

## Preface

This page discusses how to fix the Dell System Restore (DSR) feature. The term "restore" has a somewhat fuzzy definition, and users sometimes ambiguously use "restore XP" when they really mean "reinstall XP". I think it would be helpful here to make that distinction.

The term '**restore**' should be taken as meaning to return to a previously saved or stored state. A prerequisite here is that a backup must have been previously saved to which you can return. In contrast, '**reinstall**' should mean the process of installing XP again from an installation CD, just as would be done if the hard disk partition did not previously have any operating system. 'Install' and 'reinstall' are functionally the same thing--whether or not the partition previously had XP installed is not really relevant when the process will eliminate any previous installation and install XP anew.

In the case of Dell's "[PC-Restore by Symantec](#)" feature, Dell has supplied the user with a backup image made at the factory, and this backup is stored in the DSR partition. It is this backup that is restored from when the Ctrl+F11 keys are pressed.

A backup image must exist before you can restore from it. *If Dell did not ship your computer with a DSR partition, you cannot restore. If you have deleted the DSR partition, you cannot restore.* In these cases, you may still reinstall if you have the reinstallation media, but that is a different topic than what is being covered here. If a DSR partition does not exist, you cannot create one and hope a backup image will magically appear in it.

If Dell shipped your computer with a DSR partition and it has not been deleted, then you should have the backup image to restore from--although you might not always be able to get to it. That's what this page is about: re-enabling your ability to use Dell's backup image.

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## Troubleshooting the Restore Process

The Dell-specific Ctrl+F11 process is supposed to completely automate the restoration process, returning the hard disk to the state it was in when Dell shipped the computer. However, overwriting the MBR by using a boot manager, using the commands "fixmbr" or "fdisk /mbr", installing from a Windows installation CD, and assorted other tasks a user might do will inadvertently break Ctrl+F11, rendering the system unable to boot the DSR partition. Furthermore, changing the partitioning by adding, deleting, or resizing partitions will cause DSRcheck to fail, so even if Ctrl+F11 works, the restore process will abort without attempting to restore the Ghost image.

This section explains how to fix the Ctrl+F11 and DSR process following repartitioning or OS reinstallation.

First, understand that not everyone likes the Dell-specific restore process. Some people even delete the DSR partition completely and choose another method of disaster recovery. These may include, but are not limited to, using cloning/imaging products like Symantec Ghost, PowerQuest Drive Image, Acronis True Image, TeraByte Image or BootIt-NG, and others. Even if you keep the DSR partition, it's not absolutely necessary to fix a broken Ctrl+F11 operation because you can always [manually restore the Ghost image](#) from the DSR partition. However, if you do wish to repair the Dell-specific restore process, read on.

The heart of the restore process is recover.exe and the fi.gho file. However, these are scripted by recover.bat in a fairly straightforward manner, so troubleshooting the restore process is really more a matter of troubleshooting DSRcheck. The following information is about figuring out why DSRcheck might prevent recover.bat from doing its work.

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## Analyzing Your System

Dell computers now come with two hidden partitions: a [Utility partition](#) and a [Restore partition](#). DSR (Dell System Restore) is a feature that returns a computer to its "as-shipped" state, through the use of these two specialized partitions.

**DSRcheck** is a Dell utility and is included as part of the Dell PC-Restore (aka, DSR) partition. DSRcheck provides principally two functions: to evaluate the state of the computer's partition layout to determine whether to allow the restore process to proceed, and to return the partition table (specifically, the partition-type indicators) to its normal state. This latter function is necessary because the Dell-specific method of booting the Restore partition alters the partition table.

**Dsrfix** (Dell DSR Analyzer) is a diagnostic and recovery tool I wrote to help with troubleshooting DSRcheck problems. Dsrfix assesses several of the system characteristics that are crucial to dsrcheck.exe.

**WARNING:** Dsrfix is not a Dell program and is not endorsed by Dell. When used without the /F parameter, it does not write anything to disk and uses fairly straightforward procedures to read selected disk sectors, so should be safe to use.

However, no warranties are expressed or implied. **Use at your own risk!**

Dsrfix has so far been tested successfully on the following models: **Dimension 1100, 2400, 3000, 3100, 4550, 4600, 4700, 5000, 5100, 8300, 8400, 9100, 9150, B110, E310, XPS 400, XPS Gen 4. Inspiron 500m, 510m, 600m, 630m, 700m, 1150, 1300, 2200, 5100, 5150, 6000, 6400, 8600, 9300, 9400, B120, B130, E1505, E1705, M710, M1210, XPS, XPS Gen 2.** Dsrfix may work on other models as well, since I think the same DSR scheme is being widely used across model lines.

