



NTFSDOS Professional

User's Guide

Winternals Software LP
3101 Bee Caves Road, Suite 150
Austin, Texas 78746
(512) 330-9130
(512) 330-9131 Fax
www.winternals.com

Table of Contents

1	Introduction	1
1.1	How does NTFSDOS Professional work?.....	2
2	Installation Overview	3
2.1	Requirements.....	3
3	Creating an NTFSDOS Disk.....	5
4	Using NTFSDOS Professional.....	8
4.1	Setting Time Zone information	9
4.2	Long File Name Support	9
4.3	Performance.....	10
5	Using NTFCHK	11
6	NTFSPRO Command Line Options.....	12
7	NTFSCHK Command Line Options.....	13
8	Troubleshooting.....	14
9	Sales.....	17
10	Technical Support.....	18

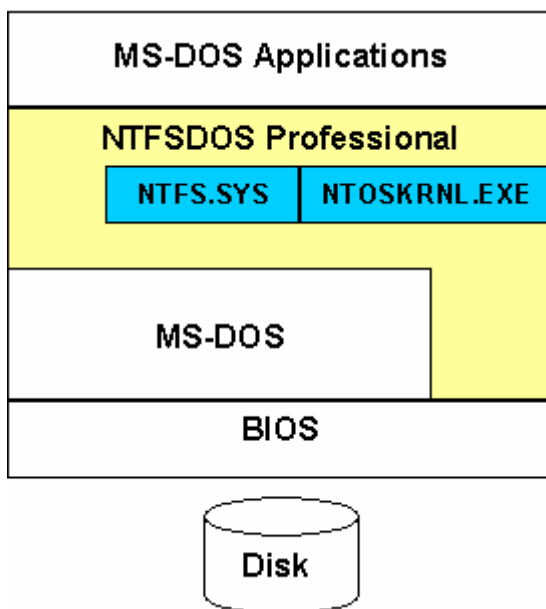
1 Introduction

Welcome to NTFSDOS Professional Edition, the program that lets you access NTFS drives from MS-DOS as easily as you do your regular drives. NTFSDOS Professional mounts your NTFS volumes and gives them drive letters, so you can run applications and use files on NTFS volumes transparently. NTFSDOS Professional is small enough to run from a MS-DOS boot diskette so you can even access NTFS volumes on a system where Windows NT/2000/XP isn't installed or able to boot. This makes it ideal for repairing corrupt files or configuration problems that prevent a Windows NT/2000/XP/Server 2003 system from booting.

NTFSDOS Professional also comes with NTFSCCHK, a tool for running the Windows NT/2000 CHKDSK program from within MS-DOS. NTFSCCHK allows you to verify and repair the NTFS disk structure in case of accidental corruption.

1.1 How does NTFSDOS Professional work?

NTFSDOS Professional runs on MS-DOS and mounts NTFS drives so your MS-DOS applications can use them. It takes the files and drivers that compose NTFS from an existing Windows NT/2000/XP installation and simulates the environment they normally run in, allowing them to run inside of MS-DOS. This approach allows NTFSDOS Professional to access your NTFS volumes using the same Microsoft drivers that Windows NT/2000/XP/Server 2003 uses, ensuring compatibility with your NTFS drives regardless of the version and Service Pack of NT you happen to use.



NTFSDOS Professional is a 32-bit application that uses the DOS Protected Mode Interface (DPMI) to allow it to run in the 16-bit MS-DOS environment. It implements a network file system redirector, allowing the programs on your system to think they are making requests to a network drive, when in fact the requests are being routed to the NTFS file system driver and then to your local hard disk.

2 *Installation Overview*

Installing NTFSDOS Professional is a two-step process. The first step is installing the NTFSDOS Pro Boot Disk Wizard and help files on a Windows NT/2000/XP/Server 2003 system, and the second step is creating your MS-DOS disks with the necessary Windows NT/2000/XP/Server 2003 drivers.

When you first receive NTFSDOS Professional you will want to run the Setup program on the Windows NT/2000/XP workstation or server that you wish to have the help files installed on, and that you wish to use to create NTFSDOS Professional diskettes. If you are installing on a dual-boot Windows NT/2000/XP/Server 2003 and MS-DOS/Win9x system then you should run the Setup program on Windows NT/2000/XP.

Once installed, you can run the NTFSDOS Professional Boot Disk Wizard to place NTFSDOS Professional and the Windows NT/2000/XP system files it requires on either your local disk(s) or MS-DOS diskettes.

