

**Laboratory Manual**  
For  
**COMPUTER PERIPHERAL INTERFACE**  
**(IT 302)**

B.Tech (IT)  
SEM III



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## **Table of Contents**

### **EXPERIMENT-1**

Assembling of Computer.....	1
-----------------------------	---

### **EXPERIMENT-2**

Study of CMOS – Setup options.....	5
------------------------------------	---

### **EXPERIMENT-3**

Study of Peripherals (Motherboards, HDD, RAM, I/O Cards).....	10
---	----

### **EXPERIMENT-4**

Installation of OS (win -Xp).....	17
-----------------------------------	----

### **EXPERIMENT-5**

Installation of OS (Linux).....	26
---------------------------------	----

### **EXPERIMENT-6**

Network Topologies & Cabling.....	33
-----------------------------------	----

### **EXPERIMENT-7**

Installation of Server OS (win 2003).....	43
---	----

### **EXPERIMENT-8**

Configuration of Client (Win Xp).....	56
---------------------------------------	----

### **EXPERIMENT-9**

User Management (win 2003).....	61
---------------------------------	----

### **EXPERIMENT-10**

Active Directory Service (win 2003).....	63
--	----

### **EXPERIMENT-11**

Policy Settings (win 2003).....	66
---------------------------------	----

### **EXPERIMENT-12**

Network Printer Configuration.....	70
------------------------------------	----

## **LABWORK BEYOND CURRICULA**

### **EXPERIMENT-13**

Study of Virtual Box.....	77
---------------------------	----

### **EXPERIMENT-14**

Study of Printers.....	78
------------------------	----

## **EXPERIMENT-1**

**AIM:** To assemble the various components of PC (peripherals) and build a standalone system.

### **PERIPHERALS REQUIRED:**

1. MOTHERBOARD
2. PROCESSOR
3. MONITOR(CRT)
4. HARD DISK DRIVES
5. FLOPPY DISK DRIVES
6. RAM
7. KEYBOARD

### **DESCRIPTION:**

#### **1. MOTHERBOARD:**

The motherboard is a single board microcomputer with provision for add-on peripheral interfaces. The keyboard, Hard Disk, Floppy Disk, Printer, Mouse, Network, Display and Sound interface are part of the motherboard logic. Additional PCI slot is provided for adding extra interfaces.

The first external operation by the microprocessor after power-on is reading the ROM. Thus the POST routines in ROM get control. After successful completion of POST, booting from CD-DVD Drive, hard disk drive, USB or Network is done.

**2. PROCESSOR:** Wide variety of processors are available. Recently one can go for P-IV.

#### **3. MONITOR:**

The CRT display is widely used visual display unit (VDU) for the past several years. The CRT monitor receives video signals from the computer and displays the video information as dots on the CRT screen. The computer has a CRT controller circuit, which works in synchronization with a CRT monitor.

Now a days LCD display is popular

#### 4. HARD DISK DRIVES:

The HDD has been very effective I/O device for the computer. It is used as a secondary memory or auxiliary storage for large data or programs.

In an HDD, there are one or more platters or disks mounted with a common spindle. Each platter has two magnetic surfaces, top and bottom. The early HDDs used ferrite heads, whereas modern HDDs use thin film heads.

A hard disk consists of both electronic circuits and electromechanical subsystems. The electromechanical subsystems are:

- 1 R/W head.
- 2 Disks.
- 3 Spindle motor.
- 4 Positioning mechanism.
- 5 Air circulation system.
- 6 Air filters.

A hard disk drive consists of magnetic tracks on which data is recorded. A track is divided into a number of sectors. Earlier, HDDs followed the hard sector format, whereas present HDDs follow soft sector format. In the soft sector format, on each sector, the track number, head number and sector number is written in the ID field.

The physical size of the hard disk has become so small that manufacturers have started integrating it with hard disk controller. The hard disk card is PCB which consists of the following two subsystems:

1. Hard Disk Drives
2. Hard Disk Controller Electronics

Usually, 3.5 inches HDDs are used in hard disk cards.

## **5. FLOPPY DISK DRIVE:**

The present day PCs use double sided disk drives of 360k capacity. The 360k FDDs are known as double density drives. The 1.2M FDDs are known as high density drives.

Data is written on the track bit by bit. The R/W heads on the diskette use standard electromagnetic recording techniques. One head writes on the top surface of the diskette and the other head writes on the bottom surface.

The HDD provides better performance than the FDD, for the following reasons:

1. Higher capacity of data storage.
2. Faster access time of data.
3. Higher data transfer rate.
4. Better reliability of operation.
5. Less data errors or data loss.

Some of the common concepts between FDD and HDD are listed below:

1. Data is written bit by bit on the disk.
2. In addition to the data bit, clock bit is also written on the medium.
3. Data is recorded on concentric circular tracks.
4. The disk rotates at a fixed speed.
5. The head is a moving head, which is positioned on the desired track by a positioning mechanism.

## **6. RAM:**

The RAM logic contains the memory modules. Earlier SD RAM was popular. Now a days DDR SD RAM is popular. DDR means Double Data Rate. Now a days DDR-2 is widely used. It has double memory bus clock rate compared to DDR. DDR is sometimes called DDR-1. DDR-1 is costly than DDR-2.

## **7. KEYBOARD:**

The keyboard is the friendliest input peripheral. Both program and data can be keyed in through it. In addition certain commands to software can be given from the keyboard. It is almost impossible to use a computer without a keyboard.

The keyboard consists of the key switches. There is one switch for each letter, number, symbol, etc. When a key is pressed, the key switch is activated. The keyboard has an electronic circuit to determine which key has been pressed.

There are two types of keyboards. A serial keyboard sends the data bit by bit, in a serial function. The computer converts the data into a parallel byte. A parallel keyboard sends the data as a byte in the parallel form; all the bits are sent simultaneously on different wires (lines). The cable between the keyboard and computer should have more wires in a parallel keyboard.

### **GENERAL STEPS FOR ASSEMBLING A PC:**

- Fix the motherboard on the cabinet panel using spacers.
- Fix the central processor in the slot provided on the motherboard.
- Ensure that the CPU fan is connected.
- Now fix the RAM on the motherboard.
- Open the lock on DIMM slots and push in the DIMM firmly.\
- Select the primary IDE port and connect the cable.
- The FDD cable goes in the port beside the IDE port.\
- Connect the IDE cable to the HDD and FDD cable to the drive.\
- Connect the power connectors to the HDD and the FDD.
- Now, connect the power switch to the motherboard. Also fixed the corresponding ADD-ON cards if any.

## EXPERIMENT-2

**AIM:** STUDY of CMOS (BIOS) Setup

**PROCEDURE:**

### **BIOS**

One of the most common uses of Flash memory is for the **basic input/output system** of your computer, commonly known as the BIOS (pronounced "bye-ose"). On virtually every computer available, the BIOS makes sure all the other chips, hard drives, ports and CPU function together. Every desktop and laptop computer in common use today contains a microprocessor as its central processing unit. The microprocessor is the **hardware** component. To get its work done, the microprocessor executes a set of instructions known as **software**(see How Microprocessors Work for details). You are probably very familiar with two different types of software:

- The **operating system** – The operating system provides a set of services for the applications running on your computer, and it also provides the fundamental user interface for your computer. Windows 98 and Linux are examples of operating systems. (See How Operating Systems Work for lots of details.)
- The **applications** - Applications are pieces of software that are programmed to perform specific tasks. On your computer right now you probably have a browser application, a word processing application, an e-mail application and so on. You can also buy new applications and install them.

It turns out that the BIOS is the third type of software your computer needs to operate successfully. In this article, you'll learn all about BIOS -- what it does, how to configure it and what to do if your BIOS needs updating.

### **What BIOS Does**

The BIOS software has a number of different roles, but its most important role is to load the operating system. When you turn on your computer and the microprocessor tries to execute its first instruction, it has to get that instruction from somewhere. It cannot get it from the operating system because the operating system is located on a hard disk, and the microprocessor cannot get to it without some instructions that tell it how. The BIOS provides those **instructions**. Some of the other common tasks that the BIOS performs include:

- A power-on self-test (POST) for all of the different hardware components in the system to make sure everything is working properly
- Activating other BIOS chips on different cards installed in the computer - For example, SCSI and graphics cards often have their own BIOS chips.
- Providing a set of low-level routines that the operating system uses to interface to different hardware devices - It is these routines that give the BIOS its name. They manage things like the keyboard, the screen, and the serial and parallel ports, especially when the computer is booting.
- Managing a collection of settings for the hard disks, clock, etc.

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The BIOS is special software that interfaces the major hardware components of your computer with the operating system. It is usually stored on a Flash memory chip on the motherboard, but sometimes the chip is another type of ROM. When you turn on your computer, the BIOS does several things. This is its usual sequence:



BIOS uses Flash memory, a type of ROM.

- Check the CMOS Setup for custom settings
- Load the interrupt handlers and device drivers
- Initialize registers and power management
- Perform the power-on self-test (POST)
- Display system settings
- Determine which devices are bootable
- Initiate the bootstrap sequence

The first thing the BIOS does is check the information stored in a tiny (64 [bytes](#)) amount of RAM located on a **complementary metal oxide semiconductor** (CMOS) chip. The CMOS Setup provides detailed information particular to your system and can be altered as your system changes. The BIOS uses this information to modify or supplement its default programming as needed. We will talk more about these settings later.

**Interrupt handlers** are small pieces of software that act as translators between the hardware components and the operating system. For example, when you press a key on your keyboard, the signal is sent to the keyboard interrupt handler, which tells the CPU what it is and passes it on to the operating system. The **device drivers** are other pieces of software that identify the base hardware components such as keyboard, mouse, hard drive and floppy drive. Since the BIOS is constantly intercepting signals to and from the hardware, it is usually copied, or **shadowed**, into RAM to run faster.

### Booting the Computer

Whenever you turn on your computer, the first thing you see is the BIOS software doing its thing. On many machines, the BIOS displays text describing things like the amount of memory installed in your computer, the type of hard disk and so on. It turns out that, during this boot sequence, the BIOS is doing a remarkable amount of work to get your computer ready to run. This section briefly describes some of those activities for a typical PC.

After checking the CMOS Setup and loading the interrupt handlers, the BIOS determines whether the video card is operational. Most video cards have a miniature BIOS of their own that initializes the memory and graphics processor on the card. If they do not, there is usually video driver information on another ROM on the motherboard that the BIOS can load.

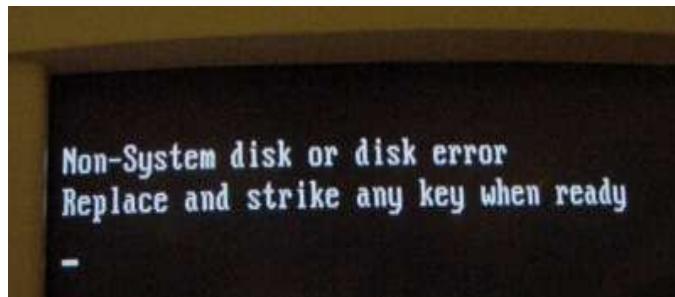


Next, the BIOS checks to see if this is a **cold boot** or a **reboot**. It does this by checking the value at memory address 0000:0472. A value of 1234h indicates a reboot, and the BIOS skips the rest of POST. Anything else is considered a cold boot.

If it is a cold boot, the BIOS verifies RAM by performing a read/write test of each memory address. It checks the PS/2 ports or USB ports for a keyboard and a mouse. It looks for a **peripheral component interconnect (PCI)** bus and, if it finds one, checks all the PCI cards. If the BIOS finds any errors during the POST, it will notify you by a series of beeps or a text message displayed on the screen. An error at this point is almost always a hardware problem. The BIOS then displays some details about your system. This typically includes information about:

- The processor
- The floppy drive and hard drive
- Memory
- BIOS revision and date
- Display

Any special drivers, such as the ones for **small computer system interface (SCSI)** adapters, are loaded from the adapter, and the BIOS displays the information. The BIOS then looks at the sequence of storage devices identified as **bootdevices** in the CMOS Setup. "Boot" is short for "bootstrap," as in the old phrase, "Lift yourself up by your bootstraps." Boot refers to the process of launching the operating system. The BIOS will try to initiate the boot sequence from the first device. If the BIOS does not find a device, it will try the next device in the list. If it does not find the proper files on a device, the startup process will halt. If you have ever left a disk when you restarted your computer, you have probably seen this message. The BIOS has tried to boot the computer off of the disk left in the drive. Since it did not find the correct system files, it could not continue. Of course, this is an easy fix. Simply pop out the disk and press a key to continue.



This is the message you receive if a disk is in the drive when you restart your computer.

## Configuring BIOS

In the previous list, you saw that the BIOS checks the CMOS Setup for custom settings. Here's what you do to change those settings.

To enter the CMOS Setup, you must press a certain key or combination of keys during the **initial startup sequence**. Most systems use "Esc," "Del," "F1," "F2," "Ctrl-Esc" or "Ctrl-Alt-Esc" to enter setup. There is usually a line of text at the bottom of the display that tells you "Press \_\_\_\_ to Enter Setup."

Once you have entered setup, you will see a set of text screens with a number of options. Some of these are standard, while others vary according to the BIOS manufacturer. Common options include:

**System Time/Date:**

Set the system time and date

**Boot Sequence :**

The order that BIOS will try to load system

theoperating

**Plug and Play:**

A standard for auto-detecting connected should be set to "Yes" if your computer operating system both support it "Enable Num Lock," "Enable the "Auto-Detect Mouse"...

devices;

and

**Mouse/Keyboard:**

Keyboard,"

**Drive Configuration:**

Configure hard drives, CD-ROM and drives

floppy

**Memory:**

Direct the BIOS to shadow to a specific address

memory

**Security:**

Set a password for accessing the

computer

**Power Management:**

Select whether to use power well as set the amount of time for **suspend**

management, as

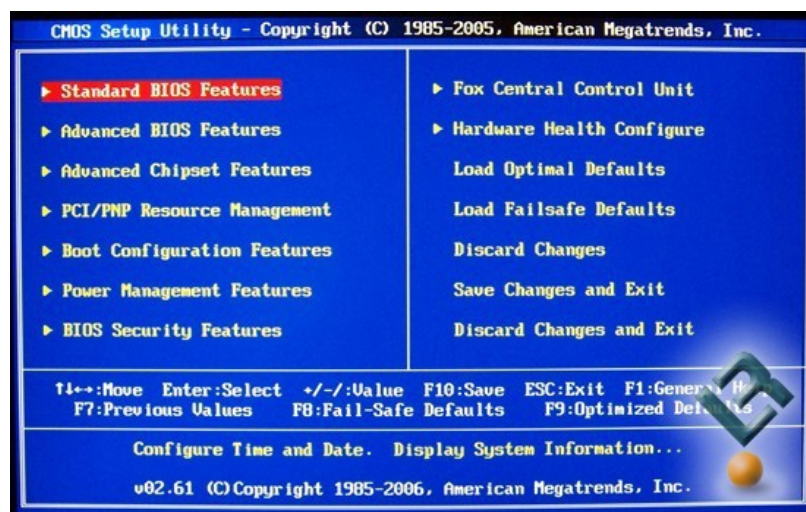
**standby** and

**Exit:**

Save your changes, discard your changes

or

restore default settings



Be very careful when making changes to setup. Incorrect settings may keep your computer from booting. When you are finished with your changes, you should choose "Save Changes" and exit. The BIOS will then restart your computer so that the new settings take effect.

The BIOS uses **CMOS** technology to save any changes made to the computer's settings. With this technology, a small lithium or Ni-Cad battery can supply enough power to keep the data for

years. In fact, some of the newer chips have a 10-year, tiny lithium battery built right into the CMOS chip!

## Updating Your BIOS

Occasionally, a computer will need to have its BIOS updated. This is especially true of older machines. As new devices and standards arise, the BIOS needs to change in order to understand the new hardware. Since the BIOS is stored in some form of ROM, changing it is a bit harder than upgrading most other types of software.

To change the BIOS itself, you'll probably need a special program from the computer or BIOS manufacturer. Look at the BIOS revision and date information displayed on system startup or check with your computer manufacturer to find out what type of BIOS you have. Then go to the BIOS manufacturer's Web site to see if an upgrade is available. Download the upgrade and the utility program needed to install it. Sometimes the utility and update are combined in a single file to download. Copy the program, along with the BIOS update, onto a floppy disk. Restart your computer with the floppy disk in the drive, and the program erases the old BIOS and writes the new one. You can find a BIOS Wizard that will check your BIOS at [BIOS Upgrades](#).

### Major BIOS manufacturers include:

- [American Megatrends Inc. \(AMI\)](#)
- [Phoenix Technologies](#)
- [ALi](#)
- [Winbond](#)

As with changes to the CMOS Setup, be careful when upgrading your BIOS. Make sure you are upgrading to a version that is compatible with your computer system. Otherwise, you could corrupt the BIOS, which means you won't be able to boot your computer. If in doubt, check with your computer manufacturer to be sure you need to upgrade.

### Assignment: Reset CMOS Password

### **EXPERIMENT-3**

**AIM:** STUDY OF PERIPHERALS(MOTHER BOARD ,HDD,RAM,I/O CARDS)

**DESCRIPTION:**

Functionally, the motherboard is a single board computer with a provision for 'add-on' boards of different peripheral controllers and memory. Physically, the motherboard is a PCB with chips and other components interconnected. The motherboard design of all IBMB.E – III Computer Peripheral Interface compatible PCs is more or less identical, except for minor variations. Understanding the operation of the motherboard requires a clear knowledge of the circuits and the firmware which dictates the mode of operation of the circuits.

**MOTHERBOARD FUNCTIONS:**

The motherboard is the heart of any PC. It contains both hardware circuits and firmware routines. Most of the activities in the PC are the actions initiated by the firmware routines in ROM BIOS. Certain functions are done exclusively by hardware without the participation of firmware. There are three such functions:

- Reset sequence.
- Interrupt sequence.
- NMI sequence.

The objectives of the motherboard design are listed below:

- Providing CPU, RAM, ROM and DMA logic.
- Providing keyboard interface.
- Interfacing with the peripheral I/O chips like Timer, PPI, Interrupt controller, etc.
- Providing interface for memory and I/O expansion boards.

The various motherboards are

- 8088 (XT)
- 80286
- 80386
- 80486
- pentium (P-III P-IV)

The important things to observe on MB are

- CMOS Cell
- CMOS refresh Jumper
- IDE, SATA Slots (for HDD)
- Memory Slots
- ISA/PCI slots (for interfacing cards)
- Power, Power LED, HDD LED, Reset Pins

The abbreviations used are

IDE:	Integrated Device Electronics
ATA:	Advanced Technology Attachment
SATA:	Serial ATA
BIOS:	Basic Input Output System
POST:	Power On Self Test
MBR:	Master Boot Record
ISA:	Industry Standard Architecture
PCI:	Peripheral Component Interconnect

## **Memory**

### **Memory Classification**

#### **1. Primary Memory**

- Memory is used by microprocessor in executing and storing programs.
- Memory is fast enough to keep up with microprocessor.
- All memory locations are able to be accessed at same speed.

#### **Read Write Memory (Random Access Memory)**

- Used for storing variable data and developing programs.
- (Generally) is volatile so data is lost when power is removed.

#### **Static RAM (SRAM)**

Constructed using flip flops and stores bit as a voltage.

Usual construction is 8 bits wide.

Zero Power

CMOS RAM with built in lithium that takes over when external power removed.

Non-volatile

Static RAM in parallel with EE-ROM which is loaded with RAM contents when power is removed.

### **Dynamic RAM (DRAM)**

Logic level stored on capacitor that must be constantly recharged/refreshed. (ie Accessed every 2-8mS)

Most common types have multiplexed address bus and 1 bit data bus.

Much greater capacity than SRAM

Slower than SRAM

### **Read Only Memory (ROM)**

- Used for storing programs and constant data.
- Contents are non volatile or permanent (or semi permanent).
- All systems must include some ROM for power up.

#### ***Permanent ROM***

##### **PROM**

Can be programmed ONCE by burning resistor links

More economic than masked for small production runs

##### **Masked ROM**

Manufacturer permanently records bit pattern with metalization layer

Economic if produced in large numbers

#### **Erasable PROM (EPROM)**

Information can be erased using UV (approx 20 minutes)

#### **Electrically Erasable-PROM(EEPROM)**

Information can be erased in circuit electrically. (20mS/chip)

For information that needs to be changed infrequently

## **2. Secondary Memory (Storage and Backup)**

Used for long term storage of programs and data.

Microprocessor cannot execute directly into this memory.

Storage is nonvolatile. That is data remains after power is removed.

The speed of retrieval is not constant and is much slower than the microprocessor speed.

The capacity can be infinite.

#### **Semi Random Access**

- Floppy Disk
- HardDisk

#### **Serial Access**

- Magnetic Tape
- Magnetic Bubble
- Charge Coupled Devices

## **Memory: Size and Speed Requirements**

Since many microprocessor systems are very memory intense the cost of the final product is very sensitive to the amount and speed of memory.

### **Memory Size.**

The amount of memory in a microprocessor system varies from very little in the case of a domestic controller unit that might be implemented with a single chip microprocessor, to a very large amount in any system that is to operate on large amounts of data. The actual amount of memory may not be known with any certainty until the bulk of the software is written and the product tested. In practice the amount of memory needs to be estimated by comparing similar products and using the designer's experience. Since memory size comes in large quantum blocks, the major concern will occur if the estimates come in close to one of the quantum steps. Adding extra memory will provide a design safety margin should the amount of code exceed expectations. However extra memory will add to the cost, increase the physical size of the product, and increase the power budget. In the case of a single chip or embedded product, if the amount of code, or data, exceeds the on chip provisions, external memory will become necessary. Aside from the physical disadvantages, the use of external code memory may not be desirable for reasons of program security.