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## Dsrfix Quick-Start

This section should give you a quick idea how Dsrfix is used. However, be sure to also read the following sections to get a clearer idea of the details and potential pitfalls.

Dsrfix is a DOS program. It does not work in Windows. It does not work in the Windows PE (preinstallation environment) or RE (recovery environment), as those are not DOS. **You need to boot to real DOS**, such as a Win98 "Startup" floppy. If you need to, [check the section below](#) for ways to boot to DOS.

- Download dsrfix.zip from [www.goodells.net/dellrestore/files/dsrfix.zip](http://www.goodells.net/dellrestore/files/dsrfix.zip). (Updated 08-20-2006 to version 3.0)
- Extract dsrfix.com from the archive.  
(Note to reader: The other files in the archive are supplemental. The only file you need to copy to floppy disk is dsrfix.com.)
- Boot from your DOS boot disk.
- Run the command "DSRFIX ". Review the results to assess whether your system is a good candidate for restoring Dell's DSR feature.
- Optional: run the command "DSRFIX /D >DSRFIX.TXT " before making any changes. This will save a dump file in case you later need the data for forensic reconstruction.
- If you decide your system is a good candidate for repairing Dell's DSR feature, rerun Dsrfix with the command "DSRFIX /F ". The program will repeat its results report, then prompt you to queue any changes to be made. Accept or deny each fix proposed by Dsrfix. After proposals have been queued, confirm whether you want Dsrfix to go ahead and write those changes to your hard disk.
- Rerun Dsrfix again for a new report to check the results.

If Dsrfix's report shows no fatal errors and no alerts, the Dell-specific restore feature should be functional on your system. You should see a blue "www.dell.com" banner across the top of the screen when the computer starts to boot. Pressing the **Ctrl+F11** keys at that moment should divert the boot process to Dell's custom restore utility.

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## Dsrfix Command Syntax

Command-line syntax is: DSRFIX [/D] [/F] [/8x] [/PBR4]

The following case-insensitive command-line switches are available:

/D	Forces Dsrfix to dump its sector data to the screen in plain-text format.
/F	Directs Dsrfix to fix minor errors (alerts) that it finds. (This switch is ignored if /D is also used.)
/80	Directs Dsrfix to access first hard disk. This is the default if no disk number is entered. Disk numbers follow the bios convention of referencing hard disks, using hexadecimal codes 80-83h.
/81	Directs Dsrfix to access second hard disk.
/82	Directs Dsrfix to access third hard disk.
/83	Directs Dsrfix to access fourth hard disk.
/PBR4	Directs Dsrfix to test for the DSR configuration in the 4th partition instead of the 3rd.

Dsrfix has been tested on IDE and SATA disks. It has not been tested with SCSI disks.

**Warning:** Normally, the first hard disk is the master disk on the motherboard's primary IDE channel. However, *do not count on this!* A modern bios may allow the system to boot from alternate hard disks or even a USB device. In that case, the disk numbers will likely be switched around. For example, if you boot from a USB flash drive, the Dell bios identifies the flash drive as disk 80h and the primary hard disk becomes disk 81h. **Before using the /F switch, it is crucial to make sure Dsrfix is reading the intended hard disk!**

## Capturing a Dsrfix Dumpfile

If you use Dsrfix to analyze your system, I would appreciate your feedback. Even if you have a new Dell system, Dsrfix dumpfiles help me find out when Dell makes changes to their MBR. If you use Dsrfix to repair your system, the Dsrfix dumpfile should be saved *before* you make the repair.

The /d parameter instructs dsrfix.com to dump the sector data it reads in plain-text to the screen, and the "> filename" redirection command can be used to reroute that output from the screen into a file.

If you boot from a floppy disk, use the command "dsrfix /d > a:\dsrfix.txt" to save the dumpfile on a floppy disk.

If you boot from a bootable CD, use the command "dsrfix /d > b:\dsrfix.txt" to save the dumpfile on a floppy disk. (The CD becomes A: and the floppy drive is bumped to B:.)

If you boot from either a floppy disk or a bootable CD, use the command "dsrfix /d > c:\dsrfix.txt" to save the dumpfile on a USB flash drive.

If you boot from a bootable USB flash drive, use the command "dsrfix /81 /d > c:\dsrfix.txt" to save the dumpfile on the flash drive.

Please email the dumpfile to dsrfix@goodells.net and which Dell model it was run on. It will help me review whether Dsrfix works properly on other Dell models, and to keep Dsrfix updated if Dell introduces a variation in the MBR.

