# The MCSE™ Windows® 2000 Professional Cram Sheet

This Cram Sheet contains the distilled, key facts about Windows 2000 Professional. Review this information last thing before you enter the test room, paying special attention to those areas where you feel you need the most review. You can transfer any of these facts from your head onto a blank sheet of paper immediately before beginning the exam.

## ADMINISTERING RESOURCES

1. Hidden or administrative shares are share names with a dollar sign ($) appended to their names. Administrative shares are created automatically for the root of each drive letter. Hidden shares do not display in the network browse list.
2. You can allow or deny share permissions of Full Control, Change, or Read for each shared folder. The default for new shares is Everyone, Allow, Full Control. If share permissions conflict with NTFS permissions, the *most restrictive* permissions take precedence.
3. NTFS permissions are cumulative for all permissions assigned to users and groups. When you combine NTFS permissions based on users and their group memberships, the *least restrictive* permissions take precedence. However, explicit Deny entries *always override* Allow entries.
4. By default, NTFS permissions are inherited from the parent folder. Permissions that are not inherited are referred to as *explicit.* Explicit permissions always override inherited permissions—an explicit Allow will even override an inherited Deny permission.
5. To change NTFS permissions on a file or folder, you must be the owner, or have the Change Permissions permission, which itself is part of Full Control. NTFS permissions are transferred when you move or copy files, as shown in Table 1.
6. NTFS for Windows 2000 supports both file compression and data encryption. Encryption is implemented via Encrypting File System (EFS). You can compress or encrypt a file, but not both.
7. Windows 2000 print server computers automatically download the correct printer drivers for client computers running Windows as long as the correct drivers have been installed on the print server.
8. Windows 2000 Professional computers can connect to printers that are attached to Windows 2000 print servers through a Web browser. You can enter one of the following URLs into your Web browser:
   - http://print_server_name/printers
   - http://print_server_name/printer_share_name

Table 1 Transferring NTFS permissions.

| Type of Transfer | Effective Permissions after Move or Copy |
|---|---|
| Moving to another folder within the same NTFS volume | Files and folders retain their explicit permissions and inherit propagated permissions from the destination folder. |
| Moving to a different NTFS volume | Files and folders inherit their permissions from the destination folder. |
| Copying within the same NTFS volume | Files and folders inherit their permissions from the destination folder. |
| Copying to a different NTFS volume | Files and folders inherit their permissions from the destination folder. |

## USER AND GROUP ACCOUNTS

9. Local user and group accounts can be granted privileges and permissions to resources on the same system only. They cannot access resources on other systems.
10. Local user accounts can belong to local groups on the same system only. They cannot belong to any other group type or to groups on any other system. A local group cannot be a member of any other group. Domain user accounts can belong to global groups in the domain, universal groups, domain local groups, and machine local groups.
11. Renaming an account maintains all group memberships, permissions, and privileges of the account. Copying a user account maintains group memberships, permissions, and privileges assigned to its groups, but doing so does not retain permissions associated with the original user account. Deleting and re-creating an account with the same name loses all group memberships and permissions.
12. The most powerful group on a system is its local Administrators group. Removing users from this group and putting them in groups such as Power Users and Backup Operators gives these users broad control of a system but less power.
13. Organizational Units (OUs) in Active Directory create a hierarchical structure of containers for other objects, such as users, groups, and computers. Objects inherit attributes of their parent objects.
14. You can remember the application of group policy as LSDOU (local, site, domain, OU). The "closer" a policy is to a user or computer, the more it "wins" over higher-level policies when a conflict occurs.
15. Incremental security templates for Windows 2000 can be applied to systems using the Security Configuration And Analysis snap-in, as shown in Table 2.

Table 2 Incremental security templates for Windows 2000.

| Template | File Name | Description |
|---|---|---|
| Compatibility | compatws.inf | Also referred to as the basic template; configures permissions of the local Users group so that legacy programs are more likely to run. |
| Secure | securews.inf | Increases security through Account Policy and Auditing settings. All members are removed from the Power Users group. |
| High security | hisecws.inf | Requires all network communications to be digitally signed and encrypted. Because Windows 9x and NT do not function on the network under this requirement, you should not use this template in environments with down-level Windows clients. |

## INSTALLATION AND CONFIGURATION

16. Know all the following processes for unattended and Remote Installation Service (RIS) installations:
    - *winnt.sif*—Used to automate CD-ROM-based installs.
    - *sysprep.inf*—The answer file for System Preparation (Sysprep) installs.
    - *winnt.exe with the /u, /s, and /udf switches*—Used for unattended installations.
    - *winnt32.exe and unattend.txt*—Automate an upgrade to Windows 2000.
    - *Requirements for RIS*—Active Directory, DNS, and DHCP.
17. **winnt32.exe** and **checkupgradeonly** are used to verify hardware and software compatibility.
18. Upgrade packs (or migration DLLs) are used during an upgrade to ensure that applications will run after the upgrade to Windows 2000 has completed.
19. **rbfg.exe** is used to create remote boot disks for RIS clients if computers don't have network adapters with Pre-boot Execution Environment (PXE) boot ROM.
20. **riprep.exe** is used to create images of Windows 2000 Professional and applications for an RIS server.
21. **risetup.exe** is used to configure RIS.
22. **update.exe /s** is used to apply a service pack to a distribution share in slipstream mode.

