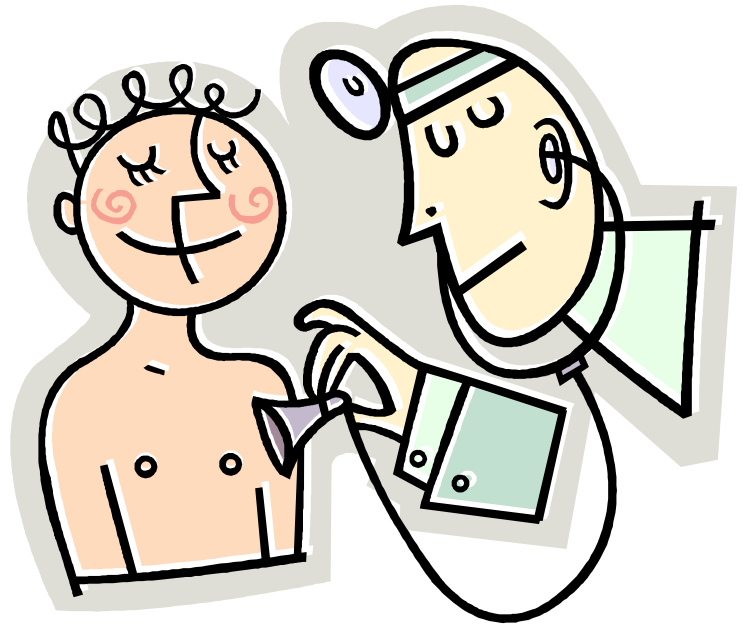# Check Disk (Chkdsk)

February 7, 2012

Check Disk

We should run Chkdsk periodically to examine the main hard drives.