## Understanding the Dsrfix Report

When used without the /F switch, Dsrfix is a report-only program; it does not make any alterations to your hard disk. Dsrfix examines your system for the signature [characteristics DSRcheck would look for](#). Results are categorized in four levels of importance:

- **Good:** These are characteristics that will pass DSRcheck's review.
- **Alerts:** These characteristics will cause DSRcheck to fail, but are relatively easy to fix.
- **Fatal:** These characteristics will cause DSRcheck to fail, but are not easily fixed.
- **Info:** These characteristics are not relevant to DSRcheck, but can help the user analyze his/her system.

**Fatal** conditions indicate a serious problem with the structure of the two Dell partitions, such as a deleted partition or a partition that has been reformatted with a different file system. Be careful here--if you are running Dsrfix on a system in which the two Dell partitions are expected to be intact, perhaps Dsrfix isn't looking at the right disk. For

safety's sake, disconnect any additional disks so that the intended target is the only disk connected. If you are booting from a USB device, you probably need to use the /81 switch to read the correct disk. If you have repartitioned your hard disk, you may need to use the /PBR4 switch.

Dsrfix cannot fix fatal conditions. If Dsrfix is looking at the right disk and partitions, correcting a fatal condition involves concerted effort, which might include completely restoring one or both Dell partitions from scratch. If that is the case, the reader should think about whether the effort is worth it.

```

DSRFIX - Dell DSR Analyzer, version 3.0
Copyright 2005-2006 by Dan Goodell, all rights reserved.
(Type DSRFIX /H for syntax help)

.Disk 80 found, master device at port 01F0
.48-bit user secs   : 152343750 (78 GB)
.48-bit max secs   : 156250000 (80 GB)

.good : boot code matches dell mbr v3.
.good : pbr descriptor 1 is type DE.
.good : pbr descriptor 2 is type 07.
♦alert: pbr descriptor 3 is type 0C, not DB.
.info : pbr descriptor 4 is type 00.
.good : pbr1 is fat16, label is DellUtility.
♦alert: pbr3 is fat32, label is not DellRestore.
.good : reference partition table in sync.
.info : sector lba-3 is not empty.

```

**Alerts** are usually easy to fix. An alert suggests the two Dell partitions are intact, but a minor identification problem would prevent DSRcheck from letting the restore process go forward. Dsrfix can repair alert conditions.

An **info** item reveals the 'type' of the extra, untested descriptor. Dsrfix tests three of the four partition table descriptors--the first two, plus either the third *or* the fourth but not both. The first partition must be a DellUtility partition and the second must be a NTFS partition. The DSR partition can be either the third or fourth. As shipped, it is often the third partition, so by default dsrfix tests the third descriptor and just lets you know what the untested fourth descriptor shows. If the `/PBR4` option is used, dsrfix instead tests the fourth descriptor and lets you know what the untested third descriptor shows. Knowing what type the untested descriptor is can help you decide whether or not you should be using the `/PBR4` switch.

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## What Dsrfix Does

Dsrfix first checks for the Dell boot code in the first 440 bytes of the MBR. Dsrfix then looks at the partition table following the boot code, and evaluates the partition-type indicators of the four partitions. Dsrfix reads the PBR (partition boot record) of the first partition, checks that it is a FAT16 boot record, and checks the partition label. It checks to see if the third partition is a DSR partition by reading the PBR, checking if it is a FAT32 boot record, and checking the partition label. It reads sector 18 of that partition (which should be the reference partition table) and compares it to the partition table in the MBR sector. In comparing the two partition tables, Dsrfix ignores differences in the active boot flag or the descriptor types. (Note the descriptor types are evaluated as a separate check.) If the `/PBR4` switch is used, Dsrfix performs these checks on the fourth partition instead of the third.

When used with the `/F` switch, Dsrfix also corrects the relevant sectors of the hard disk, including the first 440 bytes of the MBR, the PBR descriptor types, the active boot flag, the partition labels, and the reference partition table in the 18th sector of the DSR partition.

It is crucial that you make sure Dsrfix is reading the correct hard disk. To help determine that, Dsrfix begins by identifying the location where the requested hard disk is found (IO base port address and whether it is the master or slave device on that channel), and reports the disk size. Dsrfix determines whether the hard disk supports the 48-bit addressing feature (required if the hard disk is over 137GB), and whether it supports the HPA feature (required if HPA-based MediaDirect is installed).

