

Chapter  
1

# INTRODUCTION

*Get on the  
Fast Track!*



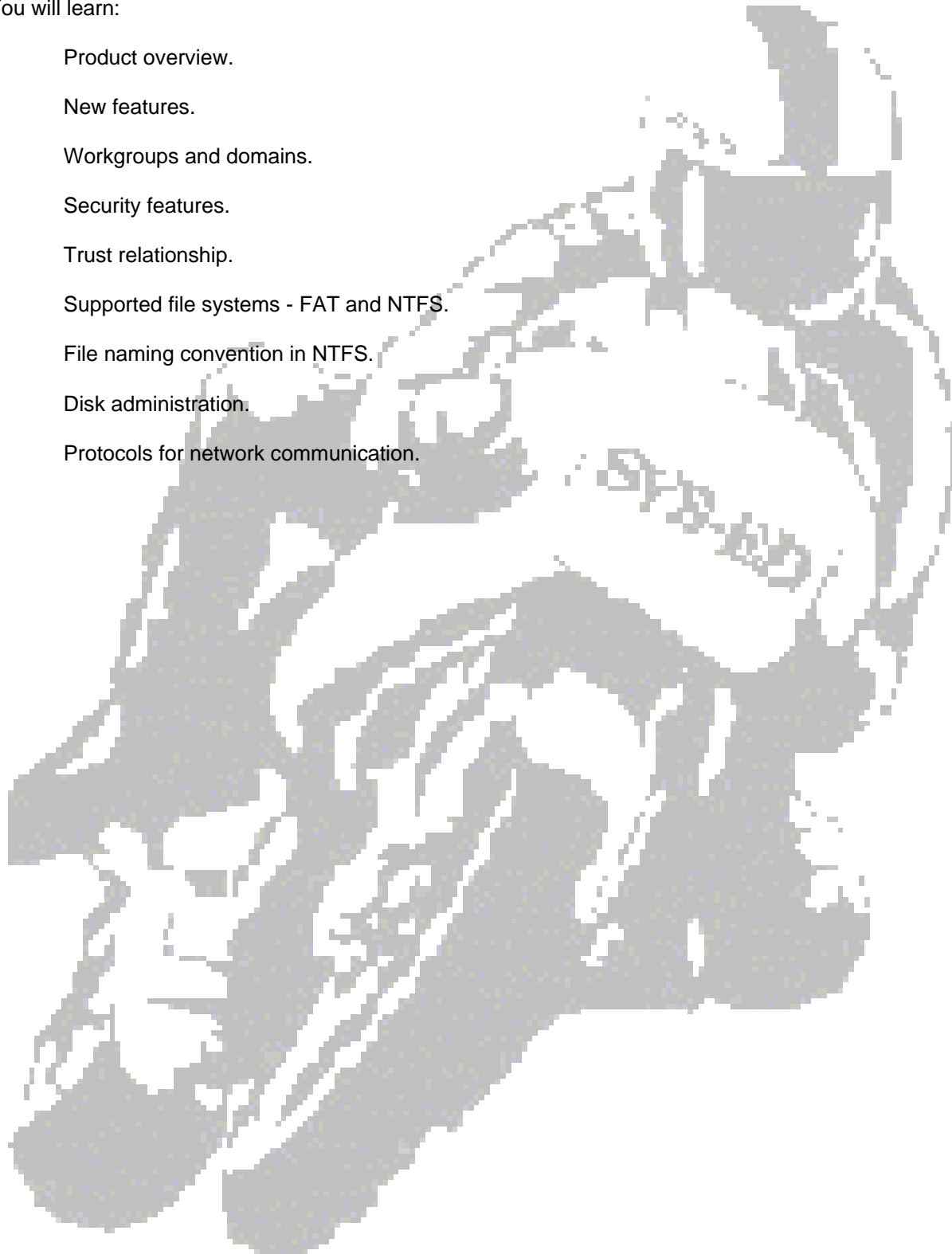
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**SYS-ED\  
COMPUTER  
EDUCATION  
TECHNIQUES, INC.**

**Objectives**

You will learn:

- C Product overview.
- C New features.
- C Workgroups and domains.
- C Security features.
- C Trust relationship.
- C Supported file systems - FAT and NTFS.
- C File naming convention in NTFS.
- C Disk administration.
- C Protocols for network communication.



## 1 Product Biography

Windows NT Workstation and Windows NT Server shipped in July of 1993.

Windows NT Workstation	Windows NT is a workstation operating system that provides you with the power of a workstation with the ease of use, productivity and compatibility of a PC. It is intended for individual users who need the power of a workstation at their desktop.
Windows NT Server	<p>Windows NT Server is a 32-bit network operating system with preemptive multitasking and memory protection.</p> <p>Windows NT Server provides you with the connectivity, the base services and the centralized administrative tools to deliver business information and services across a distributed network of computers.</p> <p>Windows NT Server scales from the small network to the enterprise, providing both basic file and print services as well as application services like database, messaging, communications and software management.</p>

Windows NT:

- C Provides support for symmetric multiprocessing.
- C Has native networking functionality with a graphical user front-end.
- C Takes advantage of advanced processors such as the Intel 80486 and Pentium, as well as reduced instruction set computers (RISC) such as the MIPS R4000 and the DEC Alpha.

Advantages/Benefits:

- C Overall throughput, defined as a combination of processor performance, data transfer, and memory access is improved in relation to the existing predominant PC operating systems: DOS and Windows.
- C Memory protection ensures that multiple programs run in their own memory area and don't corrupt the memory read and used by other applications.
- C Symmetric multiprocessing lets Windows NT take advantage of multiple processors.

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## **2 Networking Features**

Windows NT is an expandable system which supports a variety of network interface cards and network communications protocols.