The first time you run the NTFSDOS Professional Boot Disk Wizard you will be prompted to enter your licensing information. On-line purchasers receive the licensing information as an e-mail attachment that can be imported into the Wizard. The Boot Disk Wizard verifies the license information and embeds it into the boot diskettes so that it is presented whenever NTFSDOS Professional starts.

2.1 *Requirements*

You must have the following components in order to install and run NTFSDOS Professional:

- ◆ A Windows NT/2000/XP Workstation or Windows NT/2000/XP/Server 2003 installation (version 4.0 or higher). NTFSDOS Professional **does not** recognize volume sets, striped sets, or mirror sets.

- ◆ MS-DOS 5.0 or higher. It is strongly recommended that you use MS-DOS version 7.0 (the version of MS-DOS that ships with Windows 95/98), since it is the only version that will allow you to use long filenames with your NTFS drives. Using earlier versions of MS-DOS restrict you to using file names in 8.3 format.
- ◆ If your hard disk is 4GB or larger then your BIOS must support the Extended Int 13 interface (defined in the Enhanced Disk Drive Specification). Most newer systems provide such support, as it is necessary for Windows 95/98 to access large disks.
- ◆ Purchase of NTFSDOS Professional does not include licensing for MS-DOS or Windows NT/2000/XP/Server 2003. You should have a license for MS-DOS (or Windows 95/98) and Windows NT/2000/XP/Server 2003 for each system on which you intend to run NTFSDOS Professional.

3 Creating an NTFSDOS Disk

You must run the NTFSDOS Professional Boot Disk Wizard in order to create disks from which you wish to run NTFSDOS Professional. You can create regular diskettes, bootable diskettes, or hard disk installations. You can use a single diskette on any number of systems, but note that the version of NTFS might vary from one machine to the next depending on the version of Windows NT/2000/XP/Server 2003 installed.

When creating a bootable diskette you can add MS-DOS to the diskette either before or after installing NTFSDOS Professional on it. You can create a MS-DOS 7.0 boot diskette from within Windows 95/98 using either the "FORMAT /S A:" command or "SYS A:" from the command prompt.

The NTFSDOS Professional Boot Disk Wizard is installed in the program group where you installed NTFSDOS Professional. When run, it will take you through the following configuration screens:

- ◆ **Welcome screen:** Click **Next** to proceed.
- ◆ **Overview:** Click **Next** to proceed.
- ◆ **Select Character Set (Code Page):** NTFS stores file names using Unicode, while MS-DOS uses an OEM-specific character set. By default, NTFSDOS Professional assumes that the OEM character set is United States English (code page 437). If you wish to use NTFSDOS Professional with a different character set you may specify so here. This will copy the appropriate NLS (national language support) files from your system. When you run NTFSPRO.EXE you must use the /N option to specify which language you wish to use.
- **Locate Windows NT/2000/XP System Files:** NTFSDOS Professional utilizes several files that are installed with Windows NT/2000/XP. You can select either the top-level directory of your

Windows NT/2000/XP installation (for example E:\WINNT), the \i386 directory of a Windows NT/2000/XP installation or Service Pack CD-ROM, or a directory to which you have copied the necessary system files.

- **Choose Destination Disk or Directory:** Choose the disk or directory where you would like NTFSDOS Professional to be installed. This can be any directory on your hard disk or floppy disk including the root directory, but it should be a directory accessible by MS-DOS (i.e. a FAT or FAT32 volume). If you specify a location on drive A: then Creator will create either two or three diskettes:
 - If you are using system files from Windows XP or .NET server then the first two diskettes will contain the NTFSPRO.EXE executable and related files, which allows you to mount NTFS drives and access them. If you are using system files from Windows NT or Windows 2000 only one diskette is required for system files.
 - An additional diskette will contain the NTFSCHK.EXE executable and related files, which allows you to CHKDSK your NTFS drives.
 - **Advanced:** Some third-party DOS applications will conflict with the DOS support (the WDOSX DOS extender) used by the default version of NTFSPRO.EXE, resulting in crashes or hangs of the application. The advanced button allows you to specify an alternate version (based on the DOS4G DOS extender) of NTFSPRO.EXE. If you select the alternate version you will require two floppy disks for NTFSPRO.EXE and one for NTFSCHK.EXE, and that you must specify the /s option when starting NTFSPRO.EXE.

NTFSDOS Professional Boot Disk Wizard will automatically compress all Windows NT/2000/XP system files when copying them to a diskette, so the names and sizes of files may differ from those on your hard disk.