Although Dsrfix is not principally concerned with MediaDirect, it does provide two clues that may help you determine whether a MediaDirect partition may be on the hard disk. [HPA-based MediaDirect](#) requires that part of the disk be reserved for a HPA, and also requires the extra MediaDirect-specific boot code in LBA Sector 3. If the hard disk supports the HPA feature, Dsrfix reveals the true ("max") size of the hard disk in addition to the reported ("user") size. ***If these two sizes are different, that suggests a HPA exists!*** Dsrfix also checks whether LBA-3 has a boot signature. If it does, Dsrfix displays an **info** item that LBA-3 is not empty, as that may suggest LBA-3 contains MediaDirect boot code.

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## Evaluating Your Chances for a Successful Repair

Dsrfix is not designed to run automatically. It does not evaluate its findings, it only reports what is there or not there. It is up to a human to decide what those findings mean.

Dsrfix will not attempt repair if a fatal condition exists. A fatal condition means Dsrfix could not read the disk, or attempted to read the boot records of the first or third/fourth partition and could not verify it had the correct file system. This can happen if you are looking at the wrong disk, if either partition has been deleted, if the partition order has been shifted by repartitioning, if either partition has been reformatted to other than FAT16 and FAT32, or if the partition table has been corrupted.

If there are no fatal conditions, Dsrfix can attempt to repair your system. Naturally, the fewer alerts you have, the better your chances are of successfully fixing Dell's restore feature.

If you have only one alert, then you can be certain that you are looking at the right disk and there is an excellent chance of successfully restoring Dell's DSR functionality.

If you get multiple alerts, double-check whether you are looking at the correct disk. Indicators that you may be looking at the *wrong disk* include label alerts on *both* pbr1 and pbr3, or a label alert and descriptor alert for the same partition. Indicators that you are probably looking at the *right disk* are matching boot code, matching partition tables, correct descriptor types, or correct labels.

Finally, if you are just not sure and want a second opinion, you are welcome to email me a dump file for review. Please use the the command "`DSRFIX /D > DSRFIX.TXT`" and send me the dsrfix.txt file, not just a summary report screen. The full dump file contains additional information beyond what the summary report shows.

## What If I Repartitioned My Hard Disk?

Many people like to repartition their hard disks to split the main "C:" partition into more than one partition. Repartitioning will cause the DSR process to fail because the new partition table no longer matches the reference partition table stored in the DSR partition. Dsrfix can be used to refresh the reference table, but you may find Dsrfix instead reports a fatal condition on partition 3. A Dell system normally has the DSR partition third in the table, but sometimes the process of repartitioning causes the descriptor for the DSR partition to shift to the fourth row of the partition table. When that happens, Dsrfix won't be looking for DSR's signature characteristics in the right place. If you want Dsrfix to check the fourth partition instead of the third, use the `/PBR4` switch.

The illustration shown here is an example of such a case. The 'DB' partition is listed fourth, and a new partition is listed third (in this case, it is an '0F' extended partition).

Dsrfix reveals that the third partition descriptor is not 'DB', is not a FAT32 partition, and it was unable to match the reference partition table. If it weren't for the fatal error, Dsrfix could attempt to overwrite the descriptor, the space where the reference partition table should be, and the space where the partition label should be. But *that would be wrong in this case* because the third partition is not where those things should be. (See why a human needs to interpret Dsrfix's report?)

In this case, the solution is to use the `/PBR4` switch to direct Dsrfix to test the fourth partition. Dsrfix will then report the fourth partition has the proper 'DB' descriptor type, and will test the fourth partition for FAT32, proper label, and reference partition table.

```

DSRFIX - Dell DSR Analyzer, version 3.0
Copyright 2005-2006 by Dan Goodell, all rights reserved.
(Type DSRFIX /H for syntax help)

·Disk 80 found, master device at port 0170
·48-bit user secs   : 312500000 (160 GB)
·48-bit max secs   : 312500000 (160 GB)

·good  : boot code matches dell mbr v1.
·good  : pbr descriptor 1 is type DE.
·good  : pbr descriptor 2 is type 07.
♦alert: pbr descriptor 3 is type 0F, not DB.
·info  : pbr descriptor 4 is type DB.
·good  : pbr1 is fat16, label is DellUtility.
!!fatal: pbr3 is not fat32.
♦alert: reference partition table not in sync.

```

## Using Dsrfix to Make Repairs

Dsrfix can be used to repair the conditions generating alerts. If you have many alerts or you are not sure you're looking at the correct disk, it may be prudent to explore your system with the manual techniques outlined later. Otherwise, you can use Dsrfix with the `/F` option.