There are three stages of the Chkdsk utility

1. File verification
2. Verifying indexes
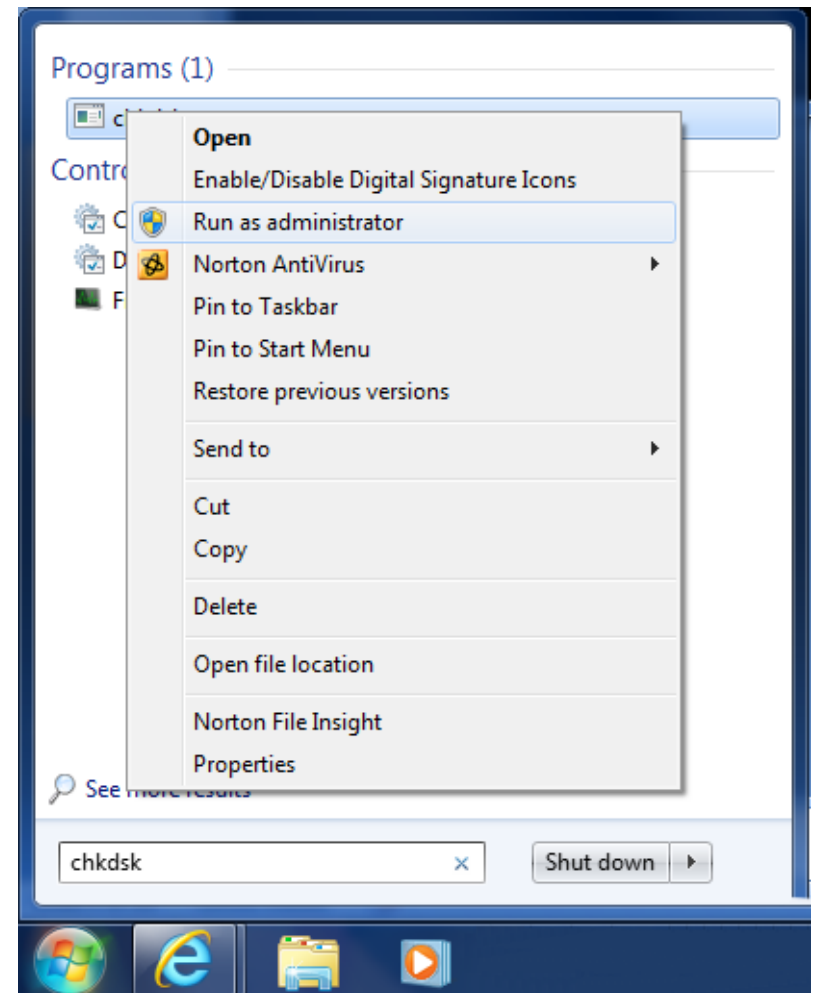3. Verifying security descriptors

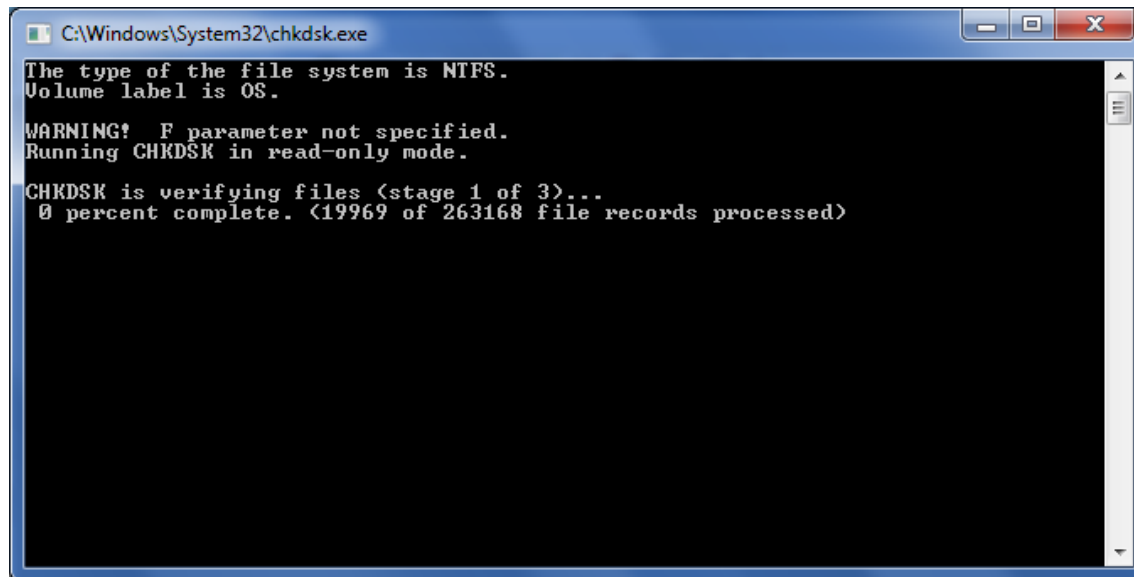A fourth stage can be run as Chkdsk/R to check for bad clusters.

1

Starting the Chkdsk Utility

To start the Chkdsk utility, we can type "chkdsk" in the search textbox on the Start menu. We right click on the Chkdsk hyperlink listed under Programs and we select Run as Administrator to run the application.

