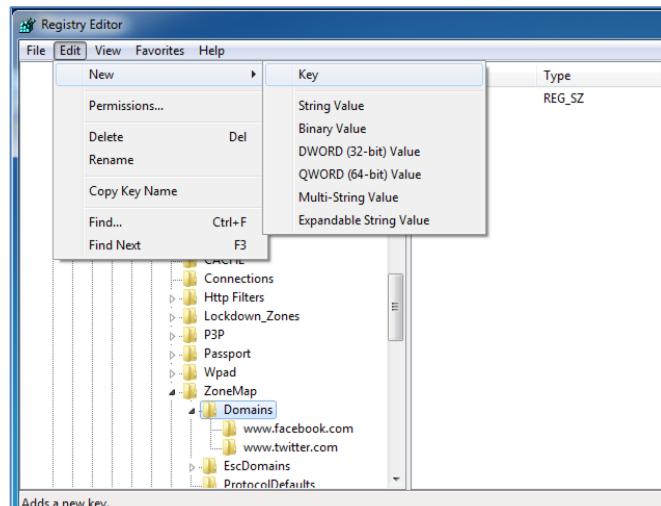
## Block access to Websites

There are many ways of blocking access to websites. Before proceeding, it is important to understand some of the options available.

### 1. Using the Registry

Open the registry editor by typing **regedit** in the search bar. Click **HKEY\_CURRENT\_USER** and choose **Software** from the list that drops down. Next, select **Microsoft**, **Windows**, **CurrentVersion**, **Internet Settings**, **ZoneMap**, **Domains**.

As per Figure 3.26 select **Edit**, **New**, **Key**, and type the url that you wish to block.

**Figure 3.26 – Blocking Websites; Registry Method**

In order for sub-domains to be blocked, select **Edit, New, DWORD (32-bit) Value**, and type in \*. Select **Edit, Modify** and enter 4 as the value; this restricts access to the page.

## 2. Anti-virus (net nanny)

Some anti-virus programs may have website blocking capabilities built in.

## 3. Using Proxy Settings

- Bluecoat proxy server

## 4. Third Party Software

- Websense (built-in software)
- Barracuda Web Filter
- OpenDNS

Third party software is likely to be used in an enterprise environment due to enhanced capabilities.

## 5. Local Group Policy

- Prevent certain users access to specific sites
- Prevent users from changing Internet Options
- Do not allow users to install software i.e. other browsers
- Do not allow the use of portable apps (via usb)

## 6. Windows Advanced Firewall

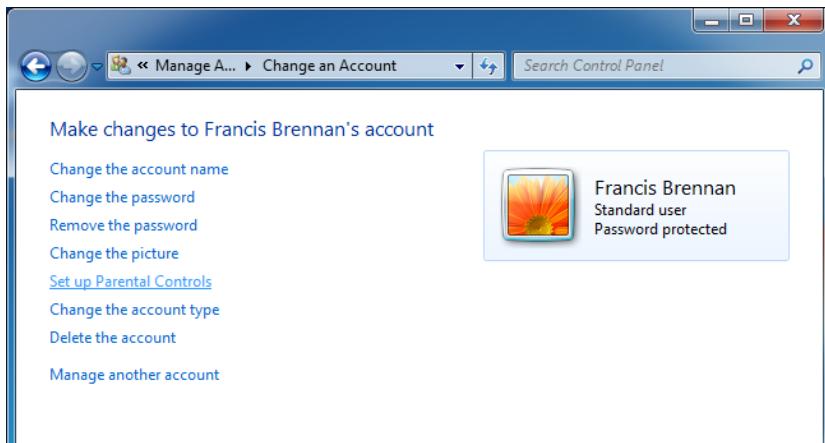
- Block outgoing connections using the browser or ports

## 7. Windows Family Safety

- This is aimed at Home Users and only applies to Internet Explorer
  - Must prevent other browsers from being installed or portable apps being used to bypass these measures

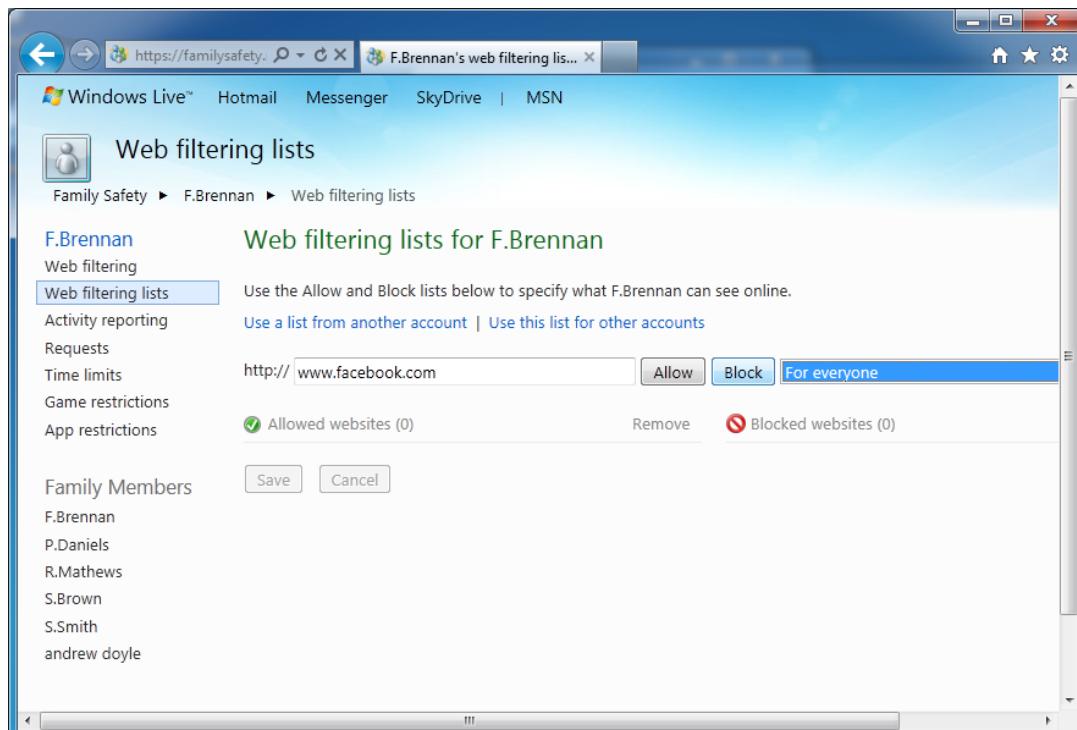
Install Windows Family Safety (part of Windows Essentials 2012). You will have to provide a Microsoft account/email address to set up Family Safety. Search for **User Accounts** in the search bar. Click **Manage another account**. Choose the account you wish to manage and select **Set up Parental Controls** (Figure 3.27).

**Figure 3.27 – Set up Parental Controls**



**Figure 3.28 – Family Safety Website**

Web filtering is enabled in the Family Safety website. Select a user, and choose **Web filtering lists** from the left-hand navigation pane. Add the url you wish to block (Figure 3.29), select **Block** and click **Save Changes**.

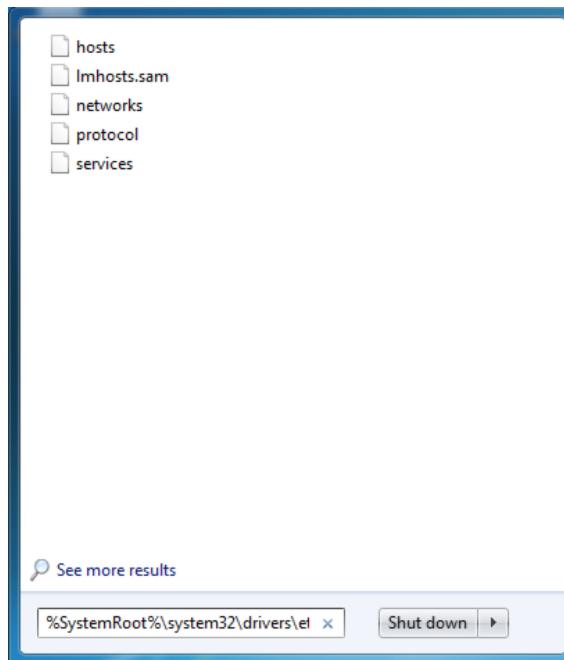
**Figure 3.29 – Blocking Facebook**

Repeat the process for each url, and the websites will be blocked for that user in IE.

## 8. Using the Host File

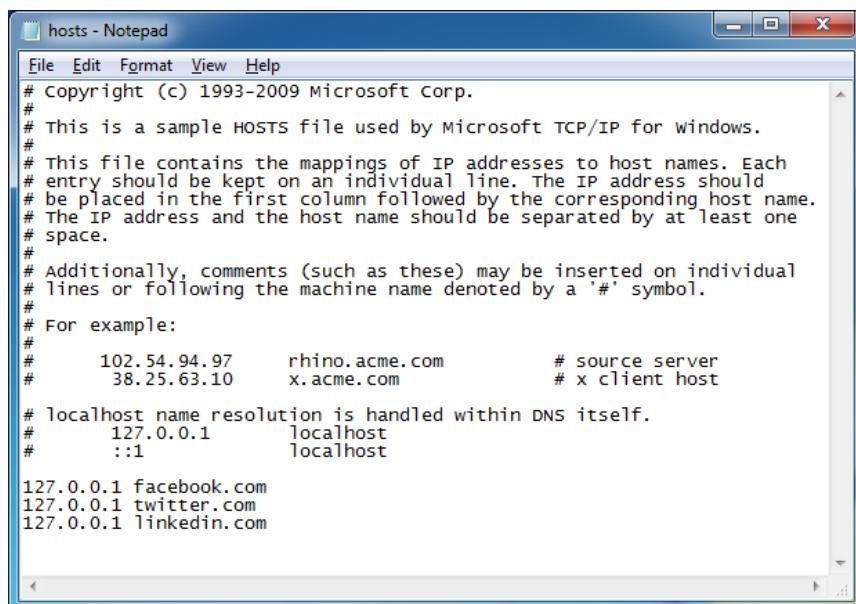
First of all, search for **Notepad** in the search bar, right-click it, and choose **Run as administrator**. Next, type `%SystemRoot%\system32\drivers\etc` into the search bar (Figure 3.30). Right-click **hosts** and choose **Open File Location**.

**Figure 3.30 – Searching for the Hosts File**



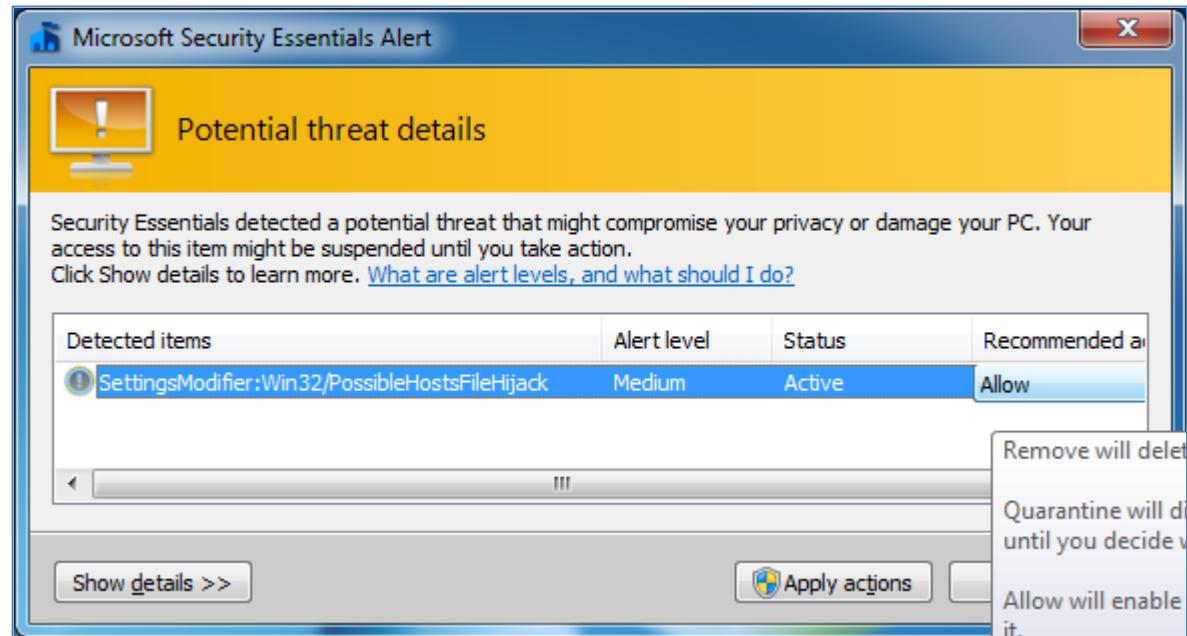
When in Notepad, click **File**, **Open** and navigate to `C:\Windows\System32\drivers\etc`. No files will show in the folder; you must click the down arrow beside **Text Documents (\*.txt)** and choose **All Files**. Now you can open the **hosts** file. Add 127.0.0.1 plus the url you wish to block at the end of the host file (as per Figure 3.31).

**Figure 3.31 – Editing the Hosts File**



Security Essentials may warn you of a possible hosts file hijack. Under **Recommended Action**, choose allow as per Figure 3.32. Click **Apply Actions** and Close.

**Figure 3.32 – Security Essentials Alert**



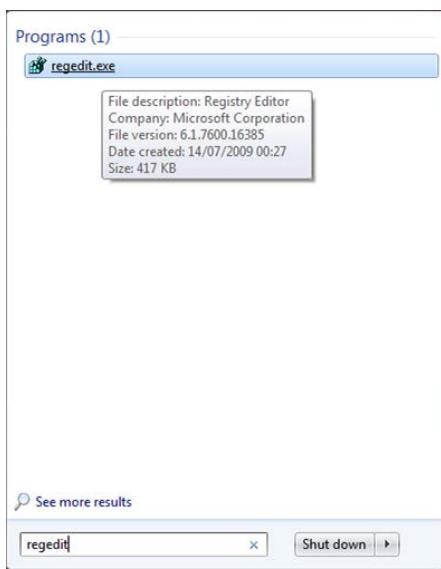
## Task A.4 – REMOTE CONNECTIVITY

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### Changing Listening Port

You can change the listening port through the registry editor. To access this, select start, and type regedit into the search bar (Figure 4.1).

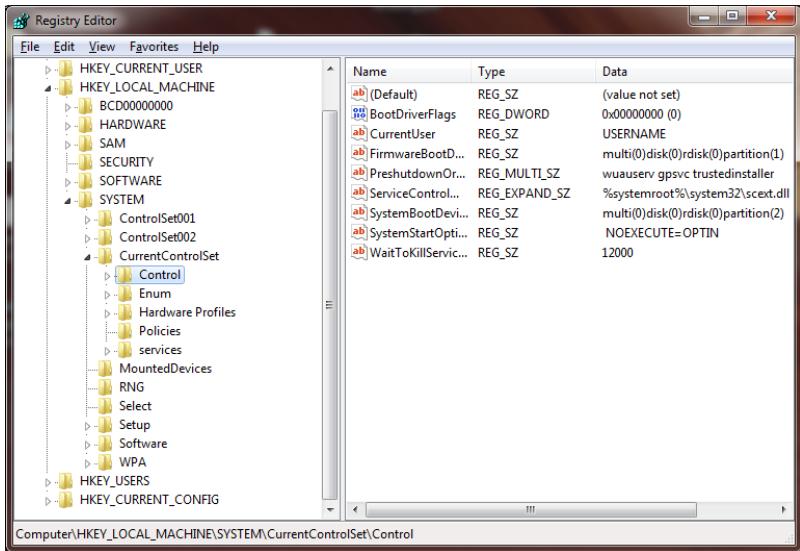
**Figure 4.1 – Regedit**



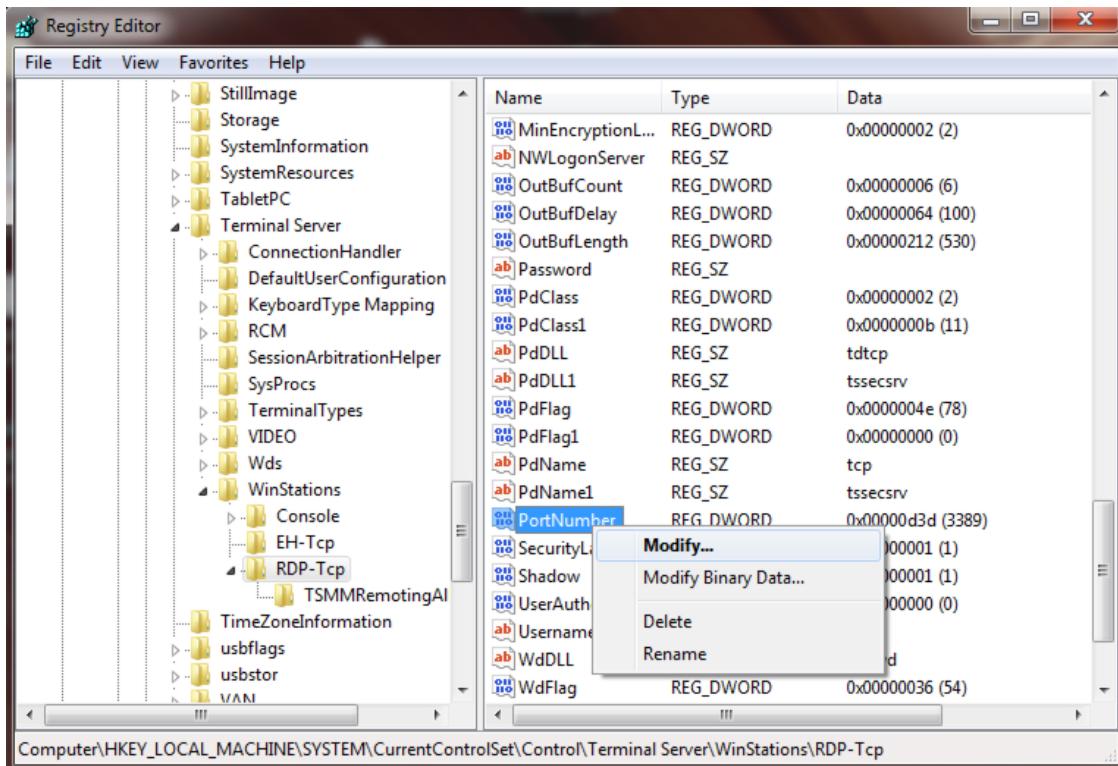
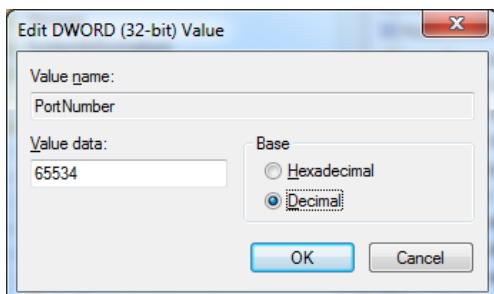
#### Steps to allow Remote Connectivity

1. Change the default listening port via the Registry Editor – Create a backup of the registry first.
2. Add an exception to the firewall for the relevant port.
3. Use Remote Desktop Connection or third party software such as RealVNC to connect.

**Figure 4.2 – Registry Editor**



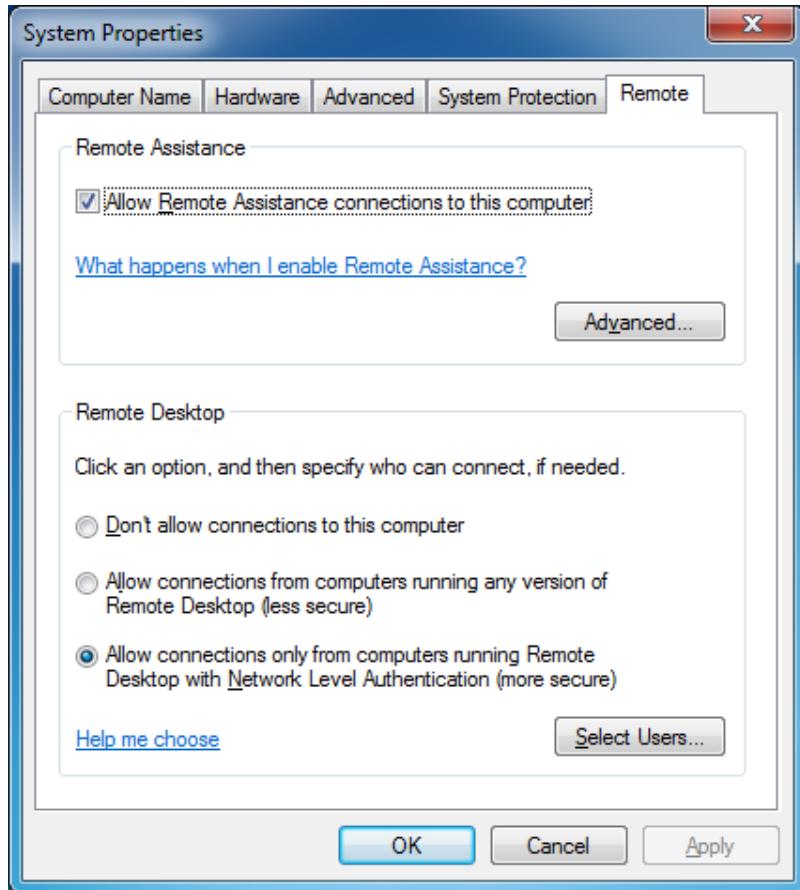
Click **HKEY-LOCAL-MACHINE**, followed by **SYSTEM**, then click **CurrentControlSet**, and select **Control**. Click **Terminal Server**, followed by **Win Stations**, and finally **RDP-Tcp**. Scroll down the list on the right-hand-side of the window until you find **PortNumber** (Figure 4.3). Double-click on it or right-click and select **Modify**.

**Figure 4.3 – PortNumber****Figure 4.4 – Edit PortNumber**

As per Figure 4.4, select **Decimal** under Base and enter your desired port number under Value Data. [It is recommended by the Internet Assigned Numbers Authority \(n.d.\) to use port numbers 49152 – 65535 for dynamic/private use](#); therefore you should use a port number in the range.

Next, you must edit remote settings to allow remote connections. Click on **Start**, right-click **Computer** and select **Properties**. In the left-hand navigation pane select **Remote Settings**. Alternatively, you could simply search for **remote settings** in the search bar and select **Allow remote access to your computer** under **Control Panel**.

You will now be in the remote tab of system properties as shown in Figure 4.5. Firstly tick the box beside **Allow Remote Assistance connections to this computer**. Under Remote Desktop, select **Allow connections only from computers running Remote Desktop with Network Level Authentication (more secure)**.

**Figure 4.5 – Remote Settings****1. Don't allow connections to this computer**

- Prevents anyone from connecting via Remote Desktop or RemoteApp.

**2. Allow connections from computers running any version of Remote Desktop (less secure)**

- Recommended if you don't know the version of Remote Desktop connection that other people are using.

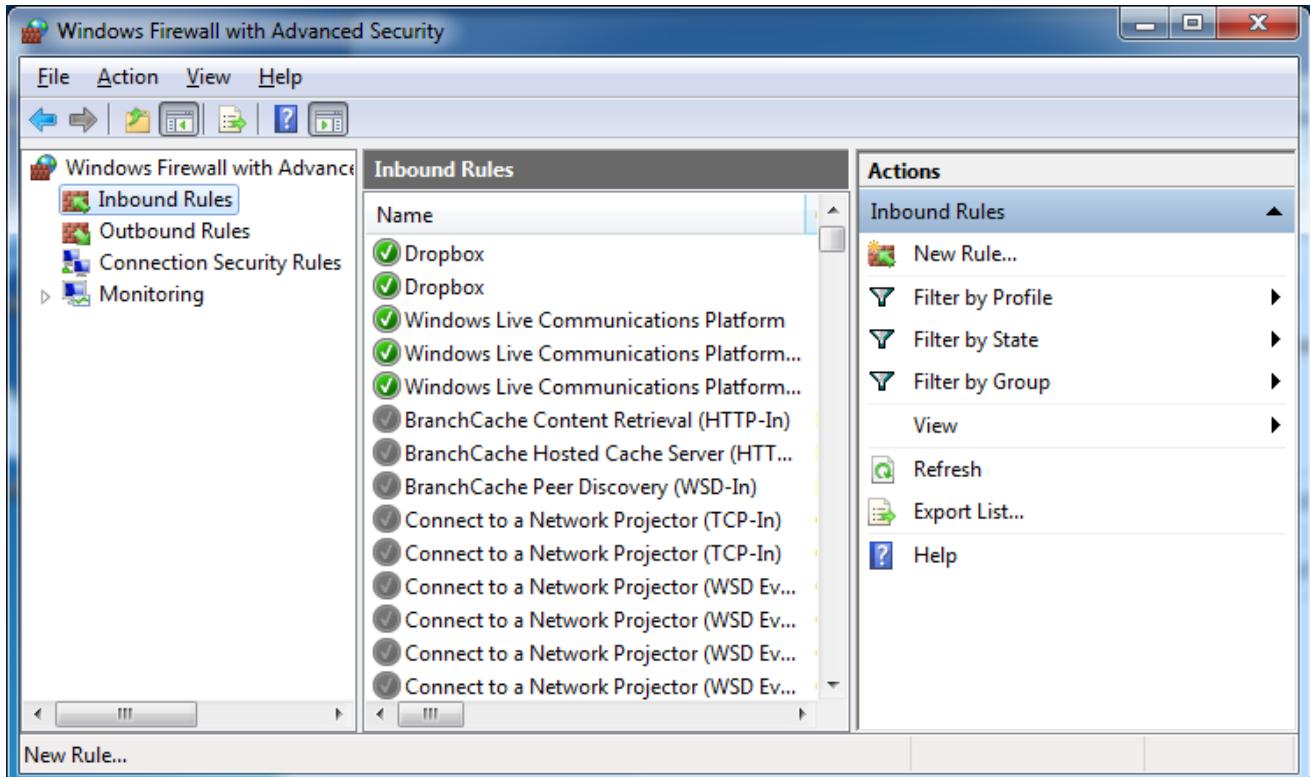
**3. Allow connections only from computers running Remote Desktop with Network Level Authentication (more secure)**

- Best option if you know that those connecting are using Vista or later.