Optional: Before making changes, make a backup of your current MBR sector. This will allow you to restore the current state of your MBR boot code and partition table if something should go wrong. There are a number of utilities available for this purpose, or use [mbrsaver.com](http://mbrsaver.com) (included with the download of [dsrfix.zip](http://dsrfix.zip)). Boot from a DOS boot disk and run the command `"MBRSAVER /S "` to save your current MBR sector, including your partition table. (Unless you specify another filename, the backup file will be named `mbrsaver.bin` by default.) If there are multiple disks in your system or you are booting from a USB device, make sure you backup the MBR from the correct disk. If you needed to use the `/81` switch with [dsrfix.com](http://dsrfix.com), use the same switch with [mbrsaver.com](http://mbrsaver.com).

```

DSRFIX - Dell DSR Analyzer, version 3.0
Copyright 2005-2006 by Dan Goodell, all rights reserved.
(Type DSRFIX /H for syntax help)

·Disk 81 found, slave device at port 01F0
·28-bit user secs   : 78125000 (40 GB)
·28-bit max secs   : 78125000 (40 GB)

♦alert: boot code does not match dell mbr.
·good  : pbr descriptor 1 is type DE.
·good  : pbr descriptor 2 is type 07.
·good  : pbr descriptor 3 is type DB.
·info  : pbr descriptor 4 is type 00.
·good  : pbr1 is fat16, label is DellUtility.
·good  : pbr3 is fat32, label is DellRestore.
♦alert: reference partition table not in sync.

Ready to queue changes . . .
·restore Dell MBR boot code? (y/n) Y
·refresh reference partition table? (y/n) Y

Changes queued. Write changes to disk now? (y/n) Y
·writing mbr rpt

```

Then run the command "DSRFIX /F". The program will repeat its results report, then prompt you to fix any alerts. Accept or deny each fix proposed by Dsrfix. After all fixes have been queued, you will have one final chance to confirm whether or not you want Dsrfix to go ahead and write those changes to your hard disk.

Finally, rerun the command "DSRFIX" for a new report to check the results.

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## How Do I Boot to DOS?

The typical way to boot to real DOS is with a DOS boot floppy. If your system does not have a floppy drive, however, booting from a bootable CD or a bootable flash drive are suitable alternatives. To prepare for the following steps, download the [dsrfix.zip](#) archive file and extract dsrfix.com or dsrfixcd.iso. You may optionally wish to include ptedit.exe from [ptedit.zip](#).

**To make a DOS boot floppy:** You will need a 1.44MB floppy disk and a machine with a floppy drive. Visit [www.bootdisk.com](http://www.bootdisk.com) and download the file to make a Win98 SE bootdisk. Use the file to make your own boot floppy. Copy dsrfix.com (and ptedit.exe, if desired) onto a second floppy disk. Boot from the bootdisk, then swap the floppies so you can run Dsrfix.

*(Note to reader: The other files in the archive are supplemental. The only file you need to copy to floppy disk is dsrfix.com.)*

**To make a bootable CD:** You will need a machine with a CD/DVD burner and your burning software must be capable of creating a CD from an ISO image. Nero and Roxio EasyCD Creator include that capability. If you don't have either of those, a very simple freeware tool that can do this is **ImgBurn**, which can be downloaded from [www.imgburn.com](http://www.imgburn.com). Download ImgBurn and install it. Launch ImgBurn and use the iso file, dsrfixcd.iso, to create a CD. Boot from the CD and run Dsrfix.

*(Note to reader: The other files in the archive are supplemental. Dsrfixcd.iso is the only file required to make a bootable CD.)*

Note: a drawback to this method is that a CD is read-only, so if you boot from a CD you cannot save a dumpfile or backup your MBR to the CD. However, if your system does not have a floppy drive, you may need to forego saving these.

**To make a bootable flash drive:** Your computer's bios must support booting from a USB device. (I believe all Dell computers shipped since the advent of the PC-Restore system probably support booting from a USB device.) Flash drives have become quite inexpensive and ubiquitous. There are plenty of good instructions on the Internet about how to make a flash drive bootable. Do a google search for "[usb bootable flash drive](#)" and find a method you like. After making your flash drive bootable, copy dsrfix.com (and ptedit.exe, if desired) onto it. Insert the flash drive into a USB port and reboot the computer.

*(Note to reader: The other files in the archive are supplemental. The only file you need to copy to the flash drive is dsrfix.com.)*

**Warning:** the computer will treat your flash drive as the first "hard disk" in the computer. Your real hard disk will typically be shifted to second in order. When you run Dsrfix, make sure you use the /B1 switch to read the "second" disk! If you forget to include the command-line switch, Dsrfix will read the MBR of the flash drive instead.