OPERATING SYSTEM

FOR

DIT

PART I

and

New Syllabus of DIT

Khyber Pakhtunkhwa Board of Technical Education

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PREFACE

Computers are general-purpose electronic device to help in data storage, processing and communication of information. Modern computers can process information not only in text form but also in graphic, audio or video form. Today, they have found their way into application areas that were not feasible twenty years ago. Revolutionary changes have occurred in the field of information technology during this period.

This first edition of the Operating has been written according to the new syllabus for D.IT-I. It presents an introduction to Operating it also includes a practical introduction to Operating System..

I hope this book will not only benefit the students but also the teachers and all other users in a better way for learning about computers and other fields of information technology.

M. Khalid Khan.

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I am grateful to all, for their valuable prefatory remarks they expressed about this book.

M. Khalid Khan

Part-1/ First Semester **Diploma in information Technology**

OPERATIONG SYSTEM.

(PAPER-I)

Total Th Hrs 40
Total Th Mks 50

Total Pr Hrs 80
Total Pr. Mks 100

OBJECTIVES

- Understanding Desktop Operating System and Server Operating System.
- Understanding the role of Operating System in computing environment.
- Hands on practice on Windows 7, Windows 2008 Server and Linux.
- Networking Features in Operating System.

COURSE CONTENTS

General

What is an Operating System and its role in the Computing environment? Major parts of Operating System.Classification of Operating System. (1-6)

- Desktop Vs Server base Operating System. 6-7

Scheduling, Deadlock 8-11

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- Configure file access and printers on a Windows 7 client computer. 22
- Configure network connectivity on a windows 7 client 35

Reference Books / Helping Material

1. DIT-I by Mohammad Khalid.
2. Operating System concept by William stalling.
3. Operating System by Andrew S.Tanenbaum.

Q) WHAT IS OPERATING SYSTEM?

Ans: Operating System is a group of program that controls all the operation of computer system and its components. An operating system is an integrated set of specialized programs that is used to manage the resources and overall operation of a computer. A computer can do nothing with out operating system. Operating System must be installed on every computer. User interacts with computer through Operating System. When computer is turned on, the operating system runs and checks that all parts of the computer are functioning properly. Operating system manages all operation on computer after loading.

Some popular operating system is IBM PC-DOS, MS-DOS, UNIX, XENIX, LINUX, WINDOWS-98, WINDOWS-2000, OS/2, and WINDOWS-XP.

TYPES OF OPERATING SYSTEM.

Operating system is classified according to the following criteria's.

1-Single User Operating System .2- Multi User Operating System.

i. SINGLE USER OPERATING SYSTEM.

Single User Operating system allows only one user to use the system. For Micro-computer single user operating system offer the following function.

1- Initialization of System in which the OS must have initial loader program to initialize the system properly

2- **File Management** An operating system contains file management programs that control the creation, deletion, and access of files of data and program

3-Memory management. In type of operating system, this memory management is simple, as only one application is executed at one time. If there is anther application to be run the previous is remove from the memory.

4- Input Output management: I/O management in this type of O.S is more simpler as compare to other because one I/O device is made active at a time.

ii. MULTI USER OPERATING SYSTEM.

Multi . User Operating system allow more then one,user at a time to use the system.

The function provide by OS are:-

1- Initialization.

Initialization is more complex than single user operating system because it is possible that more than one computer be initialized by server.

2- File Management.

File Management is more complex in this case because a file maybe access or shared by more than one user. If a user is using currently a file and another user also trying to access this file than it is duty of operating system to lock the file for other user and also set Security (permissions) on file also share a file to available it on Network

3- Memory management

available memory of server is divided among different user the rest of memory management is the same as the single OS. It also uses a technique called paging to allow your computer to run more programs than its physical memory by storing memory pages not currently in use on a mass storage device called virtual memory

4- Input Output Management.

It is also complex because more than one devices manage by OS

5-Resource Management

Resources (Printer, CD Drive, Floppy Drive etc are available to all user on network)these Device can be share to access from other computer.

6- Process Management. In multi-user operating system more then one application are executed at a time this capability is called multitasking.

7- Processor Management. In multi-user operating system more then one user connected to the system. Hence the processing speed must be fast to manage all user requests. For this reason a system must have more the one processor. multi-user system has capability to manage all these processors.

8- Communication Management

In multi-user operating system one computer is connected with more then one systems. Hence it has capability to create new user, groups and assign Passwords, and permissions.

III- TIME –SHARED SYSTEM:-

It usually consists of a "dump" type terminal connected by data lines to a centralized Micro-Computer based system that controls all operations.

Q) EXPLAIN DIFFERENT FUNCTION OF OPERATING SYSTEM FUNCTIONS

An OS performs the following basic functions in the operation of computer system:

Booting

Booting is a process of starting the computer. Operating system the computer to work. It checks the computer and makes it ready to work. There are two type of booting

- **Cold Boot:** When computer is turned on by on/off button it is called cold boot.
- **Warm Boot:** When computer is restarted, it is called warm boot.

The User Interface. User interface is used to interact with computer. User interface controls how you enter data and instructions and how information is displayed on the screen. Three main types of user interfaces

- **Command-driven:-** In command-line user interface the user enter data and instructions by typing keyword or pressing special keys on keyboard.
- **Menu-Driven interface:** In menu-driven interface, the user enter data and instruction by using menu. It is easier to use.
- **Graphical User Interface:** graphical user interface is a visual environment that is used by the user to communicate with computer. It uses windows, icon,, menu and other graphical objects to issue commands.

The trend towards an easy-to-use graphical user interface (GUI), which uses icon, bars, button, boxes and images. GUI applies by the pointing devices like the electronic mouse etc.

Resource Management. An operating system uses a variety of resource management programs to manage the hardware and networking resources of a computer system, including its CPU, memory, secondary storage devices, telecommunications processors and input/output peripherals. For example, management programs keep track of where data and programs are stored.

Memory Management: Memory management is a process of optimizing the use of main memory. RAM is used to store data and instructions temporarily during execution. Operating system allocates memory area to different programs. The allocated memory area is de-allocated when the program finishes.

File Management. An operating system contains file management programs that control the creation, deletion, and access of files of data and program. File management also keeping track of the physical location of files on magnetic disks and other secondary storage devices.

Task management/Job scheduling. The task management programs of an operating system manage the completion of the job of end users. They give each task a slice of a CPU's time and interrupt the CPU operations to substitute other tasks. Task management may involve a multitasking capability where several computing tasks can occur at the same time.

New microcomputer operating system and most minicomputer and mainframe operating systems provide a multitasking capability. With multitasking, end user can do two or more operation (e. keyboard and printing) or use of application (e.g Ms-Word, Excel) concurrently, that is at the same time.

A single CPU can run a number of programs at the same time. The numbers of program that can be run concurrently depend on the amount of memory that is available and the amount of processing each job demands. That is because a microprocessor (or CPU) can become overloaded with too many jobs and provide unacceptably slow response. Multitasking allow end user to easily switch from one application to another.

Monitoring Performance

Operating system also monitors the performance of the computer. A performance monitor is a program that checks and reports information about different systems resources and devices. For example it monitors the processor, disk, memory, and network.

Accessing the Web

Operating system provides the facility to connect to the Web. It guides the user to set up a connection between computer and

Internet Service Providers. Some operating system provides the facilities of Web browser and email program.

Administering Security

Operating system manages the security of computer system as well as data and program stored on it . Security is normally maintained by using UserID and passwords.

Device Controlling

Operating system controls all devices attached to the computer. The hardware devices are controlled with the help of small software called device drivers.

Q) EXPLAIN POPULAR OPERATING SYSTEM

Ans:- Earlier, many operating system were device-dependent. A type of software that runs only on a specific type computer is called device-dependent.

There are generally two categories of operating systems.

1- Stand-alone operating systems

An operating system that works on desktop or notebook computer is called stand-alone operating system. Some example of stand alone operating system are DOS, Windows 95, Windows NT Workstation, Windows Me and Windows XP Home Edition etc.

DOS

DOS stand for Disk operating System. It was develop by Microsoft in early 1980s for personal computers. It is a single-user, single-tasking operating system.

Windows 95, 98, Me

In 1995 Microsoft introduce Windows 95 operating system, includes the feature of Graphical User Interface. Windows 95 are multitasking, networking, multimedia, and many other capabilities operating system. Microsoft introduced an enhanced Windows 98 version during 1998, Windows Me (millennium Edition) in 2000

Windows XP

Windows XP is a product of Microsoft Corporation. It was released in 2001. XP stand for experience. It is fastest and most reliable operating system. Three versions of Windows XP are Windows XP Home Edition, Windows XP Professional and Windows XP Server.

MAC

Macintosh operating system is a product of Apple. It was one of the first successful GUI. It was release with Macintosh computer in 1984. The latest version of this operating system is called Mac OS X.

2- NETWORK OPERATING SYSTEM.

An operating System that supports network is called network operating system. It normally works on a server. Some example of network operating system are Windows NT Server, Windows 2000 Server, Netware, Unix, Linux and Solaris.

NETWARE

Novell's Netware is network operating systems. It is designed for client/server networks.

WINDOWS NT SERVER

Microsoft introduced its Windows NT (New Technology) operating system in 1995.

It is designed for client/server networks. The server in the network uses Windows NT Server. The client computer use Windows NT Workstation.

UNIX

UNIX is multitasking, network operating system. It was developed in early 1970s at bell laboratories. Many version of this operating system are available. It uses command driven interface.

LINUX

Linux is free, multitasking and network operating system. It was developed in 1991. Some version of Linux use command-line interface and other GUI.

SOLARIS

Solaris is version of UNIX operating system. It was developed by Sun Microsystems. It is network operating system designed for e-commerce applications.

5- SCHEDULING.

The Allocation of CPU time (Resources) to different jobs to be process on the computer is called scheduling and the module of operating system which handle this task is called scheduler. The Scheduler arrange jobs in the sequences base in the priority. In the time sharing system all the resources of computer system are share among the different user, as CPU is one of the primary computer resource so the sharing of CPU time among different user (Jobs) is term as scheduling.

The Scheduler has to make decision that which process should be given CPU time when and how much.

SCHEDULER ALGORITHM.

The following are well know scheduler algorithm .

Non-Preemptive Algorithm.

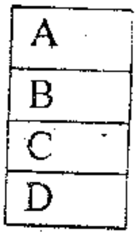
i. FIFOii. LIFO. iii. SJF

Preemptive Algorithm.

i. SJN ii RR

a). NON-PREEMPTIVE ALGORITHM

In this strategy when a process is assign to CPU will not swapped (stopped or Blocked) before its completion

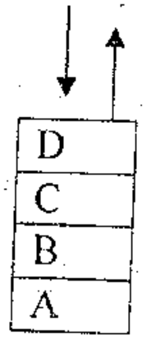


a.i. FIFO. (First in first out)

In this algorithm all the incoming jobs are placed in Queue and are proceed one by one at first come first out.

a.ii LIFO (Last in First out)

In this Strategy incoming jobs are placed in a stack and CPU is assigned to job which is at the top of the stack. However it is a scheduler algorithm but it is not actually applied.



a.iii SJF (Shortest Job First).

According to this algorithm first of all, all active process are stored according to their size and shortest job are arranged high priority it means that a job require less memory will be given high priority.

When CPU is executing some processes, at the same time a new process arrived. All the remaining processes again arranged according to the size.

b. PRE-EMPTIVE ALGORITHM.

In this strategy when a process is assign to CPU can be swapped (stopped) before its completion and new process is assign to CPU.

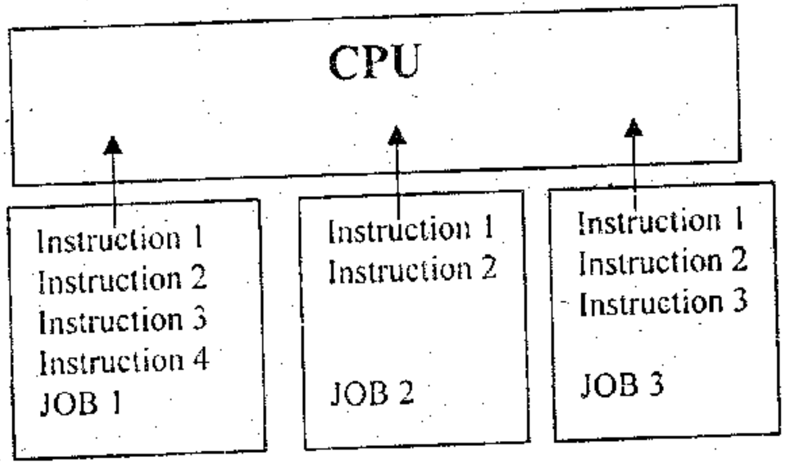
b.i SJN (Shortest job next)

In this strategy all the process are arranged according to their size from the smaller to larger and highest priority is assigned to the smaller process. Suppose a process is assign to processor a new job arrived. If the remaining portion of current job less then the new. Then current process will be swapped from

CPU (block state) and new process assign to processor (running State)

b.ii RR (Round Robbins algorithm)

In this scheduling method the process are dispatched FIFO and no priority is assigned to any job, all the active job are given a limited amount of CPU time called a time slice or quantum's. If a process doesn't complete before it CPU time expire, then this process is preemptive and CPU given to the next waiting process. The preempted process is placed at the back of ready list.



Dead Lock

A deadlock is a situation where in two or more competing actions is each waiting for the other to finish, and thus neither ever does. In an operating system, a deadlock is a situation which occurs when a process enters a waiting state because a resource requested by it is being held by another waiting process, which in turn is waiting for another resource. If a process is unable to change its state indefinitely because the resources requested by it are being used by other waiting process, then the system is said to be in a deadlock.

Deadlock is a common problem in multiprocessing systems, parallel computing and distributed systems, where software and hardware locks are used to handle shared resources and implement process synchronization.

Necessary conditions

A deadlock situation can arise only if all of the following conditions hold simultaneously in a system:

1. **Mutual Exclusion:** At least one resource must be non-shareable. Only one process can use the resource at any given instant of time.

2. **Hold and Wait or Resource Holding:** A process is currently holding at least one resource and requesting additional resources which are being held by other processes.

3.**No Preemption:** The operating system must not de-allocate resources once they have been allocated; they must be released by the holding process voluntarily.
4.**Circular Wait:** A process must be waiting for a resource which is being held by another process, which in turn is waiting for the first process to release the resource. In general, there is a set of waiting processes, P = {P1, P2, ..., PN}, such that P1 is waiting for a resource held by P2, P2 is waiting for a resource held by P3 and so on till PN is waiting for a resource held by P1.

DEADLOCK HANDLING

Most current operating systems cannot prevent a deadlock from occurring. When a deadlock occurs, different operating systems respond to them in different non-standard manners. Major approaches are as follows.

1. Ignoring deadlock

In this approach, it is assumed that a deadlock will never occur. This is also called the Ostrich algorithm. This approach was initially used by MINIX and UNIX. This is used when the time intervals between occurrences of deadlocks is large and the data loss incurred each time is tolerable. It is avoided in very critical systems.

2. Detection

Under deadlock detection, deadlocks are allowed to occur. Then the state of the system is examined to detect that a deadlock has occurred and subsequently it is corrected. An algorithm is employed that tracks resource allocation and process states, it rolls back and restarts one or more of the processes in order to remove the detected deadlock. Detecting a deadlock that has already occurred is easily possible since the resources that each process has locked and/or currently requested are known to the resource scheduler of the operating system

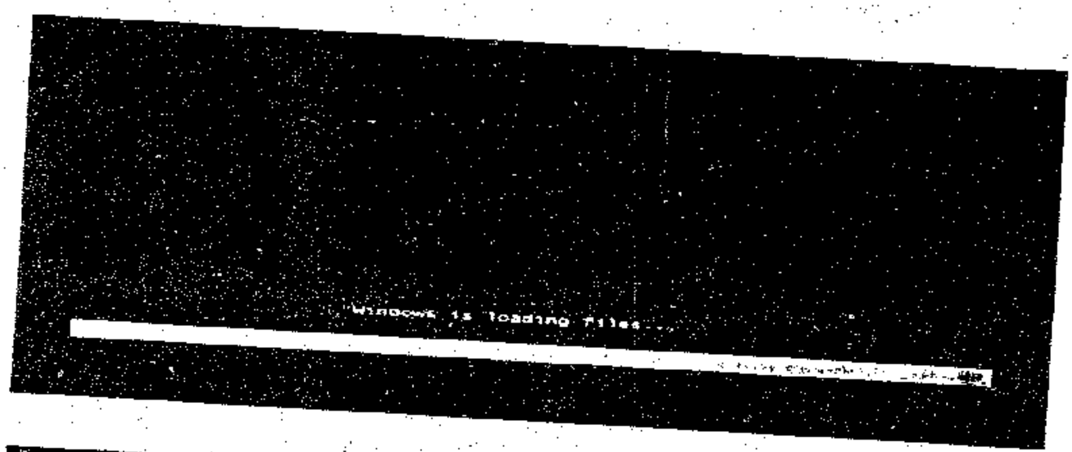
3. Avoidance

Deadlock can be avoided if certain information about processes are available to the operating system before allocation of resources, such as which resources a process will consume in its lifetime. For every resource request, the system sees if granting the request will mean that the system will enter an unsafe state, meaning a state that could result in deadlock. The system then only grants requests that will lead to safe states. In order for the system to be able to determine whether the next state will be safe or unsafe, it must know in advance at any time:

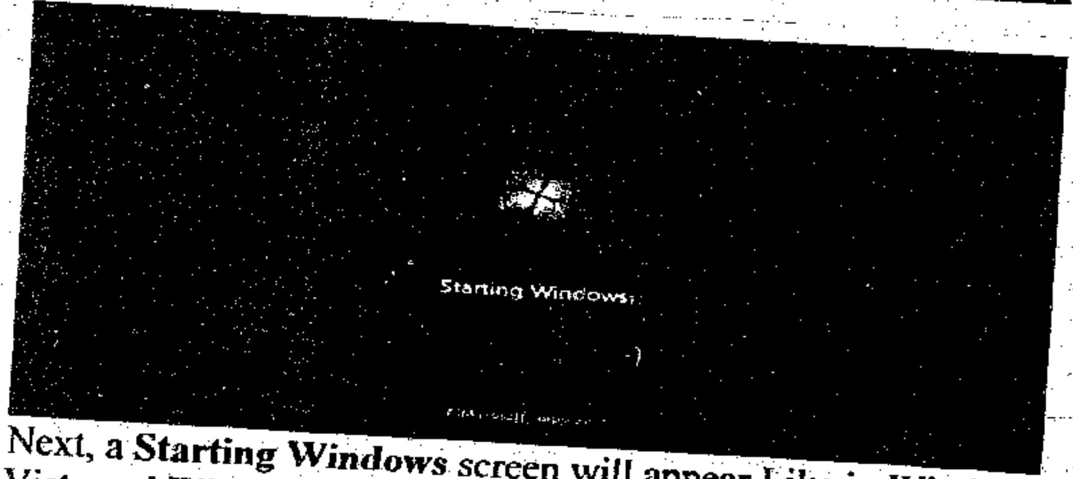
- resources currently available
- resources currently allocated to each process
- resources that will be required and released by these processes in the future

Installing Windows 7

When installing on a physical computer insert your Windows 7 DVD media into your DVD drive and reboot your computer. If you're asked to press a key to boot from DVD or CD, press any key. A black window will appear momentarily while the DVD content is read.



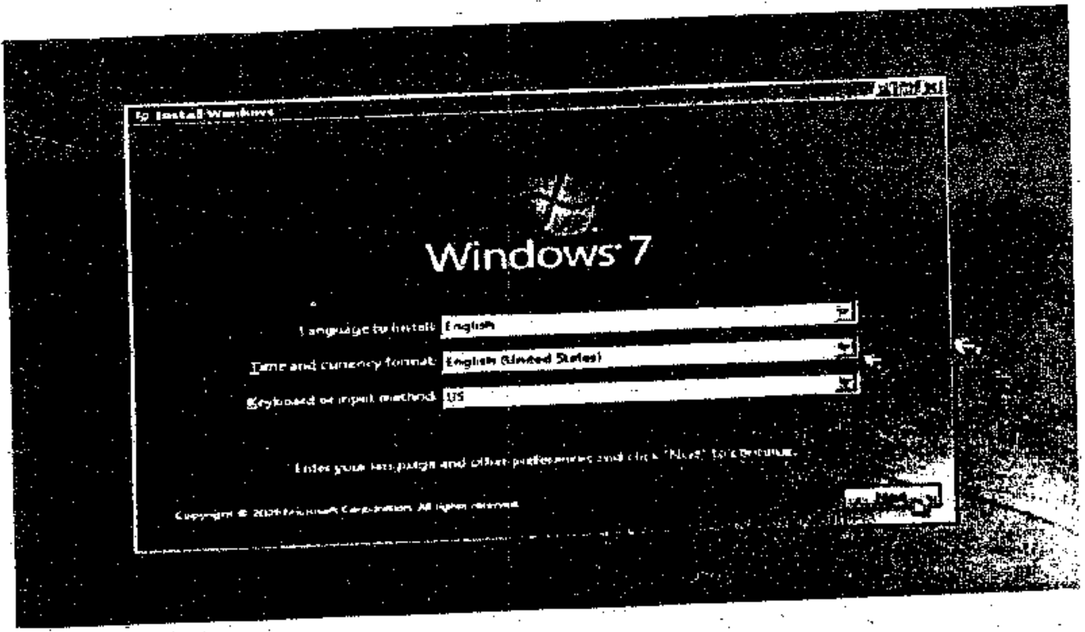
Windows is loading files...



Starting Windows

Next, a **Starting Windows** screen will appear.Like in Windows Vista and Windows Server 2008, and unlike previous versions of Windows, Windows 7 does not have a noticeable text phase of the setup process, and it will boot directly into the Graphical User Interface (GUI) mode.

After a few moments you will see the first prompt:



Language to install: English

Time and currency format: English (United States)

Keyboard or input method: US

Enter your language and other preferences and click "Next" to continue.

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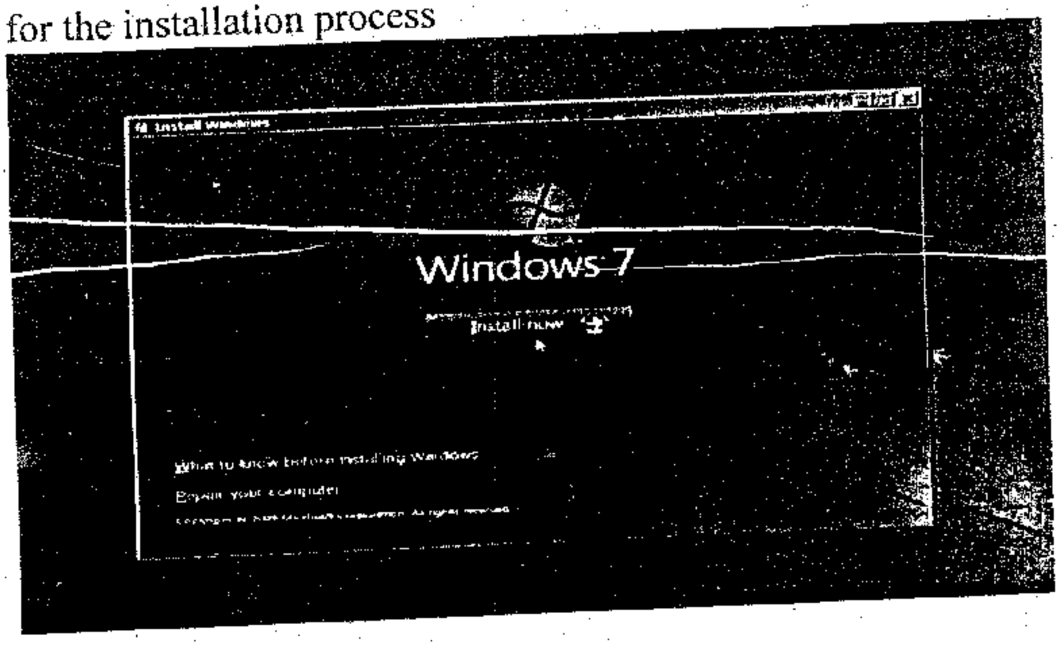
Click "Next" unless you want to change some regional settings for the installation process



What to know before installing Windows

Repair your computer

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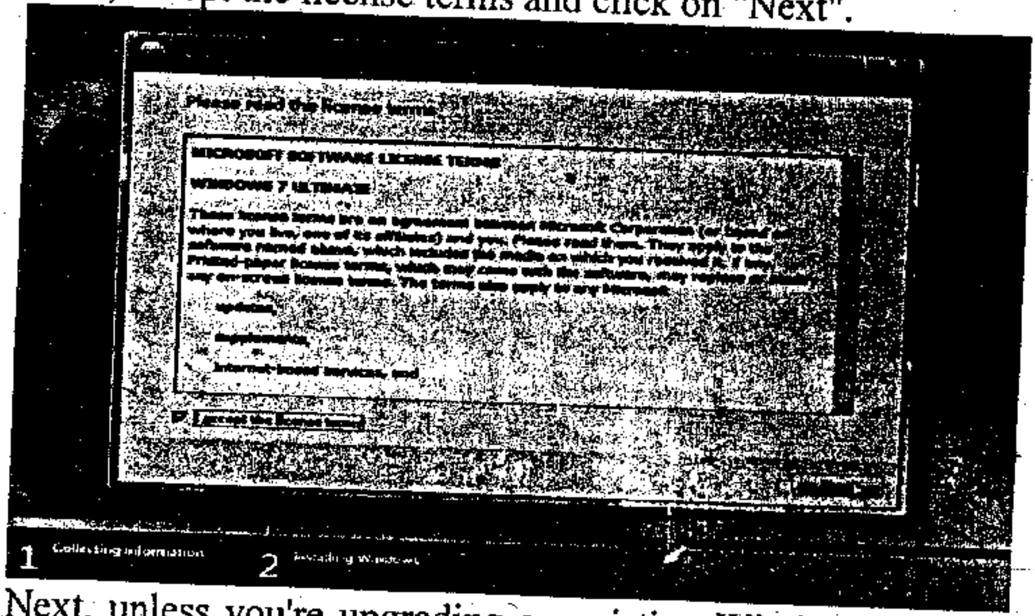
Click on the "Install now" button.

Next, accept the license terms and click on "Next".



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WINDOWS 7 ULTIMATE

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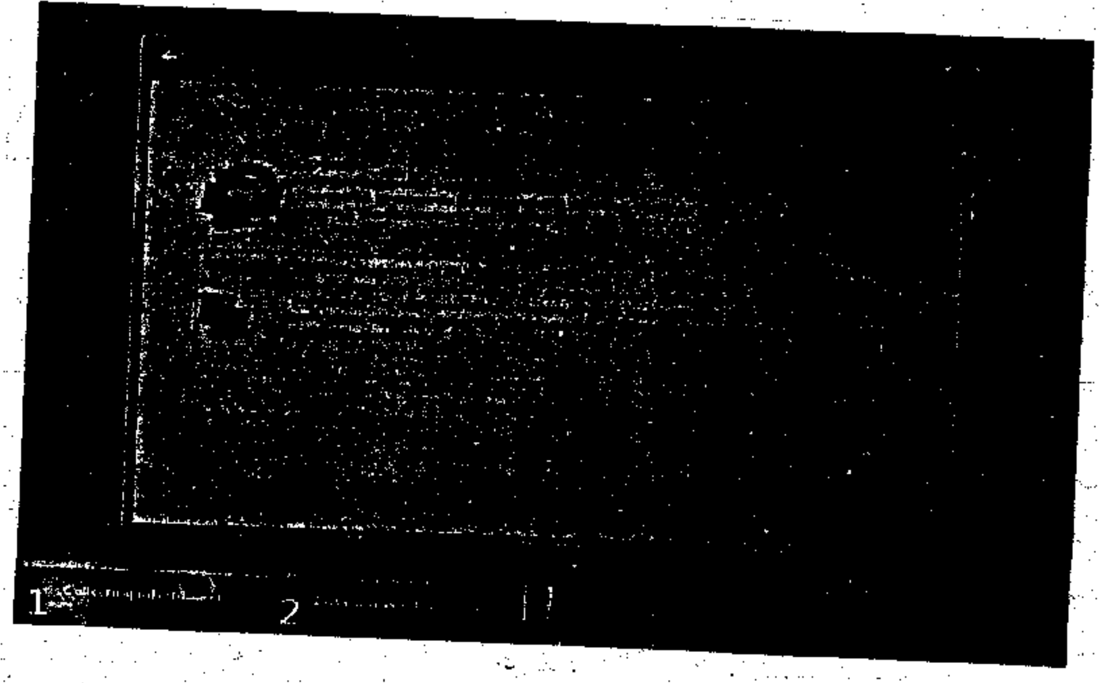
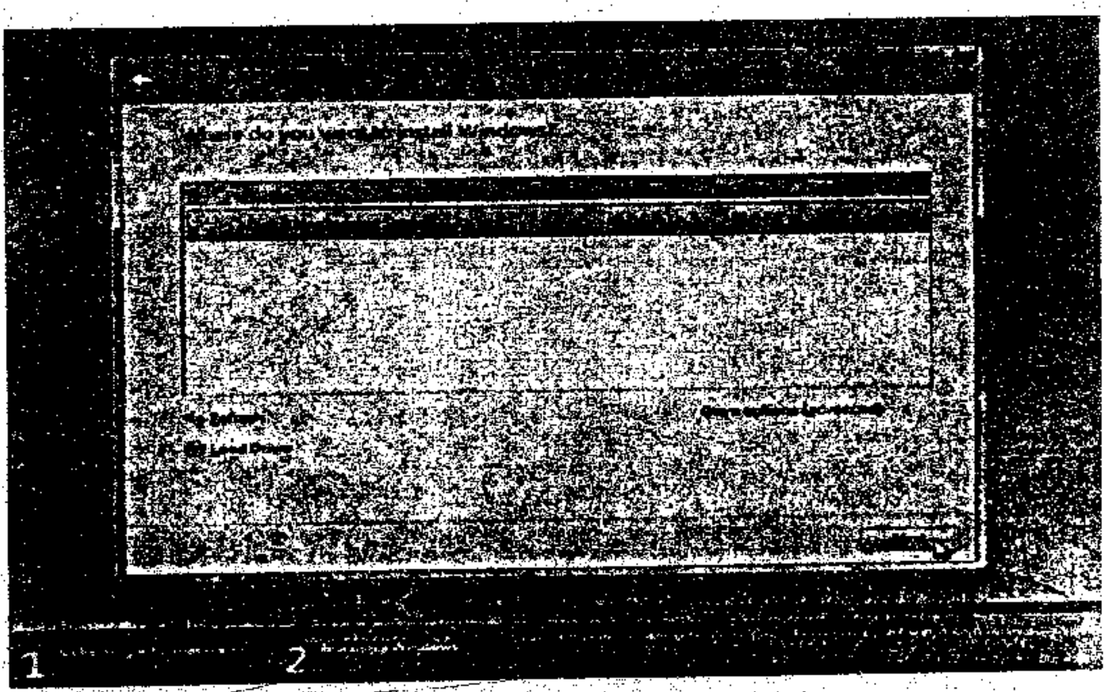
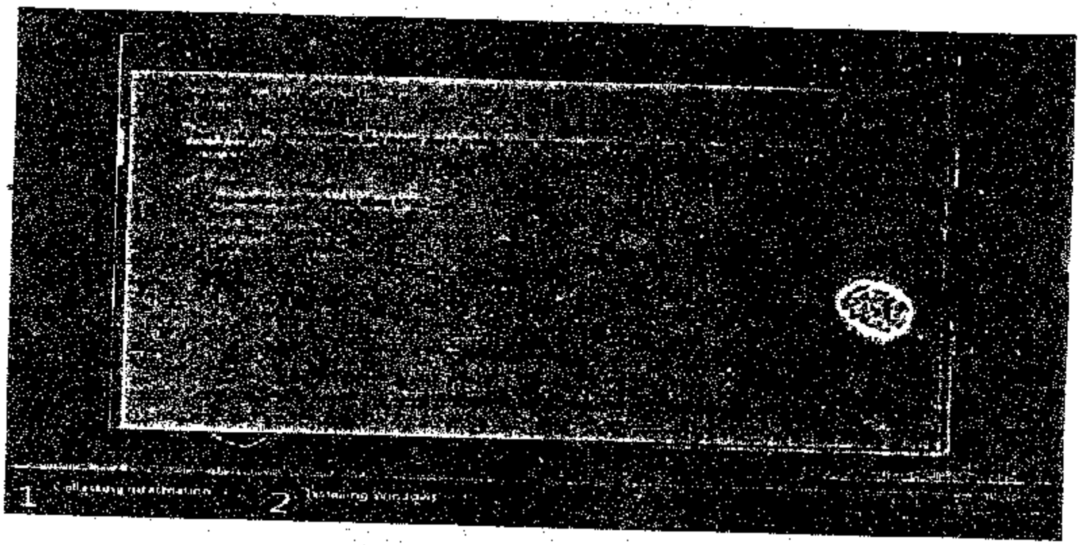
Next, unless you're upgrading an existing Windows installation, press the Custom (Advanced) installation type button. Note that in this case, the Upgrade button is disabled because this specific installation if performed on a new computer without any previous operating system on it.



The next phase is to pick the installation partition. Since this computer has a new hard disk that hasn't been formatted before, you will only have the option to create a new partition on it. If you don't want to specify a specific partition to install Windows on, or create partitions on your hard disk, click Next to begin the installation. If you already have another existing partition with enough free space and want to install the Windows 7 on that partition to create a multiboot configuration, select the partition you want to use, and then click Next to begin the installation. If you want to create, extend, delete, or format a partition, click Drive options (advanced), click the option you want, and then follow the instructions. Since I don't need to perform any additional task I will just click on the "Next" button. The installation process will then create a partition on all the available disk space, and format it.

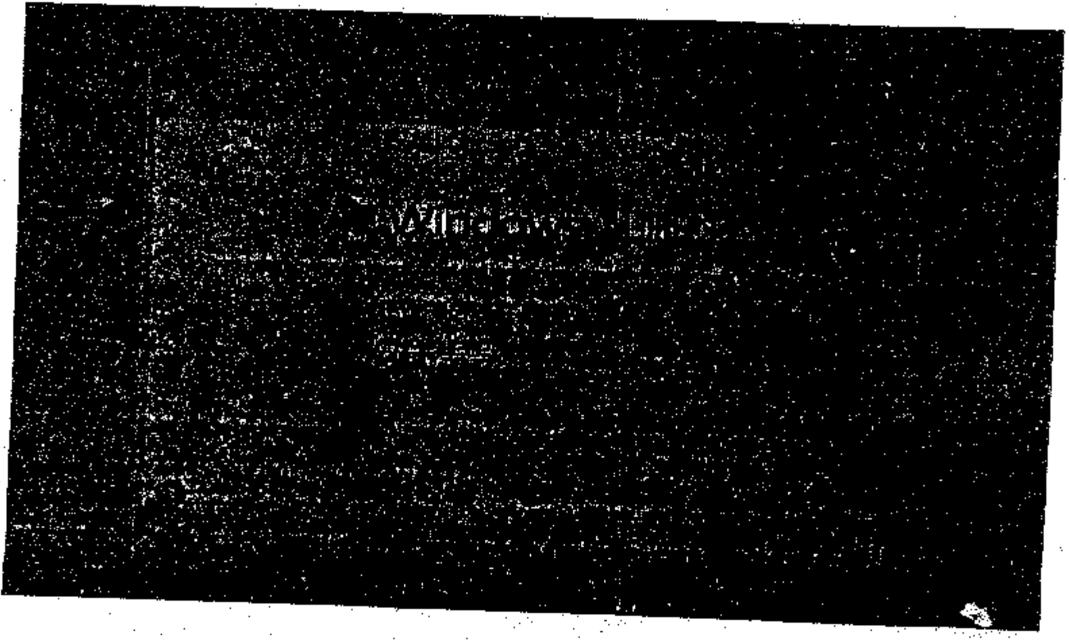


The setup process will now begin to copy files from the installation DVD media to the hard disk



The computer will reboot, and the next thing you'll see is the prompt to set the user's and computer's name. By default, the computer's name will be username-PC, where username is the username you've entered.

Click on "Next".



Create a New Partition on a Windows 7 Hard Disk

The Windows 7 Disk Management tool provides a simple interface for managing partitions and volumes.
Here's an easy way to create a new partition on your disk.

1. Open the Disk Management console by typing diskmgmt.msc at an elevated command prompt.
   In Disk Management's Graphical view, right-click an unallocated or free area, and then click New Simple Volume. This starts the New Simple Volume Wizard. (Note: If you need to create unallocated space, see the Tip Easily Shrink a Volume on a Windows 7 Disk for information on how to do this.)

2. Read the Welcome page and then click Next.

3. The Specify Volume Size page specifies the minimum and maximum size for the volume in megabytes and lets you size the volume within these limits. Size the partition in megabytes using the Simple Volume Size field and then click Next.

4. On the Assign Drive Letter Or Path page, specify whether you want to assign a drive letter or path and then click Next. The available options are as follows: Assign The Following Drive Letter Select an available drive letter in the selection list provided. By default, Windows 7 selects the lowest available drive letter and excludes reserved drive letters as well as those assigned to local disks or network drives.

5. Mount In The Following Empty NTFS Folder Choose this option to mount the partition in an empty NTFS folder. You must then type the path to an existing folder

or click Browse to search for or create a folder to use. Do Not Assign A Drive Letter Or Drive Path Choose this option if you want to create the partition without assigning a drive letter or path. Later, if you want the partition to be available for storage, you can assign a drive letter or path at that time.

6. Use the Format Partition page to determine whether and how the volume should be formatted. If you want to format the volume, choose Format This Volume With The Following Settings, and then configure the following options:

File System Sets the file system type as FAT, FAT32, or NTFS. NTFS is selected by default in most cases. If you create a file system as FAT or FAT32, you can later convert it to NTFS by using the Convert utility. You can't, however, convert NTFS partitions to FAT or FAT32.

Allocation Unit Size Sets the cluster size for the file system. This is the basic unit in which disk space is allocated. The default allocation unit size is based on the size of the volume and, by default, is set dynamically prior to formatting. To override this feature, you can set the allocation unit size to a specific value. If you use many small files, you might want to use a smaller cluster size, such as 512 or 1,024 bytes. With these settings, small files use less disk space. Volume Label Sets a text label for the partition. This label is the partition's volume name and by default is set to New Volume. You can change the volume label at any time by right-clicking the volume in Windows Explorer, choosing Properties, and typing a new value in the Label field provided on the General tab.

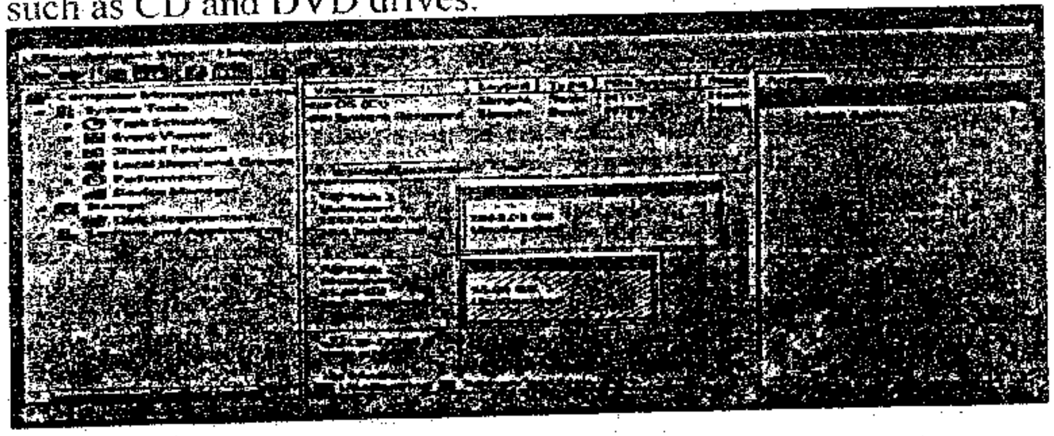
7. Perform A Quick Format Tells Windows 7 to format without checking the partition for errors. With large partitions, this option can save you a few minutes. However, it's usually better to check for errors, which enables Disk Management to mark bad sectors on the disk and lock the mount.

8. Enable File And Folder Compression Turns on compression for the disk. Built-in compression is available only for NTFS. Under NTFS, compression is transparent to users and compressed files can be accessed just like regular files. If you select this option, files and directories on this drive are compressed automatically.

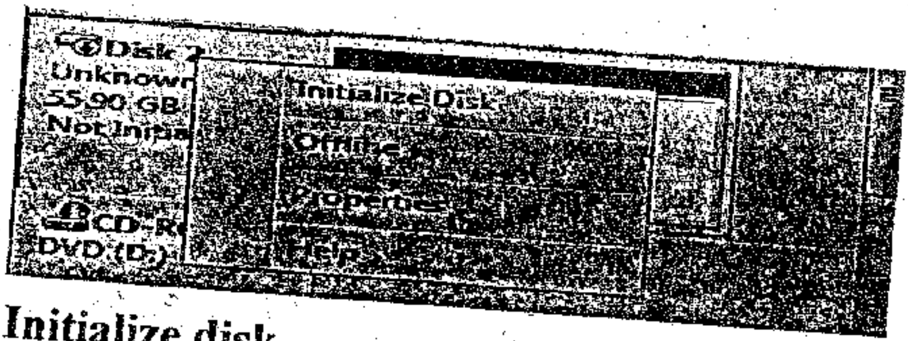
9. Click Next, confirm your options, and then click Finish.

How To Configure A New Hard Drive In Windows 7.

In Windows 7 this is done with the Disk Management tool. The easiest way to load Disk Management is to press Windows-R, type disk management's and hit enter.Disk Management lists all connected drives. This can be drives that already have a file system, drives that have not been initialized yet and optical drives such as CD and DVD drives.



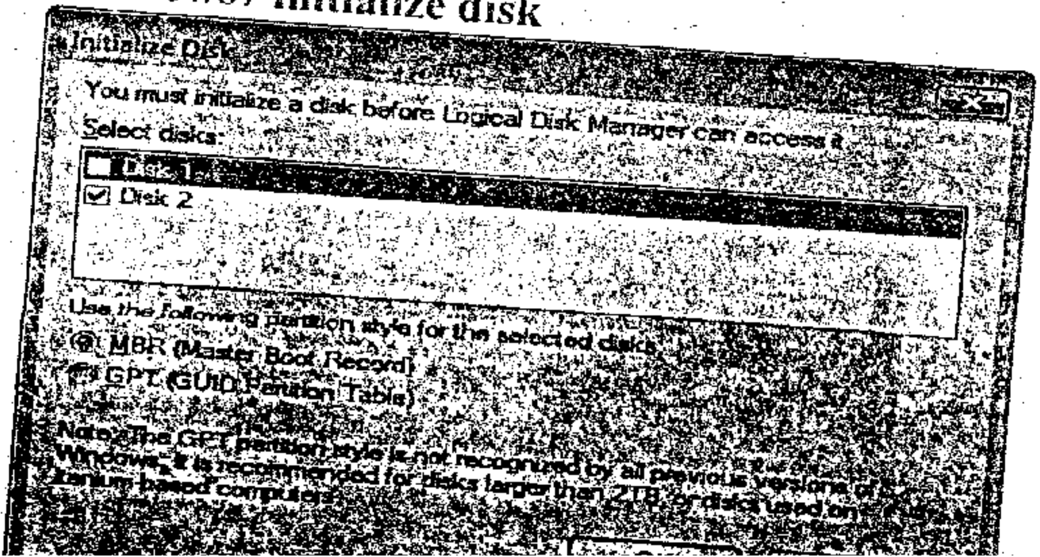
The most important part of the following operation is to pick the right drive. The easiest way to find the new drive in the drive listing is to find the drive with the right storage space. In his case, it was relatively easy as he bought a new 60 Gigabyte Solid State .Drive.The drive needs to be initialized; this is done by selecting it in the drive listing, right-clicking afterwards and clicking Initialize Disk from the context menu.