## Firewall Exception

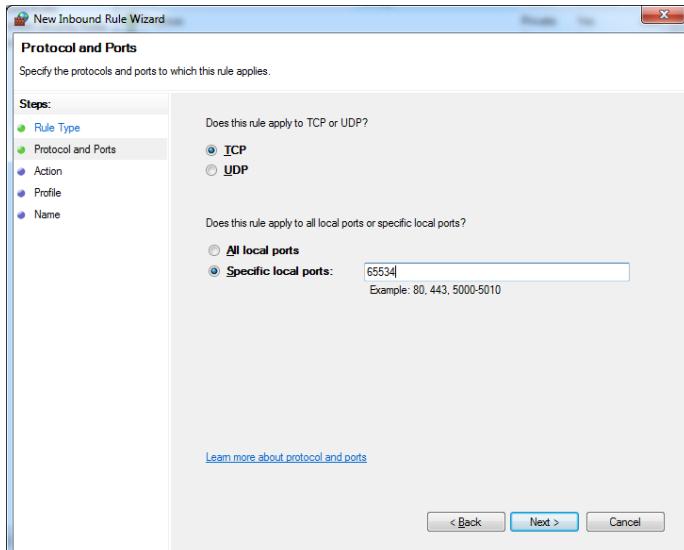
To add an exception to the firewall for your selected port number you must use **Windows Firewall with Advanced Security**. You may type the former into the search bar to locate this utility.

Alternatively select **Windows Firewall** from the icon view of **Control Panel** and then click **Advanced Settings** in the left-hand navigation pane. In the utility, highlight inbound rules and select new rule (Figure 4.6).

**Figure 4.6 – Windows Firewall with Advanced Security**

This will bring you into the **New Inbound Rule Wizard**. Select **Port** and click **Next**. You will now be in the window shown in Figure 4.7.

Select **TCP** under **Does this rule apply to TCP or UDP?**. Under **Does this rule apply to all local ports or specific local ports?** Select **Specific local ports** and enter the relevant port number.

**Figure 4.7 – New Inbound Rule Wizard**

After selecting **Next**, in the next window choose **Allow the connection** and click **Next** again. Tick all the boxes in the next window and click **Next**. In the next window you can give a name to your new rule, and also a description. Click **Finish** to complete the process.

## Establishing a Connection

In the computer you wish to connect from, search for **Remote Desktop Connection** in the search bar. In the utility, type in the IP address or Computer Name of the computer you wish to connect to and select **Connect**.

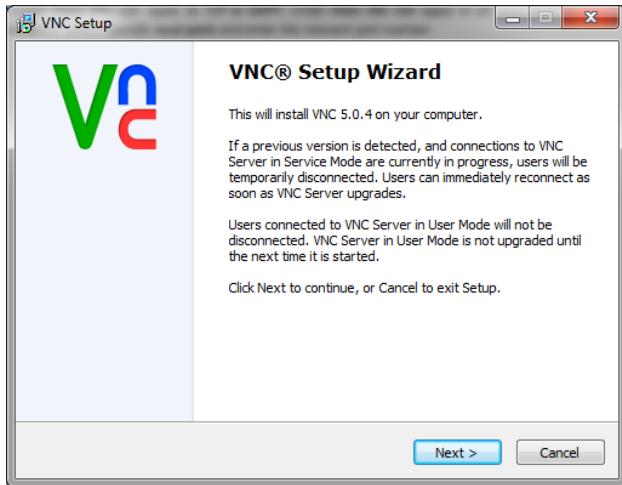
**Figure 4.8 – Establishing a connection**



In an enterprise environment, however, you are likely to use more powerful third party software, such as Real VNC. You can obtain a 30 day trial of this software at <http://www.realvnc.com/download/vnc/>. From this webpage, select **Download** beside **VNC for Windows** (the first listed – which is an exe file). Accept the terms and conditions and click **Download**.

Once the file has download it, select it, and click **Run** during the security warning. You may need to right-click the downloaded file and select **run as administrator**. Click **Yes** and you will be brought to the installation wizard screen (Figure 4.9).

**Figure 4.9 – VNC Installation Wizard**

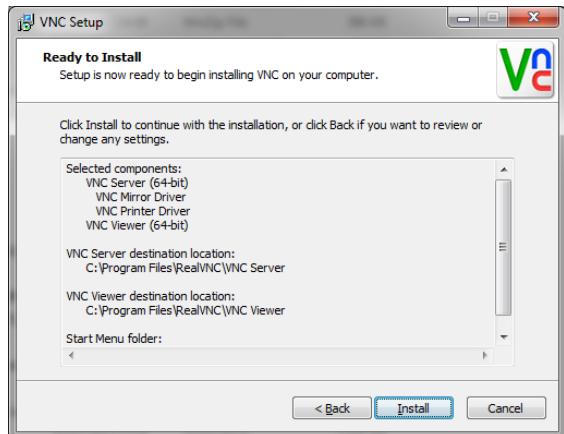


Select **Next** to continue. Accept the license agreement and select **Next**. You will now be in the **Select Components** window, all components will be ticked by default; click **Next** to continue. You may choose a different directory or proceed with the default directory; click **Next** when you are satisfied with the installation directory.

Next, you will be queried regarding a program shortcut in the Start Menu Folder, by default the folder will be name *RealVNC*; you may change this if you wish. Click **Next** to proceed. The next window will allow you to create desktop and quick launch icons, tick the relevant boxes if you wish to do so. Click **Next** to continue.

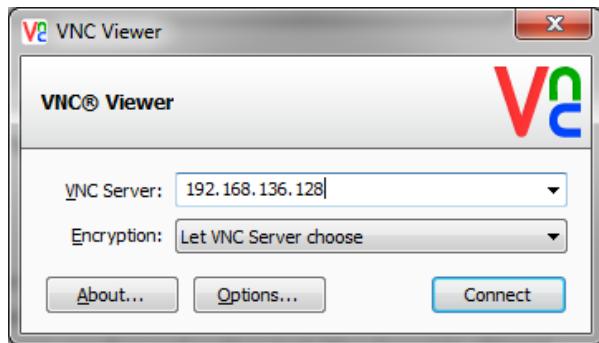
The last step provides a summary of the components and installation characteristics (Figure 4.10); click **Install** to complete the installation.

**Figure 4.10 – VNC Final Installation Step**



To connect to the other machine remotely using Real VNC, click **Start, All Programs, RealVNC, VNC Viewer**. Enter in the IP address of the computer you wish to connect to, and click **Connect** (Figure 4.11).

**Figure 4.11 – VNC Connection Window**



You may receive a message regarding the acceptance of a signature for VNC Server, click **Yes** to continue. Next, you will be presented with the authentication screen shown in Figure 4.12.

By default the computer name will automatically be placed in the **username section**; you must enter a correct username and password combination to enter the computer, like you would at the Windows welcome screen.

**Figure 4.12 – Authentication Screen**

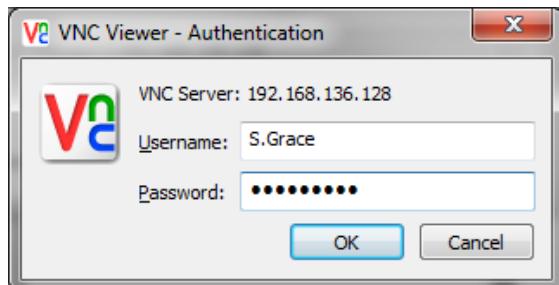
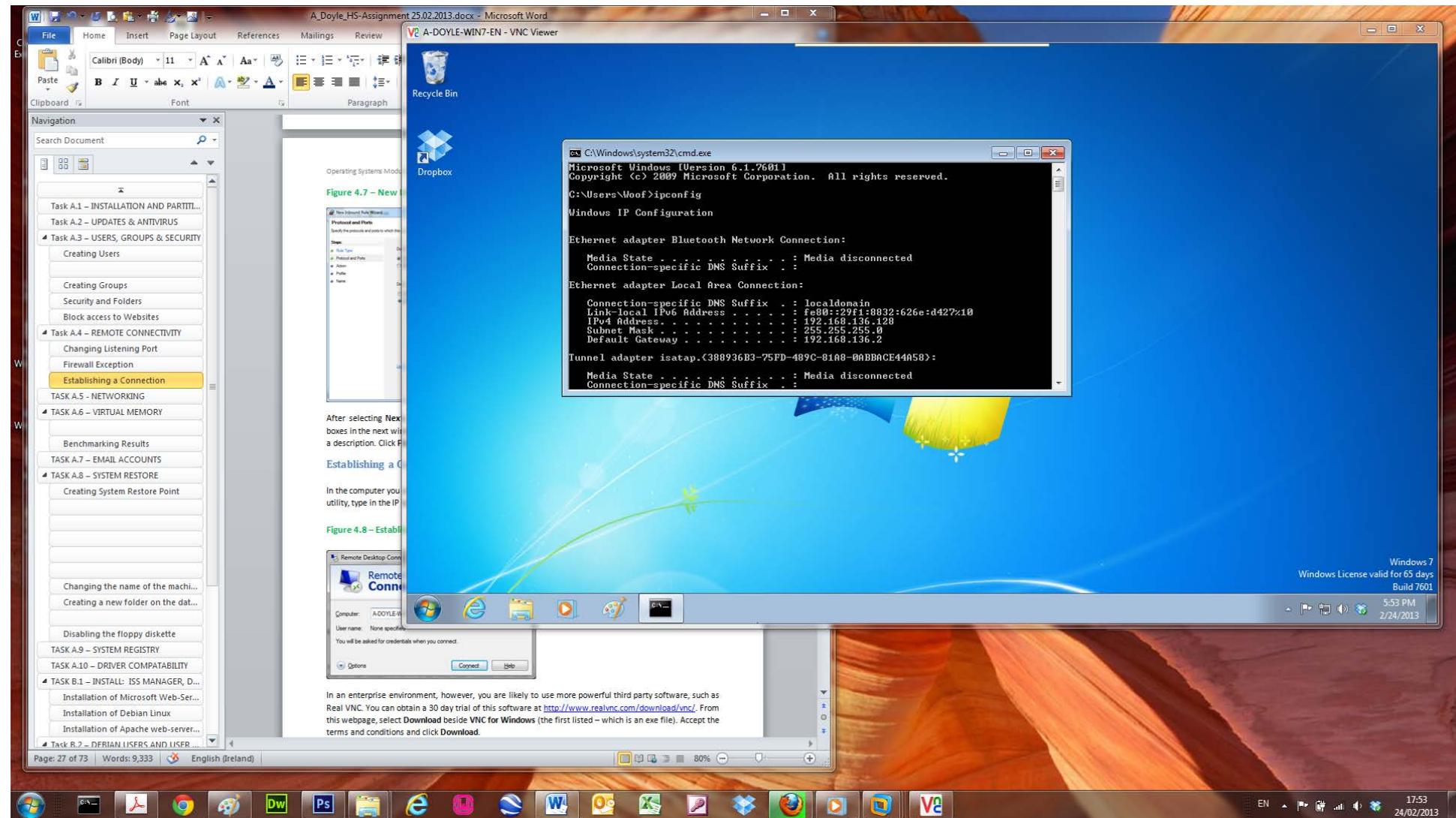


Figure 4.13 shows VNC operating on a host computer and connected to a remote computer.

**Figure 4.13 – Remote Desktop Connected using Real VNC**

## TASK A.5 - NETWORKING

This section outlines the procedures required so that the Windows and Debian Linux (Section B) machines can communicate statically with one another.

Open the root terminal in Debian Linux and run **ifconfig**, which is Linux's version of **ipconfig**. Note the networking details on the second line returned (Figure 5.1).

**Figure 5.1 – Ifconfig Debian Linux**

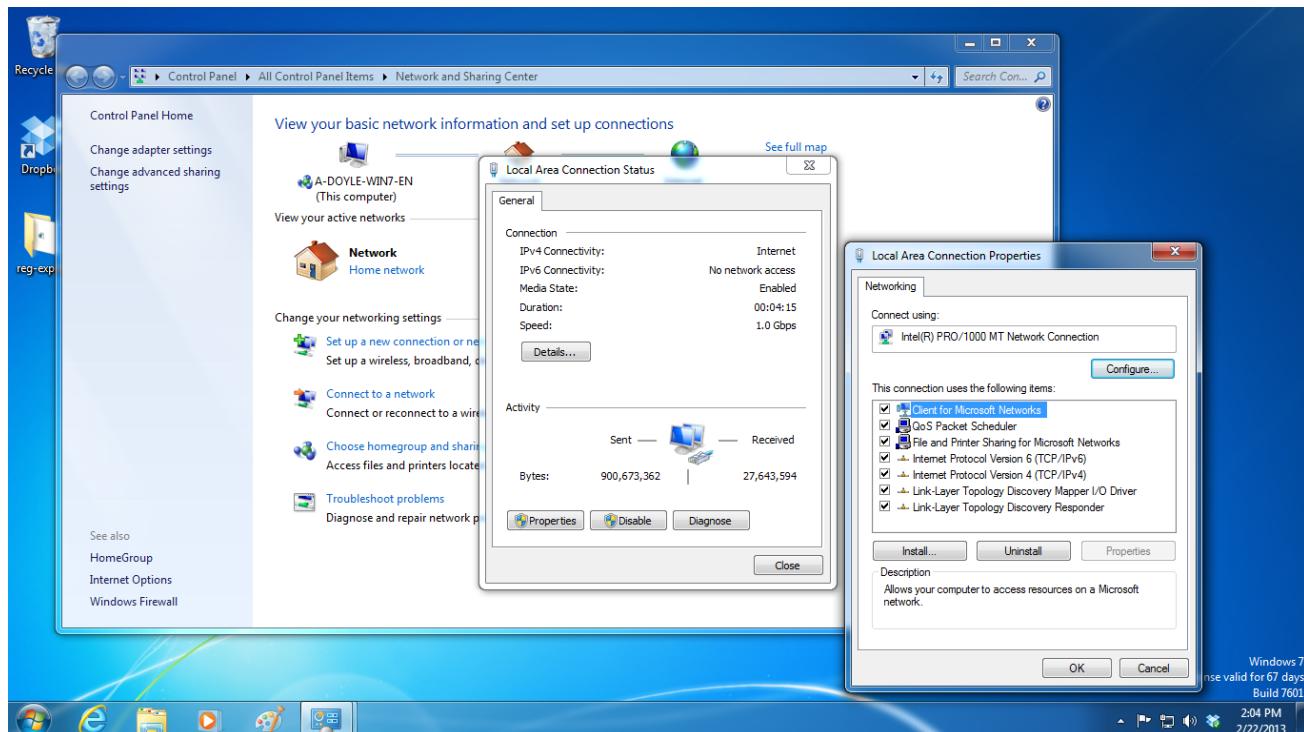
```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0c:29:6c:22:5d
          inet addr:192.168.136.129  Bcast:192.168.136.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe6c:22d/64 Scope:Link
              UP BROADCAST RUNNING MULTICAST  MTU:1500 Metric:1
              RX packets:21123 errors:0 dropped:0 overruns:0 frame:0
              TX packets:5824 errors:0 dropped:0 overruns:0 carrier:0
              collisions:0 txqueuelen:1000
              RX bytes:29536528 (28.1 MiB)  TX bytes:378024 (369.1 KiB)

lo       Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
              UP LOOPBACK RUNNING  MTU:16436 Metric:1
              RX packets:8 errors:0 dropped:0 overruns:0 frame:0
              TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
              collisions:0 txqueuelen:0
              RX bytes:560 (560.0 B)  TX bytes:560 (560.0 B)

root@A-Doyle-Debian:/home/andrew#
```

In Windows, navigate to **Network and Sharing Center**, and click **Local Area Connection** (Figure 5.2).

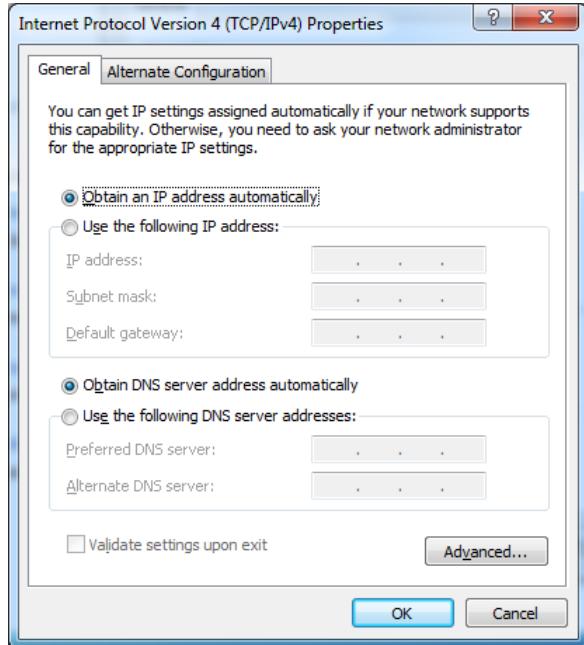
**Figure 5.2 – Windows Network Settings**



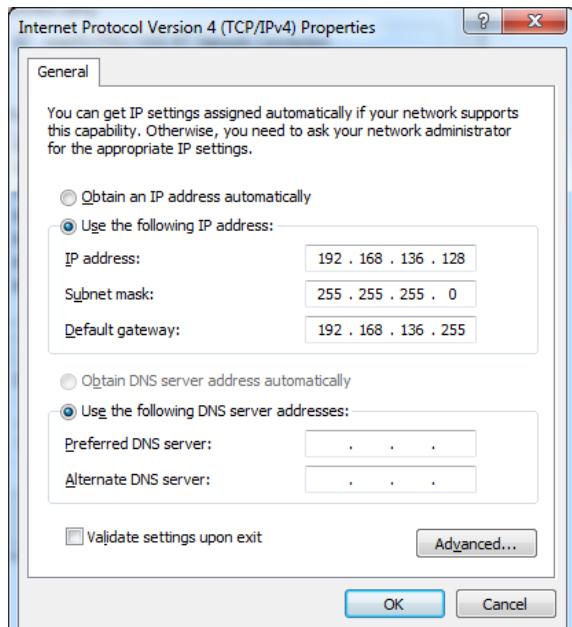
In the **Local Area Connection Status** window select **Properties** which brings you to the **Local Area Connection Properties** window. Highlight **Internet Protocol Version 4 (TCP/IPv4)** and select **Properties**.

This brings you to the window shown in Figure 5.3. Change the settings as per Figure 5.4 so that the Default Gateway and Subnet Mask and the same as in the Debian Machine, and assign an IP address.

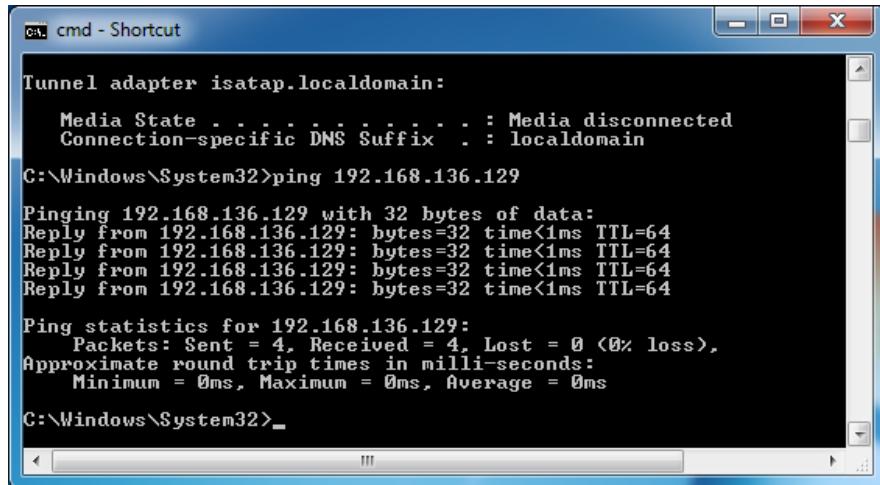
**Figure 5.3 – TCP/IPv4 Properties**



**Figure 5.4 – Static Assignment**



To verify that the machines are communicating, open the command prompt (in Windows) or the terminal (in Debian), and ping the IP address of the other machine.

**Figure 5.5 – Pinging Debian from Windows**


```

Tunnel adapter isatap.locaLdomain:
  Media State . . . . : Media disconnected
  Connection-specific DNS Suffix . : locaLdomain

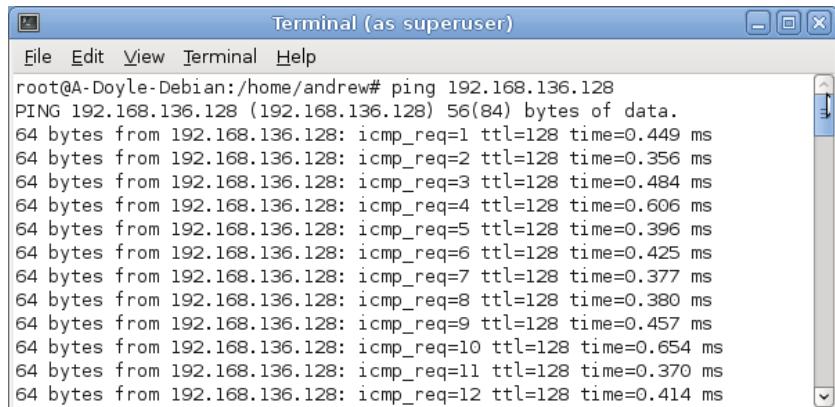
C:\Windows\System32>ping 192.168.136.129

Pinging 192.168.136.129 with 32 bytes of data:
Reply from 192.168.136.129: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.136.129:
  Packets: Sent = 4, Received = 4, Lost = 0 <0% loss>,
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\System32>_

```

**Figure 5.6 – Pinging Windows from Debian**


```

root@A-Doyle-Debian:/home/andrew# ping 192.168.136.128
PING 192.168.136.128 (192.168.136.128) 56(84) bytes of data.
64 bytes from 192.168.136.128: icmp_req=1 ttl=128 time=0.449 ms
64 bytes from 192.168.136.128: icmp_req=2 ttl=128 time=0.356 ms
64 bytes from 192.168.136.128: icmp_req=3 ttl=128 time=0.484 ms
64 bytes from 192.168.136.128: icmp_req=4 ttl=128 time=0.606 ms
64 bytes from 192.168.136.128: icmp_req=5 ttl=128 time=0.396 ms
64 bytes from 192.168.136.128: icmp_req=6 ttl=128 time=0.425 ms
64 bytes from 192.168.136.128: icmp_req=7 ttl=128 time=0.377 ms
64 bytes from 192.168.136.128: icmp_req=8 ttl=128 time=0.380 ms
64 bytes from 192.168.136.128: icmp_req=9 ttl=128 time=0.457 ms
64 bytes from 192.168.136.128: icmp_req=10 ttl=128 time=0.654 ms
64 bytes from 192.168.136.128: icmp_req=11 ttl=128 time=0.370 ms
64 bytes from 192.168.136.128: icmp_req=12 ttl=128 time=0.414 ms

```

For further information on configuring TCP/IP settings, an article from TechNet (n.d.), available at <http://technet.microsoft.com/en-us/library/dd163570.aspx> is very comprehensive.

## TASK A.6 – VIRTUAL MEMORY

---

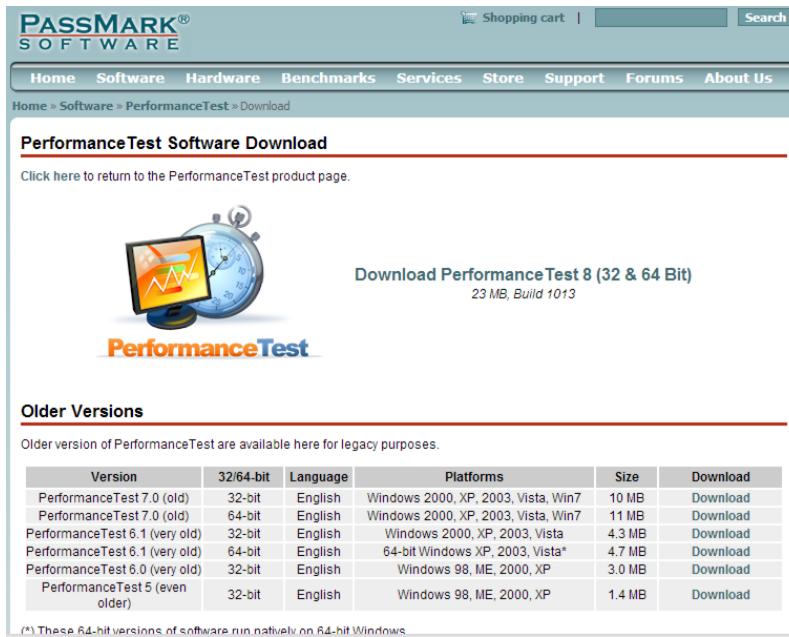
Before modifying the swap file, it is essential to run a performance benchmarking tool to establish the performance before carrying out any modifications. First of all, however, you must be aware of the current size of the swap file.

To do this, go to the **System** applet in the **Control Panel** (also accessible by right-clicking **computer** and selecting **properties**). Now, select **Advanced system settings**. You will now be in the **Advanced** tab of **System Properties**. Under **Performance** select **Settings**. The size of the swap file will be indicated under **Virtual memory** beside **Total paging file size for all drives**.

This is the same location where you will later modify the swap file. Once you have noted the swap file size you can carry out the benchmarking. It is important to note that *swap file*, *virtual memory*, and *page file* are inter-changeable terms that mean the same thing.

There are numerous benchmarking tools available, such as *Nova Bench* or *Performance Test*. For the purposes of this manual *Performance Test* by *Passmark software* is being used; which was downloaded from the following webpage: [http://www.passmark.com/download/pt\\_download.htm](http://www.passmark.com/download/pt_download.htm) (see Figure 6.1).

**Figure 6.1 – Performance Test download page**



The screenshot shows the Passmark Software download page for Performance Test. At the top, there's a navigation bar with links for Home, Software, Hardware, Benchmarks, Services, Store, Support, Forums, and About Us. Below the navigation bar, a breadcrumb trail shows 'Home > Software > PerformanceTest > Download'. The main content area has a heading 'PerformanceTest Software Download' and a sub-heading 'Click here to return to the PerformanceTest product page.' Below this, there's an icon of a computer monitor with a graph on the screen and the text 'PerformanceTest'. To the right of the icon, the download link is displayed: 'Download PerformanceTest 8 (32 & 64 Bit)' and '23 MB, Build 1013'. Below this section, there's a 'Older Versions' heading with a table showing download links for various previous versions of the software. At the bottom of the page, a note states '(\*) These 32-bit versions of software run natively on 64-bit Windows.'