### **HARD DISKS:**

The HDD has been very effective I/O device for the computer. It is used as a secondary memory or auxiliary storage for large data or programs.

In an HDD, there are one or more platters or disks mounted with a common spindle. Each platter has two magnetic surfaces, top and bottom. The early HDDs used ferrite heads, whereas modern HDDs use thin film heads.

A hard disk consists of both electronic circuits and electromechanical subsystems. The electromechanical subsystems are:

- R/W head.
- Disks.
- Spindle motor.
- Positioning mechanism.
- Air circulation system.
- Air filters.

A hard disk drive consists of magnetic tracks on which data is recorded. A track is divided into a number of sectors. Earlier, HDDs followed the hard sector format, whereas present HDDs follow soft sector format. In the soft sector format, on each sector, the track number, head number and sector number is written in the ID field.

The physical size of the hard disk has become so small that manufacturers have started integrating it with hard disk controller. The hard disk card is PCB which consists of the following two subsystems:

- Hard disk drives.
- Hard disk controller electronics.

Usually, 3.5 inches HDDs are used in hard disk cards. The capacity is usually 20 MB.

The data received from the computer is in Modified Frequency Modulation (MFM) encoded form. The data comes in serial form through a single wire. The serial bit stream on the data line includes both the DATA bits and CLOCK bits. The R/W head records both the data and clock information on the track. The control signals received from the computer inform the HDD of the exact location (cylinder number, surface number) where the data has to be recorded.

The HDDS are of many types:

1. Removable Disk Drive and Fixed Disk Drive\

In a removable disk drive, the disks can be removed when not used and stored in cupboards. Hence any number of disk packs can be used. Also, data created in one disk drive can be transported to another drive/computer. In a fixed disk drive, the disk cannot be removed from the disk drive.

2. Moving Head and Fixed Head Disk Drives

In a moving head disk drive, the R/W heads move from one track to another track as commanded by the computer. In a fixed disk drive, the R/W heads are fixed and not movable. Hence there must be one head for each track.

3. Single Head Assembly and Dual Head Assembly:

In a single head assembly drive, there is one head for each surface. All these are mounted on one spindle and always move together. At a given time all heads are positioned on the same cylinder.

In a dual head assembly drive, there are two heads for each surface. When one set of heads is in the home position, i.e., cylinder 0, the other set of heads is positioned over the middle number cylinder. When the first head comes to the middle number cylinder, the second head set reaches the final cylinder. Thus one set of heads cover the first half cylinders and the second set of heads cover the second half cylinders.



4. Winchester and Non-Winchester Disk Drive:

The term winchester refers to a new HDD technology introduced by IBM in 1973. All the disk drives in the market till 1973 were non-winchester drives.

The features of the winchester technology are summarized below:

- R/W heads and disks are contained in a sealed enclosure.
- The head flies very close to the hard disk, less than 19 microinches.
- The heads park on the parking zone (landing zone) when the disk is not rotating.
- They take off and fly on a thin layer of air when the disk starts.
- No data is written on the landing zone.

The surface of the disk is lubricated to prevent the damage to heads or track.

The winchester hard disk does not require any preventive maintenance. Higher track densities and bit densities are achieved in winchester technology. Though there is a built in preventive system against head-crash, i.e., the head touching the disk, any accidental head crash destroys data stored in the disk. Hence the user should have the back-up of data.

5. Open-loop and Closed-loop Disk Drive:

In the open-loop system, a stepper motor is used for the head movement, whereas voice coil positioners are used in the closed-loop system.

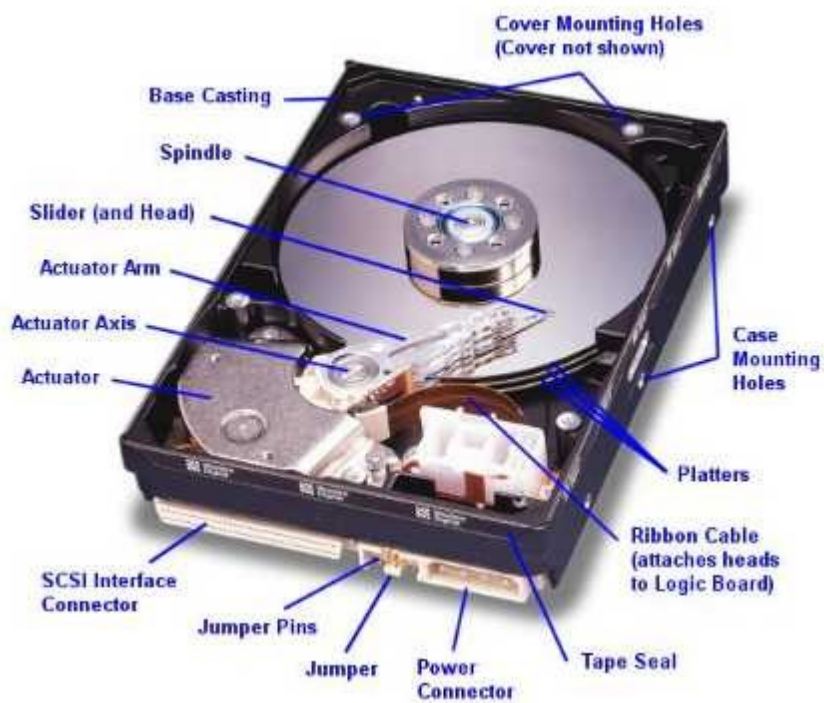


Fig : Hard disk Internals

**Assignment:** Study of Printers

## **EXPERIMENT-4**

### **AIM:STUDY OF INSTALLATION OF OS(WIN-XP)**

#### **The minimum hardware requirements for Windows XP Home Edition are:**

- Pentium 233-megahertz (MHz) processor or faster (300 MHz is recommended)
- At least 64 megabytes (MB) of RAM (128 MB is recommended)
- At least 1.5 gigabytes (GB) of available space on the hard disk
- CD-ROM or DVD-ROM drive
- Keyboard and a Microsoft Mouse or some other compatible pointing device
- Video adapter and monitor with Super VGA (800 x 600) or higher resolution
- Sound card
- Speakers or headphones

#### **PROCEDURE:**

This procedure demonstrates how to install Windows XP Professional. The procedure to install Windows XP home edition is very similar to the professional edition. Since Windows XP Pro is more advanced operating system, it will be used to demonstrate the installation procedure.

The best way install Windows XP is to do a clean install. It is not difficult to perform a clean installation. Before you perform the installation I recommend that you check [Windows XP Compatibility List](#) to ensure that your hardware is supported by XP. If your hardware is not on the compatibility list you can check your hardware manufactures website to download the drivers for Windows XP. Save all the necessary drivers onto floppy disks or CD before you start the installation.

All versions of Windows XP CD are bootable. In order to boot from CD/DVD-ROM you need to set the boot sequence. Look for the boot sequence under your BIOS setup and make sure that the first boot device is set to CD/DVD-ROM. You can then perform the following steps to install Windows XP:

**Step 1** - Start your PC and place your Windows XP CD in your CD/DVD-ROM drive. Your PC should automatically detect the CD and you will get a message saying "Press any key to boot from CD". Soon as computer starts booting from the CD you will get the following screen:



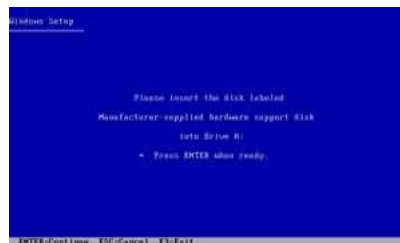
**Step 2** - At this stage it will ask you to press F6 if you want to install a third party Raid or SCSI driver. If you are using a an IDE Hard Drive then you do not need to press F6. If you are using a SCSI or SATA Hard drive then you must press F6 otherwise Windows will not detect your Hard Drive during the installation. Please make sure you have the Raid drivers on a floppy disk. Normally the drivers are supplied on a CD which you can copy to a floppy disk ready to be installed. If you are not sure how to do this then please read your motherboard manuals for more information.



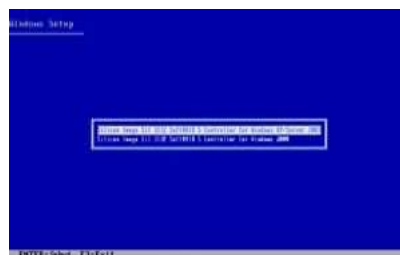
**Step 3** - Press S to Specify that you want to install additional device.



**Step 4** - You will be asked to insert the floppy disk with the Raid or SCSI drivers. Press enter after you have inserted the disk.



**Step 5** - You will see a list of Raid drivers for your HDD. Select the correct driver for your device and press enter.



**Step 6** - You will then get a Windows XP Professional Setup screen. You have the option to do a new Windows install, Repair previous install or quit. Since we are doing a new install we just press Enter to continue.



**Step 7** - You will be presented with the End User Licensing Agreement. Press F8 to accept and continue



**Step 8** - This step is very important. Here we will create the partition where Windows will be installed. If you have a brand new unformatted drive you will get a screen similar to below. In our case the drive size is 8190MB. We can choose to install Windows in this drive without creating a partition, hence use the entire size of the drive. If you wish to do this you can just press enter and Windows will automatically partition and format the drive as one large drive.

However for this demonstration I will create two partition. The first partition will be 6000MB (C: drive) and second partition would be 2180MB (E: drive). By creating two partition we can have one which stores Windows and Applications and the other which stores our data.

Press C to create a partition.



**Step 8** - Windows will show the total size of the hard drive and ask you how much you want to allocate for the partition you are about to create. I will choose 6000MB. You will then get the screen below. Notice it shows C: Partition 1 followed by the size 6000 MB. This indicates the

partition has been created. We still have an unpartitioned space of 2189MB. Next highlight the unpartitioned space by pressing down the arrow key. Then press C to create another partition. You will see the total space available for the new partition. Just choose all the space left over, in our case 2180MB.



**Step 9** - Now you will see both partition listed. Partition 1 (C: Drive) 6000MB and Partition 2 (E: Drive) 2180MB. You will also have 8MB of unpartitioned space. Don't worry about that. Just leave it how its is. Windows normally has some unpartitioned space. You might wonder what happened to D: drive. Windows has automatically allocated D: drive to CD/DVD-ROM.

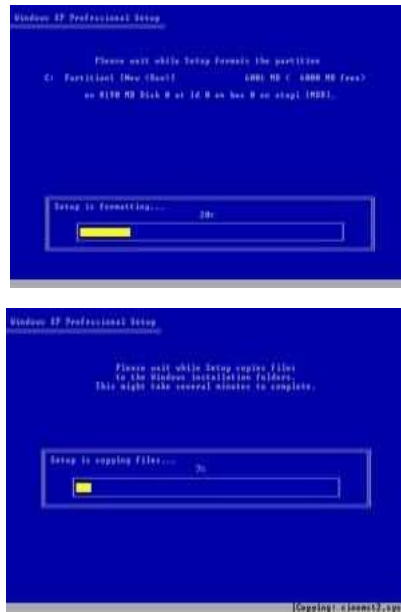
Select Partition 1 (C: Drive) and press Enter.



**Step 10** - Choose format the partition using NTFS file system. This is the recommended file system. If the hard drive has been formatted before then you can choose quick NTFS format. We chose NTFS because it offers many security features, supports larger drive size, and bigger size files.



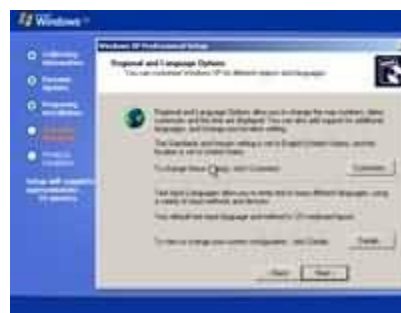
Windows will now start formatting drive C: and start copying setup files as shown on the two images below :



**Step 11** - After the setup has completed copying the files the computer will restart. Leave the XP CD in the drive but this time DO NOT press any key when the message "Press any key to boot from CD" is displayed. In few seconds setup will continue. Windows XP Setup wizard will guide you through the setup process of gathering information about your computer.



## Step 12 - Choose your region and language.



**Step 13** - Type in your name and organization.



**Step 14.** Enter your product key.



**Step 15** - Name the computer, and enter an Administrator password. Don't forget to write down your Administrator password.



**Step 16** - Enter the correct date, time and choose your time zone.





**Step 17** - For the network setting choose typical and press next.



**Step 18** - Choose workgroup or domain name. If you are not a member of a domain then leave the default settings and press next. Windows will restart again and adjust the display.



**Step 19** - Finally Windows will start and present you with a Welcome screen. Click next to continue.



**Step 20** - Choose 'help protect my PC by turning on automatic updates now' and press next.



**Step 21** - Will this computer connect to the internet directly, or through a network? If you are connected to a router or LAN then choose: *'Yes, this computer will connect through a local area network or home network'*. If you have dial up modem choose: *'No, this computer will connect directly to the internet'*. Then click Next.



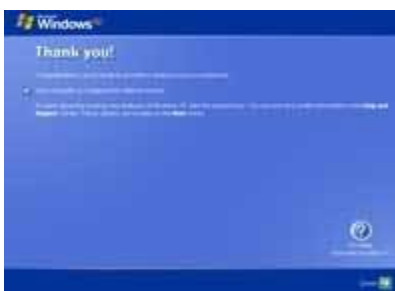
**Step 22** - Ready to activate Windows? Choose yes if you wish to activate Windows over the internet now. Choose no if you want to activate Windows at a later stage.



**Step 23** - Add users that will sign on to this computer and click next.



**Step 24** - You will get a Thank you screen to confirm setup is complete. Click finish.



**Step 25.** Log in, to your PC for the first time.



**Assignment:** Study of Driver Installation.

## **EXPERIMENT-5**

**AIM:** STUDY of Installation of linux

### **PROCEDURE:**

Installation Guide: CentOS 5.1 Desktop

---

Version 1.0

#### **1 Install Media**

---

The install media(s) are available at <http://isoredirect.centos.org/centos/5/isos/i386/>. Make one Centos Bootable DVD.

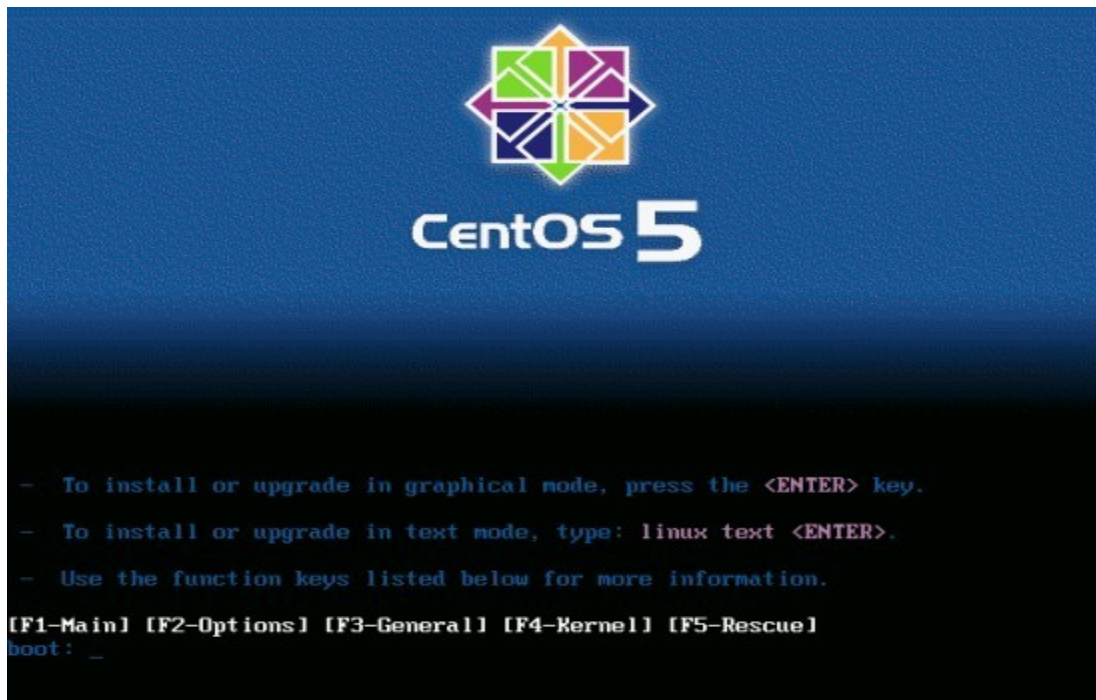
#### **2 Installation**

---

Keep First Bootable Device as DVD on your system.

Insert Bootable DVD in Drive and turn on the Computer.

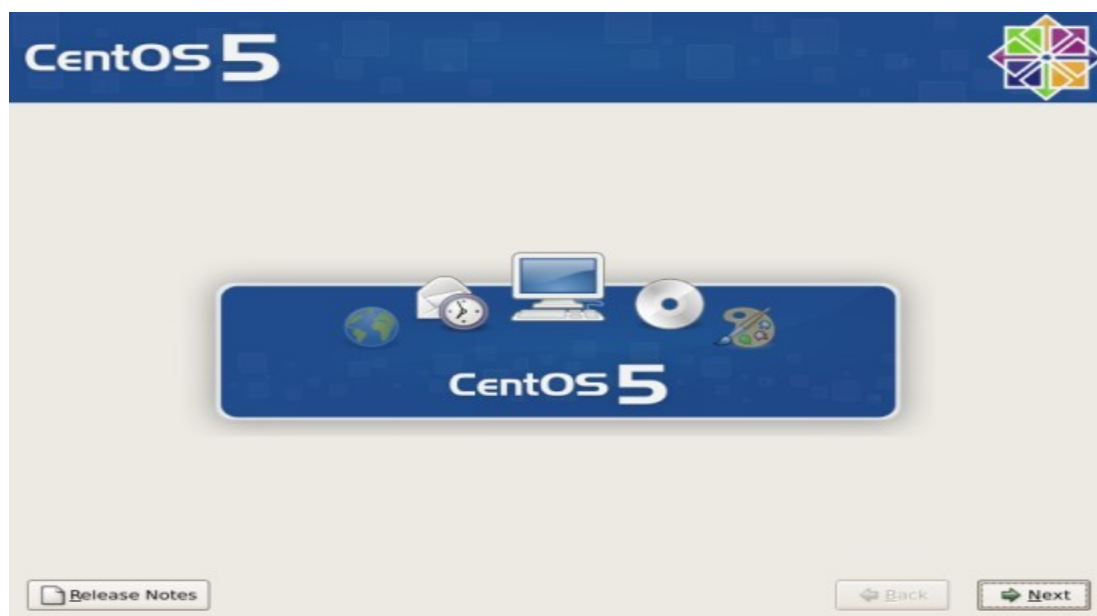
Hit "*Enter*" to start the installation.



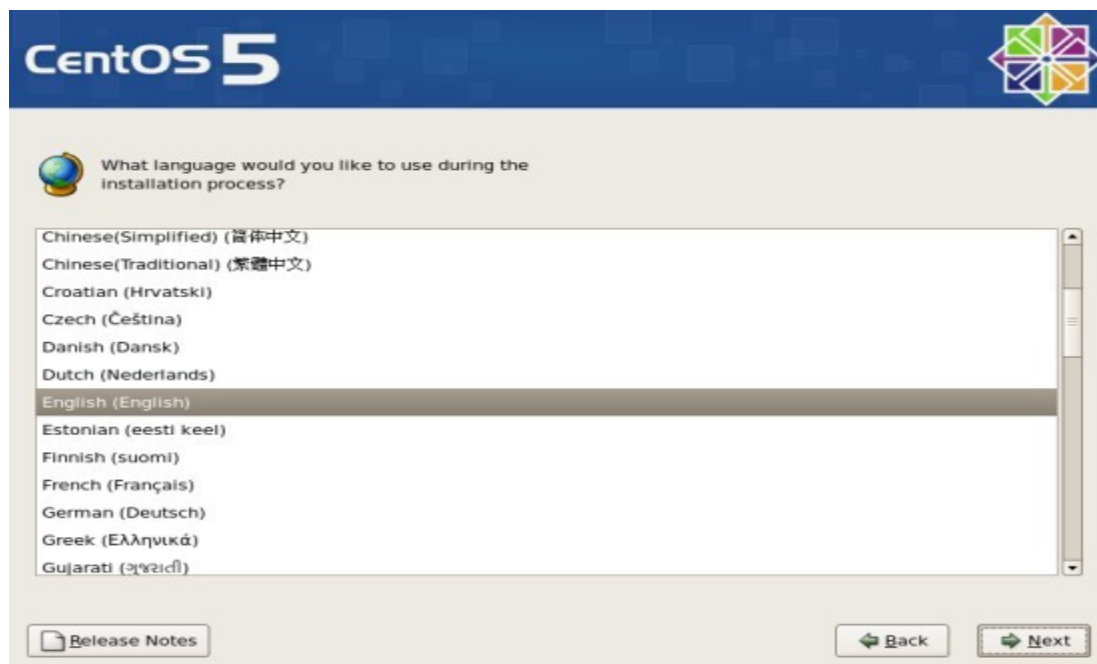
Test your install media if you want.