Initialize disk

It is now important to select the right disk from the menu. Important because there may be multiple disks that are not initialized. Disks can be unselected from the menu. It is usually sufficient to select the MBR partition style, unless the disk that needs to be initialized is larger than 2 Terabytes or is used on Itanium based computers.

Windows7 initialize disk



Initialize Disk

You must initialize a disk before Logical Disk Manager can access it.

Select disks:

☐ Disk 1
☑ Disk 2

Use the following partition style for the selected disks:

● MBR (Master Boot Record)
○ GPT (GUID Partition Table)

Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium based computers.

Thc process takes a few seconds the most, and the status of the disk should change from Not Initialized to Onlinc. The drive space on the other hand is still shown as unallocated. This is because no file system has been selected yet for the drive.
The drive can be formatted by right-clicking on the Unallocated space in Disk Management, and selecting New Simple Volume. There arc other options but those are usually for more advanced uses.
Thc operating system will then walk the user through setting up the hard drive so that it can be accessed in Windows.
Thc first step is to select the volume size for the drive, which usually should be the maximum size available unless the drive should be partitioned. After that a drive letter can be selected for the new hard drive, so that it becomes accessible in Windows 7.
In the last step, the file system can be selected. It is NTFS by default and it is usually not required to make any changes here. It may make sense however to change the volume label for better identification of the drive in Windows.
The formatting should not take long and the drive becomes available right after the operation ends.

DEVICES AND PRINTERS IN WINDOWS 7

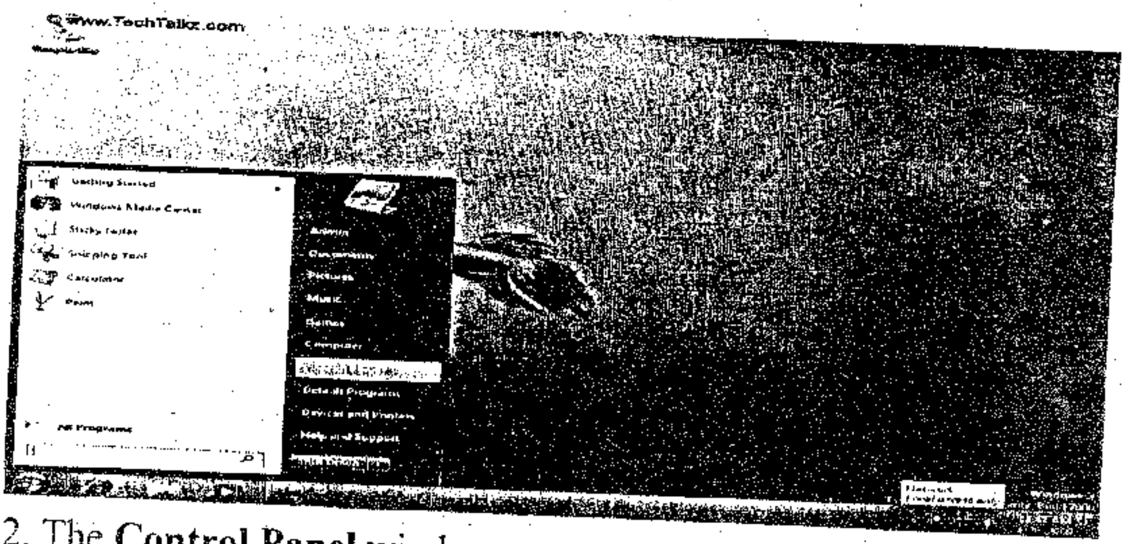
The **Devices and Printers** folder **displays devices connected externally** to your computer, including devices **connected wirclessly or over the network.**
The **Devices and Printers** folder allows you to **perform many tasks**, which **vary depending on the device.** Here are the **main tasks** you can do:
View all the external devices and printers connected to your computer.

- Add a new device or printer to your computer.
- Check to see if a specific device is connected and working properly

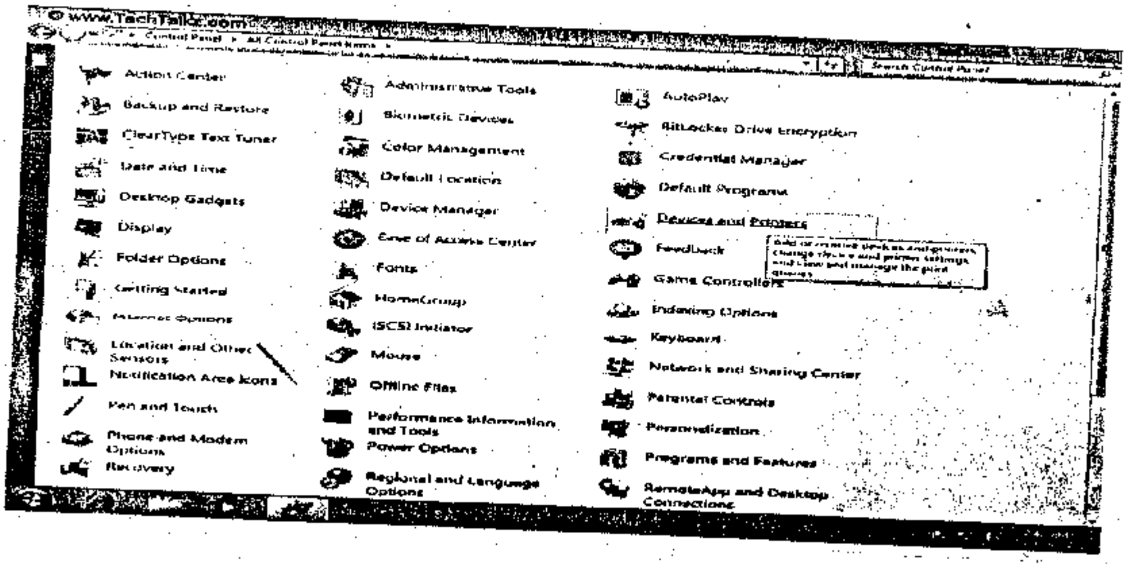
- Display detailed information about your devices, such as make, model, and manufacturer
- See what tasks you can do with a particular device.

Let's see how to explore Device and Printers folder in Windows 7:

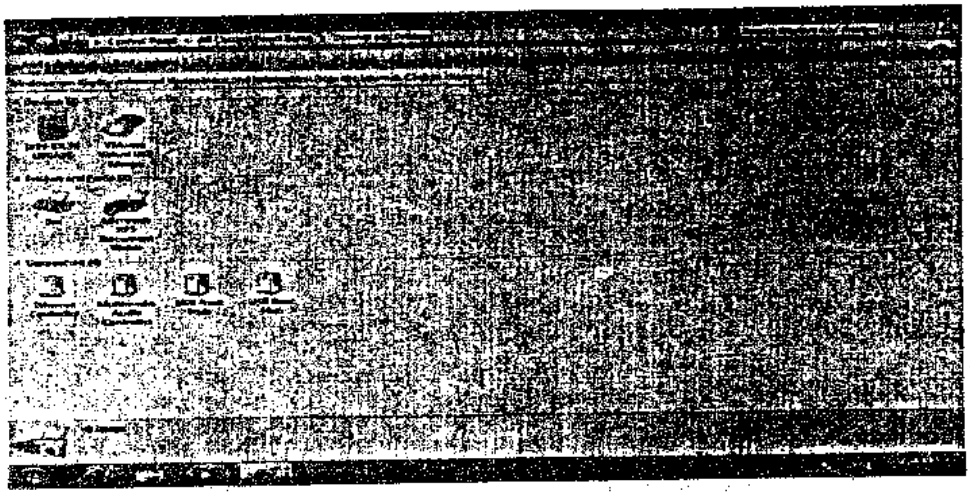
1. Click the **Start** and then choose the **Control Panel** option.



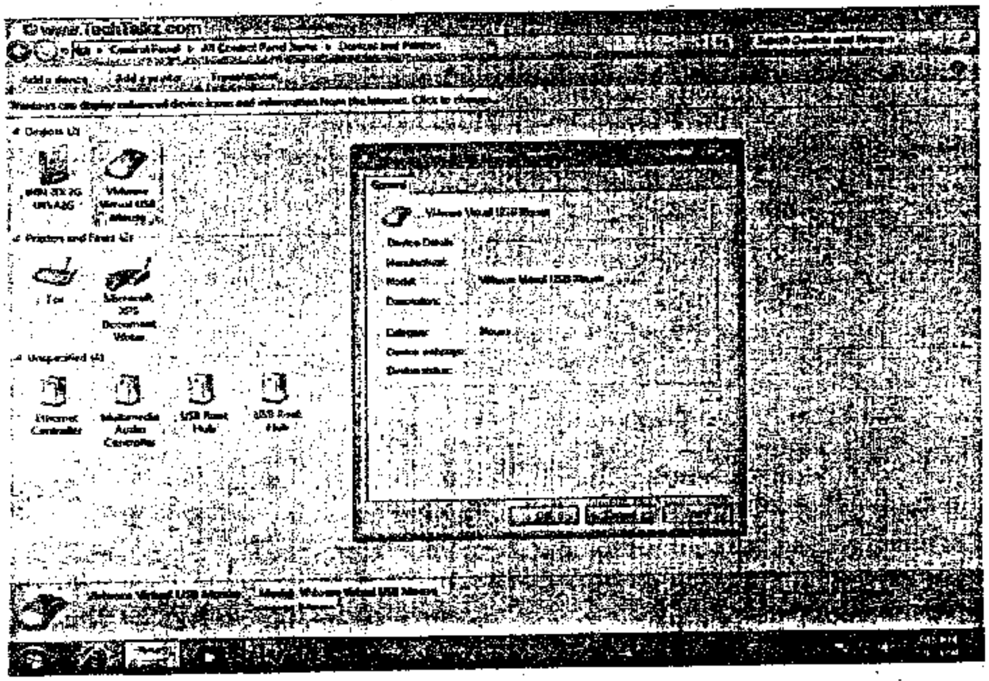
2. The **Control Panel** window opens up. Click **Device and Printer.**



3. The **Device and Printer** window opens up with the list of all **external devices and printer.**



4. Click on **Virtual USB Mouse** to view it's **Properties.**



Windows can display enhanced device icons and information from the Internet. Click to change...

VMware Virtual USB Mouse

Device Details

Manufacturer:

Model: VMware Virtual USB Mouse

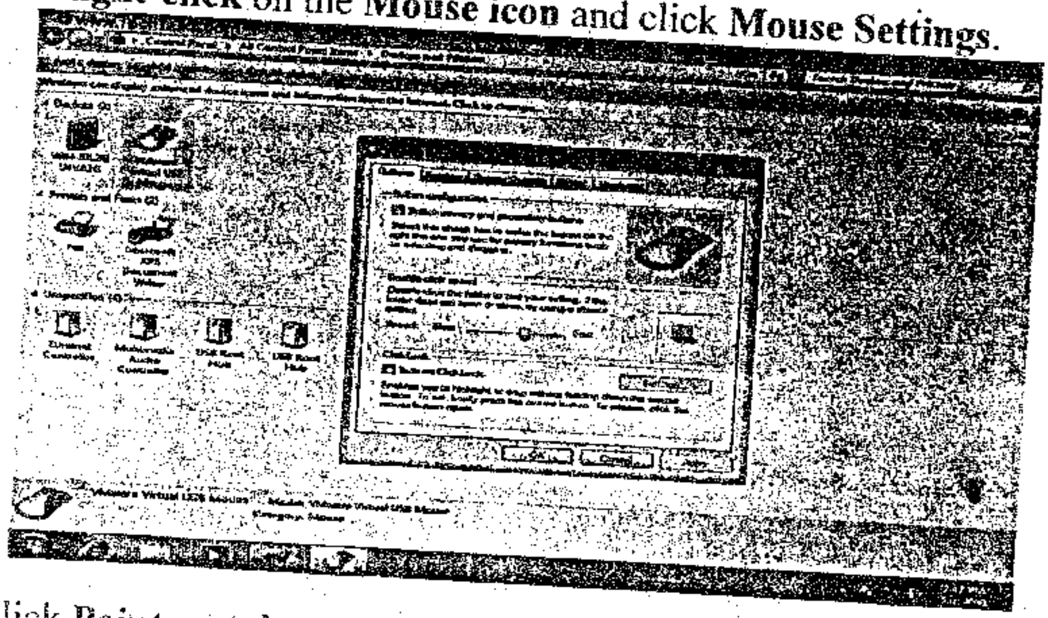
Description:

Category: Mouse

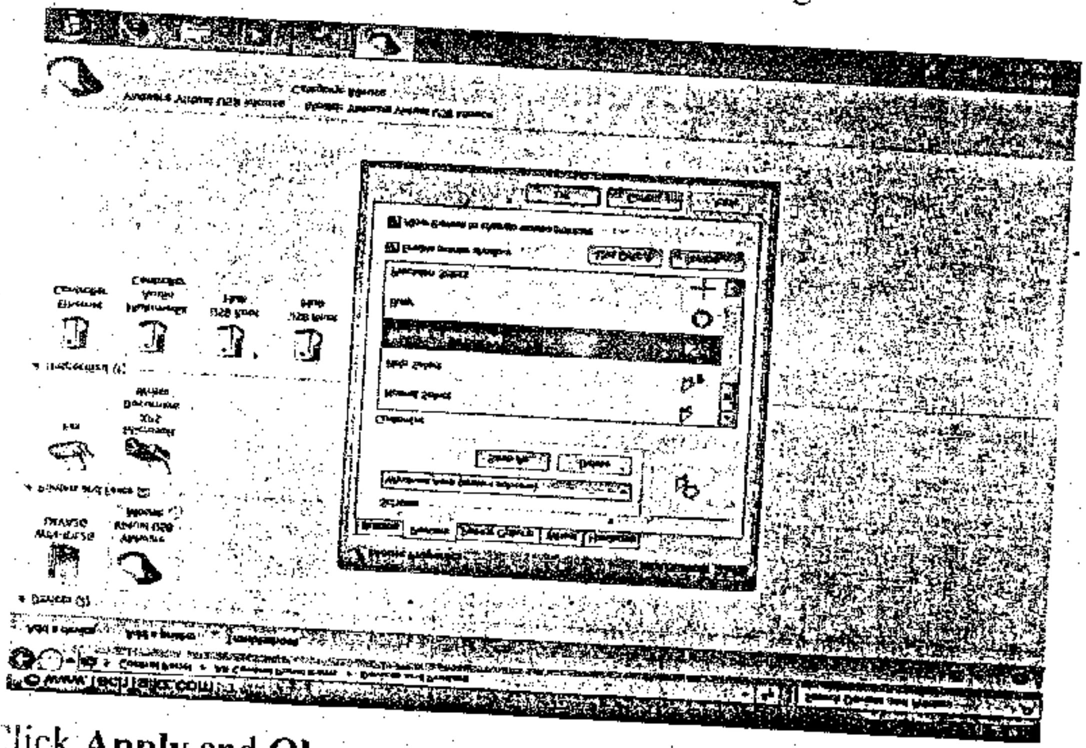
Device webpage:

Device status:

5. **Right-click** on the **Mouse icon** and click **Mouse Settings.**

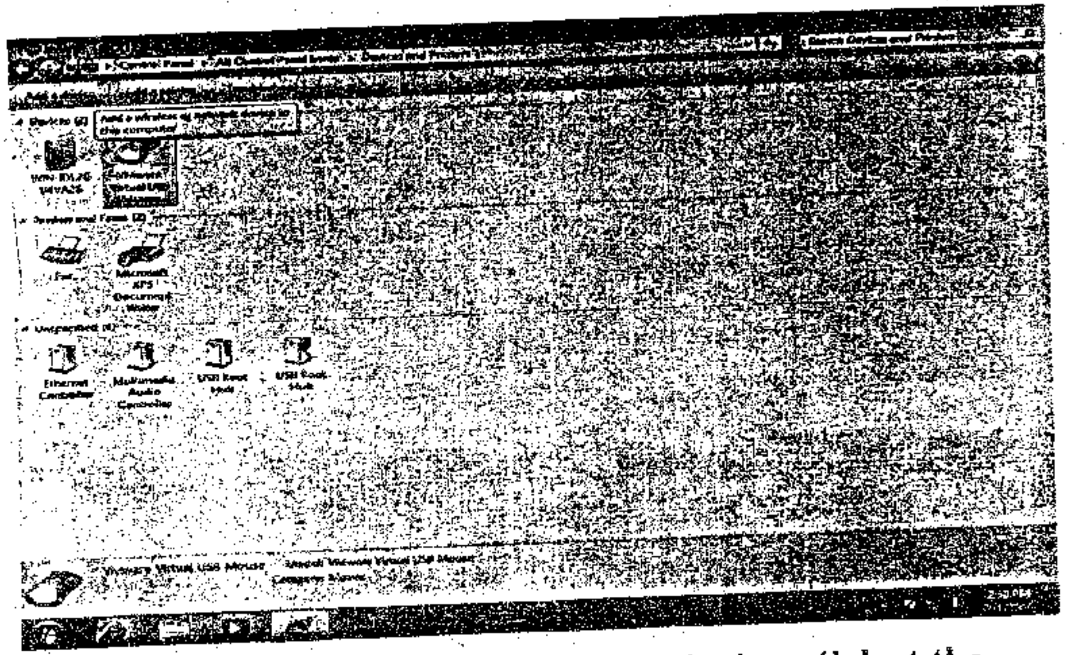


Click **Pointers tab** to change the Pointer settings.

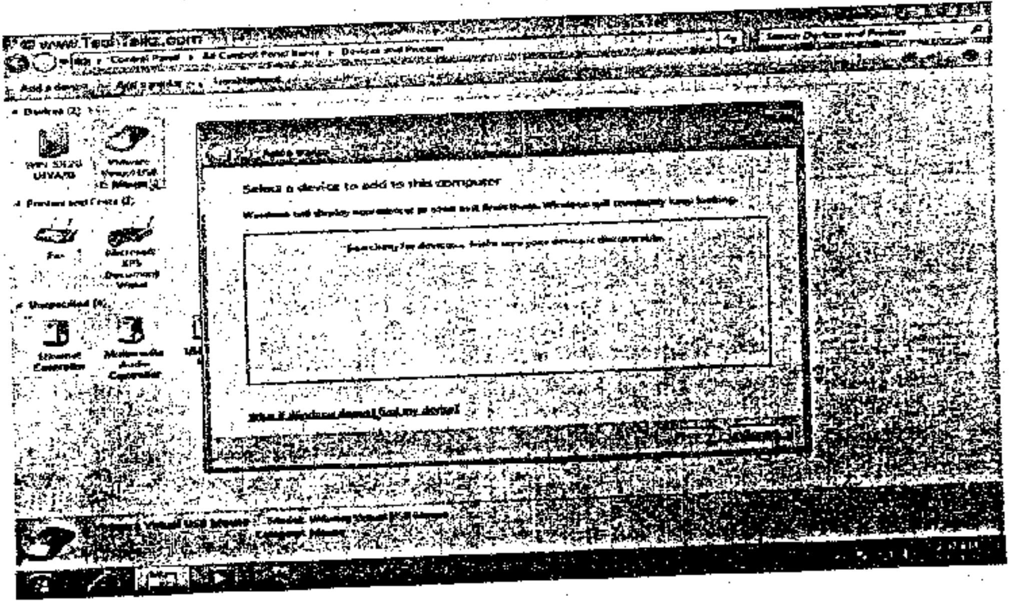


Click **Apply** and **Ok.**

6. To Add a **Wireless or network device** click **Add a device.**


Control Panel ▸ All Control Panel Items ▸ Devices and Printers
Add a device
Add a wireless or network device to this computer
Devices (2)
Printers and Faxes (2)
Fax
Microsoft XPS Document Writer
Unspecified (4)
Ethernet Controller
Multimedia Audio Controller
USB Root Hub
USB Root Hub
VMware Virtual USB Mouse

It may take some time to search for the devices. **Select the device** and **follow the instructions.**


www.TechTalkz.com
Control Panel ▸ All Control Panel Items ▸ Devices and Printers
Add a device
Devices (2)
Printers and Faxes (2)
Fax
Microsoft XPS Document Writer
Unspecified (4)
Ethernet Controller
Multimedia Audio Controller

Add a device

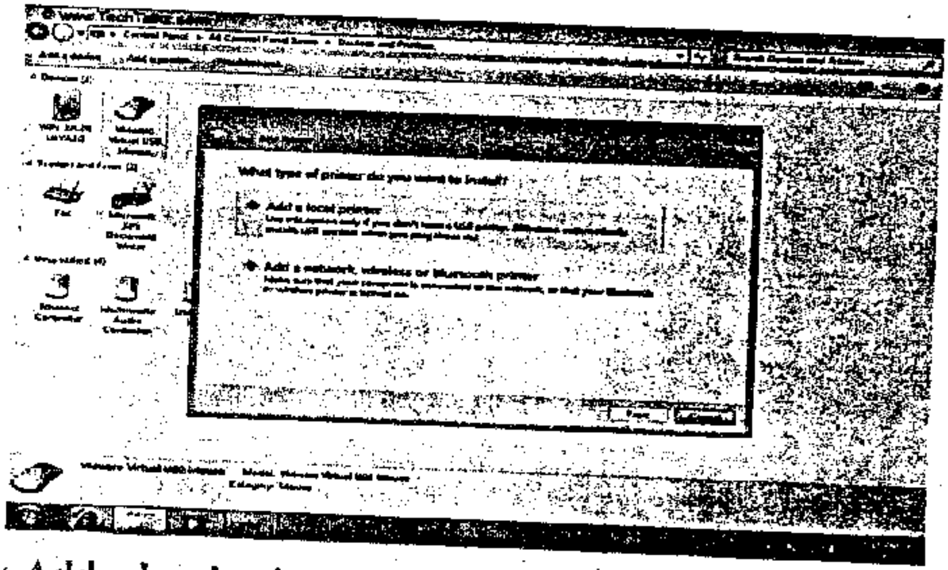
Select a device to add to this computer

Windows will display new devices [illegible]

Searching for devices. Make sure your device is discoverable.

What if Windows doesn't find my device?

7. Click **Add a printer** to add new printer.

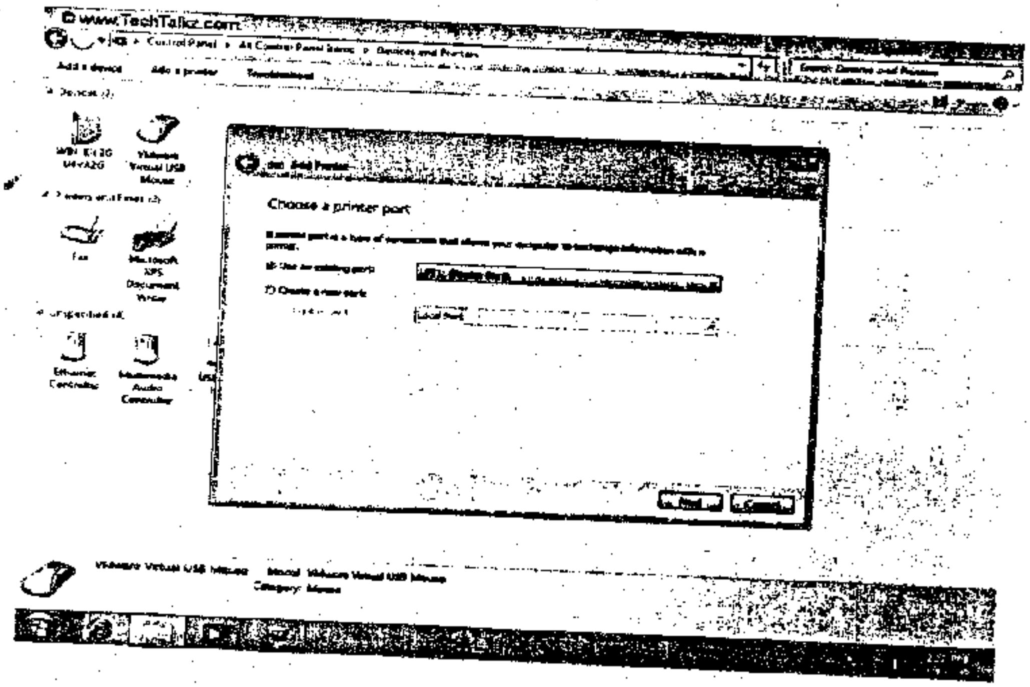


What type of printer do you want to install?

● Add a local printer

● Add a network, wireless or Bluetooth printer

Click Add a local printer.



Add Printer

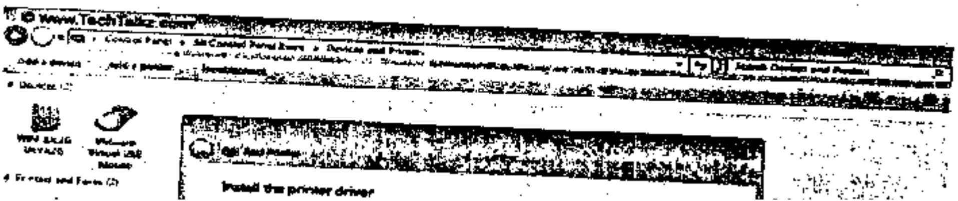
Choose a printer port

A printer port is a type of connection that allows your computer to exchange information with a printer.

● Use an existing port: LPT1: (Printer Port)

○ Create a new port: Type of port: Local Port

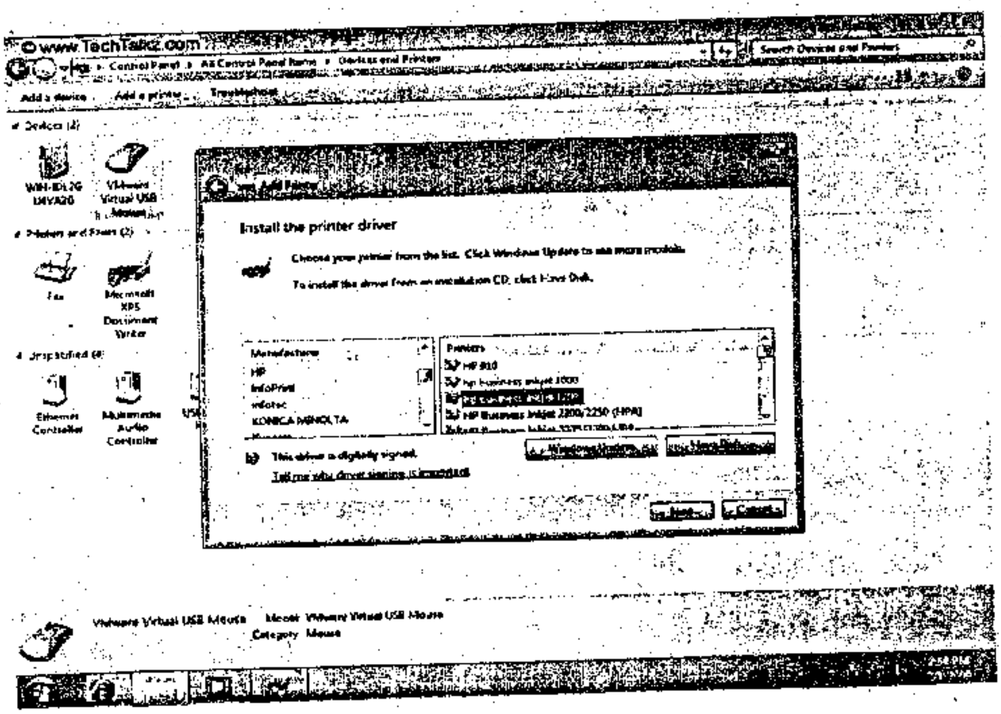
Click Next.



Add Printer

Install the printer driver

Click **Have Disk** to install **Printer Driver. Browse driver location** and click **Ok.**



Install the printer driver

Choose your printer from the list. Click Windows Update to see more models.

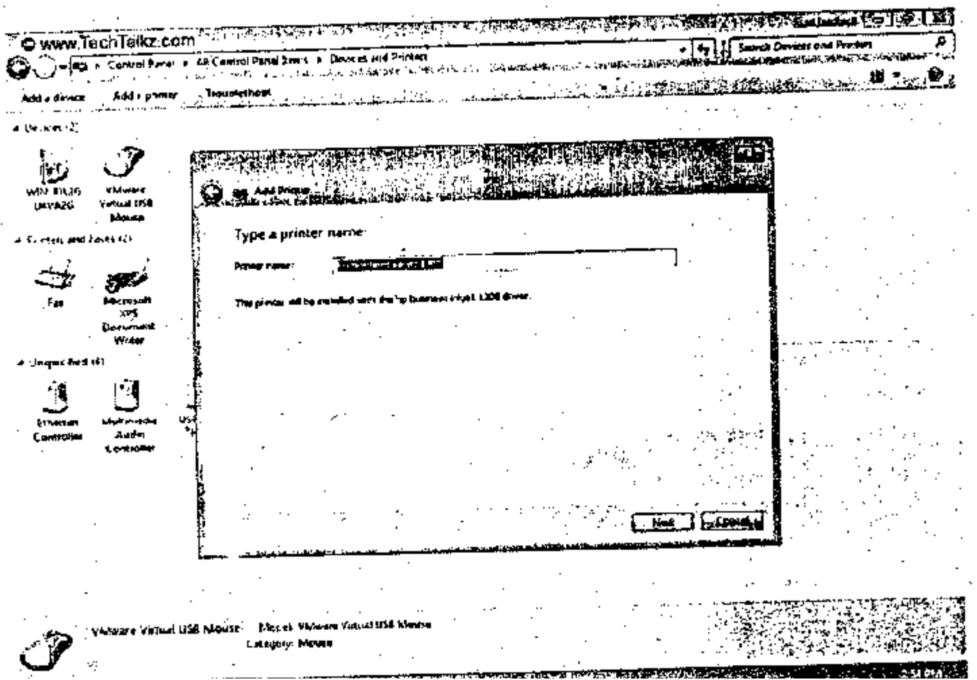
To install the driver from an installation CD, click Have Disk.

Manufacturer	Printers
HP	HP 910
InfoPrint	hp business inkjet 1000
Infotec	hp business inkjet 1200
KONICA MINOLTA	HP Business Inkjet 2200/2250 (HPA)

This driver is digitally signed.

Tell me why driver signing is important

Choose **Manufacturer** and **Printer.** Click **Next.**

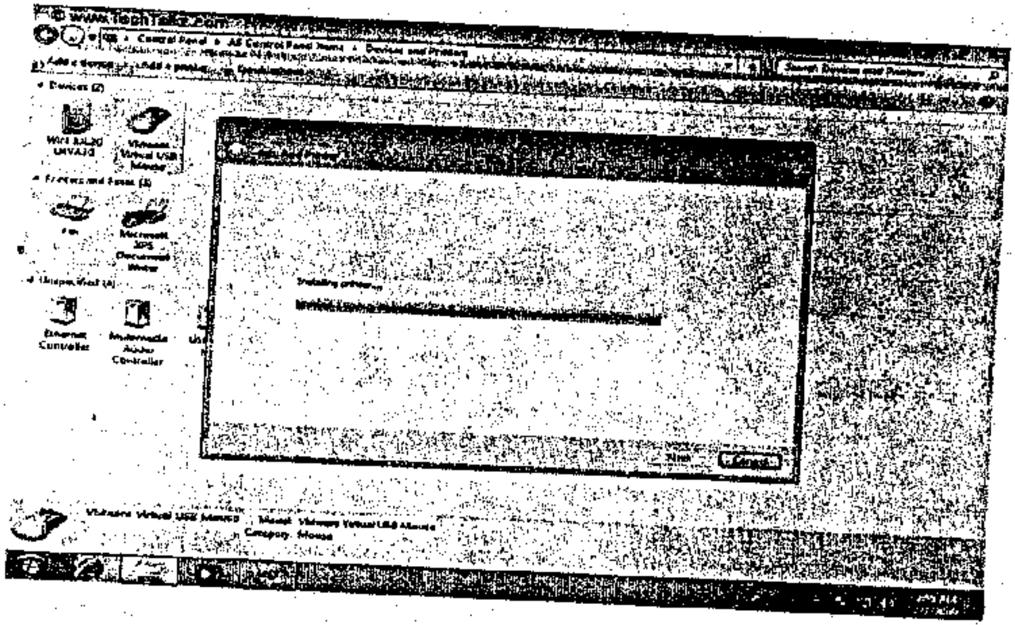


Type a printer name

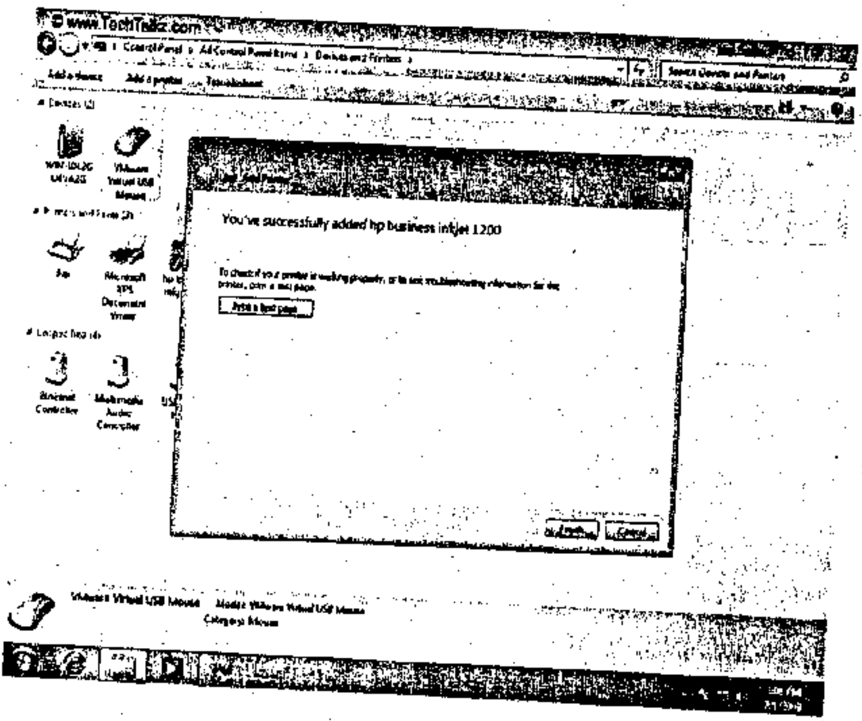
Printer name: hp business inkjet 1200

This printer will be installed with the hp business inkjet 1200 driver.

Type **Printer Name** and Click **Next.**



Click **Finish.**



www.TechTalkz.com
Control Panel ▸ All Control Panel Items ▸ Devices and Printers ▸
Search Devices and Printers
Add a device
Add a printer
Troubleshoot
Devices (2)
Fax
Microsoft XPS Document Writer
Ethernet Controller
Multimedia Audio Controller
Add Printer
Print a test page
Finish
Cancel
VMware Virtual USB Mouse
Model: VMware Virtual USB Mouse
Category: Mouse

You've successfully added hp business inkjet 1200

To check if your printer is working properly, or to see troubleshooting information for the printer, print a test page.

Configuring Disks and Drives Using Disk Management

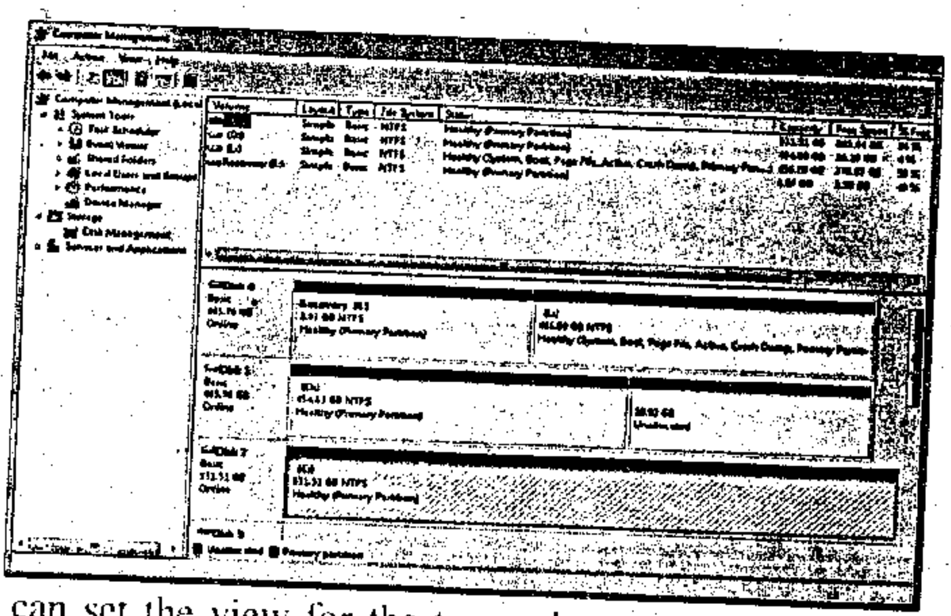
Your primary tool for working with your computer's disks is Disk Management. You will use Disk Management to partition disks, format disk volumes with file systems, and mount disk volumes. You can also use Disk Management to convert a disk from the basic disk type to the dynamic disk type and vice versa. However, while you can convert from a basic disk type to the dynamic disk type without losing data, you must remove disk volumes on a dynamic disk before you can convert the disk to the basic disk type.

Using an Administrator account, you can start and work with Disk Management by completing the following steps:

1. Right-click Computer on the Start menu.
2. On the shortcut menu, choose Manage to start Computer Management.
3. In the left pane of the Computer Management window, select Disk Management under Storage.

As Figure 1 shows, Disk Management provides an overview of the storage devices configure within or attached to your computer. By default, Disk Management's main windows show the Volume list view in the upper panel and the Graphical view in the lower panel. The third view available but not displayed is the Disk List view.

Figure 1. Managing your computer's disks



You can set the view for the top or bottom pane using options from the View menu. To change the top view, select View, choose Top, and then select the view you want to use. To change the bottom view, select View, choose Bottom, and then select the view you want to use.

Volume list view provides a detailed summary of internal drives and external devices with removable storage. Devices with removable media, such as CD-ROM and DVD-ROM drives, are listed only if you've inserted a CD or DVD. The volume details provide the following information:

Volume

The drive letter or the volume name and drive letter, such as C:

Layout

The layout type of the volume, such as simple

Type

The drive type, such as basic or dynamic

File System

The file system type, such as FAT or NTFS

Status

The status of the volume, as well as any relevant volume designations, such as Healthy (Active, Primary Partition)

Capacity

The amount of data the volume can store

Free Space

The amount of free space in megabytes or gigabytes.

% Free

The amount of free space as a percentage of total volume capacity

Fault Tolerance

An indicator as to whether the volume uses fault tolerant features

Overhead

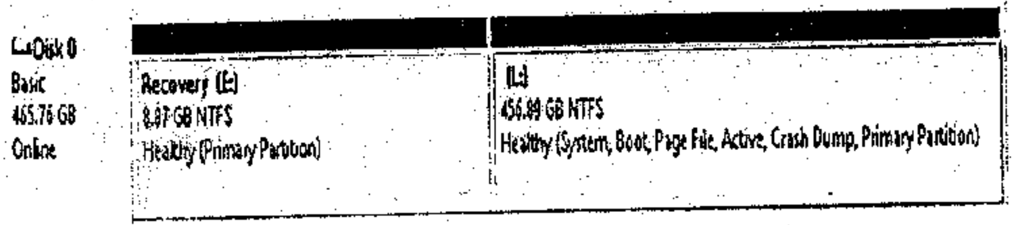
The total additional disk space required because of the fault tolerant feature used (if applicable)

The Graphical view provides a graphical overview of internal drives, external drives with removable storage, and devices with removable media. This is the view you use to partition, format, and mount disks.

In the Graphical view, you can see the individual areas of allocated and unallocated space on internal disks and disks with removable storage. An allocated area of a disk has a volume. An unallocated area of a disk is free space that's not being used.

As Figure 2 shows.

Figure 2. Viewing disk and volume details



Disk 0
Basic
465.76 GB
Online

Recovery (E:)
8.97 GB NTFS
Healthy (Primary Partition)

(C:)
456.89 GB NTFS
Healthy (System, Boot, Page File, Active, Crash Dump, Primary Partition)

Although Disk Management can show only two view panes at a time, you can display the Disk List view in either the upper or the lower pane of the main window. As Figure 3 shows, the Disk List view provides summary information about physical drives. This information includes:

Disk

The disk designator and number, such as Disk 0 or CD-ROM 1.

Type

The drive or media type, such as basic, dynamic, removable, CD, or DVD. Also displays the drive letter if one is assigned.

Capacity

The amount of data the drive, device, or media can store.

Unallocated Space

The amount of space that hasn't been allocated (if any)..

Status

The drive or device status, such as online, online (errors), no media, or offline.

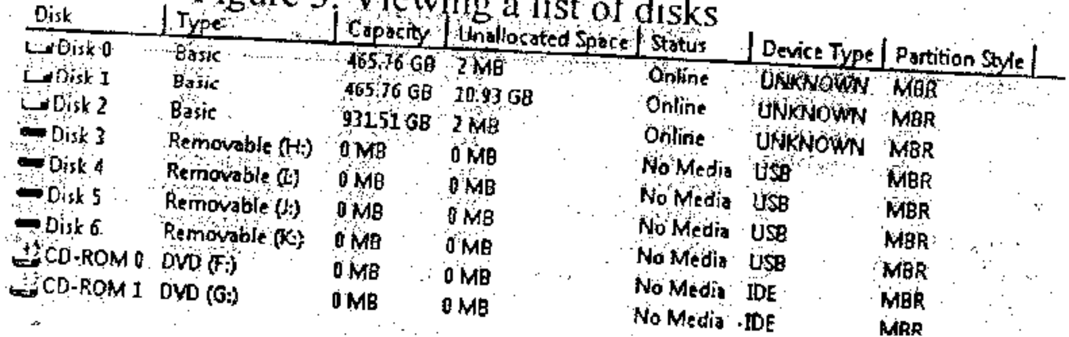
Device Type

The device interface type, such as Integrated Drive Electronics (IDE), Small Computer System Interface (SCSI), USB, or FireWire (1394).

Partition Style

The partition style of the disk or device. Windows 7 supports both Master Boot Record (MBR) and GUID Partition Table (GPT) partition styles. For the most part, the partition style used is determined by your computer's processor architecture and the type of device.

Figure 3. Viewing a list of disks



Disk	Type	Capacity	Unallocated Space	Status	Device Type	Partition Style
Disk 0	Basic	465.76 GB	2 MB	Online	UNKNOWN	MBR
Disk 1	Basic	465.76 GB	10.93 GB	Online	UNKNOWN	MBR
Disk 2	Basic	931.51 GB	2 MB	Online	UNKNOWN	MBR
Disk 3	Removable (H:)	0 MB	0 MB	No Media	USB	MBR
Disk 4	Removable (I:)	0 MB	0 MB	No Media	USB	MBR
Disk 5	Removable (J:)	0 MB	0 MB	No Media	USB	MBR
Disk 6	Removable (K:)	0 MB	0 MB	No Media	USB	MBR
CD-ROM 0	DVD (F:)	0 MB	0 MB	No Media	IDE	MBR
CD-ROM 1	DVD (G:)	0 MB	0 MB	No Media	IDE	MBR

When you are working with basic or dynamic disks, you should note the special designations assigned to drive sections. Drive sections can have one or more of the following designations:

Active

The drive section used for system cache and startup. Some devices with removable storage may be listed as having the active partition, such as when you use Ready Boost.