## CONFIGURING THE USER AND SYSTEM ENVIRONMENT

23. Know the purpose and configuration of all the accessibility features: StickyKeys, FilterKeys Narrator, Magnifier, and On-Screen Keyboard.
24. The Accessibility Wizard is an easy way to turn on accessibility features. The resulting settings can be saved with an .acw file extension. By default, this file is accessible only by the user who created the file, and the administrator.
25. The Regional Options applet controls user and input locales. It can also be used to add new language groups. Also, use this applet to pair input locales with a specific keyboard layout when a user needs to type in different languages.
26. Use the Fax Service Management console to configure the fax modem to receive faxes. By default, only an administrator can configure the fax service options.
27. The Fax applet appears only if a fax device has been installed.
28. Applications can be deployed to users via a Group Policy. Applications can be either published or assigned. Install published applications via the Add/Remove Programs applet. Assigned applications have shortcuts in the Start menu, which will launch installation on first use.
29. Typically, only applications compiled as an MSI file can be deployed via a Group Policy. However, non MSI applications can use a ZAP file to tell Group Policy how to install the application.

30. To enable roaming profiles, enter the UNC path to the user's profile in the user's account properties.
31. To configure mandatory profiles, rename ntuser.dat to ntuser.man.
32. Offline Files And Folders caches copies of network files locally. It is enabled by default on the client. On the server side, Manual Caching For Documents is the default setting for shared folders. Click the Caching button from the Sharing tab of a folder's Properties sheet to change the Offline Files settings.
33. Synchronization Manager is used to control which network device you can use to synchronize files that have changed and when synchronization will take place.

## HARDWARE AND DEVICE DRIVERS

34. Install hardware with the Add/Remove Hardware Wizard.
35. Update drivers with Device Manager.
36. Windows 2000 can control whether users can install signed or unsigned drivers, or both, for a chosen device. The selection for this is called Driver Signing and is made in a Group Policy Object (GPO) or Local Computer Policy Object. The three choices for Driver Signing are Ignore, Warn, and Block.
37. The Advanced Printer Properties sheet allows you to change the directory that contains the print spooler for a given printer.
38. To connect using both your own connection and your remote access server you must have multilink enabled. This is done in the network and dial-up connections' properties.
39. Multiple displays have to use peripheral connection interface (PCI) or Accelerated Graphics Port (AGP) port devices to work properly with Windows 2000. Configure multiple displays in the Display properties.
40. Power Options in Control Panel lets you customize your power scheme settings. Standby does not save your desktop state to disk; if a power failure occurs while the computer is on standby, you can lose unsaved information. The hibernate feature saves everything in memory to disk, turns off your monitor and hard disk, and then turns off your computer.
41. Windows 2000 Professional supports a maximum of two CPUs, without OEM modifications.

## DISKS AND FILE SYSTEMS

42. A Windows 2000 basic disk is a physical disk with primary and extended partitions. You can create up to three primary partitions and one extended partition with logical drives on a basic disk, or just four primary partitions. You cannot extend a basic disk.
43. A Windows 2000 dynamic disk is a physical disk that does not use partitions or logical drives. Instead, it has only dynamic volumes that you create using the Disk Management console. You can extend a volume on a dynamic disk. Dynamic disks can contain an unlimited number of volumes. Only Windows 2000 computers can directly access local dynamic volumes. However, computers that are not running Windows 2000 can access shared folders on dynamic volumes over the network.
44. You can convert a dynamic disk with volumes back to a basic disk, but you'll lose all your data. If you find yourself needing to do this, first save your data, convert the disk to basic, and then restore your data.
45. Mounted drives, also known as mount points or mounted volumes, are useful for increasing a drive's "size" without disturbing it. Drive paths are available only on empty folders on NTFS volumes. The NTFS volumes can be basic or dynamic.
46. Windows 2000 has FAT (also known as FAT16) and FAT32 file system support with the following conditions or specifications:
    - Pre-existing FAT32 partitions up to 127GB mount and are supported in Windows 2000.
    - Windows 2000 allows you to create new FAT32 volumes of only 32GB or less.
47. When you install Windows 2000, existing NTFS volumes are upgraded to NTFS 5 automatically.
48. Disk quotas track and control disk usage on a per-user, per-volume basis. You can apply disk quotas only to Windows 2000 NTFS volumes. Disk quotas do not use compression to measure disk space usage, so users cannot obtain or use more space simply by compressing their own data. To enable disk quotas, open the Properties dialog box for a disk, select the Quota tab, and configure the options.
49. If the uncompressed size of a compressed file is larger than the capacity of the floppy disk, you cannot copy or move the file to the disk. Use a third-party compression tool, such as WinZip, for this operation.
50. To convert a volume from FAT(32) to NTFS use **convert d: /fs:ntfs**. This command is one way and is not reversible. After the conversion, NTFS file permissions are set to Full Control for the Everyone group, whereas if you install Windows 2000 directly to NTFS, the default security settings for the WINNT and Program Files folders are more restrictive.

