

Hard Drive Maintenance Utilities (Chkdsk=Autochk)

July 14, 1999

Creo Products Inc.
3700 Gilmore Way
Burnaby, BC
Canada V5G 4M1

(604) 451-2700

Copyright 1999 Creo Products Inc. All rights reserved.

Revision History

Revision	Date	Author	Comments
Draft	July 14, 1999	Landon Guretzki	Original release.

Hard Drive Maintenance Utilities (Chkdsk=Autochk)

Creo Products Inc.

CONTENTS

REVISION HISTORY I

1. HARD DRIVE MAINTENANCE UTILITIES (CHKDSK=AUTOCHK) 1

1.1 DIRTY BITS 1
1.2 USING CHKDSK AND THE GUI TO START DISK REPAIR 1
1.3 STOPPING CHKDSK BEFORE REBOOTING 2
1.4 STOPPING CHKDSK AFTER SYSTEM HAS REBOOTED 2
1.4.1 Procedure 1 2
1.4.2 Procedure 2 2
1.4.3 Procedure 3 3
1.4.4 Procedure 4 4
1.5 SERVICE PACK 4 INFORMATION 5

1. HARD DRIVE MAINTENANCE UTILITIES (CHKDSK=AUTOCHK)

Repairing your hard disk drive is a regular maintenance procedure. Microsoft believes in it enough that it has built into NT OS the ability to detect and repair disk related problems automatically. Due to the way NT expects to be able to access data on the hard disk, only hard disks that are not being used actively by the OS will be checked (while the system is running). For drives in use, NT offers the option to schedule the repair procedure utility (autochk.exe) to be run on that disk when the system reboots - and when the drive has not yet been accessed by the OS.

The scheduling of autochk.exe is automatic for most of us; it is entered in the registry and can remain after Chkdsk has been run. The entry for autochk.exe is manipulated manually with the chkdsk.exe command and can also be modified from the NT explorer GUI.

Explorer>>drive>>properties>>tools>>error checking

1.1 Dirty Bits

Chkdsk c: /f marks a drive (c: in this example) with the dirty bit and adds the autochk.exe command "autocheck autochk *" entry in the registry. When "autochk *" runs it scans the drives to look for the dirty bit on each drive (a reserved location in the data structures on the harddrive). When autochk.exe finds the drive with the bit set, it checks it; then removes the dirty bit when complete. The dirty bit can also get added onto a drive if data is improperly saved when rebooting the server improperly.

1.2 Using Chkdsk and the GUI to start disk repair

When using the GUI interface; choosing only to "scan for and attempt recovery from bad sectors" will run a superficial scan on the system even if the system is accessing the device the equivalent command would be: chkdsk c:

Choosing the other check box "automatically fix file system errors" will be identical to chkdsk c: /f (c: can be any drive letter). This action places an entry in the registry that then calls the autochk.exe program to run upon the next reboot (autocheck autochk *). The * symbol tells autochk to run and scan all drive partitions and search for drives that contain the "dirty bit". When it finds one of these it will attempt to find and fix problems with the filesystem.

If you use the GUI and select both check boxes together, this will be identical to running chkdsk c: /r

> **Note:** chkdsk c: /r is identical to chkdsk c: /f /r as the /f switch is implied by the /r switch. Chkdsk with the /r switch overrides other commands and forces the system to check the drive.

1.3 Stopping chkdsk before rebooting

Once these entries have been entered they are stored in the registry until the system reboots. To stop them from running you need to either:

a) Edit the registry and remove the entries from;
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager (BootExecute is the key name) where it has entries listed for the autochk program. You don't need anything to be in this key for the system to function properly.

b) Use the **chkntfs.exe** utility that is on each system that is NT4 service pack 2 or later. Run this utility from a command prompt chkntfs /? to get the usage help for the command. This command will nullify the usage of previous autochk entries in the registry so long as chkdsk is not run after its application. Chkntfs can be used to tell the system to ignore dirty bit attributes on a particular drive.

> **Note:** The chkntfs.exe utility will itself be overridden by any chkdsk /r commands.

1.4 Stopping Chkdsk after system has rebooted

Once the system has rebooted from NT the autochk utility will be executed when NT begins its initial loading stage. Autochk can take about 1 hour per 15 gigs of drive space - longer on slower file systems. Very large volumes will take many hours to run. This sometimes is not a tolerable situation in a case where the autochk runs on a large volume and the system must be used immediately. Currently there is very little that can be done to recover from this situation and rebooting the server will NOT stop this action from functioning on the next reboot. The following are ways to recover from this situation but it is suggested you not stop autochk unless you absolutely have to:

1.4.1 Procedure 1

> **Note:** This will not work if the dirty bit has been given to the drive and if the autocheck autochk * entry is located in the backup registry keys.

a) If the the server is running a check on the drive you must reboot to stop it.

b) To stop the server from running on next boot, select the "last known good" configuration by hitting space bar after the boot selection menu and then hitting the 'L' key to tell the system to boot with the backup registry hive.

If this doesn't stop chkdsk then you need to go to the next procedure as your backup registry must also contain an autochk * entry and the drive is marked as dirty.

1.4.2 Procedure 2

> **Note:** Use when the drive is not a system drive and 'last known good' doesn't work required to load the OS.