Windows NT provides the following networking features:

- C Directory and file-saving capabilities, and the ability to connect with shared directories and files on remote computers.
- C Sharing of a local printer and connection to shared printers on remote systems.
- C Messaging and electronic mail capabilities among users in workgroups and domains.
- C Industry-standard methods for establishing network connections and session management.
- C Remote Procedure Call (RPC) which enables a local workstation to run utilities and functions on remote workstations.

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### 3 New Features

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#### 3.1 New Features: Release 4.0

Feature	Description
A new look and feel	The Desktop, Start Button and Taskbar, My Computer, Windows NT Explorer, Microsoft Internet Explorer, Network Neighborhood, Folders, Shortcut menus, Close, Minimize, and Maximize buttons, What's This?
Faster ways to get your work done	Find command, Run command, Documents command, Quick View Open with command, Faster printing
More ways to customize Windows NT	Shortcuts on the desktop, Display properties, Fonts folder, Accessibility options for people with disabilities, System properties
New programs and features	Windows Messaging, Microsoft Internet Explorer, Peer Web Services for Windows NT Workstation, Internet Information Server for Windows NT Server, Distributed Applications for the Internet, DirectDraw and DirectSound Support
New accessories in Windows NT	WordPad, Paint, Phone Dialer, HyperTerminal, CD Player, Volume Control
Support for portable computers	My Briefcase, Hardware Profiles
Improved networking	Network Neighborhood icon, Microsoft Internet Explorer, Dial-Up Networking, Peer Web Services for Windows NT Workstation, Internet Information Server for Windows NT Server

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## 4 Accessing the Windows NT System

### Local Users

The Windows NT operating system allows multiple users to log on at the physical computer running Windows NT. Windows NT maintains account information for each user and stores customized settings that are restored when a user next logs on.

When a user logs on by typing an account name and password, Windows NT authenticates that user. If the account is valid and has not expired, the user gains access to the system.

### Network Users

Network users access an Windows NT system over a network from another computer. Once connected, they can access shared directories, files, and resources such as printers.

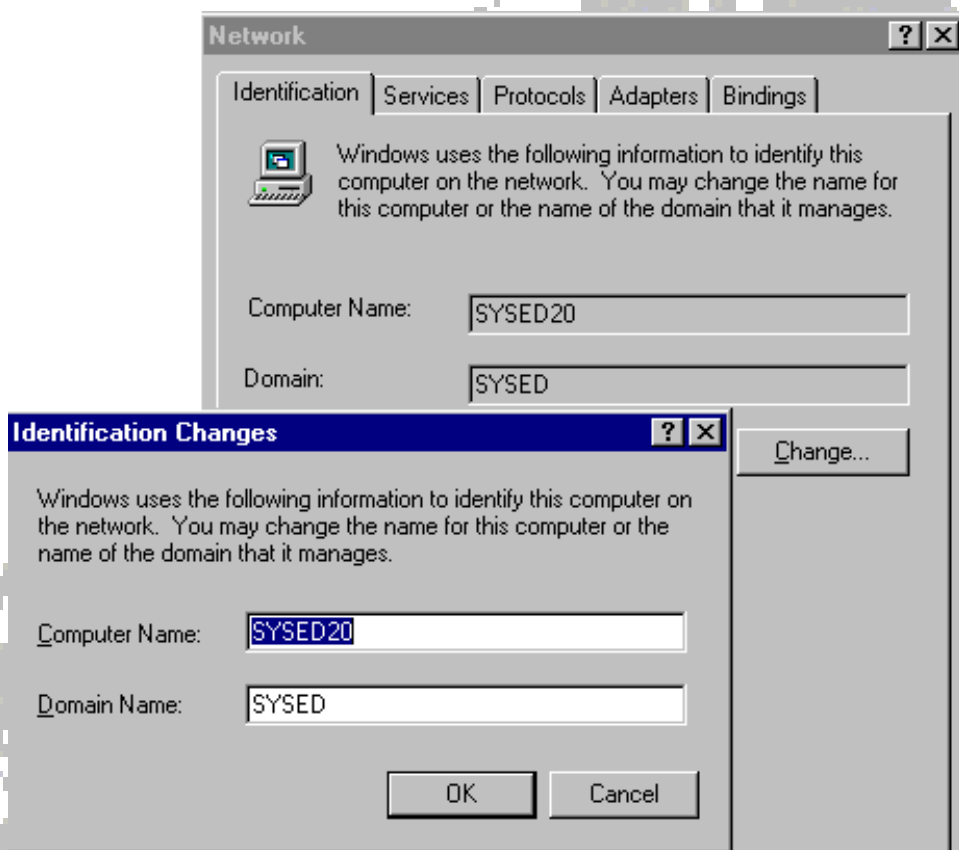
Network connections under Windows NT have a client/server relationship. A Windows NT computer that shares its files and resources is the server and computers that access those resources are the clients.

## 5 Computer Name

All Windows NT workstations that participate in a network must have a name assignment. It is usually designated during installation.

The Computer Name field can be changed from the Network Object in the Control Panel or the properties menu choice in the Network Neighborhood icon.

For a computer to participate in a Windows NT Server domain, an account must exist in the domain for the name specified in the Computer Name field.



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## 6 Security and User Hierarchy

Users have accounts that require logon with password identification.

Logon account information is stored in a master database known as a security accounts manager (aka SAM) on each Windows NT system.

The account tracks various actions performed by a user for auditing purposes, such as logons, logoffs, and file accesses. Management tasks such as changing user accounts or server settings can also be tracked.

### User Hierarchy

- C Users are prevented from examining the contents of memory.
- C Administrators and users can control file, directory, and resource (printers) access on their own system.
- C System administrators can track and view auditable events.

Permissions can be applied to shared directories, and administrators must create user accounts that require logon passwords and provide logon restrictions.

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## 7 File Systems

### File Allocation Table File System

FAT is the file system for DOS. It uses a file naming format with an eight-character filename and a three-character extension.