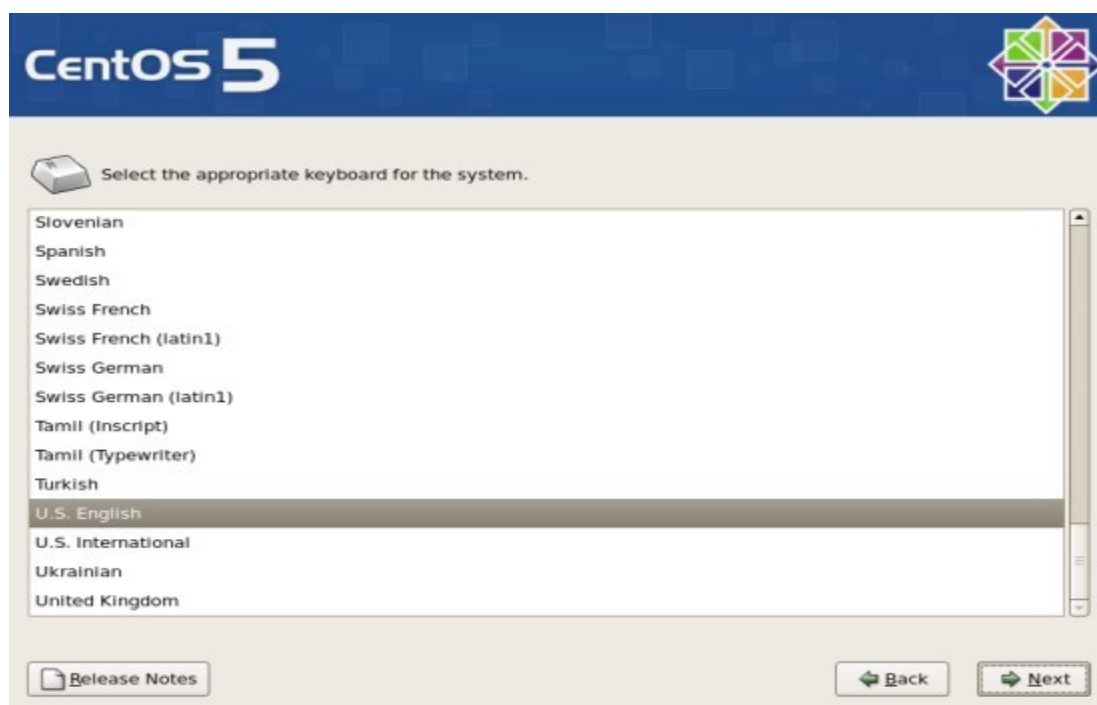
The installation wizard is starting.



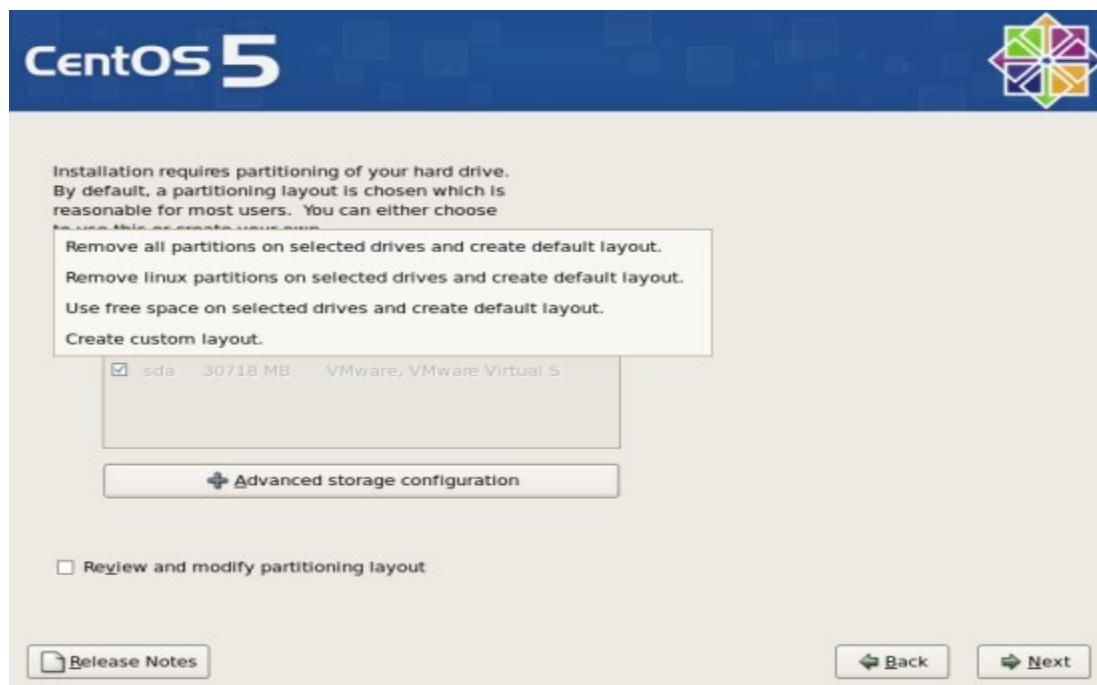
Select your language and proceed.



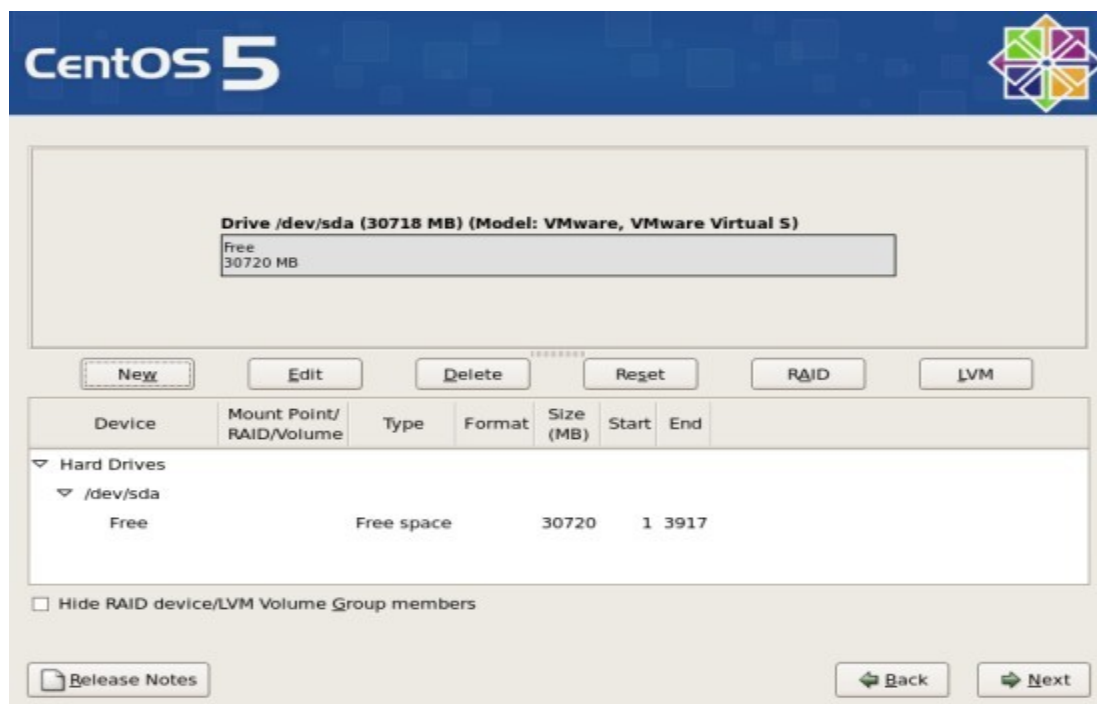
Choose your keyboard-layout and proceed.

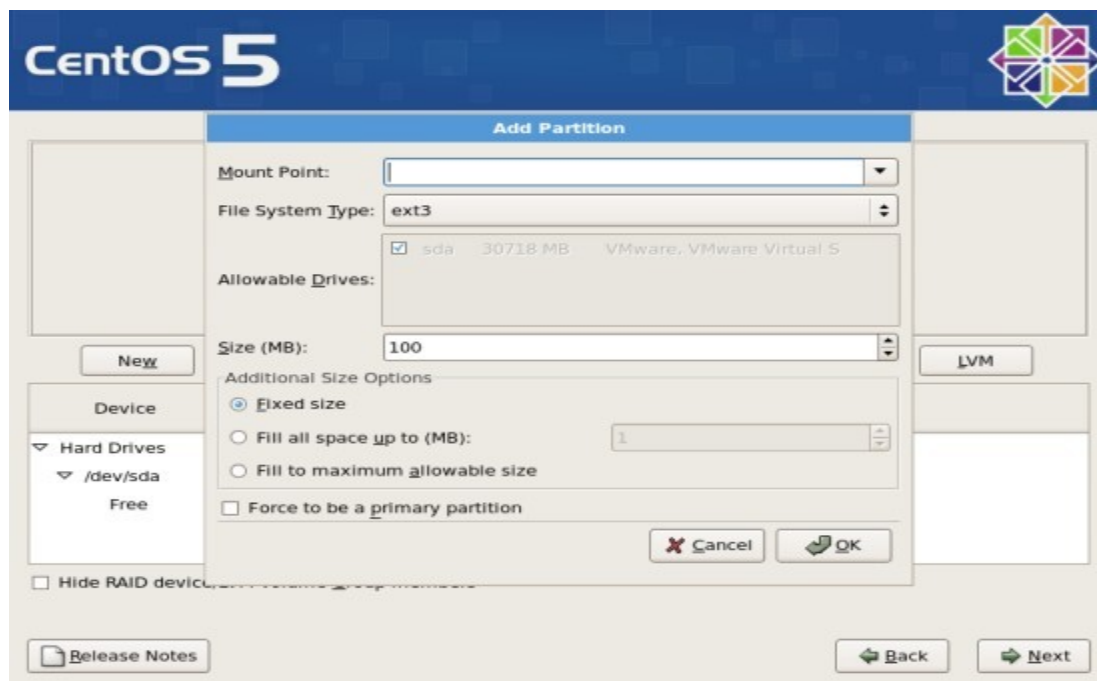


Here you can select/edit the partitioning layout.




If you chose the manual setup, you'll see the following two windows.





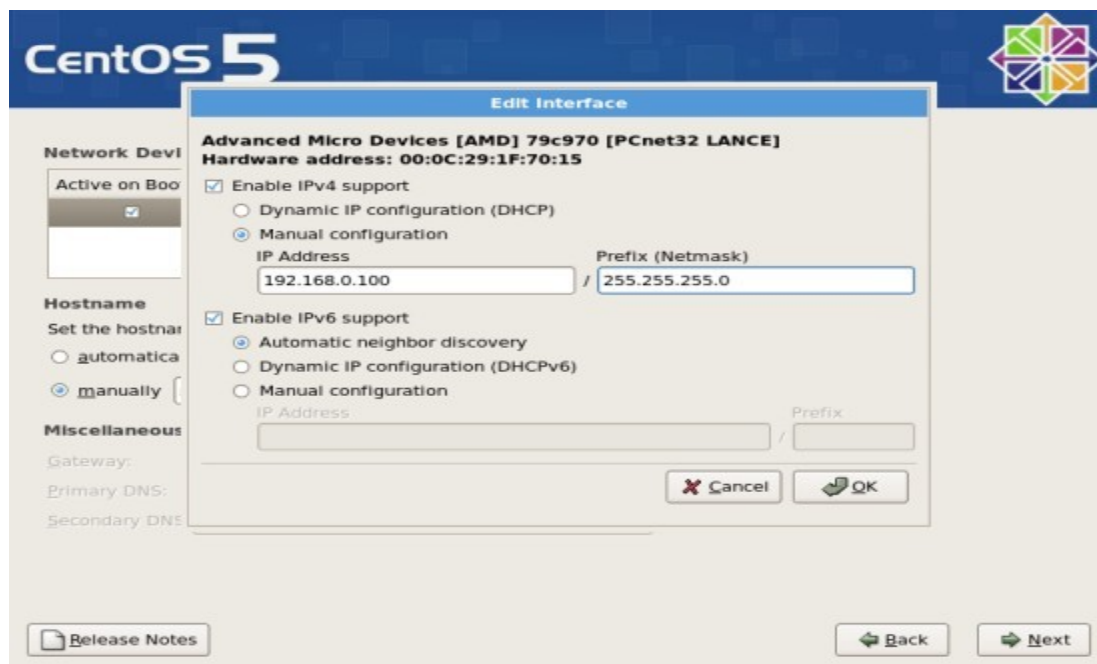
The image shows the 'Add Partition' window in the CentOS 5 installer. The window has a blue header with the 'CentOS 5' logo and a colorful geometric icon. The main area is divided into several sections. On the left, there is a 'Device' tree showing 'Hard Drives' expanded, with '/dev/sda' selected and 'Free' space available. The 'Mount Point' is a dropdown menu. The 'File System Type' is set to 'ext3'. The 'Allowable Drives' section shows a table with one entry: 'sda' (30718 MB, VMware, VMware Virtual S), which is checked. The 'Size (MB)' is set to '100'. Under 'Additional Size Options', 'Fixed size' is selected. There are also options for 'Fill all space up to (MB):' (set to 1) and 'Fill to maximum allowable size'. A checkbox for 'Force to be a primary partition' is present. At the bottom right, there are 'Cancel' and 'OK' buttons. On the far right, there is an 'LVM' button. At the bottom of the window, there are 'Back' and 'Next' navigation buttons, and a 'Release Notes' button on the left.

Here you can adjust the network settings.



The image shows the 'Network Devices' window in the CentOS 5 installer. The window has a blue header with the 'CentOS 5' logo and a colorful geometric icon. The main area is divided into several sections. The 'Network Devices' section has a table with columns: 'Active on Boot', 'Device', 'IPv4/Netmask', and 'IPv6/Prefix'. There is an 'Edit' button to the right of the table. The table has one row: 'eth0' (DHCP, Auto). Below this, there is a 'Hostname' section with the text 'Set the hostname:' and two radio buttons: 'automatically via DHCP' and 'manually'. The 'manually' option is selected, and there is a text input field containing 'server1.example.com' with a hint '(e.g., host.domain.com)'. Below this, there is a 'Miscellaneous Settings' section with three text input fields: 'Gateway:', 'Primary DNS:', and 'Secondary DNS:'. At the bottom of the window, there are 'Back' and 'Next' navigation buttons, and a 'Release Notes' button on the left.





**CentOS 5**

**Edit Interface**

**Advanced Micro Devices [AMD] 79c970 [PCnet32 LANCE]**  
**Hardware address: 00:0C:29:1F:70:15**

☒ Enable IPv4 support

☐ Dynamic IP configuration (DHCP)

☒ Manual configuration

IP Address:  / Prefix (Netmask):

☒ Enable IPv6 support

☒ Automatic neighbor discovery

☐ Dynamic IP configuration (DHCPv6)

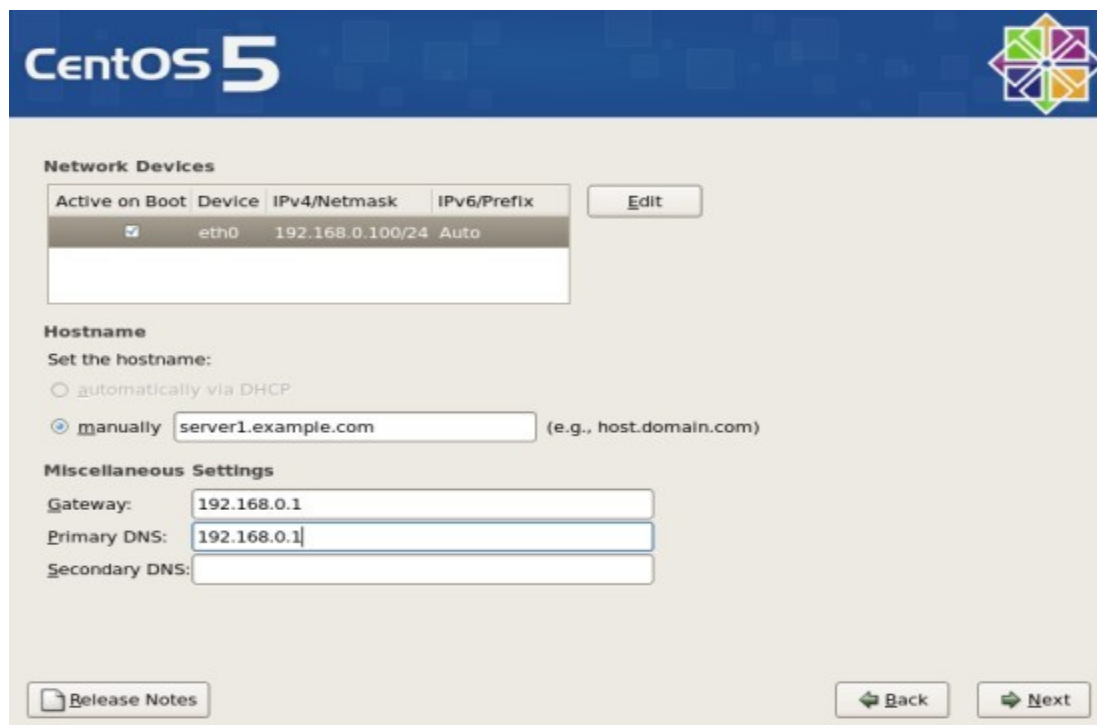
☐ Manual configuration

IP Address:  / Prefix:

Gateway:

Primary DNS:

Secondary DNS:



**CentOS 5**

**Network Devices**

Active on Boot	Device	IPv4/Netmask	IPv6/Prefix
<input checked="" type="checkbox"/>	eth0	192.168.0.100/24	Auto

**Hostname**

Set the hostname:

☐ automatically via DHCP

☒ manually  (e.g., host.domain.com)

**Miscellaneous Settings**

Gateway:

Primary DNS:

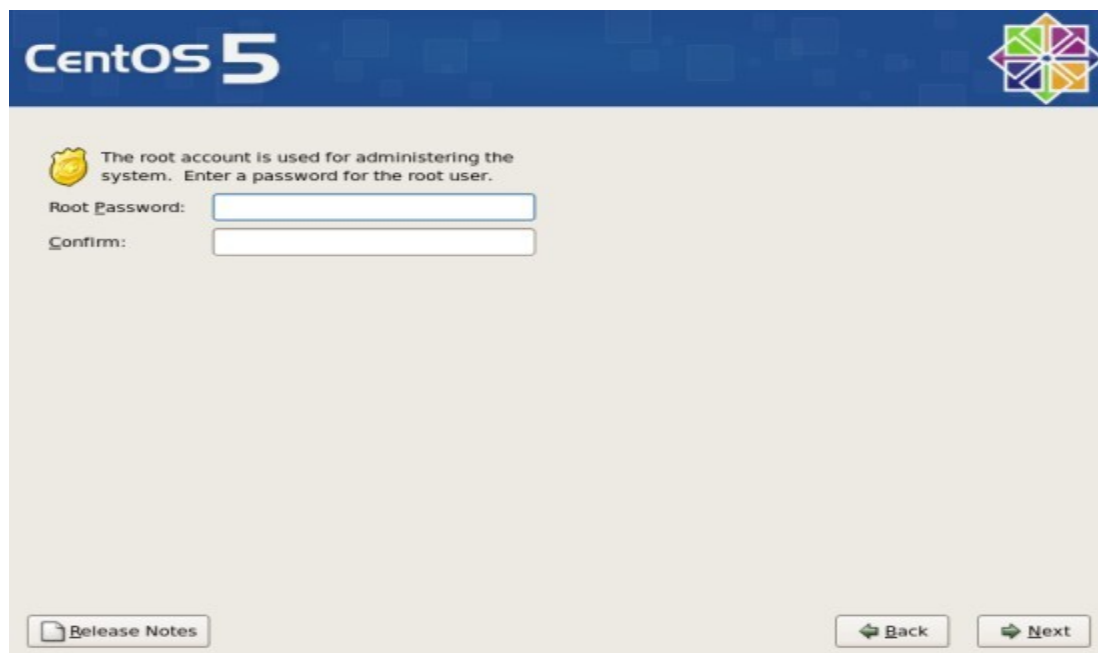
Secondary DNS:

Select the location nearest to yours and configure the clock. Unmark the checkbox if there are other operating systems installed, that expects the clock to be set to local time - e.g. Windows.



The image shows the CentOS 5 installation interface for selecting a time zone. At the top, the CentOS 5 logo and a colorful geometric icon are visible. Below the header, the text "Please select the nearest city in your timezone:" is displayed. A world map is shown with numerous yellow dots representing cities. Below the map, a dropdown menu is set to "Europe/Berlin". A checkbox labeled "System clock uses UTC" is checked. A yellow warning box contains the text: "Use this if you want to automatically switch between normal and daylight savings time. Don't use this if you have other operating systems on this computer which adjust the hardware clock to achieve this, e.g. Microsoft Windows(tm)." At the bottom right, there are "Back" and "Next" buttons.

Choose a password for the root-account and confirm it.



The image shows the CentOS 5 installation interface for setting the root password. At the top, the CentOS 5 logo and a colorful geometric icon are visible. Below the header, a yellow shield icon is next to the text: "The root account is used for administering the system. Enter a password for the root user." Below this, there are two input fields: "Root Password:" and "Confirm:". At the bottom left, there is a "Release Notes" button. At the bottom right, there are "Back" and "Next" buttons.

**Assignment:** Study of Driver Installation.

## **EXPERIMENT-6**

**AIM:** To study the various network topologies & cabling.

### **THEORY:**

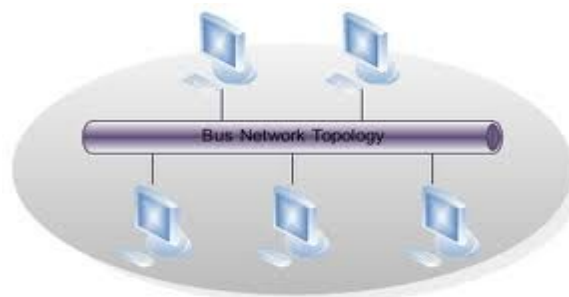
The way in which the connection are made is called the topology of the Network. Network topology specifically refers to the physical layout of the network, especially the locations of the computers and how the cable is run between them. It is important to select the right topology for how the network will be used. Each topology has its own strengths and weaknesses.

The four common topologies are the bus, star, ring and the mesh.