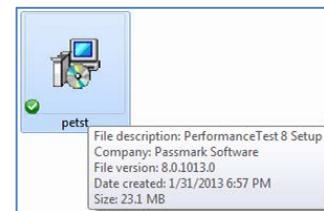
Version	32/64-bit	Language	Platforms	Size	Download
PerformanceTest 7.0 (old)	32-bit	English	Windows 2000, XP, 2003, Vista, Win7	10 MB	<a href="#">Download</a>
PerformanceTest 7.0 (old)	64-bit	English	Windows 2000, XP, 2003, Vista, Win7	11 MB	<a href="#">Download</a>
PerformanceTest 6.1 (very old)	32-bit	English	Windows 2000, XP, 2003, Vista	4.3 MB	<a href="#">Download</a>
PerformanceTest 6.1 (very old)	64-bit	English	64-bit Windows XP, 2003, Vista*	4.7 MB	<a href="#">Download</a>
PerformanceTest 6.0 (very old)	32-bit	English	Windows 98, ME, 2000, XP	3.0 MB	<a href="#">Download</a>
PerformanceTest 5 (even older)	32-bit	English	Windows 98, ME, 2000, XP	1.4 MB	<a href="#">Download</a>

### Performance Test download page

For Windows 7 Enterprise 64bit choose the second file in the list. Right-click on **Download** and save it in your chosen directory.

Navigate to the directory and run (double-click) the setup file downloaded (Figure 6.2)

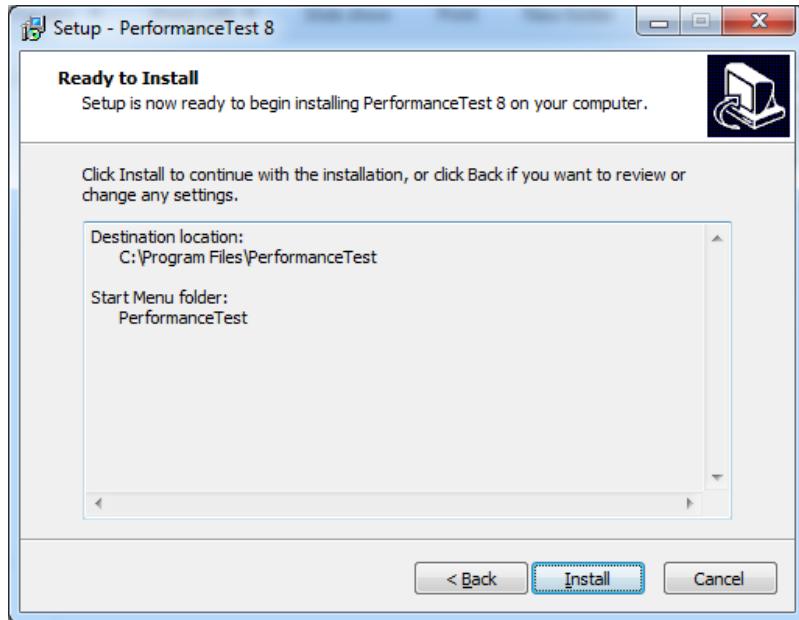
**Figure 6.2 – Setup File**



After running the setup file, you will be again be asked permission to proceed, select **Yes** to continue. You will be brought to the start of the setup wizard. Click **Next** to continue. You will then be asked to read the license agreement. Select **I accept the agreement** and click **Next** to proceed.

Now, you will be asked to select the directory you wish to install the software. Click **Next** if you are happy with the default path, otherwise click **Browse** to choose another directory. Alternatively you could edit the default path highlighted in blue if you are certain of a directory path. After proceeding you will be asked to specify the start menu folder's name. The default is **PerformanceTest**. If you are satisfied with this naming convention, select **Next** to proceed.

Now, the software is ready to be installed. (see Figure 6.3). Click **Install** if you are happy to proceed.

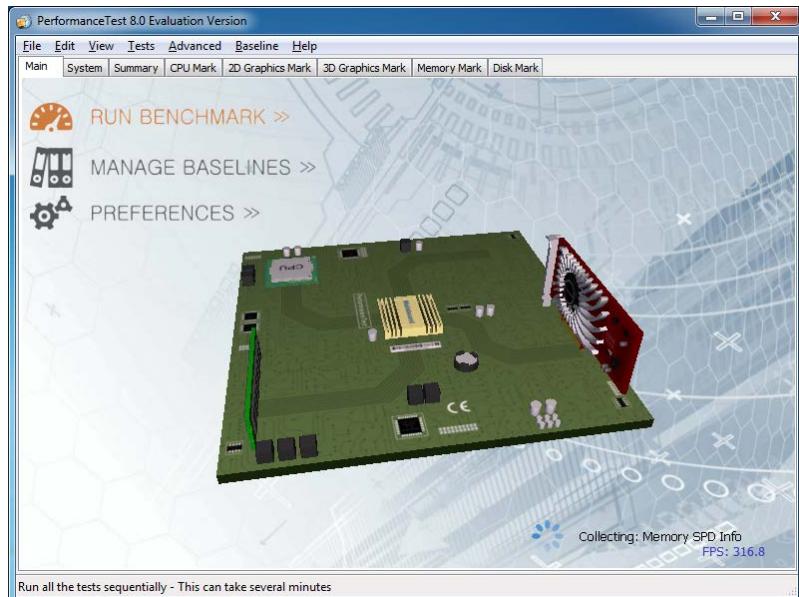
**Figure 6.3 – Ready to Install Benchmarking Software****Ready to Install Software**

If you are not happy with the destination location or start menu folder at this stage, you may select **Back** to edit these properties.

A progress bar will be displayed during the installation process. When complete a window will be displayed prompting you to finish the wizard. By default, *Launch Performance Test* will be selected. If you wish to launch the program now, click **Finish** to do so, otherwise deselect *Launch Performance Test*.

When you launch the program, since it is a trial version, you will be encouraged to purchase the software. Click **Continue** to begin the 30 day evaluation. The program will now launch.

Select **Run Benchmark** to test the computer (Figure 6.4). You will then be warned that the tests will take several minutes. Select **Yes** to continue. You should make sure all other programs are closed. A number of tests will be carried out, for example, you may see an animation of a fighter jet plane(s) flying over mountainous terrain, a picture of a cheetah, etc.

**Figure 6.4 – Performance Test Software (Main Menu)**

The overall rating of the benchmarking is shown in Figure 6.5.

**Figure 6.5 – Pre Swap File modification overall benchmarking rating**

### Overall Benchmarking

The results of the benchmarking will be analysed in more detail later. There are much more in-depth results available, as you will see later.

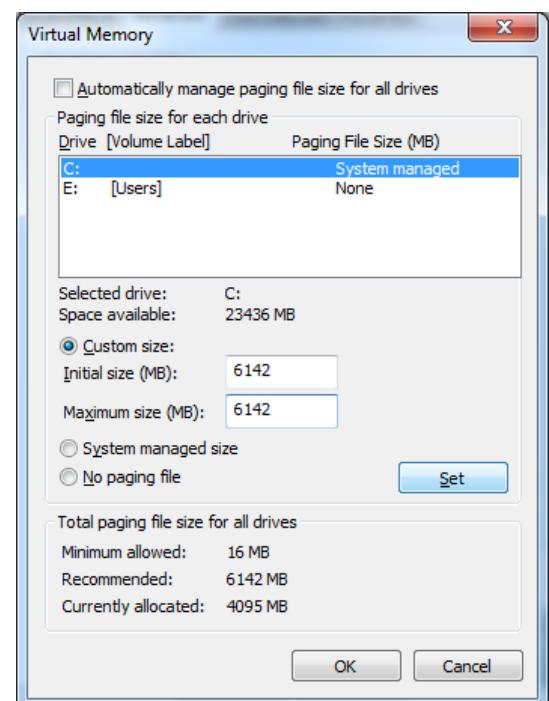
After running the pre-modification benchmark, you can modify the swap file as you wish. After doing this, running the benchmarking tool again may highlight any performance gains/losses.

To change the swap file, go to the **System** applet in the **Control Panel** (also accessible by right-clicking **computer** and selecting **properties**). Now, select **Advanced system settings**. You will now be in the **Advanced** tab of **System Properties**. Under **Performance** select **Settings**.

The size of the swap file will be indicated under **Virtual memory** beside **Total paging file size for all drives**. You will have been here before to check the current size of the swap file. Click **Change** and you will be brought to the **Virtual Memory** window (Figure 6.6).

By default, **System managed size** will be selected. Select **Custom size** to change the size of the virtual memory. Microsoft recommends the virtual memory to be set at 1.5 times the RAM. Indeed, in this window, the recommended paging file size is noted to be 6142mb (1.5 times the RAM).

After entering in 6142mb (or whatever figure you wish for experimental purposes), click **set** and then **ok** to implement your changes. Run the benchmarking tool as before, the overall results of which are shown in Figure 6.7 below (based on increasing page file to 6142mb).

**Figure 6.7 – Overall benchmarking rating after modification****Figure 6.6 – Virtual Memory**

It is important to reiterate that the overall benchmarking results shown in Figure 6.6 and Figure 6.7 are quite basic; more detailed results will be analysed later.

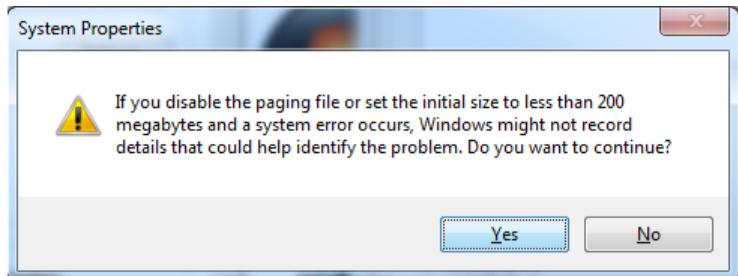
The process of programs alternating between RAM and virtual memory is time consuming, since the hard drive is very slow compared to RAM, as discussed by Myers (2013, p.60). Consequently a reduction in performance may occur if a lot of paging activity is occurring. To combat this, you could implement one of two solutions:

- If you have more than enough system RAM, you could decrease the size of the paging file. If your system can accommodate more RAM you could install the maximum amount RAM possible which may negate the need for the paging file.
- If your system has more than one hard drive you could increase performance by moving the pagefile from the drive with windows installed to another drive.

Benchmarking will be completed for both of the scenarios above; however since the system used in this manual has only one physical drive, the pagefile will be moved to a different partition.

To decrease the size of the paging file, as before navigate to the **Advanced** tab of **System Properties**. Click **Settings** and select the **Advanced** tab. Under **Virtual memory** click **change**. You will notice that the minimum allowed paging file size is 16mb. If you attempt to set the paging file size less than 200mb you will get a warning as shown in Figure 6.8.

**Figure 6.8 – Warning if page file less than 200mb**



With this in mind, for the purposes of this test, set the initial and maximum size to be 200mb under **Custom size**. Then click **set** and **OK** to implement your changes. You will be prompted to restart your computer in order for the changes to take effect. Click **OK** and then **Apply**. Restart your system. 200mb should be now be indicated beside **Currently allocated** in the virtual memory window (as shown in Figure 6.9).

**Figure 6.9 – Allocation of 200mb Virtual Memory**

Total paging file size for all drives	
Minimum allowed:	16 MB
Recommended:	6142 MB
Currently allocated:	200 MB

Now you can carry out the benchmarking to see the changes in the results. In order to test the effects of the page file being on the separate partition, set the C drive to have **No paging file**, and set the E drive to have the recommended amount of memory (6142mb). As before click **set**, **ok**, **ok**, **apply**, and restart your computer.

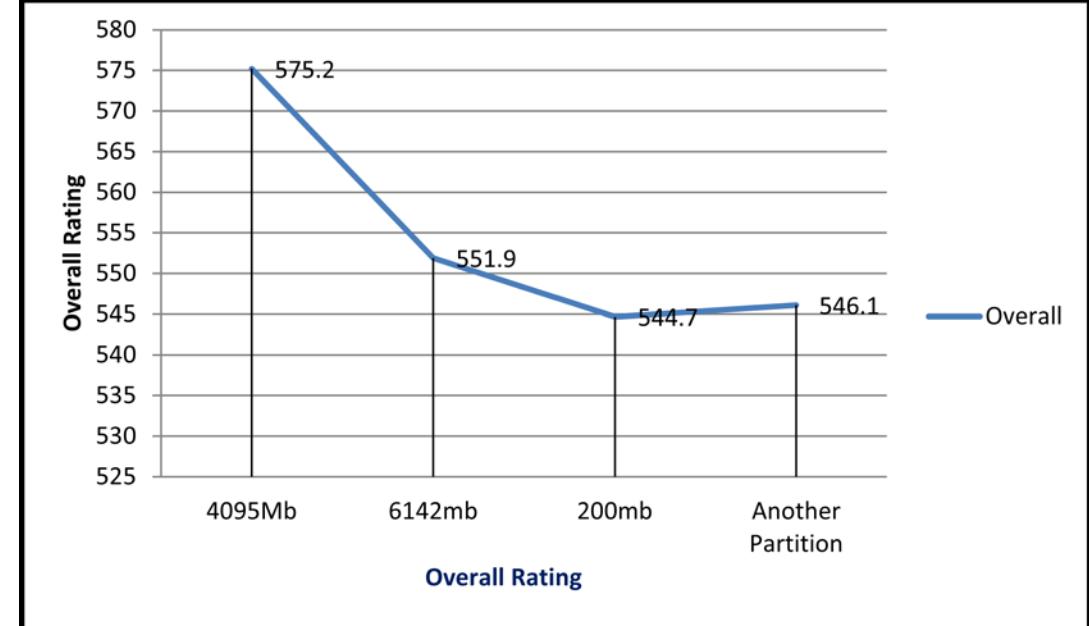
## Benchmarking Results

Read the following articles for industry thoughts on virtual memory:

[Learn Best Practices for Optimizing the Virtual Memory Configuration](#) by Technet (n.d.).

[Pushing the Limits of Windows: Virtual Memory](#) by Russinovich (2008).

	Unit	Before Modification		Altering Size		Moving to Another Partition	
		4095Mb		6142mb	200mb		6142mb
Overall		575.2		551.9	544.7		546.1
Memory Mark	AVG	764		755	724		735
Database Operations	Operations/sec	26.7		24.3	17.9		21.9
Read Cached	MB/sec	8628		8758	8810		8674
Read Uncached	MB/sec	4377		4319	4616		4308
Write	MB/sec	3646		3358	3783		3638
Available Ram	MBs	2607		3005			2945
Latency	Nanoseconds	80.2		76.5			80.5
Threaded	MB/sec	5659		5339			5235
Memory Speed	MB/sec	2070		2292	2232		2092



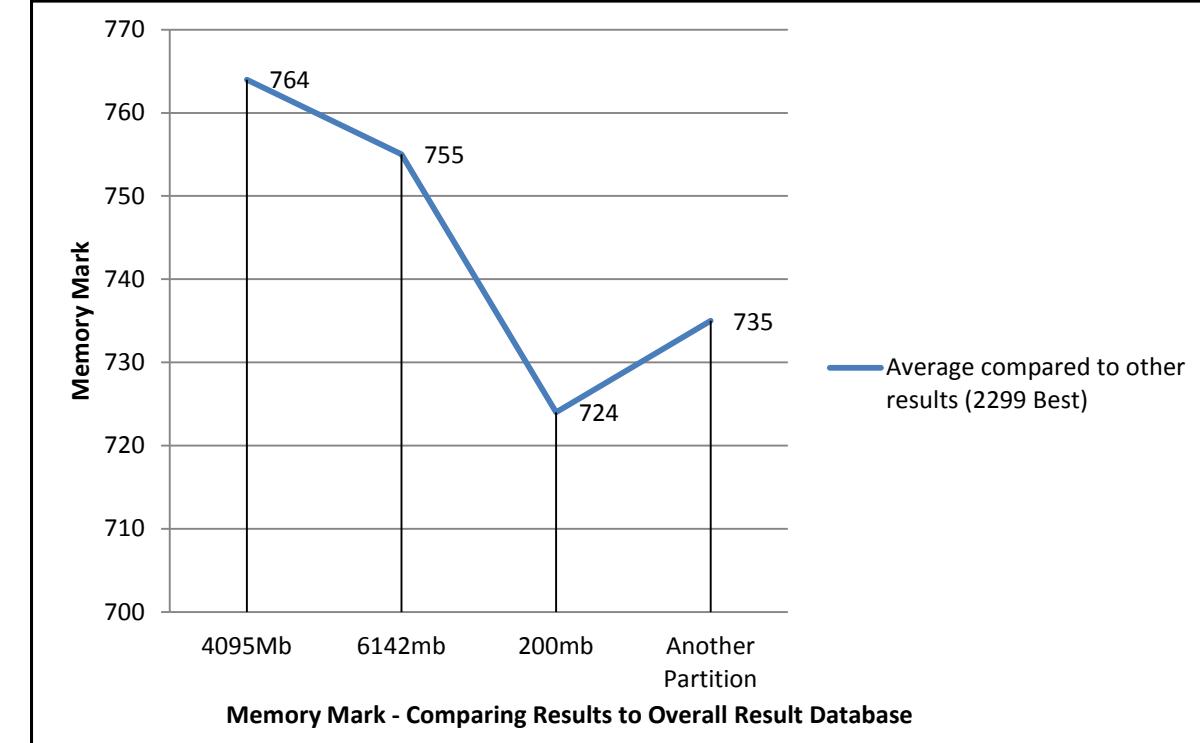
1) Memory mark measures against a composite average of other results; 2299 being the best result

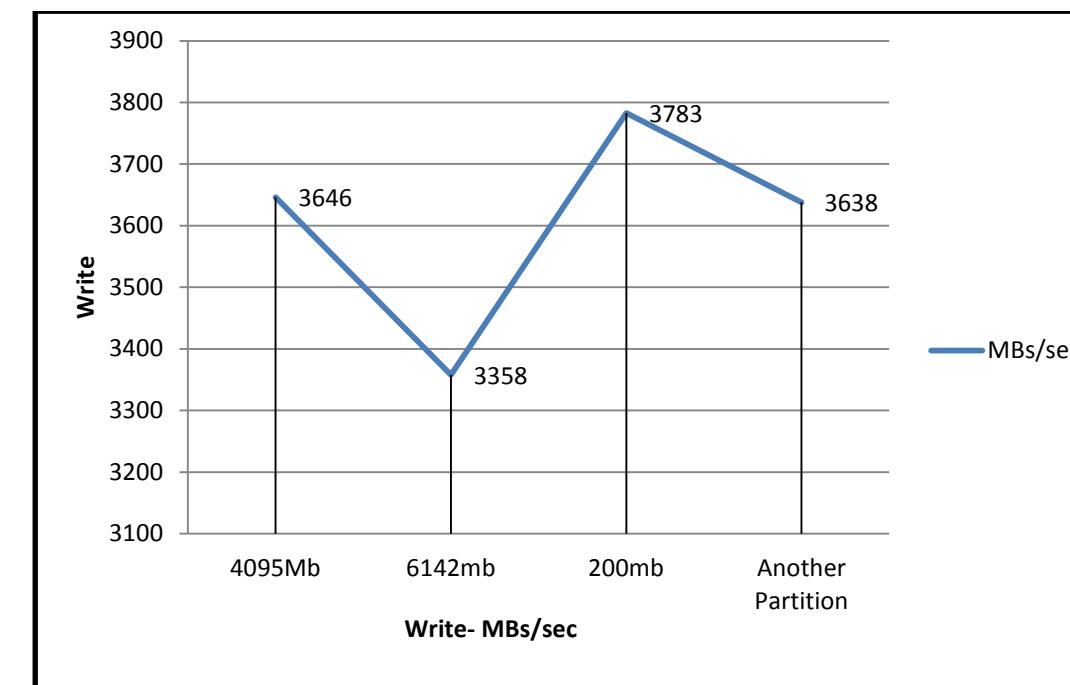
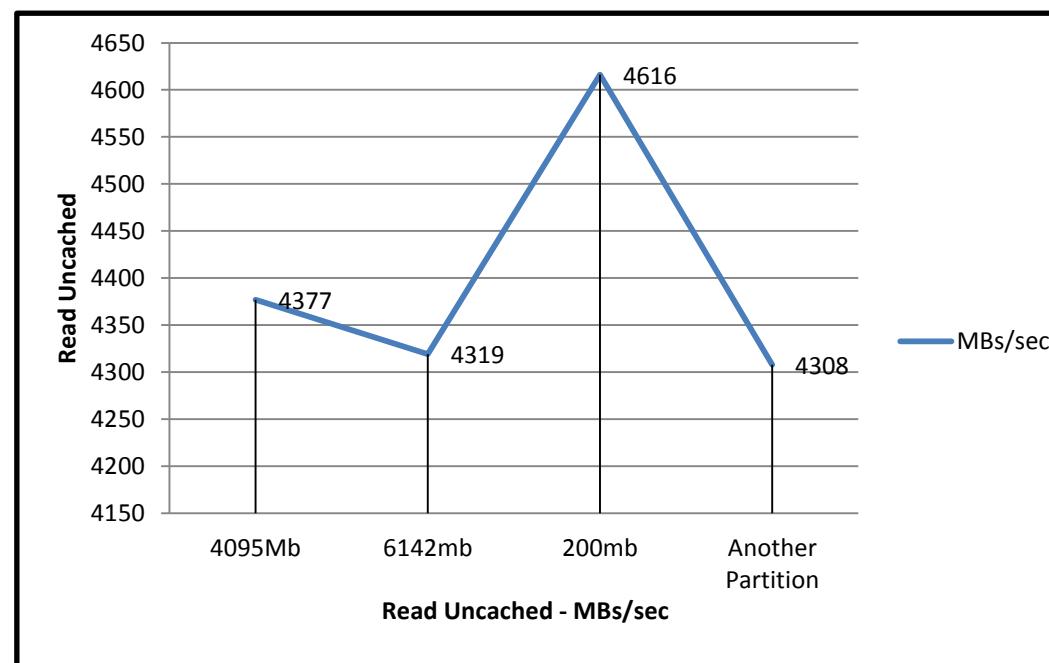
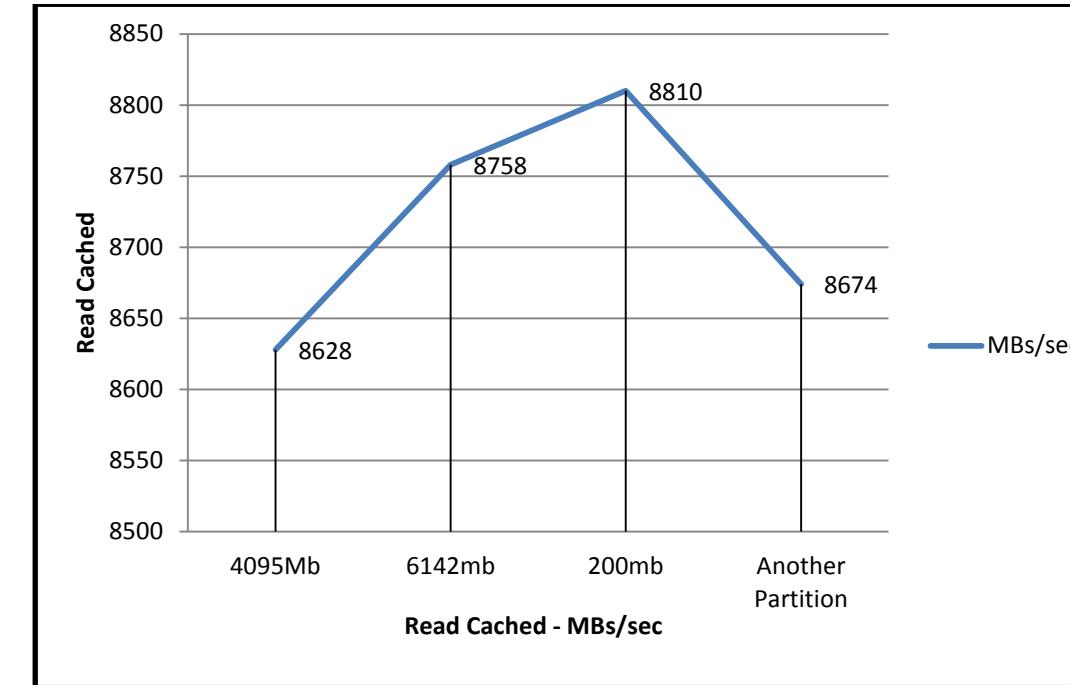
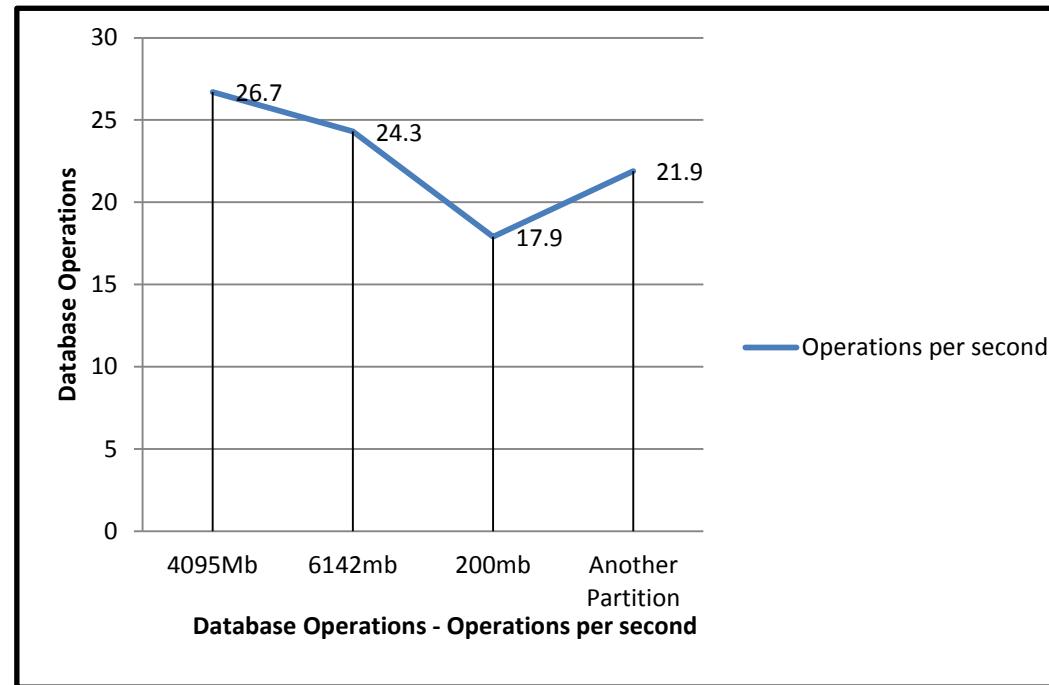
2) With regard to latency; lower is better