Windows NT can access FAT drives, but if you boot the system with DOS, you cannot access NTFS drives.

### New Technology File System

This new NT file system provides long filenames, data protection/recovery, and security through directory and file permissions.

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## 7.1 NTFS

NTFS supports large hard disks and the storage of files over multiple hard disks; this is known as spanning volumes.

NTFS provides built-in security features that control file ownership and access.

Files on an NTFS volume are not accessible from DOS or other operating systems.

NTFS is part of the Windows NT security system, but only when you use NTFS.

#### File Naming Rules:

C Maximum of 256 characters in file and directory names.

You can use multiple period-separated extensions, if necessary, to create filenames such as REPORTS.SALES.SMITH.JUNE93.

C Names cannot include these symbols:

? \ / \* " < > | : .

C Windows NT preserves the uppercase/lowercase format of the name specified but does not use case to distinguish between filenames.

Wildcard characters (? and \*) can be used for searching and listing filenames.

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## 7.2 File Naming Conventions

The file systems supported by Windows NT have naming conventions.

Files within the same directory cannot have the same name, but you can use names that have characters in common as part of a strategy to keep your files organized.

Windows warns you if you try to create a file with a name that's already in use by another file.

Only drives formatted to the NTFS file system can store files with long filenames and security attributes. Use a mix of periods and upper and lowercase letters to differentiate parts of the filename.

Not all Windows NT applications let you save or open files that have long filenames.

All NTFS files are assigned a name that follows the DOS convention if copied to a DOS file system.

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## 7.3 Recoverable File System

Windows NT has a recoverable file system, which adds very little overhead to the file system. All modifications to files on an NTFS volume are logged with redo and undo information.

- C Redo provides information on how to repeat transactions while undo provides information on how to "roll back" transactions.
- C With undo information, the disk can be restored to the state it was in before the transaction was ever started.

The recovery options work on all drives formatted to the NTFS file system; no special equipment is required to use this option.

Consider a scenario where the power goes out while a transaction is being written, the disk contains only half the correct information.

Upon rebooting, Windows NT scans the disk and determines whether it needs to redo transactions, it looks up the undo information and restores the records to their pre-transaction state.

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## **8 Printing**

In Windows 3.1, you had to install a printer driver on your own system when accessing a printer of that type on a remote network computer.

The location where printer drivers are stored for shared network printers has been changed. In Windows NT, printer drivers are stored on the computer where the printer is connected (ie. the server). When you access the printer, your application uses the printer driver on that computer.

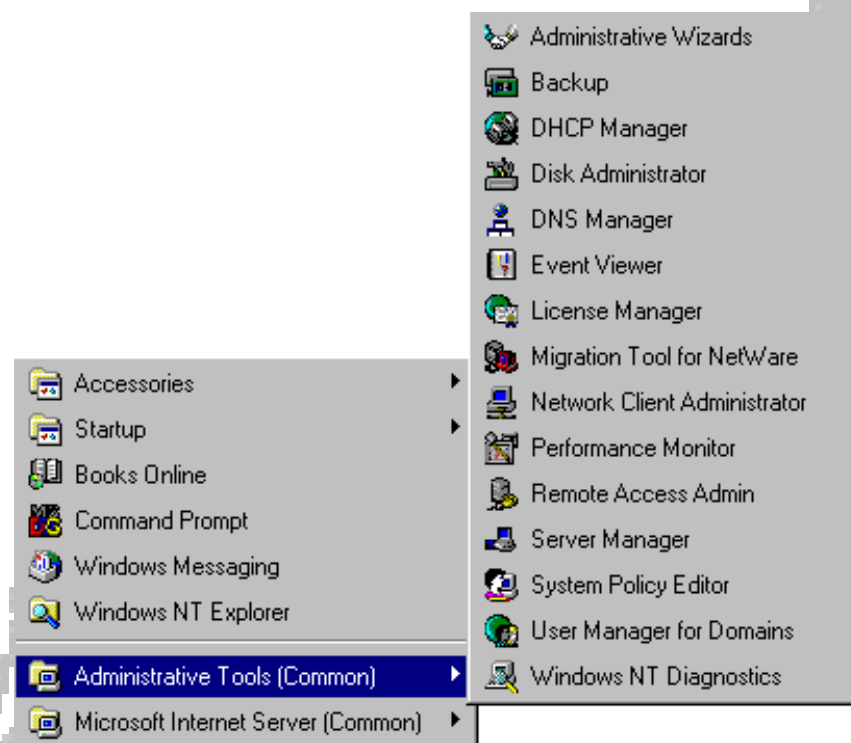
Permissions can also be set that control the type of access users have to printers.

Users can be prevented/allowed access to a printer or granted the ability to control documents in the printer's queue.

Administrators have full control over printers.

## 9 Administrative Tools

The standard Administrative tools which can be accessed through the Start Menu and cascaded menu submenus are:



Tool	Purpose
Administrative Wizards	Step-by step instructions for user accounts, group management, file and folder access, add printer, add/remove programs, install new modem, network client administrator, and license compliance.
Backup	Used to back up directories and files on the system.
DHCP Manager	Used for managing DHCP servers and the configuration options.
Disk Administrator	Used to prepare and manage the disks on the system.
DNS Manager	Used for configuring/add servers which map IP addresses to host names on workstations which have TCP/IP installed.
Event Viewer	Used to view logs that display system, security, and application events for troubleshooting and auditing purposes.
License Manager	Tracks the software product history of software licenses by product and per seat on Windows NT Server across the browsable network.