### **BUS TOPOLOGY:**

IN a typical bus topology, the cable is just one or more wires, with no active electronics to amplify the signal or pass it along from the computer to computer. This makes bus a passive topology. When one computer sends a signal up (and down) the wire, all the computers on the network receive the information, but only one (the one with the address that matches the one coded in the message) accepts the information. The rest disregards the message.

Another important issue in bus network is termination. Since the bus is a passive topology, the electrical signal from a transmitting computer is free to travel the entire length of the cable. Without termination, when the signal reaches the end of the wire, it bounces back and forth along an unterminated bus, it is called ringing. To avoid ringing, you attach terminators at either end of the segment. The terminators absorb the electrical energy and stop the reflections.



**Fig: BUS TOPOLOGY**

### **ADVANTAGES OF THE BUS**

- The bus is simple, reliable in very small networks, easy to use, and easy to understand.
- The bus requires the least amount of cable to connect the computers together and is therefore less expensive than other cabling arrangements.
- It is easy to extend a bus. Two cables can be joined into one longer cable with a BNC barrel connector, making a longer cable and allowing more computers to join.
- A repeater can also be used to extend a bus, a repeater boosts the signal and allows it to travel a longer distance.

### **DISADVANTAGES OF THE BUS**

- Heavy network traffic can slow a bus considerably .The problem only gets worse as more computers are added to the network.
- Each barrel connector weakens the electrical signal, and too many may prevent the signal from being correctly received all along the bus.
- It is difficult to troubleshoot a bus. A cable break or malfunctioning computer anywhere between two computers can cause them not to be able to communicate with each other.

### **STAR TOPOLOGY**

In a star topology, all the cables run from the computers to a central location, where they are all connected by a device called a hub.

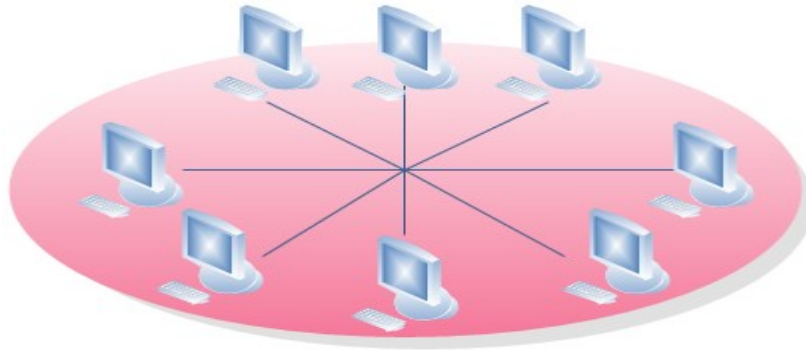
Stars are used in concentrated networks, where the endpoints are directly reachable from a central location, when network expansion is expected, and when the greater reliability of a star topology is needed.

#### **How a star Network Works.**

Each computer on a star network communicates with a central hub that resends the message either to all the computers (in a broadcast star network) or only to the destination computer ( in a switched star network). The hub in a broadcast star network can be active or passive.

An active hub regenerates the electrical signal and sends it to all the computers connected to it. This type of hub is often called a multiport repeater. Active hubs and switches require electrical power to run. A passive hub, such as wiring panels or punch-down blocks, merely acts as a connection point and does not amplify or regenerate the signal. Passive hubs do not require electrical power to run.

A star network can be expanded by placing another star hub where a computer might otherwise go, allowing several more computers or hubs to be connected to that hub. This creates a hybrid star network.



**Fig: STAR TOPOLOGY**

**ADVANTAGES OF THE STAR:**

- It is easy to modify and add new computers to a star network without disturbing the rest of the network.
- The centre of a star network is a good place to diagnose network faults. Intelligent hubs (hubs with microprocessors that implement features in addition to repeating network signals) also provide for centralized monitoring and management of the network.
- Single computer failures do not necessarily bring down the whole star network.
- Several cable types in the same network with a hub than can accommodate multiple cable types

**DISADVANTAGES OF THE STAR:**

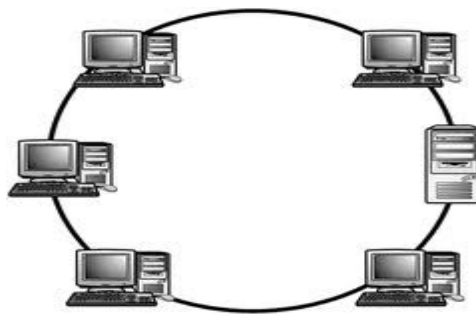
- If the central hub fails, the whole network fails to operate.
- Many star networks require a device at the central point to rebroadcast or switch network traffic.
- It costs more to cable a star network because all network cables must be pulled to one central point, requiring more cable than other networking topologies.

**RING NETWORKS**

Rings are used in high-performance networks, networks requiring that bandwidth be reserved for time-sensitive features such as video and audio.

Every computer is connected to the next computer in the ring, and each retransmits what it receives from the previous computer. The messages flow around the ring in one direction. Since each computer retransmits what it receives, a ring is an active network and is not subject to the signal loss problems a bus experiences. There is no termination because there is no end to the ring.

Some ring networks do token passing. A short message called a token is passed around the ring until a computer wishes to send information to another computer. That computer modifies the token, adds an electronic address and data, and sends it around the ring. Each computer in sequence receives the token and the information and passes them to the next computer until either the electronic address matches the address of a computer or the token returns to its origin. The receiving computer returns a message to the originator indicating that the message has been received. The sending computer then creates another token and places it on the network, allowing another station to capture the token and begin transmitting. The token circulates until a station is ready to send and captures the token.



**Fig: RING TOPOLOGY**

### **ADVANTAGES OF THE RING:**

The ring topology offers the following advantages

- Because every computer is given equal to the token , no one computer can monopolize the network.
- The fair sharing of the network allows the network to degrade gracefully as more users are added.

### **DISADVANTAGES OF THE RING:**

The ring topology has the following disadvantages:

- Failure of one computer on the ring can affect the whole network.
- It is difficult to troubleshoot a ring network.
- Adding or removing computers disrupts the network.

**Sometimes one or more types of topologies are used in combination.**

**STAR BUS TOPOLOGY:**

The star bus topology combines the bus and the star , linking several star hubs together with bus trunks. If one computer fails, the hub detects the fault and isolates the computer . If a hub fails computers connected to it will not be able to communicate , and the bus network will be broken into two segments that cannot reach each other.

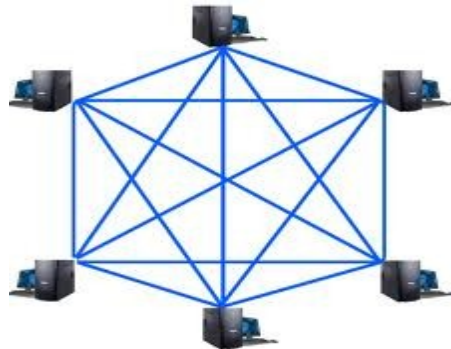
**STAR RING TOPOLOGY:**

In a star ring network the network cables are laid out much like at star network , but a ring is implemented in the central hub. Outlying hubs can be connected to the inner hub, effectively extending a loop of the inner ring.

**PHYSICAL MESH TOPOLOGY:**

The mesh topology is distinguished by having redundant links between devices.

A true mesh configuration has a link between each device in the network. This gets unmanageable beyond a very small number of devices. Most mesh topology networks are not true mesh networks. Rather, they are hybrid mesh networks , which contain some redundant links, but not all.



**ADVANTAGES AND DISADVANTAGES:**

The major advantage of the mesh topology is fault tolerance. Other advantages include guaranteed communication channel capacity and the fact that mesh networks are relatively easy to troubleshoot.

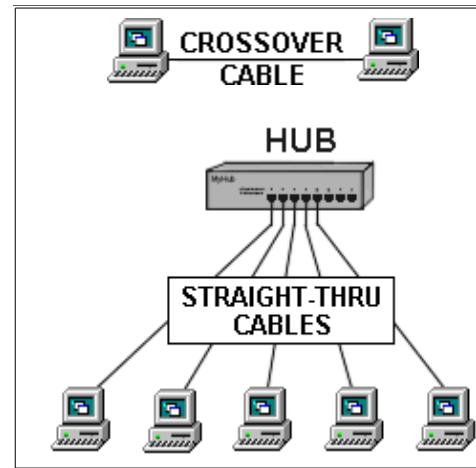
Disadvantages include the difficulty of installation and reconfiguration , as well as the cost of maintaining redundant links.

## HOW TO MAKE YOUR OWN CAT 5 TWISTED-PAIR NETWORK CABLES

**INTRODUCTION.** The purpose of this article is to show you how to make the two kinds of cables which can be used to network two or more computers together to form quick and simple home or small office local area networks (LANs). These instructions can also be used to make patch cables for networks with more complex infrastructure wiring.

The two most common unshielded twisted-pair (UTP) network standards are the 10 Mhz 10BASE-T Ethernet and the 100Mhz 100BASE-TX Fast Ethernet. The 100BASE-TX standard is quickly becoming the predominant LAN standard. If you are starting from scratch, to build a small home or office network, this is clearly the standard you should choose.

**LANs SIMPLIFIED.** A LAN can be as simple as two computers, each having a network interface card (NIC) or network adapter and running network software, connected together with a crossover cable.



The next step up would be a network consisting of three or more computers and a hub. Each of the computers is plugged into the hub with a straight-thru cable (the crossover function is performed by the hub).

## NETWORK CABLE AND CONNECTORS

There are several classifications of cable used for twisted-pair networks. I'll skip right over them and state that I use and recommend Category 5 (or CAT 5) cable for all new installations.

**CAT 5** wire is available in reel-in-box packaging. This is very handy for pulling the wire without putting twists in it.

Stranded wire patch cables are often specified for cable segments running from a wall jack to a PC and for patch panels. They are more flexible than solid core wire. However, the rationale for using it is that the constant flexing of patch cables may wear-out solid core cable--break it. I don't think this is a real concern in the average small network. Stranded cable is susceptible to degradation from moisture infiltration, may use an alternate color code, and should not be used for cables longer than 3 Meters (about 10 feet).

CAT 5 cable has four twisted pairs of wire for a total of eight individually insulated wires. Each pair is color coded with one wire having a solid color (blue, orange, green, or brown) twisted around a second wire with a white background and a stripe of the same color. The solid colors may have a white stripe in some cables. Cable colors are commonly described using the background color followed by the color of the stripe; e.g., white-orange is a cable with a white background and an orange stripe.



**CONNECTORS:** The straight through and cross-over patch cables discussed in this article are terminated with CAT 5 RJ-45 modular plugs. RJ-45 plugs are similar to those you'll see on the end of your telephone cable except they have eight versus four or six contacts on the end of the plug and they are about twice as big. Make sure they are rated for CAT 5 wiring. (RJ means "Registered Jack").

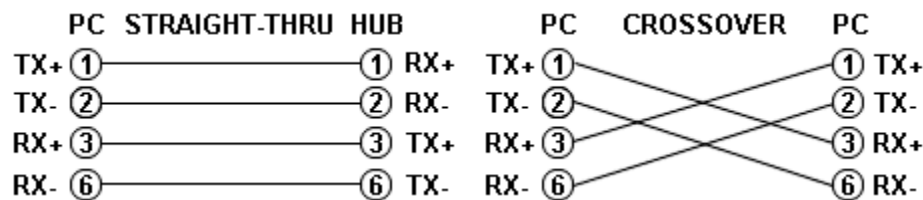
### NETWORK CABLE TOOLS

Modular Plug Crimp Tool. You will need a modular crimp tool.  
Universal UTP Stripping Tool (Eclipse).



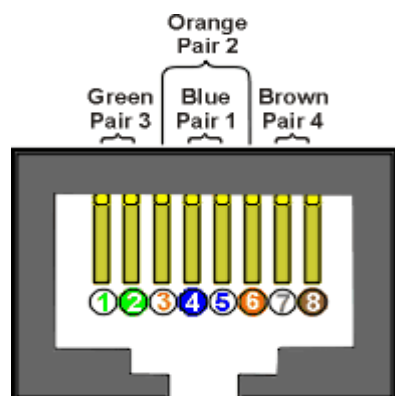
### COLOR-CODE STANDARDS

Let's start with simple pin-out diagrams of the two types of UTP Ethernet cables and watch how committees can make a can of worms out of them. Here are the diagrams:

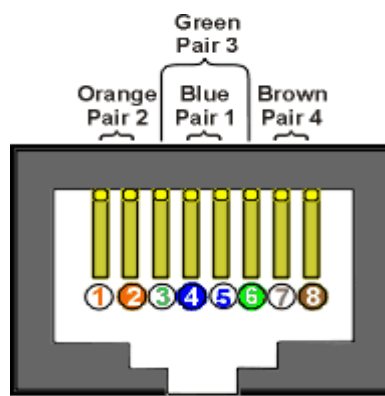


Note that the TX (transmitter) pins are connected to corresponding RX (receiver) pins, plus to plus and minus to minus. And that you must use a crossover cable to connect units with identical interfaces. If you use a straight-through cable, one of the two units must, in effect, perform the cross-over function.

Two wire color-code standards apply: EIA/TIA 568A and EIA/TIA 568B. The codes are commonly depicted with RJ-45 jacks as follows:

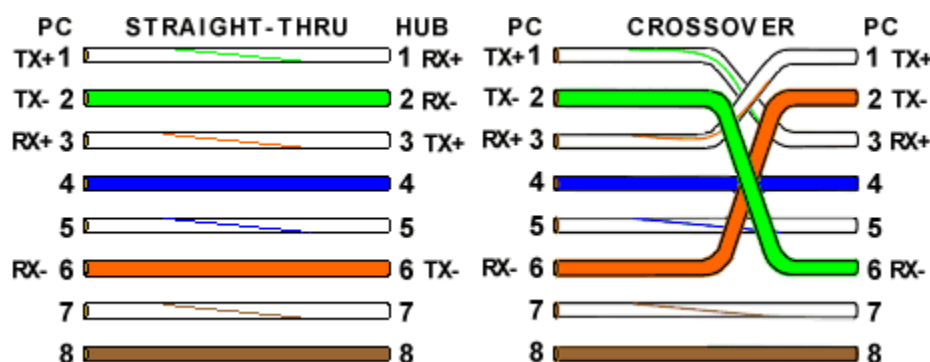


**RJ-45 JACK  
EIA/TIA 568A STANDARD**



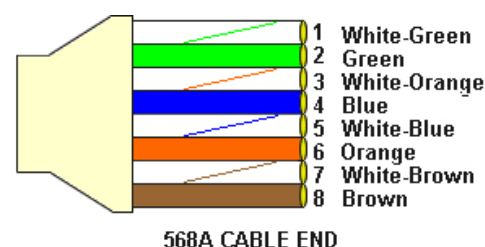
**RJ-45 JACK  
EIA/TIA 568B STANDARD**

If we apply the 568A color code and show all eight wires, our pin-out looks like this:



Note that pins 4, 5, 7, and 8 and the blue and brown pairs are not used in either standard.

LET'S MAKE IT SIMPLE



**568A CABLE END**



**568B CABLE END**

There are only two unique cable ends in the preceding diagrams. They correspond to the 568A and 568B RJ-45 jacks and are shown to the right.

Again, the wires with colored backgrounds may have white stripes and may be denoted that way in diagrams found elsewhere. For example, the green wire may be labeled Green-White--I don't bother. The background color is always specified first.

**Now, all you need to remember, to properly configure the cables, the diagrams for the two cable ends and the following rules:**

- A straight-thru cable has identical ends.
- A crossover cable has different ends.

### **LET'S MAKE SOME CABLES**

1. Pull the cable off the reel to the desired length and cut.
2. Strip one end of the cable with the stripper or a knife and diags.
3. Inspect the wires for nicks. Cut off the end and start over if you see any. You may have to adjust the blade with the screw at the front stripper. Cable diameters and jacket thicknesses vary.
4. Spread and arrange the pairs roughly in the order of the desired cable end.
5. Untwist the pairs and arrange the wires in the order of the desired cable end.

It is very important that the unstripped (untwisted) end be slightly less than 1/2" long. If it is longer than 1/2" it will be out-of-spec and susceptible to crosstalk. If it less than slightly less than 1/2" it will not be properly clinched when RJ-45 plug is crimped on.. Flatten again. There should be little or no space between the wires.

6. Hold the RJ-45 plug with the clip facing down or away from you. Push the wire firmly into the plug. Now, inspect the darn thing... before crimping and wasting the plug! Looking through the bottom of the plug, the wire on the far left side will have a white background. The wires should alternate light and dark from left to right. The furthest right wire is brown. The wires should all end evenly at the front of the plug. The jacket should end just about where you see it in the diagram--right on the line. Aren't you glad you didn't crimp the plug?

### **ALL ABOUT CRIMPING**

7. Hold the wire near the RJ-45 plug with the clip down and firmly push it into the left side of the front of the crimper (it will only go in one way). Hold the wire in place squeeze the crimper handles quite firmly. This is what will happen:

(Crimp it once.) The crimper pushes two plungers down on the RJ-45 plug. One forces what amounts to a cleverly designed plastic plug/wedge onto the cable jacket and very firmly clinches it. The other seats the "pins," each with two teeth at its end, through the insulation and into the conductors of their respective wires.

8. Test the crimp... If done properly an average person will not be able to pull the plug off the cable with his or her bare hands. And that quite simply, besides lower cost, is the primary advantage of twisted-pair cables over the older thinwire, coaxial cables. In fact, I would say the

RJ-45 and ease of its installation is the main reason coaxial cable is no longer widely used for small Ethernets. But, don't pull that hard on the plug. It could stretch the cable and change its characteristics. Look at the side of the plug and see if it looks like the diagram and give it a fairly firm tug to make sure it is crimped well.

9. Prepare the other end of the cable so it has the desired end and crimp.
10. If both ends of the cable are within reach, hold them next to each other and with RJ-45 clips facing away. Look through the bottom of the plugs. If the plugs are wired correctly, and they are identical, it is a straight-thru cable. If they are wired correctly and they are different, it is a crossover cable.
11. If you have an operational network, test the cable. Copy some large files.
12. If the cable doesn't work, inspect the ends again and make sure you have the right cable and that it is plugged into the correct units for the type of cable. Try power-cycling (cold booting) the involved computers.
13. If you have many straight-thru cables and a crossover cable in your system, you should consider labeling the crossover cable or using a different colored cable for the crossover cable so you don't mix them up.

### **CABLING RULES**

1. Try to avoid running cables parallel to power cables.
2. Do not bend cables to less than four times the diameter of the cable.
3. If you bundle a group of cables together with cable ties (zip ties), do not over-cinch them. It's okay to snug them together firmly; but don't tighten them so much that you deform the cables.
4. Keep cables away from devices which can introduce noise into them. Here's a short list: copy machines, electric heaters, speakers, printers, TV sets, fluorescent lights, copiers, welding machines, microwave ovens, telephones, fans, elevators, motors, electric ovens, dryers, washing machines, and shop equipment.
5. Avoid stretching UTP cables (tention when pulling cables should not exceed 25 LBS).
6. Do not run UTP cable outside of a building. It presents a very dangerous lightning hazard!
7. Do not use a stapler to secure UTP cables. Use telephone wire/RJ6 coaxial wire hangers which are available at most hardware stores.

**Assignment:** Make your own  
i) Straight Patch Cord  
ii) Cross Patch Cord

## **EXPERIMENT-7**

**AIM:**INSTALLATION OF SERVER OS(WINDOWS 2003)

### **PROCEDURE:**

Windows Server 2003 operating systems take the best of Windows 2000 Server technology and make it easier to deploy, manage, and use. The result: a highly productive infrastructure that helps make your network a strategic asset for your organization. Windows Server 2003 SP2 provides enhanced security, increased reliability, and a simplified administration to help enterprise customers across all industries.

Microsoft Windows Server 2003 R2 Standard Edition Requirements

**Computer and processor:** PC with a 133-MHz processor required; 550-MHz or faster processor recommended; support for up to four processors on one server

**Memory:** 128 MB of RAM required; 256 MB or more recommended; 4 GB maximum

**Hard disk:** 1.2 GB for network install; 2.9 GB for CD install

**Drive:** CD-ROM or DVD-ROM drive

**Display:** VGA or hardware that supports console redirection required; Super VGA supporting 800 x 600 or higher-resolution monitor recommended

### **Plan your installation**

When you run the Windows Server 2003 Setup program, you must provide information about how to install and configure the operating system. Thorough planning can make your installation of Windows Server 2003 more efficient by helping you to avoid potential problems during installation.

when planning for your Windows Server 2003 installation

Check System Requirements

- Check Hardware and Software Compatibility
- Determine Disk Partitioning Options
- Choose the Appropriate File System: FAT, FAT32, NTFS
- Decide on a Workgroup or Domain Installation
- Complete a Pre-Installation Checklist

After you made sure you can go on, start the installation process.

### **Beginning the installation process**

You can install Windows Server 2003 in several methods – all are valid and good, it all depends upon your needs and your limitations.

In this tutorial we are installing directly from a CD by booting your computer with the CD.