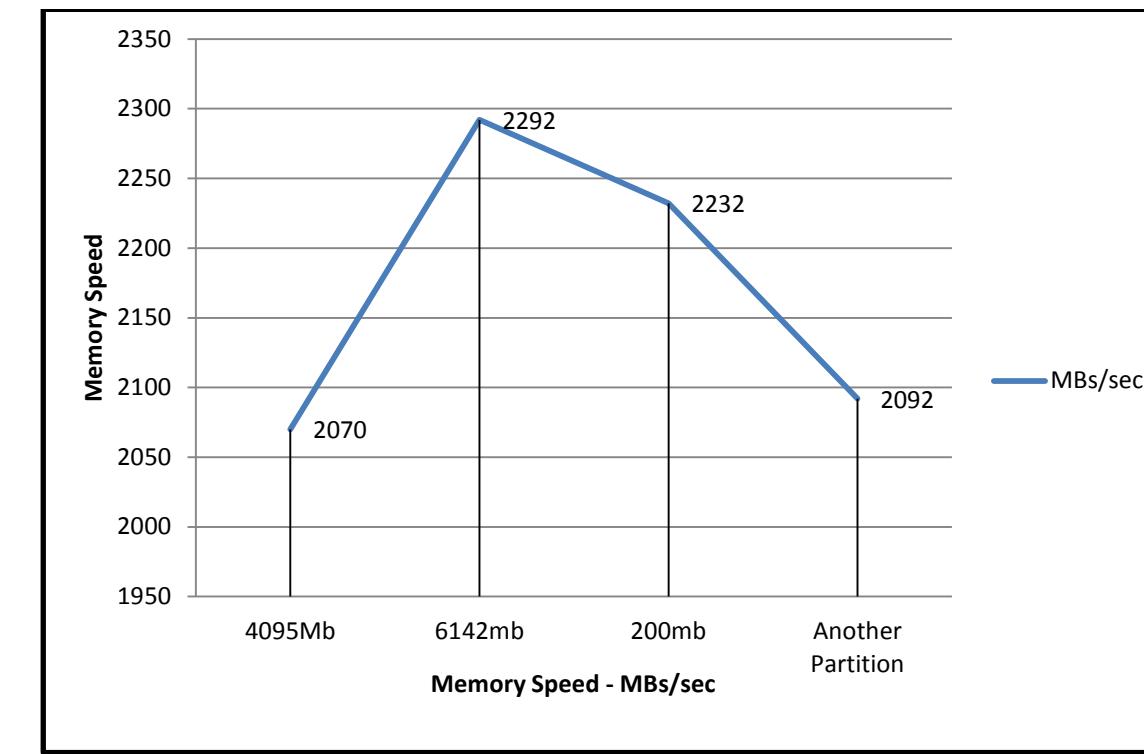
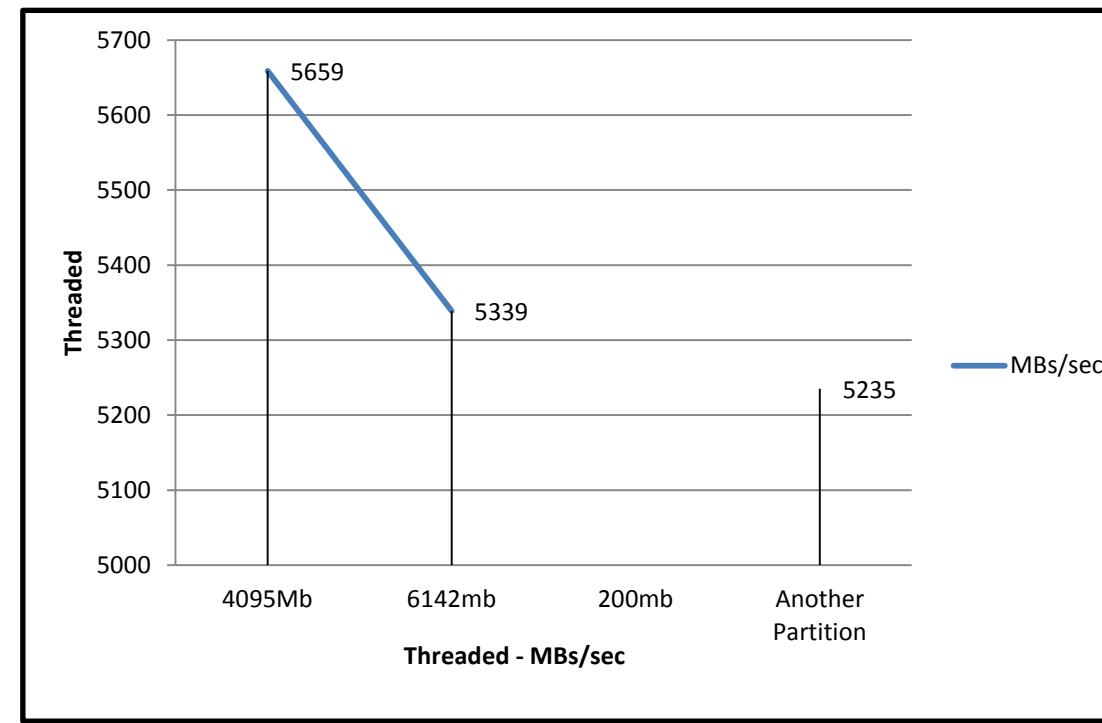
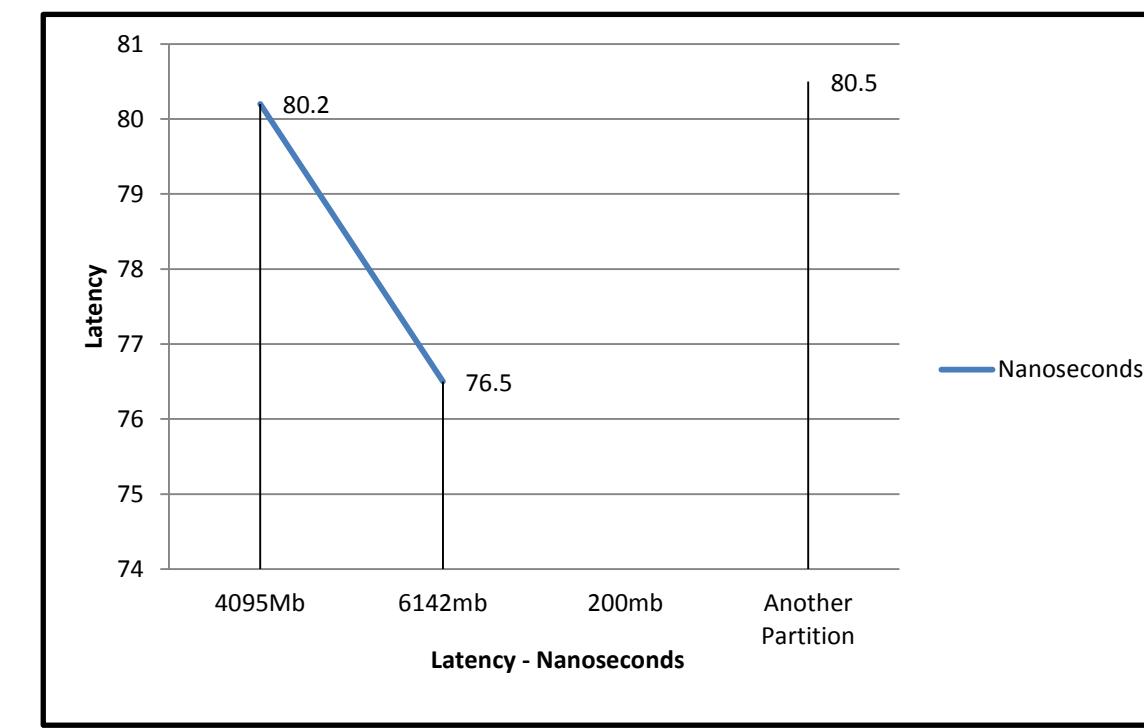
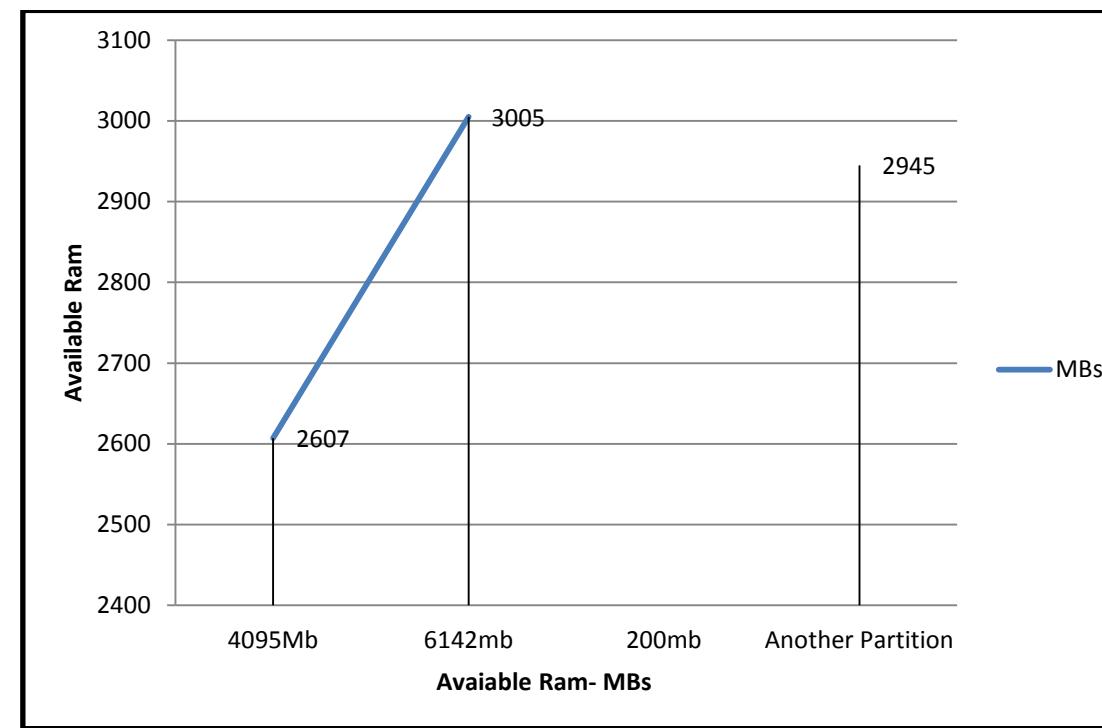
3) Results for Available Ram, Latency, and Threaded were lost in documentation for the 200mb page size file; VM State Lost since: results irretrievable.

### Summary of Benchmarking Results

1. **Overall:** The best overall score was for the unaltered page file; scores reduced when altering the size of the page file.
2. **Memory Mark:** Again, the best result was the unaltered size.
3. **Database Operations:** Unaltered page file achieves best result
4. **Read cached:** Speed improves when increasing page file size, and slightly improves again when reducing it to 200mb; other partition result not as favourable.
5. **Read Uncached:** only improvement resulted from reducing to 200mb.
6. **Write:** Slight improvement at 200mb, noticeable drop at 6142mb (on same partition).
7. **Available Ram:** Consistent with modifying page file size
8. **Latency:** No major changes; slight improvement by increase to 6442mb (on same partition).
9. **Threaded:** Slows down as a result of modification
10. **Memory Speed:** Improved for both size alterations, very slight improvement when moving partition.







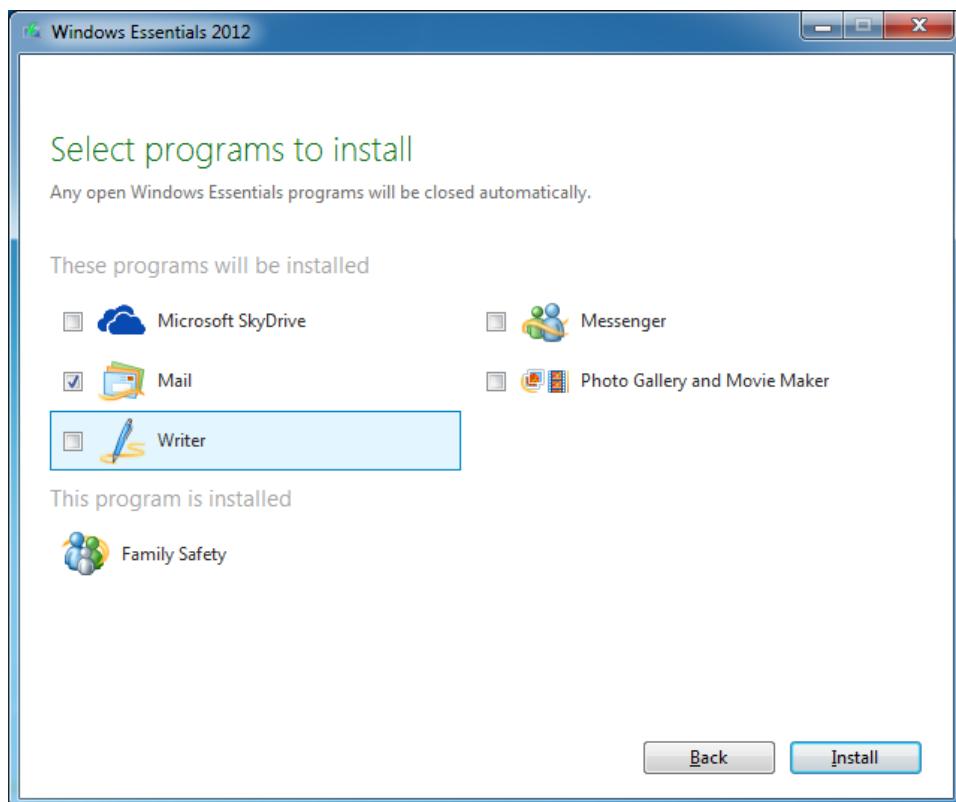
## TASK A.7 – EMAIL ACCOUNTS

As outlined by Microsoft (n.d.), Outlook express was replaced with Windows Mail in Windows Vista, which was itself replaced by Windows Live Mail with Windows 7. Therefore, for this system, you need to install Windows Live Mail.

The first step is to search for “*windows live mail download*” with your favourite search engine. The first search result is likely to take you to a page to download Windows Essentials (a suite of Microsoft programs that includes the email program).

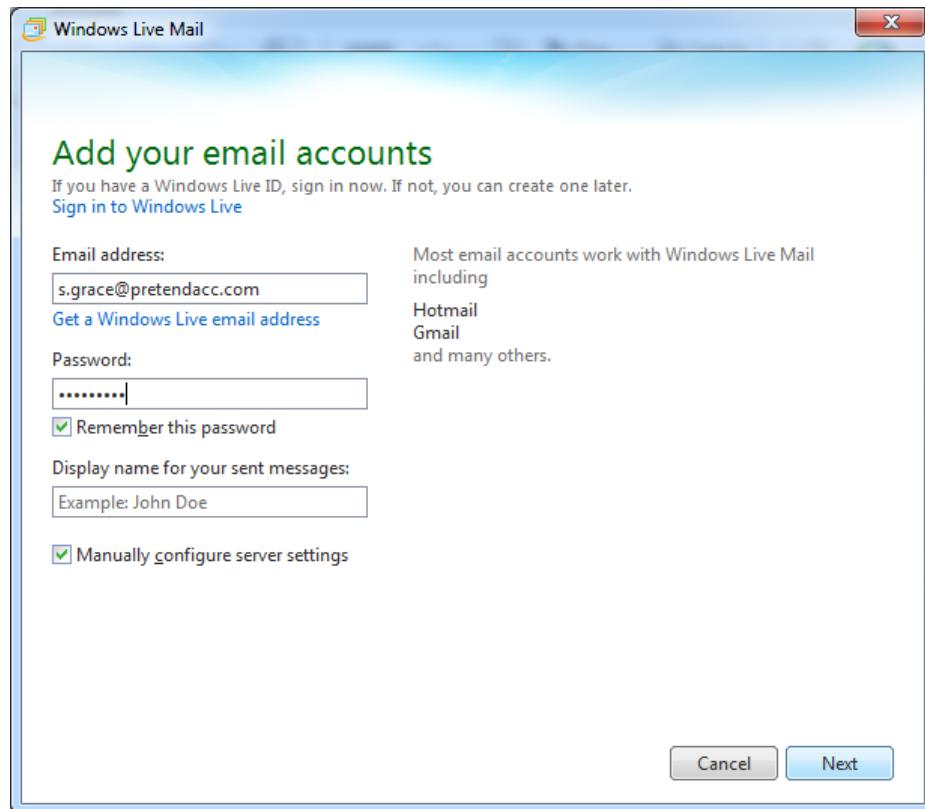
Click **Download now** under **Get Windows Essentials**. You can run the installation now or save it to a directory for installation now. Choose **Run** to begin the installation process. Click **Yes** to continue in the **User Account Control window**. You will now be in the first window of the installation wizard. Unless you want to bloat your system with unwanted software, it is best to select **Choose the programs you want to install**. In the next window, make sure only **Mail** is ticked (see Figure 7.1).

**Figure 7.1 – Windows Essentials installation wizard**

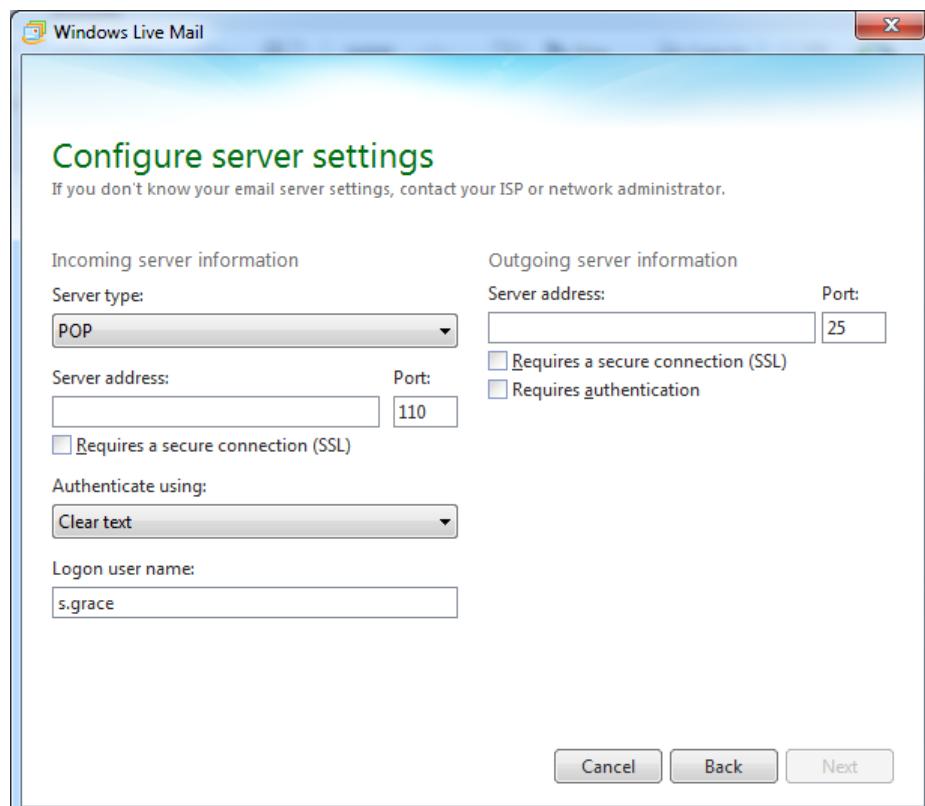


Click **Install** to proceed with the installation. When installation has finished, select **Close**. To launch the program, click **Start** and the program should be listed in the start menu; if not you can search for it.

When the program launches, you will be greeted with a wizard to add an email account (see Figure 7.2). Enter the email address and your desired password. Select the box beside **Manually configure server settings** and then select **Next**.

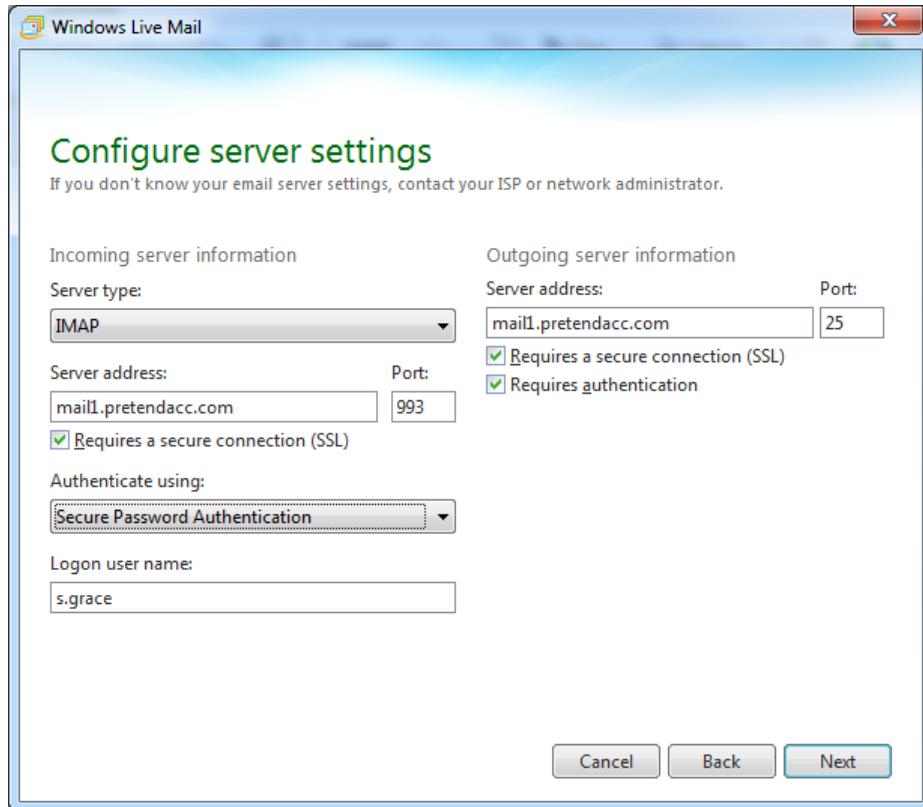
**Figure 7.2 – Add your email accounts**

You will now be in the server settings window. By default, the settings will be as per Figure 7.3. Change these settings to be exactly as shown in Figure 7.4.

**Figure 7.3 – Default server settings**

#### Default server settings

These are the default settings in Windows Live mail. You must change the settings as shown in Figure 7.4

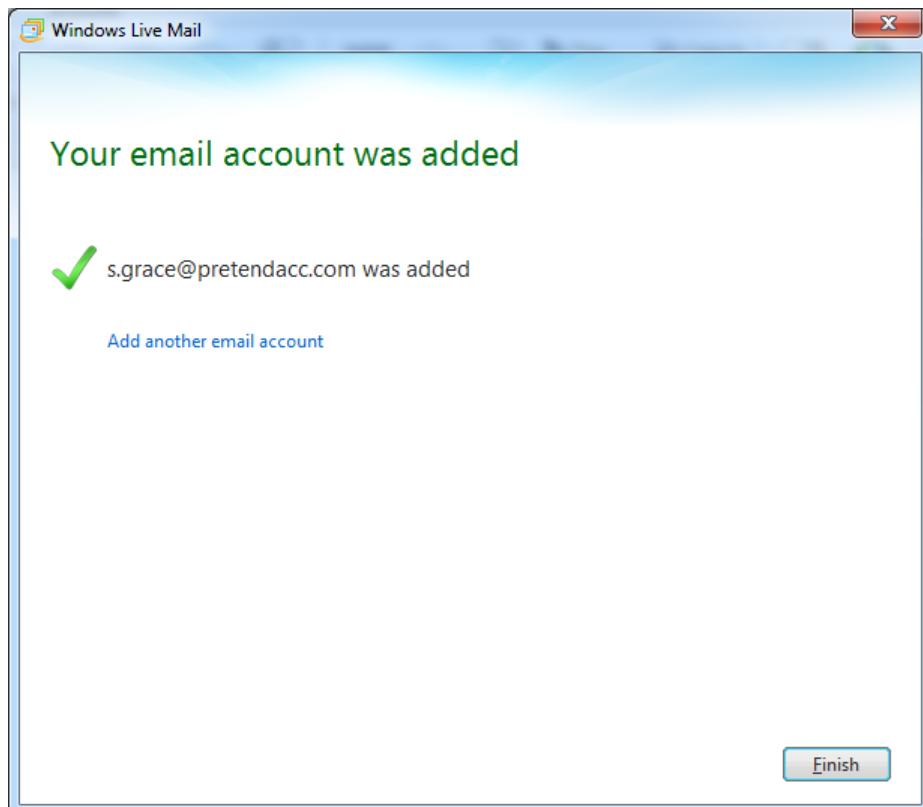
**Figure 7.4 – New Server Settings****Note****IMAP**

Internet Message Access Protocol. Allows an email client to access the remote mail server.

**SSL**

Secure Sockets Layer. Encrypts information.

Click **Next** and your email account will be created (see Figure 7.5). Click **Finish** to exit.