System

The drive section containing the boot manager files needed to load the operating system. A drive section with this designation can't be part of a striped or spanned volume.

Boot

The drive section containing the operating system and its related files.

Page File

A drive section containing a paging file used by the operating system.

Crash Dump

The drive section to which the computer attempts to write dump files in the event of a system crash.

Your computer has one active. one system, one boot, and one crash dump drive section. The page file designation is the only drive designation you might see on multiple drive sections.

Depending on the disk type and status.. you might also see the following designations:

At Risk

A drive section with this designation is at risk of failing, and probably also has an error status, such as Online (Errors).

Primary Partition

A -drive section that is designated as a primary partition. Although this designation is usually displayed only for fixed disks, you may see this designation on devices with removable storage and on devices with removable media.

How to Set Up VPN in Windows 7

VPN (Virtual Private Network) technology lets a computer using a public Internet connection join a private network by way of a secure "tunnel" between that machine and the network. The most common case is a business allowing its employees to connect to its work network from home or from the road.

There are two principal ways to configure VPN. The first and more-common scenario, called *outgoing*, is setting up a remote computer to call into the office network. The second scenario, called *incoming*, occurs on the network side, where a computer allows secure connections from other computers. Windows 7 comes preloaded with the Agile VPN client, which makes setting up either kind of connection relatively easy.

Step by Step: Connecting to a VPN (Outgoing)

Step 1 Click the *Start* button. In the search bar, type **VPN** and then select *Set up a virtual private network (VPN) connection.*

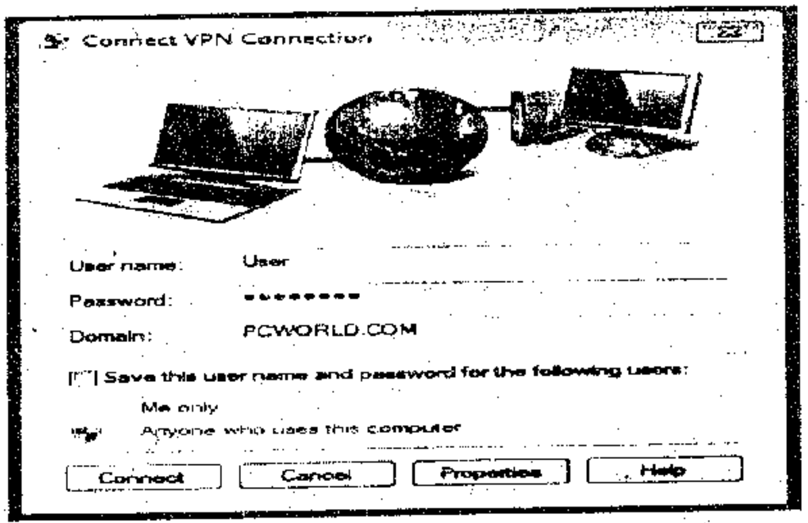
Step 2 Enter the IP address or domain name of the server to which you want to connect. If you're connecting to a work network, your IT administrator can provide the best address.

Step 3 If you want to set up the connection, but not connnect, select *Don't connect now*; otherwise, leave it blank and click *Next*.

Step 4 On this next screen, you can either put in your username and password, or leave it blank. You'll be prompted for it again on the actual connection. Click *Connect*.

Step 5 To connect, click on the Windows network logo on the lower-right part of your screen; then select *Connect* under VPN Connection.

Step 6 In the Connect VPN Connection box, enter the appropriate domain and your log-in credentials; then click *Connect*.



User name: User

Password: ●●●●●●●●●

Domain: PCWORLD.COM

□ Save this user name and password for the following users:

○ Me only

● Anyone who uses this computer

Step 7 If you can't connect, the problem could be due to the server configuration. (There are different types of VPN.) Check with your network administrator to see what kind is in use--such as PPTP--then, on the Connect VPN Connection screen, select *Properties*.

Step 8 Navigate to the Security tab and select the specific Type of VPN from the drop-down list. You may also have to unselect *Include Windows logon domain* under the Options tab. Then click *OK* and *Connect*.

Step by Step: Building a VPN (Incoming)

Step 1 Click the *Start* button, and, in the search bar, type **Network and Sharing**.

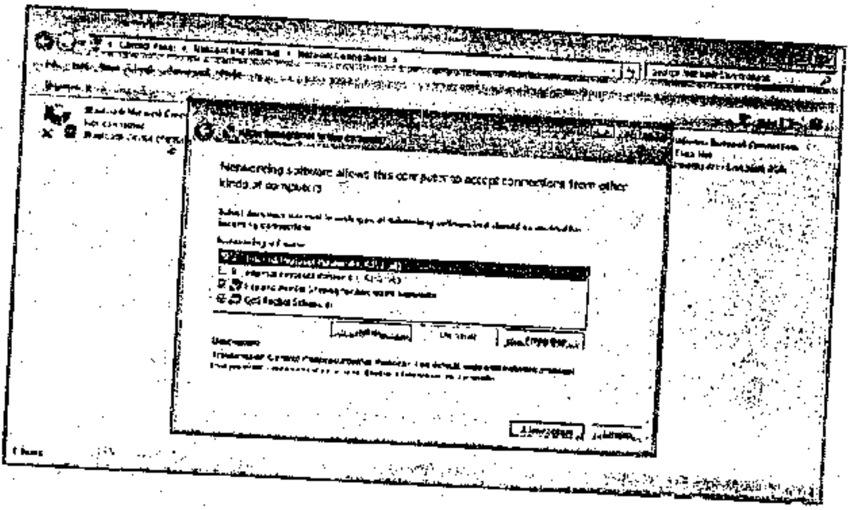
Step 2 Click *Change Adapter Settings* in the left-hand menu.

Step 3 Click *File*, and then *New Incoming Connection*.

Step 4 Select the users you'd like to give access to and click *Next*.

Step 5 Click *Through the Internet* and select *Next*.

Step 6 Select the Internet Protocol you'd like to use. (The default TCP/IPv4--the line highlighted in the screenshot below--will work fine.)



Networking software allows this computer to accept connections from other kinds of computers

Step 7 Finally, click Allow access; you've now set up an incoming VPN connection.

CONNECTING TO WIRELESS NETWORKS WITH WINDOWS 7

Wireless network configuration methods

You can configure connections to wireless networks, known as wireless profiles, for a computer running Windows 7 with the following methods:

- **Network notification area icon**

This is the primary method by which users connect to available wireless networks.

- **Set up a connection or network** dialog box

This is a method by which users can manually create wireless network profiles.

- **Manage Wireless Networks** dialog box

This is another method to manually configure wireless networks and specify their detailed settings.

- ***Group Policy***

Network administrators can use Group Policy settings in an Active Directory Domain Services (AD DS) environment to centrally configure and automatically deploy wireless network settings for domain member computers.

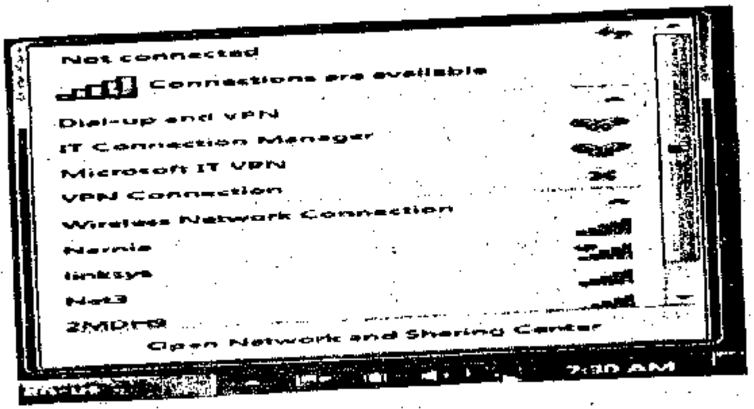
- **Command line**

Network administrators can use commands in the **netsh wlan** context of the Netsh.exe tool to manually configure wireless networks and their settings. There are Netsh commands to export an existing wireless profile to an XML file and then import the wireless profile settings stored in the XML file on another computer.

The following sections describe in detail how to connect to a wireless network using the Network notification area icon and the **Set up a connection or network** dialog box in Windows 7, how to manage your wireless networks, and how to connect to non-broadcasting wireless networks.

The Network notification area icon

To connect to an available wireless network, click the Network icon in the notification area of your desktop. The resulting pane contains a list of detected wireless networks and, for domain-joined computers, the names of wireless networks configured through Group Policy. Figure 1 shows an example.



Not connected

Connections are available

Dial-up and VPN

IT Connection Manager

Microsoft IT VPN

VPN Connection

Wireless Network Connection

Narnia

linksys

Net3

2MDr9

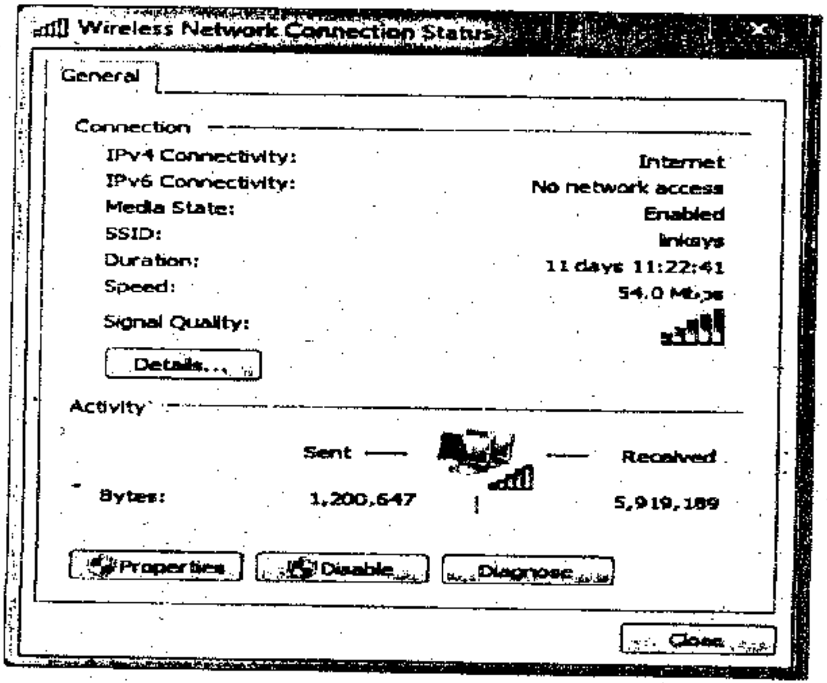
Open Network and Sharing Center

2:30 AM

Figure 1 Example of the list of available networks

From this pane you can connect to a listed wireless network by double-clicking it, clicking the network and then clicking **Connect**, or by right-clicking the network and clicking **Connect**. To view information for a listed wireless network, place the mouse pointer over the network name. The information includes the wireless network's name, signal strength, security type, radio type (802.11b/g/n), and Service Set Identifier (SSID). To refresh the list of wireless network, click the up/down arrow icon in the upper right of the pane. To disconnect from a connected wireless network, right-click the network and then click **Disconnect**.

You can obtain status of a connected network and properties of a connected network or a network that has been configured through Group Policy through the wireless network's context menu. Figure 2 shows an example of the **Wireless Network Connection Status** dialog box.



Connection

IPv4 Connectivity: Internet
IPv6 Connectivity: No network access
Media State: Enabled
SSID: linksys
Duration: 11 days 11:22:41
Speed: 54.0 Mbps
Signal Quality:

Activity

Sent — — Received

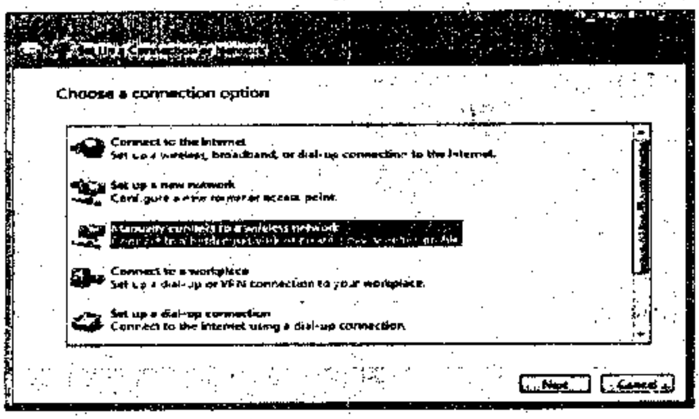
Bytes: 1,200,647 5,919,189

Figure 2 Example of the Wireless Network Connection Status dialog box

The properties dialog box of a wireless network is described later in this article.

Set up a connection or network dialog box

You can access the **Set up a connection or network** dialog box in Windows 7, as shown in Figure 3, from the **Set up a new connection or network** link in the Network and Sharing center.



Choose a connection option

Connect to the Internet
Set up a wireless, broadband, or dial-up connection to the Internet.

Set up a new network
Configure a new router or access point.

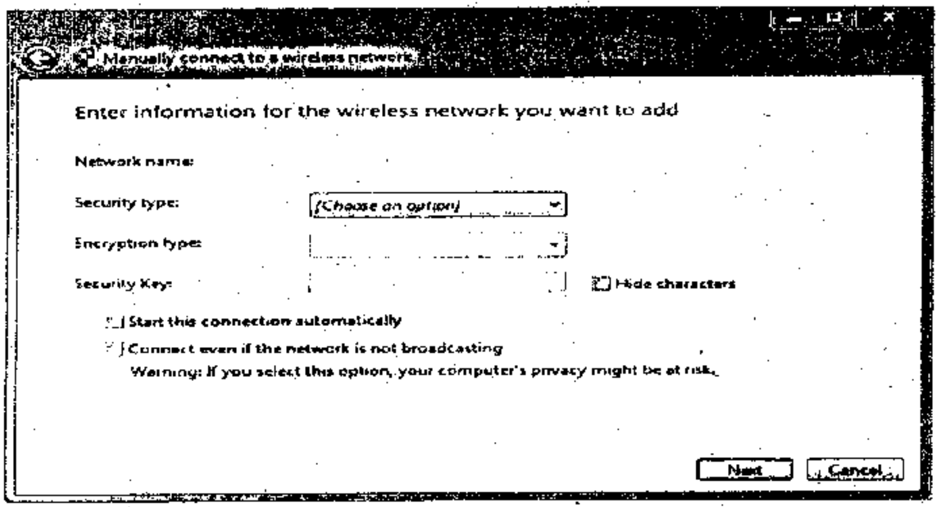
Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.

Connect to a workplace
Set up a dial-up or VPN connection to your workplace.

Set up a dial-up connection
Connect to the Internet using a dial-up connection.

Figure 3 The Set up a connection or network dialog box

To manually create a wireless network profile, click **manually connects to a wireless network**, and then clicks **Next**. You should see Figure 4.



Enter information for the wireless network you want to add

Network name:

Security type: (Choose an option)

Encryption type:

Security Key: ☐ Hide characters

☐ Start this connection automatically

☐ Connect even if the network is not broadcasting

Warning: If you select this option, your computer's privacy might be at risk.

Figure 4 The Enter information for the wireless network you want to add page

On the **Enter information for the wireless network you want to add** page, configure the following:

- **Network name** Type the name of the wireless network.
- **Security type** Select the method used to authenticate a connection to the wireless network. The choices are the following:
    - **No authentication (Open)** Open system authentication with no encryption.
    - **WEP** Open system authentication with Wired Equivalent Privacy (WEP).
    - **WPA2-Personal** Wi-Fi Protected Access 2 (WPA2) with a preshared key (also known as a passphrase).
    - **WPA-Personal** Wi-Fi Protected Access (WPA) with a preshared key.
    - **WPA2-Enterprise** WPA2 with IEEE 802.1X authentication.
    - **WPA-Enterprise** WPA with IEEE 802.1X authentication.
    - **802.1x** IEEE 802.1X authentication with WEP (also known as dynamic WEP).

The choices listed depend on the capabilities of your wireless network adapter that are reported to Windows. If an authentication type does not appear in the list, ensure that your wireless adapter supports the type and that you have installed the latest driver for your adapter that is compatible with Windows 7.

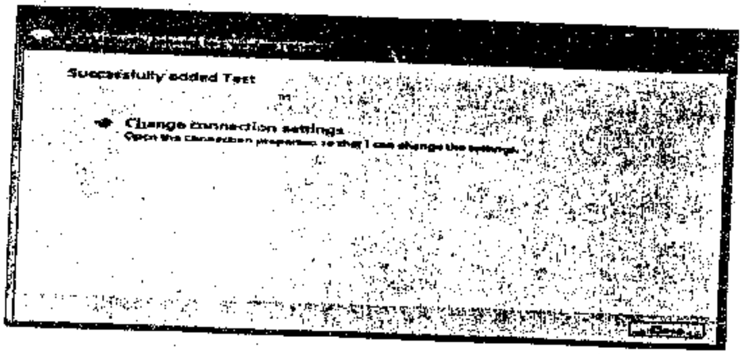
The shared key authentication method is not listed. Microsoft strongly discourages its use because it provides weak security for your wireless network. To configure shared key authentication, select **No authentication (Open)** here and then select **Shared** from the **Security** tab in the properties of the wireless network (described later in this article).

- **Encryption type** Select the method used to encrypt data sent over the wireless network. The choices depend on the selected security type.
  - When you select the **No authentication (Open)** security type, **None** is selected for you.
  - When you select the **WEP** security type, **WEP** is selected for you.
  - When you select the **802.1x** security type, **WEP** is selected for you.
  - When you select the **WPA2-Personal**, **WPA2-Enterprise**, **WPA-Personal**, **WPA-Enterprise** security types, you can select **AES** or **TKIP**.

The encryption type choices listed depend on the capabilities of your wireless network adapter that it reports to Windows.

- **Security Key** Type the WEP key (if you selected the **WEP** security type), the WPA preshared key (if you selected the **WPA-Personal** security type), or the WPA2 preshared key (if you selected the **WPA2-Personal** security type). For the **WPA2-Enterprise**, **WPA-Enterprise**, and **802.1x** security types, Windows 7 automatically determines the security key when performing 802.1 X-based authentications.

- **Hide characters** Specifies whether you want to view the value typed in **Security Key**.
- **Starts this connection automatically** Specifies whether Windows 7 will automatically connect to this wireless network. If you clear this checkbox, you must manually connect to the wireless network from the list of networks available from the Network notification area icon.
- **Connect even if the network is not broadcasting** Specifies whether Windows should attempt to connect even if the wireless network is not broadcasting its name. This will cause Windows to send Probe Request frames to locate the wireless network. These probe request frames can be used by malicious users to determine the name of the non-broadcast network.
- When you click **Next**, you should see Figure 5.



Successfully added Test

Change connection settings
Open the connection properties so that I can change the settings.

Figure 5 The Successfully added page

You can click **Change connection settings** to access the properties of the wireless network, as described later in this article, or click **Close**.

The Manage Wireless Networks dialog box

You can access the **Manage Wireless Networks** dialog box from the **Manage wireless networks** link in the Network and Sharing Center. Figure 6 shows an example.

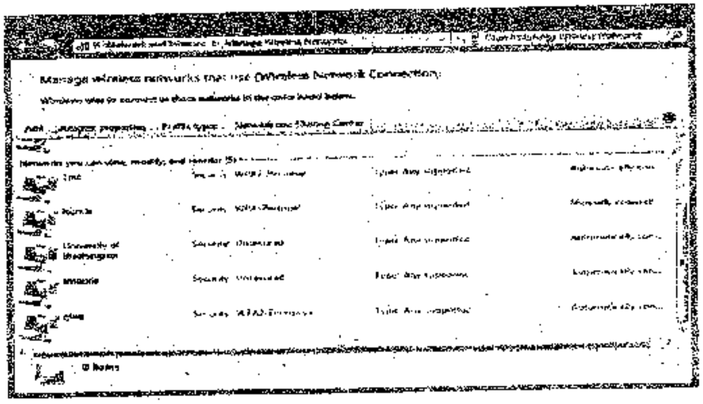
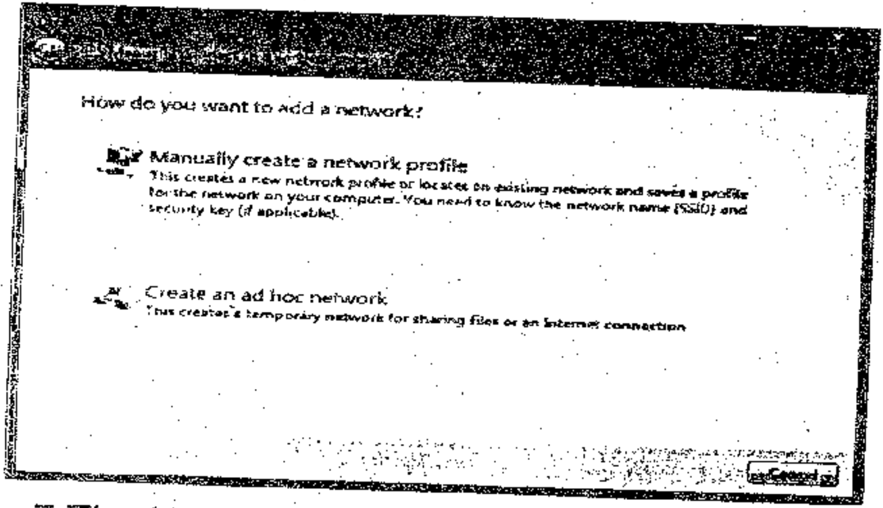

Manage wireless networks that use (Wireless Network Connection)
Add
Network and Sharing Center
University of Washington
0 items

Figure 6 The Manage Wireless Networks dialog box

- **Note** If the **Manage wireless networks** link is not present from the Network and Sharing Center, click the **Change adapter settings** link and ensure that your wireless network adapter is enabled on your laptop or notebook computer, appears in the Network Connections folder as a wireless connection, and is enabled. If your wireless network adapter appears in the Network Connections folder as a wired connection, ensure that you have installed the latest driver that is compatible with Windows 7.

From the **Manage Wireless Networks** dialog box, you can add a new wireless network, remove a selected wireless network; obtain the properties of the wireless network adapter, and choose the type of profile to assign to new wireless networks (applies to all users or the current user).

To manually add a wireless network, click **Add** to launch the Manually connect to a wireless network wizard, which allows you to create a wireless network profile for either an infrastructure or ad hoc wireless network. Figure 7 shows an example.



How do you want to add a network?

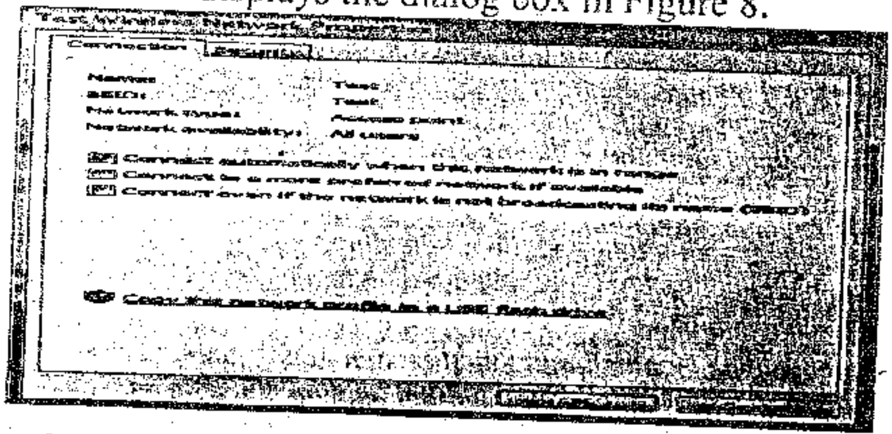
Manually create a network profile
This creates a new netrork profile or locates on existing network and saves a profile for the network on your computer. You need to know the network name (SSID) and security key (if applicable).

Create an ad hoc network
This creates a temporary network for sharing files or an Internet connection

Figure 7 The How do you want to add a network? page

To create a wireless profile for an infrastructure wireless network, click **Manually create a network profile.** To create a wireless profile for an ad hoc wireless network, click **Create an ad hoc network.**

To view or modify the properties of a wireless network in the list, double-click the name in the **Manage wireless networks** dialog box. Windows 7 displays the dialog box in Figure 8.



Test Wireless Network Properties

Name: Test
SSID: Test
Network type: Access point
Network availability: All users

☑ Connect automatically when this network is in range
☐ Connect to a more preferred network if available
☐ Connect even if the network is not broadcasting its name (SSID)

Figure 8 The Wireless Network Properties dialog box

From the **Connection** tab, you can view the wireless network's name, SSID, network type (either **Access point** for infrastructure mode networks or **Computer-to-computer** for ad hoc mode networks), and availability. You can also configure the following:

- Connect automatically when the network is in range
- Connect to a more preferred network if available Specifies whether Windows 7 will automatically disconnect from this wireless network if a more preferred wireless network comes within range.
- Connect even if the network is not broadcasting its name (SSID)
- The **Copy this network profile to a USB flash drive** link launches the Copy Network Settings wizard, which writes the wireless network profile settings to a USB flash drive. You can then use this flash drive to automate the wireless network profile configuration of other computers.

Figure 9 shows the **Security** tab.

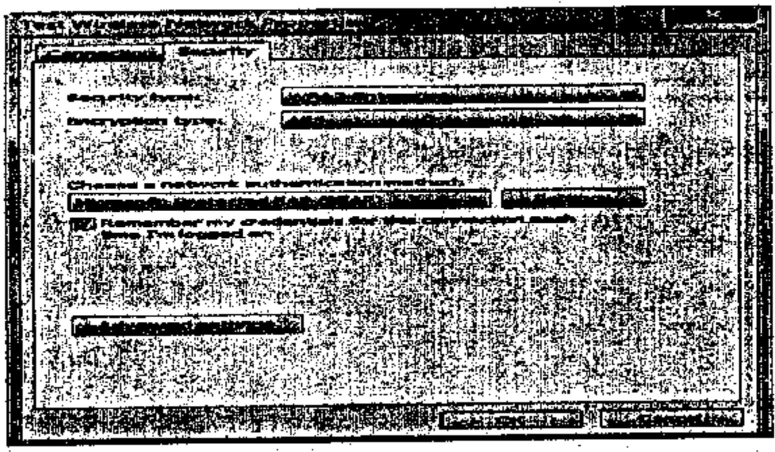

Security
Security type:
Encryption type:
Choose a network authentication method:
Remember my credentials for this connection each time I'm logged on

Figure 9 The Security tab of the Wireless Network Properties dialog box

On the **Security** tab, you can specify the following security types:

No authentication (Open)
Shared

Shared key authentication. The **Security** tab is the only location where you can configure shared key authentication because its use is highly discouraged.

- WPA2-Personal
- WPA-Personal
- WPA2-Enterprise
- WPA-Enterprise
- 802.1x

Based on the selected security type, you can configure either a network security key or specify and configure a network authentication method. If you specify **WPA-Enterprise, WPA2-Enterprise**, or **802.1x** as your security type, you must configure the following (as shown in the Figure 9):

- **Choose a network authentication method** Select an Extensible Authentication Protocol (EAP) method and click **Settings** to configure the EAP type as needed.
- **Remember my credentials for this connection each time I'm logged on** Specifies that when the user logs off, the user credential data is not removed from the registry. If you clear the checkbox, the next user logs on, they will be prompted for their credentials (such as user name and password).

If you specify the use of **WPA-Personal** or **WPA2-Personal** as your security type or **No authentication (Open)** or **Shared** as your security type with WEP as your encryption type, you must configure a network security key, as shown in Figure 10.

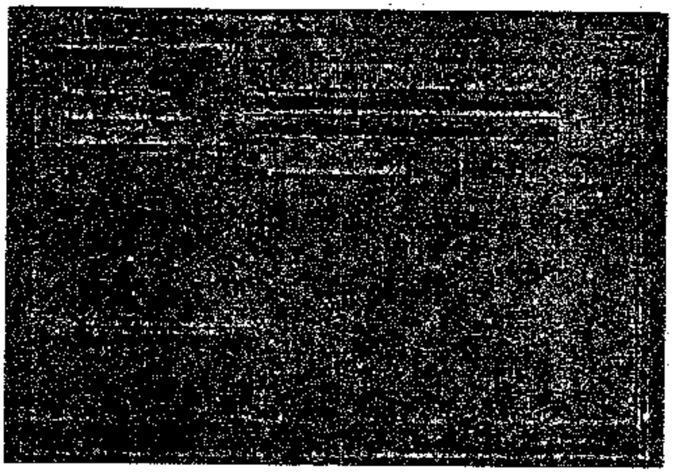
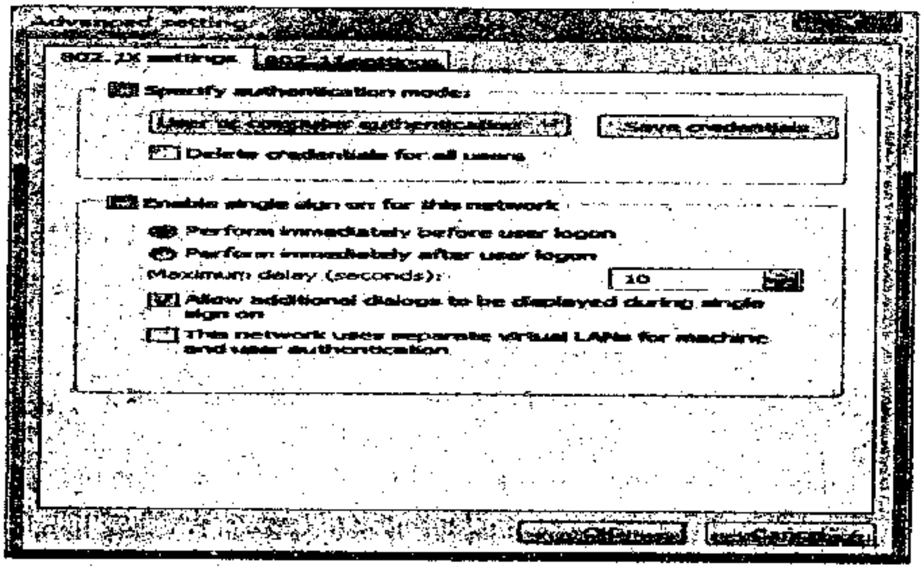


Figure 10 Example of configuring a network security key

If you choose the WPA-Enterprise, WPA2-Enterprise, or WPA2-Personal security types, you can also configure advanced settings. Figure 11 shows the **Advanced settings** dialog box for the WPA2-Enterprise security type.



Advanced settings

802.1X settings | 802.11 settings

☑ Specify authentication mode:

User or computer authentication ▾ | Save credentials

□ Delete credentials for all users

☑ Enable single sign on for this network

● Perform immediately before user logon

○ Perform immediately after user logon

Maximum delay (seconds): 10

☑ Allow additional dialogs to be displayed during single sign on

□ This network uses separate virtual LANs for machine and user authentication

OK | Cancel

Figure 11 The Advanced settings dialog box

On the **802.1X settings** tab, you can specify the authentication mode (User or computer authentication, Computer authentication, User authentication, or Guest authentication), save a set credentials for user authentication, and delete credentials for all users.

Single sign-on (SSO) allows you to configure when 802.1X authentication occurs relative to the user logon and to integrate user logon and 802.1X authentication credentials on the Windows logon screen.

Figure 12 shows the **802.11 settings** tab.

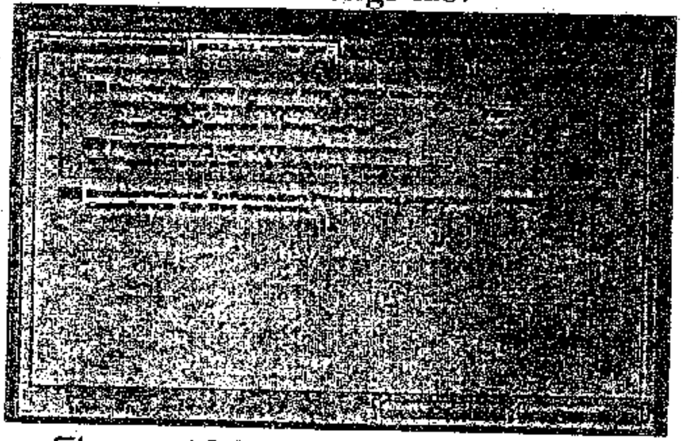


Figure 12 The 802.11 settings tab

In the **Fast roaming** section, you can configure Pair wise Master Key (PMK) caching and pre-authentication options.

- **Note** When you select the **WPA-Enterprise** security type, the **Advanced settings** dialog box does not contain the **802.11 settings** tab.

The **Enable Federal Information Processing Standard (FIPS) compliance for this network** check box allows you to specify whether to perform AES encryption in a FIPS 140-2 certified mode. FIPS 140-2 is a U.S. government computer security standard that specifies design and implementation requirements for cryptographic modules. Windows 7 is FIPS 140-2 certified. When you enable FIPS 140-2 certified mode, Windows 7 performs the AES encryption in software, rather than relying on the wireless network adapter. This check box only appears when you select WPA2-Enterprise or WPA2-Personal as the authentication method on the **Security** tab.

Non-broadcasting wireless networks

A non-broadcasting wireless network does not advertise its network name, also known as its SSID. A wireless access point of a non-broadcasting wireless network can be configured to send Beacon frames with an SSID set to NULL. A non-broadcasting wireless network is also known as a hidden wireless network. You can configure wireless networks in Windows 7 as broadcast or non-broadcast. A computer running Windows 7 will attempt to connect to wireless networks in the preferred networks list order, regardless of whether they are broadcast or non-broadcast. Additionally, non-broadcast networks appear last in the list of available networks with the name **Other Network**. Figure 13 shows an example.

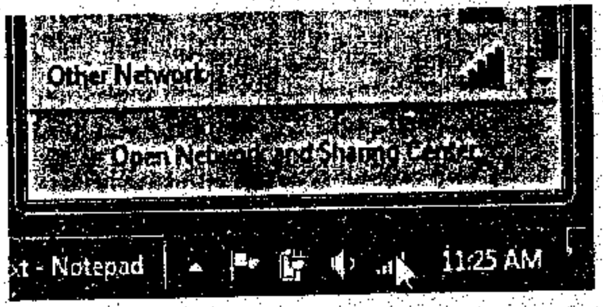
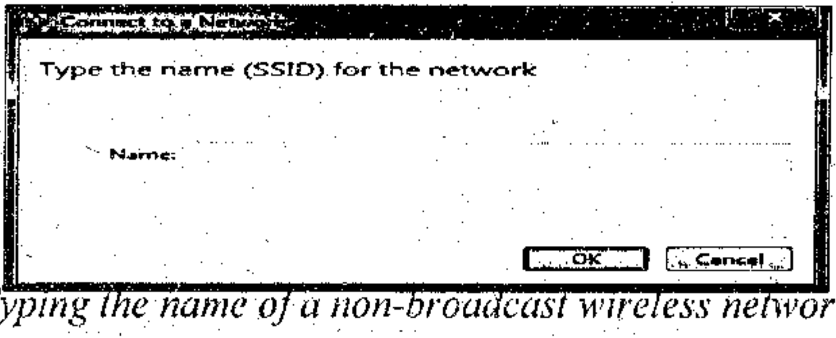


Figure 13 Example of a non-broadcast wireless network

When you connect to the **Other Network**, Windows 7 prompts you to specify the wireless network name (SSID). Figure 14 shows an example.



Connect to a Network

Type the name (SSID) for the network

Name:

Figure 14 Typing the name of a non-broadcast wireless network

Configure Remote Desktop Access on Windows 7 Systems

Remote Desktop is not enabled by default. You must specifically enable it to allow remote access to the workstation. When it is enabled, any member of the Administrators group can connect to the workstation. Other users must be placed on a remote access list to gain access to the workstation. To configure remote access, follow these steps:

1. In Control Panel, click System And Security, and then click System.

2. On the System page, click Remote Settings in the left pane. This opens the System Properties dialog box to the Remote tab.

3. To disable Remote Desktop, select Don't Allow Connections to This Computer, and then click OK. Skip the remaining steps.

4. To enable Remote Desktop, you have two options. You can:

- Select Allow Connections from Computers Running Any Version of Remote Desktop to allow connections from any version of Windows.
- Select Allow Connections Only from Computers Running Remote Desktop with Network Level Authentication to allow connections only from Windows 7 or later

computers (and computers with secure network authentication).

5. Click Select Users. This displays the Remote Desktop Users dialog box.

6. To grant Remote Desktop access to a user, click Add. This opens the Select Users dialog box. In the Select Users dialog box, click Locations to select the computer or domain in which the users you want to work with are located. Type the name of a user you want to work with in the Enter The Object Names To Select field, and then click Check Names. If matches are found, select the account you want to use and then click OK. If no matches are found, update the name you entered and try searching again. Repeat this step as necessary, and then click OK.

7. To revoke remote access permissions for a user account, select the account and then click Remove.

8. Click OK twice when you have finished. Windows Firewall must be configured to allow inbound Remote Desktop exceptions. You can configure this on a per-computer basis in Windows Firewall for the domain profile and the standard profile.

Step by Step installation of Windows Server 2008

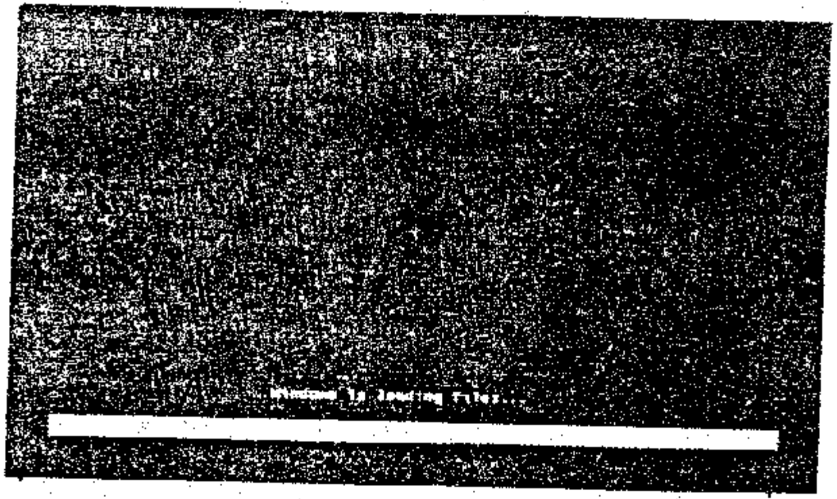
To use Windows Server 2008 you need to meet the following hardware requirements:

Component	Requirement
Processor	• Minimum: 1GHz (x86 processor) or 1.4GHz (x64 processor) • Recommended: 2GHz or faster Note: An Intel Itanium 2 processor is required for Windows Server 2008 for Itanium-based Systems
Memory	• Minimum: 512MB RAM • Recommended: 2GB RAM or greater • Maximum (32-bit systems): 4GB (Standard) or 64GB (Enterprise and Datacenter) • Maximum (64-bit

	systems): 32GB (Standard) or 2TB (Enterprise, Datacenter and Itanium-based Systems)
Available Disk Space	• Minimum: 10GB • Recommended: 40GB or greater Note: Computers with more than 16GB of RAM will require more disk space for paging, hibernation, and dump files
Drive	DVD-ROM drive
Display and Peripherals	• Super VGA (800 x 600) or higher-resolution monitor • Keyboard • Microsoft Mouse or compatible pointing device

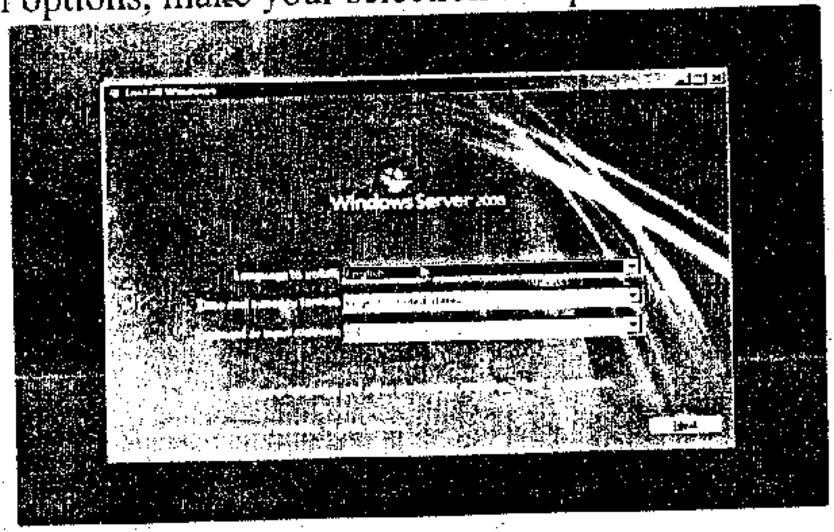
Follow this procedure to install Windows Server 2008:

1. Insert the appropriate **Windows Server 2008 installation media** into your DVD drive. If you don't have an installation DVD for Windows Server 2008,
2. **Reboot** the computer.

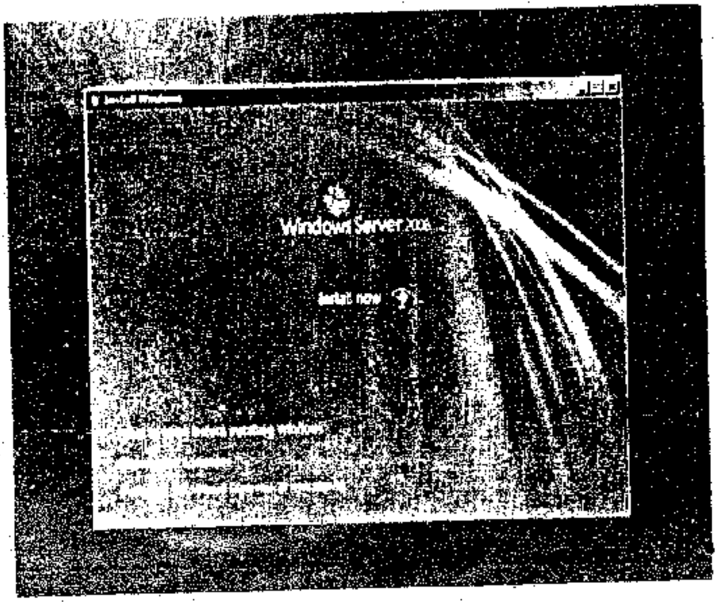


Windows is loading files...