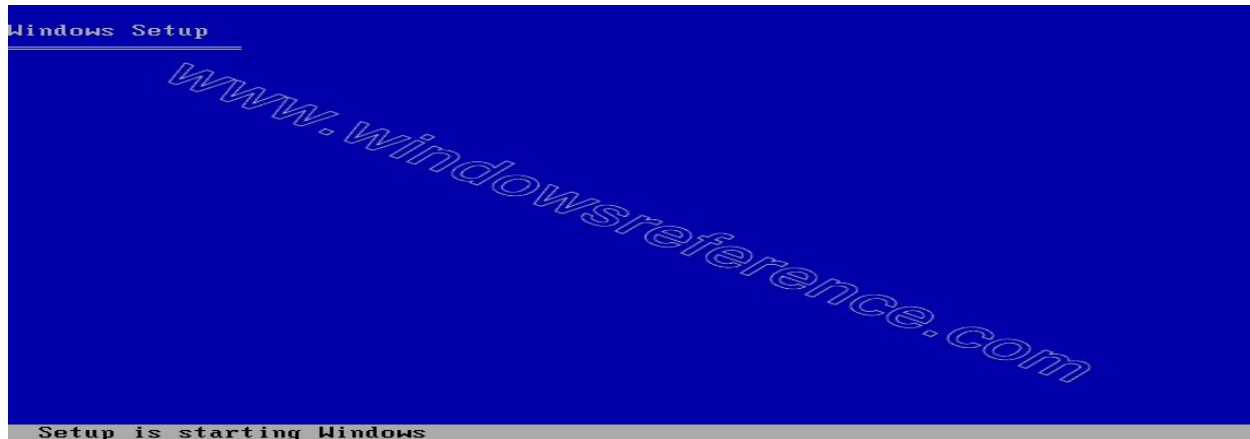
Start the computer from the CD.



You can press F6 if you need to install additional SCSI adapters or other mass-storage devices.



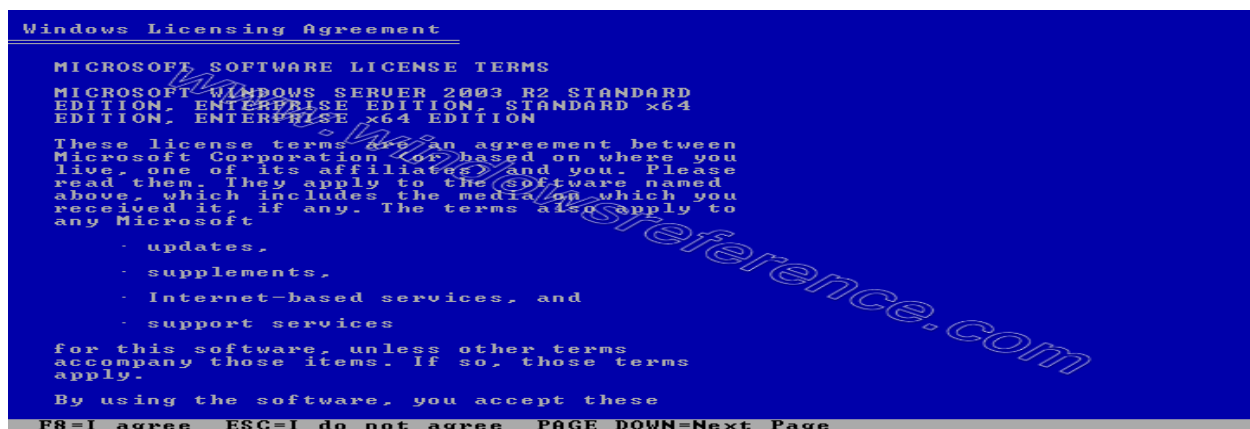
Setup will load all the needed files and drivers.



Windows server 2003 welcome screen and available options press enter



Read and accept the licensing agreement and press F8 if you accept it.



Select or create the partition on which you will install Windows Server 2003. Now you need to click C to create new partition

```
Windows Server 2003, Standard Edition Setup

The following list shows the existing partitions and
unpartitioned space on this computer.

Use the UP and DOWN ARROW keys to select an item in the list.

  • To set up Windows on the selected item, press ENTER.
  • To create a partition in the unpartitioned space, press C.
  • To delete the selected partition, press D.

8190 MB Disk 0 at Id 0 on bus 0 on symmpi [MBR]
  Unpartitioned space 8189 MB

ENTER=Install  C=Create Partition  F3=Quit
```

Enter the partition size and press enter

```
Windows Server 2003, Standard Edition Setup

You asked Setup to create a new partition on
8190 MB Disk 0 at Id 0 on bus 0 on symmpi [MBR].

  • To create the new partition, enter a size below and
    press ENTER.
  • To go back to the previous screen without creating
    the partition, press ESC.

The minimum size for the new partition is 8 megabytes <MB>.
The maximum size for the new partition is 8182 megabytes <MB>.
Create partition of size <in MB>: 8182

ENTER=Create  ESC=Cancel
```

After creating the partition you need to select where you want to install windows server 2003 press enter

```
Windows Server 2003, Standard Edition Setup

The following list shows the existing partitions and
unpartitioned space on this computer.

Use the UP and DOWN ARROW keys to select an item in the list.

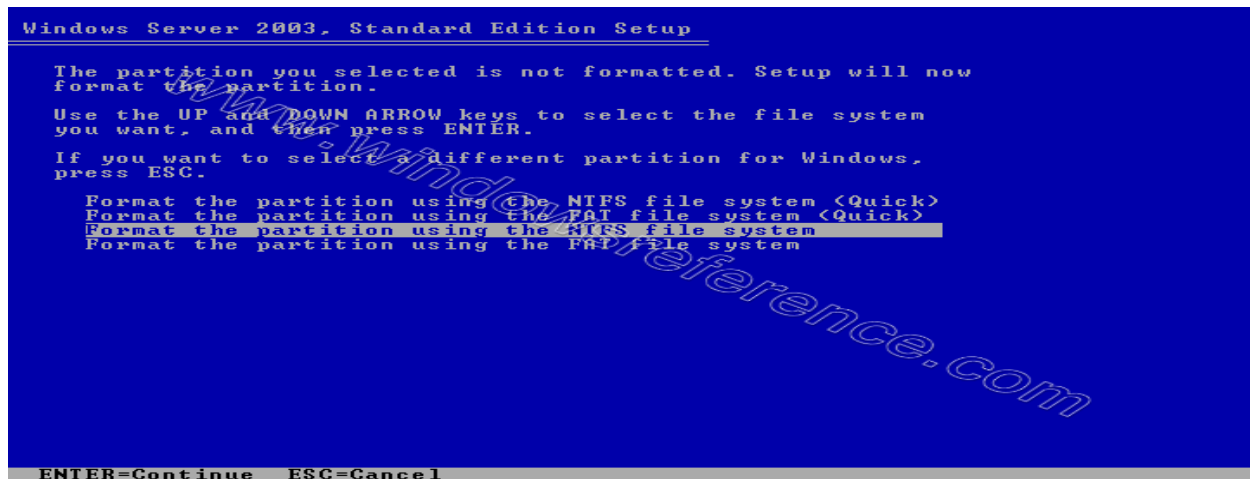
  • To set up Windows on the selected item, press ENTER.
  • To create a partition in the unpartitioned space, press C.
  • To delete the selected partition, press D.

8190 MB Disk 0 at Id 0 on bus 0 on symmpi [MBR]
  C: Partition1 [New <Raw>] 8182 MB < 8181 MB free>
  Unpartitioned space 8 MB

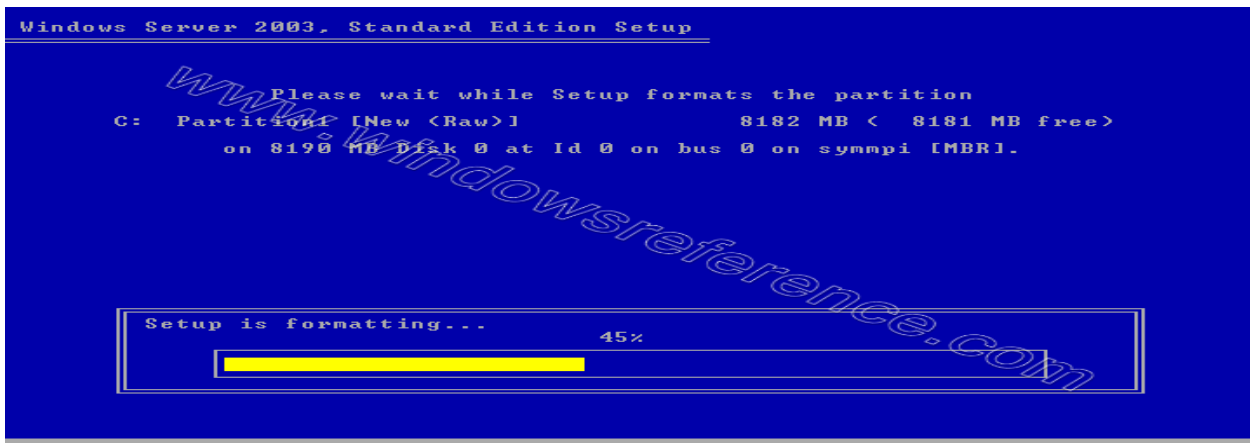
ENTER=Install  D=Delete Partition  F3=Quit
```



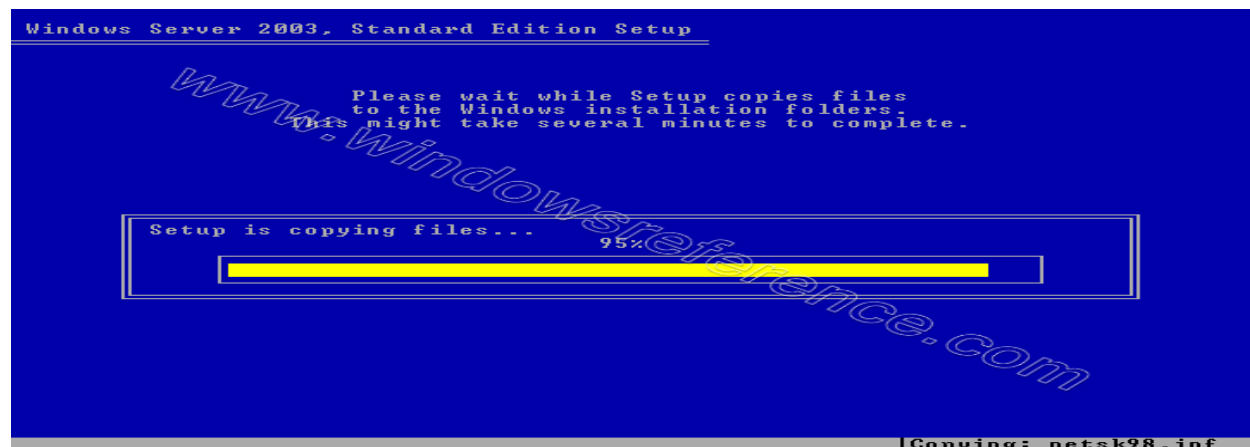
Now you need to format your new partition with NTFS select the option as below and press enter



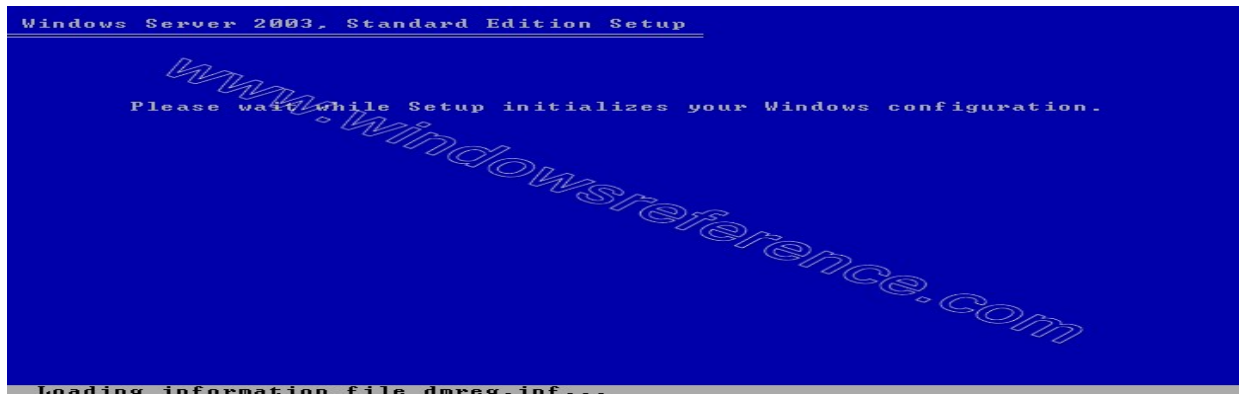
Drive Format is in progress



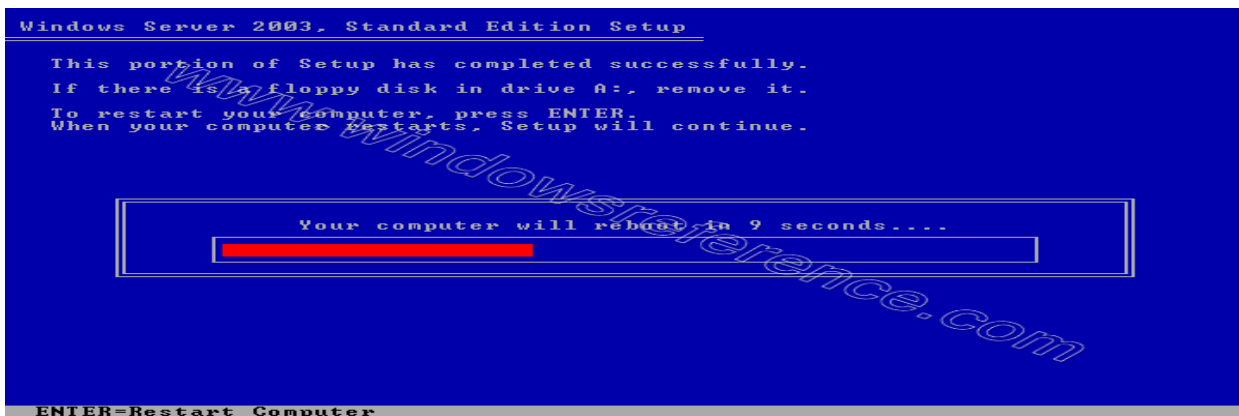
After format setup will start copying files is in progress



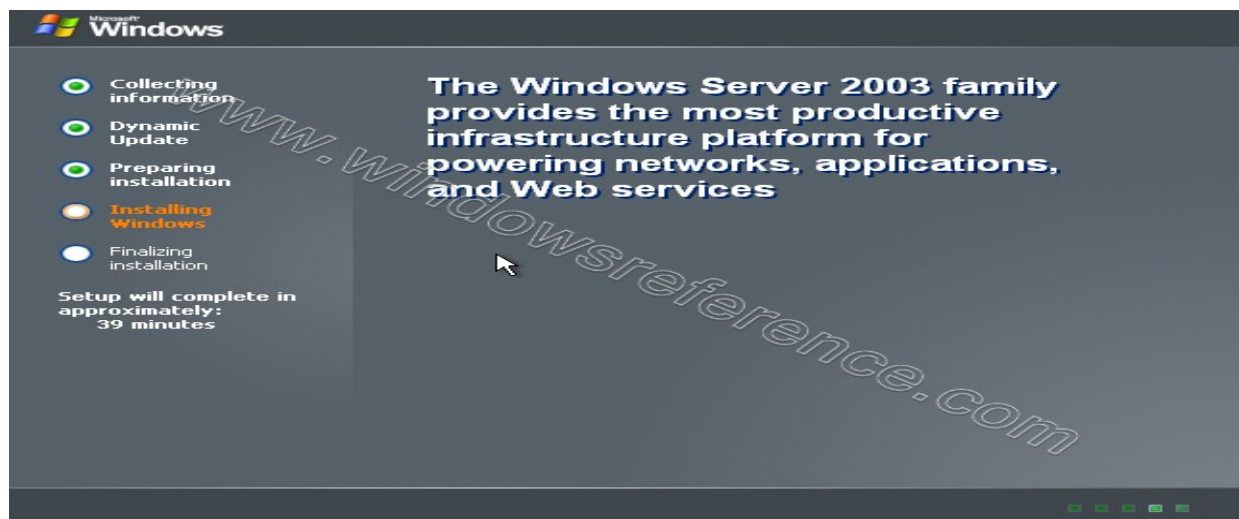
Setup Initializes your windows configuration



The computer will restart now and the installation process will start in graphical mode.



It will then begin to load device drivers based upon what it finds on your computer. You don't need to do anything at this stage.

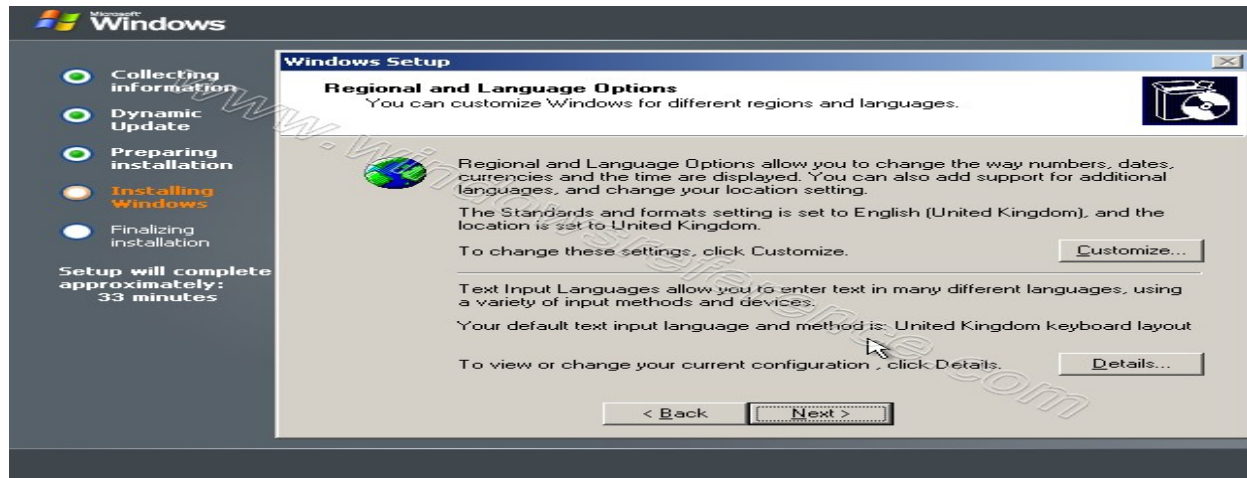


Click Customize to change regional settings, if necessary.

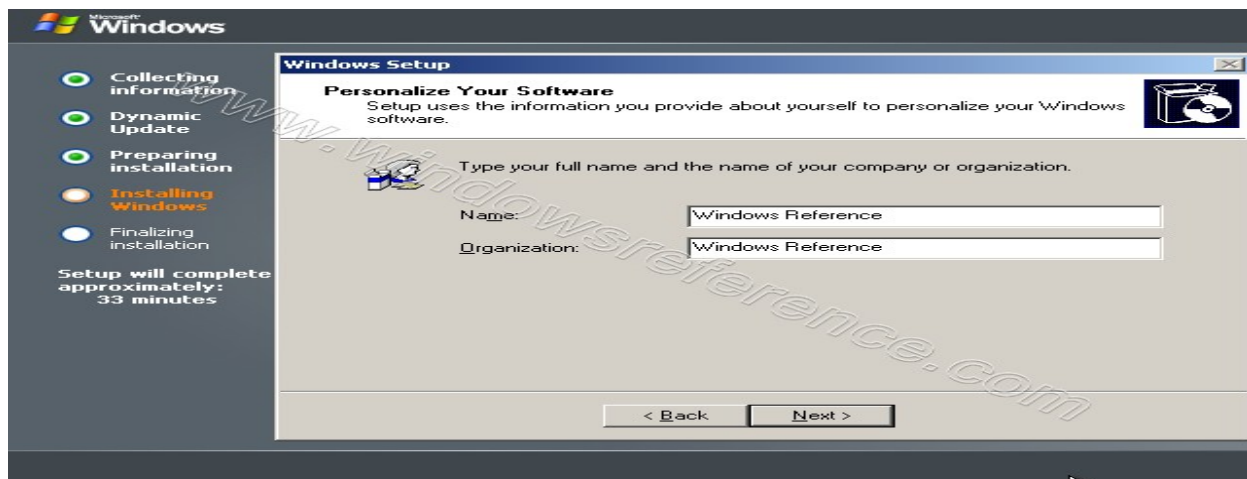
Current System Locale – Affects how programs display dates, times, currency, and numbers. Choose the locale that matches your location, for example, United Kingdom.

Current Keyboard Layout – Accommodates the special characters and symbols used in different languages. Your keyboard layout determines which characters appear when you press keys on the keyboard.

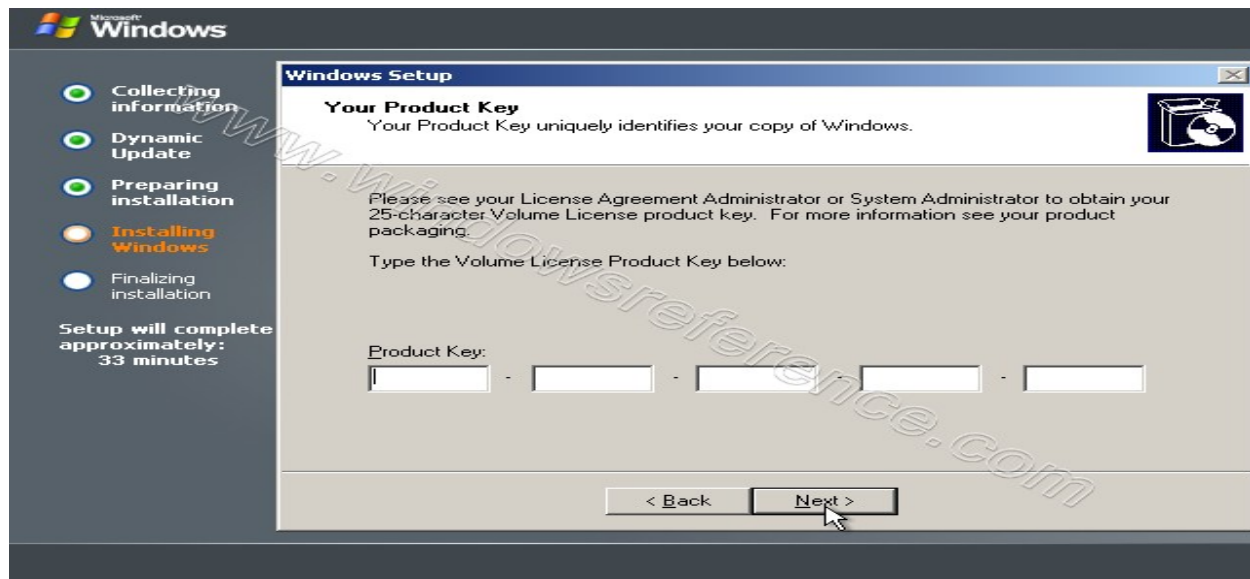
If you don't need to make any changes just press Next.