**Figure 7.5 – Email account added**

## TASK A.8 – SYSTEM RESTORE

---

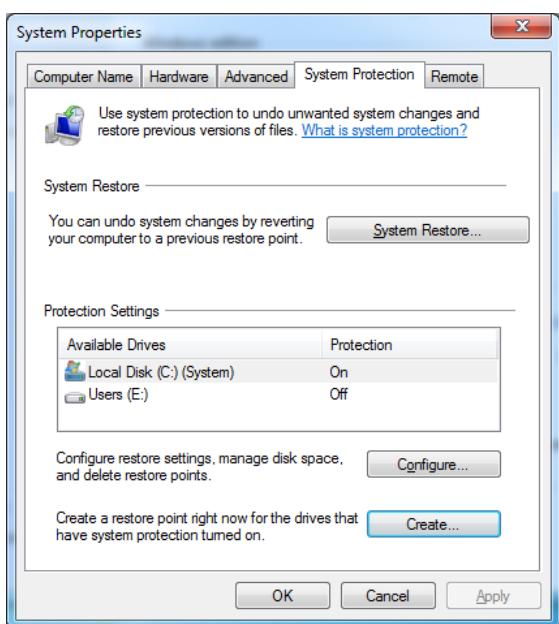
### Why create a system restore

System restore provides protection against unforeseen system problems, which may arise, for example, when new software is installed. As outlined by Meyers (2012, p.768), “*The System Restore tool enables you to create a restore point, a copy of your computer’s configuration at a specific point in time. If you later crash or have a corrupted OS, you can restore the system to its previous state.*”

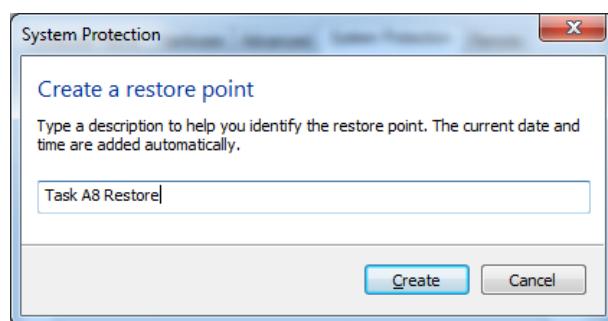
### Creating System Restore Point

To create a restore point, right-click **computer** from the **start menu** and select **properties**. In the left-hand navigation pane, choose **System protection**. You should now be in the **system protection** tab of **system properties** (Figure 8.1). Click **Create**, name your restore point (Figure 8.2) and then click **Create**.

**Figure 8.1 – System Protection Tab**



**Figure 8.2 – Restore point naming**



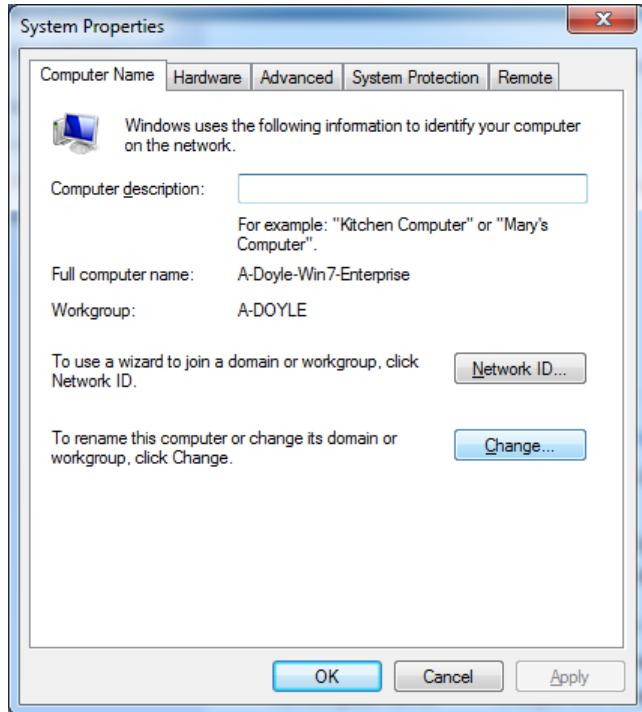
You will be notified that system protection is *creating a restore point*...then you will be notified that *The restore point was created successfully*.

### Changing the name of the machine to ‘mc1’

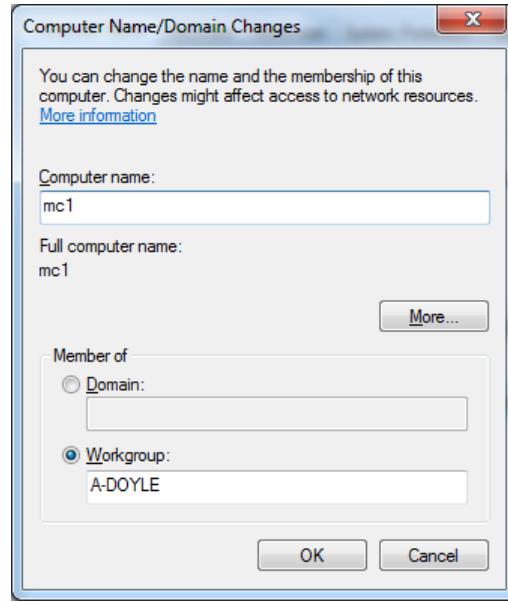
One might change the name of the computer for a number of reasons. The computer name provided by the manufacturer is generally boring or non-descriptive. Changing it to something more meaningful makes it easier to find on a network.

Navigate to the **Computer Name** tab in **System properties** (Figure 8.3). As always with Windows, there are many ways of navigating to this location. In the **System** applet of the control panel, you can click **Change settings** beside **Computer name, domain, and workgroup settings**.

**Figure 8.3 – System Properties: Computer Name**

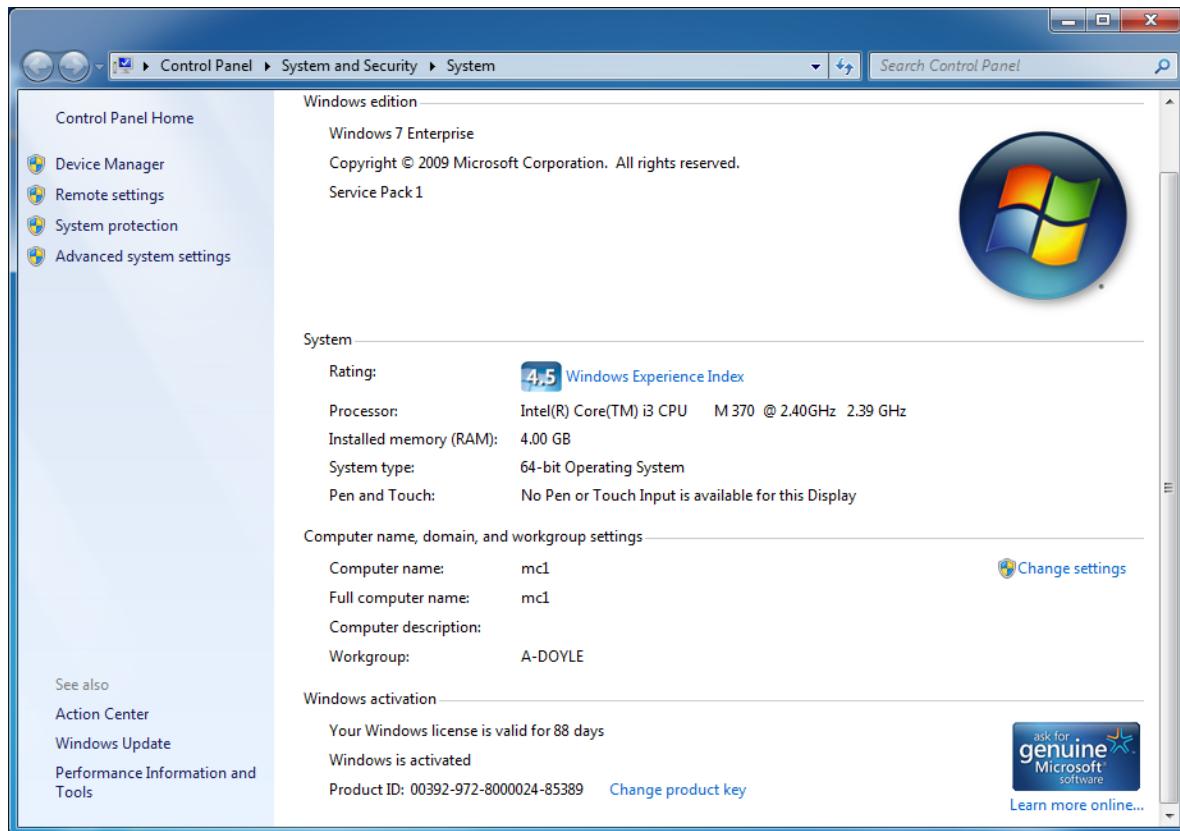


**Figure 8.4 – Change Computer Name**



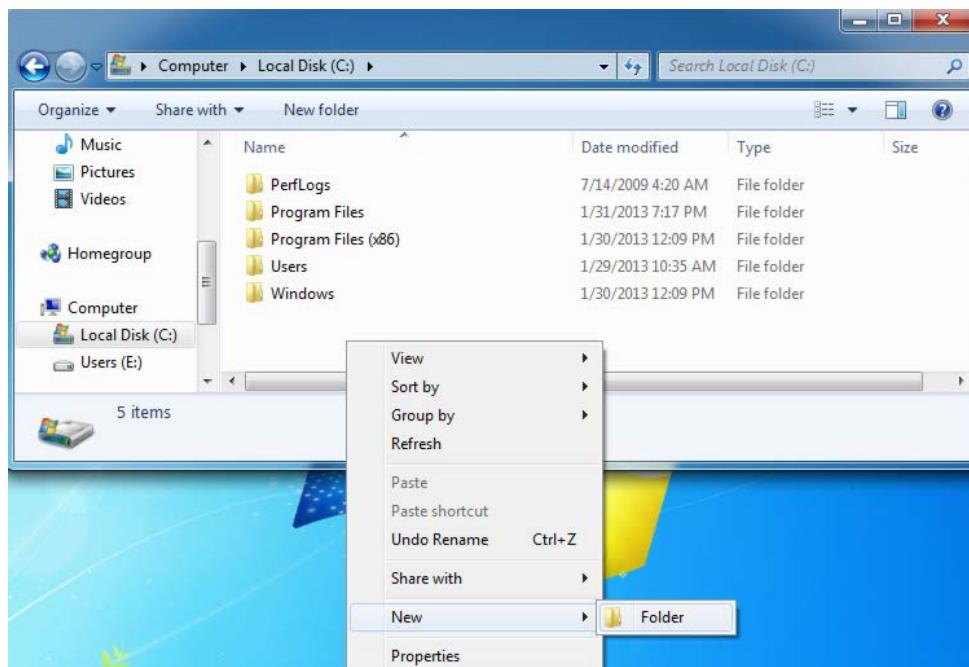
Click **Change** and you will be brought to the window shown in Figure 8.4 where you can change the computer name as required. When you have made the desired changes, click **OK** to confirm. You will be notified of the requirement to restart to computer to implement the changes made. Click **OK** and **Restart Now**.

The computer name should be changed, as shown in Figure 8.5 where the computer name is now 'mc1'.

**Figure 8.5 – Computer Name Successfully changed**

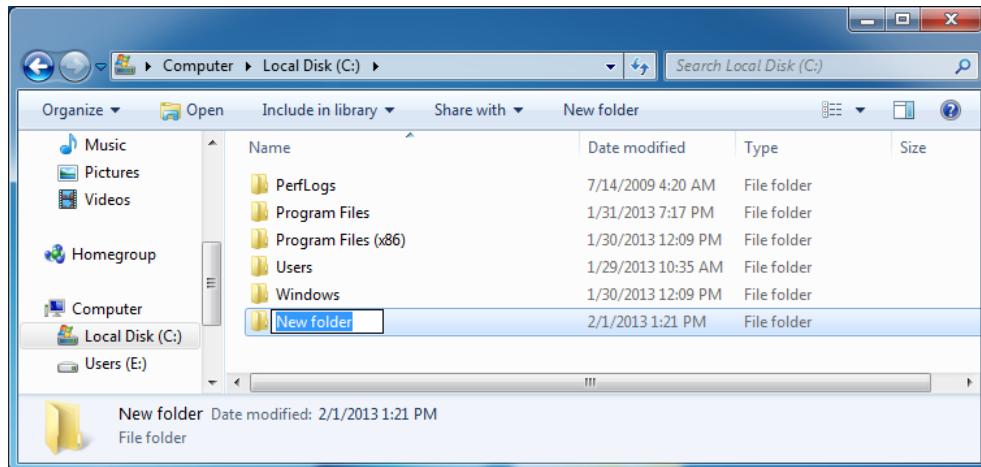
## Creating a new folder on the data partition

Navigate to the data partition, hover over a white space under existing folders, right-click, and hover over New and select **Folder** (Figure 8.6).

**Figure 8.6 – Creating a new folder**

By default the folder will be named *New folder* (Figure 8.7), however it will be highlighted so that you may simply type your desired folder name immediately, after which your folder will be created by hitting **enter** or clicking the mouse in a blank space.

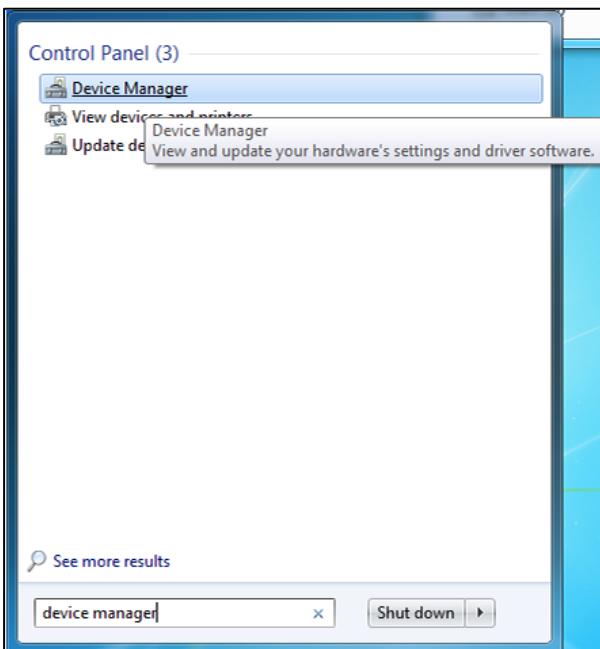
**Figure 8.7 – Renaming the folder**



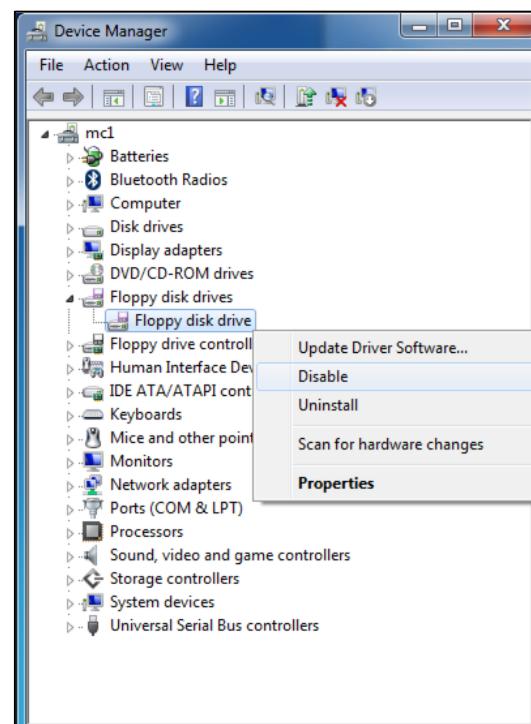
## Disabling the floppy diskette

You can disable the floppy diskette via the **Device Manager**, which is easily accessible through the search bar (Figure 8.8). It is good practice to disable un-needed devices (to clean up the interface, and avoid confusion).

**Figure 8.8 – Searching for Device Manager**



**Figure 8.9 – Disabling Floppy disk controller**

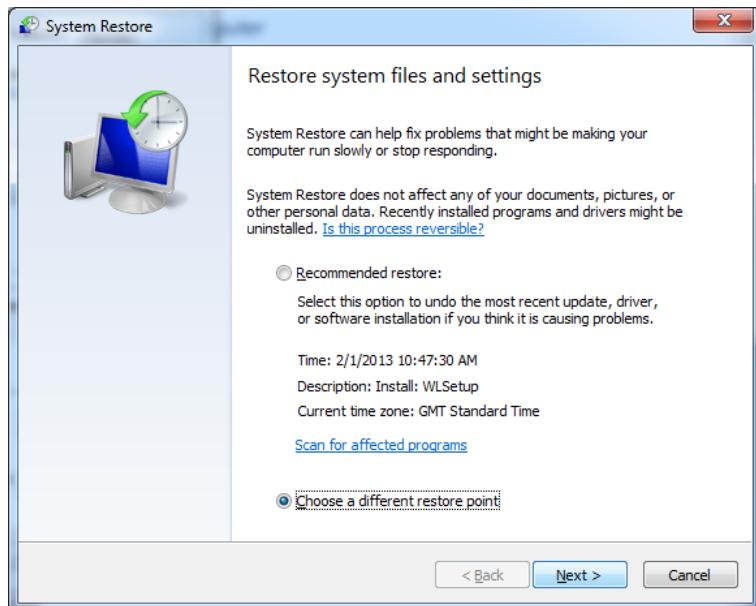


Once you are in Device Manager (Figure 8.9), under **Floppy disk drives**, right-click **Floppy disk drive** and select **Disable**. Repeat this process under **Floppy drive controllers** with **Standard floppy disk controller**. You will be asked to confirm that you wish to disable the device, click **Yes** to proceed as required.

## Restoring the pc to the restore point

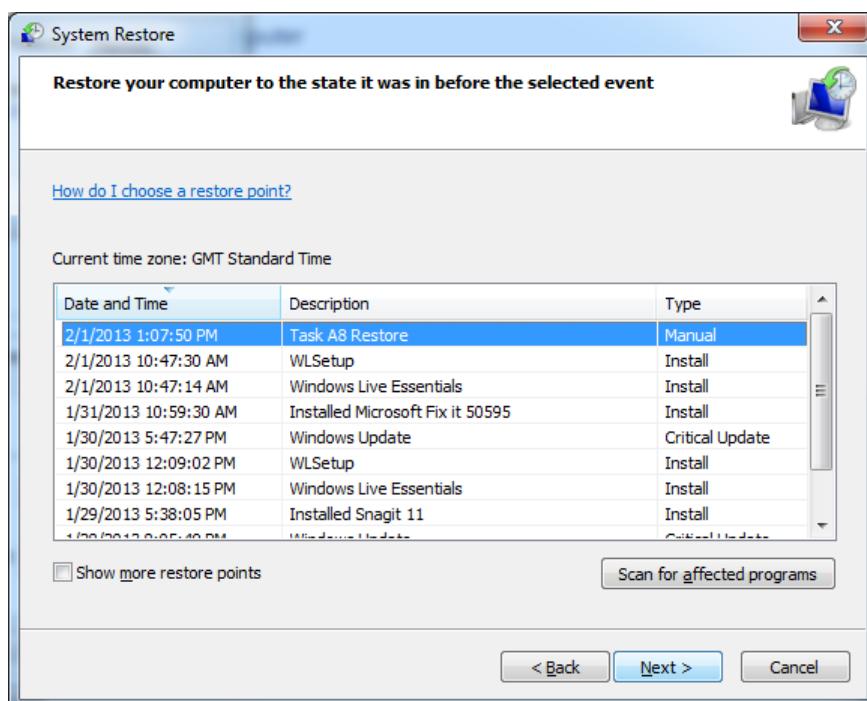
To initiate a system restore, navigate to the **System Protection** tab of **System Properties** as before. Select **System Restore**. You will have two options, as shown in Figure 8.10, select **Choose a different restore point** and click **Next**.

**Figure 8.10 – System Restore Options**



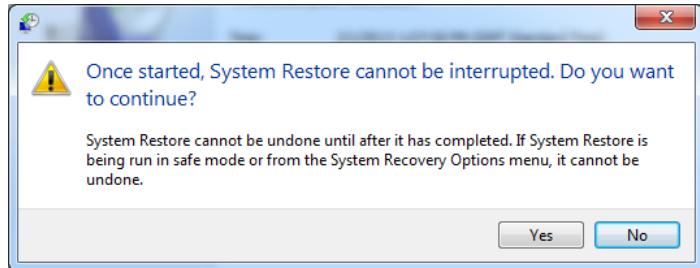
You will then be given a list of restore points to choose from (Figure 8.11). Windows automatically creates restore points when new software is installed, or when Windows Updates were installed. The restore point you created earlier will be indicated on the list with a **Type of Manual** (in Figure 8.11, this is *Task A8 Restore*).

**Figure 8.11 – Choosing System Restore Point**



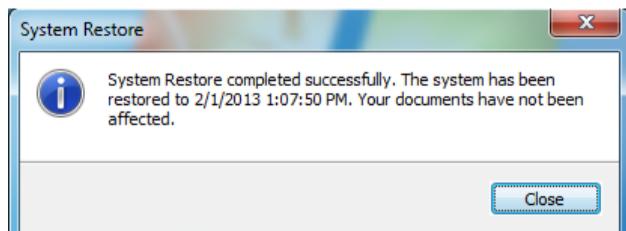
Ensure the correct restore point is highlighted, and click **Next** to continue. You will then be warned as per Figure 8.12, select **Yes** to continue.

**Figure 8.12 – System Restore Warning**



Once system restore is complete, you will be notified as per Figure 8.13.

**Figure 8.13 – System Restore Complete**



#### Explanation of modifications performed by System Restore

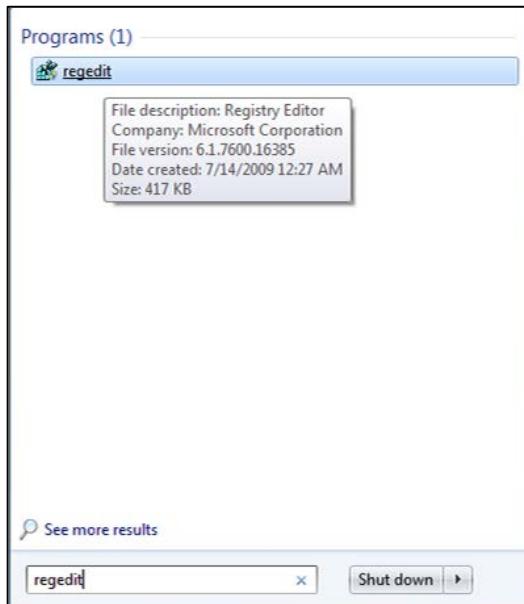
The system restore will revert the system to the state it was in when you created the restore point. The floppy diskette will be enabled again, the **backup** folder will no longer exist, and the machine will no longer be named **mc1**.

## TASK A.9 – SYSTEM REGISTRY

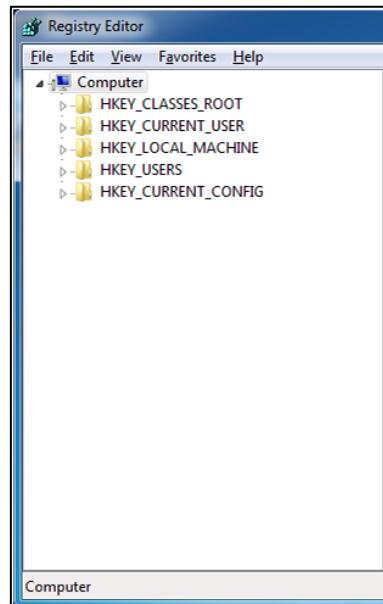
---

The backup of the system registry can be done from the **Registry Editor**. The quickest path to this location is to type ‘*regedit*’ in the search bar as shown in Figure 9.1.

**Figure 9.1 – Search for Registry Editor**

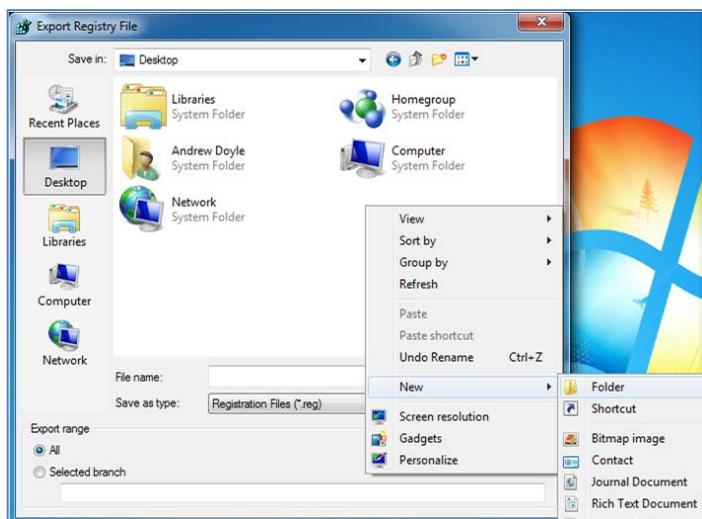


**Figure 9.2 – Registry Editor**

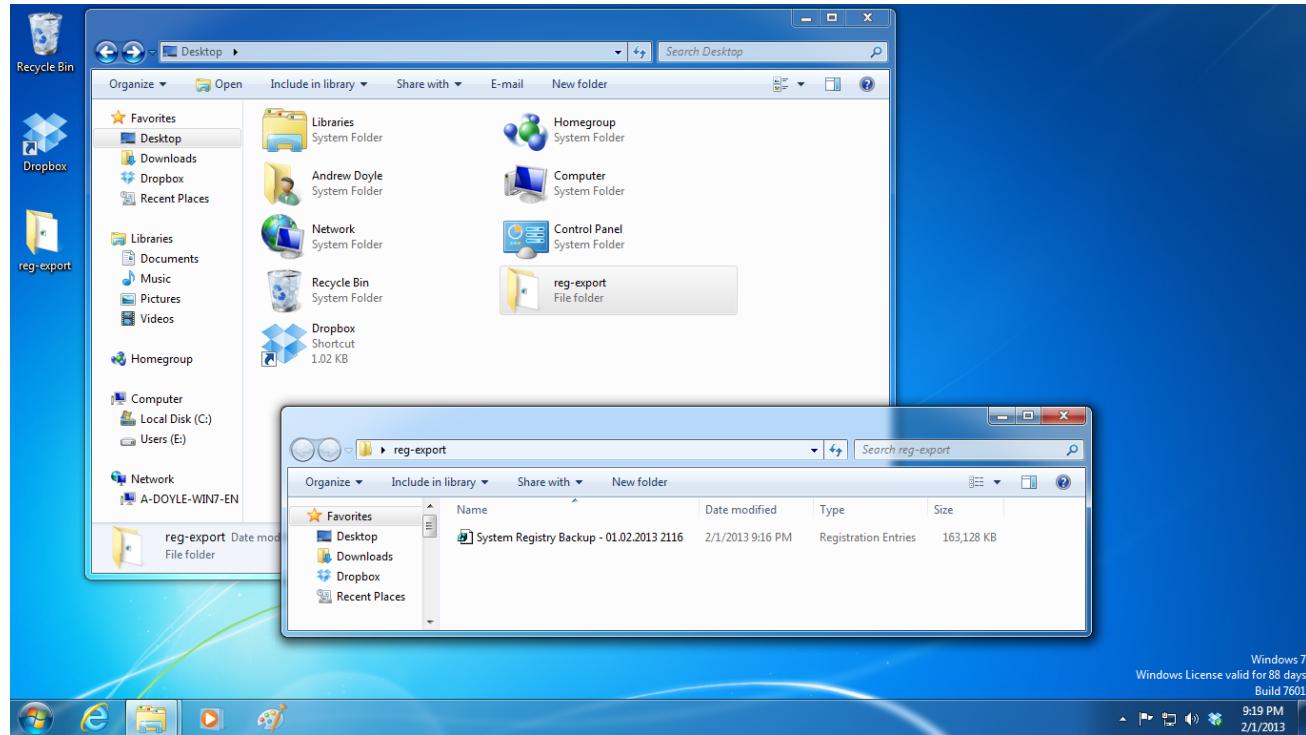


Right-click on **Computer** (Figure 9.2) and choose **Export**. Alternatively click **File** and then **Export**. You will be prompted to select a location to export the registry file to. Select **Desktop** from the left-hand navigation pane (as shown in Figure 9.3). Create a folder on the desktop by right-clicking in the blank space under **Computer** or **Network** (or whatever desktop icons you may have) as shown in Figure 9.3.