- **Copying Files:** Press Next to begin copying files. If you selected drive A:\ as the destination you will be prompted for two or three (for Windows XP system files) disks during the copy operation.
- **Finish:** At this point all files have been copied and you are ready to begin using NTFSDOS Professional.

4 Using NTFSDOS Professional

Once you have run Creator you are ready to boot into MS-DOS and begin using NTFSDOS Professional.

To start NTFSDOS Professional, simply execute it from the DOS command line or from your AUTOEXEC.BAT. NTFSDOS must be started from the directory that contains its support files.

When NTFSDOS Professional starts it will scan all hard-disk partitions on your system looking for NTFS drives. It will mount each NTFS drive it finds with a unique DOS drive letter.

Once the NTFS drives are mounted you can treat them just as you do any other drive on your system.

```
A:\>ntfspro

NTFSDOS Professional Edition
NTFS File System Driver for DOS, v5.00
Copyright (C) 1999-2003 Winternals Software LP
www.winternals.com

You have specified your time zone as GMT+00:00.
GMT time is 2003/8/4 19:41
Local time is 2003/8/4 19:41

Mounting NTFS partition at 0x80:3 as drive F:
Mounting NTFS partition at 0x80:4 as drive G:
Mounting NTFS partition at 0x80:5 as drive H:
Going resident...
```

NTFSDOS Professional indicates the locations of the partitions it mounts using the BIOS unit number and partition. The unit, starting at 80, indicates the physical hard disk, while partitions are numbered sequentially on each unit starting at 1. The screenshot indicates that NTFS volumes were found on the 3rd partition of the first disk, and the 1st partition of the second disk.

4.1 Setting Time Zone information

Because NTFS stores timestamps on files using Universal Coordinated Time (same as Greenwich Mean Time) rather than your local time, it may be necessary to configure NTFSDOS Professional with time-zone information in order for NTFS timestamps to be correctly interpreted. This information is not available from MS-DOS or your BIOS, so you must specify it manually. You specify your time zone as an offset from Greenwich Mean Time (GMT), so, for example, the time zone for New York is -05:00, meaning the clocks run 5 hours later than GMT. If your region also uses Daylight Savings Time you may need to adjust by an additional hour when it is in effect.

You can specify your time zone by either using the **/T** command line option ("**/T-5:00**") or by setting the "**TZ**" environment variable ("**TZ=-5:00**"). The general form of the time zone specification is **[+|-]hh[:mm[:ss]]** where **hh** is hours, **mm** is minutes and **ss** is seconds.

It may not be important to you to set the time zone information before using NTFSDOS Professional, but remember that file times will be reported to you up to 12 hours off their actual times, and when you boot back into Windows NT/2000/XP any files you have modified will similarly have incorrect time stamps.

4.2 Long File Name Support

NTFSDOS Professional supports long file names, just as Windows 95/98/NT/2000/XP do. Long file name support was introduced to MS-DOS in version 7.0 (the version released with Windows 95), so if you use MS-DOS 7.0 you will see your Windows NT/2000/XP files with the regular names, rather than the 8.3 names. If you use an earlier version of MS-DOS you can still access your files, but you will need to use names like "PROGRA~1" rather than "Program Files".

Many people believe that MS-DOS doesn't support long file names at all, but that isn't the case. It is the MS-DOS FAT file system driver that lacks support, rather than MS-DOS itself. When used with a file system that supports long file names MS-DOS handles them fine, as do MS-DOS applications that are written to take advantage of the support.

The result of this situation is that if you copy a file with a long file name from NTFS to a local FAT drive, you will lose the long file name. However, if you copy it to a network drive that supports long file names, or to another NTFS drive, the long file name will be preserved. Similarly, if you use an archiver (such as one of the ZIP compressors) that supports long file names on an NTFS drive, the long file name information will be preserved.

4.3 Performance

The performance of NTFSDOS Professional is surprisingly good, considering that it runs on MS-DOS. NTFSDOS Professional is a 32-bit protected mode program, which means that the code usually executes at the same rate as for programs running under Windows NT/2000/XP/Server 2003 and Windows 95/98. NTFSDOS Professional is not as fast as Windows NT/2000/XP/Server 2003 overall, however, because it must switch back to 16-bit mode in order to interface to MS-DOS and the BIOS, to access the disk, and to interact with other applications.

NTFSDOS Professional implements its own disk cache for use when accessing NTFS volumes. You can increase the size of the disk cache in order to increase performance by using the **/C** option ("**/C2000**" sets the cache to 2000KB). The cache uses a write-through policy, meaning that while data read from the disk is served from the cache (if available), data written to disk is always committed to disk immediately. This is done to minimize loss of data in case of a crash.