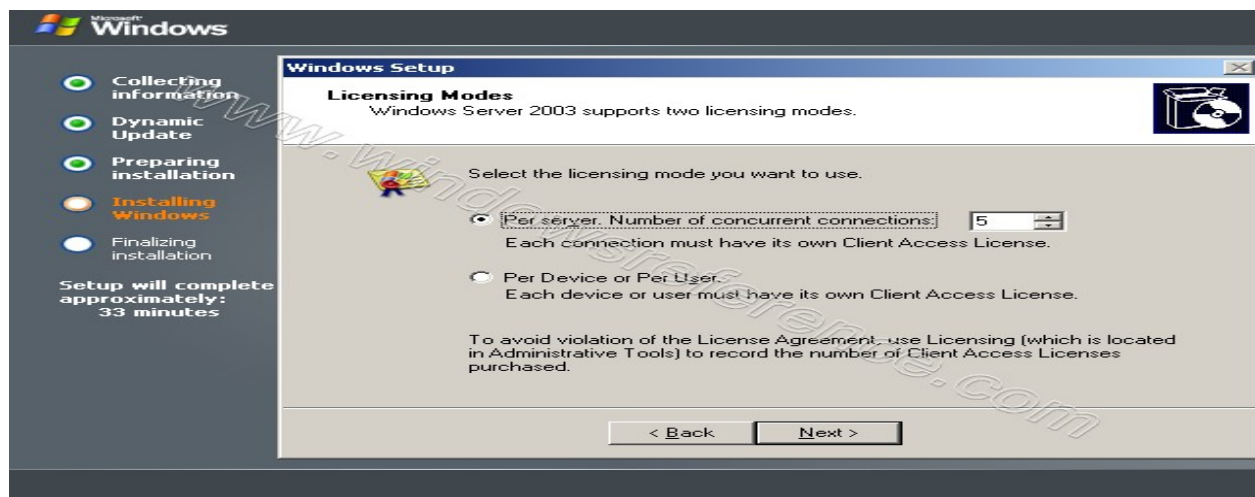
Enter the name and Organization click next



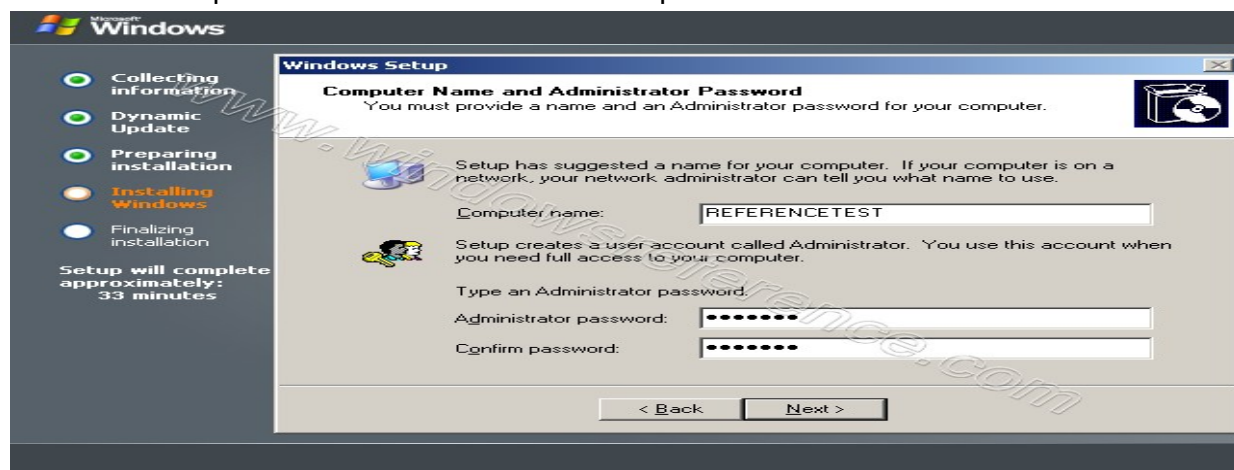
Enter your product key click next



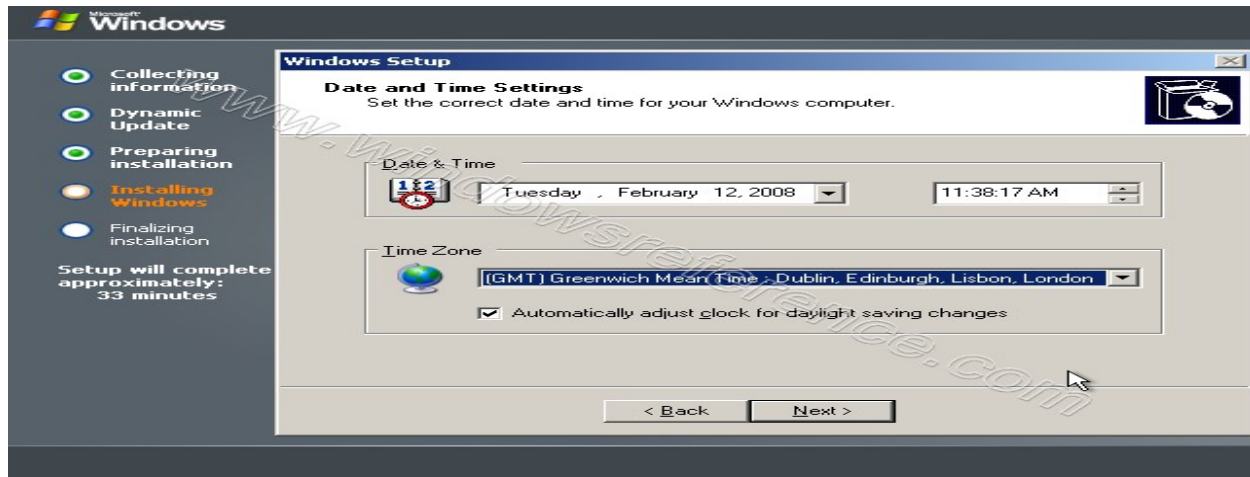
Select the license mode you want to use click next



Enter the computer name and administrator password click next



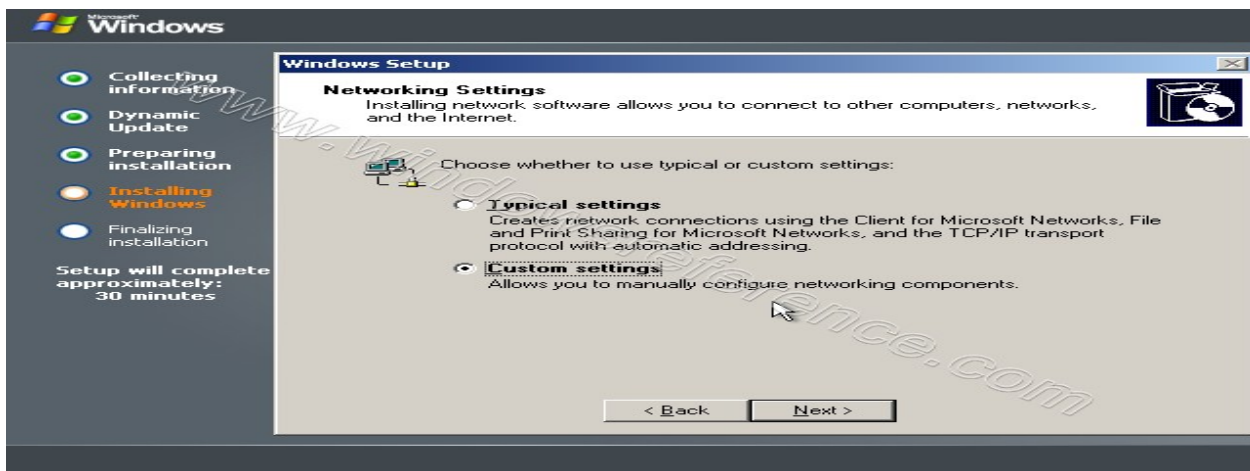
Select the correct date and time for your computer click next



Installing network in progress

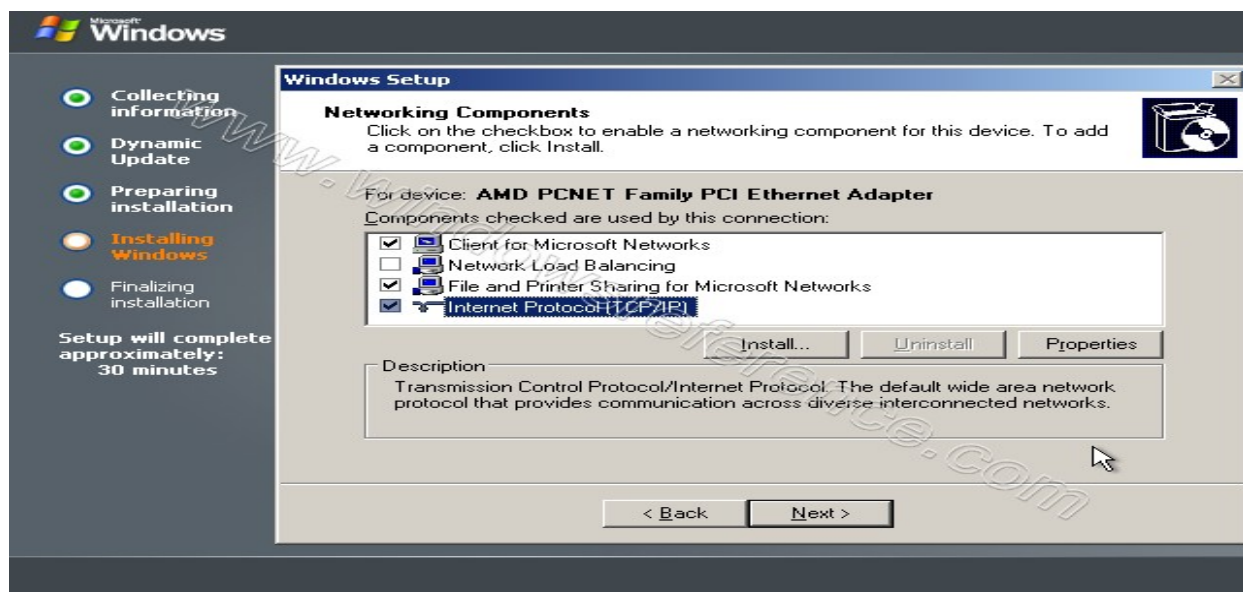


Now you need to set the network settings here select custom settings click next

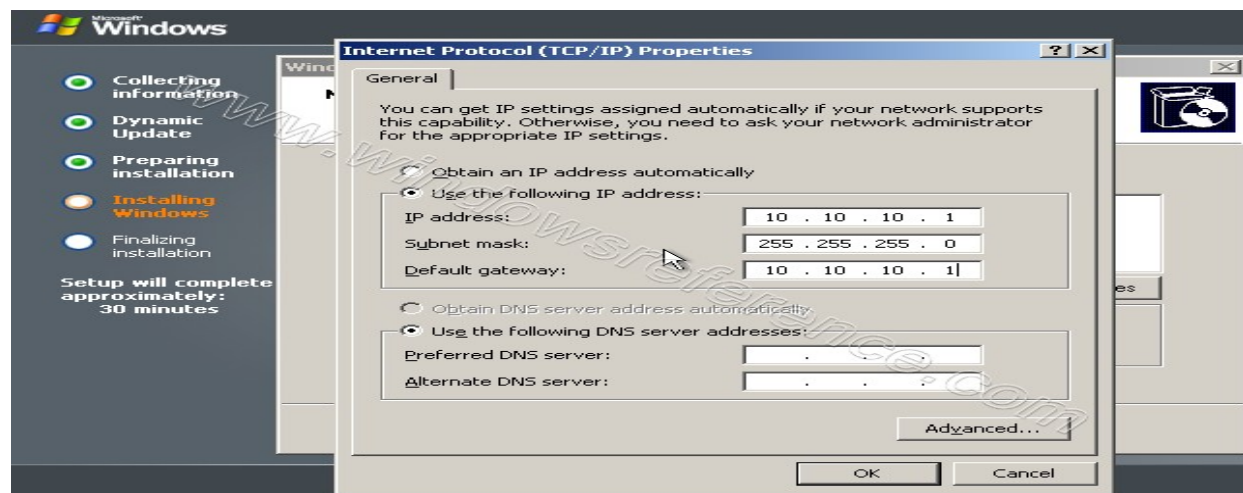




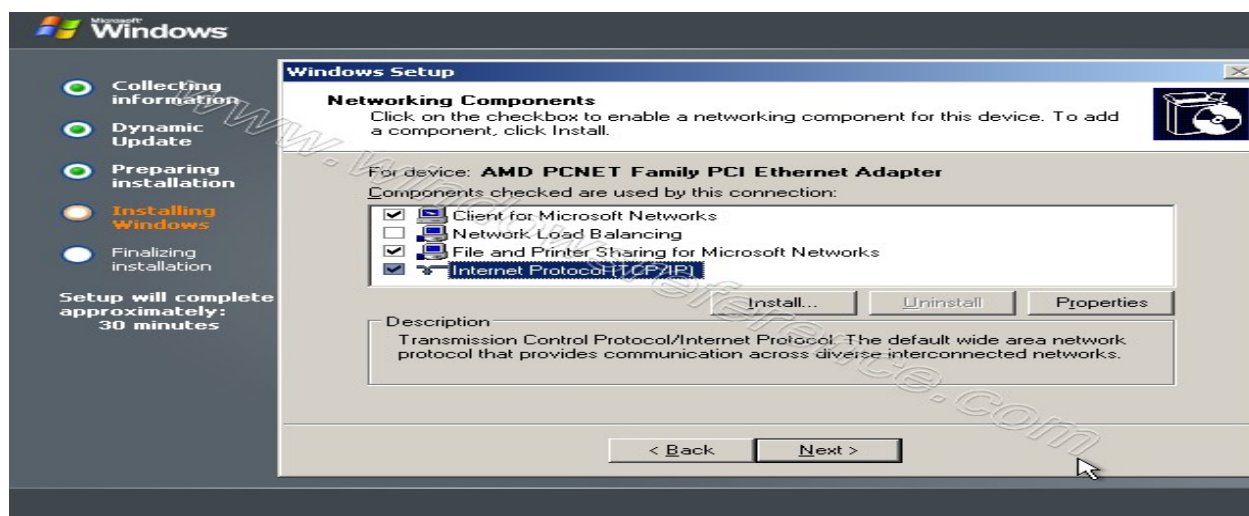
Select Internet Protocol (TCP/IP) click on properties



Select use the following ip address radio button and enter you ip address details click ok



After configuring IP address you need to click next

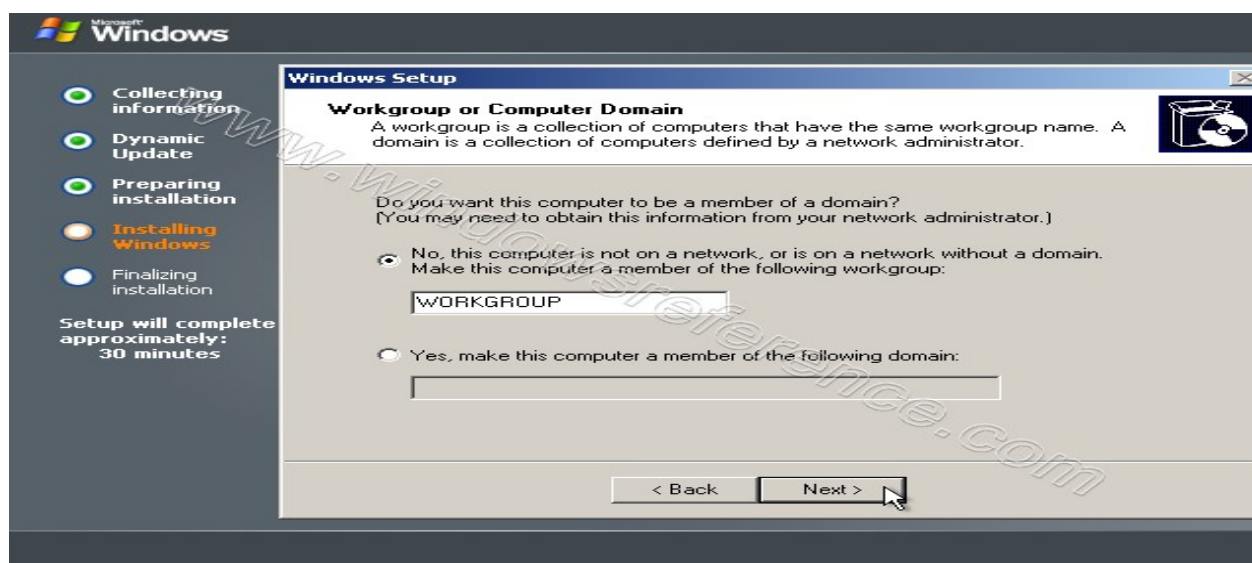


In the Workgroup or Domain window enter the name of your workgroup or domain.

A workgroup is a small group of computers on a network that enables users to work together and does not support centralized administration.

A domain is a logical grouping of computers on a network that has a central security database for storing security information. Centralized security and administration are important for computers in a domain because they enable an administrator to easily manage computers that are geographically distant from each other. A domain is administered as a unit with common rules and procedures. Each domain has a unique name, and each computer within a domain has a unique name.

If you're a stand-alone computer, or if you don't know what to enter, or if you don't have the sufficient rights to join a domain – leave the default entry selected and press Next.

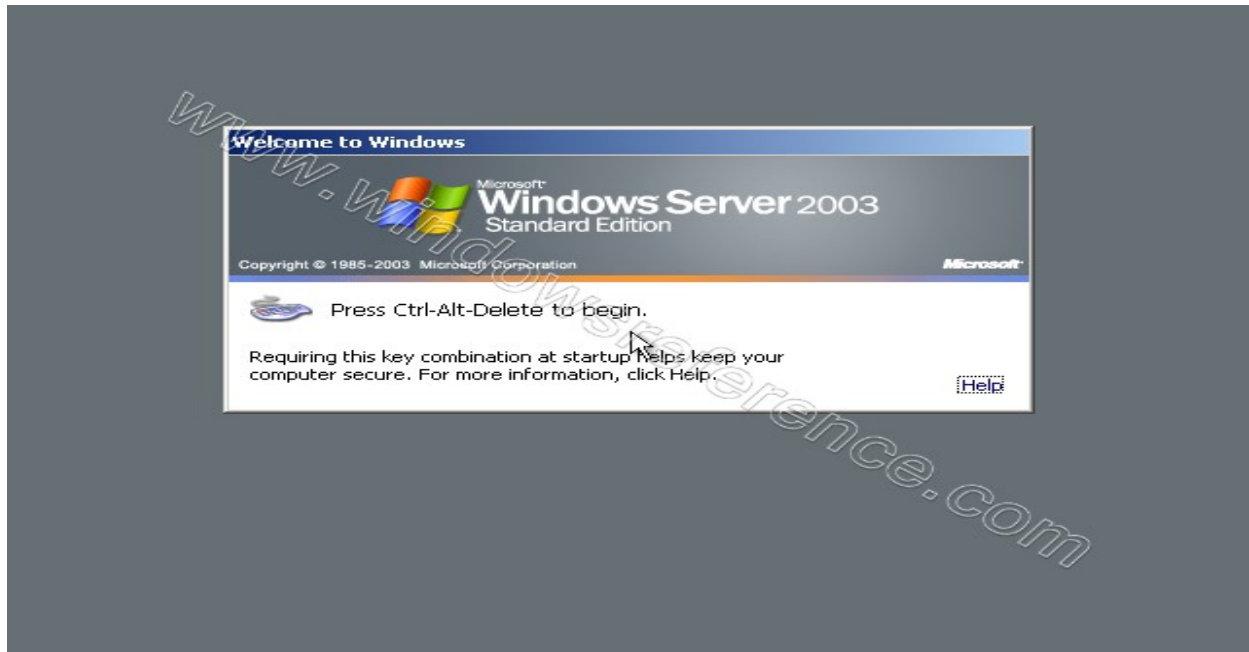


Next the setup process will finish copying files and configuring the setup. You do not need to do anything.