**Figure 9.3 – Export Registry File to Desktop**



When you have the created the folder and are within that folder, select save and the registry will be exported. The file should be accessible via the desktop as shown in Figure 9.4.

**Figure 9.4 – System Registry Back-up in place**

### Why back up registry

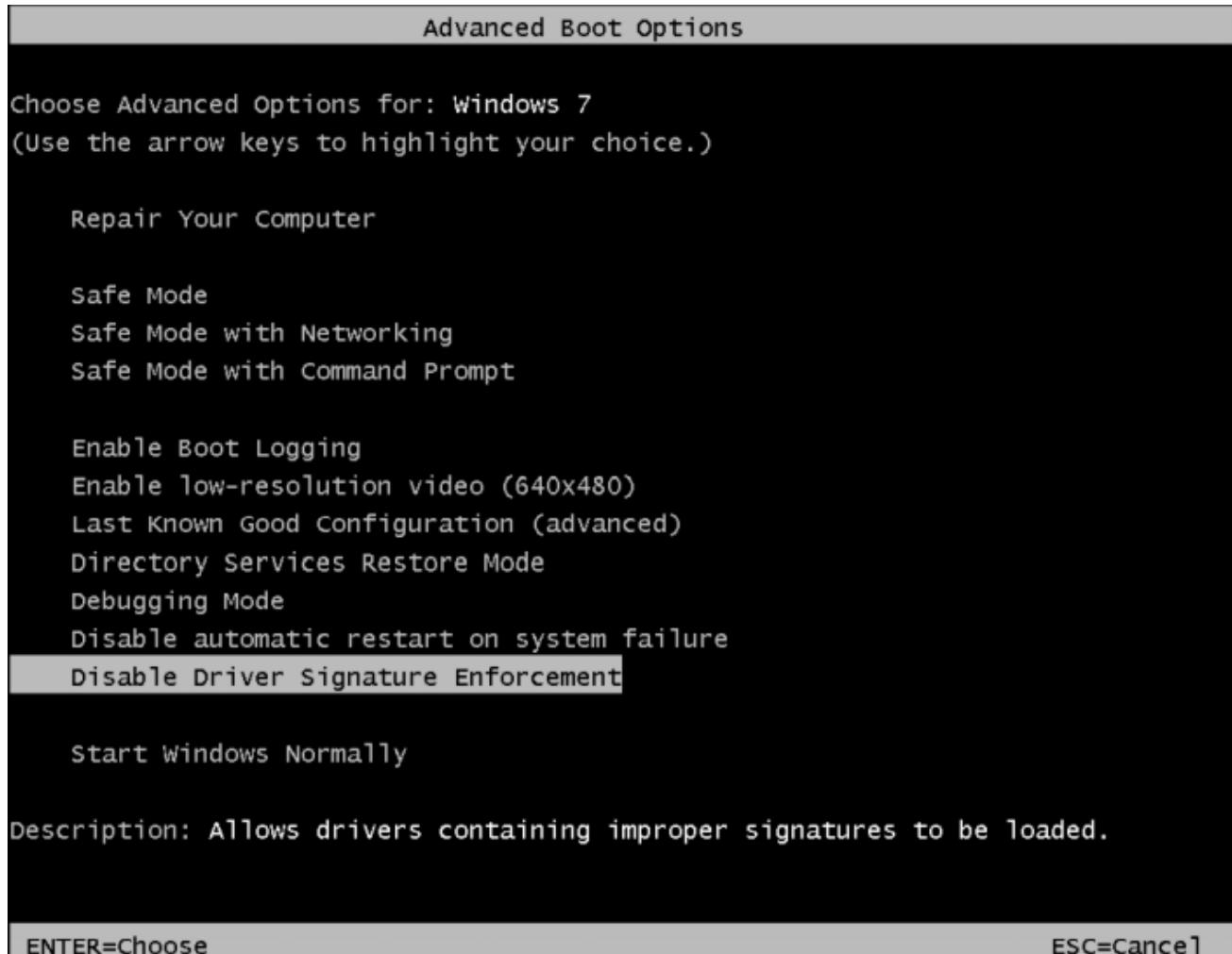
As outlined by programmerworld.net (n.d), there are a number of occasions when you should back up the system registry:

- Before making changes to a registry key or sub key
- In advance of making any major system or network configuration alterations on your computer
- Prior to installing or uninstalling a large program
- Before using a registry cleaner

## TASK A.10 – DRIVER COMPATABILITY

By default, with Windows 7 x64 and Windows Vista x64, driver signature is enforced. However, as shown in Figure 10.1, it can be disabled in the **Advanced Boot Options**. Therefore standard users should not be allowed access this utility.

**Figure 10.1 – Disable Driver Signature Enforcement**



An article by Raymond (2012), discusses methods of loading unsigned drivers in Windows 7; measures must therefore be put in place to stop users from implementing Raymond's suggestions.

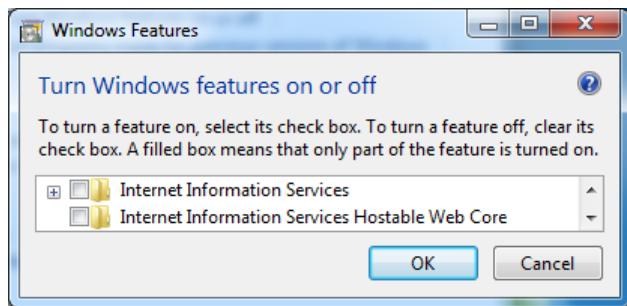
Methods discussed include the advanced boot method (shown above), third party utilities, and command prompts.

## TASK B.1 – INSTALL: ISS MANAGER, DEBIAN AND APACHE WEB-SERVER

### Installation of Microsoft Web-Server

Microsoft's web server, also known as Internet Information Services, is included in Windows 7 but must be enabled. In the **Control Panel** select **Programs and Features** (in applet view) or **Programs** (in category view). Now select **Turn Windows features on or off**. Navigate to **Internet Information Services** (Figure B\_1.1) and click the + symbol beside the un-ticked box.

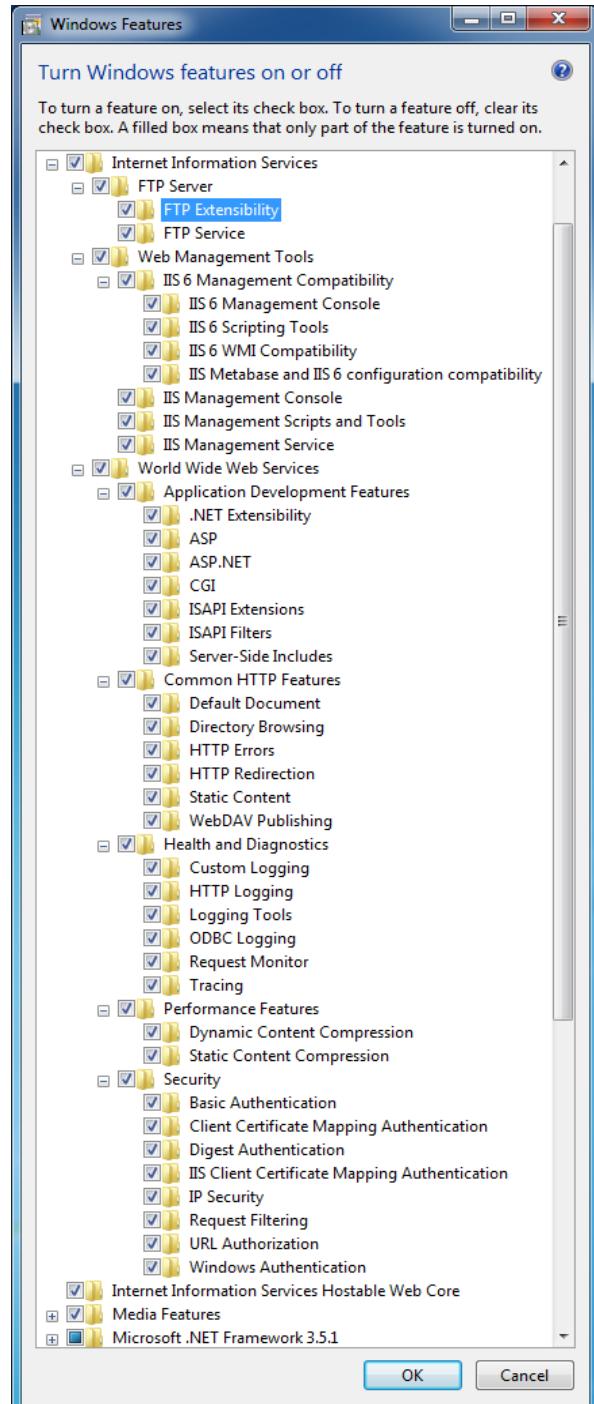
**Figure B1.1 – Windows Features**



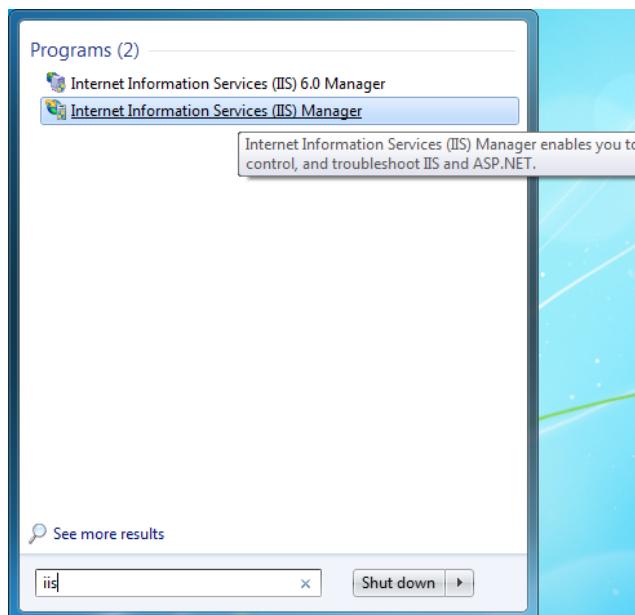
Ensure that all boxes are now ticked (as shown in Figure B1.2). Click **OK** and you will then be notified that it may take several minutes for Windows to make changes.

To check it is installed, type *iis* into the search bar (as shown in Figure B1.3). Click **Internet Information Services (IIS) Manager** to open the utility.

**Figure B1.2 – Windows Features**

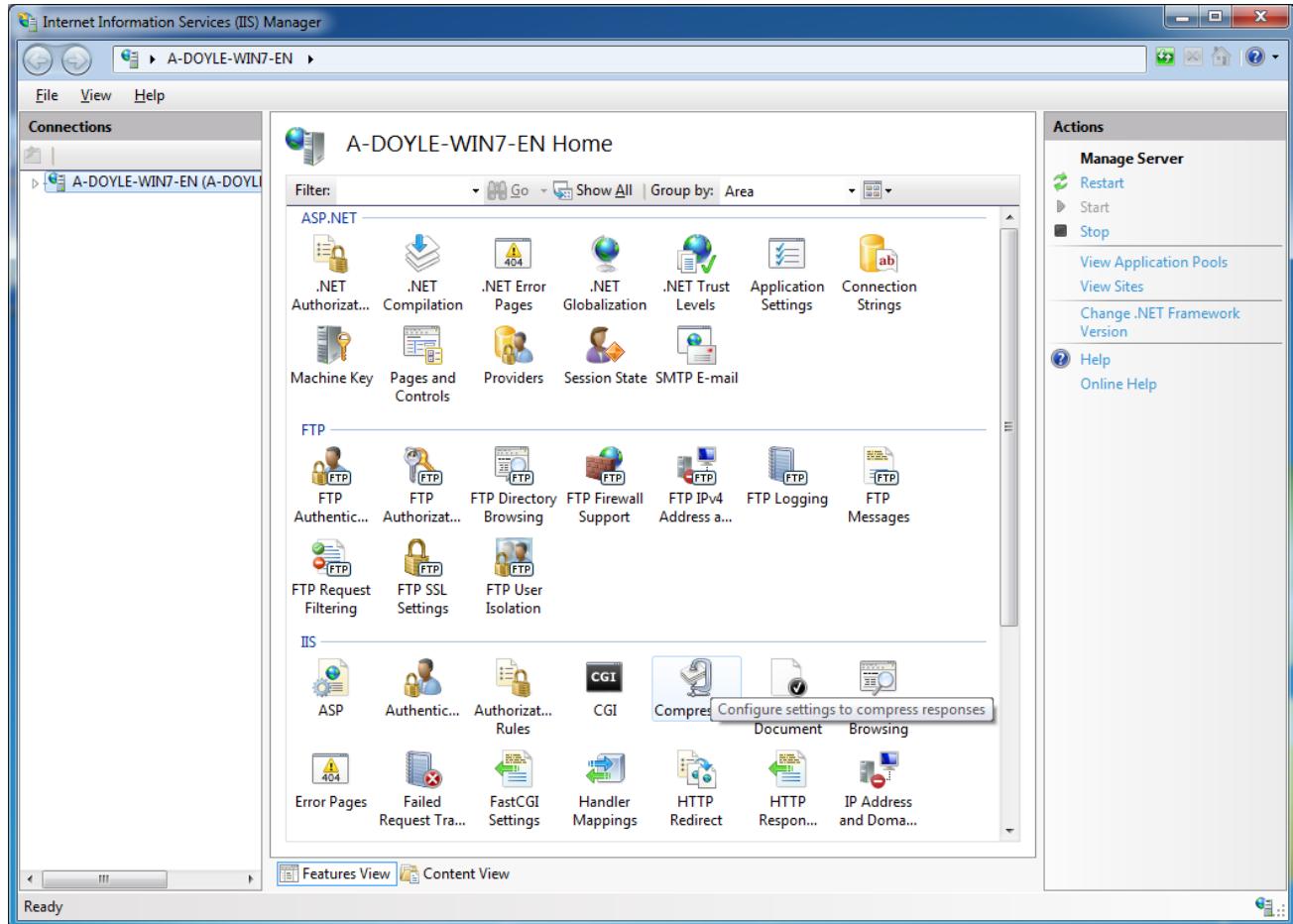


**Figure B1.3 – Verify IIS installation**



The utility will open, as shown in Figure B1.4.

**Figure B1.4 – Internet Information Services (IIS) Manager**



## Benefits and drawbacks to using both Windows and Linux as a hosting Platform

As discussed by Seymour (n.d.), there are two main hosting platforms; IIS for Windows and Apache for Linux. Apache brings with it a number of benefits, including lower cost (no licensing fees), open source flexibility (access to the underlying code), and enhanced security.

Whilst IIS incurs more costs due to the necessity of using a Windows Server, and it is more prone to security issues, it brings its own benefits to the table. Microsoft provides support for IIS whilst Apache is only supported by the users themselves.

If the company wishes to blend the benefits of both systems, the security and flexibility of Apache, with the supportability of IIS, then choosing to use both Windows and Linux as a hosting platform may be a smart move.

## Installation of Debian Linux

When you first launch your Debian installation medium, you will be greeted by the menu shown in Figure B1.5. Select **Install** to continue; you use the **ENTER** key instead of mouse-clicks during this installation.

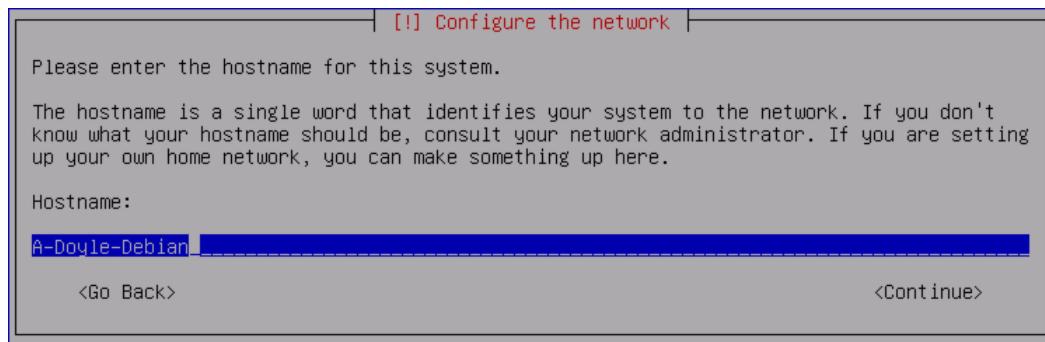
**Figure B1.5 – Debian Linux Installation Menu**



You will then be prompted to choose a language, select **English** and as before, use **ENTER** to proceed. You will now be asked to choose your location, which is used to set up your time zone. Next, you will be asked to select a keyboard layout; select **British English**.

The next window, shown in Figure B1.6, asks you to enter a hostname for the system, which identifies your system to the network. When you have entered the name, navigate to **Continue** using the arrow keys and use the **ENTER** key to proceed.

**Figure B1.6 – Debian Hostname**



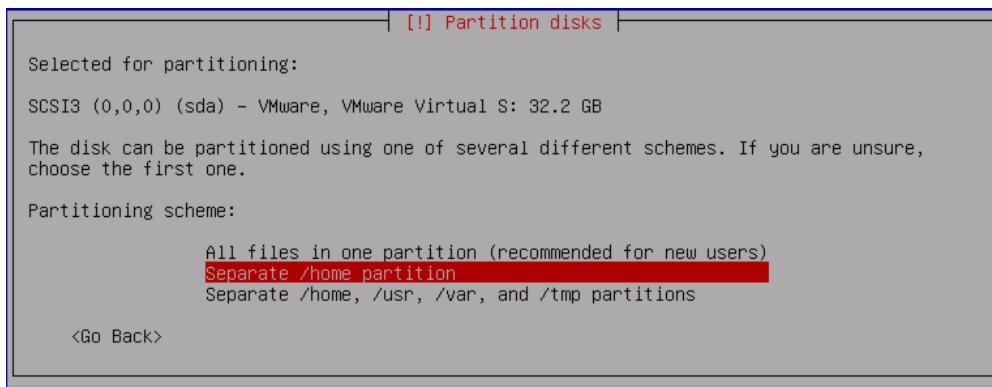
You will now be prompted to enter a domain name, and will be advised that if you are setting up a home network, you must use the same domain name on all the computers.

The next step is to set a root password, which ideally should be a non-dictionary word with a mixture of letters, numbers and punctuation. Be careful when entering this password, as you will not be able to see it as you type. The next screen will prompt you to re-enter your chosen password.

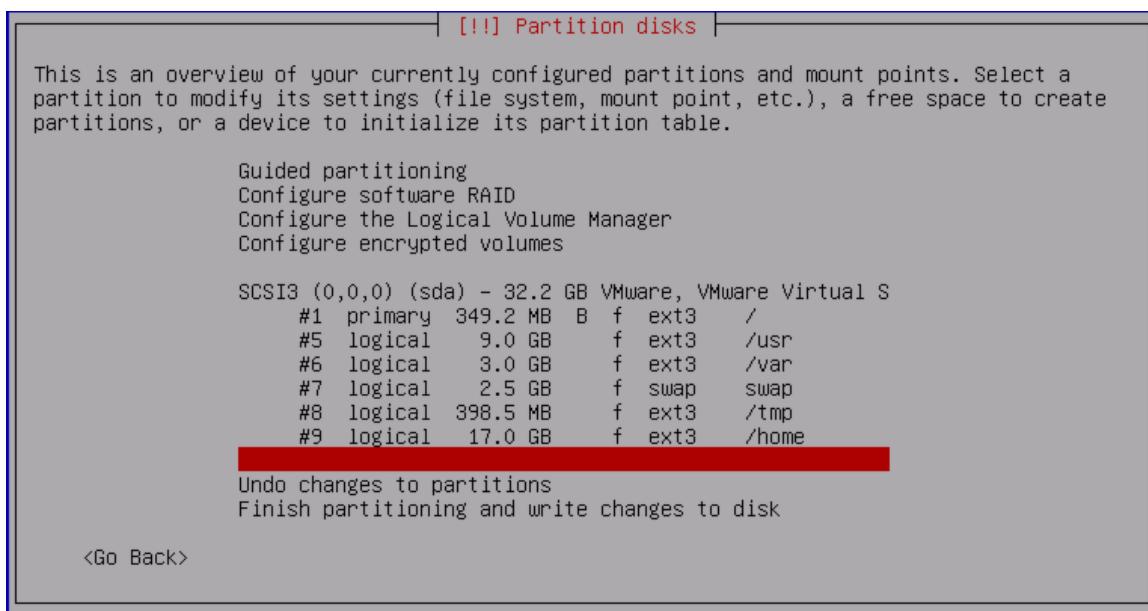
Next, you will be asked to create a user to be utilised instead of the root account for non-administrative purposes. In the first window you must enter the full name of the user and in the following window you enter the actual username. You will then be asked to set a password for this user.

Now, you will have reached the **Partition disks** wizard. Select **Guided – use entire disk**. You will be asked to choose a disk drive to install Debian on; note that all data on the selected drive will be erased. Figure B1.7 shows the partitioning scheme options. For the purposes of this manual, the third option will be demonstrated: **Separate /home, /usr, /var, and /tmp partitions**. Figure B1.8 shows a breakdown of the partitioning to be implemented.

**Figure B1.7 – Partitioning Schemes**



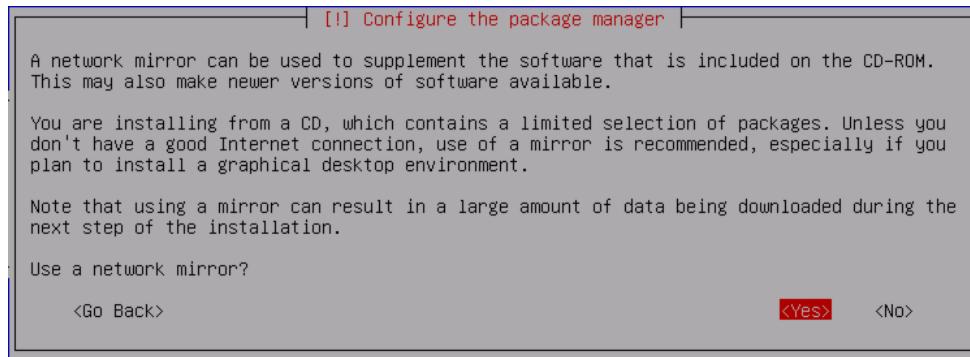
**Figure B1.8 – Partitions Configured**



You will then be asked to confirm the partitioning details, select **Yes** to continue. The next window will ask you if you have any additional CDs or DVDs to scan; this option would be useful if the installation files were spread across multiple CDs or DVDs. Select **No** to continue.

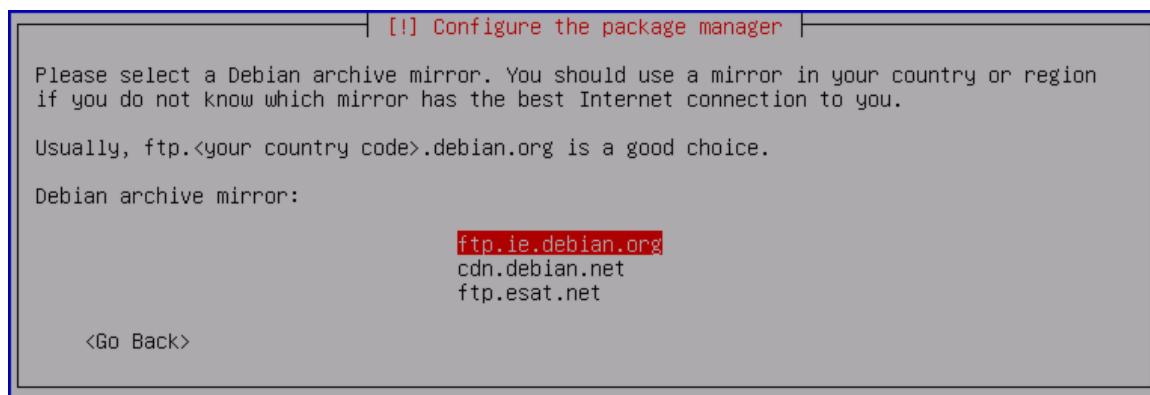
You will now be asked whether to use a *Network Mirror*. It is recommended to use a network mirror when installing a GUI (Graphical User Interface). Select **Yes** to continue (Figure B1.9).

**Figure B1.9 - Network Mirror**



The next step is to choose your country for the Debian archive mirror, the details of which are selected as per Figure B1.10.

**Figure B1.10 – Debian archive mirror**



Next, you will be asked about a HTTP proxy; leave this blank and select **Continue**. You will then be asked to participate in the package usage survey. This is a matter of personal preference. Next, you will be asked if you wish to install packages from a predefined collection of software. For the purposes of this manual, the defaults have been selected as per Figure B1.11; but you may select any of the others using the **space** key.