## NETWORK PROTOCOLS AND SERVICES

51. TCP/IP is the default protocol suite. Its default setting is to obtain an IP address automatically. All IP addresses must have a subnet mask.
52. DHCP runs on Windows NT and Windows 2000 Server computers to automatically lease out dynamic IP addresses to client computers.
53. DNS is required for Active Directory. DNS provides name resolution by mapping host names to IP addresses and vice versa.
54. WINS is not required for Active Directory. WINS offers name resolution by mapping NetBIOS computer names to IP addresses and vice versa.
55. To troubleshoot TCP/IP connectivity problems, use the **ipconfig** and **ping** command-line utilities. The **ipconfig** tool displays the local computer's IP configuration; **ping** tests connectivity to remote computers and can test the local configuration by pinging the loopback address of 127.0.0.1.
56. Auto Private IP Addressing (APIPA) takes effect on Windows 2000 Professional computers if no DHCP server can be contacted. APIPA assigns the computer an IP address within the range of 169.254.0.0 through 169.254.255.254 with a subnet mask of 255.255.0.0.
57. IPSec negotiates encryption settings between the client and server to encrypt both passwords and data before an L2TP session is created.
58. EAP is an extension of Point-to-Point Protocol (PPP) for dial-up connections, and L2TP and PPTP clients. EAP supports several authentication protocols:
    - Message Digest 5 Challenge Handshake Authentication Protocol (MD5-CHAP)
    - Generic token cards
    - Transport Layer Security (TLS) for use with smart cards
59. Bandwidth Allocation Protocol (BAP) works together with Bandwidth Allocation Control Protocol (BACP) as enhancements to Multilink to dynamically add or drop dial-up lines based on pre-defined usage levels. BAP is configured as a remote access policy.
60. Internet Connection Sharing (ICS) uses the DHCP Allocator service to assign dynamic IP addresses to clients on the LAN within the range of 192.168.0.2 through 192.168.0.254. In addition, the DNS Proxy service becomes enabled when you implement ICS.

## TROUBLESHOOTING, MONITORING, AND OPTIMIZATION

61. You can back up and restore files and directories with Windows Backup. You can launch this from the Accessories Program group, the System applet, the **ntbackup** command, or the Properties sheet of any drive volume. Users can back up files to which they have at least the Read permission, and they can restore files to which they have at least the Write permission. To back up or restore other files, users must have the Backup Files and Directories, as well as Restore Files and Directories user rights.
62. Backing up the system state allows you to back up the registry, COM+ objects, and system startup files.
63. Know the following options for troubleshooting a system:
    - The Recovery Console is a command-line interface you must boot to using the Windows 2000 CD-ROM, or startup floppies, or by running **winnt32 /cmdcons** *before* a failure. It is particularly useful for copying files from a CD-ROM or floppy disk to the system folder (WINNT) and for configuring services not to start up during the next boot. You can also run **chkdsk** (to scan the disk for file and sector errors), **diskpart** (to create or delete partitions), and **fixboot** (to replace the hard drive's boot sector).
    - Safe Mode is generally the most useful trouble-shooting mode because it starts the operating system with minimal services and drivers. It is best for removing services or drivers that are causing blue screens of death.
    - Last Known Good Configuration starts the system with the ControlSet (a portion of the registry) that was used the last time the system booted successfully and instantiated the shell. If you install a driver or service that crashes *before you restart and log on again successfully*, you can restart the machine and select Last Known Good Configuration. Doing so effectively removes the driver or service from the active registry.
    - The repair process allows you to recover system files, the startup environment, and the registry. To use it, boot a system with the Windows 2000 CD-ROM or startup floppies and choose Repair. You can then select a Fast Repair or Manual Repair. Fast Repair is the only mode that restores the registry. Some options require the Emergency Repair Disk (ERD), which you create using Windows Backup. The Windows NT 4 command **rdisk** no longer works.
64. Task Manager allows you to monitor particular performance metrics and to set the priority of applications. You should not select Realtime priority, which can interfere with other applications.
65. Logical disk counters must be enabled using the **diskperf -yv** command.

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