NTFSDOS Professional is capable of using up to 64MB of physical memory for caching and other operations.

5 Using NTFSCHK

NTFSCHK is the second component of NTFSDOS Professional. NTFSCHK allows you to run the Windows NT/2000 CHKDSK program from MS-DOS.

You cannot run NTFSCHK while NTFSPRO is running. If you need to run NTFSCHK after starting NTFSPRO you must reboot before doing so.

You run NTFSCHK by simply specifying the drive you wish to check, for example "**NTFSCHK E:**". By default NTFSCHK runs in read-only mode, just as the regular CHKDSK does. If you wish to have NTFSCHK repair errors it finds, use the **/F** (fix) option. If you wish to check all drives on the system you can specify **"*"** as the drive letter. If you aren't certain what drives are available you can use the **/S** option to get a list of drives.

```
A:\>ntfschk g: /f

NTFSCHK v5.00
Copyright (C) 1999-2003 Winternals Software LP
www.winternals.com

Checking file system on G:
The type of the file system is NTFS.
Volume label is WinXP.

CHKDSK is verifying files (stage 1 of 3)...
File verification completed.
CHKDSK is verifying indexes (stage 2 of 3)...
Index verification completed.
CHKDSK is verifying security descriptors (stage 3 of 3)...
Security descriptor verification completed.

2048255 KB total disk space.
1556358 KB in 6977 files.
 1808 KB in 587 indexes.
   0 KB in bad sectors.
 20465 KB in use by the system.
12304 KB occupied by the log file.
469624 KB available on disk.

 2048 bytes in each allocation unit.
1024127 total allocation units on disk.
 234812 allocation units available on disk.
Windows has finished checking the disk.
```

6 NTFSPRO Command Line Options

You can change the default behavior of NTFSDOS Professional by specifying one or more command line options.

NTFSPRO.EXE understands the following options:

- ◆ **/L:<letter>... - Specify drive letter(s):** Specifies the set of drive letters you wish NTFSDOS Professional to use when mounting NTFS volumes. Multiple drive letters may be listed, and each NTFS drive will be mounted according to its position in the sequence.
- ◆ **/C:<size> - Disk cache size (KB):** Allocates the specified amount of memory for the disk cache. The default disk cache is 500KB.
- ◆ **/T:[+|-]hh[:mm[:ss]] - Set time zone info:** Specifies the local time zone in effect, for translating NTFS time stamps from Universal Coordinated Time to local time.
- ◆ **/N:<codepage> – Use an alternate code page for character set translation:** Allows the user to specify an alternate code page to use for translating from Unicode to a multi-byte character set. For example, code page 932 is used for Japanese versions of MS-DOS.
- ◆ **/S – Create a command shell instead of becoming resident:** This option causes NTFSDOS Professional to spawn a command shell rather than going resident as a TSR. Using a command shell requires slightly more memory, but allows you to unmount your NTFS drives without rebooting. This option requires the COMSPEC environment variable to be initialized to the location of COMMAND.COM.
- ◆ **/P<path> - Specify path for system files:** Specifies the directory containing the system files loaded by NTFSPRO.EXE. By default the files are loaded from the directory containing NTFSPRO.EXE.

7 **NTFSCHK Command Line Options**

You can change the default behavior of NTFSDOS Professional by specifying one or more command line options.

NTFSCHK.EXE understands the following options:

- ◆ **[drive:] – Drive to check:** Specifies which volume to check. Use '*' to check all NTFS volumes.
- ◆ **/F - Fix errors:** By default NTFCHK operates in read-only mode. This option tells NTFCHK to repair any errors it finds.
- ◆ **/S - Show NTFS drives without checking:** Display a list of the NTFS drives on the system, without checking them. This is useful if you are not certain what drives are on the system.
- ◆ **/Q - Quick:** By default NTFCHK will perform a thorough analysis of the disk every time it runs, just as CHKDSK does under Windows NT/2000/XP. This option tells NTFCHK to test the disk only if it appears to be dirty (was dismounted uncleanly). This mimics the behavior the AUTOCHK service (run at boot time) which Windows NT/2000 features.

8 Troubleshooting

One of the key advantages of Windows 98/95 and Windows XP/2000/NT over MS-DOS is the ability of the operating systems to function with a variety of hardware and provide a uniform environment for the applications that run on them. Applications running on MS-DOS are subject to a wider variety of factors that can affect their behavior.