**Figure B1.11 – Final configuration step**

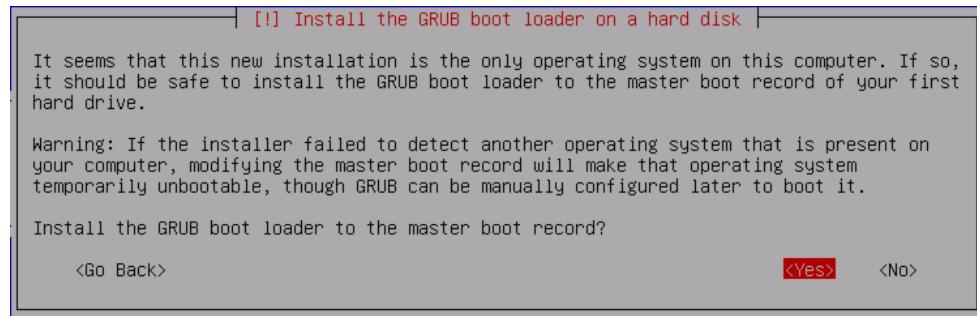


#### Note

This is the final configuration step. When you select **Continue** the installation of Debian will commence, taking approximately ten minutes

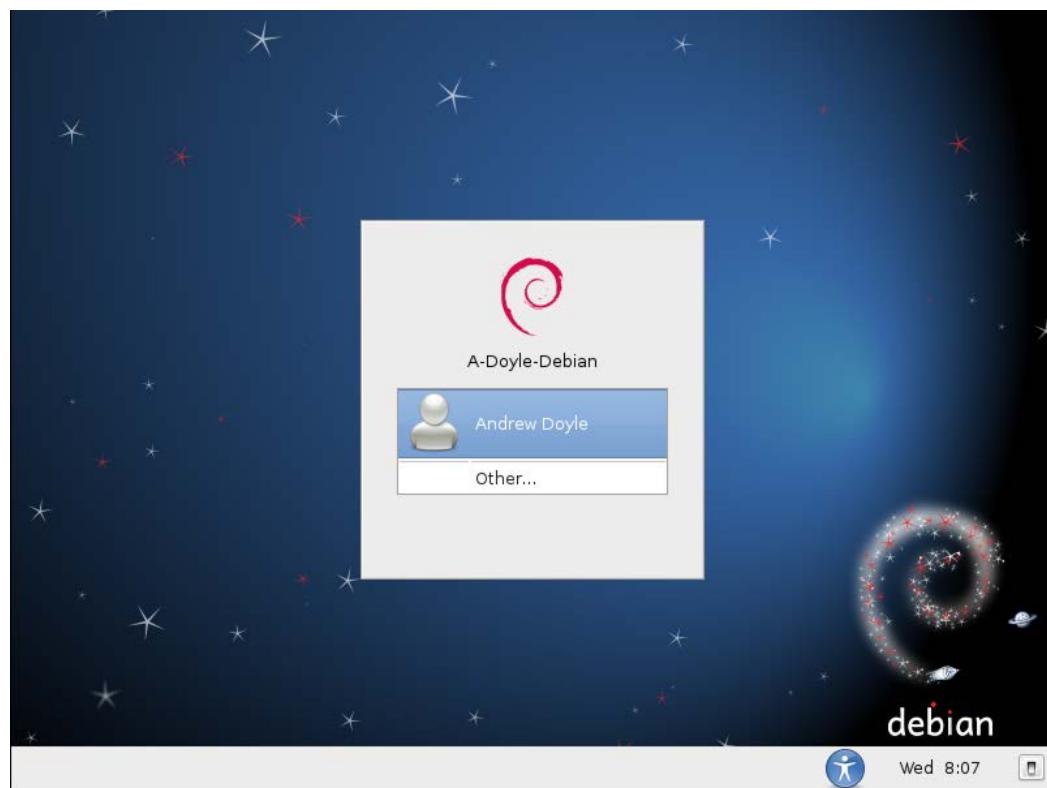
After selecting **Continue**, the installation will commence, typically taking approximately ten minutes. Afterwards, you will be prompted to install the GRUB boot loader since the installer will have detected the lack of an existing operating system on the computer.

**Figure B1.12 – GRUB boot loader**

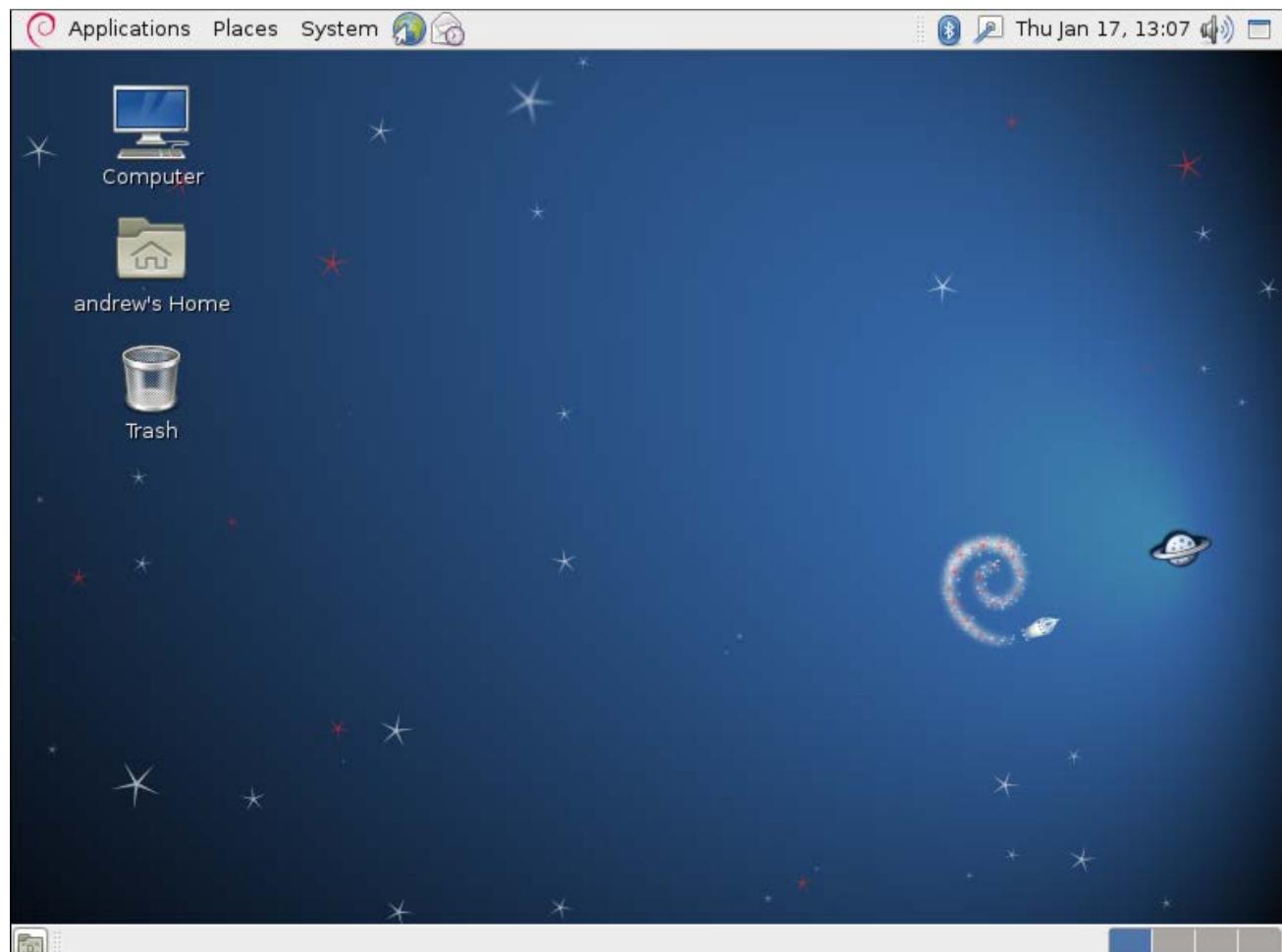


You will be greeted with an *installation complete* window. Select **Continue** and you should be brought to the Debian welcome screen as shown in Figure B1.13.

**Figure B1.13 – Debian Welcome Screen**



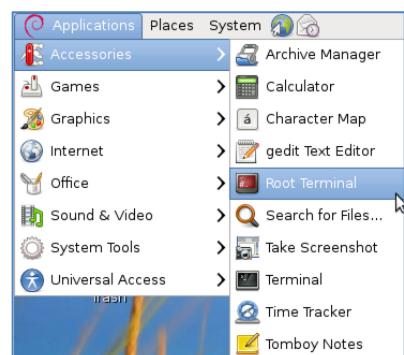
Select the user and enter your password, and you will enter the Debian GUI desktop (Figure B1.14). Congratulations – you have successfully installed Debian Linux!!

**Figure B1.14 – Debian GUI Desktop**

## Installation of Apache web-server on *Debian Linux*

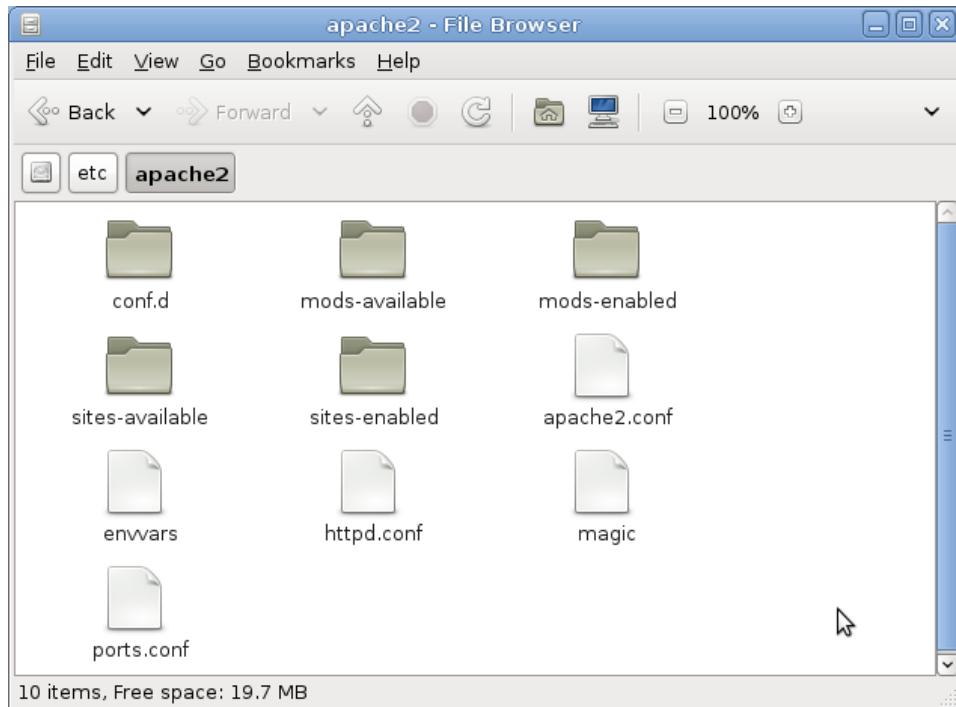
As outlined by Tuohaihe (2012), Installing apache web server is as easy as running `apt-get install apache2` from the root terminal.

To open the root terminal, select **Applications** from the top right of your screen, choose **Accessories**, followed by **Root Terminal** (Figure B1.15). Figure B1.16 shows the Root Terminal itself.

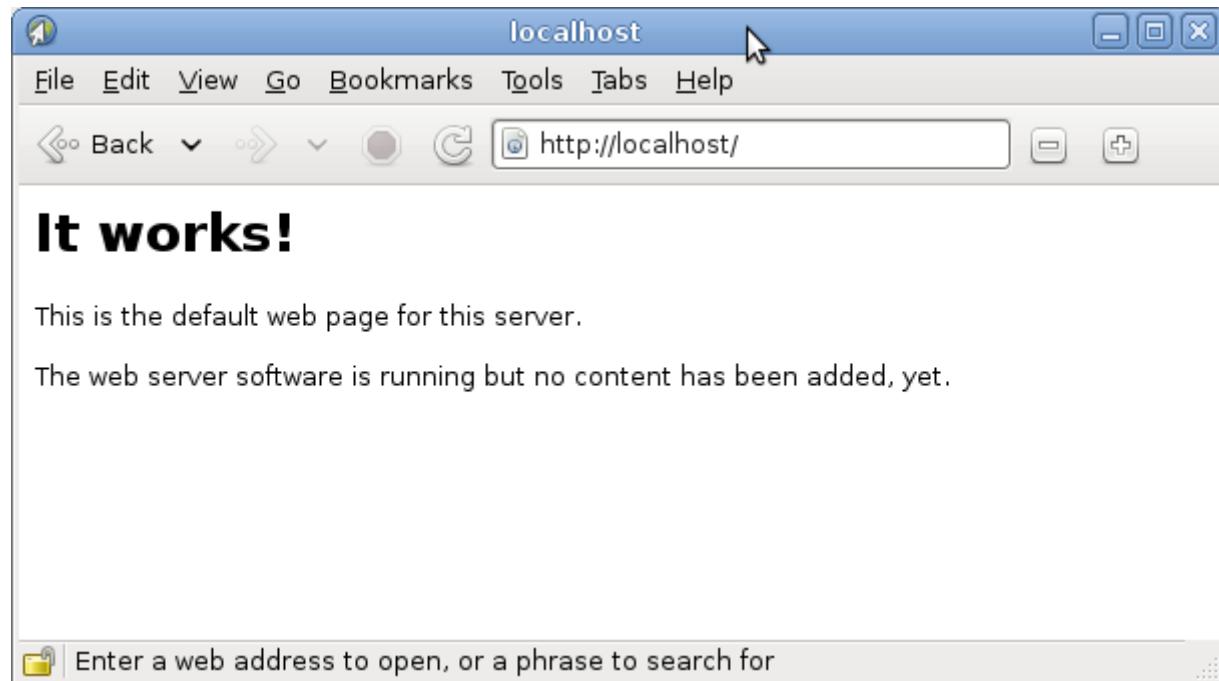
**Figure B1.15 – Accessing Root Terminal**

**Figure B1.16 – Root Terminal**

In the root terminal type '`apt-get install apache2`'. To check that this has been successful, click **Places**, then **Computer**, and **File System**. You are now in the **File Browser**. Select the folder **etc**. and there should be a folder named **apache2**. Inside the folder note that there is a file named **apache2.conf** (Figure B1.17 ). Run this file in the terminal.

**Figure B1.17 – Apache2 File Browser**

To verify Apache web-server is running open your browser (**Applications -> Internet -> Epiphany Web Browser**) and type <http://localhost/> in the address bar as shown in Figure B1.18.

**Figure B1.18 – Verifying Apache web-server installation**

## Task B.2 – DEBIAN USERS AND USER ACCOUNT STRUCTURES

---

### Create Users, Groups, and Directories

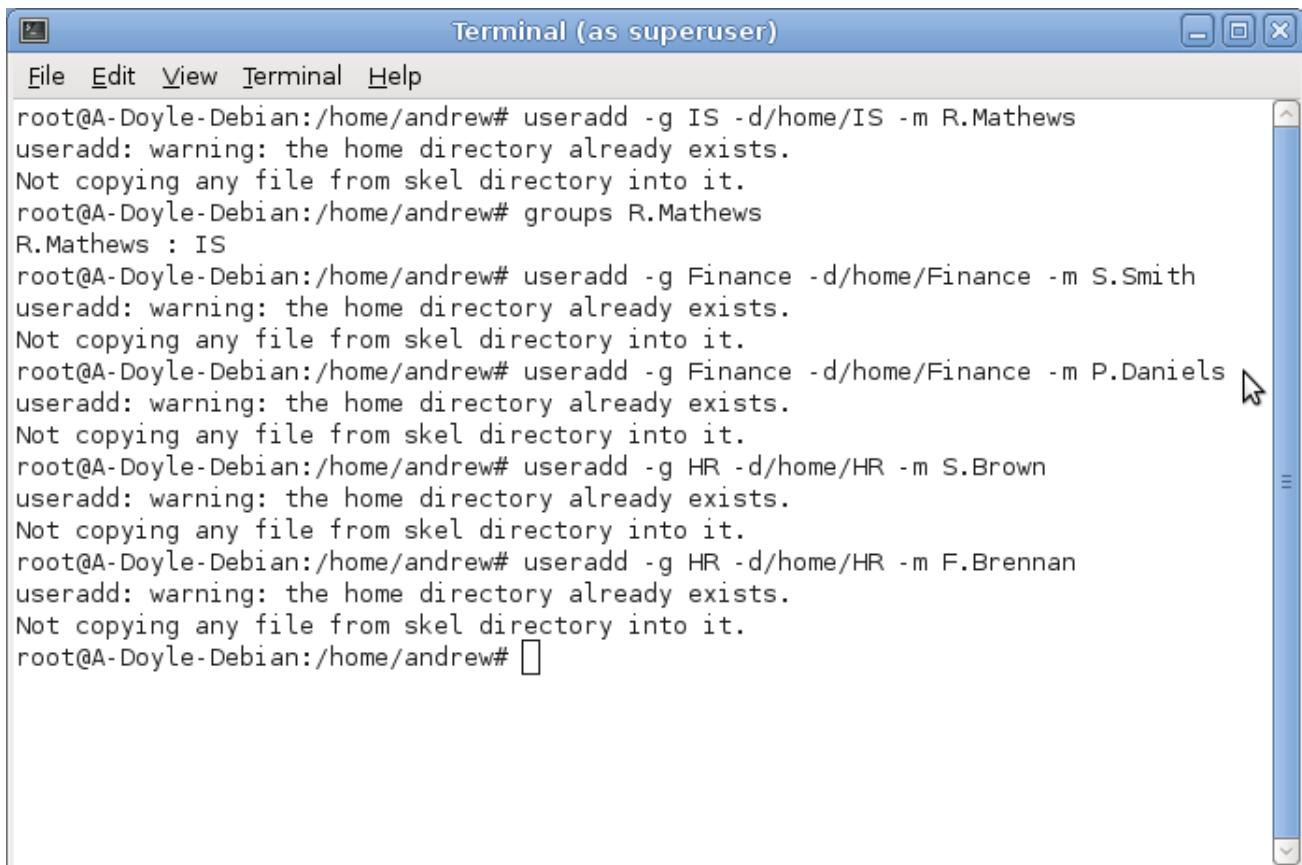
You can create users and account structures in the root terminal. The following command creates a user *R.Mathews*, assigns him to the group *IS* and creates a directory in the home folder called *IS*:

```
useradd -g IS -d/home/IS -m R.Mathews
```

- -g creates the group
- -d creates the directory
- -m creates the user

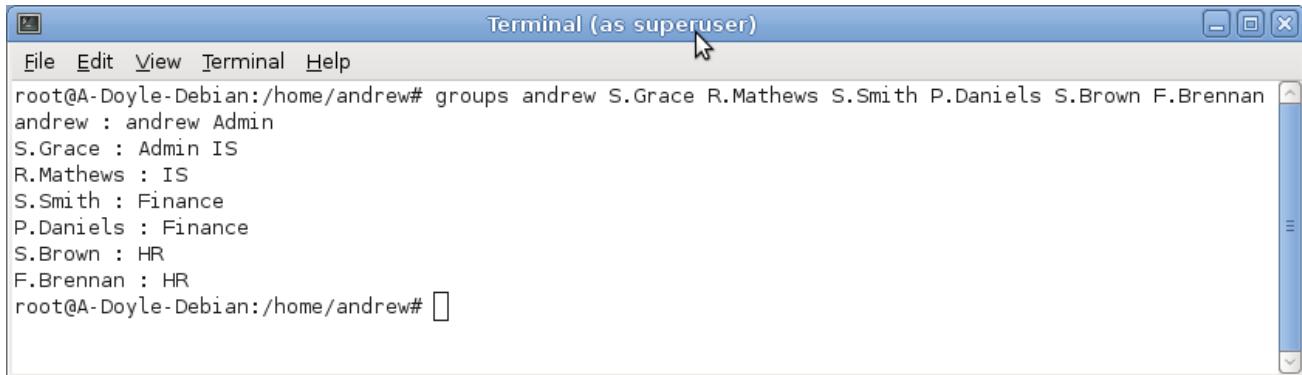
Figure B2.1 shows the commands for users, groups, and directories being created. Note that when these commands were run, the directories had already been created, which is why the following warning is displayed: ***the home directory already exists. Not copying any file from skel directory into it.***

**Figure B2.1 – Creating Users, Groups, and Directories**



```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# useradd -g IS -d/home/IS -m R.Mathews
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
root@A-Doyle-Debian:/home/andrew# groups R.Mathews
R.Mathews : IS
root@A-Doyle-Debian:/home/andrew# useradd -g Finance -d/home/Finance -m S.Smith
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
root@A-Doyle-Debian:/home/andrew# useradd -g Finance -d/home/Finance -m P.Daniels
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
root@A-Doyle-Debian:/home/andrew# useradd -g HR -d/home/HR -m S.Brown
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
root@A-Doyle-Debian:/home/andrew# useradd -g HR -d/home/HR -m F.Brennan
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
root@A-Doyle-Debian:/home/andrew# 
```

To check the users and groups structure, you can run the command **groups** followed by the usernames separated by a space. This is demonstrated in Figure B2.2.

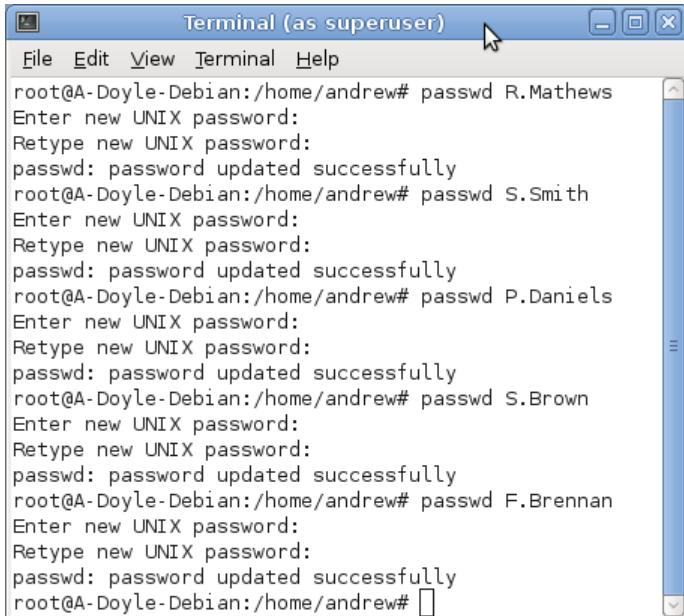
**Figure B2.2 – Verify Users and Group Structures**


```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# groups andrew S.Grace R.Mathews S.Smith P.Daniels S.Brown F.Brennan
andrew : andrew Admin
S.Grace : Admin IS
R.Mathews : IS
S.Smith : Finance
P.Daniels : Finance
S.Brown : HR
F.Brennan : HR
root@A-Doyle-Debian:/home/andrew#
```

\*Note that S.Grace was created and added to the **Admin** group previously with the same syntax as previous commands.

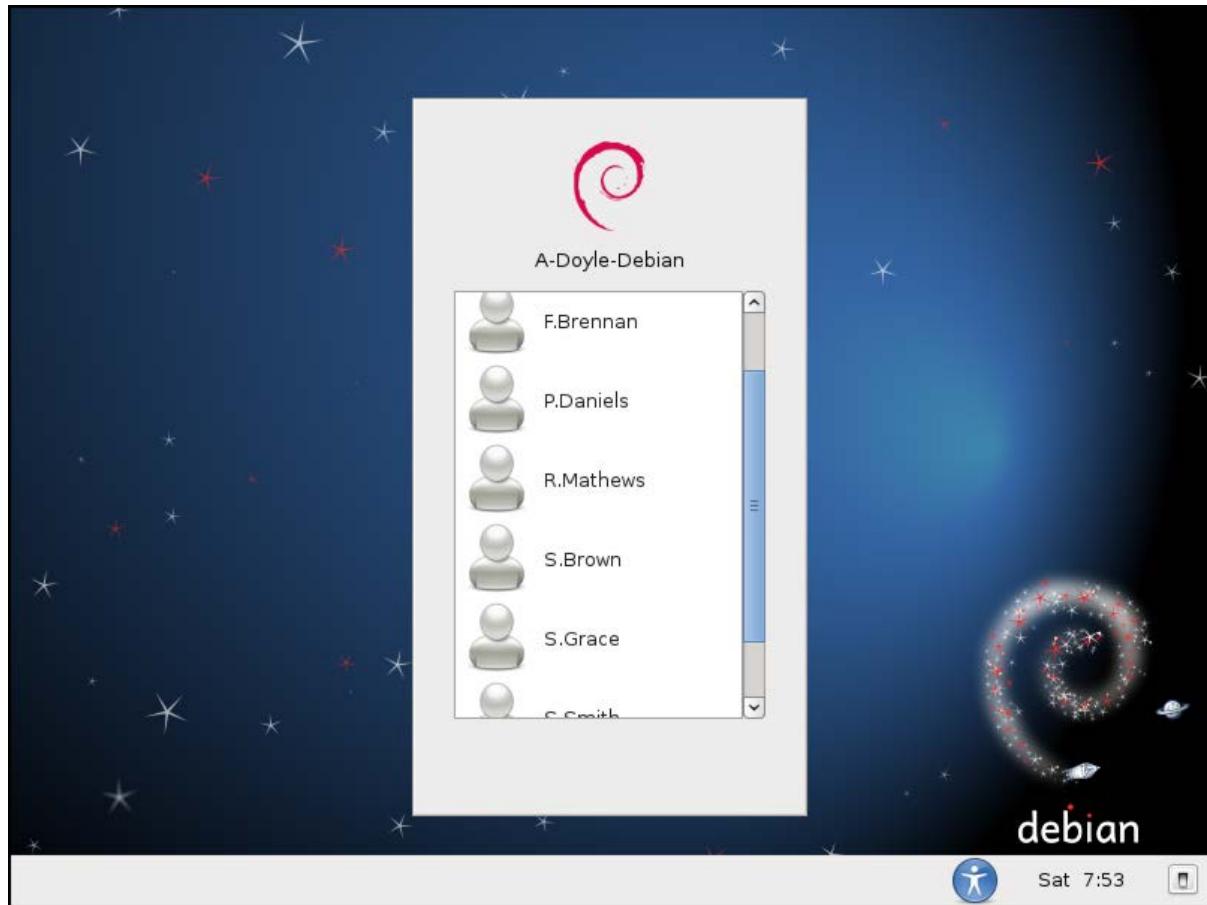
## Setting Passwords

To set passwords for the users, in the command prompt type **passwd** followed by the username. You enter and re-enter the password; be careful as you cannot see what you type, not even asterisks (see Figure B2.3).