3. When prompted for an **installation language** and other regional options, make your selection and press **Next**.

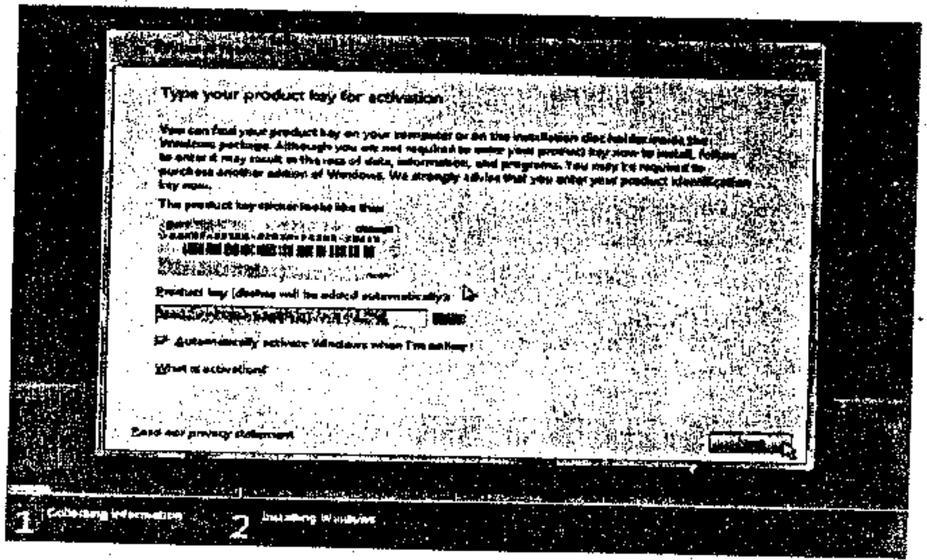


4. Next, press **Install Now** to begin the installation process.



5. Product activation is now also identical with that found in Windows Vista. Enter your **Product ID** in the next window, and

if you want to automatically activate Windows the moment the installation finishes, click **Next**.



Type your product key for activation

You can find your product key on your computer or on the installation disc holder inside the Windows package. Although you are not required to enter your product key now to install, failure to enter it may result in the loss of data, information, and programs. You may be required to purchase another edition of Windows. We strongly advise that you enter your product identification key now.

The product key sticker looks like this:

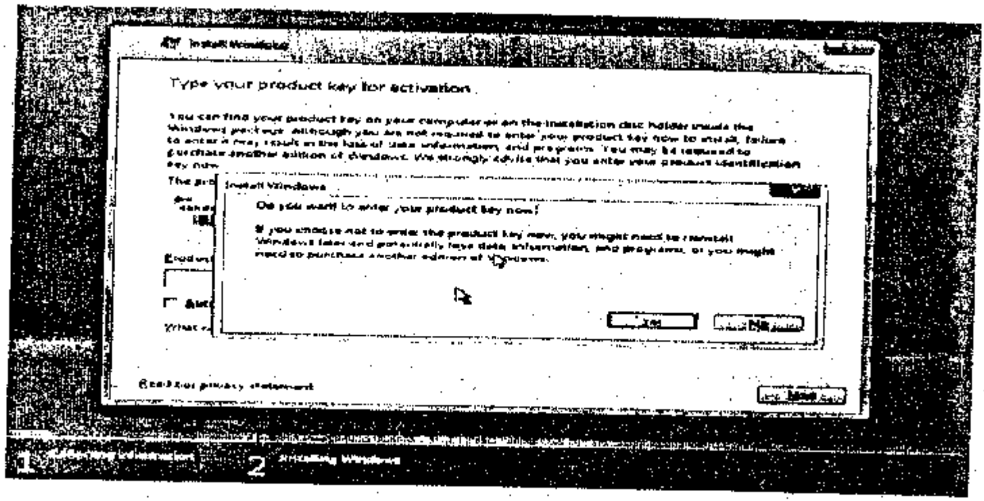
Product key (dashes will be added automatically):

☑ Automatically activate Windows when I'm online

What is activation?

Read our privacy statement

If you do not have the Product ID available right now, you can leave the box empty, and click Next. You will need to provide the Product ID later, after the server installation is over. Press No.



Install Windows

Type your product key for activation

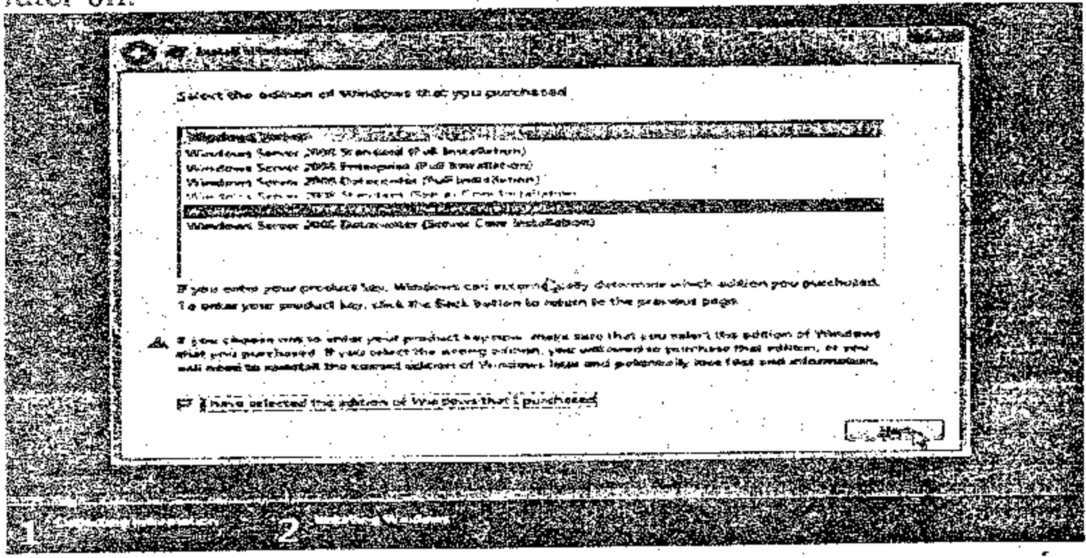
You can find your product key on your computer or on the installation disc holder inside the Windows package. Although you are not required to enter your product key now to install, failure to enter it may result in the loss of data, information, and programs. You may be required to purchase another edition of Windows. We strongly advise that you enter your product identification key now.

Install Windows

Do you want to enter your product key now?

If you choose not to enter the product key now, you might need to reinstall Windows later and potentially lose data, information, and programs, or you might need to purchase another edition of Windows.

6. Because you did not provide the correct ID, the installation process cannot determine what kind of Windows Server 2008 license you own, and therefore you will be prompted to select **your correct version** in the next screen, assuming you are telling the truth and will provide the correct ID to prove your selection later on.



Select the edition of Windows that you purchased

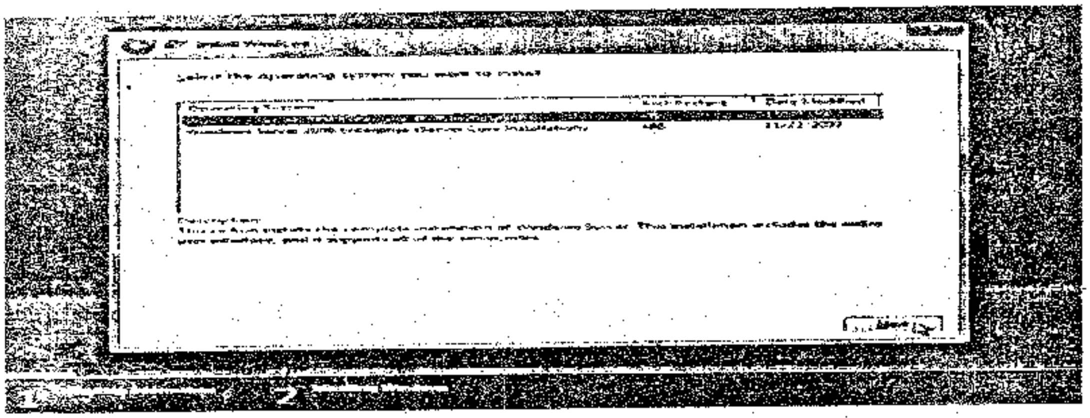
Windows Server 2008 Standard (Full Installation)
Windows Server 2008 Enterprise (Full Installation)
Windows Server 2008 Datacenter (Full Installation)
Windows Server 2008 Standard (Server Core Installation)
[illegible]
Windows Server 2008 Datacenter (Server Core Installation)

If you enter your product key, Windows can automatically determine which edition you purchased. To enter your product key, click the Back button to return to the previous page.

If you choose not to enter your product key now, make sure that you select the edition of Windows that you purchased. If you select the wrong edition, you will need to purchase that edition, or you will need to reinstall the correct edition of Windows later and potentially lose files and information.

☑ I have selected the edition of Windows that I purchased

7. If you did provide the right Product ID, select the **Full version** of the right Windows version you're prompted, and click **Next**.

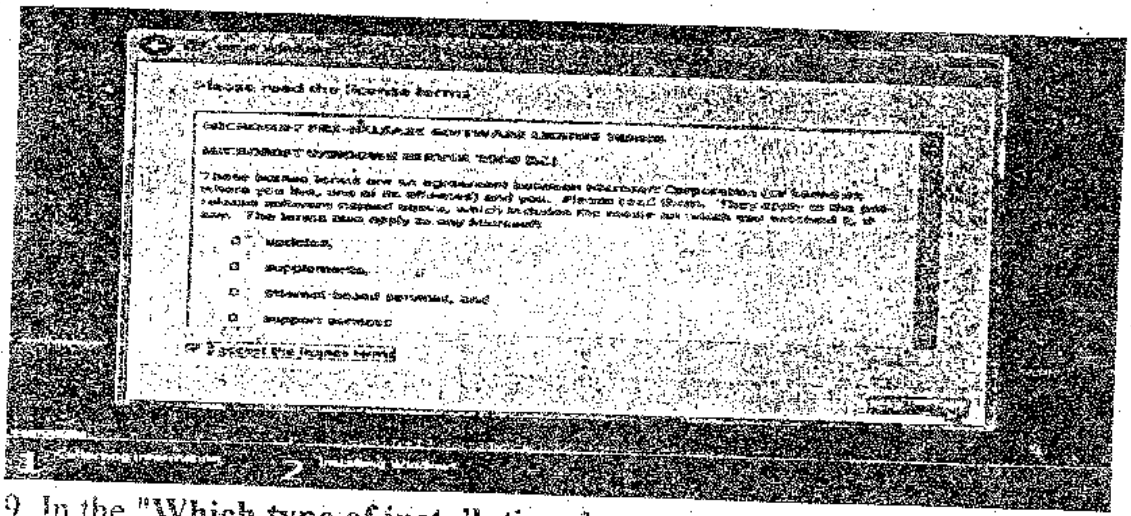


Select the operating system you want to install

Operating System	Architecture	Date Modified
[illegible]	[illegible]	[illegible]
Windows Server 2008 Enterprise (Server Core Installation)	x86	11/22/2007

Description:
[illegible]

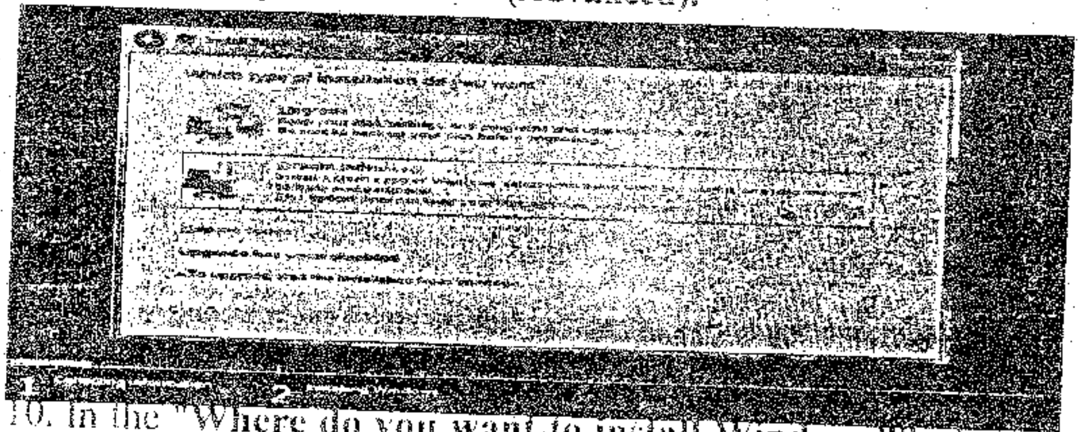
8. Read and accept the license terms by clicking to select the **checkbox** and pressing **Next.**



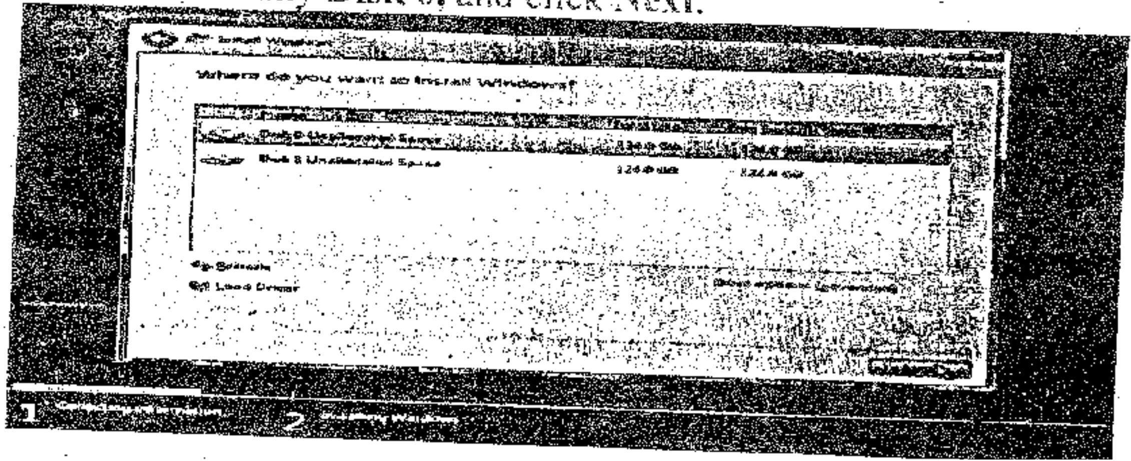
Please read the license terms

☑ I accept the license terms

9. In the **"Which type of installation do you want?"** window, click the only available option – **Custom (Advanced).**



10. In the **"Where do you want to install Windows?"**, if you're installing the server on a regular IDE hard disk, click to select the **first disk**, usually **Disk 0**, and click **Next.**

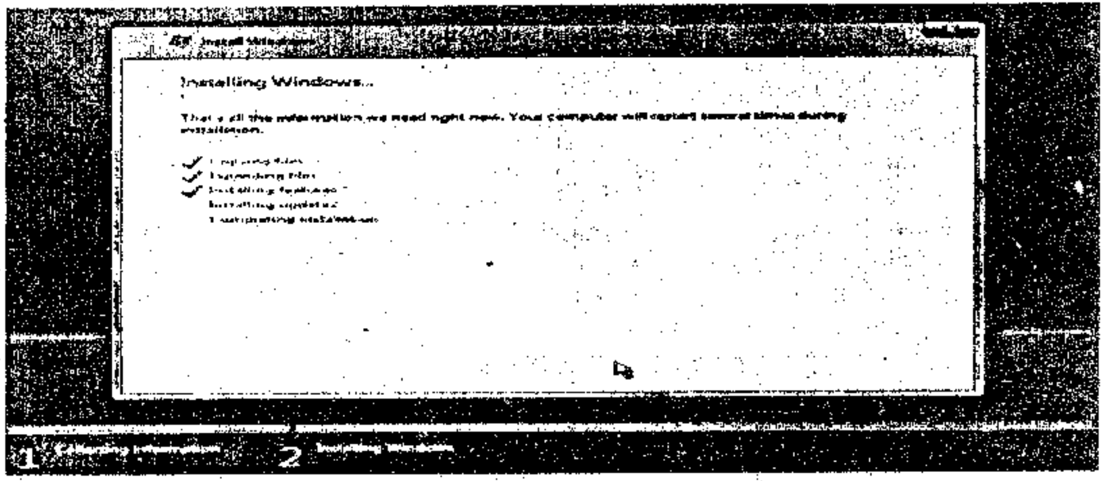


Where do you want to install Windows?

If you're installing on a hard disk that's connected to a SCSI controller, click Load Driver and insert the media provided by the controller's manufacturer.

If you must, you can also click Drive Options and manually create a partition on the destination hard disk.

11. The installation now begins, and you can go and have lunch. Copying the setup files from the DVD to the hard drive only takes about one minute. However, extracting and uncompressing the files takes a good deal longer. After 20 minutes, the operating system is installed. The exact time it takes to install server core depends upon your hardware specifications. Faster disks will perform much faster installs... Windows Server 2008 takes up approximately 10 GB of hard drive space.



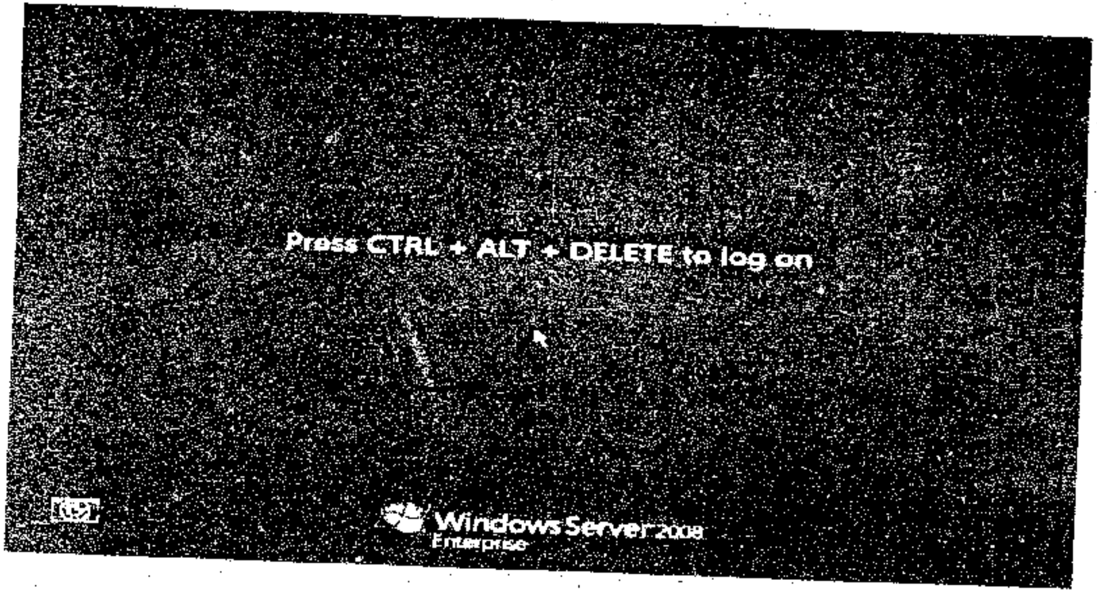
Installing Windows...

That's all the information we need right now. Your computer will restart several times during installation.

✓ Copying files
✓ Expanding files
✓ Installing features
Installing updates
Completing installation

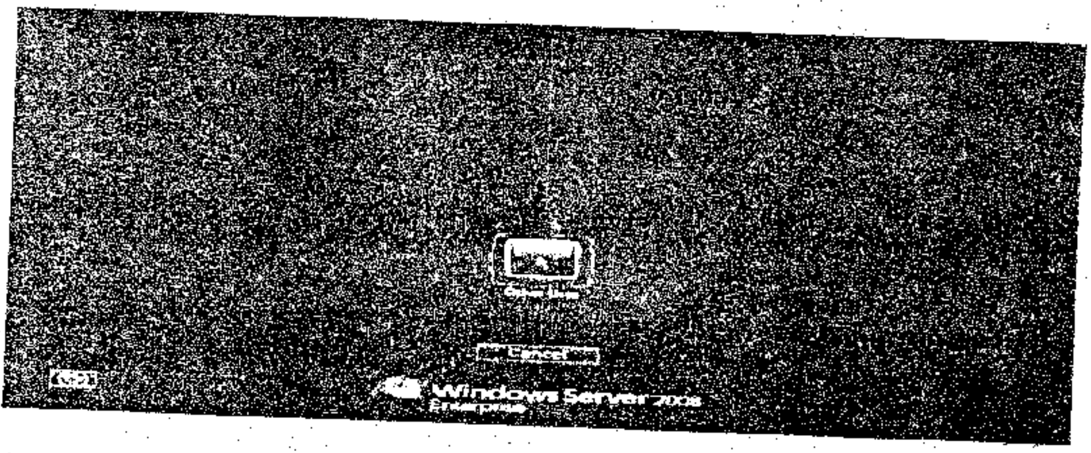
The installation process will reboot your computer, so, if in step #10 you inserted a floppy disk (either real or virtual), make sure you remove it before going to lunch, as you'll find the server hanged without the ability to boot (you can bypass this by configuring the server to boot from a CD/DVD and then from the hard disk in the booting order on the server's BIOS)

12. Then the server reboots you'll be prompted with the new Windows Server 2008 type of login screen. Press **CTRL+ALT+DEL** to log in.



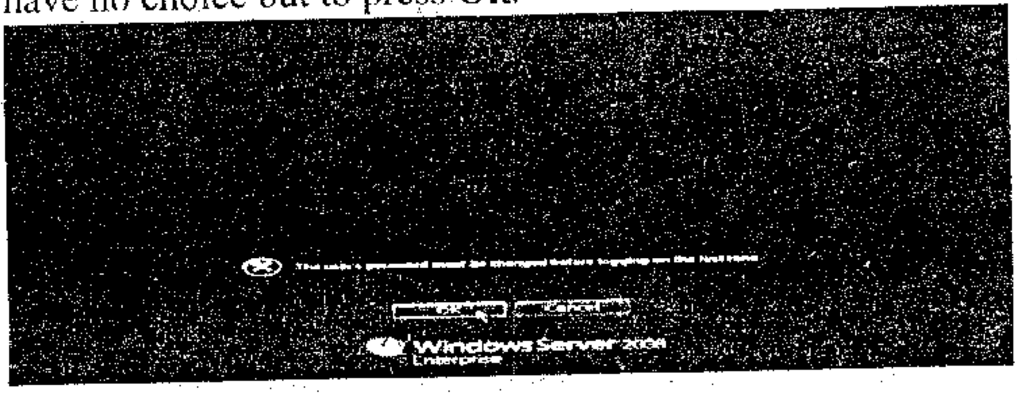
Press CTRL + ALT + DELETE to log on

13. Click on Other User.

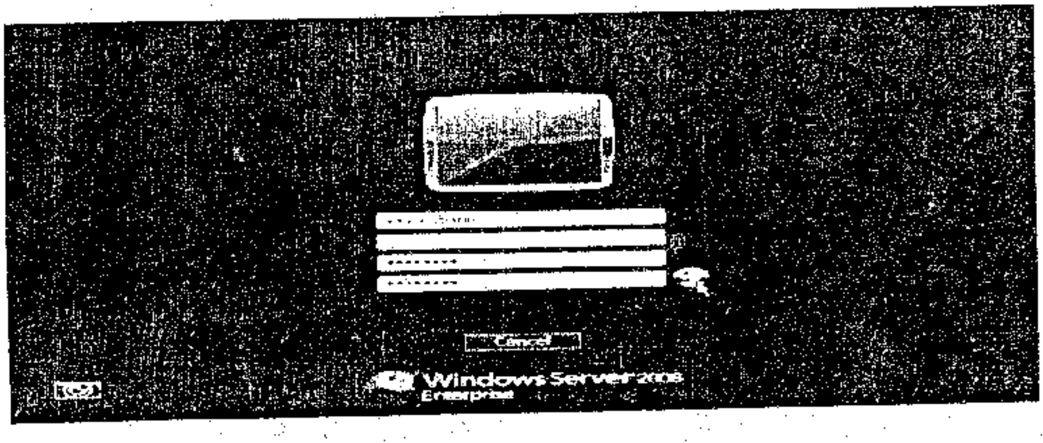


14. The default **Administrator** is **blank**, so just type **Administrator** and press **Enter**.

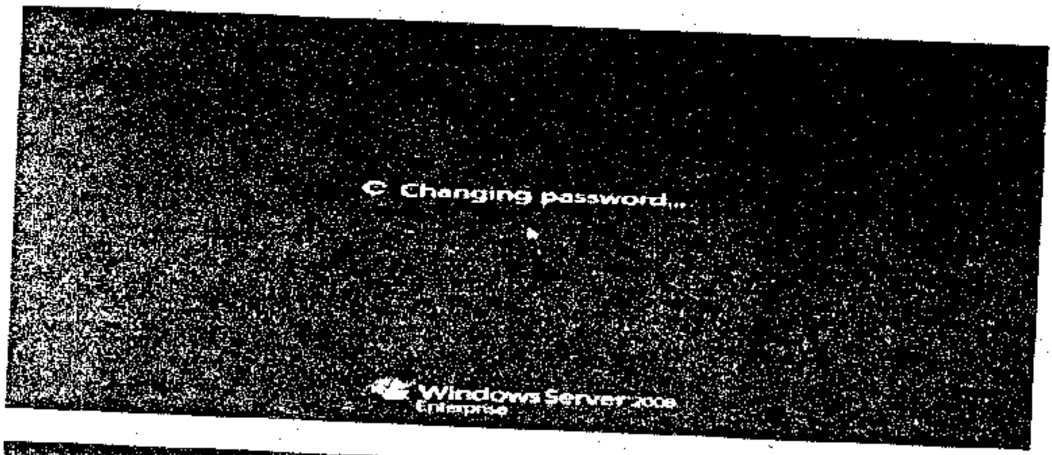
15. You will be prompted to change the user's password. You have no choice but to press **Ok**.



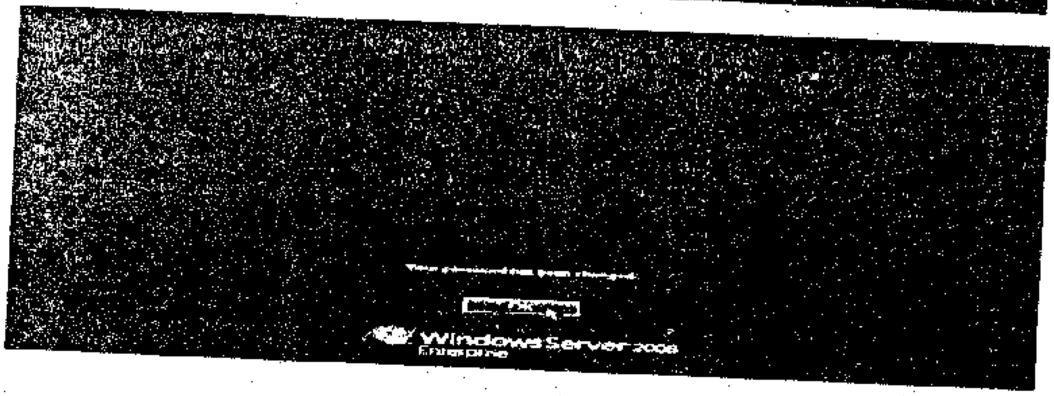
16. In the password changing dialog box, leave the **default password blank** and enter a new, complex, at-least-7-characters-long new password twice. A password like "topsecret" is not valid (it's not complex), but one like "T0pSecreT!" sure is. Make sure you remember it.



17. Someone thought it would be cool to nag you once more, so now you'll be prompted to accept the fact that the password had been changed. Press **Ok**.



Changing password...

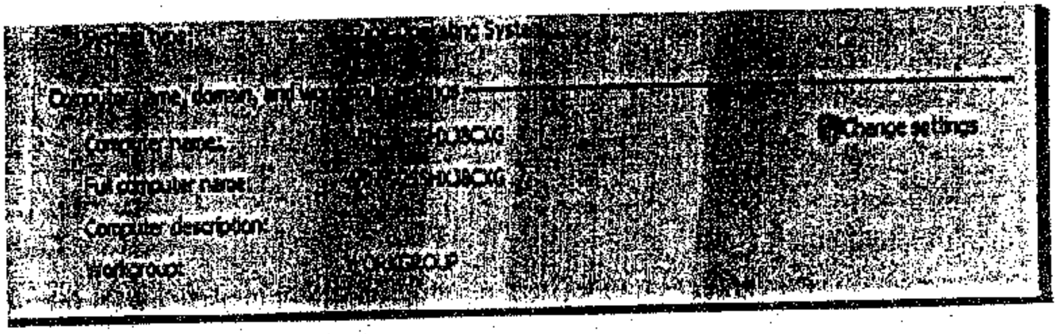


Your password has been changed.

18. Finally, the desktop appears and that's it, you're logged on and can begin working. You will be greeted by an assistant for the **initial server configuration**, and after performing some initial configuration tasks, you will be able to start working.

Active Directory Installation on Windows Server 2008

To start the installation of active directory is to change the name of the computer to reflect the new status. To do that, login to the server and click on the **Start** button and **right-click** on **Computer** and go to **Properties.** At the bottom under **computer name, domain, and workgroup settings,** click on the **Change settings:**



Computer name, domain, and workgroup settings

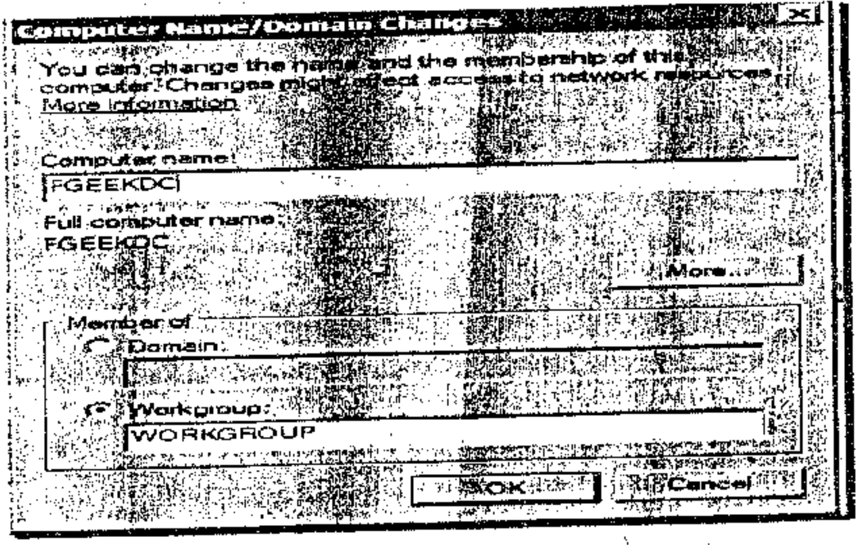
Computer name: [illegible]H0J38CXG

Full computer name: [illegible]H0J38CXG

Computer description:

Workgroup: WORKGROUP

The **System Property** window will come up.
Click on the **change** tab, and change the computer name to whatever you want.



Computer Name/Domain Changes

You can change the name and the membership of this computer. Changes might affect access to network resources.
More information

Computer name:
FGEEKDC

Full computer name:
FGEEKDC

Member of
○ Domain:

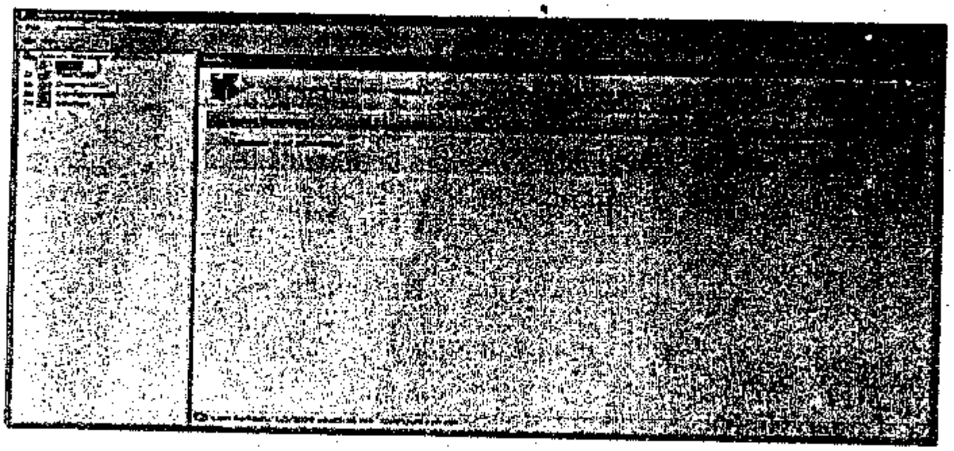
● Workgroup:
WORKGROUP

Click on the **OK** button. Windows Server 2008 will now reboot.

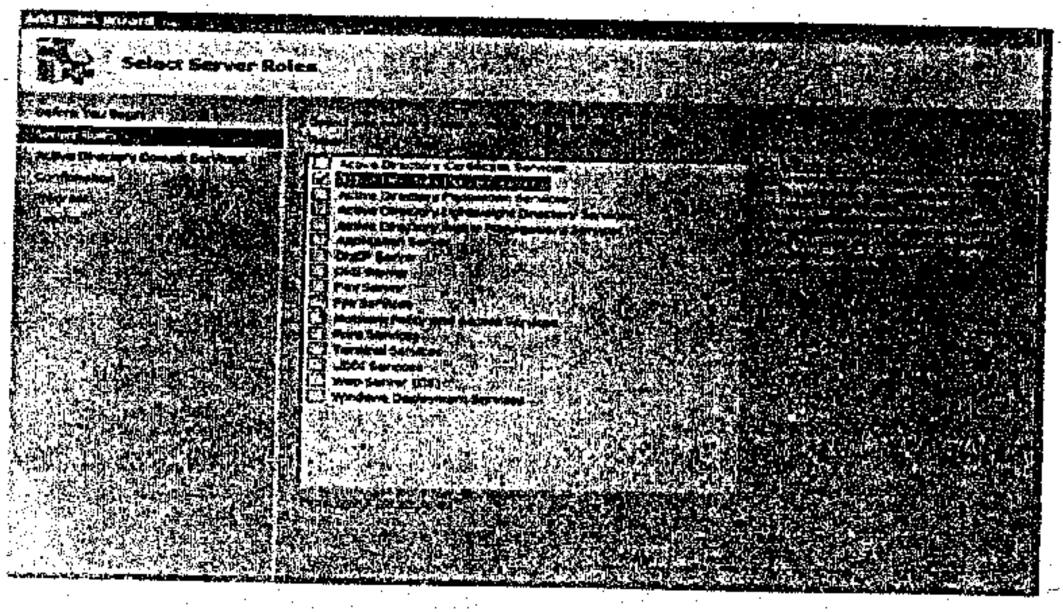
Installing Active Directory Domain Services

Now that we have renamed the computer to something that reflects the new role on windows server 2008, we will proceed with the installation of active directory. To install active directory domain

The server manager window will come up:



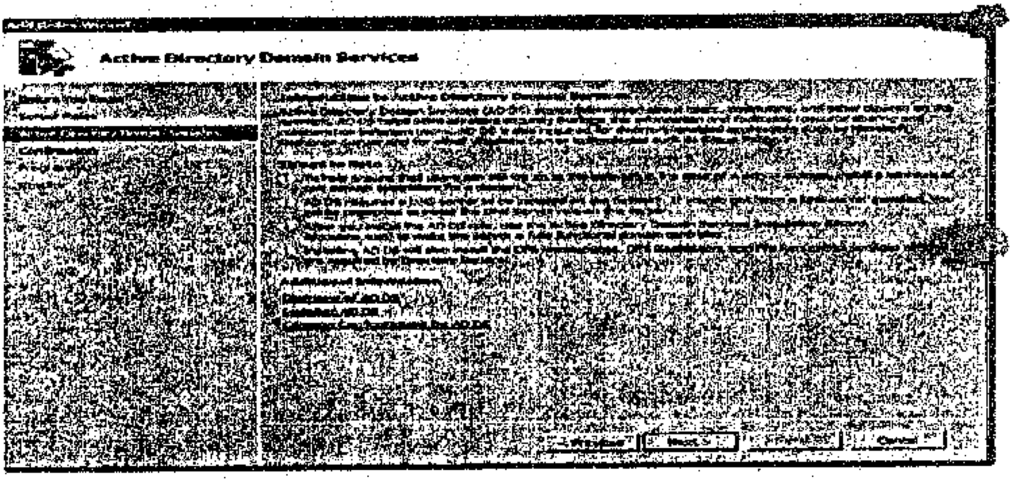
The **Select Server Role** window will come up:



□ Active Directory Certificate Services
☑ Active Directory Domain Services
□ Active Directory Federation Services
□ Active Directory Lightweight Directory Services
□ Active Directory Rights Management Services
□ Application Server
□ DHCP Server
□ DNS Server
□ Fax Server
□ File Services
□ Network Policy and Access Services
□ Print Services
□ Terminal Services
□ UDDI Services
□ Web Server (IIS)
□ Windows Deployment Services

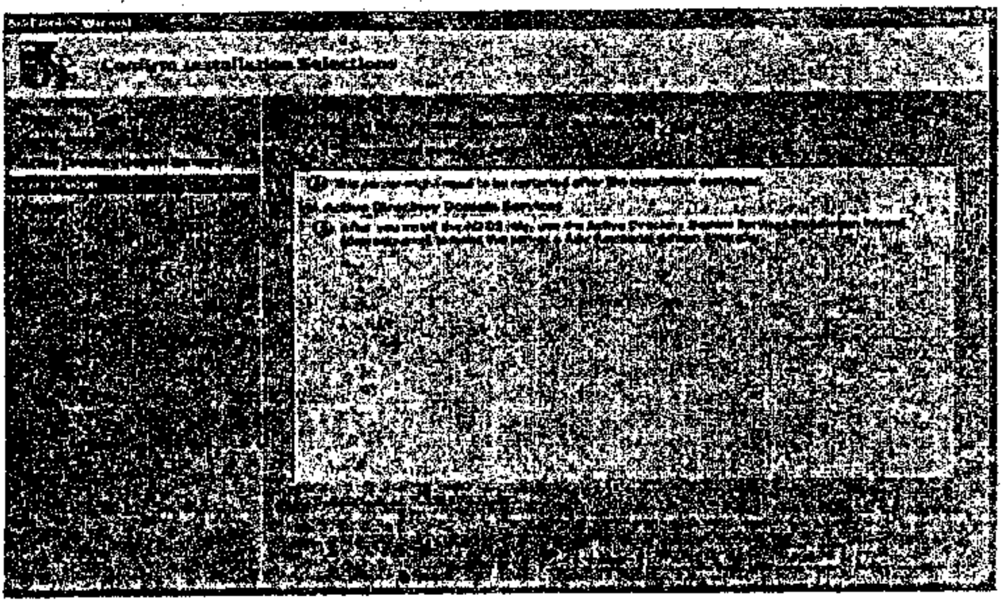
Make sure the **Active Directory Domain Services** option is checked. Click on **Next** after checking the option.

Active directory domain services (AD DS) is something new on Windows Server 2008. On the following window you can read a small introduction about it. Click next when you finish reading.

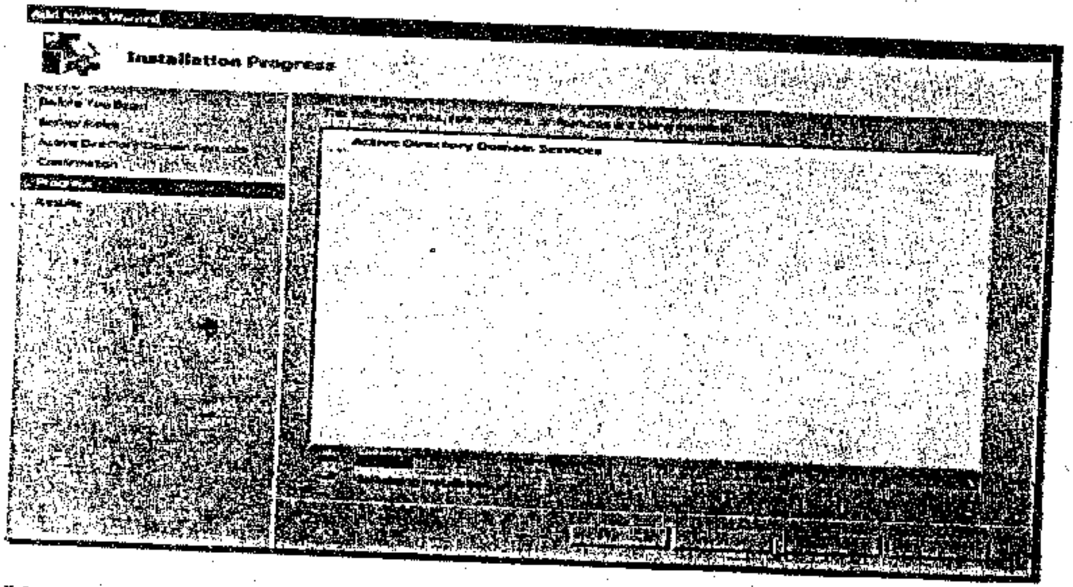


click **Next** on the above window.

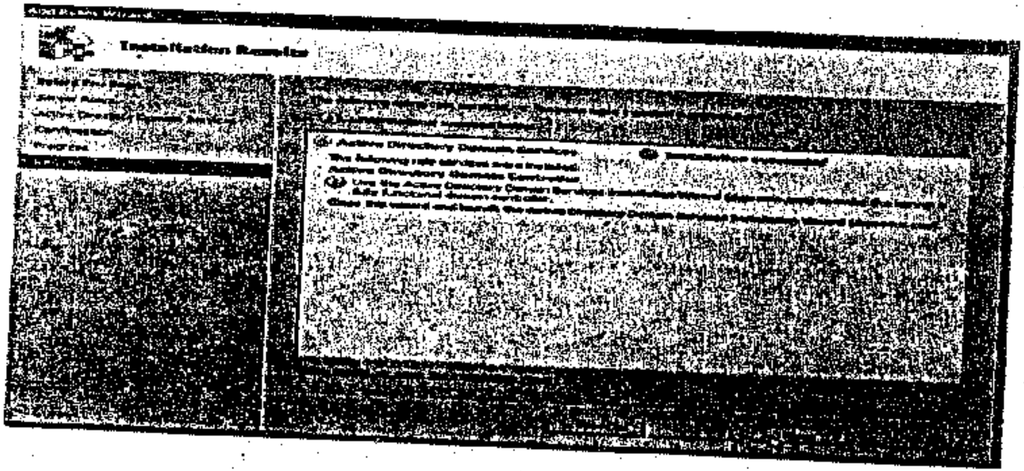
On the following window, you will be asked to confirm the installation of domain services:



Click on **Install** to start the installation.



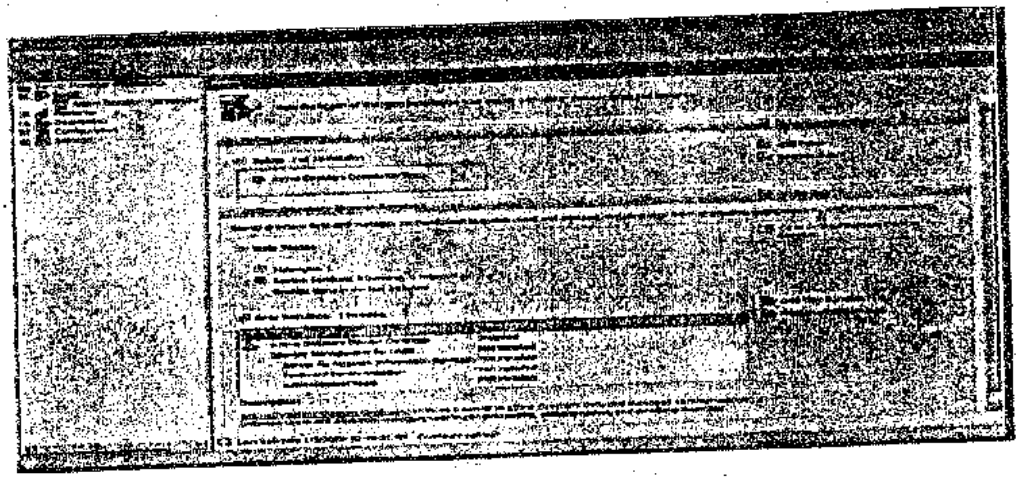
You should receive the Installation Results window after the installation completes.