Tool	Purpose
Migration Tool for NetWare	Program for converting the Novell bindery and NDS accounts database to a structure/format which can be utilized by Windows NT Server.
Network Client Administrator	Used to make Network Installation Startup and Installation Disk Sets, copy client-based administrative tools, and Remote Boot Client Information.
Performance Monitor	Used to track system usage, monitor performance, perform troubleshooting, and plan for system expansion.
Remote Access Admin	Used for managing communication ports, starting/stopping/pausing RAS and granting permissions to user accounts on RAS servers.
Server Manager	Used to manage domains and computers.
System Policy Editor	Used for creating policies and modifying policies on a per user/group or machine basis.
User Manager for Domains	Used to create accounts that other users log onto and groups that provide system security. Also provides for creating customized user profiles.
Windows NT Diagnostics	Used for gathering information and troubleshooting.
WINS	Used for mapping NetBios names to IP addresses and configuring Windows NT Server options and replication services.

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## 10 Control Functions/Control Panel

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### 10.1 Windows NT Server

Name	Description
SCSI Adapters	Add/Remove SCSI adapters and view their properties.
Printers	Adds, removes, and changes printer properties.
Microsoft Postoffice	Administers a Microsoft Workgroup Postoffice.
HP Jet Admin	Allows to configure and monitor HP printers
Licensing	Change licensing options.
Accessibility Options	Changes accessibility options for your system.
Date/Time	Changes, date, and time zone information.
Display	Changes display settings.
Keyboard	Changes keyboard settings.
Mouse	Changes mouse settings.
Multimedia	Changes multimedia devices settings.
Sounds	Changes system and program sounds.
Regional Settings	Changes the appearance of numbers, currencies, dates, and times.
Internet	Changes your Internet settings.
Telephony	Configure Telephony Drivers and Dialing Properties.
Monitoring Agent	Configure the Network Monitoring Agent software.
Console	Configures console properties.
Network	Configures network hardware and software.
UPS	Configures the Uninterruptible Power Supply.
Tape Devices	Detect tape devices and view their properties.
Server	Displays and manages local server properties.
Fonts	Displays, adds, and removes fonts.
PC Card (PCMCIA)	Enables PCMCIA sockets and changes PC Card (PCMCIA) settings.
Modems	Installs a new modem and changes modem properties.
ODBC	Maintains ODBC data sources and drivers.
Mail and Fax	Microsoft Windows Messaging Profiles.

<b>Name</b>	<b>Description</b>
Dial-up Monitor	Monitors status of dial-up connections.
System	Provides system information and changes environment settings.
Add/Remove Programs	Sets up programs and creates shortcuts.
Ports	Specifies serial port communications settings.
Devices	Starts and stops device drivers.
Services	Starts, stops, and configures services.

## 11 Widely Used Microsoft Clients

The preferred client for Windows NT Server domain is Windows NT Workstation.

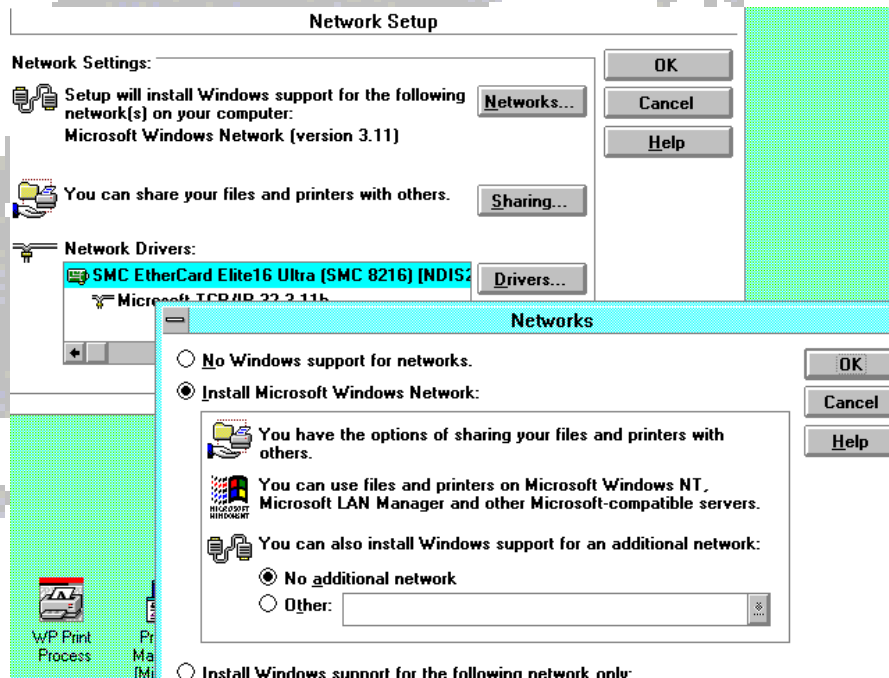
Other Microsoft clients, Windows for Workgroups and Windows 95/98 are widely used and will continue to be so for many years to come. Both Windows for Workgroups and Windows 95/98 can be configured to participate both in peer-to-peer based networks and domain based networks.

Networking for Windows for Workgroups can done during the initial installation or configured later. The basic steps in the configuration are setting up drivers for the network interface card (NIC), selecting the access protocol, and making the appropriate choices for enabling resource sharing, logon userid, specifying the network server, and choosing other NOS specific features.

### 11.1 Windows for Workgroups

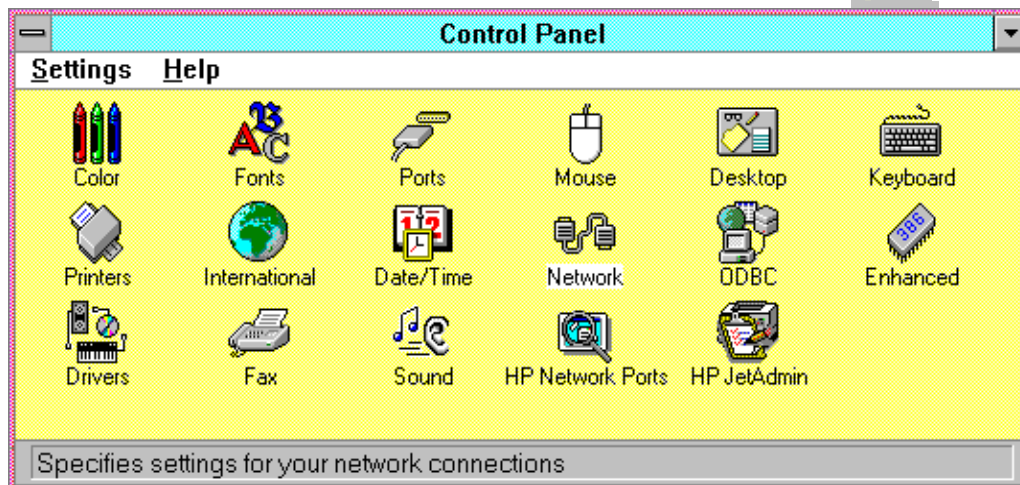
This interface is available from the Network Setup application in the Network Group.