1) Physically shut off the NT server computer.
2) Physically disconnect the drive that you want to stop the autochk process from running on. This can be done in a number of ways:

- Shutting of an external RAID unit.
- Disconnecting the External drive unit via its SCSI host connector on the server.
- Disconnecting the drive from the hot swap bay or the hard disk cable connecting it to its controller.

3) Reboot the NT server (ignore error messages reported about missing the drive you disconnected but do not change any configurations).
4) Open Regedt32.exe and edit the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager (BootExecute is the key name)** key and remove the autochk entry referencing the drive letters you don't want to be scanned on boot (or use the chkntfs.exe utility).
5) Save your changes and shut down the server.
6) Power off the NT server, reconnect the drive unit or power it up properly then restart the NT server

The above should bring the NT OS back up so you can use it but chkdsk should be run again at the next possible moment.

1.4.3 Procedure 3

This procedure is needed if you cannot run autochk on the system drive but the autochk bit has been set for it in the registry and the server was rebooted. In some cases autochk.exe cannot process the contents of a drive and it causes BSOD lockups.

From Microsoft's Technet Support CD:

```
   WARNING: This procedure should not be performed unless it is impossible
   to get back into Windows NT any other way in order to perform data
   recovery procedures. Bypassing the Autochk process simply to save time
   could cause additional corruption of the partition if you continue to use
   it without having it repaired by Autochk.

To replace the Autochk.exe with a nonexecutable file, perform the
following procedure:

1. Modify the contents of the emergency repair disk (ERD) by performing the
following steps:

      A. Find the hidden file called Setup.log on the ERD.

      B. In Setup.log, find the entry that references autochk.exe in the
      [files.WinNt] section (Where %systemroot% is your NT installation
      directory IE: WINNT35).  Change the line to the following:

      \%SystemRoot%\System32\autochk.exe="autochk.exe","99999","\","ERD
      disk","autochk.exe"

      C. While using a text editor such as Notepad, create a file called
      Autochk.exe, enter any text in the file, then save the file as
      Autochk.exe in the root directory of the ERD.
```

```
      Note: If Running Windows NT V4.0, you must replace the file
      Setupdd.sys on setup disk #2 with that from Windows NT Service Pack 2
      or later.

    See the following KB articles for more details

    ARTICLE-ID : Q168015
    TITLE      : Files Not Replaced When Running Emergency Repair on X86
    Intel

    ARTICLE-ID : ID: Q158423
    TITLE      : WinNT 4.0 ERD Won't Allow Repair w/out Compact Disc
    Installed

2. Restart your computer with the three Windows NT setup disks.

  NOTE: If you are running Windows NT 4.0, be sure to copy the Service Pack
  3 version of the Setupdd.sys file to the second disk of the three disk
  installation set. The Setupdd.sys file ensures that the necessary files
  are actually copied during the ERD process.

3. Choose "R" to repair your Windows NT installation.

4. Select only "Verify Windows NT System Files," then choose Continue.

5. If prompted for "Windows NT Workstation or Server setup disk #4," press
the ESC key to allow you to continue with the repair process.

6. DO NOT SELECT TO REPLACE ALL FILES; ONLY REPLACE AUTOCHK.EXE.

7. After Autochk.exe is replaced with the file copied from the repair
disk, press F3 to exit the repair process and reboot the computer.
Autochk.exe will not run because it was replaced with the text file you
created in step 1C above.

8. After performing this process, you will need to make another Emergency
Repair Disk by running the RDISK utility.  Choose Run from the Start menu,
type RDISK and select UPDATE.

9. Replace the autochk.exe file that is on the system.
```

1.4.4 Procedure 4

Complete reinstall of the NT OS

1. Make a temporary installation of the NT OS in order to boot into NT and access the physical registry hives located on the system drive of the former NT install in 'systemdrive'\winnt(install folder)\system32\config.

2. Load regedt32.exe and open the system hive from the above location. Choose the load hive option from the 'registry' menu and navigate to that location. Give the hive a temporary name in order to browse it's content within your currently opened registry.

3. Navigate in the hive to the **HKEY_LOCAL_MACHINE\"Customename"\CurrentControlSet\Control\Session**

Manager (BootExecute is the key name) and remove the entry for the autochk values referencing the original system drive.

4. Unload the hive to save the changes back into the old location.

5. Reboot into the old operating system.

Note: the above procedure can be used to repair a number of registry related NT OS problems.

1.5 Service Pack 4 information

SP4 adds a 10 second countdown timer to Autochk, the process that runs Chkdsk on the blue screen during boot. This gives the user 10 seconds to decide whether they need to stop the system from checking the disk for errors.

If you prefer a different number of seconds; you can alter the default timer value by:

1. Navigating to: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager

2. Add Value name of AutoChkTimeOut as a type REG_DWORD. Select the Decimal Radix and enter the number of seconds desired.

3. If you set the value to 1, it will effectively cancel your ability to abort the Chkdsk.

Bug Note: When you schedule a chkdsk on NT 4.0 SP4, the system event log records Event Id 41, *The file system structure on the disk is corrupt and unusable. Please run the chkdsk utility on the device \Device\Harddiskx\Partitiony with label "z".* where x, y and z match the drive letter you scheduled. On my Server, I get an Event ID 41, description not found.