Stage 1 of Chkdsk

The first stage is for file verification where the Chkdsk utility examines each File Record Segment (FRS) in the volume's (typically the C: drive) master file table. Each segment is tested and two bitmaps are built, the first showing what FRS are being used and the second one displaying what clusters on the drive volume are being used. At the end, we have a picture of what space is being utilized in the master file table and in the overall volume. The NTFS file system has bitmaps of its own and this can be compared against the Chkdsk bitmap images. Inconsistency are shown in the Chkdsk output.
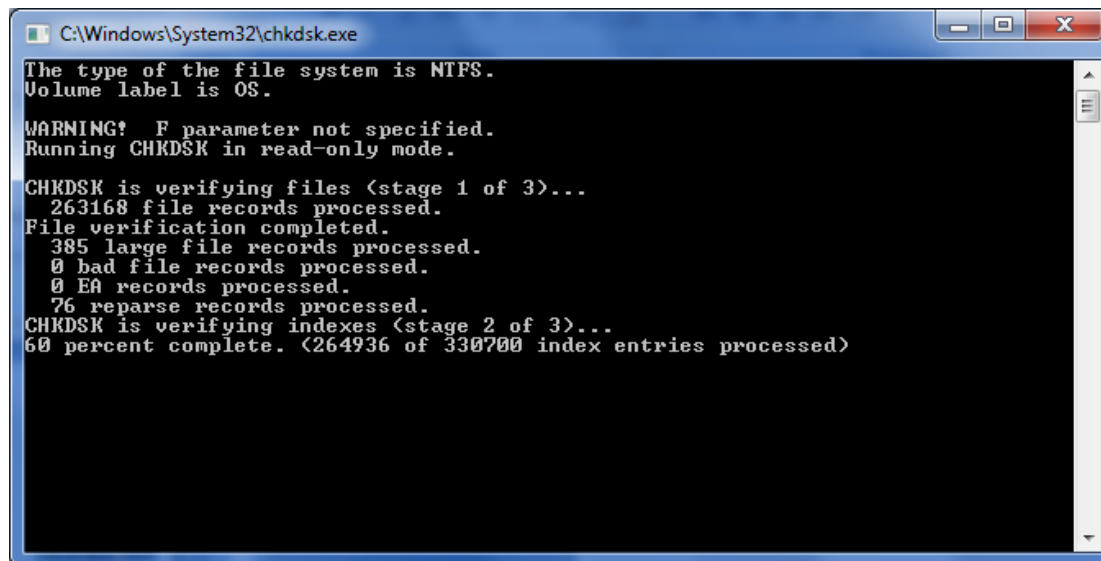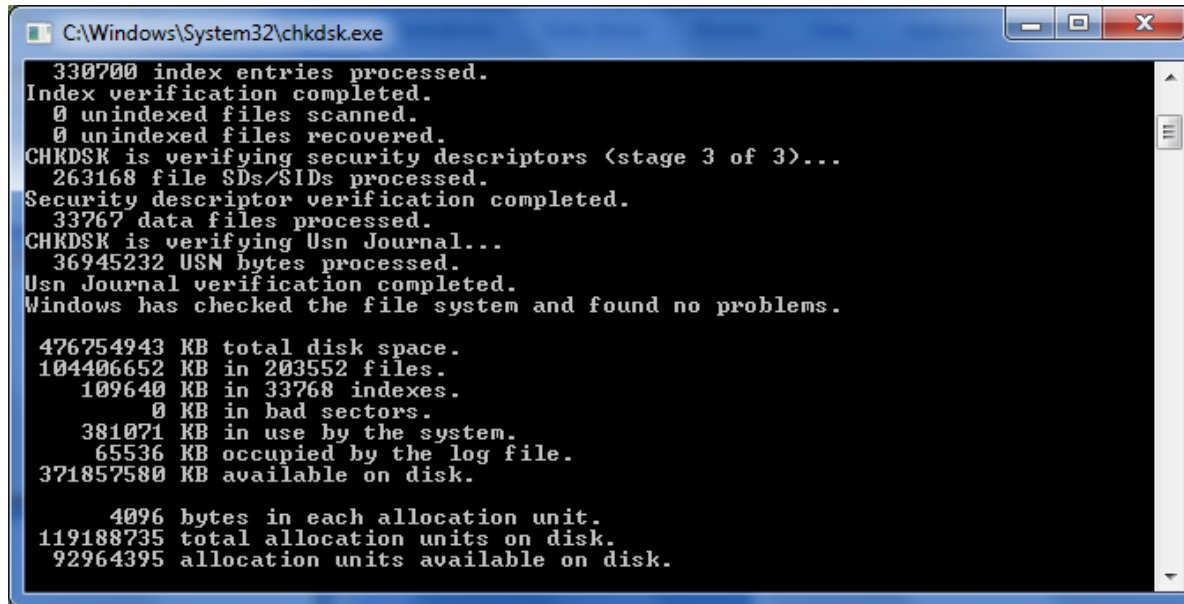


```
C:\Windows\System32\chkdsk.exe

The type of the file system is NTFS.
Volume label is OS.

WARNING!  F parameter not specified.
Running CHKDSK in read-only mode.

CHKDSK is verifying files (stage 1 of 3)...
  0 percent complete. (19969 of 263168 file records processed)
```

Stage 2 of Chkdsk

In the second stage of Chkdsk, it verifies each of the indexes on the volume. Indexes are directories on the volume. In this operation, Chkdsk checks each directory on the volume for discrepancies and verifies that every file and directory represented by an File Record Segment in the Master File Table is referenced by at least one directory. It does the same check for subdirectories and their contents. File time data and size are verified as up-to-date. It checks to make sure that all files are in directories. Orphaned files can be restored and if the directory was removed, Chkdsk will create a new directory in the root directory.

Stage 3 of Chkdsk

During this phase, CHKDSK examines each of the security descriptors associated with each of the files and directories on the volume. Security descriptors are data that describe the owner, NTFS permissions, and auditing data of the file or directory. It checks for the integrity of the information.

Chkdsk Report

The final report shows the total amount of disk space, the kilobytes used and the number of files on the volume. We also see the kilobyte and the number of indexes. We see the kilobytes of bad clusters. Also included in the report is kilobytes in use by the system, kilobytes occupied by the log file, and the kilobytes available on the disk.

In a second list, we will see bytes in each allocation unit, total units on the disk and those that are available.

The C and I Switches

The / C switch will allow Chkdsk to run faster since it will not check for cycle or directory loops on the NTFS volume. This is a rare occurrence, so we can run Chkdsk /c.

Also, we can use the I switch to skip checks that compare directory entries to the File Record Segments entries. If we find errors on the disk, we should run the full Chkdsk.

[1] An explanation of CHKDSK and the new /C and /I switches, 2012, Microsoft, Feb 7, 2012, <http://support.microsoft.com/kb/187941>