Note: *this only installs Active Directory domain services, it does not make Windows server 2008 a domain controller. For that we will need to run the DCPROMO wizard.*

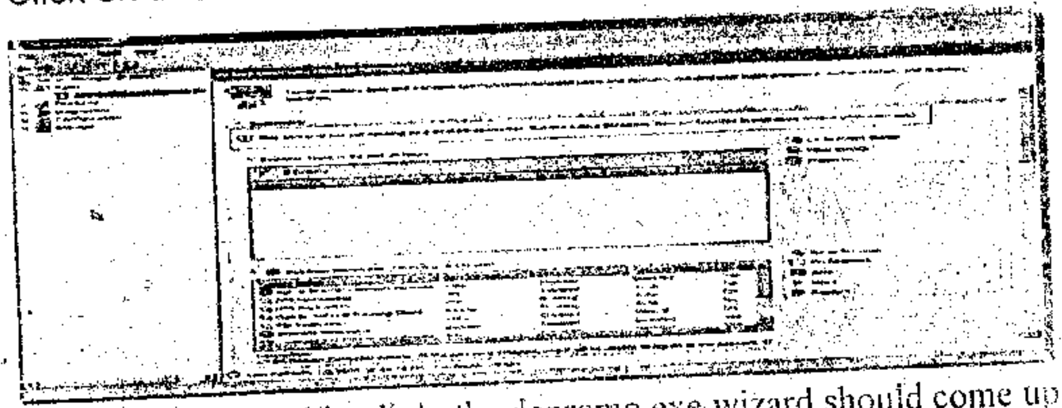
Installing Active Directory Domain Controller

After Active Directory Domain Services have been installed, you should return to the Server Role Interface. Click on **Active Directory Domain Services:**

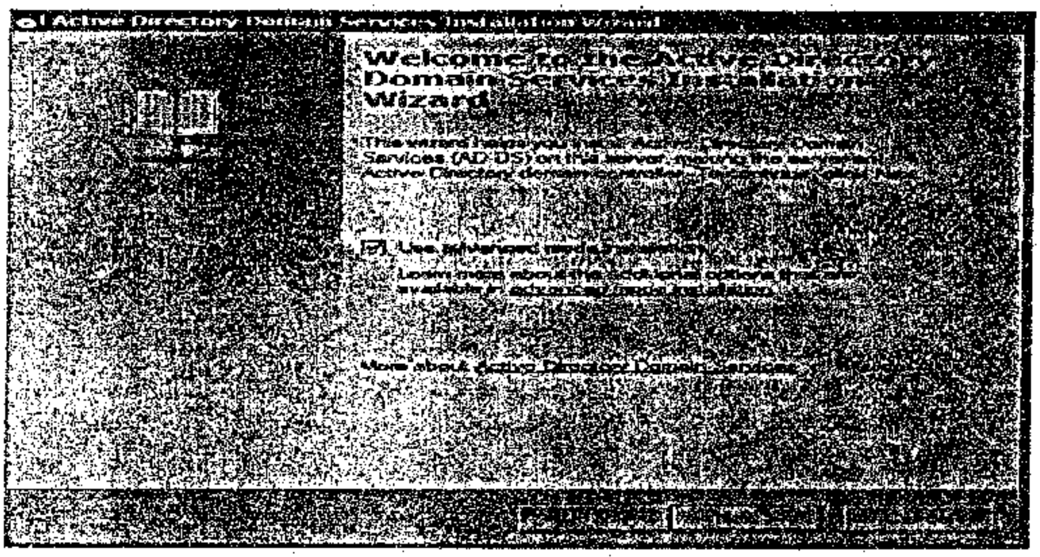


On the window that pops up, you will see a summary message that reads, "*This server is not yet running as a domain controller: Run Active Directory Domain Services Installation Wizard (dcpromo.exe)*

Click on the blue link.



By clicking on the blue link, the dcpromo.exe wizard should come up



Active Directory Domain Services Installation Wizard

Welcome to the Active Directory Domain Services Installation Wizard

This wizard helps you install Active Directory Domain Services (AD DS) on this server, making the server an Active Directory domain controller. [illegible]

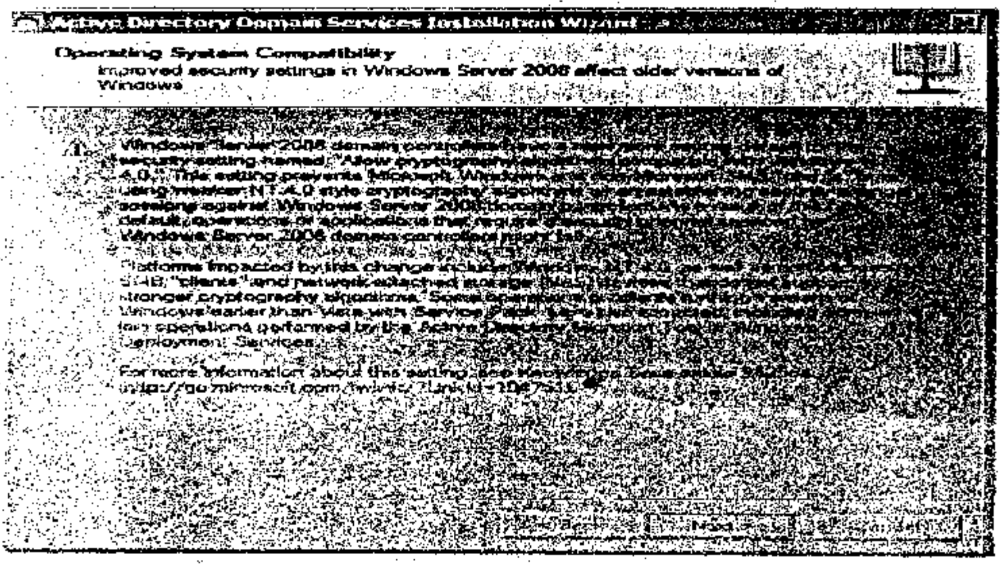
☑ Use advanced mode installation

Learn more about the additional options that are available in advanced mode installation.

More about Active Directory Domain Services

Make sure "**Use advanced mode installation**" option is checked and click **Next.**

read the provided information on the next screen. that explains some new features on windows server 2008 domain services that might affect older Windows operating systems and non Microsoft SMB clients on an existing domain.



Active Directory Domain Services Installation Wizard

Operating System Compatibility

Improved security settings in Windows Server 2008 affect older versions of Windows

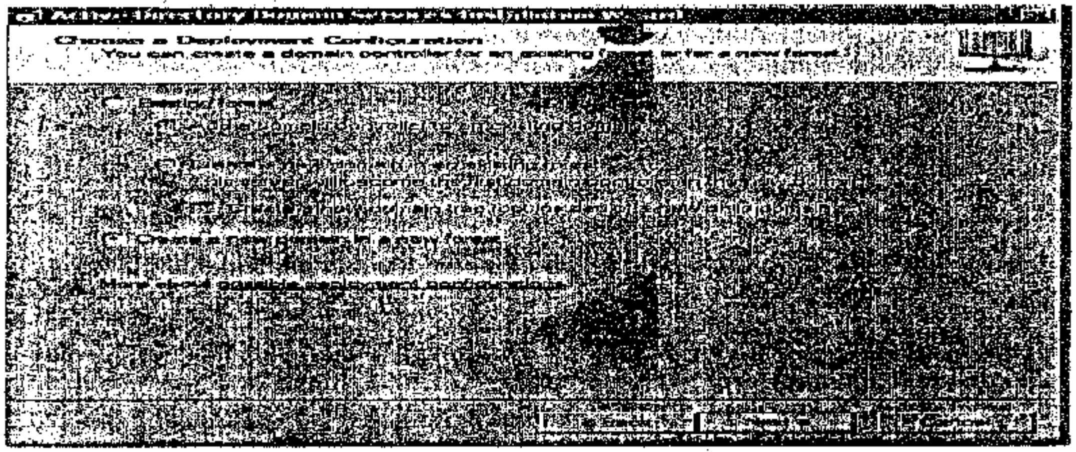
Windows Server 2008 domain controllers [illegible] security setting named "Allow cryptography algorithms compatible with Windows NT 4.0." This setting prevents Microsoft Windows [illegible] using weaker NT 4.0 style cryptography algorithms [illegible] sessions against Windows Server 2008-based domain controllers. By default, operations of applications that require [illegible] Windows Server 2008 domain controllers might fail.

Platforms impacted by this change include Windows NT 4.0 [illegible] SMB "clients" and network-attached storage (NAS) devices [illegible] stronger cryptography algorithms. Some operations [illegible] Windows earlier than Vista with Service Pack [illegible] for operations performed by the Active Directory [illegible] Deployment Services.

For more information about this setting, see [illegible]
http://go.microsoft.com/fwlink/?LinkId=104751

Click **Next** after you read the above warning.

On the following screen, choose your deployment configuration.



Active Directory Domain Services Installation Wizard

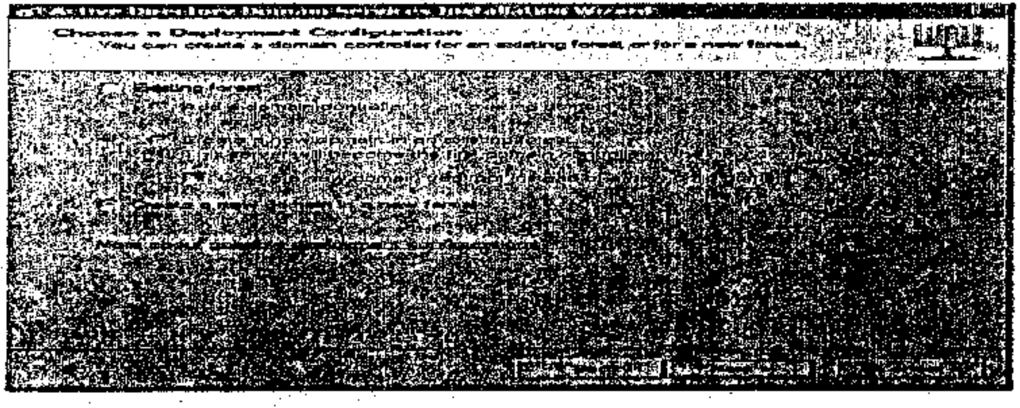
Choose a Deployment Configuration
You can create a domain controller for an existing forest or for a new forest.

○ Existing forest

○ Create a new domain in a new forest

More about possible deployment configurations

Because this is my first domain controller, I will choose the "Create a new domain in a new forest" option.



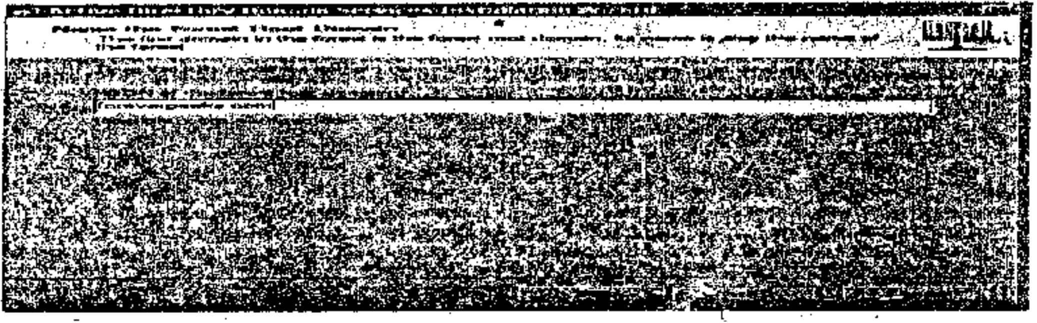
Active Directory Domain Services Installation Wizard

Choose a Deployment Configuration
You can create a domain controller for an existing forest or for a new forest.

○ Existing forest

○ Create a new domain in a new forest

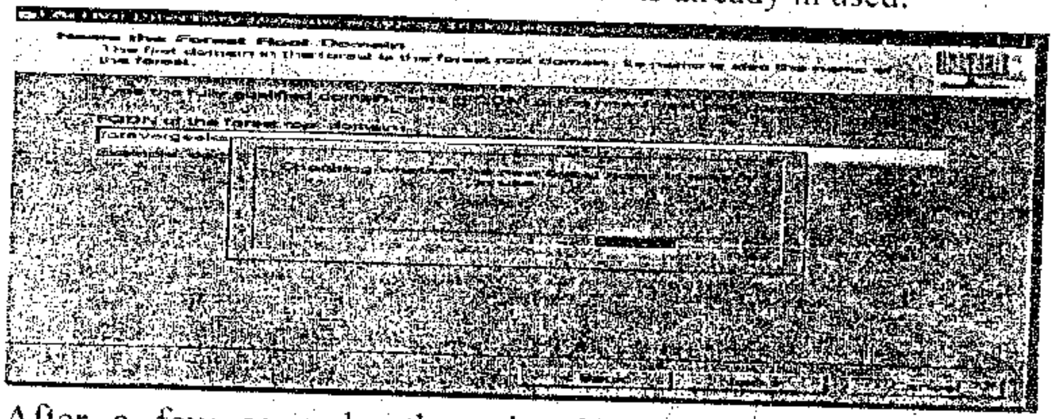
click on Next.
Choose the name for your forest root domain on the following window



Active Directory Domain Services Installation Wizard

Name the Forest Root Domain
The first domain in the forest is the forest root domain. Its name is also the name of the forest.

click **Next** after choosing your fully qualified domain name.
The wizard will check if that forest name is already in used:



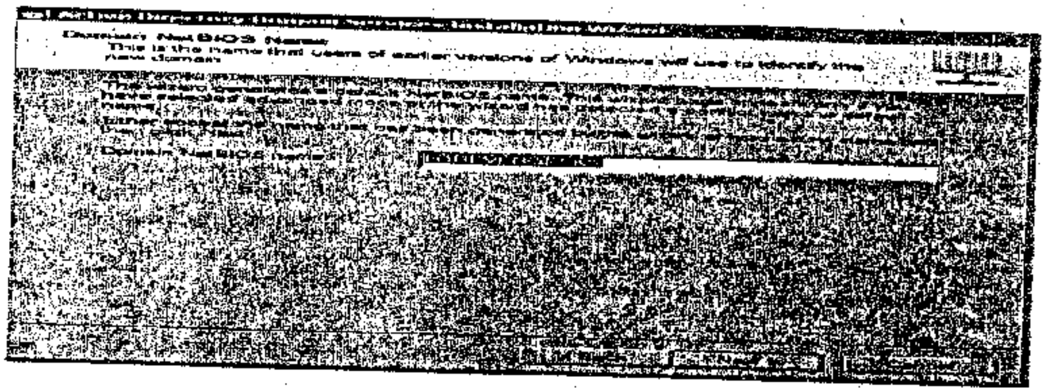
Name the Forest Root Domain
The first domain in the forest is the forest root domain. Its name is also the name of the forest.

Type the fully qualified domain name (FQDN) of the new forest root domain.

FQDN of the forest root domain:
[illegible]

Checking whether the name is already in use...

After a few seconds, the wizard will ask you to enter the NetBIOS name:



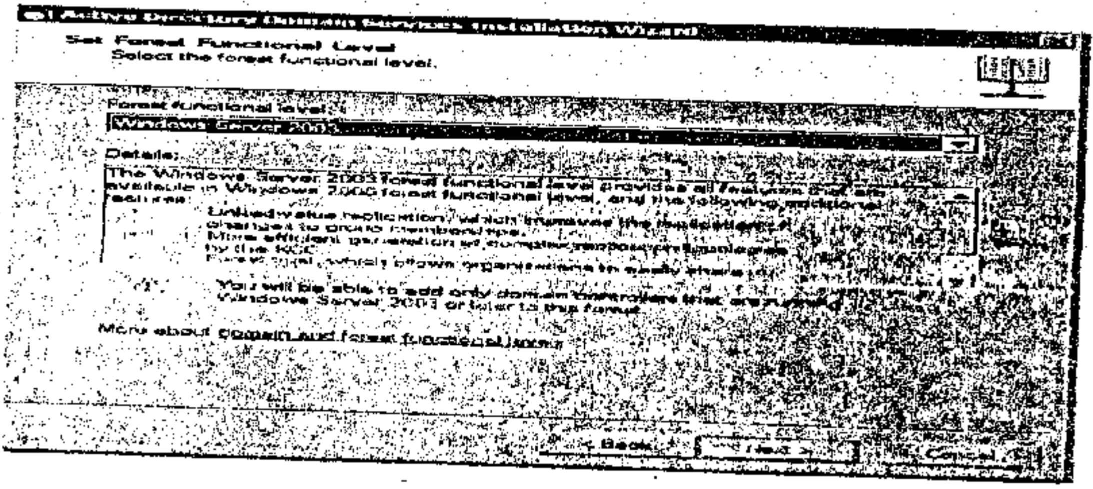
Active Directory Domain Services Installation Wizard

Domain NetBIOS Name
This is the name that users of earlier versions of Windows will use to identify the new domain.

[illegible]

Domain NetBIOS name: [illegible]

The default NetBIOS name should be fine. Click on the Next tab.
on the following screen, choose the **forest functional level:**



Active Directory Domain Services Installation Wizard

Set Forest Functional Level
Select the forest functional level.

Forest functional level:
Windows Server 2003

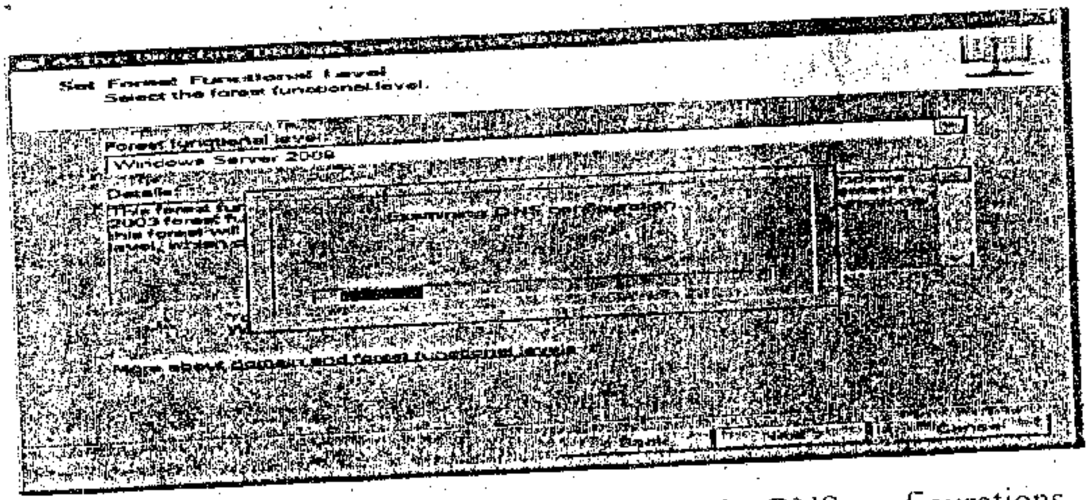
Details:
The Windows Server 2003 forest functional level provides all features that are available in Windows 2000 forest functional level, and the following additional features:

Linked-value replication, which improves the replication of changes to group memberships.
More efficient generation of complex replication topologies by the KCC.
Forest trust, which allows organizations to easily share [illegible]

You will be able to add only domain controllers that are running Windows Server 2003 or later to this forest.

More about domain and forest functional levels

I will choose Windows Server 2003 as my functional level. Choosing windows server 2008 functional level does not provide any new features over the Windows 2003 forest functional level. However, it ensures that any new domains created in this forest will automatically operate at the Windows Server 2008 domain functional level, which does provide unique features. click on **Next.**



Set Forest Functional Level
Select the forest functional level.

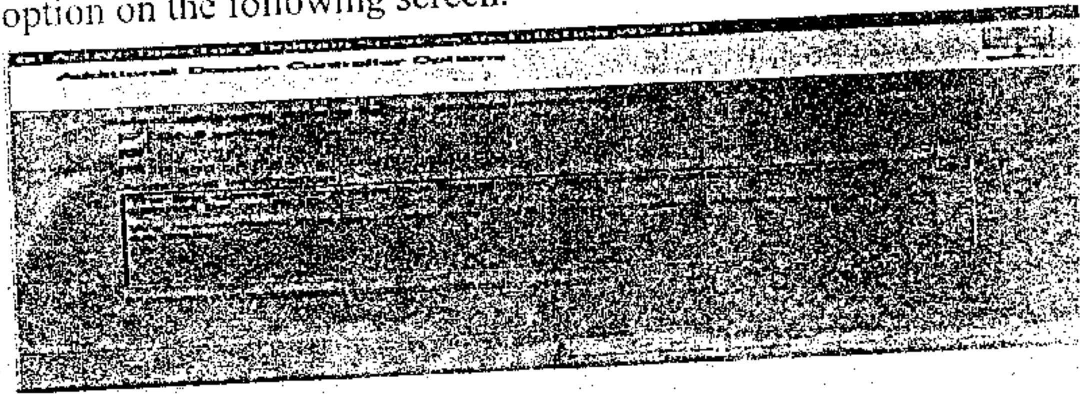
Forest functional level:
Windows Server 2008

Details:

Examining DNS configuration...

Clicking next, the dcpromo wizard will check for DNS configurations.

If DNS is not installed on your system, choose the DNS Server option on the following screen.



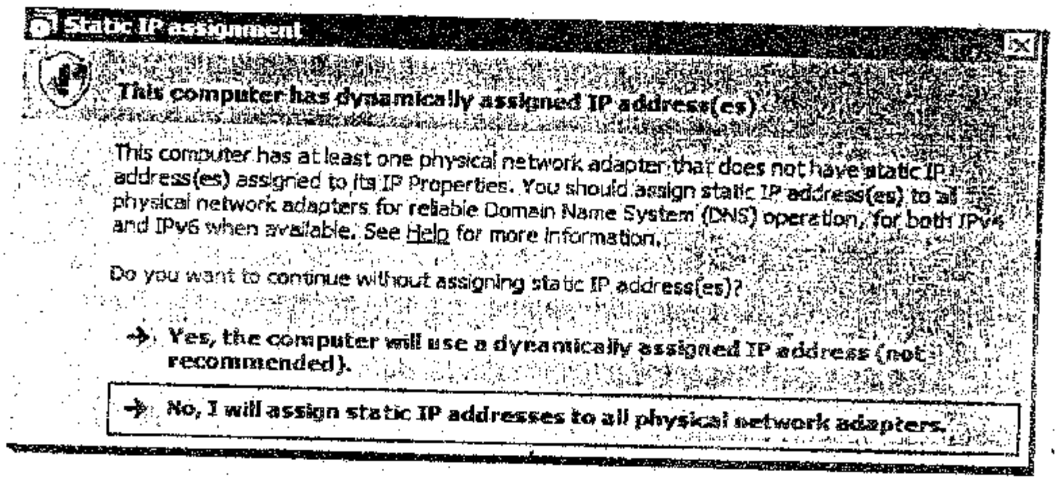
Additional Domain Controller Options

Here you get the info that tells you:

The first domain controller in a forest must be a global catalog server and cannot be an RODC.

Click on **Next.**

If your server does have static IP address assigned on the server, you might get the following warning:



Static IP assignment

This computer has dynamically assigned IP address(es)

This computer has at least one physical network adapter that does not have static IP address(es) assigned to its IP Properties. You should assign static IP address(es) to all physical network adapters for reliable Domain Name System (DNS) operation, for both IPv4 and IPv6 when available. See Help for more information.

Do you want to continue without assigning static IP address(es)?

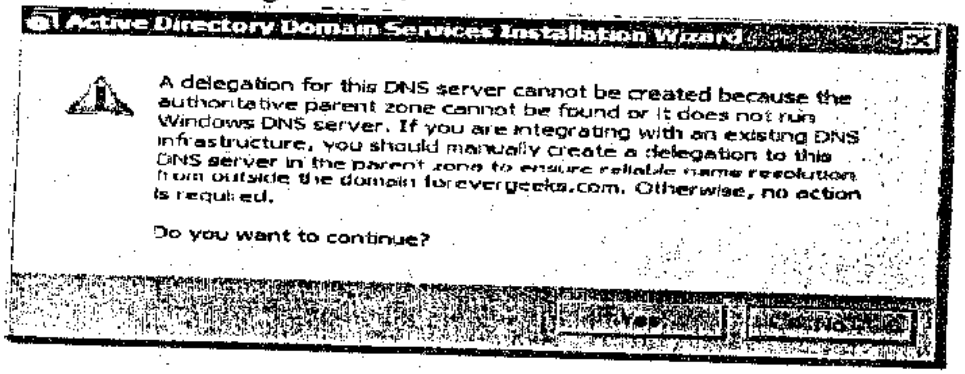
→ **Yes, the computer will use a dynamically assigned IP address (not recommended).**

→ **No, I will assign static IP addresses to all physical network adapters.**

as you can see, having dynamic assigned IP address is not recommended. use static IP addresses for servers whenever is possible.

Choose your option, and click **Next.**

another warning:



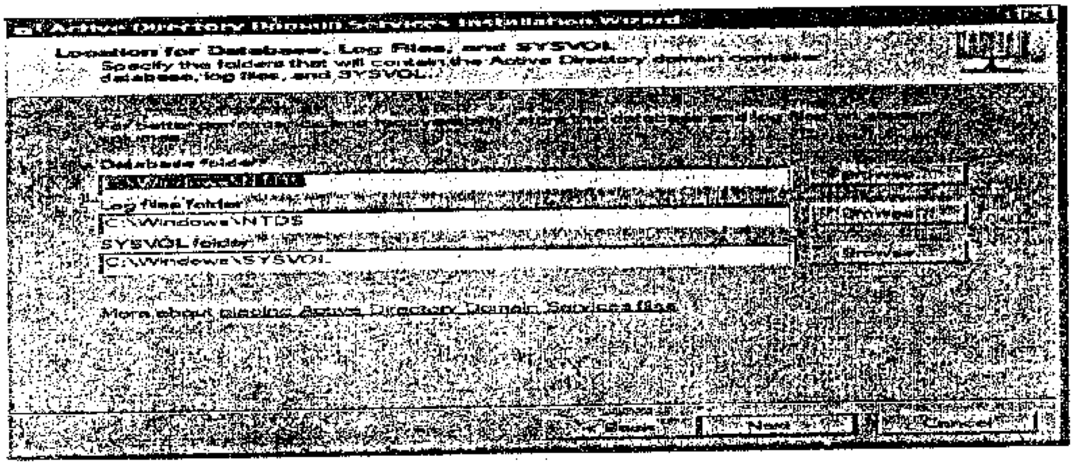
Active Directory Domain Services Installation Wizard

A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not run Windows DNS server. If you are integrating with an existing DNS infrastructure, you should manually create a delegation to this DNS server in the parent zone to ensure reliable name resolution from outside the domain forevergeeks.com. Otherwise, no action is required.

Do you want to continue?

if you get this warning, click on OK

choose the location of the AD database on the following screen:



Active Directory Domain Services Installation Wizard

Location for Database, Log Files, and SYSVOL
Specify the folders that will contain the Active Directory domain controller database, log files, and SYSVOL.

For better performance and recoverability, store the database and log files on separate volumes.

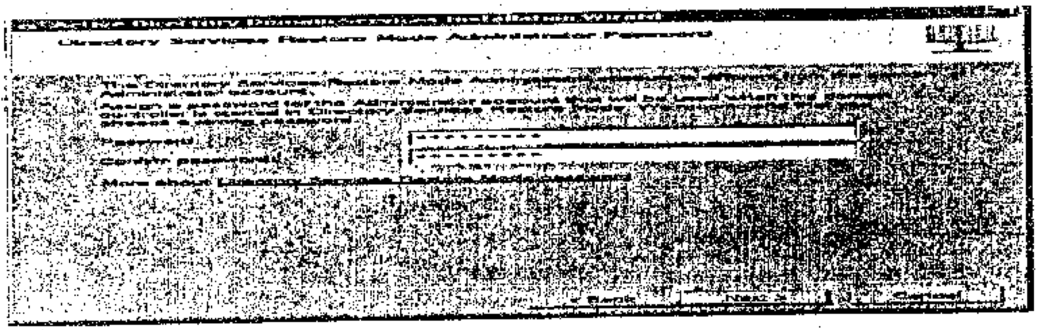
Database folder:
C:\Windows\NTDS

Log files folder:
C:\Windows\NTDS

SYSVOL folder:
C:\Windows\SYSVOL

More about placing Active Directory Domain Services files

Leave the default settings, and click on Next.
Enter yóur the password for your Restore Mode Administrator on the following screen.



Active Directory Domain Services Installation Wizard

Directory Services Restore Mode Administrator Password

The Directory Services Restore Mode Administrator account is different from the domain Administrator account.

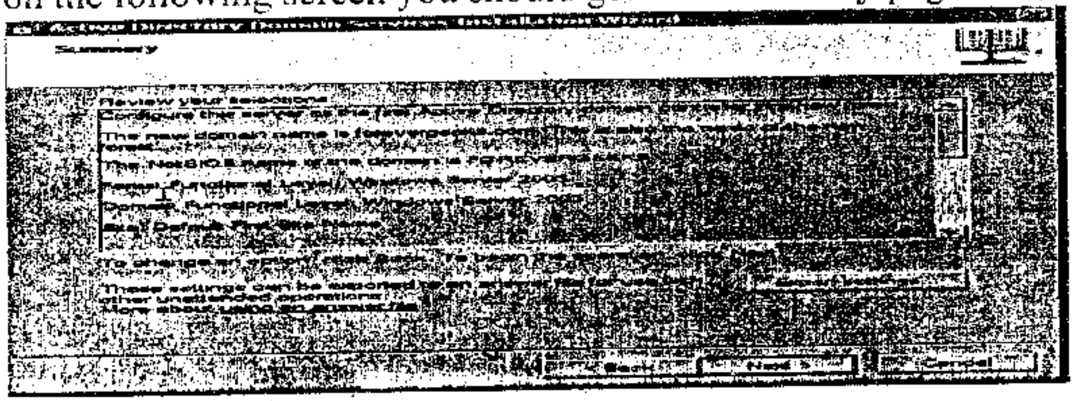
Assign a password for the Administrator account that will be used when this domain controller is started in Directory Services Restore Mode. We recommend that you choose a strong password.

Password: ••••••••••
Confirm password: ••••••••••

More about Directory Services Restore Mode password

click Next after entering the password.

on the following screen you should get the **Summary** page.



Active Directory Domain Services Installation Wizard

Summary

Review your selections:

Configure this server as the first Active Directory domain controller in a new forest.

The new domain name is [illegible]. This is also the name of the new forest.

The NetBIOS name of the domain is [illegible]

Forest Functional Level: Windows Server 2003

Domain Functional Level: Windows Server 2003

Site: Default-First-Site-Name

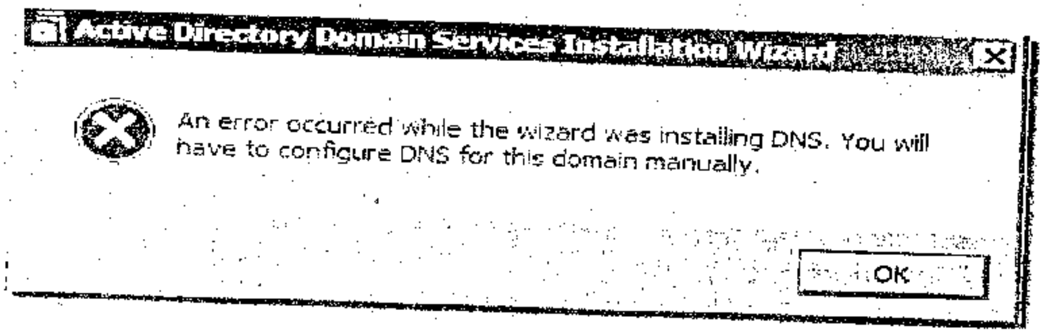
To change an option, click Back. To begin the operation, click Next.

These settings can be exported to an answer file for use with other unattended operations.

More about using an answer file

click on **Next.**

damn it!! I got an error saying I need to install DNS manually.



Active Directory Domain Services Installation Wizard

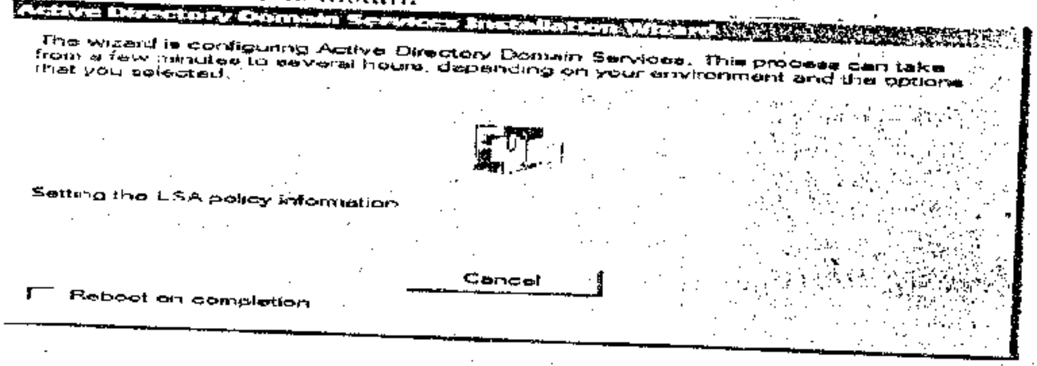
An error occurred while the wizard was installing DNS. You will have to configure DNS for this domain manually.

"*An error occurred while the wizard was installing DNS, you will have to configure DNS for this domain manually.*

This is the first time I let the dcpromo.exe to configure DNS for me. and I kind of was expecting for this error. that will be the subject of the next article.

click **OK** on the error for now.

active directory installation should start installing. but it won't work perfect until DNS is install.

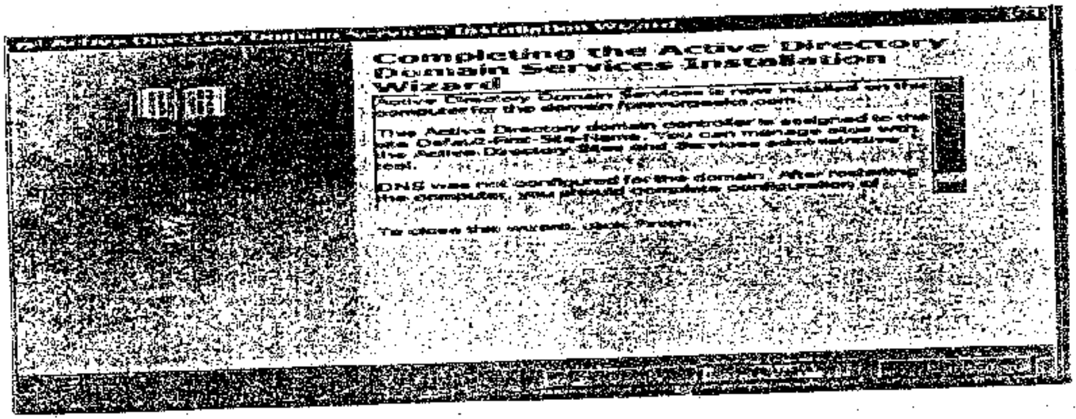


Active Directory Domain Services Installation Wizard

The wizard is configuring Active Directory Domain Services. This process can take from a few minutes to several hours, depending on your environment and the options that you selected.

Setting the LSA policy information

after awhile, you should get the completion window.



Active Directory Domain Services Installation Wizard

Completing the Active Directory Domain Services Installation Wizard

Active Directory Domain Services is now installed on this computer for the domain [illegible].com.

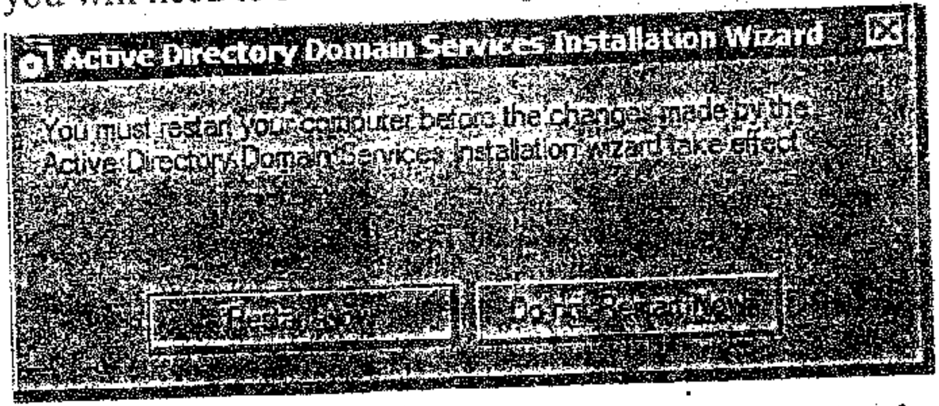
The Active Directory domain controller is assigned to the site Default-First-Site-Name. You can manage sites with the Active Directory Sites and Services administrative tool.

DNS was not configured for the domain. After restarting the computer, you should complete configuration of [illegible]

To close this wizard, click Finish.

click on **Finish.**

you will need to reboot the computer.



Active Directory Domain Services Installation Wizard

You must restart your computer before the changes made by the Active Directory Domain Services Installation wizard take effect.

go ahead and restart the computer, and if you need to install DNS do so after the reboot.

Install a DNS server in Windows Server 2008

Installation

You can install a DNS server from the Control Panel or when promoting a member server to a domain controller (DC) **(Figure A)**.

During the promotion, if a DNS server is not found, you will have the option of installing it.

Domain controller

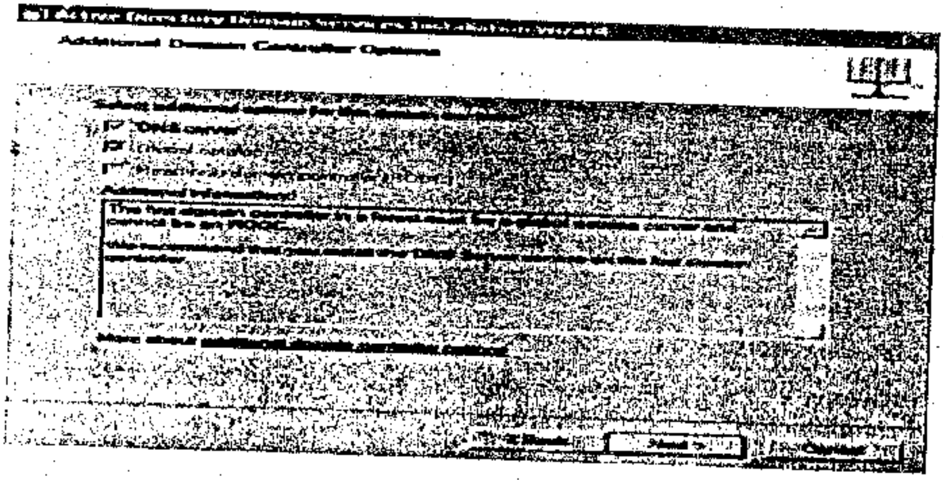
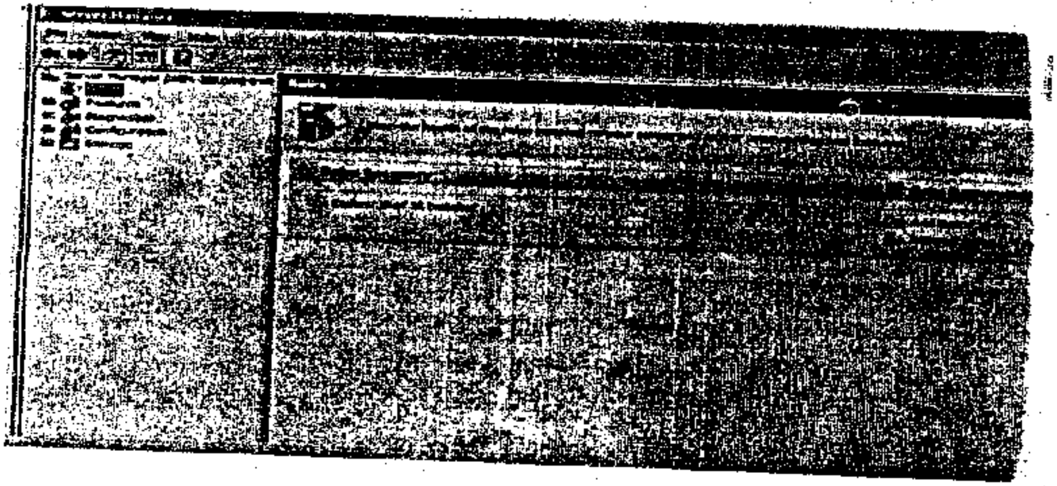


Fig A

To install a DNS server from the Control Panel, follow these steps

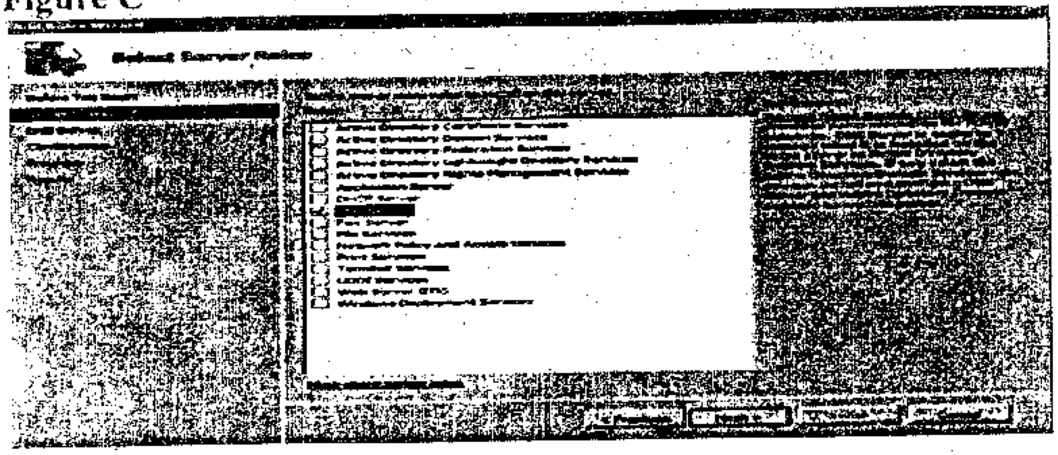
- From the Start menu, select | Control Panel | Administrative Tools | Server Manager.
- Expand and click Roles (**Figure B**).
- Choose Add Roles and follow the wizard by selecting the DNS role (**Figure C**).
- Click Install to install DNS in Windows Server 2008 (**Figure D**).

Figure B



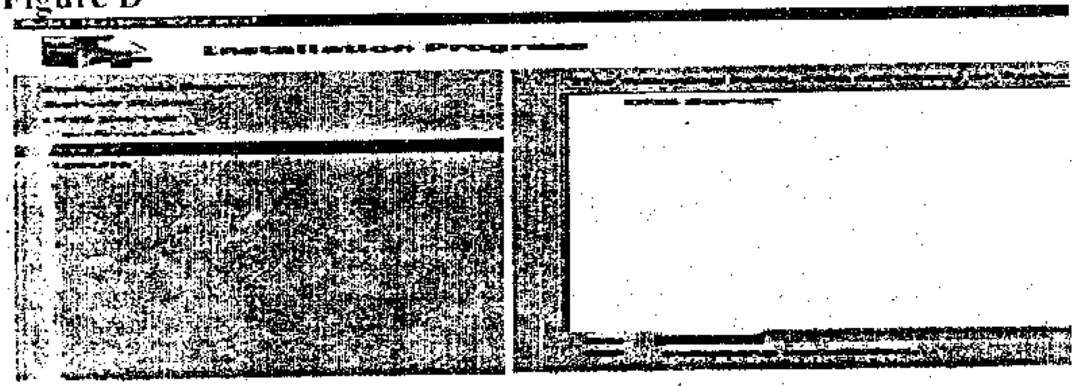
Expand and click Roles

Figure C



DNS role

Figure D



Install DNS

DNS console and configuration

After installing DNS, you can find the DNS console from Start | All Programs | Administrative Tools | DNS. Windows 2008 provides a wizard to help configure DNS.