#### Network Setup

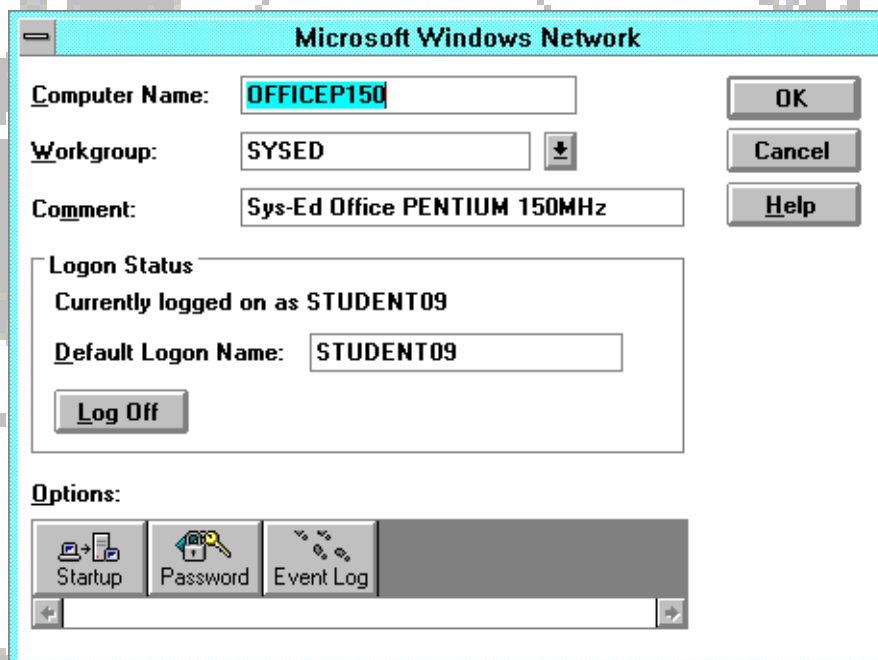


## Network from the Control Panel

The application is located in the Control Panel.

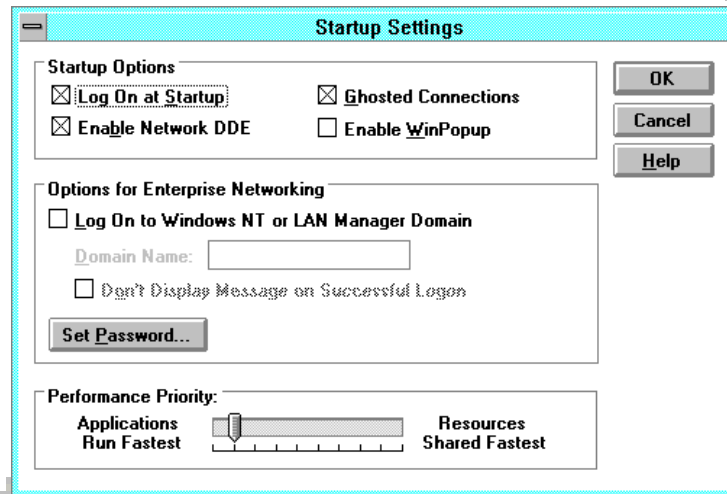


Double clicking the Network icon opens up the Microsoft Windows Network dialog box and the related network configuration pushbuttons.



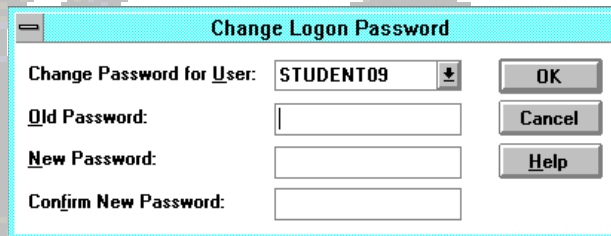
## Startup Settings

The Startup Settings provides for the optimization and selective configuration of the machine resources for networking under Windows for Workgroups.



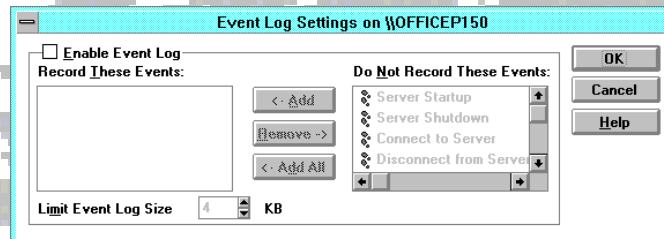
## Change Logon Password

The password button provides for the specification/changing of the password options for user accounts.