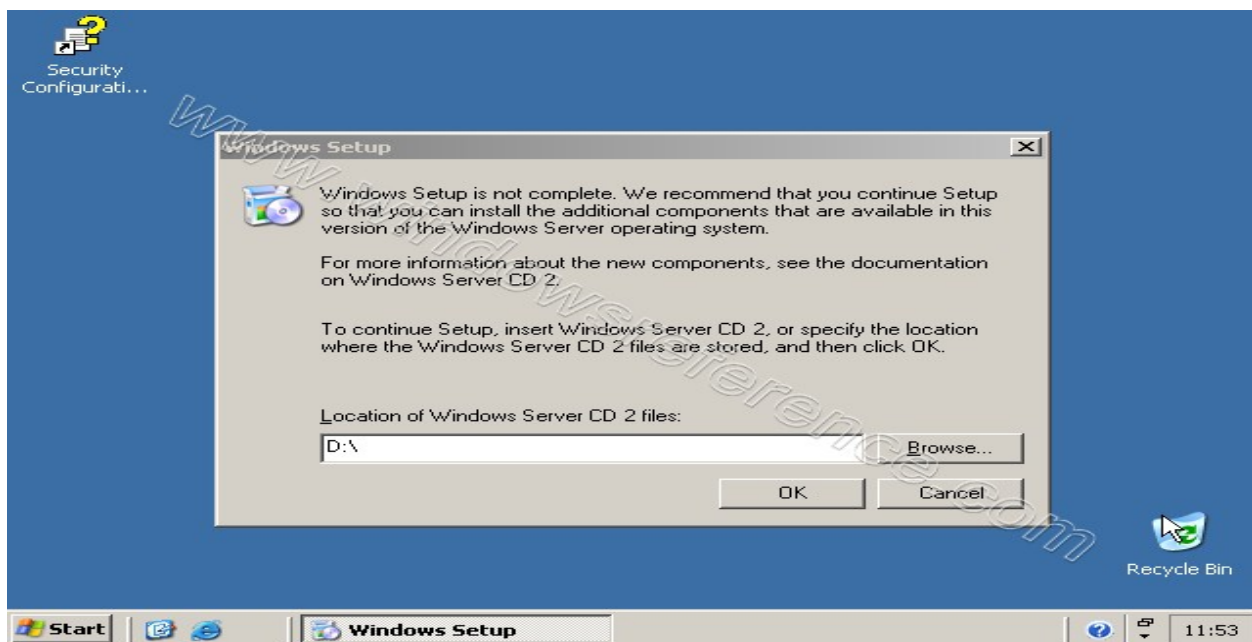


After finishing installation process your system will reboot and you can see logon screen





After logging in you should see similar to the following screen for Windows server 2003 R2 editions now you need to insert CD2 to install extra components click ok



That's it you have completed windows server 2003 R2 installation.

**Assignment:** Study of IP addressing

## **EXPERIMENT-8**

**AIM:**STUDY ABOUT CONFIGURATION OF CLIENT

### **PROCEDURE:**

#### **To add a computer description**

On the Computer Name tab, type a name or description in the box, and then click Apply.

This name will help you identify the computer on the network and in the Network Neighborhood.

#### ***To change a computer name***

Make note of the following naming rules:

- If your computer does not have TCP/IP networking installed, or it has other networking protocols installed (without TCP/IP), the computer name must be in uppercase 15 or fewer bytes long (depending on which characters are used and the language set as the Language for non-Unicode programs in Regional and Language Options in Control Panel).
- If your computer has TCP/IP networking installed, the computer name can be up to 63 bytes long (depending on which characters are used and the language set as the Language for non-Unicode programs in Regional and Language Options in Control Panel) but should only contain the numbers 0-9, the letters A-Z and a-z, and hyphens. You can use other characters, but doing so might prevent other users from finding your computer on the network. If your network is using a Microsoft DNS server, you can use any characters except periods.
- Microsoft recommends using computer names that are shorter than 16 bytes. If you want to specify a computer name that is longer than 15 bytes and you want to join your computer to a domain that includes Windows 2000 domain controllers, the domain administrator should enable longer names in the computer account of the Active Directory domain.
- If you rename your computer or workgroup when it is disconnected from the network, duplicate computer names might result. Check with your network administrator before renaming your computer.

On the Computer Name tab, click Change, and then enter the information in the Computer Name Changes dialog box.

A reboot will be necessary to complete this process.

## To join a Domain or Workgroup

On the Computer Name tab, click Change, and then enter the domain membership information.

If everything is in place (especially the computer's TCP/IP and DNS configuration - read [Requirements when Joining a Domain](#) for more info) then you should receive a username and password dialog box. Enter the username and password of a user that has enough right to create computer accounts in the domain (for example - a Domain Admin group member).

If all went ok you'll get a welcome message.

If a computer account was already established in the domain then you can enter any username and password of any valid user (for example - your own domain username and password). This is true if the Domain Admin that has created the computer account has specified the EVERYONE special group on the new computer account's permissions box.

**Note:** Usually, there is no need to manually change the computer's DNS Suffix when joining an Active Directory domain, because the suffix will automatically be set to match the DNS name of the domain. So if you plan to join an AD domain, leave the DNS suffix empty.

**Note:** Home Edition is not designed to join domains; only workgroups. To join domains, use XP Professional version or above.

A reboot will be necessary to complete this process.

## Network ID Wizard

If you are unfamiliar or uncertain about performing these tasks, you can use the Network Identification (ID) Wizard to help you.

Click Network ID on the System Properties dialog box. This step starts the Network ID Wizard. This wizard is new to Windows XP, and its purpose is to guide you with a series of questions that can enable the computer to be added to either a workgroup or domain. You can move backwards and forwards in the wizard by using the Back and Next buttons.

The first set of options in the wizard are:

- Option 1 states: "This computer is part of a business network, and I use it to connect to other computers at work."
- Option 2 states: "This computer is for home use and is not part of a business network."

If you select option 2, the wizard requests you to click Finish to restart the computer. If you follow this step, the configuration of the computer is "Workgroup Member", with the name of the workgroup as "Workgroup," by default.

If you select option 1, the following options are displayed:

- Option 1a: "My company uses a network with a domain."
- Option 1b: "My company uses a network without a domain."

If you select option 1b, you can also configure the computer as a "Workgroup Member", and you can enter the name of the workgroup.

If you select option 1a, a dialog box is displayed that requests the following information:

- User name
- Password
- User account domain
- Computer name
- Computer domain

The next page requires the domain name to which the computer is to be added and the username and password of an account that has the rights to add a computer to the domain.

The next page enables the user account from the previous page to be added to this computer.

The next page enables that newly added user to have various rights on the local computer.

The user may be added to the following built-in groups on the local computer:

Administrators Backup Operators Debugger Users Guests HelpServicesGroup Network  
Configuration Operators Power Users Remote Desktop Users Replicator Users

**Note:** If the computer is a member of a domain, the computer also maintains a local domain with security accounts that pertain only to that computer. To change domains at the logon screen, press CTRL+ALT+DELETE. If the domain box is not displayed, click the Options button to display the domain box. Then, select the required domain from the menu.

**Assignment:** Study of Domain Name System.

## **EXPERIMENT-9**

**AIM:**Study of computer management(WINDOWS 2003)

### **PROCEDURE:**

#### **Computer Management Overview**

Computer Management is a collection of Windows administrative tools that you can use to manage a local or remote computer. The tools are organized into a single console, which makes it easy to view administrative properties and to gain access to the tools that are necessary to perform your computer-management tasks.

#### **The Computer Management Console**

The Computer Management console consists of a window divided into two panes. The left pane contains the console tree; the right pane contains details. When you click an item in the console tree, information about that item is displayed in the details pane. The information that is displayed is specific to the item that you select.

The administrative tools in Computer Management are grouped into the following three categories:

- System Tools
- Storage
- Services and Applications

Each category includes several tools or services.

#### **System Tools**

- **Event Viewer**  
Use the Event Viewer tool to manage and view events that are recorded in the Application, Security, and System logs. You can monitor the logs to track security events and to identify possible software, hardware, and system problems.
- **Shared Folders**  
Use the Shared Folders tool to view connections and resource in use on the computer. You can create, view, and manage shares, view open files and sessions, and close files and disconnect sessions.
- **Local Users and Groups**  
Use the Local Users and Groups tool to create and manage your local user accounts and groups. Local Users and Groups is available only in Windows XP Professional.

- **Performance Logs and Alerts**

Use the Performance Logs and Alerts tool to configure performance logs and alerts to monitor and collect data about your computer's performance.

- **Device Manager**

Use Device Manager to view the hardware devices installed in your computer, update device drivers, modify hardware settings, and troubleshoot device conflicts.

## **Storage**

- **Removable Storage**

Use the Removable Storage tool to track your removable storage media and manage the libraries, or data-storage systems, that contain them.

- **Disk Defragmenter**

Use the Disk Defragmenter tool to analyze and defragment volumes on your hard disks.

- **Disk Management**

Use the Disk Management tool to perform disk-related tasks such as converting disks or creating and formatting volumes. Disk Management helps you manage your hard disks, and the partitions or volumes that they contain.

## **Services and Applications**

- **Services**

Use Services to manage services on local and remote computers. You can start, stop, pause, resume, or disable a service.

- **WMI Control**

Use WMI Control to configure and manage the Windows Management Instrumentation (WMI) service.

- **Indexing Service**

Use Indexing Service to manage the Indexing service, and to create and configure additional catalogs to store index information.

**NOTE:** The actual set of tools and services that is listed in Computer Management depends on the services that are installed on the host computer.

## How to Use Computer Management on the Local Computer

**NOTE:** You must be logged on as Administrator or as a member of the Administrators group view and modify most properties and perform most computer-management tasks.

To start and use Computer Management on the local computer:

- Click **Start**, and then click **Control Panel**. Click **Performance and Maintenance**, click **Administrative Tools**, and then double-click **Computer Management**.

The Computer Management window for the local computer is displayed. "Computer Management (Local)" is displayed at the root of the console tree.

- In the console tree, expand **System Tools**, **Storage**, or **Services and Applications** to view the tools and services in each of these containers.
- Click the item that you want (for example, **Event Viewer**) to use the tool, and then view the information that is associated with it.

## How to Use Computer Management on a Remote Computer

**NOTE:** You must be logged on as Administrator or as a member of the Administrators group to view and modify most properties and perform most computer-management tasks.

To connect to and use Computer Management on another computer:

- Click **Start**, and then click **Control Panel**. Click **Performance and Maintenance**, click **Administrative Tools**, and then double-click **Computer Management**.
- Right-click **Computer Management (Local)**, and then click **Connect to another computer**.
- Click **Another Computer**, and then type the name of the computer that you want to manage remotely, or click **Browse** to locate the computer. Click **OK** and then click **OK** to return to the Computer Management window. The Computer Management window of the remote computer is displayed. The name of the remote computer is displayed at the root of the console tree.
- In the console tree, expand **System Tools**, **Storage**, or **Services and Applications** to view the tools and services in each of these containers.
- Click the item that you want (for example, **Event Viewer**) to use the tool, and then view the information that is associated with it.

### How to Use Help in Computer Management

To use Computer Management Help or to use the Help files for any of the individual administrative tools that are contained in Computer Management:

- Start Computer Management.
- Use either of the following steps:
  1. In the console tree, right-click the item that you want (for example, **Computer Management** or **Device Manager**), and then click **Help**.
  2. Click the item in the console tree (for example, **Device Manager** or **Computer Management**), and then click **Help** on the **Action** menu.



## **EXPERIMENT-10**

**AIM:**ACTIVE DIRECTORY SERVICE(WINDOWS 2003)

### **PROCEDURE:**

#### Creating the Active Directory

After you have installed Windows Server 2003 on a stand-alone server, run the Active Directory Wizard to create the new Active Directory forest or domain, and then convert the Windows Server 2003 computer into the first domain controller in the forest. To convert a Windows Server 2003 computer into the first domain controller in the forest, follow these steps:

- Insert the Windows Server 2003 CD-ROM into your computer's CD-ROM or DVD-ROM drive.
- Click **Start**, click **Run**, and then type `dcpromo`.
- Click **OK** to start the **Active Directory Installation Wizard**, and then click **Next**.
- Click **Domain controller for a new domain**, and then click **Next**.
- Click **Domain in a new forest**, and then click **Next**.
- Specify the full DNS name for the new domain. Note that because this procedure is for a laboratory environment and you are not integrating this environment into your existing DNS infrastructure, you can use something generic, such as `mycompany.local`, for this setting. Click **Next**.
- Accept the default domain NetBIOS name (this is "mycompany" if you used the suggestion in step 6). Click **Next**.
- Set the database and log file location to the default setting of the `c:\winnt\ntds` folder, and then click **Next**.
- Set the Sysvol folder location to the default setting of the `c:\winnt\sysvol` folder, and then click **Next**.
- Click **Install and configure the DNS server on this computer**, and then click **Next**.
- Click **Permissions compatible only with Windows 2000 or Windows Server 2003 servers or operating systems**, and then click **Next**.
- Because this is a laboratory environment, leave the password for the Directory Services Restore Mode Administrator blank. Note that in a full production environment, this password is set by using a secure password format. Click **Next**.
- Review and confirm the options that you selected, and then click **Next**.
- The installation of Active Directory proceeds. Note that this operation may take several minutes.
- When you are prompted, restart the computer. After the computer restarts, confirm that the Domain Name System (DNS) service location records for the new domain controller have been created.

**To confirm that the DNS service location records have been created, follow these steps:**

1. Click **Start**, point to **Administrative Tools**, and then click **DNS** to start the DNS Administrator Console.
2. Expand the server name, expand **Forward Lookup Zones**, and then expand the domain.
3. Verify that the **\_msdcs**, **\_sites**, **\_tcp**, and **\_udp** folders are present. These folders and the service location records they contain are critical to Active Directory and Windows Server 2003 operations.

### **Adding Users and Computers to the Active Directory Domain**

After the new Active Directory domain is established, create a user account in that domain to use as an administrative account. When that user is added to the appropriate security groups, use that account to add computers to the domain.

- To create a new user, follow these steps:
  1. Click **Start**, point to **Administrative Tools**, and then click **Active Directory Users and Computers** to start the Active Directory Users and Computers console.
  2. Click the domain name that you created, and then expand the contents.
  3. Right-click **Users**, point to **New**, and then click **User**.
  4. Type the first name, last name, and user logon name of the new user, and then click **Next**.
  5. Type a new password, confirm the password, and then click to select one of the following check boxes:
    1. Users must change password at next logon (recommended for most users)
    2. User cannot change password
    3. Password never expires
    4. Account is disabledClick **Next**.
  6. Review the information that you provided, and if everything is correct, click **Finish**.
- After you create the new user, give this user account membership in a group that permits that user to perform administrative tasks. Because this is a laboratory environment that you are in control of, you can give this user account full administrative access by making it a member of the Schema, Enterprise, and Domain administrators groups. To add the account to the Schema, Enterprise, and Domain administrators groups, follow these steps:
  1. On the Active Directory Users and Computers console, right-click the new account that you created, and then click **Properties**.
  2. Click the **Member Of** tab, and then click **Add**.
  3. In the **Select Groups** dialog box, specify a group, and then click **OK** to add the groups that you want to the list.
  4. Repeat the selection process for each group in which the user needs account membership.
  5. Click **OK** to finish.

- The final step in this process is to add a member server to the domain. This process also applies to workstations. To add a computer to the domain, follow these steps:
  1. Log on to the computer that you want to add to the domain.
  2. Right-click **My Computer**, and then click **Properties**.
  3. Click the **Computer Name** tab, and then click **Change**.
  4. In the **Computer Name Changes** dialog box, click **Domain** under **Member Of**, and then type the domain name. Click **OK**.
  5. When you are prompted, type the user name and password of the account that you previously created, and then click **OK**.

A message that welcomes you to the domain is generated.

6. Click **OK** to return to the **Computer Name** tab, and then click **OK** to finish.
7. Restart the computer if you are prompted to do so.

## Troubleshooting

### You Cannot Open the Active Directory Snap-ins

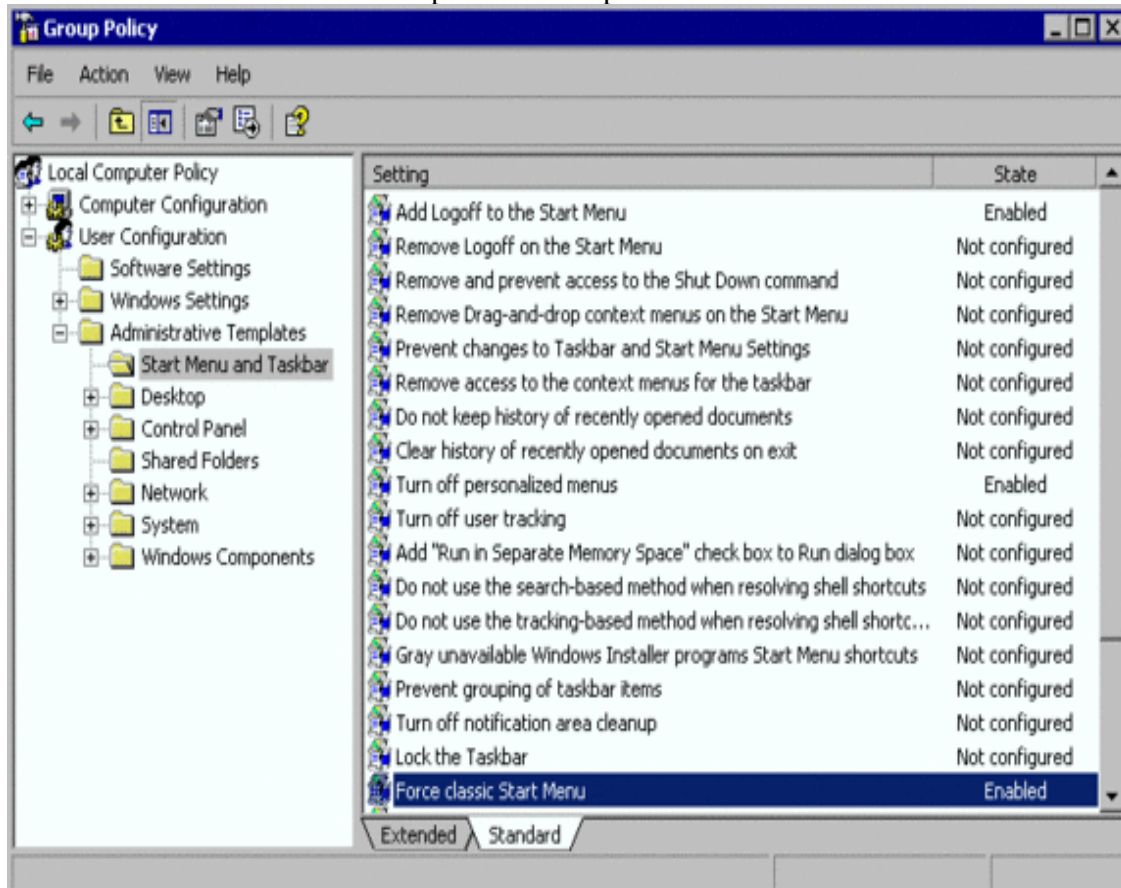
After you have completed the installation of Active Directory, you may not be able to start the Active Directory Users and Computers snap-in, and you may receive an error message that indicates that no authority can be contacted for authentication. This can occur if DNS is not correctly configured. To resolve this issue, verify that the zones on your DNS server are configured correctly and that your DNS server has authority for the zone that contains the Active Directory domain name. If the zones appear to be correct and the server has authority for the domain, try to start the Active Directory Users and Computers snap-in again. If you receive the same error message, use the DCPROMO utility to remove Active Directory, restart the computer, and then reinstall Active Directory.