When configuring your DNS server, you must be familiar with the

- Forward lookup zone
- Reverse lookup zone
- Zone types

A forward lookup zone is simply a way to resolve host names to IP addresses. A reverse lookup zone allows a DNS server to discover the DNS name of the host. Basically, it is the exact opposite of a forward lookup zone. A reverse lookup zone is not required, but it is easy to configure and will allow for your Windows Server 2008 Server to have full DNS functionality.

When selecting a DNS zone type, you have the following options: Active Directory (AD) Integrated, Standard Primary, and Standard Secondary. AD Integrated stores the database information in AD and allows for secure updates to the database file. This option will appear only if AD is configured. If it is configured and you select this option, AD will store and replicate your zone files.

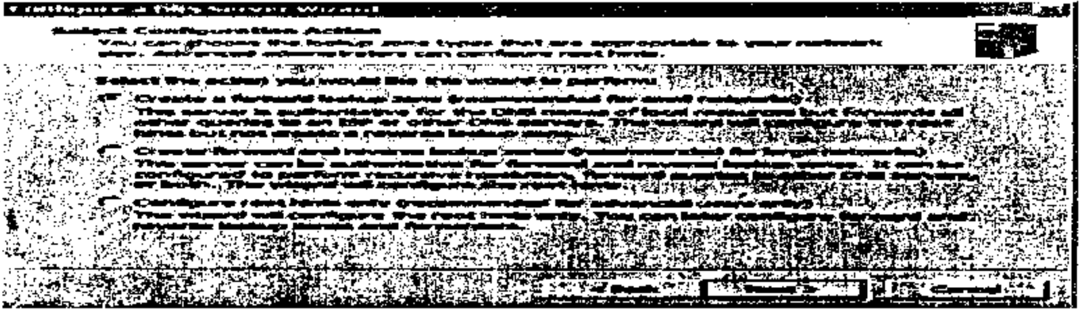
A Standard Primary zone stores the database in a text file. This text file can be shared with other DNS servers that store their information in a text file. Finally, a Standard Secondary zone simply creates a copy of the existing database from another DNS server. This is primarily used for load balancing.

To open the DNS server configuration tool:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Highlight your computer name and choose Action | Configure a DNS Server' to launch the Configure DNS Server Wizard.
3. Click Next and choose to configure the following: forward lookup zone, forward and reverse lookup zone, root hints only **(Figure E)**.
4. Click Next and then click Yes to create a forward lookup zone **(Figure F)**.

5. Select the appropriate radio button to install the desired Zone Type **(Figure G)**.
6. Click Next and type the name of the zone you are creating.
7. Click Next and then click Yes to create a reverse lookup zone.
8. Repeat Step 5.
9. Choose whether you want an IPv4 or IPv6 Reverse Lookup Zone **(Figure H)**.
10. Click Next and enter the information to identify the reverse lookup zone **(Figure I)**.
11. You can choose to create a new file or use an existing DNS file **(Figure J)**.
12. On the Dynamic Update window, specify how DNS accepts secure, nonsecure, or no dynamic updates.
13. If you need to apply a DNS forwarder, you can apply it on the Forwarders window. **(Figure K)**.
14. Click Finish **(Figure L)**.

Figure E



Configure a DNS Server Wizard

Select Configuration Action

You can choose the lookup zone types that are appropriate for your network size. Advanced administrators can configure root hints.

Select the action you would like this wizard to perform:

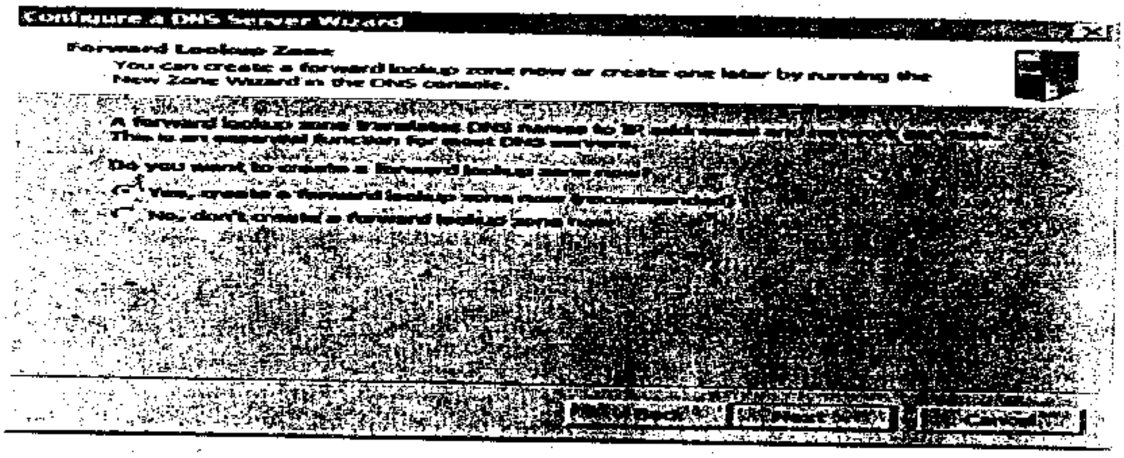
● Create a forward lookup zone (recommended for small networks)
This server is authoritative for the DNS names of local resources but forwards all other queries to an ISP or other DNS servers. The wizard will configure the root hints but not create a reverse lookup zone.

○ Create forward and reverse lookup zones (recommended for large networks)
This server can be authoritative for forward and reverse lookup zones. It can be configured to perform recursive resolution, forward queries to other DNS servers, or both. The wizard will configure the root hints.

○ Configure root hints only (recommended for advanced users only)
The wizard will configure the root hints only. You can later configure forward and reverse lookup zones and forwarders.

Configure

Figure F



Configure a DNS Server Wizard

Forward Lookup Zone

You can create a forward lookup zone now or create one later by running the New Zone Wizard in the DNS console.

A forward lookup zone translates DNS names to IP addresses [illegible]
This is an essential function for most DNS servers.

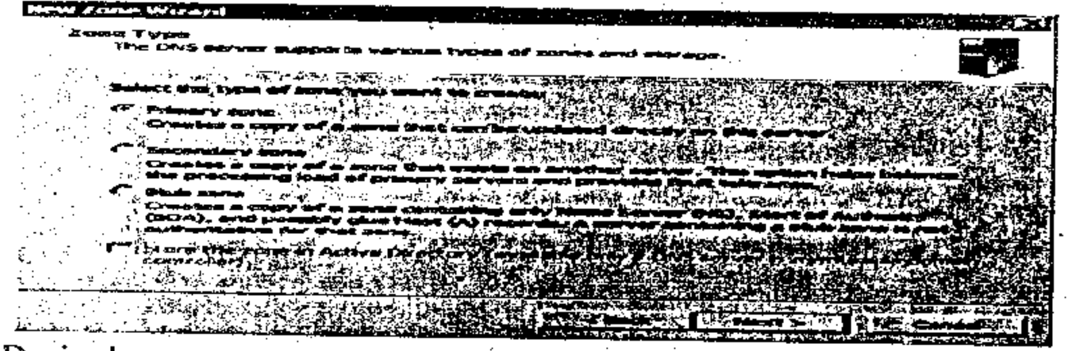
Do you want to create a forward lookup zone now?

● Yes, create a forward lookup zone now (recommended)

○ No, don't create a forward lookup zone now

Forward lookup zone

Figure G



New Zone Wizard

Zone Type

The DNS server supports various types of zones and storage.

Select the type of zone you want to create:

● Primary zone
Creates a copy of a zone that can be updated directly on this server.

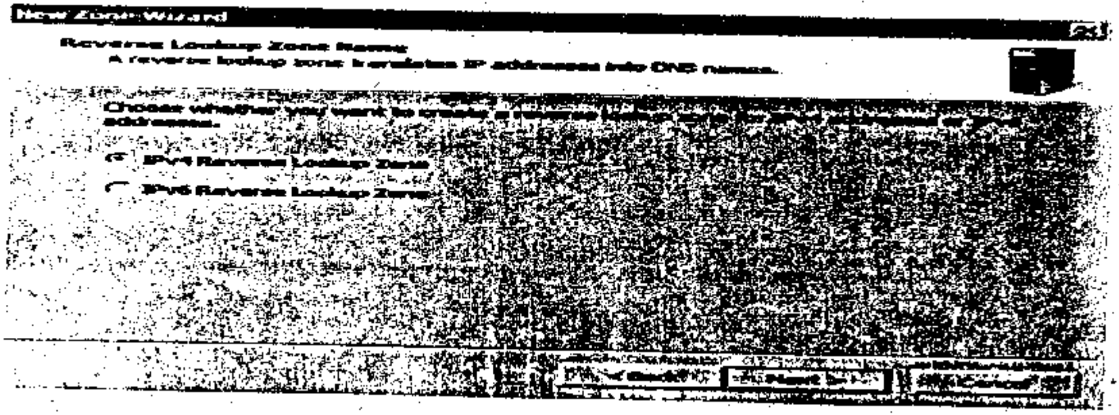
○ Secondary zone
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.

○ Stub zone
Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.

□ Store the zone in Active Directory [illegible]
controller)

Desired zone

Figure H



New Zone Wizard

Reverse Lookup Zone Name

A reverse lookup zone translates IP addresses into DNS names.

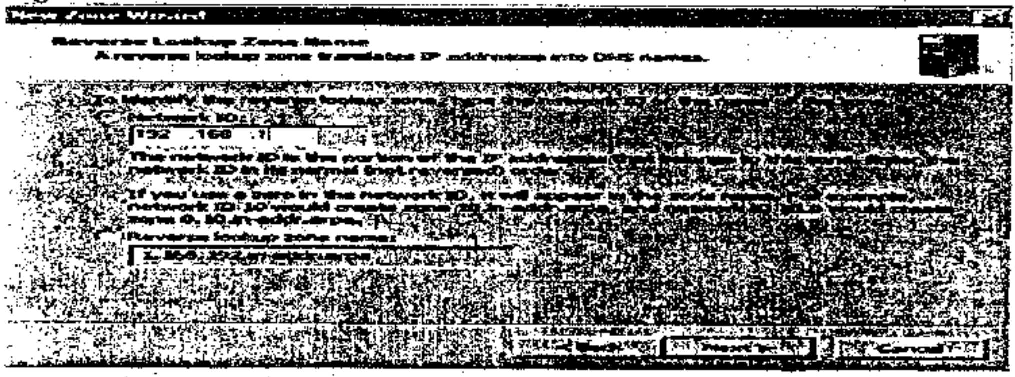
Choose whether you want to create a reverse lookup zone for [illegible]
addresses.

● IPv4 Reverse Lookup Zone

○ IPv6 Reverse Lookup Zone

IPv4 or IPv6

Figure I



New Zone Wizard

Reverse Lookup Zone Name
A reverse lookup zone translates IP addresses into DNS names.

To identify the reverse lookup zone, type the network ID or the name of the zone.

○ Network ID:

192 .168 .1

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

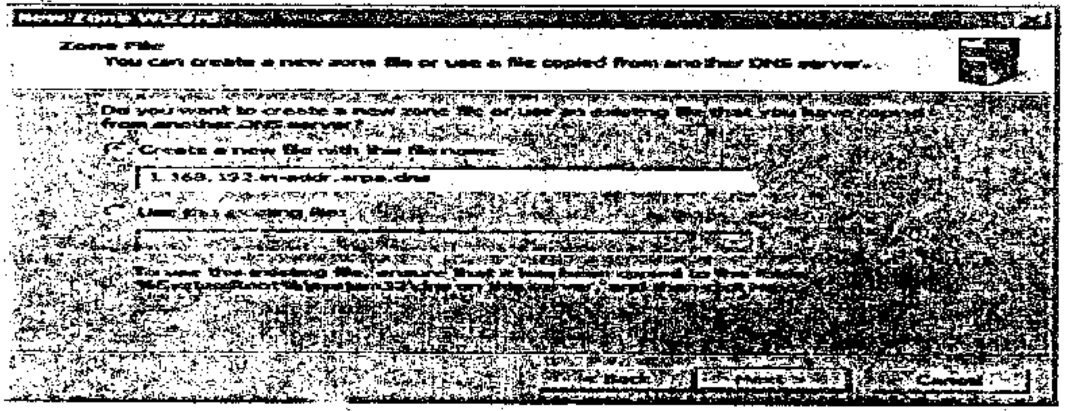
If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

○ Reverse lookup zone name:

1.168.192.in-addr.arpa

Reverse lookup zone

Figure J



New Zone Wizard

Zone File
You can create a new zone file or use a file copied from another DNS server.

Do you want to create a new zone file or use an existing file that you have copied from another DNS server?

● Create a new file with this file name:

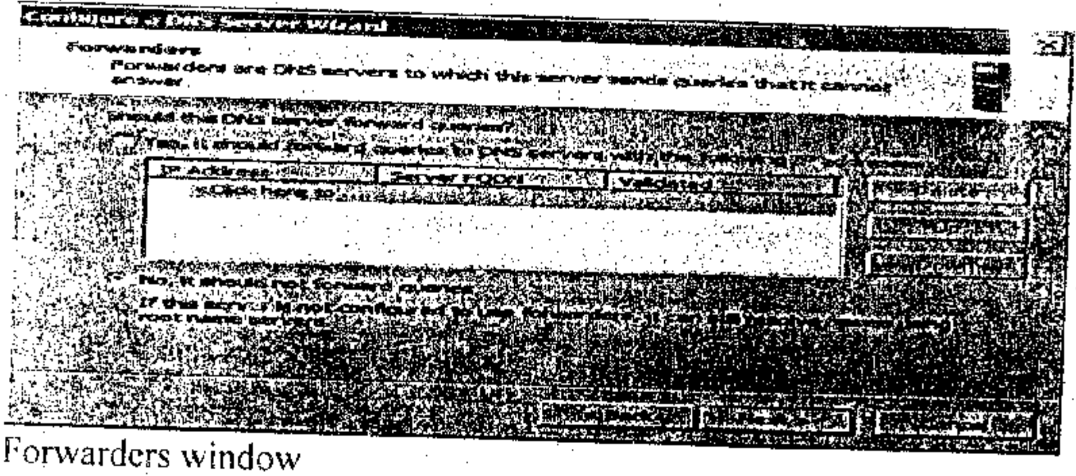
1.168.192.in-addr.arpa.dns

○ Use this existing file:

To use the existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.

Choose new or existing DNS file

Figure K



Configure a DNS Server Wizard

Forwarders

Forwarders are DNS servers to which this server sends queries that it cannot answer.

Should this DNS server forward queries?

○ Yes, it should forward queries to DNS servers with the following [illegible]

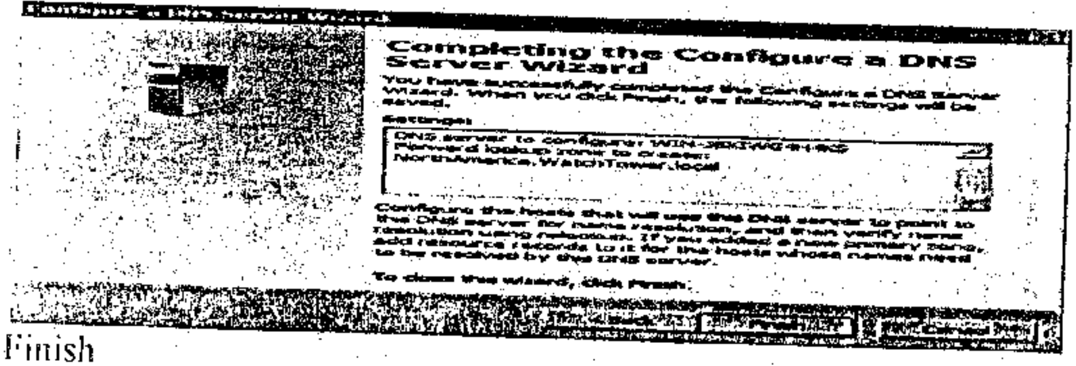
IP Address	Server FQDN	Validated
<Click here to [illegible]		

○ No, it should not forward queries.

If this server is not configured to use forwarders, it can [illegible] root name servers.

Forwarders window

Figure L



Configure a DNS Server Wizard

Completing the Configure a DNS Server Wizard

You have successfully completed the Configure a DNS Server Wizard. When you click Finish, the following settings will be saved.

Settings:

DNS server to configure: WIN-[illegible]
Forward lookup zone to create: NorthAmerica.WatchTower.local

Configure the hosts that will use this DNS server to point to the DNS server for name resolution, and then verify name resolution using nslookup. If you added a new primary zone, add resource records to it for the hosts whose names need to be resolved by the DNS server.

To close the wizard, click Finish.

Finish

Managing DNS records

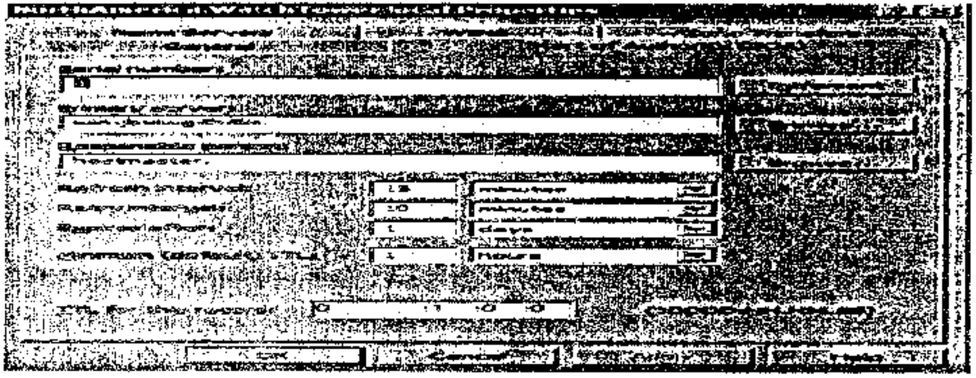
You have now installed and configured your first DNS server, and you're ready to add records to the zone(s) you created. There are various types of DNS records available. Many of them you will never use. We'll be looking at these commonly used DNS records:

- Start of Authority (SOA)
- Name Servers
- Host (A)
- Pointer (PTR)
- Canonical Name (CNAME) or Alias
- Mail Exchange (MX)

Start of Authority (SOA) record

The Start of Authority (SOA) resource record is always first in any standard zone. The Start of Authority (SOA) tab allows you to make any adjustments necessary. You can change the primary server that holds the SOA record, and you can change the person responsible for managing the SOA. Finally, one of the most important features of Windows 2000 is that you can change your DNS server configuration without deleting your zones and having to re-create the wheel (**Figure M**).

Figure M



Change configuration

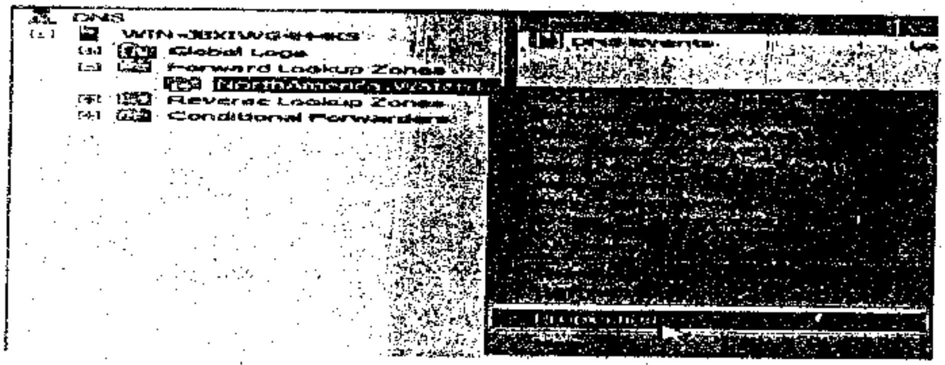
Name Servers

Name Servers specify all name servers for a particular domain. You set up all primary and secondary name servers through this record.

To create a Name Server, follow these steps:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Expand the Forward Lookup Zone.
3. Right-click on the appropriate domain and choose Properties (**Figure N**).
4. Select the Name Servers tab and click Add.
5. Enter the appropriate FQDN Server name and IP address of the DNS server you want to add.

Figure N



Name Server

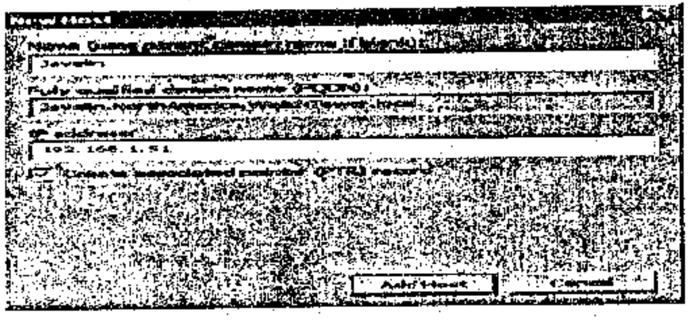
Host (A) records

A Host (A) record maps a host name to an IP address. These records help you easily identify another server in a forward lookup zone. Host records improve query performance in multiple-zone environments, and you can also create a Pointer (PTR) record at the same time. A PTR record resolves an IP address to a host name.

To create a Host record:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Expand the Forward Lookup Zone and click on the folder representing your domain.
3. From the Action menu, select New Host.
4. Enter the Name and IP Address of the host you are creating (**Figure O**).
5. Select the Create Associated Pointer (PTR) Record check box if you want to create the PTR record at the same time. Otherwise, you can create it later.
6. Click the Add Host button.

Figure O


Fully qualified domain name (FQDN):
IP address:
192.168.1.51
Create associated pointer (PTR) record
Add Host
Cancel

A Host (A) record

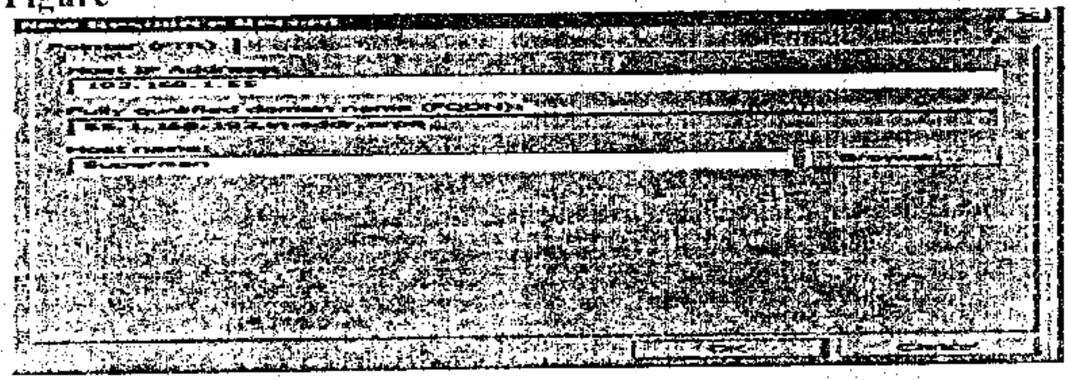
Pointer (PTR) records

A Pointer (PTR) record creates the appropriate entry in the reverse lookup zone for reverse queries. As you saw in Figure H, you have the option of creating a PTR record when creating a Host record. If you did not choose to create your PTR record at that time, you can do it at any point.

To create a PTR record:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Choose the reverse lookup zone where you want your PTR record created.
3. From the Action menu, select New Pointer (**Figure P**).
4. Enter the Host IP Number and Host Name.
5. Click OK.

Figure P



New Pointer

Canonical Name (CNAME) or Alias records

A Canonical Name (CNAME) or Alias record allows a DNS server to have multiple names for a single host. For example, an Alias record can have several records that point to a single server in your environment. This is a common approach if you have both your Web server and your mail server running on the same machine.

To create a DNS Alias:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Expand the Forward Lookup Zone and highlight the folder representing your domain.
3. From the Action menu, select New Alias.
4. Enter your Alias Name **(Figure Q).**
5. Enter the fully qualified domain name (FQDN).
6. Click OK.

Figure Q

Alias Name

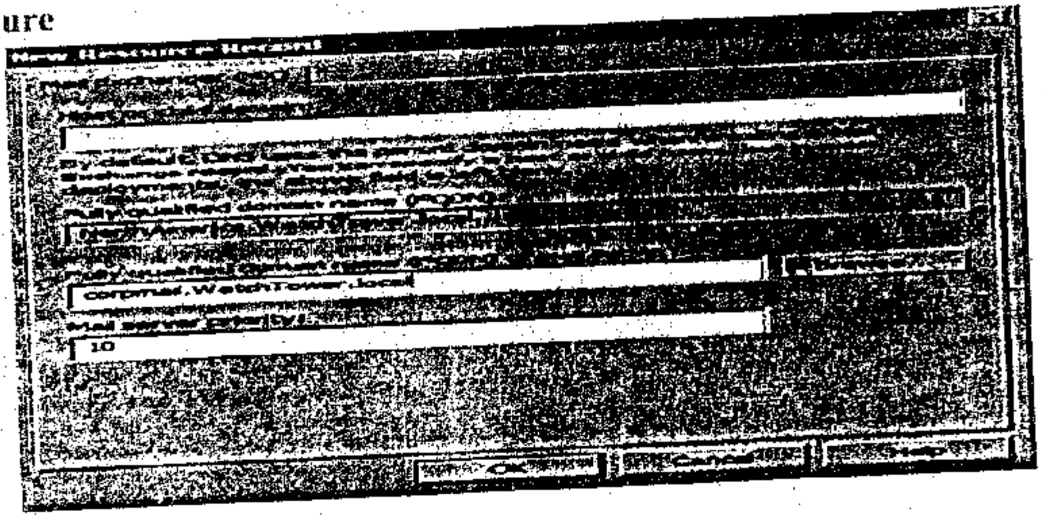
Mail Exchange (MX) records

Mail Exchange records help you identify mail servers within a zone in your DNS database. With this feature, you can prioritize which mail servers will receive the highest priority. Creating MX records will help you keep track of the location of all of your mail servers.

To create a Mail Exchange (MX) record:

1. Select DNS from the Administrative Tools folder to open the DNS console.
2. Expand the Forward Lookup Zone and highlight the folder representing your domain.
3. From the Action menu, select New Mail Exchanger.
4. Enter the Host Or Domain (**Figure R**).
5. Enter the Mail Server and Mail Server Priority.
6. Click OK.

Figure R



New Resource Record

corpmail.WatchTower.local

Mail server priority:

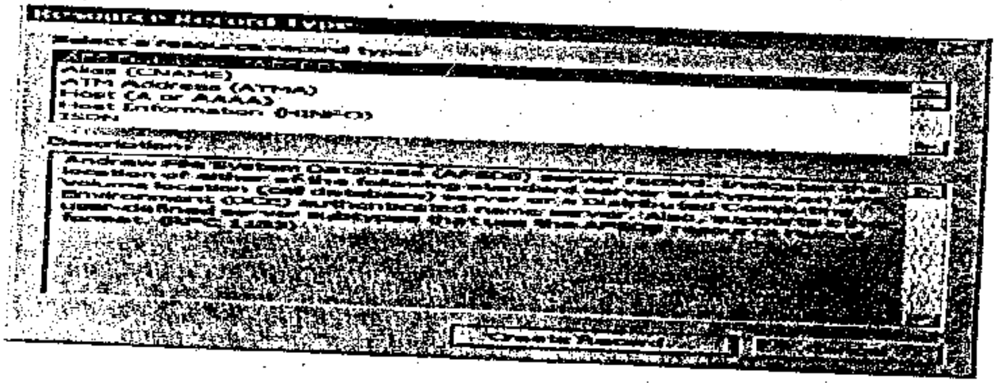
10

Host or Domain

Other new records

You can create many other types of records. For a complete description, choose Action | Other New Records from the DNS console (Figure S). Select the record of your choice and view the description.

Figure



S

Resource Record Type

Select a resource record type:

AFS Database (AFSDB)
Alias (CNAME)
ATM Address (ATMA)
Host (A or AAAA)
Host Information (HINFO)
ISDN

Description:

Andrew File System Database (AFSDB) server record. Indicates the location of either of the following standard server subtypes: an AFS volume location (cell database) server or a Distributed Computing Environment (DCE) authenticated name server. Also supports user-defined server subtypes that use the AFSDB record format. (RFC 1183)

Create records from the DNS console

Implement strong passwords

Password policies are a set of rules that can enhance the security of your Windows SBS 2008 network. Using strong password provides an additional layer of defense against an unauthorized user gaining access to your network.

To help implement strong passwords, password polices are enabled by default in Windows SBS 2008 during installation. You can ensure that users implement strong passwords by enforcing password polices in your network.

The password policies in Windows SBS 2008 include the following:

Minimum length Enable this policy to determine the least number of characters that a password can contain. Setting a minimum length helps protect your network by preventing users from having short or blank passwords. The default is eight characters.

Complexity Enable this policy to determine whether passwords must contain different types of characters. If this policy is enabled, passwords cannot contain all or part of a user's account name, and it must contain characters from three of the following four categories:

- English uppercase characters (A through Z)
- English lowercase characters (a through z)
- Numerals (0 through 9)
- Non-alphanumeric characters (such as , !, $, #, %)

Maximum age Enable this policy to determine the period of time (in days) that a password can be used before the system requires that the user change it. The default is 180 days.

Educate users

After implementing strong password policies, educate users about strong and weak passwords. Ask users to treat their password as they would private information, such as a credit card personal identification number (PIN).

Following are typical guidelines for creating a strong password. When implemented, they provide protection for your local network.

A password should not include any of the following:

- All or part of the user's account name.
- User's name or e-mail alias.
- Name of the user's child, parent, spouse/partner, or friend.
- Any word found in a dictionary.
- Old password that is reused by appending numbers.
- User's birth date.
- User's phone number.

Any easily obtained personal information (for example, a city of birth).

A strong password consists of the following:

- At least eight characters.
- Characters from three of the following four categories:
- Uppercase letters (A through Z)
- Lowercase letters (a through z)
- Numbers (0 through 9)
- Non-alphanumeric characters (for example, !, $, #, %)

Creating a new computer account

To create a new computer account using the Windows interface

1. To open Active Directory Users and Computers, click **Start**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Active Directory Users and Computers**.
2. In the console tree, right-click **Computers**.

Where?

- Active Directory Users and Computers*domain node*\\Computers

Or, right-click the folder in which you want to add the computer.

3. Point to **New**, and then click **Computer**.
4. Type the computer name.

Group Policy and the Active Directory

In Windows server 2008, administrators use Group Policy to enhance and control users' desktops. To simplify the process, administrators can create a specific desktop configuration that is applied to groups of users and computers. The Windows server 2008 Active Directory™ service enables Group Policy. The policy information is stored in Group Policy objects (GPOs), which are linked to selected Active Directory containers: sites, domains, and organizational units (OUs).

A GPO can be used to filter objects based on security group membership, which allows administrators to manage computers and users in either a centralized or a de-centralized manner. To do this, administrators can use filtering based on security groups to define the scope of Group Policy management, so that Group Policy can be applied centrally at the domain level, or in a decentralized manner at the OU level, and can then be filtered again by security groups. Administrators can use security groups in Group Policy to:

- Filter the scope of a GPO. This defines which groups of users and computers a GPO affects.
- Delegate control of a GPO. There are two aspects to managing and delegating Group Policy: managing the group policy links and managing who can create and edit GPOs.

Administrators use the Group Policy Microsoft Management Console (MMC) snap-in to manage policy settings. Group Policy includes various features for managing these policy settings. In addition, third parties can extend Group Policy to host other policy settings. The data generated by Group Policy is stored in a Group Policy object (GPO), which is replicated in all domain controllers within a single domain.

The Group Policy snap-in includes several MMC snap-in extensions, which constitute the main nodes in the Group Policy snap-in. The extensions are as follows:

- **Administrative templates.** These include registry-based Group Policy, which you use to mandate registry settings that govern the behavior and appearance of the desktop, including the operating system components and applications.
- **Security settings.** You use the Security Settings extension to set security options for computers and users within the scope of a Group Policy object. You can define local computer, domain, and network security settings.
- **Software installation.** You can use the Software Installation snap-in to centrally manage software in your organization. You can assign and publish software to users and assign software to computers.
- **Scripts.** You can use scripts to automate computer startup and shutdown and user logon and logoff. You can use any language supported by Windows Script Host. These include the Microsoft Visual Basic® development system, Scripting Edition (VBScript); JavaScript; PERL; and MS-DOS®-style batch files (.bat and .cmd).
- **Remote Installation Services.** You use Remote Installation Services (RIS) to control the behavior of the Remote Operating System Installation feature as displayed to client computers.

- **Internet Explorer maintenance.** You use Internet Explorer Maintenance to manage and customize Microsoft® Internet Explorer on Windows server 2008-based computers.
- **Folder redirection.** You use Folder Redirection to re.lirect Windows server 2008 special folders from their default user profile location to an alternate location on the network. These special folders include My Documents, Application Data, Desktop, and the **Start** Menu.

·igure 1 below shows how Group Policy objects use the Active)irectory hierarchy for deploying Group Policy.

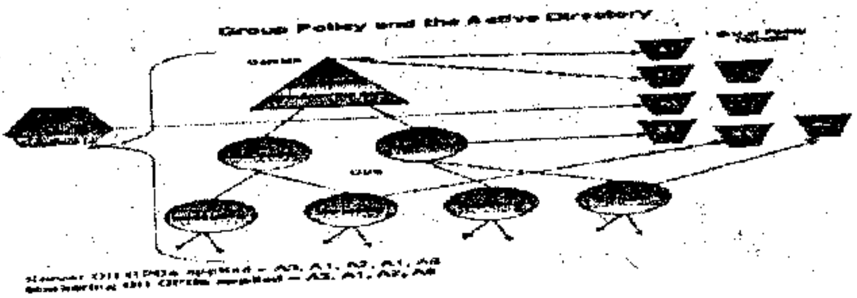


Figure 1: The Hierarchy of Group Policy and the Active Directory

Group Policy objects are linked to site, domain, and OU containers in the Active Directory. The default order of precedence follows the hierarchical nature of the Active Directory: sites are first, then domains, and then each OU. A GPO can be associated with more than one Active Directory container or multiple containers can be linked to a single GPO.

Prerequisites and Initial Configuration

Prerequisites

This Software Installation and Maintenance document is based on Step-by-Step to a Common Infrastructure for Windows server 2008 Server Deployment

Before using this guide, you need to build the common infrastructure as described in the document above. This infrastructure specifies a particular hardware and software configuration. If you are not using the common infrastructure, you must take this into account when using the guide.

Group Policy Scenarios

Note that this document does not describe all of the possible Group Policy scenarios. Please use this instruction set to begin to understand how Group Policy works and begin to think about how your organization might use Group Policy to reduce its TCO. Other Windows server 2008 features, including Security Settings and Software Installation and Maintenance, are built on Group Policy. To learn how to use Group Policy in those specific scenarios, refer to the white papers and Windows server 2008 Server online help on Windows server 2008 Security and Software Installation and Maintenance, which are available on the Windows server 2008 Web site.

Important Notes

The Example Company, organization, products, people, and events depicted in this guide are fictitious. No association with any real company, organization, product, person, or event is intended or should be inferred.

This common infrastructure is designed for use on a private network. The fictitious company name and DNS name used in the common infrastructure are not registered for use on the Internet. Please do not use this name on a public network or Internet.

The Active Directory™ service structure for this common infrastructure is designed to show how Windows server 2008 Change and Configuration Management works and functions with Active Directory. It was not designed as a model for configuring an Active Directory service for any organization—for such information see the Active Directory documentation.

Group Policy Snap-in Configuration

Group Policy is tied to the Active Directory service. The Group Policy snap-in extends the Active Directory management tools using the Microsoft Management Console (MMC) snap-in extension mechanism.

The Active Directory snap-ins set the scope of management for Group Policy. The most common way to access Group Policy is by using the Active Directory User and Computers snap-in, for setting the scope of management to domain and organizational units (OUs). You can also use the Active Directory Sites and Services snap-in to set the scope of management to a site. These two tools can be accessed from the Administrative Tools program group; the Group Policy snap-in extension is enabled in both tools. Alternatively, you can create a custom MMC console, as described in the next section.

Configuring a Custom Console

The examples in this document use the custom MMC co: sole that you can create by following the procedure in this sec tion. You need to create this custom console before attemptinc the remaining procedures in this document.

Note: If you want more experience building MMC consoles, run through the procedures outlined in "Step-by-Step Guide to Microsoft Management Console"

To configure a custom console

1. Log on to the **HQ-RES-DC-01** domain controller server as an administrator.
2. Click **Start**, click **Run**, type **mmc**, and then click **OK**.
3. On the **Console** menu, click **Add/Remove Snap-in**.
4. In the **Add/Remove Snap-in** dialog box, click **Add**.
5. In the **Add Standalone Snap-in** dialog box, in the **Available standalone snap-ins** list box, click **Active directory users and computers**, and then click **Add**.
6. Double-click **Active directory sites and services snap-in** from the **Available standalone snap-ins** list box.
7. In the **Available standalone snap-ins** list box, double-click **Group Policy**.
8. In the **Select Group Policy** object dialog box, **Local computer** is selected under **Group Policy object**. Click **Finish** to edit the local Group Policy object. Click **Close** in the **Add standalone snap-in** dialog box.
9. In the **Add/Remove Snap-in** dialog box, click the **Extensions** tab. Ensure that the **Add all extensions** check box is checked for each primary extension added to the MMC console (these are checked by default). Click **OK**.

To save console changes

1. In the MMC console, on the **Console** menu, click **Save**.
2. In the **Save As** dialog box, in the **File** name text box, type **GPWalkthrough**, and then click **Save**.

The console should appear as in Figure 2 below:

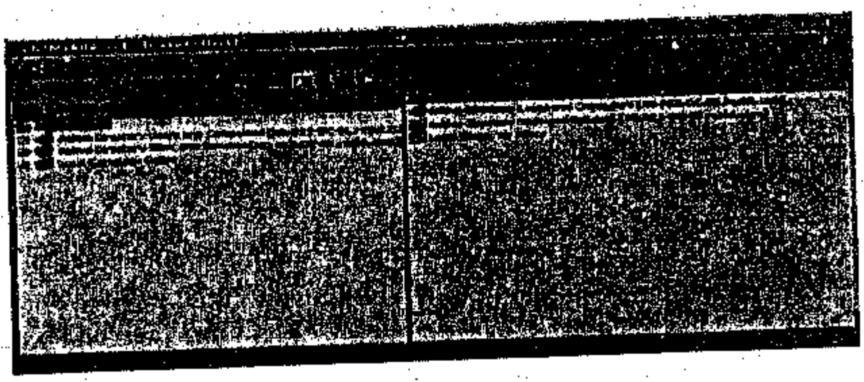


Figure 2: Group Policy MMC Console

Accessing Group Policy

You can use the appropriate Active Directory tools to access Group Policy while focused on any site, domain, or OU.

To open Group Policy from Active Directory Sites and Services

1. In the **GPWalkthrough** MMC console, in the console tree, click the + next to **Active Directory Sites and Services**.
2. In the console tree, right-click the site for which to access Group Policy.
3. Click **Properties**, and click **Group Policy**.

To open Group Policy from Active Directory Users and Computers

1. In the console tree in the **GPWalkthrough** MMC console, click the + next to **Active Directory Users and Computers.**
2. In the console tree, right-click either the **reskit** domain or the OU for which to access Group Policy.
3. Click **Properties**, and click **Group Policy**.

To access Group Policy scoped to a specific computer (or the local computer), you must load the Group Policy snap-in into the MMC console namespace targeted at the specific computer (or local computer). There are two major reasons for these differences:

- Sites, domains, and OUs can have multiple GPOs linked to them; these GPOs require an intermediate property page to manage them.
- A GPO for a specific computer is stored on that computer and not in the Active Directory.

Scoping a Domain or OU

To scope the domain or OU, use the GPWalkthrough MMC console that you saved earlier.

To scope Group Policy for a domain or OU

1. Click **Start**, point to **Programs**, click **Administrative Tools**, and click **GPWalkthrough** to open the MMC console you created earlier.
2. Click the + next to **Active Directory Users and Computers** to expand the tree.
3. Click the + next to **reskit.com** to expand the tree.

4. Right-click either the domain (reskit.com) or an OU, and click **Properties**.
5. Click the **Group Policy** tab as shown in Figure 3 below.

This displays a property page where the GPOs associated with the selected Active Directory container can be managed. You use this property page to add, edit, delete (or remove), and disable GPOs; to specify No Override options; and to change the order of the associated GPOs. Selecting **Edit** starts the Group Policy snap-in. More information on using the Group Policy property page and the Group Policy snap-in can be found later in this document.

Note: The Computers and Users containers are not organizational units; therefore, you cannot apply Group Policy directly to them. Users or computers in these containers receive policies from GPOs scoped to the domain and site objects only. The domain controller container is an OU, and Group Policy can be applied directly to it.

Figure 3: Group Policy Link Management

Scoping Local or Remote Computers

To access Group Policy for a local or a remote computer, you add the Group Policy snap-in to the MMC console, and focus it on a remote or local computer. To access Group Policy for the local computer, use the GPWalkthrough console created earlier in this document, and choose the **Local Computer Policy** node. You can add other computers to the console namespace by adding another Group Policy snap-in to the GPWalkthrough console, and clicking the **Browse** button when the **Select Group Policy** object dialog box is displayed.

Note: Some of the Group Policy extensions are not loaded when Group Policy is run against a local GPO.

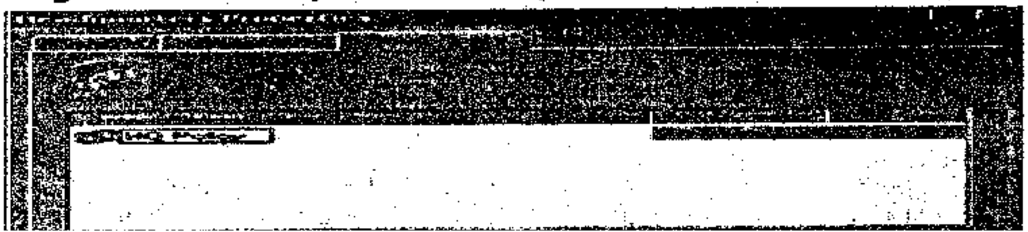
Creating a Group Policy Object

The Group Policy settings you create are contained in a Group Policy Object (GPO) that is in turn associated with selected Active Directory objects, such as sites, domains, or organizational units (OUs).

To create a Group Policy Object (GPO)

1. Open the **GPWalkthrough** MMC console.
2. Click the **+** next to **Active Directory Users and Computers**, and click the **reskit.com** domain.
3. Click the **+** next to **Accounts** to expand the tree.
4. Right-click **Headquarters**, and select **Properties** from the context menu.
5. In the **Headquarters Properties** page, click the **Group Policy** tab.
6. Click **New**, and type **HQ Policy**.
   The **Headquarters Properties** page should appear as in Figure 4 below:

Figure 4: Headquarters Properties



At this point you could add another GPO for the Headquarters OU, giving each one that you create a meaningful name, or you could edit the HQ Policy GPO, which starts the Group Policy snap-in for that GPO. All Group Policy functionality is derived from the snap-in extensions. In this exercise, all of these extensions are enabled. It is possible—using standard MMC methods—to restrict the extension snap-ins that are loaded for any given snap-in. For information on this capability, see the Windows server 2008 Server Online Help for Microsoft Management Console.