## Enable Event Log

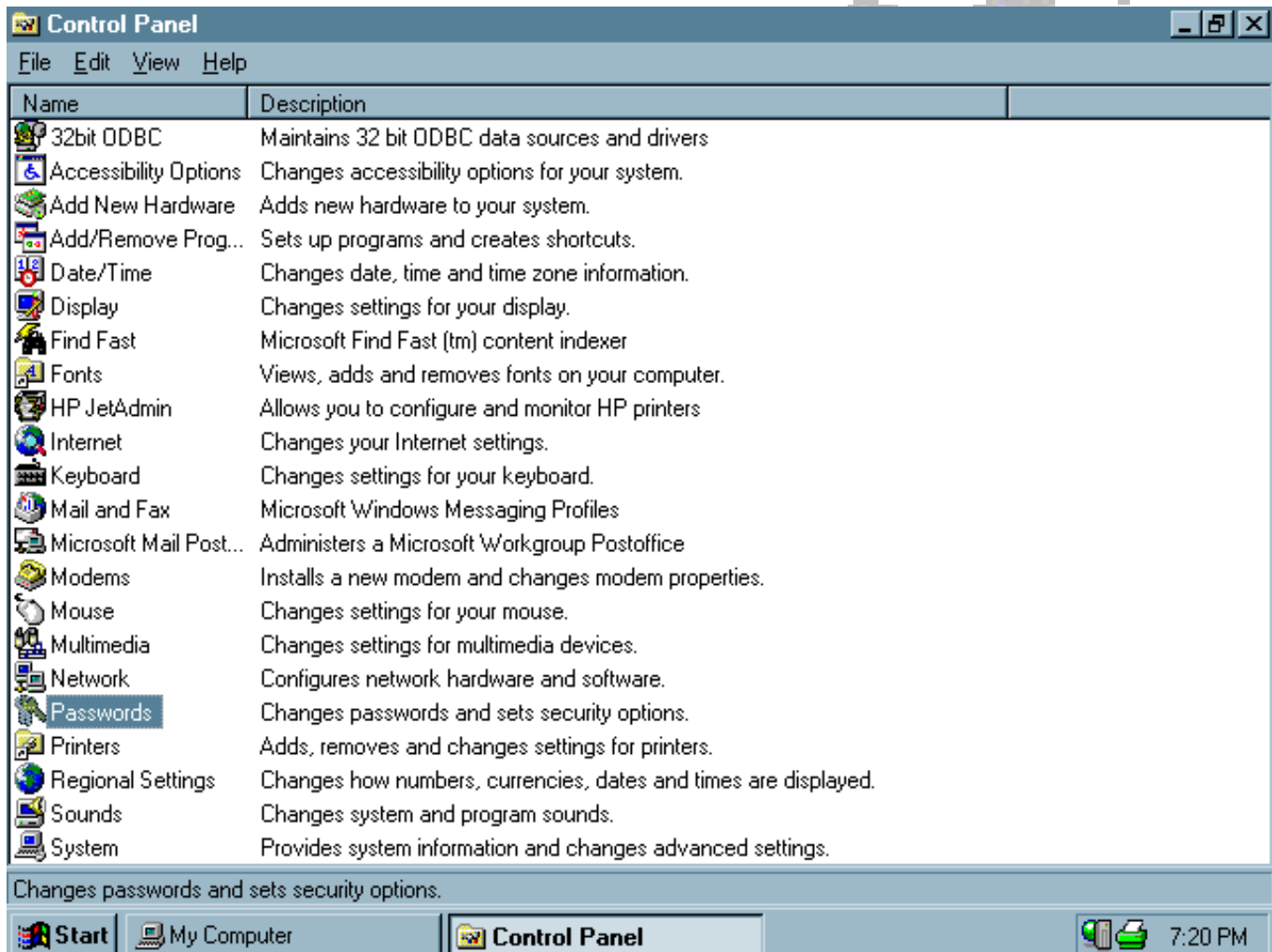
The Event Log pushbutton allows for the enabling/disabling of event logs and event log size.



## 11.2 Windows 95/98

Windows 95/98 networking will be autodetected during the installation process or can be implemented later through the Control Panel using the Network and Password utilities. The Network properties can also be accessed through the Network object on the desktop