**Figure B2.3 – Setting passwords for users**


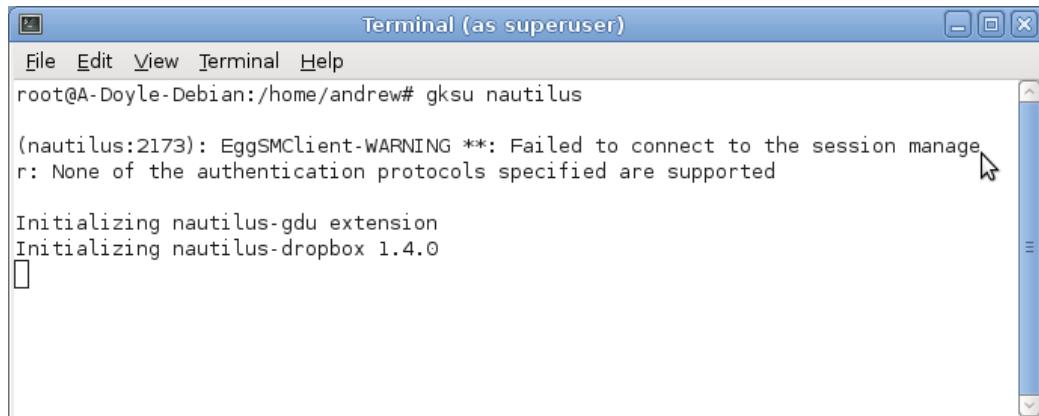
```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# passwd R.Mathews
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@A-Doyle-Debian:/home/andrew# passwd S.Smith
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@A-Doyle-Debian:/home/andrew# passwd P.Daniels
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@A-Doyle-Debian:/home/andrew# passwd S.Brown
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@A-Doyle-Debian:/home/andrew# passwd F.Brennan
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@A-Doyle-Debian:/home/andrew#
```

To test the user accounts, log out (**System -> Log Out username**) and attempt to login to the relevant user shown on the welcome screen (see Figure B2.4).

**Figure B2.4 – Debian Welcome Screen; Users Created**

## Applying permissions to folders

To restrict access to relevant folders via the Graphical User Interface, you must first run `gksu nautilus` in the root terminal (Figure B2.5). This will allow you to set permissions.

**Figure B2.5 – GKSU NAUTILUS**

To set permissions for a folder, right-click the folder and select **Properties**. You can then allow a **Group** to access the folder and restrict **Others**, as demonstrated for the finance folder in Figure B2.6.

**Figure B2.6 – Setting Permissions for Finance Folder****Setting Permissions for Finance**

The **Owner** can be set to either Sam Smith or Paul Daniels.

Setting the **Group** to finance allows both Sam and Paul to access this folder.

Under **Others**, setting **Folder access** to **None** restricts other users from accessing the folder.

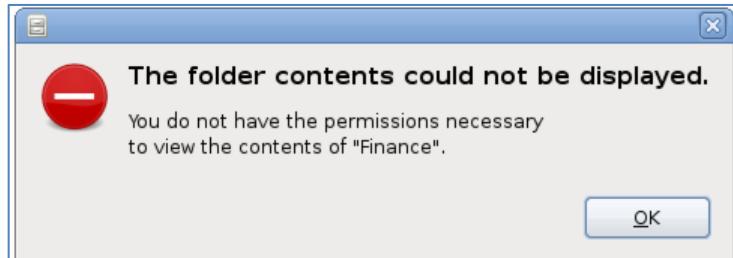
**Click Apply Permissions to Enclosed Files**

Note: to allow administrators access to these folders, you must grant **root** access to the **home** folder (Figure B2.7).

**Figure B2.7 – Allowing root access to folders**

To test that the permissions have been implemented, logon on as a different user and attempt to access a folder that should be inaccessible. For example, Rachael Matthews should not have access to the **Finance** folder. Trying to access this folder from Rachael's account should result in a message being displayed as per Figure B2.8.

**Figure B2.8 – Testing folder permissions**



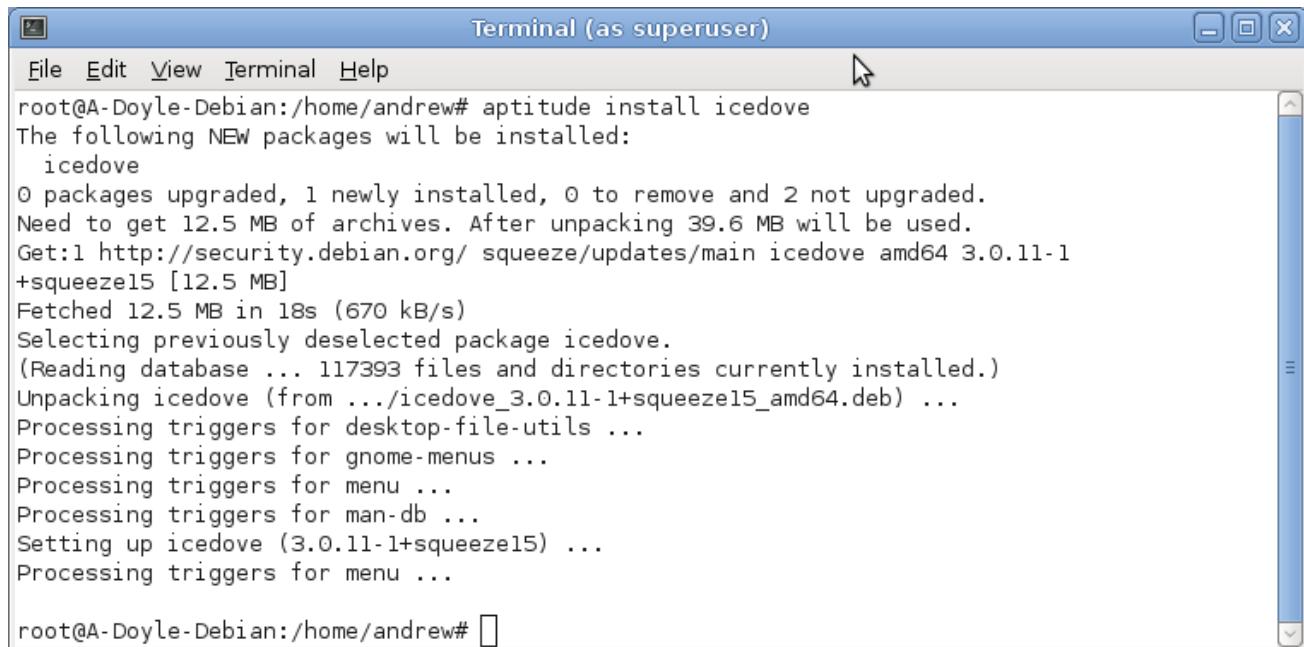
## TASK B.3 – INSTALLING OPEN SOURCE SOFTWARE

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### Email

As discussed by Ruchi (2006), there is an unbranded version of **Thunderbird** named **Icedove**. In the Root Terminal, run *aptitude install Icedove* as shown in Figure B3.1.

**Figure B3.1 – Installing an Email Client**

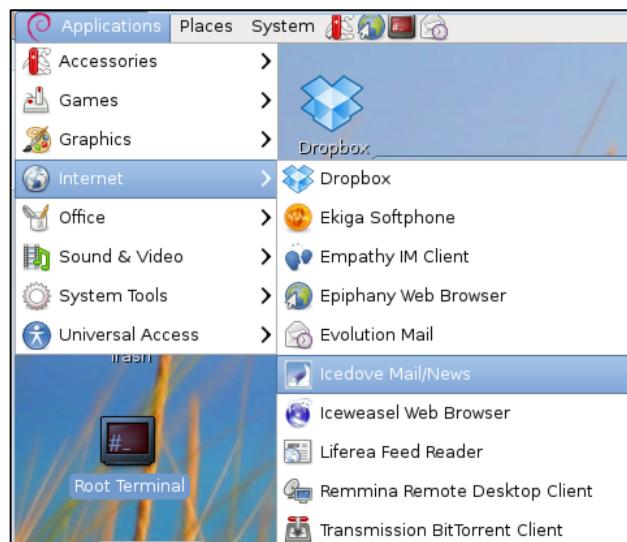


```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# aptitude install icedove
The following NEW packages will be installed:
  icedove
0 packages upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 12.5 MB of archives. After unpacking 39.6 MB will be used.
Get:1 http://security.debian.org/ squeeze/main icedove amd64 3.0.11-1
+squeeze15 [12.5 MB]
Fetched 12.5 MB in 18s (670 kB/s)
Selecting previously deselected package icedove.
(Reading database ... 117393 files and directories currently installed.)
Unpacking icedove (from .../icedove_3.0.11-1+squeeze15_amd64.deb) ...
Processing triggers for desktop-file-utils ...
Processing triggers for gnome-menus ...
Processing triggers for menu ...
Processing triggers for man-db ...
Setting up icedove (3.0.11-1+squeeze15) ...
Processing triggers for menu ...

root@A-Doyle-Debian:/home/andrew#
```

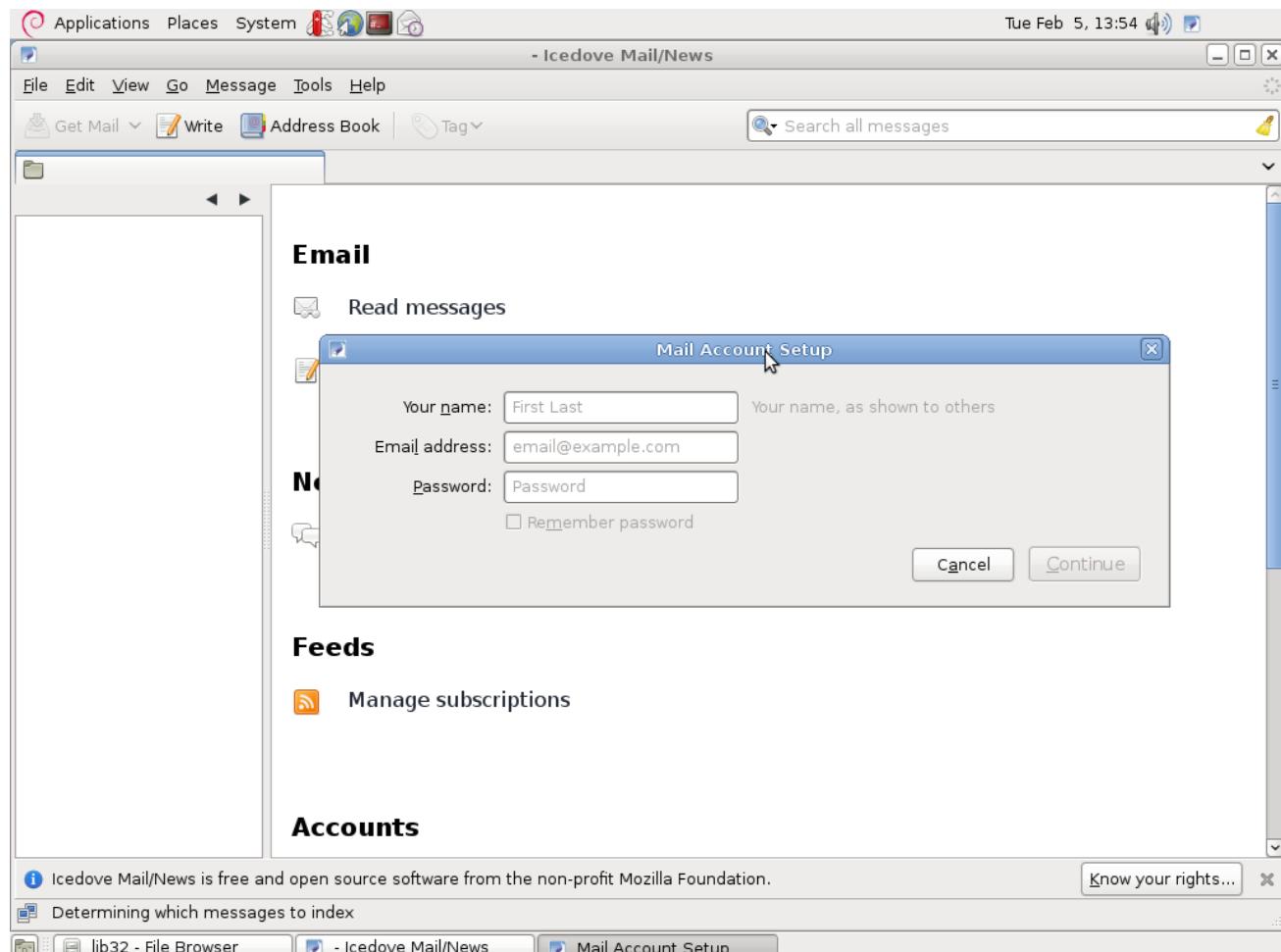
Once installed, you can find it in the **Internet** section of **Applications** as shown in Figure B3.2.

**Figure B3.2 – Location of Icedove Email Client**



When you open Icedove, you will be prompted to set up an email account, as shown in Figure B3.2.

**Figure B3.3 – Icedove Email Client Interface**



## Firewall

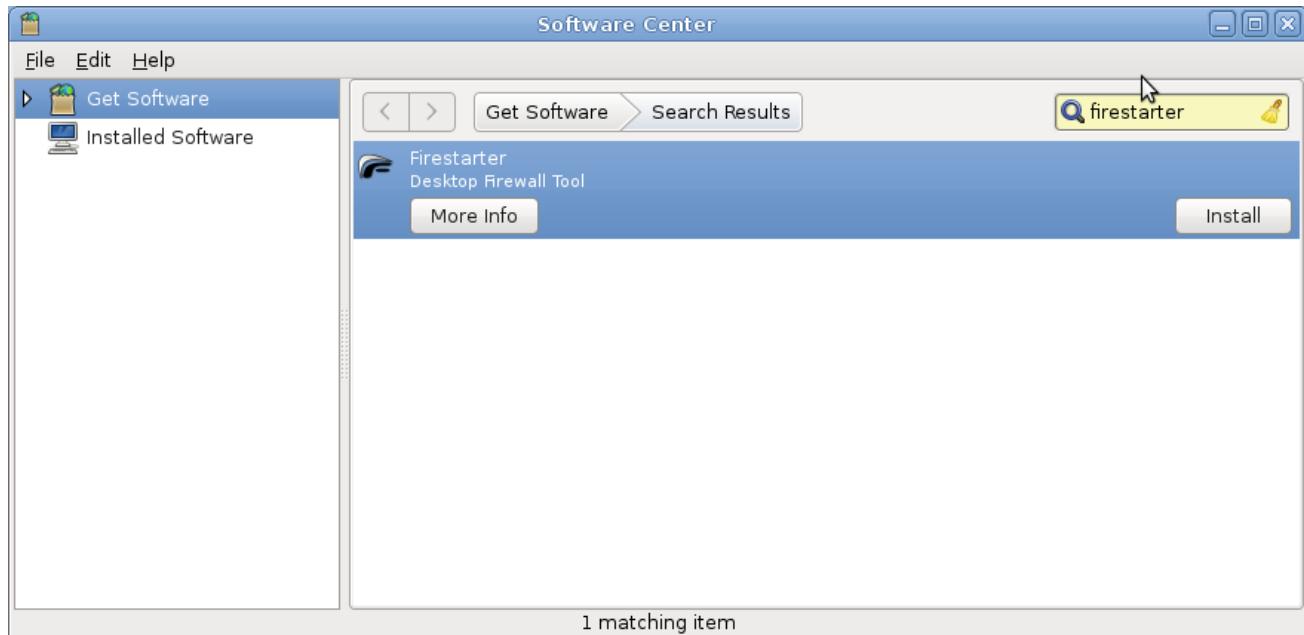
To install a firewall, open up **Software Center** as shown in Figure B3.4.

**Figure B3.4 – Path to Software Center**



Search for *firestarter* as shown in Figure B3.5 and select **Install**. You may be prompted to enter the password for root for authentication purposes.

**Figure B3.5 – Search for Firestarter**



## Anti-Virus

To install an Anti-Virus, run `apt-get install clamav clamtk` as shown in Figure B3.6. You will have to specify **Y** to allow the install when it warns you of the disk space required.

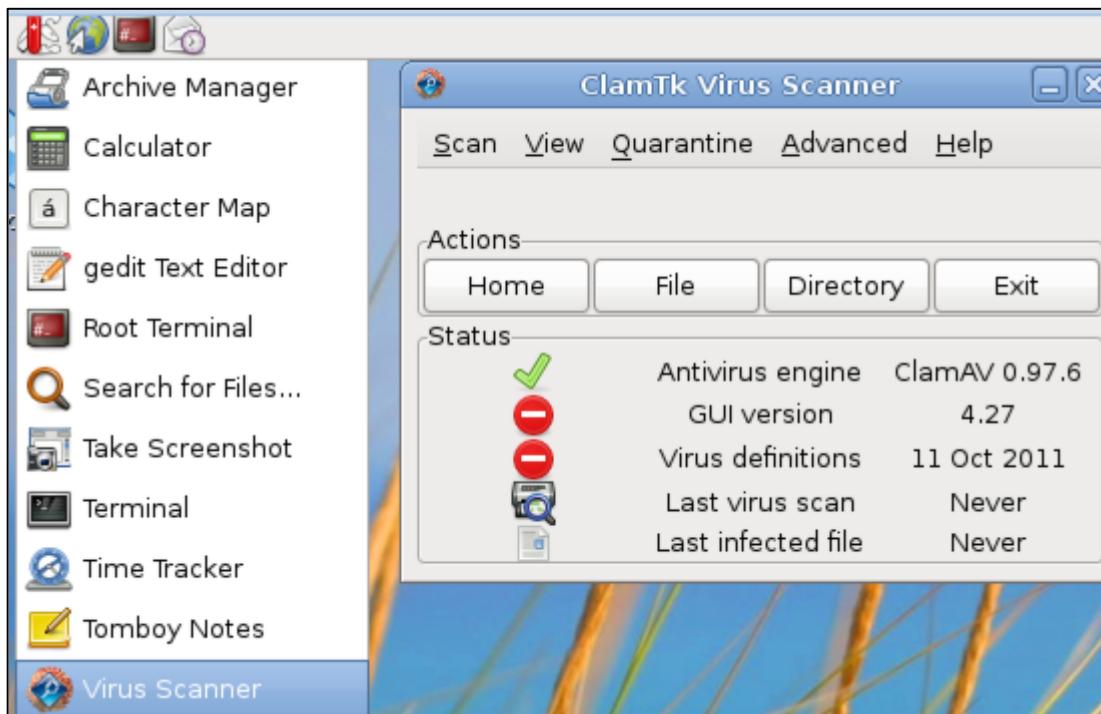
**Figure B3.6 – Install ClamTk Virus Scanner**

```

Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# apt-get install clamav clamtk
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  clamav-base clamav-freshclam libbit-vector-perl libcarp-clan-perl libclamav6
  libdate-calc-perl libdigest-hmac-perl libdigest-shal-perl
  libfile-find-rule-perl libnet-dns-perl libnet-ip-perl libnumber-compare-perl
  libtext-glob-perl libtommath0
Suggested packages:
  clamav-docs cabextract libclamunrar6 libio-socket-inet6-perl
The following NEW packages will be installed:
  clamav clamav-base clamav-freshclam clamtk libbit-vector-perl
  libcarp-clan-perl libclamav6 libdate-calc-perl libdigest-hmac-perl
  libdigest-shal-perl libfile-find-rule-perl libnet-dns-perl libnet-ip-perl
  libnumber-compare-perl libtext-glob-perl libtommath0
0 upgraded, 16 newly installed, 0 to remove and 51 not upgraded.
Need to get 6,373 kB of archives.
After this operation, 16.5 MB of additional disk space will be used.
Do you want to continue [Y/n]? 
  
```

You will find the program in the system tools drop-down menu (icon picture of a hand); as shown in Figure B3.7.

**Figure B3.8 – Location of Anti-virus**



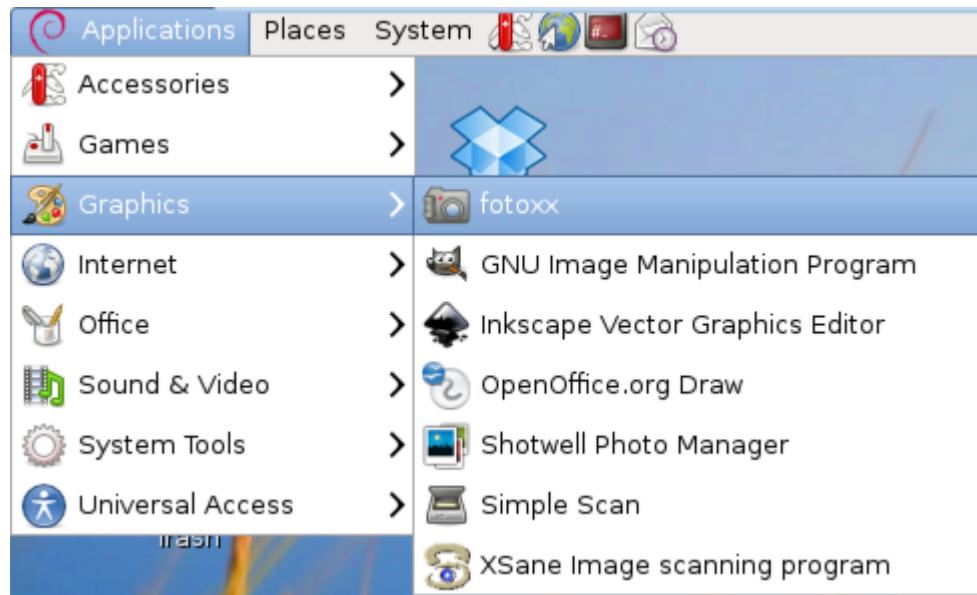
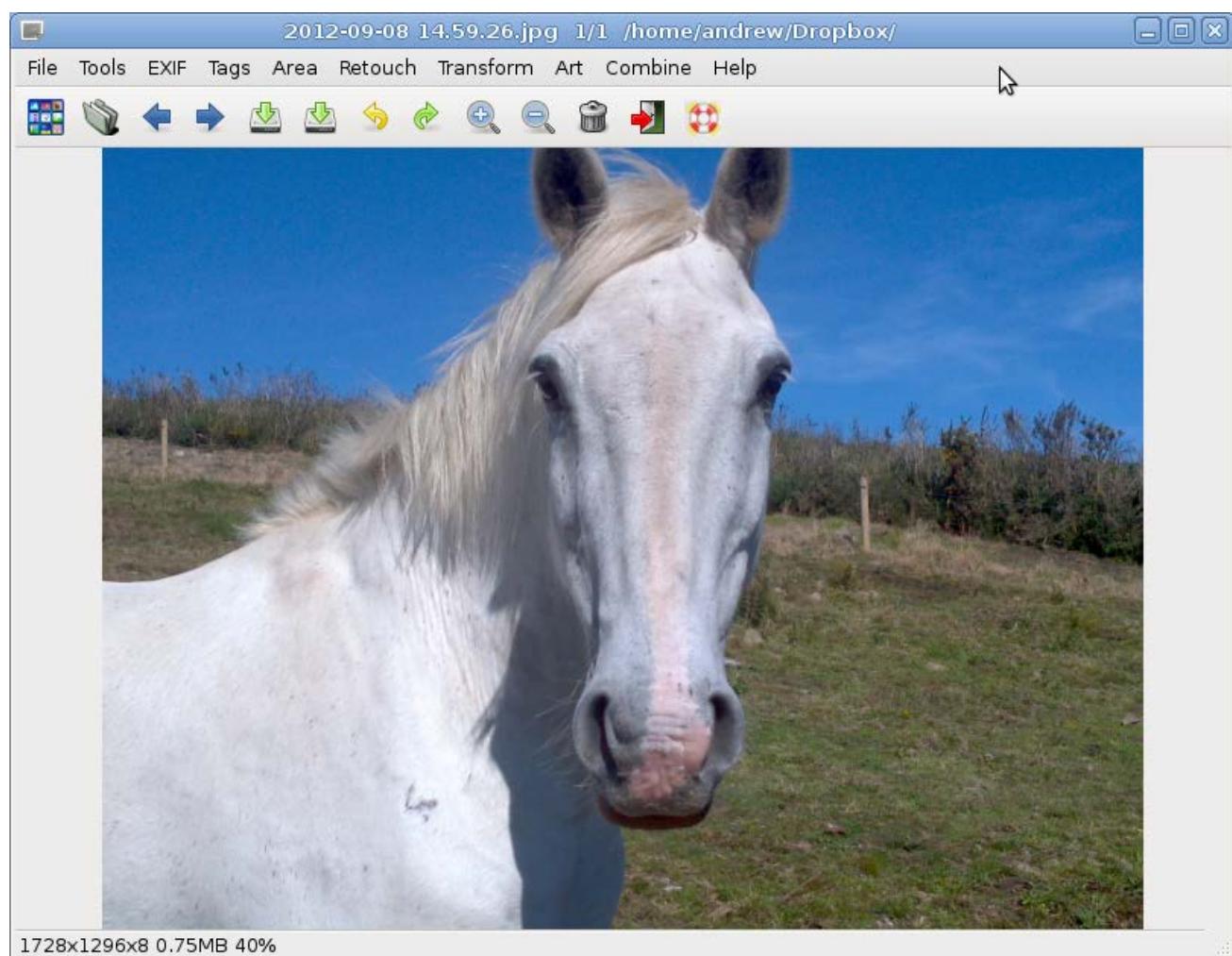
## Graphics and Image editing package

The popular program GIMP comes pre-installed on many Debian installs. If you would like an alternative, there are many, fotoxx is one example. Run *apt-get install fotoxx* from the terminal as shown in Figure B3.9. You will have to specify **Y** to allow the install when it warns you of the disk space required.

**Figure B3.9 – Installing Fotoxx**

```
Terminal (as superuser)
File Edit View Terminal Help
root@A-Doyle-Debian:/home/andrew# apt-get install fotoxx
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  libimage-exiftool-perl
The following NEW packages will be installed:
  fotoxx libimage-exiftool-perl
0 upgraded, 2 newly installed, 0 to remove and 51 not upgraded.
Need to get 3,453 kB of archives.
After this operation, 11.5 MB of additional disk space will be used.
Do you want to continue [Y/n]? 
```

The application can be found in the **Graphics** section under **Applications**, as shown in Figure B3.10.

**Figure B3.10 – Fotoxx Location****Figure B3.11 – Fotoxx Application**

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