There is also a Group Policy that you can use to restrict the use of MMC snap-in extensions. To access this policy, navigate to the System\Group Policy node under Administrative Templates. Use the Explain tab to learn more about the use of these policies.

If you have more than one GPO associated with an Active Directory folder, verify the GPO order; a GPO that is higher in the list has the highest precedence. Note that GPOs higher in the list are processed last (this is what gives them a higher precedence). GPOs in the list are objects; they have context menus that you use to view the properties of each GPO. You can use the context menus to obtain and modify general information about a GPO. This information includes Discretionary Access Control Lists (DACLs, which are covered in the Security Group Filtering section of this document), and lists the other site, domain, or OUs to which this GPO is linked.

7. Click **Close**

Managing Group Policy

To manage Group Policy, you need to access the context menu of a site, domain, or OU, select **Properties**, and then select the

Group Policy tab. This displays the Group Policy Properties page. Please note the following:

- This page displays any GPOs that have been associated with the currently selected site, domain, or OU. The links are objects; they have a context menu that you can access by right-clicking the object. (Right-clicking the white space displays a context menu for creating a new link, adding a link, or refreshing the list.)
- This page also shows an ordered GPO list, with the highest priority GPO at the top of the list. You can change the list order by selecting a GPO and then using the **Up** or **Down** buttons.
- To associate (link) a new GPO, click the **Add** button.
- To edit an existing GPO in the list, select the GPO and click the **Edit** button, or just double-click the GPO. This starts the Group Policy snap-in, which is how the GPO is modified. This is described in more detail later in this document.
- To permanently delete a GPO from the list, select it from the list and click the **Delete** button. Then, when prompted, select **Remove the link and delete the Group Policy object permanently**. Be careful when deleting an object, because the GPO may be associated with another site, domain, or OU. If you want to remove a GPO from the list, select the GPO from the links list, click **Delete**, and then when prompted, select **Remove the link from the list**.
- To determine what other sites, domains, or OUs are associated with a given GPO, right-click the GPO, select **Properties** from the context menu, and then click the **Links** tab in the GPO **Properties** page.

- The **No override** check column marks the selected GPO as one whose policies cannot be overridden by another GPO.

Note: You can enable the No Override property on more than one GPO. All GPOs that are marked as No override will take precedence over all other GPOs not marked. Of those GPOs marked as No override, the GPO with the highest priority will be applied after all the other similarly marked GPOs.

- The **Disabled** check box simply disables (deactivates) the GPO without removing it from the list. To remove a GPO from the list, select the GPO from the links list, click **Delete**, and then select **Remove the link from the list** in the **Delete** dialog box.
- It is also possible to disable only the User or Computer portion of the GPO. To do this, right-click the GPO, click **Properties**, click either **Disable computer configuration settings** or **Disable user configuration settings**, and then click **OK**. These options are available on the GPO **Properties** page, on the **General** tab.
- The **Block policy inheritance** check box has the effect of negating all GPOs that exist higher in the hierarchy. However, it cannot block any GPOs that are enforced by using the **No override** check box; those GPOs are *always* applied.

Note: Policy settings contained within the local GPO that are not specifically overridden by domain-based policy settings are also always applied. Block Policy Inheritance at any level will not remove local policy.

Editing a Group Policy Object

You can use the custom console to edit a GPO. You will need to log on to the HQ-RES-DC-01 server as an Administrator, if you have not already done so.

To edit a Group Policy Object (GPO)

1. Click **Start**, point to **Programs**, click **Administrative Tools**, and then select **GPWalkthrough.**
2. Click the + next to **Active Directory Users and Computers**, click the **reskit.com** domain, and then click the **Accounts** OU.
3. Right-click **Headquarters**, select **Properties**, and then click the **Group Policy** tab. **HQ Policy** in the **Group Policy object links** list box should be highlighted.
4. Double-click the **HQ Policy** GPO (or click **Edit**).

This opens the Group Policy snap-in focused on a GPO named HQ Policy, which is linked to the OU named Headquarters. It should appear as in Figure 5 below:

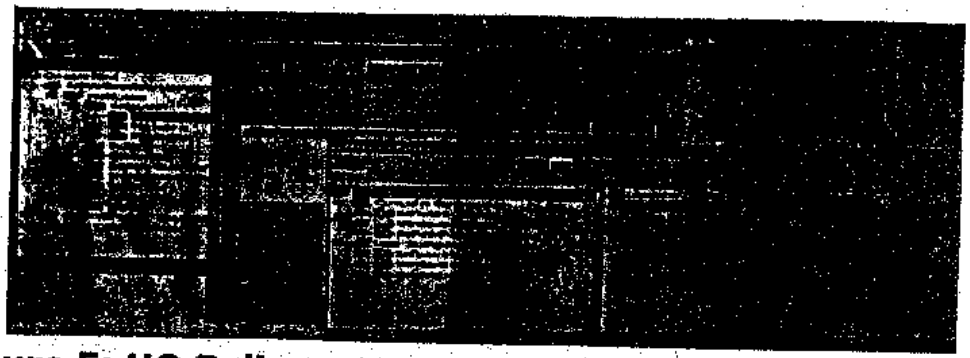


Figure 5: HQ Policy

Adding or Browsing a Group Policy Object

The **Add a Group Policy Object Link** dialog box shows GPOs currently associated with domains, OUs, sites, or all GPOs without regard to their current associations (links). The **Add a Group Policy Object Link** dialog box is shown in Figure 6 below.

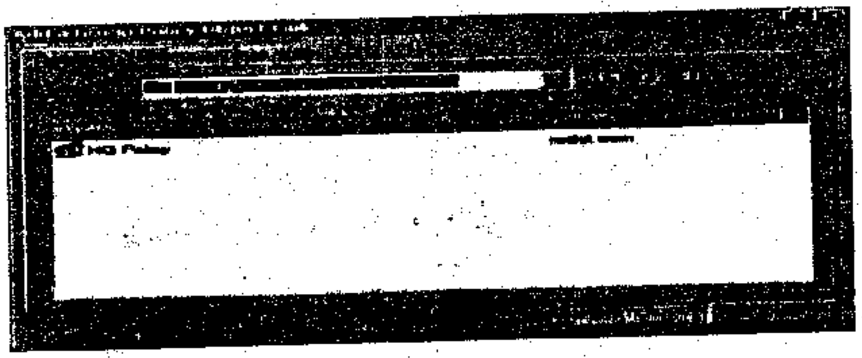


Figure 6: Add a Group Policy Object Link

- GPOs are stored in each domain. The **Look In** drop-down box allows you to select a different domain to view.
- In the **Domains/OUs** tab, the list box displays the sub-OUs and GPOs for the currently selected domain or OU. To navigate the hierarchy, double-click a sub-OU or use the **Up one level** toolbar button.
- To add a GPO to the currently selected domain or OU, either double-click the object, or select it and click **OK**.
- Alternatively, you can create a new GPO by clicking the **All** tab, right-clicking in the open space, and selecting **New** on the context menu, or by using the **Create New GPO** toolbar button. The Create New GPO toolbar button is only active in the All tab. To create a new GPO and link it to a particular site, domain, or OU, use the New button on the Group Policy Property page.

Note: It is possible to create two or more GPOs with the same name. This is by design and is because the GPOs are actually stored as GUIDs and the name shown is a friendly name stored in the Active Directory.

- In the **Sites** tab, all GPOs associated with the selected site are displayed. Use the drop-down list to select another site. There is no hierarchy of sites.
- The **All** tab shows a flat list of all GPOs that are stored in the selected domain. This is useful when you want to select a GPO that you know by name, rather than where it is currently associated. This is also the only place to create a GPO that does not have a link to a site, domain, or OU.
- To create an unlinked GPO, access the **Add a Group Policy Link** dialog box from any site, domain, or OU. Click the **All** tab, select the toolbar button or right-click the white space, and select **New**. Name the new GPO, and click **Enter**, and then click **Cancel**—*do not click **OK*** . Clicking **OK** links the new GPO to the current site, domain, or OU. Clicking **Cancel** creates an unlinked GPO.

Registry-based Policies

The user interface for registry-based policies is controlled by using Administrative Template (.adm) files. These files describe the user interface that is displayed in the **Administrative Templates** node of the Group Policy snap-in. These files are format-compatible with the .adm files used by the System Policy Editor tool (poledit.exe) in Microsoft Windows NT 4.0. With Windows server 2008, the available options have been expanded.

Note: Although it is possible to add any .adm file to the namespace, if you use an .adm file from a previous version of Windows, the registry keys are unlikely to have an effect on Windows server 2008, or they actually set preference settings and mark the registry with these settings; that is, the registry settings persist.

By default, only those policy settings defined in the loaded .adm files that exist in the approved Group Policy trees are displayed; these settings are referred to as *true policies*. This means that the Group Policy snap-in does *not* display any items described in the .adm file that set registry keys *outside* of the Group Policy trees; such items are referred to as Group Policy *preferences*. The approved Group Policy trees are:

\Software\Policies

\Software\Microsoft\Windows\CurrentVersion\Policies

A Group Policy called **Enforce Show Policies Only** is available in **User Configuration\Administrative Templates,** under the **System\Group Policy** nodes. If you set this policy to **Enabled,** the **Show policies only** command is turned on and administrators cannot turn it off, and the Group Policy snap-in displays only true policies. If you set this policy to **Disabled or Not configured**, the **Show policies only** command is turned on by default; however, you can view preferences by turning off the **Show policies only** command. To view preferences, you must turn off the **Show policies only** command, which you access by selecting the **Administrative Templates** node (under either **User Configuration** or **Computer Configuration** nodes), and then clicking the **View** menu on the Group Policy console and clearing the **Show policies only** check box. Note that it is not possible for the selected state for this policy to persist; that is, there is no preference for this policy setting.

In Group Policy, preferences are indicated by a red icon to distinguish them from true policies, which are indicated by a blue icon.

Use of non-policies within the Group Policy infrastructure is strongly discouraged because of the persistent registry settings behavior mentioned previously. To set registry policies on

Windows NT 4.0, and Windows 95 and Windows 98 clients, use the Windows NT 4.0 System Policy Editor tool, Poledit.exe.
By default the System.adm, Inetres.adm, and Conf.adm files are loaded and present this namespace as shown in Figure 7 below:

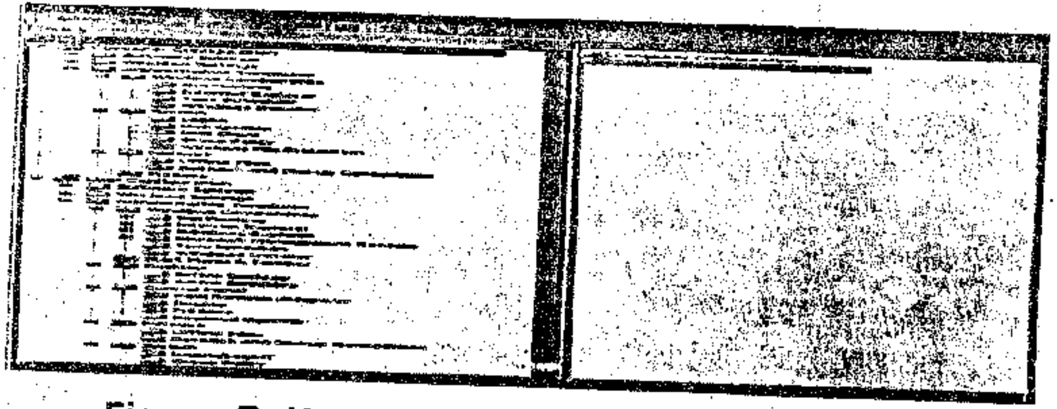


Figure 7: User Configuration

- The .adm files include the following settings:
- System.adm: Operating system settings
- Inetres.adm: Internet Explorer restrictions
- Conf.adm: NetMeeting settings

Adding Administrative Templates

The .adm file consists of a hierarchy of categories and subcategories that together define how options are organized in the Group Policy user interface.

To add administrative templates (.adm files)

1. In the Group Policy console double-click **Active Directory Users and Computers**, select the domain or OU for which you want to set policy, click **Properties**, and then click **Group Policy**.
2. In the **Group Policy** properties page, select the Group Policy Object you want to edit from the **Group Policy objects links** list, and click **Edit** to open the Group Policy snap-in.

3. In the Group Policy console, click the plus sign (+) next to either **User Configuration** or **Computer Configuration**. The .adm file defines which of these locations the policy is displayed in, so it doesn't matter which node you choose.
4. Right-click **Administrative Templates**, and select **Add/Remove Templates**. This shows a list of the currently active templates files for this Active Directory container.
5. Click **Add**. This shows a list of the available .adm files in the %systemroot%\inf directory of the computer where Group Policy is being run. You can choose an .adm file from another location. Once chosen, the .adm file is copied into the GPO.

To set registry-based settings using administrative templates

1. In the GPWalkthrough console, double-click **Active Directory Users and Computers**, double-click the **reskit.com** domain, double-click **Accounts**, right-click the **Headquarters** OU, and then click **Properties**.
2. In the **Headquarters Properties** dialog box, click **Group Policy**.
3. Double-click the **HQ Policy** GPO from the **Group Policy object links** list to edit the HQ Policy GPO.
4. In the Group Policy console, under the **User Configuration** node, click the plus sign (+) next to **Administrative Templates**.
5. Click **Start Menu & Taskbar**. Note that the details pane shows all the policies as **Not configured**.
6. In the details pane, double-click the **Remove Run menu from Start menu** policy. This displays a dialog box for the policy as shown in Figure 8 below.

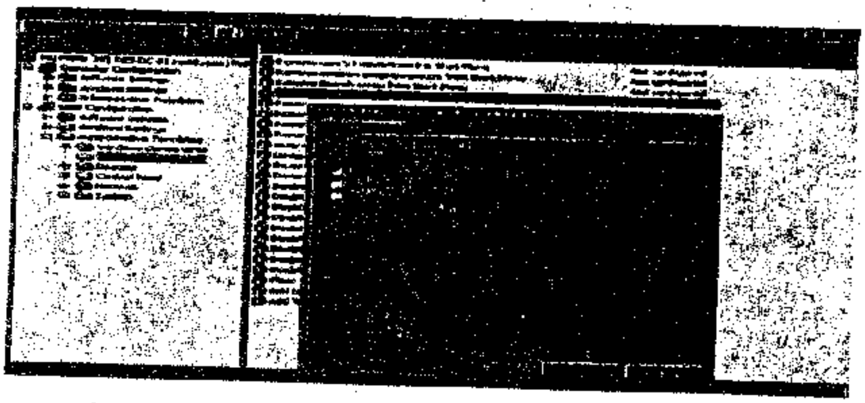


Figure 8: Remove Run menu from Start Menu

7. In the **Remove Run menu from Start menu** dialog box, click **Enabled.**

   Note the **Previous Policy** and **Next Policy** buttons in the dialog box. You can use these buttons to navigate the details pane to set the state of other policies. You can also leave the dialog box open and click another policy in the details pane of the Group Policy snap-in. After the details pane has the focus, you can use the **Up** and **Down** arrow keys on the keyboard and press **Enter** to quickly browse through the settings (or **Explain** tabs) for each policy in the selected node.

8. Click **OK**. Note the change in state in the **Setting** column, in the details pane. This change is immediate; it has been saved to the GPO. If you are in a replicated domain controller (DC) environment, this action sets a flag that triggers a replication cycle.

If you log on to a workstation in the **reskit.com** domain with a user from the **Headquarters** OU, you will note that the **Run** menu has been removed.

At this point, you may want to experiment with the other available policies. Look at the text in the **Explain** tab for information about each policy.

Scripts

You can set up scripts to run when users log on or log off, or when the system starts up or shuts down. All scripts are Windows Script Host (WSH)-enabled. As such, they may include Java Scripts or VB Scripts, as well as .bat and .cmd files. Links to more information on the Windows Script Host are located in the More Information section at the end of this document.

Setting up a Logon Script

Use this procedure to add a script that runs when a user logs on.

Note: This procedure uses the Welcome2000.js script described in Appendix A of this document, which includes instructions for creating and saving the script file. Before performing the procedure for setting up logon scripts, you need to create the Welcome2000.js script file and copy it to the HQ-RES-DC-01 domain controller.

To set up logon scripts

1. In the GPWalkthrough console, double-click **Active Directory Users and Computers**, right-click the **reskit.com** domain, click **Properties**, and then click **Group Policy**.
2. In the **Group Policy** properties page, select the **Default Domain Policy** GPO from the **Group Policy objects links** list, and click **Edit** to open the Group Policy snap-in.
3. In the Group Policy snap-in, under **User Configuration**, **Windows Settings**, and then click the

In the details pane, double-click **Logon**.

- The **Logon Properties** dialog box displays the list of scripts that run when affected users log on. This is an ordered list, with the script that is to run first appearing at the top of the list. You can change the order by selecting a script and then using the **Up** or **Down** buttons.
- To add a new script to the list, click the **Add** button. This displays the **Add a Script** dialog box. Browsing from this dialog allows you to specify the name of an existing script located in the current GPO or to browse to another location and select it for use in this GPO. The script file must be accessible to the user at logon or it does not run. Scripts in the current GPO are automatically available to the user. You can create a new script by right-clicking the empty space and selecting **New**, then selecting a new file.

  Note: If the View Folder Options for this folder are set to Hide file extensions for known file types, the file may have an unwanted extension that prevents it from being run.
- To edit the name or the parameters of an existing script in the list, select it and click the **Edit** button. This button does not allow the script itself to be edited. That can be done through the **Show Files** button.
- To remove a script from the list, select it and click **Remove**.
- The **Show Files** button displays an Explorer view of the scripts for the GPO. This allows quick access to these files or to the plåce to copy support

files to if the script files require them. If you change a script file name from this location, you must also use the **Edit** button to change the file name, or the script cannot execute.

4. Click on the **Start** menu, click **Programs,** click **Accessories,** click **Windows Explorer,** navigate to the **Welcome2000.js** file (use Appendix A to create the file), and then right-click the file and select **Copy.**
5. Close Windows Explorer.
6. In the **Logon Properties** dialog box, click the **Show Files** button, and paste the Welcome2000.js script into the default file location. It should appear as in Figure 9 below:

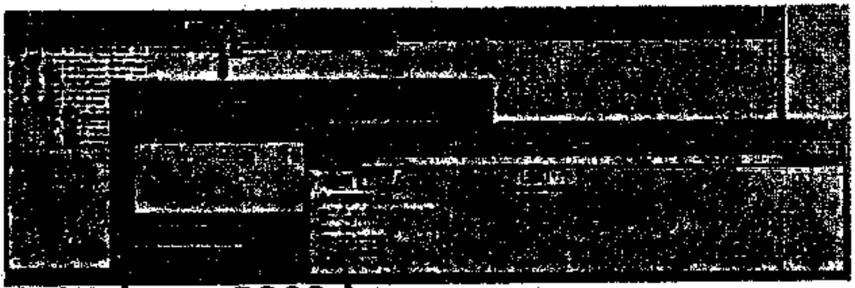


Figure 9: Welcome2000.js

7. Close the **Logon** window.
8. Click the **Add** button in the **Logon Properties** dialog box.
9. In the **Add a Script** dialog box, click **Browse,** and then in the **Browse** dialog box, double-click the **Welcome2000.js** file.
10. Click **Open.**
11. In the **Add a Script** dialog box, click **O.K** (no script parameters are needed), and then click **OK** again.

You can then logon to a client workstation that has a user in the **Headquarters OU**, and verify that the script is run when the user logs on.

Setting Up a Logoff or Computer Startup or Shutdown Script

You can use the same procedure outlined in the preceding section to set up scripts that run when a user logs off or when a computer starts up or is shut down. For logoff scripts, you would select **Logoff** in step 4.

Other Script Considerations

By default, Group Policy scripts that run in a command window (such as .bat or .cmd files) run hidden, and legacy scripts (those defined in the user object) are by default visible as they are processed (as was the case for Windows NT 4.0), although there is a Group Policy that allows this visibility to be changed. The policy for users is called **Run logon scripts visible** or **Run logoff scripts visible**, and is accessed in the **User Configuration\Administrative Templates** node, under **System\Logon/Logoff**. For computers, the policy is **Run startup scripts visible** and can be accessed in the **Computer Configuration\Administrative Templates** node, under **System\Logon.**

http://technet.microsoft.com/en-us/library/bb742376.aspx - mainSection#mainSection

Security Group Filtering

You can refine the effects of any GPO by modifying the computer or user membership in a security group. To do this, you use the **Security** tab to set Discretionary Access Control Lists (DACLs) for the properties of a GPO. DACLs are used for performance reasons, the details of which are contained in the

Group Policy technical paper referenced earlier in this document. This feature allows for tremendous flexibility in designing and deploying GPOs and the policies they contain.

By default, all GPOs affect all users and machines that are contained in the linked site, domain, or OU. By using DACLs, the effect of any GPO can be modified to exclude or include the members of any security group.

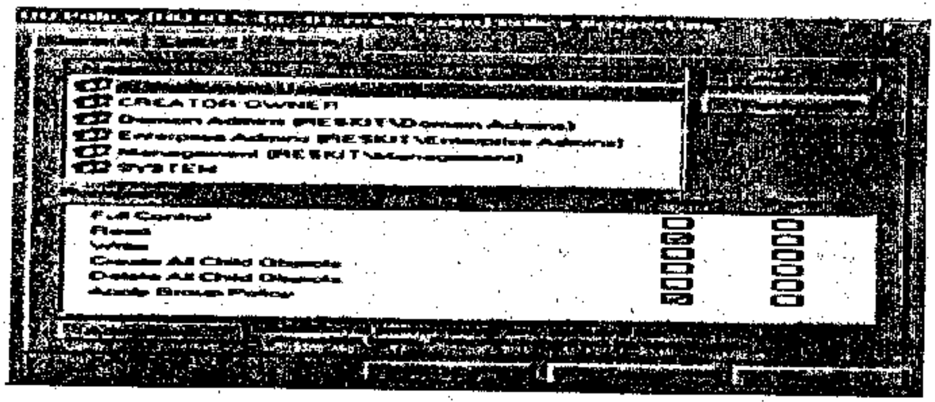
You can modify a DACL using the standard Windows server 2008 **Security** tab, which is accessed from the **Properties** page of any GPO.

To access a GPO Properties page from the Group Policy Properties page of a Domain, or OU

1. In the GPWalkthrough console, double-click **Active Directory Users and Computers**, double-click the **reskit.com** domain, double-click **Accounts**, right-click the **Headquarters** OU, and then click **Properties**.
2. In the **Headquarters Properties** dialog, click **Group Policy**.
3. Right-click the **HQ Policy** GPO from the **Group Policy Object Links** list, and select **Properties** from the context menu.
4. In the **Properties** page, click the **Security** tab. This displays the standard **Security** properties page.

   You will see security groups and users based on the Common Infrastructure. For more information, see the Windows server 2008 step-by-step guide, A Common Infrastructure for Change and Configuration Management. Make sure that you have completed the appropriate steps in that document before continuing.

5. In the **Security** property page, click **Add**.
6. In the **Select Users, Computers, and Groups** dialog box, select the **Management** group from the list, click **Add**, and click **OK** to close the dialog.
7. In the **Security** tab of the **HQ Policy Properties** page, select the **Management** group, and view the permissions. By default, only the **Read** Access Control Entry (ACE) is set to **Allow** for the Management group. This means that the members of the Management group do not have this GPO applied to them unless they are also members of another group (by default, they are also Authenticated Users) that has the **Apply Group Policy** ACE selected. At this point, *everyone* in the Authenticated Users group has this GPO applied, regardless of having added the Management group to the list, as shown in Figure 10 below..



CREATOR OWNER
Domain Admins (RESKIT\Domain Admins)
Enterprise Admins (RESKIT\Enterprise Admins)
Management (RESKIT\Management)
SYSTEM

Full Control
Read
Write
Create All Child Objects
Delete All Child Objects
Apply Group Policy

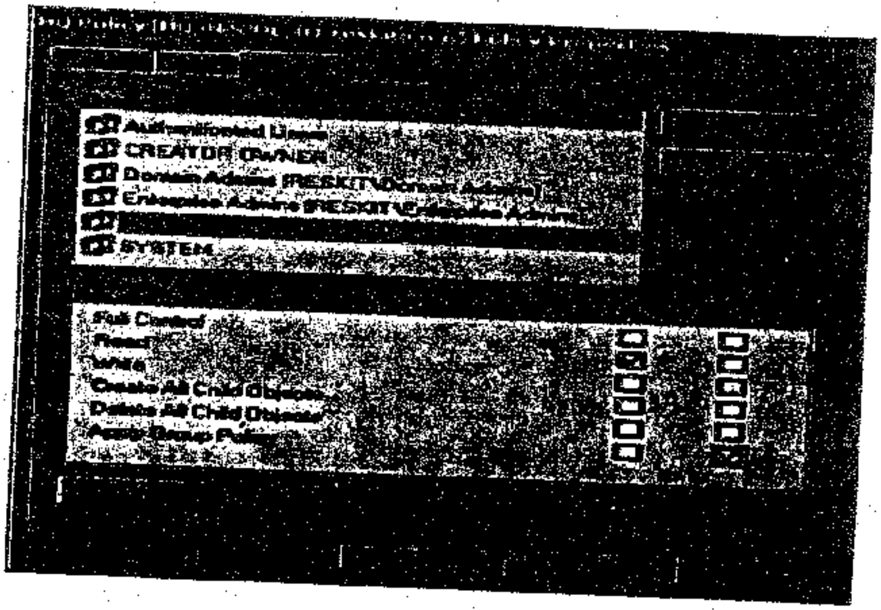
Figure 10: Authenticated Users

8. Configure the GPO so that it applies to the members of the Management group *only*. Select **Allow** for the **Apply Group Policy** ACE for the Management group, and then remove the **Allow Group Policy** ACE from the Authenticated Users group.

By changing the ACEs that are applied to different groups, administrators can customize how a GPO affects the users or computers that are subject to that GPO. **Write** access is required for modifications to be made; **Read** and **Allow Group Policy** ACEs are required for a policy to affect a group (for the policy to apply to the group).

Use the **Deny** ACE with caution. A **Deny** ACE setting for any group has precedence over any **Allow** ACE given to a user or computer because of membership in another group. Details of this interaction may be found in the Windows server 2008 Server online Help by searching on Security Group.

Figure 11 below shows an example of the security settings that allow everyone to be affected by this GPO *except* the members of the Management group, who were explicitly *denied* permission to the GPO by setting the **Apply Group Policy** ACE to **Deny**. Note that if a member of the Management group were also a member of a group that had an explicit **Allow** setting for the **Apply Group Policy** ACE, the **Deny** would take precedence and the GPO would not affect the user.



Authenticated Users
CREATOR OWNER
Domain Admins (RESKIT\Domain Admins)
Enterprise Admins (RESKIT\Enterprise Admins)
SYSTEM

Full Control
Read
Write
Create All Child Objects
Delete All Child Objects
Apply Group Policy

Figure 11: Security Settings

Variations on the above may include:

- Adding additional GPOs with different sets of policies and having them apply only to groups other than the Management group.
- Creating another group with members of the existing groups in them, and then using those groups as filters for a GPO.

Note: You can use these same types of security options with the Logon scripts you set up in the preceding section. You can set a script to run only for members of a particular group or for everyone except the members of a specific group.

Security group filtering has two functions: the first is to modify which group is affected by a particular GPO, and the second is to delegate which group of administrators can modify the contents of the GPO by restricting Full Control to a limited set of administrators (by a group). This is recommended because it limits the chance of multiple administrators making changes at any one time.

Blocking Inheritance and No Override

The **Block inheritance** and **No override** features allow you to have control over the default inheritance rules. In this procedure, you set up a GPO in the Accounts OU, which applies by default to the users (and computers) in the Headquarters, Production, and Marketing OUs.

You then establish another GPO in the Accounts OU and set it as **No override**. These settings apply to the children OUs, even if you set up a contrary setting in a GPO scoped to that OU.

You then use the **Block inheritance** feature to prevent Group policies set in a parent site, domain, or OU (in this case, the Accounts OU) from being applied to the Production OU.

A description of how to disable portions of a GPO to improve performance is also included.

Setting Up the Environment

You must first set up the environment for the procedures in this section.

To set up the GPO environment

1. Open the saved MMC GP ccnsole GPWalkthrough, and the open the **Active Directory User and Computers** node.
2. Double-click the **reskit.com** domain, and then doubl click the **Accounts** OU.
3. Right-click the **Accounts** OU, and select **Properties** fro the context menu, and click the **Group Policy** tab.Cli **New** to create a new GPO called **Default User Policies**.
4. Click **New** to create a new GPO called **Enforced User Policies**.

5. Select the **Enforced Users Policies** GPO, and click the **Up** button to move it to the top of the list. The **Enforced Users Policies** GPO should have the highest precedence. Note that this step only serves to demonstrate the functionality of the **Up** button; an enforced GPO always takes precedence over those that are not enforced.
6. Select the **No override** setting for the **Enforced User Policies** GPO by double-clicking the **No override** column or using the **Options** button. The **Accounts Properties** page should now appear as in Figure 12 below:

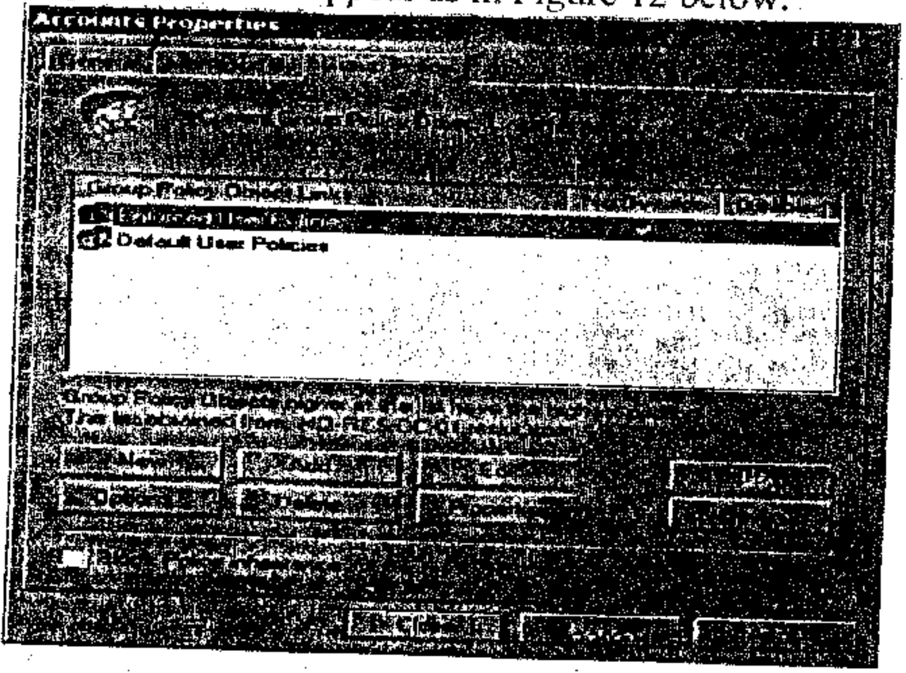


Figure 12: Enforced User Policies

7. Double-click the **Enforced User Policies** GPO to start the Group Policy snap-in.
8. In the Group Policy snap-in, under **User Configuration**, click **Administrative Templates**, click **System**, and then click **Logon/Logoff**.
9. In the details pane, double-click the **Disable Task Manager** policy, click **Enabled** in the **Disable Task**

on the policy, click the **Explain** tab. Note that the setting is now **Enabled** as in Figure 13 below.

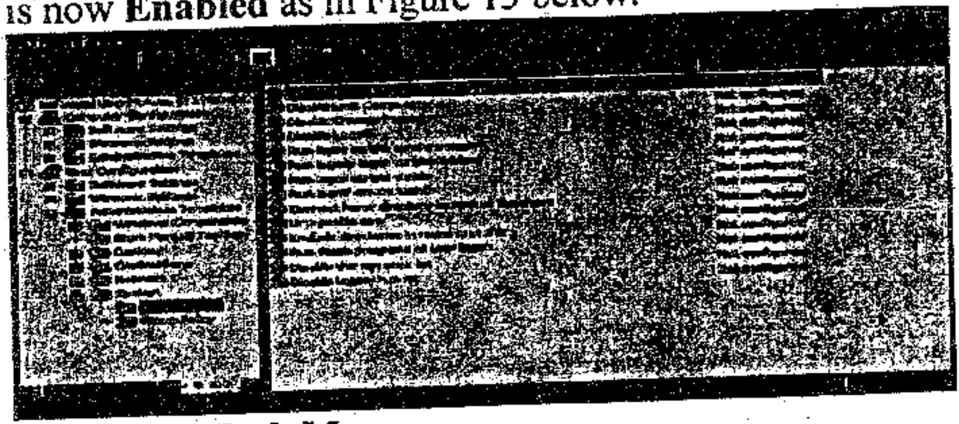


Figure 13: Task Manager

10. Click the **Close** button to exit the Group Policy snap-in.
11. In the **Accounts Properties** dialog box, on the **Group Policy** tab, double-click the **Default User Policies** GPO from the **Group Policy objects links** list.
12. In the Group Policy snap-in, in the **User Configuration** node, under **Administrative Templates**, click the **Desktop** node, click the **Active Desktop** folder, and then double-click the **Disable Active Desktop** policy on the details pane.
13. Click **Enabled**, click **OK**, and click **Close**.
14. In the **Accounts Properties** dialog box, click **Close**.

You can now log on to a client workstation as any user in any of the OUs under the Accounts OU. Note that you cannot run the Task Manager—the tab is unavailable from both CTRL+SHIFT+ESC and CTRL+ALT+DEL. In addition, the Active Desktop cannot be enabled. When you right-click on **Desktop** and select **Properties**, you will see that the **Web** tab is missing.

As an extra step, you can reverse the setting of the **Disable Task Manager** policy in a GPO that is linked to any of the child OUs of the Accounts OU (Headquarters, Production, Marketing). To do this, change the radio button for that policy.

Note: Doing this has no effect while the Enforced User Policies GPO is enabled in the Accounts OU.

Disabling Portions of a GPO

Because these GPOs are used solely for user configuration, the computer portion of the GPO can be turned off. Doing so reduces the computer startup time, because the Computer GPOs do not have to be evaluated to determine if any policies exist. In this procedure, no computers are affected by these GPOs. Therefore, disabling a portion of the GPO has no immediate benefit. However, since these GPOs could later be linked to a different OU that may include computers, you may want to disable the computer side of these GPOs.

To disable the Computer portion of a GPO

1. Open the saved MMC console GPWalkthrough, and then double-click the **Active Directory User and Computers** node:
2. Double-click the **reskit.com** domain.
3. Right-click the **Accounts** OU, select **Properties** from the context menu, and click the **Group Policy** tab.
4. In the **Accounts Properties** dialog box, click the **Group Policy** tab, right-click the **Enforced User Policies** GPO, and select **Properties**.
5. In the **Enforced User Policies Properties** dialog box, select the **General** tab, and then select the **Disable computer configuration settings** check box. In the **Confirm Disable** dialog box click **Yes**.

   Note that the **General** properties page includes two check boxes for disabling a portion of the GPO.
6. Repeat steps 4 and 5 for the **Default Users Policies** GPO.

Blocking Inheritance

You can block inheritance so that one GPO does not inherit policy from another GPO in the hierarchy. After inheritance, only those settings in the Enforced User Policies affect the users in this OU. This is simpler than reversing each individual policy in a GPO scoped at this OU.

To block inheritance of Group Policy for the Production OU

1. Open the saved MMC console GPWalkthrough, and then double-click the **Active Directory User and Computers** node.
2. Double-click the **reskit.com** domain, and then double-click the **Accounts** OU.
3. Right-click the **Production** OU, select **Properties** from the context menu, and then click the **Group Policy** tab.
4. Select the **Block policy inheritance** check box, and click **OK**.

To verify that inherited settings are now blocked, you can logon as any user in the Production OU. Notice that the Web tab is present in the Display setting properties page. Also, note that the task manager is still disabled, as it was set to No Override in the parent OU.

Linking a GPO to Multiple Sites, Domains, and OUs

This section demonstrates how you can link a GPO to more than one container (site, domain, or OU) in the Active Directory. Depending on the exact OU configuration, you can use other methods to achieve similar Group Policy effects; for example, you can use security group filtering or you can block inheritance. In some cases, however, those methods do not have the desired affects. Whenever you need to explicitly state which sites, domains, or OUs need the same set of policies, use the method

To link a GPO to multiple sites, domains, and OUs

1. Open the saved MMC console GPWalkthrough, and then double-click the **Active Directory User and Computers** node.
2. Double-click the **reskit.com** domain, and double-click the **Accounts** OU.
3. Right-click the **Headquarters** OU, select **Properties** from the context menu, and then click the **Group Policy** tab.
4. In the **Headquarters Properties** dialog box, on the **Group Policy** tab, click **New** to create a new GPO named **Linked Policies.**
5. Select the **Linked Policies** GPO, and click the **Edit** button.
6. In the Group Policy snap-in, in the **User Configuration** node, under **Administrative Templates** node, click **Control Panel**, and then click **Display**.
7. On the details pane, click the **Disable Changing Wallpaper** policy, and then click **Enabled** in the **Disable Changing Wallpaper** dialog box and click **OK**.
8. Click **Close** to exit the Group Policy snap-in.
9. In the **Headquarters Properties** page, click **Close**.

Next you will link the **Linked Policies** GPO to another OU.

1. In the GPWalkthrough console, double-click the **Active Directory User and Computers** node, double-click the **reskit.com** domain, and then double-click the **Accounts** OU.
2. Right-click the **Production** OU, click **Properties** on the context menu, and then click the **Group Policy** tab on the **Production Properties** dialog box.

3. Click the **Add** button, or right-click the blank area of the **Group Policy objects links** list, and select **Add** on the context menu.
4. In the **Add a Group Policy Object Link** dialog box, click the down arrow on the **Look in** box, and select the **Accounts.reskit.com** OU.
5. Double-click the **Headquarters.Accounts.reskit.com** OU from the **Domains, OUs, and linked Group Policy objects** list.
6. Click the **Linked Policies** GPO, and then click **OK**.

You have now linked a single GPO to two OUs. Changes made to the GPO in either location result in a change for both OUs. You can test this by changing some policies in the **Linked Policies** GPO, and then logging onto a client in each of the affected OUs, **Headquarters** and **Production**.

Loopback Processing

This section demonstrates how to use the loopback processing policy to enable a different set of user type Group Policies based on the Computer being logged onto. This policy is useful when you need to have user type policies applied to users of specific computers. There are two methods for doing this. One allows for the policies applied to the user to be processed, but to also apply user policies based on the computer that the user has logged onto. The second method does not apply the user's settings based on where the user object is, but only processes the policies based on the computer's list of GPOs. Details on this method can be found in the Group Policy white paper referred to earlier.

To use the Loopback processing policy

1. In the GPWalkthrough console, double-click the **Active Directory User and Computers** node, double-click the **reskit.com** domain, and then double-click the **Resources** OU.
2. Right-click the **Desktop** OU, click **Properties** on the context menu, and then click the **Group Policy** tab on the **Desktop Properties** dialog box.
3. Click **New** to create a new GPO named **Loopback Policies.**
4. Select the **Loopback Policies** GPO, and click **Edit.**
5. In the Group Policy snap-in, under the **Computer Configuration** node, click **Administrative Templates**, click **System**, and then click **Group Policy.**
6. In the details pane, double-click the **User Group Policy loopback processing mode** policy.
7. Click **Enabled** in the **User Group Policy loopback processing mode** dialog box, select **Replace** in the **Mode** drop-down box, and then click **OK** to exit the property page.

Next, you will set several **User Configuration** policies by using the **Next Policy** navigation buttons in the policy dialog boxes.

1. In the Group Policy snap-in, under the **User Configuration** node, click **Administrative Templates**, and cli k **Start Menu & Taskbar.**
2. In the details pane, double-click the **Remove user's folders from the Start menu** policy, and then click **Enabled** in the **Remove user's folders from the Start menu** dialog box.
3. Cli k **Apply** to apply the policy, and click the **Next Policy** button to go on to the next policy, **Disable and remove links to Windows update.**

4. In the **Disable and Remove Links to Windows Update** dialog box, click **Enabled**, click **Apply**, and then click the **Next Policy** button.
5. In each of the following policies' dialog boxes, set the state of the policies as indicated on the list below:

Policy	Setting
Remove common program groups from Start Menu	Enabled
Remove Documents from Start Menu	Enabled
Disable programs on Settings Menu	Enabled
Remove Network & Dial-up Connections from Start menu	Enabled
Remove Favorites Menu from Start menu	Enabled
Remove Search Menu from Start menu	Enabled
Remove Help Menu from Start menu	Enabled
Remove Run Menu from Start menu	Enabled
Add Logoff on the Start Menu	Enabled
Disable Logoff on the Start Menu	Not configured
Disable and remove the Shut Down command	Not configured
Disable drag-and-drop context menus on the Start Menu	Enabled
Disable changes to Taskbar and Start	Enabled

Menu Settings	
Disable Context menus for the taskbar	Enabled
Do not keep history of recently opened documents	Enabled
Clear history of recently opened documents on exit	Enabled

6. Click **OK** when you have set the last policy from the list in step 5.

7. In the Group Policy console tree, navigate to the **Desktops** node under **User Configuration\Administrative Templates**, and set the following policies to **Enabled**:

Policy	Setting
Hide Remove My Documents from Start Menu	Enabled
Hide My Network Places icon on desktop	Enabled
Hide Internet Explorer icon on desktop	Enabled
Prohibit user from changing My Documents path	Enabled
Disable adding, dragging, dropping and closing the Taskbar's toolbars	Enabled
Disable adjusting desktop toolbars	Enabled
Don't save settings at exit	Enabled

8. Click **OK** when you have set the last policy from the list in step 7.

9. In the Group Policy console tree, navigate to the **Active Desktop** node under **User Configuration\Administrative Templates\Desktops**, set the **Disable Active Desktop** policy to **Enabled**, and then click **OK.**
10. In the Group Policy console tree, navigate to the **Control Panel** node under **User Configuration\Administrative Templates**, click the **Add/Remove Programs** node, double-click the **Disable Add/Remove Programs** policy, set it to **Enabled**, and then click **OK.**
11. In the Group Policy console tree, navigate to the **Control Panel** node under **User Configuration\Administrative Templates**, click the **Display** node, double click the **Disable display in control panel** policy, set it to **Enabled**, and then click **OK.**
12. In the Group Policy snap-in, click **Close.**
13. In the **Desktops Properties** dialog box, click **Close.**

At this point, all users who log on to computers in the **Desktops** OU have no policies that would normally be applied to them; instead, they have the user policies set in the **Loopback Policies** GPO. You may want to use the procedures outlined in the section on Security Group Filtering to restrict this behavior to specific groups of computers, or you may want to move some computers to another OU.

For the following example, a security group called **No Loopback** is created. To do this, use the **Active Directory Users and Computers** snap-in, click the **Groups** container, click **New**, and create this global security group.