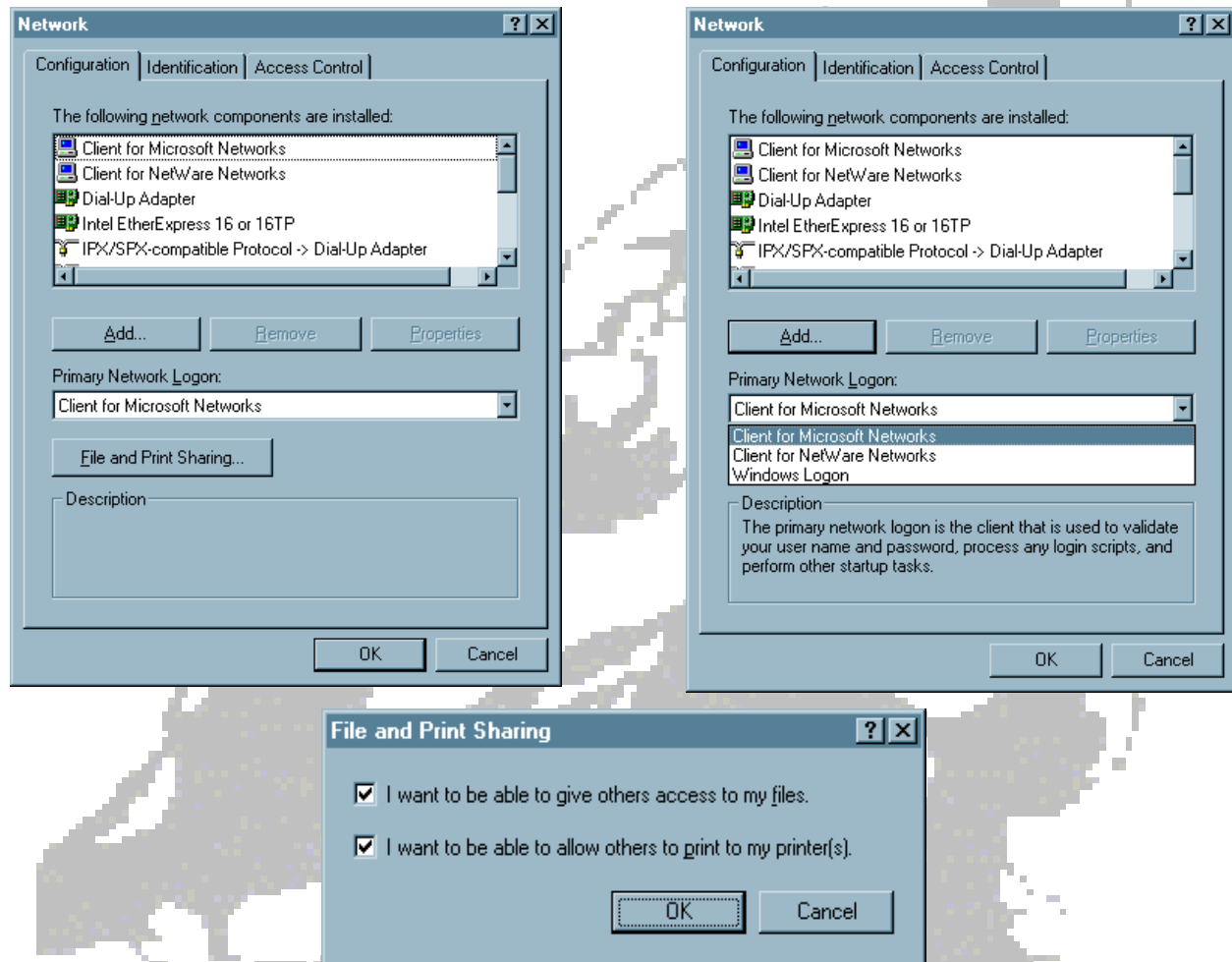
### Control Panel



## Network from the Control

This utility is used for implementing the Windows 95/98 networking facilities.

## Configuration

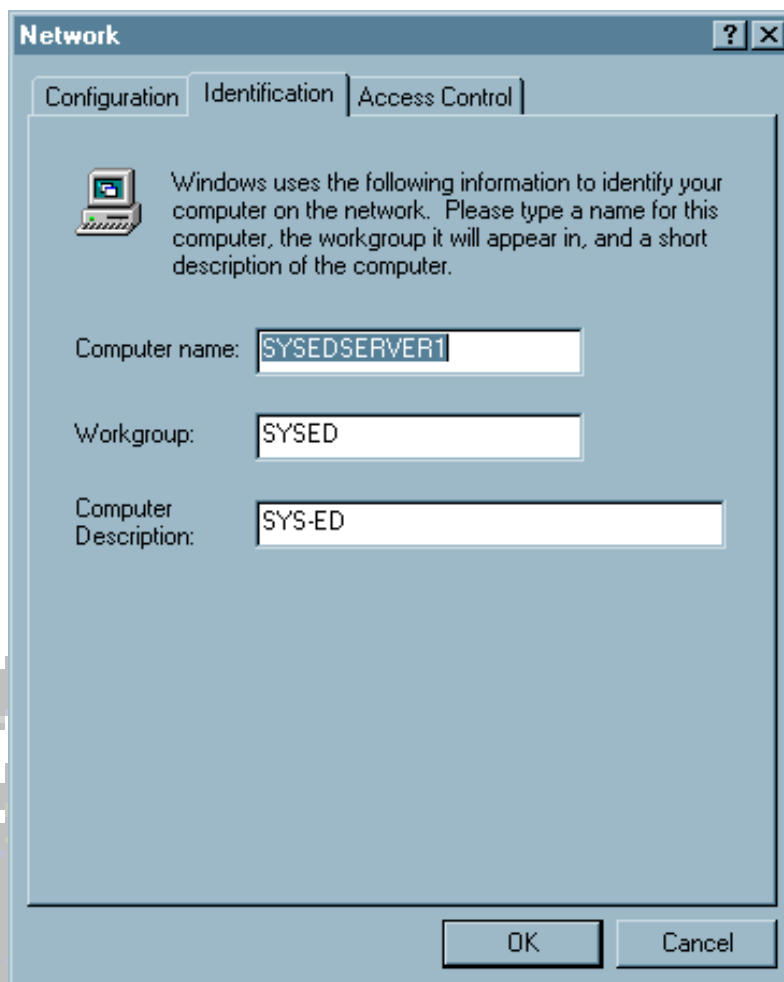


Windows 95/98 supports multiple network protocols and virtualized drivers.

A Windows 95/98 workstation can serve as a peer-to-peer workstation and/or be part of a domain based network - Windows NT or Novell NetWare.

This is also the interface which specifies whether the Windows 95/98 workstation will allow its file and printer resources to be shared.

## Identification

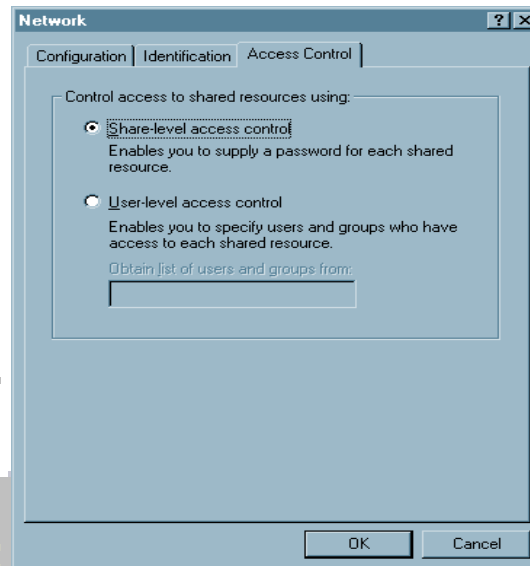


This is the interface where the machine name is designated. This is also where the decision is made whether the Windows 95/98 workstation is to participate in a workgroup or in a domain.