## **EXPERIMENT-11**

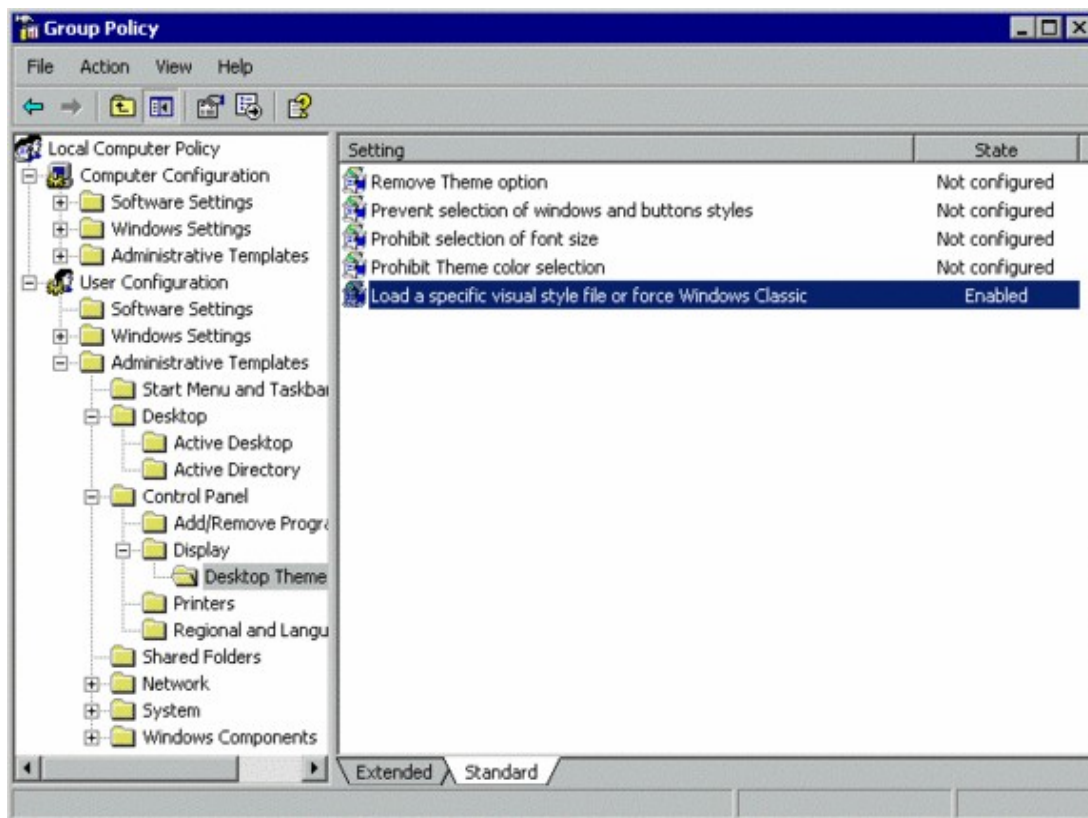
**AIM:**STUDY ABOUT policy settings

### **PROCEDURE:**

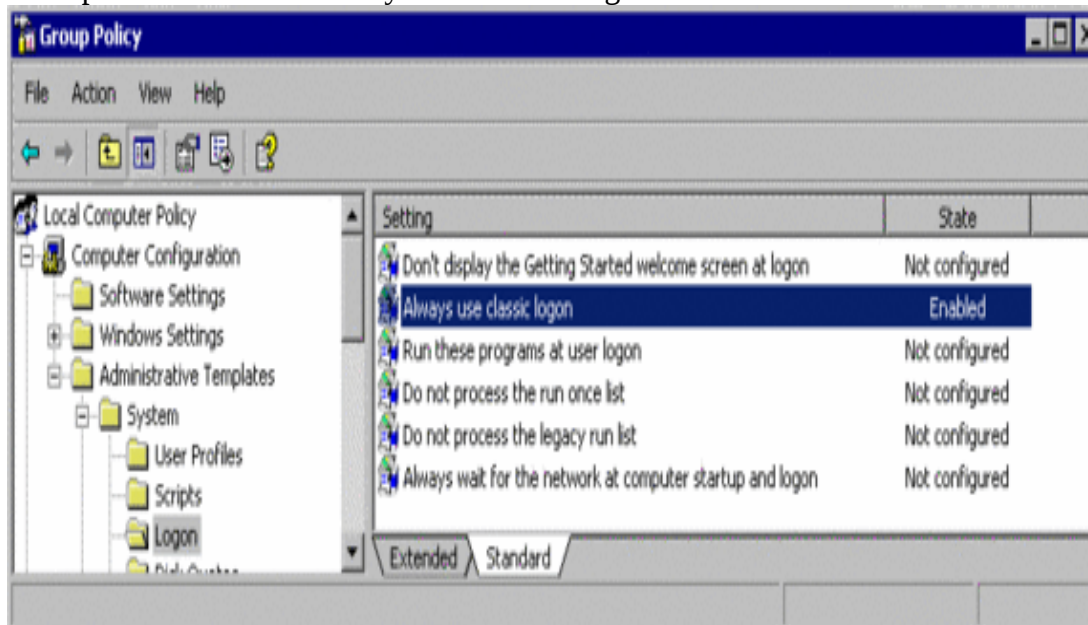
Define Start menu and Taskbar options : example : Force the use of the Classic Start Menu :



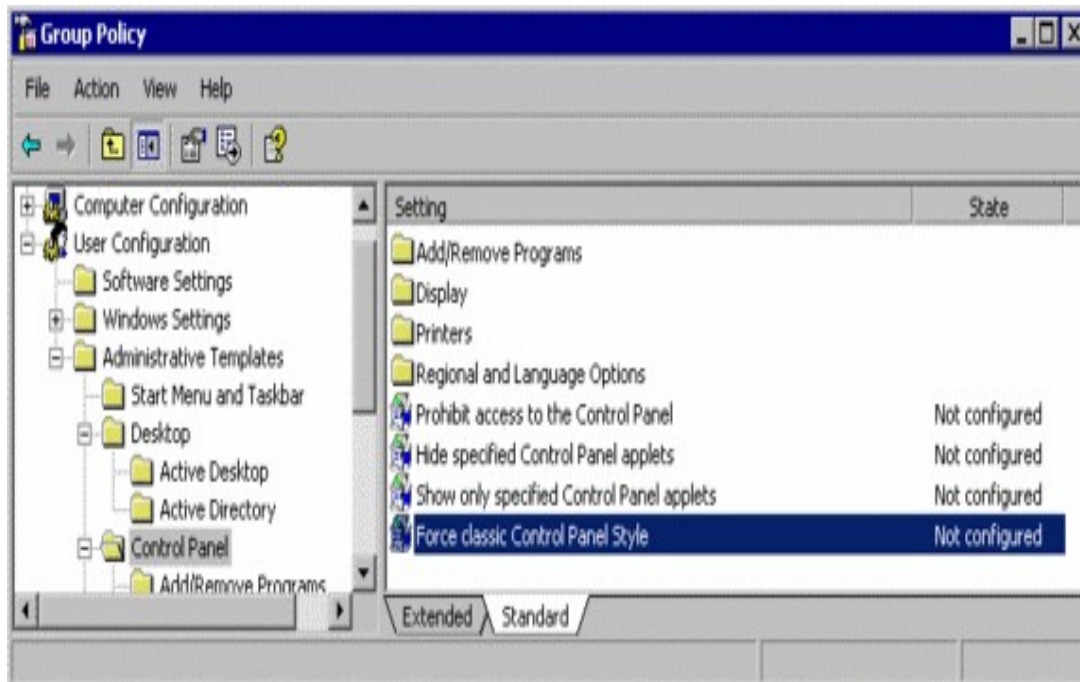
Example : Define for the Control-Panel / Desktop to use the "Windows Classic" [theme](#) :



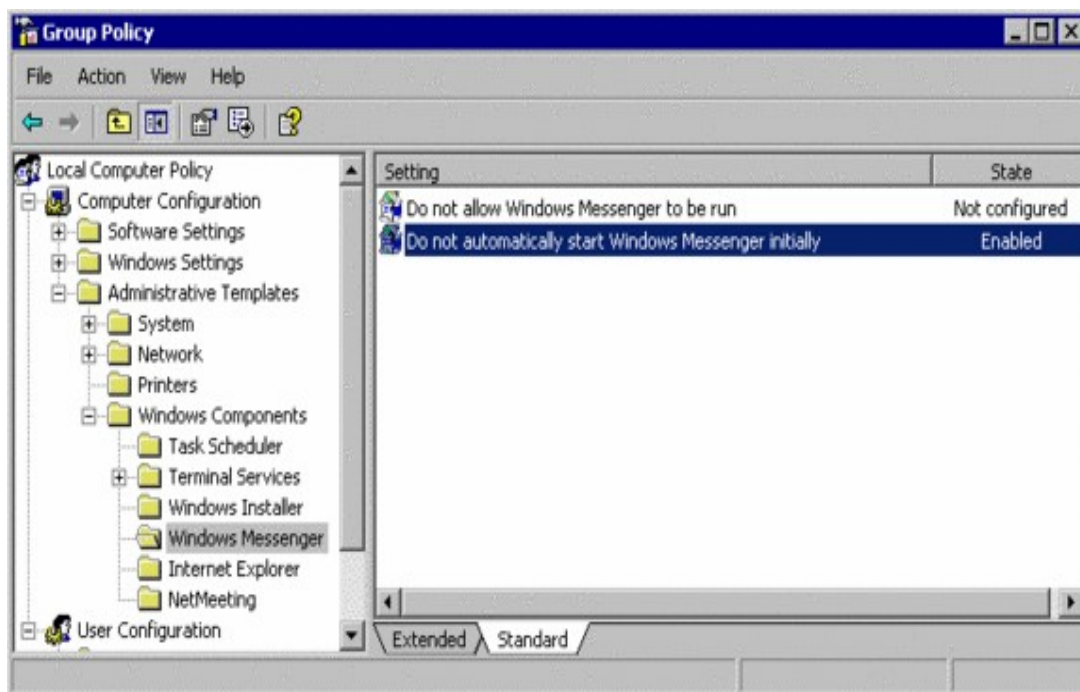
Example : Define to use always the Classic Logon :



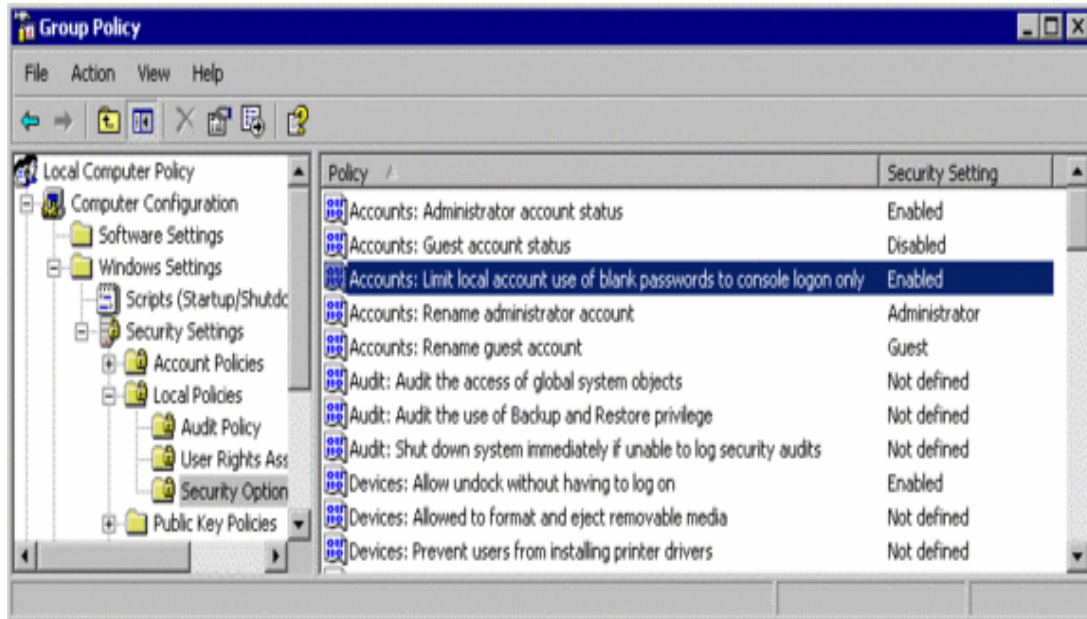
Example : Define to use always the Classic Control Panel style :



example : switch off the [automatic start of the Microsoft Windows Messenger](#) :



Example : allow access to shared Windows XP resources without passwords defined for users :



By default, Windows XP is configured (= enabled) to allow blank password (= no password) only for logon via the console (= keyboard, mouse and screen), requiring passwords to be defined for accessing shared resources (=disks/folders) on this system via the network.

## **EXPERIMENT-12**

**AIM:**STUDY OF NETWORK PRINTER CONFIGURATION

**PROCEDURE:**

Print Management Step-by-Step Guide

**Windows Server 2003 R2**

Microsoft Corporation

Published: September 2005

### **Step-by-Step Guide for Print Management**

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#### ***Requirements for Print Management***

Here are some important notes about the requirements for Print Management and the print servers that you can monitor using Print Management:

- You can install Print Management only on computers running Windows Server 2003 R2.
- You can use Print Management to monitor printers that are on print servers running Microsoft® Windows® 2000 Server, Windows Server 2003, and Windows Server 2003 R2 operating systems.
- You can use Print Management to monitor multiple print servers at a time.

Print Management can display and install printer drivers on computers running the Microsoft® Windows NT® Server 4.0 operating system, but it cannot display printer drivers that are already installed. It is not possible to display forms on computers running Windows NT 4.0.

#### ***Security Requirements***

To take full advantage of Print Management, you must be logged on as an administrator or a member of the Administrators group on the print servers you are managing.

It is good practice for administrators to use an account with restrictive permissions to perform routine, non-administrative tasks and to use an account with broader permissions only when performing specific administrative tasks.

You can open Print Management and monitor any print server and printer without administrative privileges. However, you will be unable to perform certain functions such as adding and deleting printers and printer drivers.



### ***Steps for Deploying and Operating Print Management***

To deploy and operate Print Management, complete the following tasks:

#### **Step 1: Install Print Management**

Installing Print Management is accomplished by adding or updating the print server role. Note that the computer on which Print Management is installed does not need to be a print server. Do one of the following:

- If the print server role is not installed, perform the following procedure.

##### **To install the print server role**

1. Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **Manage Your Server**.
  2. Click **Add or remove a role**.
  3. In the Configure Your Server Wizard, click **Next** to get to the **Server Role** page.
  4. On the **Server Role** page, click **Print Server**, and then click **Next** twice. Follow the steps in the wizard to complete the installation.
- If you are running an earlier version of a Windows server operating system that has the print server role and at least one shared printer already installed, perform the following procedure.

##### **To update the print server role**

1. Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **Manage Your Server**.
2. Click **Update this role**.
3. In the Print Server Role Wizard, click **Next**.
4. Follow the steps in the wizard to complete the installation.

#### **Step 2: Open Print Management**

After you install both Windows Server 2003 R2 and Print Management, then open Print Management. If you want to use Print Management on a computer in another location by using Remote Desktop, the remote computer must have Windows Server 2003 R2 and Print Management installed.

##### **To open Print Management**

- Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **Print Management**.

### Step 3: Add and remove print servers

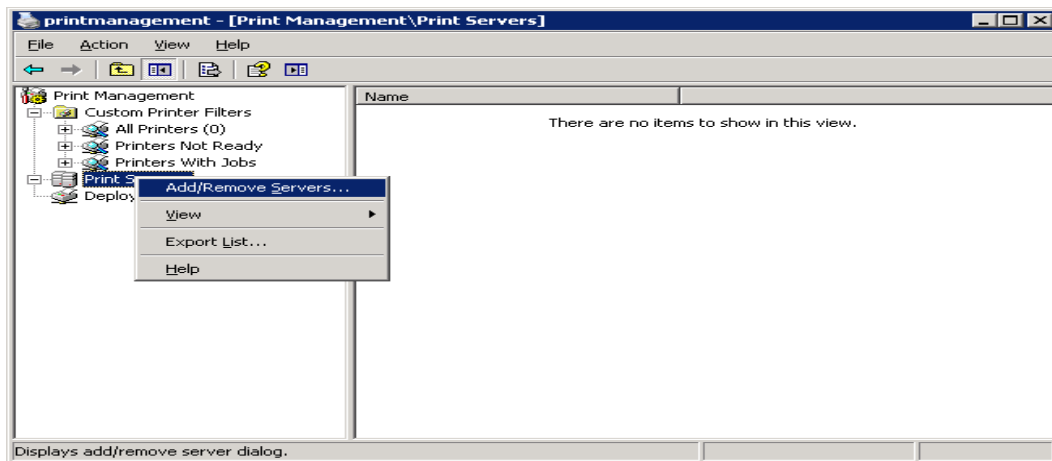
You can add both a local print server and network print servers to Print Management. Note that the computer on which Print Management is installed does not need to be a print server.

#### Adding a Print Server

If the server on which you use Print Management is also a print server and you want to manage the printers that it hosts by using Print Management, use the following procedure to add the print server to Print Management.

#### To add print servers to Print Management

1. In the Print Management tree, right-click **Print Management**, and then click **Add/Remove Servers**.



2. In the **Add/Remove Servers** dialog box, under **Specify print server**, in **Add server**, do one of the following:
  - Type the name.
  - Click **Browse** to locate and select the print server.
3. Click **Add to List**.
4. Add as many print servers as you want, and then click **OK**.

#### Note

You can add the local server on which you are working by clicking **Add the Local Server**.

#### To remove print servers from Print Management

1. In the Print Management tree, right-click **Print Management**, and then click **Add/Remove Servers**.
2. In the **Add/Remove Servers** dialog box, under **Print servers**, select one or more servers, and click **Remove**.

### Step 3: View Printers

The Print Management tree contains three places where printer information is stored: **Custom Printer Filters**, **Print Servers**, and **Deployed Printers**. The **Custom Printer Filters** folder contains the **All Printers** object, which contains a dynamic view of all of the printers on all of the servers available for managing by Print Management. All of the custom views, or filters, of printers that you create are stored in **Custom Printer Filters**.

The network printer servers that you add are stored in **Print Servers**. Every printer server automatically is given four objects that serve as filters for information about a server:

- Drivers
- Forms
- Ports
- Printers

To quickly access the **Print Server Properties** dialog box, right-click the **Drivers**, **Forms**, or **Ports** objects, and then click **Manage Drivers**, **Manage Forms**, or **Manage Ports**.

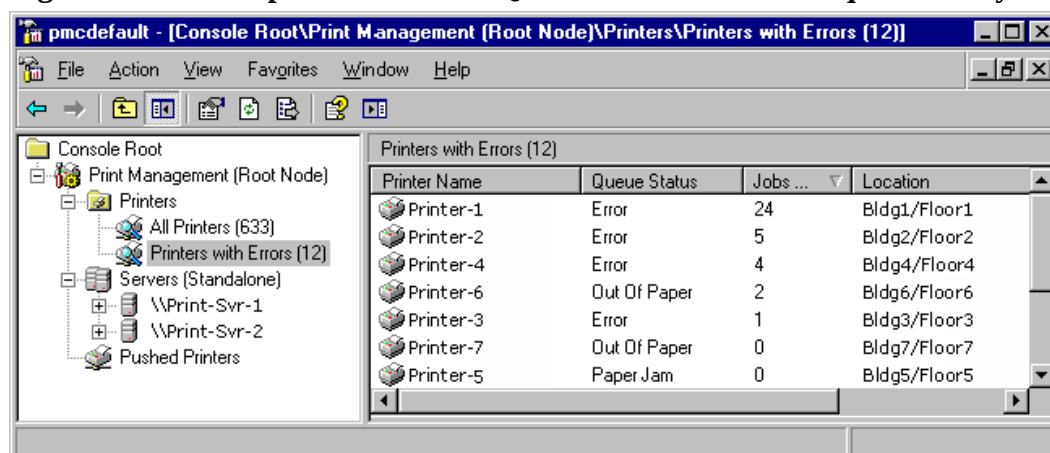
### Offline Print Servers

If a server goes offline, the printer server icon will change. You will be able to unable to manage the Drivers, Forms, Ports, and Printers objects until the server comes back online.

### Printer Details

The details for each printer display in the results pane of the snap-in console. The results pane contains columns with values such as the printer name, queue status, jobs in the queue, printer location, and driver version. You can add and remove columns to show only certain characteristics of the printers, and you can filter among all the print servers in your organization to display only printers with specific criteria in the columns. Figure 1 shows both a filtered view and the resulting columns.

In any view, you can sort on one criterion by clicking on the heading of one of the columns.

**Figure 1 A view of printers where "Queue Status" does not equal "Ready"**

You can also show an extended view, which shows more detail about the queue and provides access to the printer's Web page, if one is available. You can add, remove, and sort columns in extended view.

#### Step 4: Manage Printers

##### Automatically Installing Printers to the Local Print Server

As the administrator on the local print server, you can add and remove printers. Print Management can automatically detect all printers located on the same subnet as the print server, install the appropriate printer drivers, set up the queues, and share the printers. Unless a printer driver cannot be found, no intervention is needed.

You need to have administrator permissions on the computer where the printers will be added.

If you want to automatically detect printers for a branch office or another location beyond the subnet of your server, use Remote Desktop to log on to the remote print server and start the process from that computer. You need to have administrator permissions on the computer where the printers will be added. Once you connect to the remote server by using Remote Desktop, you can search for network printers by starting Print Management or by running `\windows\pmcsnap\fnprinters.exe` from the command line.

##### To add network printers to the local printer server automatically

- In the Print Management tree, right-click *ServerName (local)*, click **Automatically Add Network Printers**, and then click **Start** to automatically locate and install printers found on this server's local subnet.

**Note :** You may be prompted to specify which driver you want to install for a printer, but otherwise, the process is automatic.

## Updating Device Drivers

Printer driver details are shown separately for each server that you have added to the Print Management snap-in console. By default, the driver name, driver version, environment, and provider columns are visible. You can add columns to show more details such as the config file path, data file path, default datatype, driver file path, manufacturer, and so on.

You can export the list of details to a text file for use outside of Print Management.

## To manage device drivers

1. In the Print Management tree, under the appropriate print server, right-click **Drivers**, and then click **Manage Drivers**.
2. Do one or more of the following:
  - To add a printer driver, click **Add**, and then complete the **Add Printer Driver Wizard**.
  - To remove a printer driver, select a driver from the list, and then click **Remove**.
  - To reinstall a printer driver, select a driver, and then click **Reinstall**.
  - To view the details for a printer driver, select the driver, and then click **Properties**.

## Listing and Removing Printers in Active Directory

Listing printers in the Active Directory® directory service makes it easier for users to locate and install printers. After you install printers on a printer server, you can use Print Management to list them in Active Directory.

In fact, you can list more than one printer simultaneously. You may want to set up a filter to show all of the printers to list or remove, so that you can easily select all of the printers at the same time.

## To list or remove printers in Active Directory

1. In the Print Management tree, under the appropriate print server, click **Printers**.
2. In the results pane, right-click the printer you want to list or remove from the directory service, and then click **List in Directory** or **Remove from Directory**.

## Exporting a List of Printers and Displayed Columns

You can export a text file containing the data available on any **Printers** object, which includes the currently displayed columns.

### **To export a list of printers**

1. In the Print Management tree, under the appropriate print server, right-click **Printers**, then click **Export List**.
2. In the **Export List** dialog box, in **File name**, type the name of the file, and then click **Save**.

### **Printing a Test Page**

You can quickly print a test page from any printer in your organization. This is helpful for testing a printer, particularly when you are not in the same building.

### **To print a test page**

1. In the Print Management tree, click the appropriate print server.
2. In the results pane, right-click the printer for which you want a test page, and then click **Print Test Page**.

### **Step 5: Troubleshoot Print Management**

If you are using a firewall with Print Management, some or all of the printers on a network print server may not be displayed. To solve the problem, add File and Printer Sharing to the list of exceptions in the firewall software configuration. For example, in Windows Firewall the setting is on the **Exceptions** tab.

### **To display all of the printers on a network print server when using a firewall**

1. Once File and Printer Sharing has been added, click **Edit**.
2. In the **Edit a Service** dialog box, click **Change scope**.
3. In the **Change Scope** dialog box, select **Any computer (including those on the Internet)**.

**EXPERIMENT-13**

**AIM:**STUDY OF VIRTUAL BOX

**EXPERIMENT-14**

**AIM:** STUDY of PRINTERS



## References

### Websites

- [www.novopc.com](http://www.novopc.com)
- [www.microsoft.com](http://www.microsoft.com)
- [www.centos.org](http://www.centos.org)
- [www.edrawsoft.com](http://www.edrawsoft.com)