In this example, computers that are in the **No-Loopback** security group are excluded from this loopback policy, if the following steps are taken:

1. In the GPWalkthrough console, double-click **Active Directory Users and Computers**, double-click **reskit.com**, double-click **Resources**, right-click **Desktop**, and then select **Properties**.
2. In the **Desktop Properties** dialog box, click **Group Policy**, right-click the **Loopback Policies** GPO, and then select **Properties**.
3. In the **Loopback Policies Properties** page, click **Security**, and select **Allow** for the **Apply Group Policy** ACE for the **Authenticated Users** group.
4. Add the **No Loopback** group to the **Name** list. To do this, click **Add**, select the **No Loopback** group, and click **OK**.
5. Select **Deny** for the **Apply Group Policy** ACE for the **No Loopback** group, and click **OK**.
6. Click **OK** in the **Loopback Policies Properties** page.
7. Click **Close** in the **Desktop Properties** dialog box
8. In the GPWalkthrough console, click **Save** on the **Console** menu.

Other Group Policy Scenarios

Now that you familiar with the methodologies for administrating Group Policy, you may want to set up some security policies, perform some software installation and maintenance, and redirect some user folders—such as the My Documents folder. These topics are covered in detail in the following step-by-step guides, available on the Windows server 2008 Server Web site:

- Deploying Security Policies
- Software Installation and Maintenance
- User Data and Settings Management

HISTORY OF LINUX

In August 1991, A student from university of Helsinki in Finland began a post to the Comp.os.minix, news group with word " Hello every body out there using minix, I am doing a free operating System (Just a hobby, won't be big and professional like GNU) for 386(486) at colons. Name Linus Torvalds,"
The hobby he spoke of eventually become what we know today LINUX

At that time UNIX and other operating systems was costly then PC hardware. While versions of UNIX have long been available for PC's. They never had the grace of power of operating system available for mini computers, mainframes and today servers. This lack of accessing ultimately give birth to LINUX as a means to make a UNIX like operating system available on wide spread basis.

Today's Linux was developed with the assistance of programmer's word wide; Linus Torvalds still retains control of evolving core of Linux operating system the Kernel..0000000
In march 1992, version 1.0 of the Kernel was first official release of Linux.

MAIN FEATURES AND ADVANTAGES OF LINUX

Linux system offers many salient features, for example

1) MULTITASKING CAPABILITY

Full multitasking and 32-bit support. Linux, is a real multitasking system, allowing multiple users to run many programs on the same system at once.

2) MULTIUSER CAPABILITY

Multiuser operating system permits several users to use the same computer to carry out their computing jobs. can run programs, access files and print documents at the same time.

3) **SYSTEM PORTABILITY**

Linux has this outstanding feature that it is not written for specific hardware platforms. It can be ported to another system (installation) without the need to make any major changes.

4) **SYSTEM SECURITY**

Several levels of security exist in Linux.

First level is system security is A login is simply the name that you supply to Linux to identify yourself to the operating system. Linux keeps track of which names are permitted to log in or access the system, and only allows valid users to have access.

a- Another level of security is when it comes to accessing files. Three permissions "Read, Write and Execute" can be assigned by the owner of the file to each of his files. All of these permissions can be individually either granted or denied to all the users of the system.

b- Third level of security allows users to encrypt data files on the disk so that even if someone manage to access then he can't make much sense of it.

5. **LINUX APPLICATION**

a. Text and word processing application

In addition to commercial word processing software's such as Word perfect, star office, applixware, Linux offers powerful tools for editing text files and processing text in an automated fashion.

b. Programming Languages

There is a wide variety of programming and scripting languages & tools available for Linux

c. Internet tools

In addition to supporting Well-Known software such as Netscape Communicator and Mosaic, Linux provide wide verity of internet software and full range of software needed to create internet services such as Web Server, Mail Server plus complete network support to connect to the internet via Local network or modem

d. Databases

Linux provide robust platform for running client server database application such as free database mSQL and postgre available for Linux also commercial database such as Oracle, Sybase and Informix

6. DOS and Window compatibility

Linux can run DOS software with a high degree of stability and compatibility and offers several approaches to run Windows software, Wabi,Wine,VM ware

7. Linux is free Software

Linux kernel and most of the applications written for Linux are available for free on the Internet, often with no restriction on the copying and redistribution of the software.

8. Virtual memory and shared libraries.

Linux can use a portion of your hard drive as virtual memory, expanding your total amount of available RAM. Linux also implements shared libraries, allowing programs that use standard subroutines to find the code for these subroutines in the libraries at runtime. This saves a large amount of space on your system;

9. Linux supports (almost) all of the features of commercial versions of UNIX.

In fact, some of the features found in Linux may not be available on other proprietary UNIX systems

10.GNU software suppor t(Free Software's).

Linux supports a wide range of free software written by the GNU Project, including utilities such as the GNU C and C++ compiler, gawk, groff, and so on. Many of the essential system utilities used by Linux are GNU software

11. Built-in support for networking, multitasking, and other features

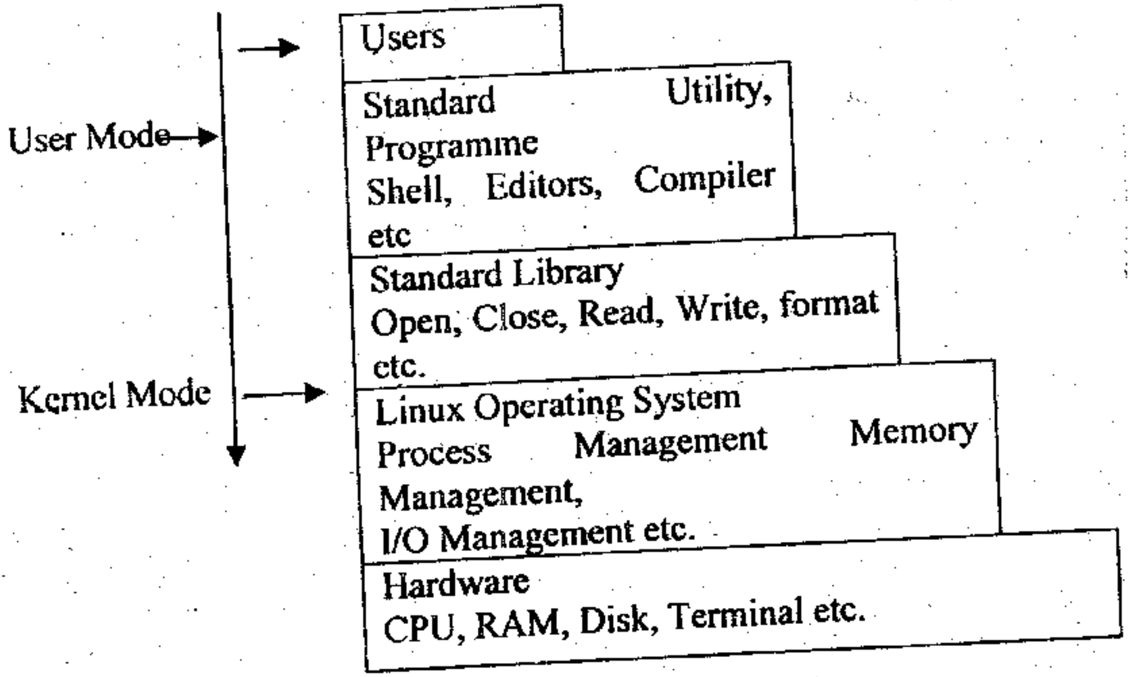
12. X Windows System. The X Window convert text base Linux to graphics Operating system A complete version of the X Window System, known as XFree86, is available for Linux. The X Window System is a very powerful graphics interface, supporting many applications

Hardware Requirement

You can run an entire system from a single, high-density 5.25-inch floppy. but Hardware requirement depends upon Linux software & accessories selection.

Component	Minimum	Good Pc
Processor	386	Pentium 133
RAM	4 MB	32 –64 MB
Hard disk	150 MB	1GB
Display VGA, Mouse, CD-ROM Etc	-	-

STRUCTURE OF THE LINUX SYSTEM


User Mode
Kernel Mode
Users
Standard Utility, Programme
Shell, Editors, Compiler etc
Standard Library
Open, Close, Read, Write, format etc.
Linux Operating System
Process Management Memory Management,
I/O Management etc.
Hardware
CPU, RAM, Disk, Terminal etc.

Linux Tools and Applications:

The outermost layer of the Linux operating system is its tools and applications. These tools can be invoked from the command line itself and help perform the day-to-day as well as complex tasks of the system.

The Shell:

It is the command interpreter of the operating system. It accepts commands from users and analyses and interprets these commands.

The Linux Kernel:

It is the core of the system. It controls all the tasks, schedules all the processes and carries out all the crucial functions of the operating system. All operating systems have a kernel that contains thousands of routines to carry out the numerous tasks that the operating system has to handle. The major duties of the kernel are as under:

i)To keep track of the programs that are executing

ii)All processor time to each and also decide when one program stops and another starts.

iii)It also handles exchange of information between computer and its terminals, tape drives and printers.

LINUX FILE SYSTEM

To store data in a computer system so that you can retrieve it at some time in the future, you place it in a file in the file system and give the file a filename so that you can reference it again later on. Files are, stored on magnetic disk and hence continue to exist even if the computer is switched off and also set permission on it

Linux distinguishes three types of files in its file system –

An ordinary file has no internal structure imposed on it by the system - it is simply a sequence of characters.

A directory file stores information about other files and directories. This enables Linux to organize its file system into a hierarchy of files and directories.

The special files are the input/output devices attached to a particular computer system.

Important Directories in the Linux File System

Most of the directories that hold Linux system files are "standard." some of the most important directories on your Linux system.

/ This is the root directory. It holds the actual Linux program, as well as subdirectories. Do not store your own files here.

/home This directory holds users' home directories. After logging to the system this is PWD for a user

/bin This directory holds many of the basic Linux programs. bin stands for binaries, files that are executable and that hold text only computers could understand.

/usr This directory holds many other user-oriented directories. Like games, help files

/dev Linux treats everything as a file! The /dev directory holds devices. These are special files that serve as gateways to physical computer components. For instance, if you copy to /dev/fd0, you're actually sending data to the system's floppy disk. Your terminal is one of the /dev/tty files. Partitions on the hard drive are of the form /dev/hd0. Even the system's memory is a device!

/usr/sbin This directory holds system administration files. If you do an ls -l, you see that you must be the owner, root, to run these commands.

/sbin This directory holds system files that are usually run automatically by the Linux system.

/etc This directory and its subdirectories hold many of the Linux configuration files. These files are usually text, and they can be edited to change the system's configuration .

File and Directories:

A file as a container of information. Once information is stored in a file, it will remain there until it is changed or the file is removed from the system.

A Linux allows filenames to be up to 256 characters long. These characters can be lower- and uppercase letters, numbers, and other characters, usually the dash (-), the underscore (_), and the dot (.).

DIRECTORY

A directory is simply a file that contains the names of other files and information about how to locate them. There is no limit imposed by Linux on the number of levels of sub-directories that may be created by a user.

HOME DIRECTORY:

Whenever a new user is created in the Linux system to use Linux, a directory is created for that user which has a unique name. This directory is called the home directory When you login successfully, Linux makes your home directory the current directory and you are then ready to begin your session. You can create, modify and delete files; you can also make and remove sub-directories.

File naming Rules:

1) A filename must be 1 to 255 characters long.

2) All characters are legal except (/) which is used for separating directory levels and files.

3) Spaces and tabs must be quoted if used as a part of filename. Avoid using following characters:

@ # $ ^ & * ? (

) [ ] { }

/ \ | ; ' " < >

space Tab Esc Ctrl-characters

4) A (.) at the beginning of a filename hides it from ls command.

5) Upper and lower case characters are interpreted differently. TMP is different from tmp.

6) Do not use following at beginning of filename:

+ - = _

Wildcards:

*It matches any string with zero or more characters.

? It matches any single character.

[*characters*] It matches any one of the character enclosed in [ ]c1-c2 will match characters c1 through c2

[!*characters*] It matches any one of characters not enclosed in [ ].

Examples using wildcards:

1. ls *.db It displays all files ending with .db
2. ls [0-9]* It displays all files beginning with a number
3. ls [!0-9]* It displays all files not beginning with a number
4 ls *.[bdfg] It displays all files ending with characters b, d, f or g
5. ls !(m*)It displays all files not beginning with m

The Shell:

It is the command interpreter of the operating system. It accepts commands from users and analyses and interprets these commands. Most of the Linux commands are executable C programs. Shell interprets user command and starts executing appropriate executable file. It then request kernel to carry out actual transfer of data which finally leads to output that is displayed on the screen of the terminal. Shell acts as middle man between kernel and user of the operating system. These shells are mainly used with Linux:

1) **Bourne Shell (sh):**

This is one of the most widely used shells in the Linux world. It was developed by Steve Bourne of AT&T Bell Laboratories in the late 1970's. It is the primary Linux command interpreter and comes along with every Unix system. It introduced many shell concepts such as the ability to test program for success of failure status, allows for sophisticated scripting (Programming) but lack of features such as history list and command line editing. The prompt used by the Bourne shell in the Linux installation is shown by a ($) dollar sign.

2) **C Shell (Csh):**

The C shell was developed by Bill Joy at the University of California at Berkeley. The C shell is the default shell in the Berkeley version of Unix. It has a few principal advantages over the Bourne shell.

(i) A history mechanism: The C shell remembers the commands that the user types and allows him to recall them without having to retype them.

Aliasing: The C shell permits you to call frequently used commands by your own formulated abbreviations. This is a type of "macro" facility that is available at the command line.

Arithmetic calculation and comparison ,testing can be performed by the shell itself.

3) **Korn Shell (Ksh):**

Developed by David Korn at AT&T, this shell was designed to be much bigger than the Bourne shell and includes several features that make it more superior. It includes all the enhancement of C shell like command history and aliasing and offers a few more features itself which makes it more efficient than the Bourne shell.

4) **Bourne Again Shell (Bash)**

it is the most common shell installed with Linux Distribution. It is based on Bourne Shell and provides additional feature set including command line editing . a history list and filename completion and allow to write sophisticated shell scripts using Bourne Sh ll like syntax

What is Distribution?

Distribution is different sets of applications, utilities, tools and drivers modules are built on same versions of Kernel (the heart of the Operating System), can include and can offer different installation and upgrade programes to ease management of the system.

As windows 98 or Windows NT defines the complete set of windows utilities applications, and drivers that Microsoft ships. There is no room for variation in any application, drivers or Utility

But Linux has opened the door to different flavors of Linux meet differed need. On the same Kernel version they allow to add are remove applications, derivers and utility and allow to redistribute their product. Hence each product are called Distribution

Following are the different types of Distributions.

1. ***Red Hat***

Red Hat Linux distribution from Red Hat Software (www.redhat.com) has emerged as the favorite Linux distribution for most users. Red Hat gained fame for its tools for installation and upgrading the operating system. It introduce GNOME Desktop some feature are Improve installation, improved Administration Tools like LinuxConfig, Xconfigurator, GNOME Desktop environment for X Windows, improved performance features like Symmetrical Multiprocessing and offer different RAID Techniques.

2. ***Slack ware***

Before Red Hat Linux come to fame, slack ware was the distribution to beat but still a popular distribution and found on (www.slackware.com) the distribution offers the full Range of expected utilities, tools, applications, including X windows, development tools such as GNU computers Full Java Support and Java SDK for Linux. It can be downloaded Walnut Greek FTP site (ftp.cdram.com)

3. ***Debian.***

Debian has no commercial organization backing it. It is produced by a team of volunteers. Debian offer more than 1000 software packages and publicized their bugs on website (www.debian.org). It is offer free distribution redistribution right, available source code.

4. ***Caldera open Linux.***

This distribution can be downloaded at no cost from Caldera Website at (www.calerasystems.com). It include K desktop environment and non commercial Star office for Linux, Word Perfect 6 for Linux Netware support and licence of DR-DOS for Dos compatibility.

Installing Linux(Redhat)

Step by Step guide to installing Redhat

Screen 1 If you have booted your system with the Redhat installation media or are installing by NFS you will see the Redhat welcome screen. Press *enter* for install in graphical mode.

Screen 2 Press *next*

Screen 3 for language select English

Screen 4 Keyboard type. Choose *US International*

Screen 5 Mouse type. Select your mouse type here and, if you are going to use this system as a desktop, enable the *emulate 3 buttons* check box.

Screen 6 Installation type. Choose *Custom*

Screen 7 Disk Partitioning. Choose *Manually with Disk Druid*

Screen 8 Disk Setup. Delete all existing partitions **(WARNING: ALL Data currently on the disk is erased!)** Depending on your needs, create new partitions. for simplicity, creating two partitions, one for use as swap which I make twice as large as the amount of physical RAM and one for all other data, called a root partition. Here's how;

Select *new* then enter the following into the pop-up box;

file system type *swap*

size *(2x RAM) e.g. 64*
then *OK*
then:
Select ***new***
enter the following into the pop-up box;
Mount Point /
File system type *EXT3*
and click the *Fill to maximum allowable size* checkbox
then click *OK*

You should now have two visible partitions, called /dev/hda1 and /dev/hda2 underneath the /dev/hda entry. One will be type *EXT3* and one will be type *swap*.
At this stage we have finished configuring partitions. Click ***next*** to go to the next screen.

Screen 9 Boot Loader. Grub is the preferred boot loader and the default options are suitable, so nothing needs to be changed here. **Click *next*.**
Screen 10 Network configuration. You will see a list of your network interfaces (such as *eth0*). Configure each one to suit your own physical network requirements,
here we don't use DHCP for wired machines so we select to configure *manually* and enter the IP information in the box provided.
Note that your wireless card probably has not been detected by this stage. Don't worry we'll configure it later.
Screen 11 Firewall configuration. If you intend to run NoCat your entries here will be superseded by the NoCat configuration process. For the purpose of the initail configuration, select *Medium* security level and *ETH0* as a *trusted device*. Allow Incoming *ssh*.
Screen 12 Additional Language Support. Select Other language

from the list and uncheck *English (USA)*
Screen 13 Time zone. Click on the map of pakistan to set the time zone.
Screen 14 Root password. This screen is where we set the password for the super-user.Create a root password that you will remember. Click *OK* then *Next*
Screen 15 Authentication Configuration. The default settings don't need to be changed. Click *Next*.

Screen 16 Package selection. The packages you chose here will depend on what you want to do with your system, so the recommendations we make below are guidelines. Anything that you omit here but need later can be installed at a later stage. Here it is section by section;

In **Editors** *Emacs* can be removed and *vim-enhanced* can be added

In **Graphical Internet** *evolution, gaim, mozilla-mail, pan* and *xchat* can be removed.
In **Office/Productivity** *mrproject* and *openoffice* can be removed.
In **Sound and Video** Any selected packages in this section can be removed.
In **Graphics** *gimp, gimp-data-extras, gtkam, sane-frontends, xsane* and *xsane-gimp* can be removed.
In **Server Configuration Tools** select all of the GUI configuration tools you require for the various services you intend to have on the box. You may find *redhat-config-bind, redhat-config-httpd, redhat-config-network* and *redhat-config-services* useful.
In **Web server** select all that are applicable for your situation if this system as a web server in addition to an

Access Point. For use with NoCat you will need *mod_perl* and *mod_ssl*

In **Network Servers** Select all of the services you wish to run. For our Access Point we need *ZEBRA* and *DHCP cipe, pxe, rsh-server, talk-server, telnet-server* and *ypserv* can be removed.

In **Administration Tools** select all of the GUI config tools that you think you require. They are safe to install even if you don't end up using them.

In **System Tools** *amanda, ethereal, ethereal-gnome, nmap* and *nmap-front-end* are useful and can be installed and we will use *shapecfg* in appendix C for configuring bandwidth management.

Click ***next*** to being the actual RedHat installation. The install process will begin by formatting the new partitions and installing the various packages required for a functioning Linux system. The installation should take approximately 25 minutes. At the end of this process, configure the X display system for your hardware if required. It is a good idea to turn off *Graphical* login type at this point. You will be presented with the option to create a bootdisk once the install is complete. It is a good idea to do so.

Turning off unnecessary services

One last job remains; after you have logged into your system and are satisfied that it is working correctly, we'll turn off some of the plethora of services that Redhat has enabled. Some of these services we will enable later but in the mean time they are using system resources unnecessarily and taking time to load when the system boots, both of which are inconvenient while we are building and testing our new system.

You can manually turn off services by re-naming files in the /etc/rc.d/ heirarchy, but Redhat has a menu driven system called simply *setup* that is easier to use. Access it with this command;

```
[root@accesspoint root]# setup
```

A menu will come up. Scroll down to *System services* and press *enter* to select it. You will see a list of services, those with an asterix are enabled. Disable the following services by highlighting the asterix and pressing the *space bar*.

anacron Scheduling daemon
apmd Power management daemon
atd Scehduling daemon
autofs Automounting of remote filesystems
cups Unix print daemon
gpm Console mouse support daemon
isdn isdn
iptables Firewalling
kudzu Hardware maintenance daemon
netfs Remote file system mounter daemon
nfslock Network File System daemon
pcmcia PCMCIA monitor daemon
portmap RPC control daemon
rhnsd Redhat update daemon
sendmail Mail server daemon
xinetd TCP/IP services super-daemon

This leaves us with only these services enabled; **crond, keytable, network, random, rawdevices, sgi_fam, sshd, syslog** and **xfs** which will make the system more responsive. Note that **xfs,** the X font server, can be disabled as well if you have no intention of running X.

Reboot and test

You may like to reboot your system now to make sure that it comes back up OK. Reboot with this command;

```
[root@accesspoint root]# shutdown -r now
```

Once your system comes back up and you're satisfied that it is functioning nominally,

LINUX FILE SYSTEM MANAGEMENT

badblocks	Used to search a disk or partition for badblocks.
cfdisk	Similar to fdisk but with a nicer interface.
debugfs	Allows direct access to filesystems data structure.
df	Shows the disk free space on one or more filesystems.
dosfsck	Check and repair MS-Dos filesystems.
du	Shows how much disk space a directory and all its files contain.
dump	Used to back up an ext2 filesystem. Complement is restore.
dumpe2fs	Dump filesystem superblock and blocks group information. Ex: dumpe2fs /dev/hda2
e2fsck	Check a Linux second extended file system.
e2label	Change the label on an ext2 file system.
exportfs	Used to set up file systems to export for nfs (network file sharing).
fdisk	Used to fix or create partitions on a hard drive.
fdformat	Formats a floppy disk.
fsck	Used to add new blocks to a file system. Must not be run on a mounte file system.
hdparm	Get/set hard disk geometry parameters, cylinders, heads, sectors.
mkfs	Initializes a Linux file system. This is a front end that runs a separate program depending on the file system's type.
mke2fs	Create a Linux second extended file system.
mkswap	Sets up a Linux swap area on a device or file.
mount	Used to mount a filesystem. Complement is umount.
rdev	Query/set image root device, swap device, RAM disk size of video mode. What this does is code the device containing the root filesystem into the kernel image specified.
rdump	Same as dump.
rmt	Remote magtape protocol module.
restore	Used to restore an ext2 filesystem.
setfdprm	Set floppy drive parameters.
swapoff(8)	Used to de-activate a swap partition.
swapon(8)	Used to activate a swap partition.
sync	Forces all unwritten blocks in the buffer cache to be written to disk.
tune2fs	Adjust tunable filesystem parameters on second extended filesystems
umount	Unmounts a filesystem. Compl

Creating a User Account

When you first started your Red Hat Enterprise Linux system after installation, you were given the opportunity to create one or more user accounts using the **Setup Agent**. If you did not create at least one account (not including the root account) you should do so now. You should avoid working in the root account for daily tasks.

There are two ways to create new and/or additional user accounts: using the graphical **User Manager** application or from a shell prompt.

To create a user account graphically using the **User Manager**:

1. Select **Applications** (the main menu on the panel) => **System Settings** => **Users & Groups** from the panel. You can also start the **User Manager** by typing redhat-config-users at a shell prompt.
2. If you are not logged in as root, you will be prompted for your root password.
3. The window shown in Figure 1-16 will appear. Click **Add User**.

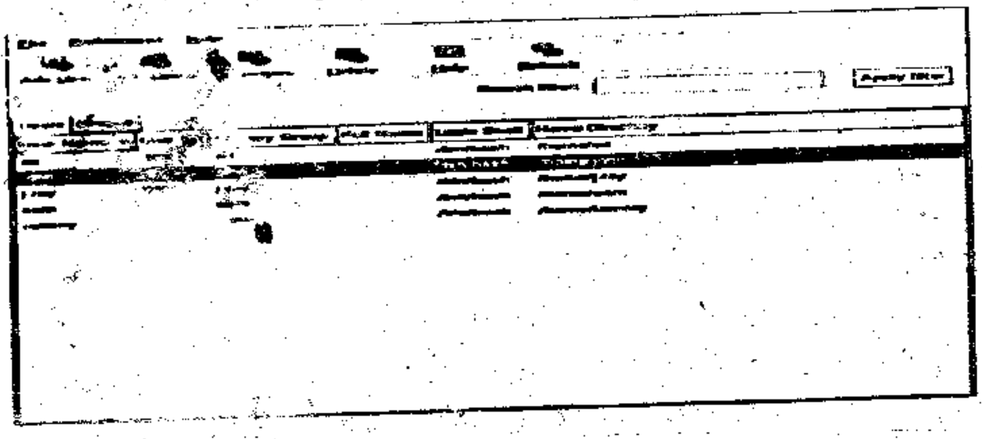


Figure 1-16. The Red Hat User Manager

4. **In the Create New User** dialog box, enter a username (this can be an abbreviation or nickname), the full name of the user for whom this account is being created, and a password (which you will enter a second time for verification). The name of this user's home directory and the name of the login shell should appear by default. For most users, you can accept the defaults for the other configuration options. Refer to the *Red Hat Enterprise Linux System Administration Guide* for details about additional options.
5. Click **OK**. The new user will appear in the user list, signaling that the user account creation is complete.

To create a user account from a shell prompt:

1. Open a shell prompt.
2. If you are not logged in as root, type the command su - and enter the root password.
3. Type useradd followed by a space and the username for the new account you are creating at the command line (for example, useradd *jsmith*). Press [Enter]. Often, usernames are variations on the user's name, such as jsmith for John Smith. User account names can be anything from the user's name, initials, or birthplace to something more creative.
4. Type passwd followed by a space and the username again (for example, passwd *jsmith*).
5. At the New password: prompt enter a password for the new user and press [Enter].
6. At the Retype new password: prompt, enter the same password to confirm your selection.

How to add a new user in Redhat

To add a user and set up the directories you want that user to have, use the **useradd** command. By default, this will add a user and create a home directory for that user, which will be located in /home.

EXAMPLE: **/usr/sbin/useradd *yourname*** will create the user *yourname*, and make the directory */home/yourname*

Set the password for the new user by running **passwd**. This will give the user a password and activate the account.

EXAMPLE: **/usr/bin/passwd *yourname***. You will be prompted twice for a password.

NOTE: If you want useradd to create more default directories than just /home/newuser, you can add them to /etc/skel. Anything you add to this directory will be created when you add a new user.

EXAMPLE: **mkdir /etc/skel/www** will add a directory called www to the skel dir. Now whenever you run useradd to create a new user, it will also create a www directory in the new users home directory.

There are also some options for useradd you can add if you wish, such as changing where the users home directory will be, or which skeleton directory to use

LINUX COMMANDS

clear Command:

The external clear command clears your terminal screen if possible.
$ clear and press <Enter>
the terminal screen is cleared and the shell prompt $ appears at the top of the screen.

pwd Command:

pwd command displays the full path of your present working directory. Present working directory is your current working directory. The format of the command is
$ pwd

cd Command:

The internal cd command changes your current working directory. cd lets you do the following:

- change working directory
- change to last previous working directory
- use a string substitute in the current path to change to a similar directory path

The general format of the command is:
$ chdir/cd -
$ cd *[directory]*
$ cd.. The present working directory is changed to previous working directory.

mkdir Command:

The external mkdir command makes a new directory. You can pass multiple arguments to mkdir. Each argument is used by mkdir as the name of a new directory to create.
The general format of mkdir command is
$ mkdir *[-m mode] [-p] directory_list*
Options:
-m mode : Mode to use for new directories. This allows you to specify what mode all of new directories will have when they are created.

-p : Parent directory creator. If you specify a pathname to create a new directory and the parent directories do not exist, mkdir will create them as needed.

Note: You must have write permission for the directory when you are creating new subdirectories. If no write permission is available, you will not be able to create new directories.

Examples:

(1) To create a subdirectory called misc which has another subdirectory named misc1

$ mkdir misc misc/misc1

rmdir Command:

The external rmdir command removes a directory. The directory must be empty.

rmdir is a safe way to perform directory removal than using rm -r command. It checks the directory for existence of files and subdirectories. If any exists, rmdir complaints and exits without removing the directory.

The general format of rmdir is

$ rmdir *[-ps] directory_list*

or $ rm -r *directory_list*

Options:

-p: Removes empty directories specified in the directory path. Name of each directory is displayed on standard output as it is removed. Directories that are not removed are displayed on standard error.

-s : Suppress any messages produced. Both standard output and standard error are suppressed.

Examples:

(1) $ rmdir misc/misc1 misc

To check whether the directories misc and misc/misc1 are removed use the following command to list the directory

$ ls -l

cat command:

The external cat command reads each file in the argument list and displays the data to the standard output. It can read data from files or from standard input. It only writes to the standard output. By using shell re-direction capabilities cat can be used to combine multiple files into one large file that is why it is called concatenate. Some of the uses of cat command are as under:

- Display contents of ASCII files.
- Make a copy of a file.
- Combine multiple files into one file.
- Copy input from your keyboard to a file.
- Send output to a pipe used for multiple file input.
- Combine input from screen and a file into one output stream.

General format of the cat command is

```
cat [-] [-su] [-v [-et]] file_list
```

Options:

- :Read from standard input, treated as one input file.

-s :Error messages for non-existent files are suppressed.

-v : Prints non-printing characters in visible form. Control characters e.g., Control-X is printed as ^X.

-e : Print a $ sign to represent new-line character.

-t : Print a ^I (Control-I) in place of tabs.

file_list : One or more files in sequential order and write to standard output. If no argument is specified cat reads from standard input.

Examples:

(1) $ cat myfile
- To display a file

(2) $ cat mylist yourlist hislist -To display multiple files

(3) $ cat originalfile > newfile -To copy a file

(4) $ cat file1 file2 file3 > file123 - Combining multiple files

(5) $ cat > newfile - Creating a file from keyboard

{ here you type whatever you like and at the end press Ctrl-D}

ls command:

ls command is used to display files and directories names. The format of ls command is:

```
$ ls [options] [filesnames or wild cords)
```

Some of the essential options are:

-a: lists all files. Including hidden files starting form "."

-d: displays data about directories.

-l: long list files and directories.

-t: lists file in order of last modification time.

-R: recursively lists files in all subdirectories.

-r: displays files in reverse alphabetical order of filenames.

-U: Sort entries by the last access time

-x: Sort files by file extension in alphabetical order

mv command:

The external mv command moves a file from an existing location to a new location. It is also used as the rename command to change the name of a file. It has three formats:

- rename a file with a new filename
- move one or more files to reside under a different directory
- rename a directory with a new directory name

General format of the mv format is:

```
$ mv [-if] filename new_filename
$ mv [-if] filename directory
$ mv [-if] old_directory new_directory
```

Options:

-f : Force the move to occur. Response "Yes" is assumed and move is performed.

-i : Commands runs in interactive mode. If destination file already exists, mv prompts you with the filename followed by a question mark (?). If you respond with 'Y' or 'Yes', move is performed. Any other response will cause mv to skip to next move.

Examples:

(1) Display the list of files in the current directory

```
$ ls -x
caller file1    file2       db      letters
```

Now use mv command to rename the file file2 as stuff

```
$ mv file2 stuff
```

Now display the list of files

```
$ ls -x
caller  file1  db    letters  stuff
```

cp command:

The external cp command copies a file. It reads the contents of a file and creates a new file or overwrites an existing file. There are two basic formats of cp that allow you to:

- copy one file to another file
- copy multiple files to a directory
- copy input from your keyboard to a file
- copy a file to your terminal

General format of the cp command is

```
    $ cp [-ip] source_file  dest_file
$ cp [-ipr] source_file_list dest
      directory
     $ cp [-ip] source_directory
       dest_directory
```

First format copies one ordinary file to a new file. Second format will copy one or more files to a specific directory. Third format allows you to copy an entire directory structure to a new directory.

Options:

-i : Interactive confirmation is required. You are prompted if an existing file is overwritten. If 'Y' or 'Yes' is given in response, copy is performed otherwise not.

-p : Preserve the characteristics of the source file. Copy the contents, modification times and permission modes of the source file to the destination file.

-r : Recursively copy any source directories. If a directory is given as the source file, then all of its files and subdirectories are copied. The destination must be a directory.

Examples:

```
(1)   $ cp letter  letter.bak     # make a backup copy of file letter
(2)   $ cp letter  ../temp                # copy letter to temp working
directory
(3)   $ cp /dev/tty  note # copy input from
         keyboard to file note
(4)   $ cp file1  stuff  # copy file1 to file stuff
```

```
(5)     $ cp calendar  letters      # copy file calendar to directory letters
```

rm command:

The external rm command removes (deletes) files or directories.
The general format of the rm command is

```
        $ rm [fi] file_list
        $ rm [-fir] directory_list [file_list]
```

Options:

-f : Forces the removal of all files listed. Does not check whether file is write-protected or not. Does not prompt for confirmation. If directory is write-protected, files are never removed.

-i : Interactive file removal. Response is awaited.

-r : Recursively removes files and directories. All files are removed from each directory. Each directory is then removed. If a file is write-protected, then rm prompts you for confirmation to remove the file.

Examples:

```
(1)     $ rm stuff                # to remove a file named stuff
(2)     $ rm -ri letters
        letters/calendar ? y
        letters/file1 ? y
        letters ?
```

press Return not to delete letters directory.

more/page Command:

The external more command allows you to view a file on your terminal. It lets you view one screen of text at a time. The page command performs the same function as more but with a different screen control. The screen is cleared before each full screen of text is displayed.

The general format of the more command is

```
        $ more [-option]  [+linenum] [file_list]
or      $ page [-option]  [+linenum]  [file_list]
```

Options:

-f : Do not fold long lines. Count logical lines instead of screen lines. Normally more truncates lines longer than the screen width

-s : Squeeze out adjacent blank lines. Two or more blank lines are grouped together and are reduced to one blank line. This increases amount of text displayed on the screen

-w : Prompts and waits for any key to be pressed before exiting. By default more/page will exit without waiting when end-of-file reaches

-rows : Specifies the No. of rows (lines) to display on your terminal screen

+linenum : Begin display at line number linenum of the input

file_list : The list of files to be read by more.

Examples:

(1) type more /etc/passwd /etc/group /u1/ts/mylogin/file1 and press Return. First screen of /etc/passwd file will appear.

(2) press Spacebar, next screen of data is displayed. (If the data in the file has been finished, next file is started)

(3) type 2:n to skip to /etc/group file. The output will look like

. . . skipping

. . . skipping to file /u1/ts/mylogin/file1

---more---(Next file: /u1/ts/mylogin/file1)

(4) To return to second file, type :p to skip backward to /etc/group file.

. . . skipping

. . skipping to file /etc/group

---more---(Next file: /etc/group)

(5) press Spacebar to move forward one screen

(6) press Spacebar to move until (Next file: /u1/ts/mylogin/file1) appears

At the end, type 'q' to exit from more.

Grep Command

Search files for lines matching a specified pattern and display the lines

Syntax Grep [option] [pattern] files

-c instead of displaying matching lines simply output a count of total number matching the expression

-i ignore case in both the pattern and files

-L instead of displaying each line simply display the name of each file that contains no matches for the pattern

-n prefixes each out put line its line number in the file

-w Display only those lines with matches for the patterns that complete word

-x Display only those lines with matches for the patterns that complete line

zip Command

Create a Zip archive from one or more files and directories

Syntax zip zipfilename file1 file2 file3

-r Recursively work with directories adding all files in the subdirectories to the archive

-m move files into the archive deleting them form original location.

-e Encrypt the archive after prompting for a password this password will be use in extracting

unzip command

Manipulates and extract ZIP archive

Syntax unzip [option] ziped filename

-f: Extract only those files that are newer than already-existing version of the file

-l: Displays the contents of the archive without extraction

Chmod Command

Change the access permission of one or more files or Directory

Syntax chmod [option] mode files

options

-r recursive Recursively changes the permissions of all files in all subdirectories

-v verbose Displays the results of all permission changes

-f silent Suppress display of error messages when files permissions cannot be changed

Mode it is in the form [ugoa][+-=] [rwx]

u = user who owned the file

g = all members of the group that owns the file

o = anyone who is not the owner or in the owner group

a = all user

+ = Specified modes should be add to already specified permission

- = Specified modes should be remove from already specified permission

= = Specified modes will replace existing permission

r = read permission

w = write permission

x = execute permission

Example $ Chmod u+x a.bat will give execute permission to user on a.bat file

$ Chmod u-x a.bat will remove execute permission to user

$ Chmod a+x a.bat will give execute permission to all user

$ Chmod a=rx a.bat will give read and execute permission to all user and remove existing permissions

at command

Schedules commands to be executed at a specific time. User is prompted for the commands .

Syntax at [options] time

-f filename: read commands from the specified file rather than prompting for the commands

example $at 2.30

rm*. Temp ctrl-d

specifying times

now =specifies the current time

today = specifies the today

tomorrow = specifies the next day

+ = specify offsets in minutes hours days of weeks

now+ 2 hours = two hours from now

oday + 3 days= 3 days form today

Job Control

Using Job control, it is possible to use a single shell to execute and control multiple programs running simultaneously

Normally, when you execute a command, it runs in the foreground. That is , the shell executes the command and the prompt doesn't return until the command is finished

I.e. executing a command

```
$ find / -name '*.tmp' –print >findfile
```

This command searches the entire structure of Linux system for files with the .tmp extension and store the result in the findfile file. While executing this command you won't be able to run other commands while find is running

To place a job in the background is to add an ampersand(&) to the end of the command when you run it

```
$ find / -name '*.tmp' –print &
```

once you press enter to execute this command, you are immediately presented with a new command prompt; at the same time and you will be able to execute the next command same time

thus you can execute multiple task an the same time

jobs command

This command will list all jobs running

```
$ jobs
[1]     Running          $ find / -name '*.tmp' –print >findfile &
[2]      Running         $ ls –lR / '*.bmp' >dirlist &
```

fg command

This command bring the background job to foreground

Syntax fg Jobs no

Example

```
$ fg 1
```

this will bring $ find / -name '*.tmp' –print >findfile from background to foreground ie on screen

bg command

This command start the stopped job in the background

Syntax bg Jobs no

The foreground job first stopped by pressing Ctrl-Z and command prompt will be available. Where you can run the bg command to run the stopped command in the background

Example

Suppose you enter another command

```
        $ ls –lR / '*.bmp' >dirlist
```

This will execute in the foreground then press Ctrl-Z . This will temporary stopped the ls job

And give command prompt .to see the all current job

```
        $ jobs
        [1]     Running         find / -name '*.tmp' –print >findfile &
        [2]     Stopped         $ ls –lR / '*.bmp' >dirlist &
```

Now to start the stopped job ie [2] enter the command and prompt

```
        $ bg 2
```

to see the result

```
        $ jobs
        [1]     Running  $ find / -name '*.tmp' –print >findfile &
        [2]     Running  $ ls –lR / '*.bmp' >dirlist &
```

cal Command:

The external cal command generates a simple calendar and write it to the standard output. The default output for cal is current month. Using specific argument, a calendar for specific year or year and month can be created. Valid years are 1 to 9999. Valid months are 1 to 12.

The general format of the cal command is

$ cal *[[month] year]*

year :   Produces calendar for given year

month : Produces calendar for specified month of given year

Example:

To create a calendar for September 1924, the command is given as

```
        $ cal 9 1924
```

echo command

Displays a line of text to your terminal. Some of the feature and use of echo are 1)Display string of text 2) Display variables 3)Display menu screen

Syntax echo "string"

Example

```
        $echo " my home directory is $home"
```

write Command:

The external write command sends messages you type on your terminal to another user's terminal. write reads the standard input and writes to the specified user's terminal tty. The write command is used to communicate with the fellow users on an interactive basis. It is useful to send a brief message to someone immediately or to carry on conversations using terminals.The general format of the write command is

```
$ write user_name [tty]
```

Options:

user_name : The name of a user who is currently logged in to the system. Use the who command to list who is on the system

tty : Specify which terminal tty to connect to if the same user is logged on more than once.

Examples:

(1) Create a file and type some message in it, then use the following command:

```
$ write alpha < tempmesg
```

where alpha is the name of the user to whom the message is to send while tempmesg is the file containing the text of the message.

(2) Type the following command:

$ echo "How are you? I want to meet you in the library at 9:00" | write alpha. The echo will send the message to write via a pipe. The message will appear on the screen of username alpha all at one time as shown below:

```
message from mylogin tty11 [ date & time ]
How are you? I want to meet you in the library at 9:00
```

wall Command:

The external wall command performs a write to all users currently logged on to the system.

The general format of the wall command is

```
$ wall
```

The wall message precedes its message text with the following line:

Broadcast message from use_name

It is usually used by super user to warn all users of immediate problems. The most command warning is that the system is being shutdown within 60 seconds.

The super user can write to any user's terminal regardless of the permissions set by that user using mesg command. The wall command is commonly used by the super user. It can also be used by any user but many users do not need to send message to every one on the system. Common formats are:

```
        $ wall < mesgfile
or      $ cat mesgfile | wall
```

Examples:

```
(1)     $ wall
```

This is a broadcast message of the Linux Beginners Broadcasting Foundation. Please disregard this message and get back to your work immediately. Ctrl-D

The message will also be sent to your tty since you are also logged on to the system. This provides a verification that the message was sent as expected.

man Command:

The external man command display help about any command to your terminal screen.

The general format of the man command is

```
$ man command
```

Example

```
        $ man cp
```

will display help page of cp command.

head Command:

The external head command will display the first 23 lines of a file on screen

The general format of the head command is

```
$head file name
```

Example:

```
        $ head abc
```

will display first 23 lines of abc file .

tail Command:

The external tail command will display the last 23 lines of a file on screen.

The general format of the tail command is

```
$ tail file_list
```

Example $ tail abc

will display last 23 lines of abc file

mail Command:

The external mail command is an electronic post office. You can send, receive and store messages using mail command. There is a long list of options associated with mail command which can be used according to the requirement. The general format of mail command is

```
$ mail options
```

To read mail, use the following command

```
$ mail
```

all the messages stored in the mailbox can be displayed.

To send mail to another user of the system, the following command is used:

```
$ mail user_name
```

Examples:

(1) To send mail to a user named alpha

$ mail alpha and press Return. The following screen appears

Subject: -------------- (type the subject of the message) (type the message) press Ctrl-d to end the message

(2) To read mail, type

```
$ mail
```

The display will show *mail version .... 01/29/99 Type ? for help*

Type ? to display the commands to view, edit, delete or store the messages to files.`aq

Shutdown command

The external Shutdown command will shutdown the system. the root user are allowed to use this command on server, specifying time, will broadcast the message to all connected users. This command be used according to the requirement. The general format of shutdown command is

```
$ shutdown options time [massage]
```

option	
-h	will halt after shutdown
- r	system will reboot after the shutdown .
Time	time specified in minutes

Example $ shutdown –h 3 "please save you work .. the system is shutdowning in 3 minutes"