## Access Control

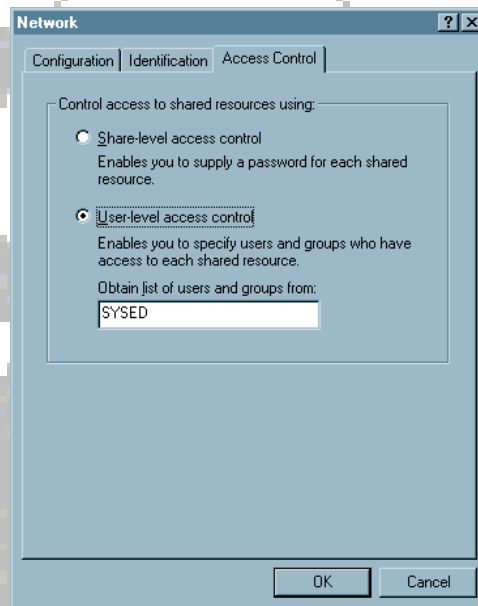
A Windows 95/98 networked enabled workstation can utilize either share-level access control or user-level access control.

### Share-level



Share-level access is the default access and enables a resource to be shared as read-only, no access, or by password authentication.

### User-level

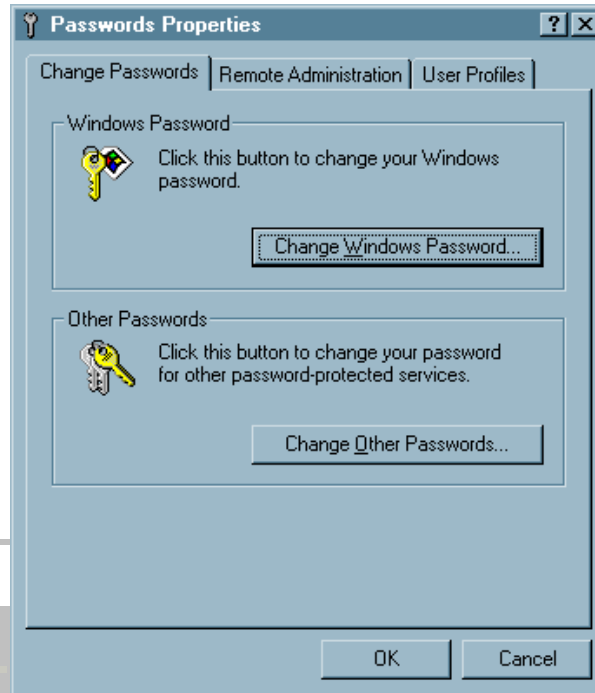


User-level access control requires a centralized database by a file server in order to enforce authorization of user and group account privileges. The file server typically will be Windows NT Server or Novell NetWare.

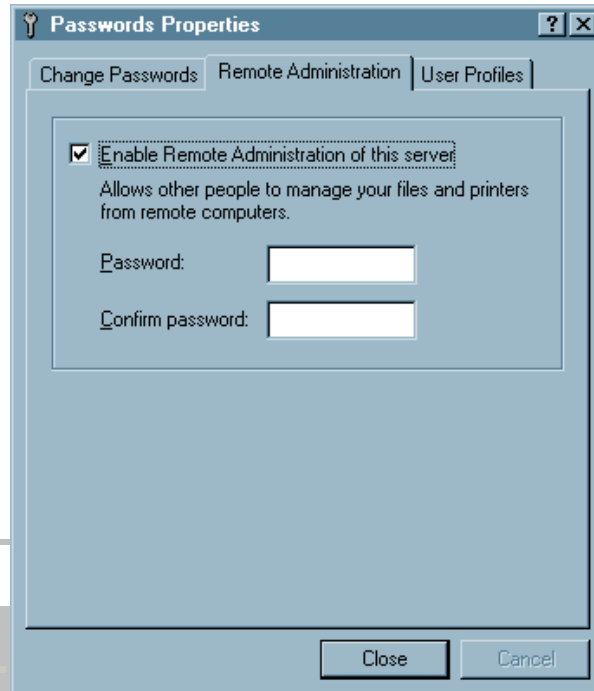
## Password Properties

Password properties are used to establish the Windows 95/98 workstation logon configuration based upon single or multiple user requirements and the type of network configuration and network access which is to be permitted.

Change Passwords

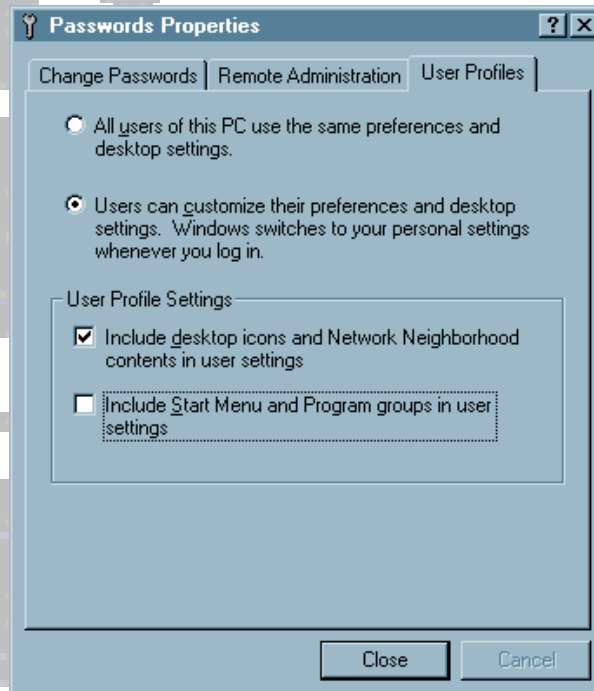


Remote Administration



This option allows for remote administration of this Windows 95/98 workstation from another Windows 95/98 workstation.

User Profiles



This option allows multiple user profiles on a Windows 95/98 Workstation. Each profile is associated with a user account.