Problem: Unable to mount one or more NTFS volumes

The NTFS file system was dismounted uncleanly or has errors: NTFSPRO and NTFCHK are not as tolerant of errors in NTFS as Windows NT/2000 because they lack the level of exception handling available in 32-bit operating systems. Run CHKDSK under Windows NT/2000 and shutdown cleanly before accessing the drive.

BIOS is unable to detect the disk: If you are using SCSI-based hardware it is possible that your BIOS is unable to detect your disk. This is especially common with high-end disk systems (RAID, etc.). Determine whether your BIOS is correctly recognizing your disk. If not, you must either update your BIOS to a newer version, or locate and install whatever DOS-based drivers are necessary to access your disk.

BIOS is unable to access the entire disk: This problem is much more common than not detecting the disk at all. The BIOS is only capable of accessing a portion of the entire disk, because the disk is too large. This is likely the cause if you get an error message saying NTFSPRO was unable to verify the boot sector for one or more partitions. Verify this by checking the reported size of the disk using FDISK under MS-DOS and comparing it to that reported by Windows NT/2000. To fix this problem you must update the BIOS or install additional drivers that allow the entire disk to be seen. Note that it is possible for Windows 95/98 and Windows NT/2000/XP/Server 2003 to access a large disk while MS-DOS can only access a portion of it.

Problem: System crashes while loading

The system is not correctly reading the disk: This problem is the same as when the drive won't mount. Use the same approach as for unmountable drives.

Extended memory is not being correctly accessed: NTFSPRO and NTFSCHK both use an integrated DPML memory manager in order to allocate and run in extended memory. If you are loading your own memory manager before starting NTFSPRO or NTFSCHK there may be an incompatibility with NTFSPRO's. Try removing HIMEM.SYS, EMM386.EXE, and any other memory managers from your CONFIG.SYS file.

Incompatible version of NTFS: *NTFSDOS Professional* has been tested with Windows NT 4.0 (all service packs), Windows 2000 (all service packs), and Windows XP. Future Service Packs or releases may introduce incompatibilities with *NTFSDOS Professional*. The Winternals website, <http://www.winternals.com>, will have free upgrades available for download in this event.

Problem: System crashes while running applications

A memory conflict with another extended memory application occurred: Many MS-DOS based applications make use of extended memory, and may or may not be compatible with NTFSDOS Professional. In particular, most versions of PKZIP use XMS, DPML or other extended memory protocols. If you encounter problems with this or other applications try disabling or modifying their use of extended memory when running them.

Incompatible version of NTFSPRO.EXE DOS extender: If you have disabled extended memory usage of the application and still encounter problems, there may be a conflict between the application's DOS extender support and that of NTFSPRO.EXE. The default version of NTFSPRO.EXE copied by the NTFSDOS Professional Boot Disk Wizard is based on

WDOSX. Create boot disks that have an alternate version of NTFSPRO.EXE that's based on the DOS4G DOS extender by making the appropriate selection in the Advanced dialog (accessible from the **Choose Destination Disk or Directory** page of the NTFSDOS Professional Boot Disk Wizard).

Problem: NTFSCHK returns errors

Previous crash or incomplete disk flush: NTFSCHK will occasionally report minor disk inconsistencies. These can occur if your MS-DOS session crashes and NTFSPRO has not completed writing to disk when the system goes down.

Incompatible version of NTFS: If NTFSCHK is using files from a different version of NTFS it may report minor errors.

Problem: Data read from NTFS is incorrect, or CHKDSK reports errors after booting Windows NT/2000.

You should never encounter data corruption errors. If you do, please contact Winternals' technical support immediately.

9 Sales

Order Winternals products online at www.winternals.com, or by fax, phone or email:

Phone: (800) 408-8415
(512) 330-9130

Fax: (512) 330-9131

Email: sales@winternals.com

Mail: Winternals Software LP
3101 Bee Caves Road
Suite 150
Austin, TX 78746
USA

10 Technical Support

To view Online help for NTFSDOS Professional, select Help from within the NTFSDOS Professional Disk Creator Wizard.

To access Winternals Support Knowledge Base, visit our support web site at:

www.winternals.com/support

You may also request help by email for issues not covered in the Online Help or Support Knowledge Base. Please visit:

www.winternals.com/support/getsupport.asp or send email to:

support@winternals.com

Customers who have purchased Product Assurance may receive phone support by calling 512-330-9861. Please have your license number available.

Before contacting support, please determine if the problem is reproducible, and if so, record the steps necessary to reproduce it. In addition, please have the following information about your system ready:

- Windows version (including Service Pack) of the system being repaired
- Memory size, disk types, and file system types
- Version NTFSDOS Professional