

Solve (Almost) Any Problem Your Computer May Have

If your PC refuses to start or keeps crashing for some unknown reason, Safe Mode is often your last resort. In Safe Mode your system starts with a very limited version of Windows where most drivers and some settings are not loaded. This minimal configuration allows you to troubleshoot Windows and attempt to discover why it is not working properly. In this article you will learn how to find the cause of startup problems by using different start options. You'll see how to disable applications, drivers and devices which may be preventing Windows from starting normally, and track down errors in Windows using its diagnostic tools. In this article you will learn about:

Mark Lewin:
"Windows Safe Mode is sometimes the only way to track down the cause of crashes or startup errors. With the knowledge in this article you'll have your PC up and running again in no time."

- Windows Advanced Startup Options S 3/2
- Accessing the Advanced Startup Options Menu S 3/3
- Start Options available in Safe Mode S 3/3
- Strategies for solving startup problems S 3/5
- Troubleshooting errors using different start configurations..... S 3/6
- Detailed searching for errors in Safe Mode S 3/10
- Using the Event Viewer..... S 3/11
- Using the System Information tool..... S 3/13
- How to view Event Logs S 3/14

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When you have problems with Windows ...

... the Advanced Startup Options Menu can help.

Troubleshooting and repairing Windows in Safe Mode.

Windows Advanced Startup Options

The Windows start procedure is completely automatic as long as you are not connected to a network. But, as you may already know, Windows offers a number of advanced startup options. It presents these in a menu in place of the normal start process. You can then choose a variety of startup options from this menu, which can be selected one at a time on each startup.

This menu often confuses the user. Which option should you choose? The first choice 'Start Windows Normally' won't help you start your PC normally if there is a faulty configuration. This option can cause more problems as after choosing it Windows could fail to start properly, stop responding altogether or produce an error report as this option does nothing to fix the original cause of your PC's startup problems. After re-booting you are back to where you started with Windows once again offering you the advanced startup options.

Microsoft created the Advanced Windows Startup Options Menu to help you diagnose and fix problems that may be preventing normal startup. In order to correct the settings in a faulty Windows system, you need a minimal version of Windows without any drivers. This is what Safe Mode offers with its various options, and it is therefore the best tool for repairing Windows or for correcting faulty settings.

If Windows loads in Safe Mode then you can generally conclude that a device driver or program that is usually loaded at startup or a faulty setting in the system configuration is the cause of the problem.

In Safe Mode you can deactivate or re-install Services or device drivers that are preventing a normal startup.

Accessing the Advanced Startup Options Menu



You can call up the Advanced Windows Startup Options Menu even if your system is running properly. It is worthwhile experimenting with them now so that you will be better prepared in the case of an emergency. To start your PC in Safe Mode follow these steps:

1. Restart your computer. After the initial BIOS screen appears, look at the bottom part of the display. As Windows starts to load you may see a message prompting you to press **(F8)** to view the advanced startup options. Some computers won't display this message, so you will need to hold down the **(F8)** key while Windows loads.
2. If you miss the message that should appear on your screen, Windows will startup as normal. In this case, restart your PC and try again.



Accessing the Advanced Startup Options Menu.

Start Options Available in Safe Mode

As well as Safe Mode, you will find other options in the Windows Start Menu. These options allow a startup in Safe Mode but offer greater functionality, as shown in the following table:



Safe Modes with additional functionality.

Mode	Description
Safe Mode	Windows Safe Mode provides you with a basic graphics driver (enough to display the user interface), access to your drives and windows configuration, and very little else.
Safe Mode with Networking	As Safe Mode, with the addition of drivers required for network connectivity. Safe Mode with networking enables logging on to the network, logon scripts, security, and Group Policy settings. Non-essential services and startup programs not related to networking do not run.

Mode	Description
Safe Mode with Command Prompt	As Safe Mode, but the command prompt is started instead of the Windows Graphical User Interface.
Enable Boot Logging	The start process is logged. In Windows 2000/XP you will find the log file text in the NTBTLOG.TXT file in the '\WINNT' or 'Windows' folder. In Windows 98/Me, the log file is called 'BOOTLOG.TXT'.
Enable VGA Mode	Starting Windows in 640x480 displays the desktop using standard VGA mode. Use this mode if you suspect a faulty graphics card. All other Windows functions run as normal.
Last Known Good Configuration	(Windows 2000/XP only). Start Windows using the settings (registry data) that were saved at the last normal Windows shutdown. Only use this option when you have a faulty configuration. You cannot solve problems with damaged or faulty drivers or files in this way. Warning: You will lose all changes to settings made since the last successful startup if you follow this option.
Directory Service Restore Mode	Only applies to Windows 2000/XP where a PC is on a network. If computer fails and needs to re-establish its connection to the domain this option can be used.
Debugging Mode	Activates the debug mode in Windows 2000/XP. Using a serial cable, you can transfer the debugging information to another computer where a debugger is used. This mode is configured for the use of COM2.
Start Windows Normally	Windows starts as normal.
Reboot	Start the computer again.
Return to OS Choices Menu	If you have installed two or more operating systems on your PC, you are able to choose again which operating system you wish to boot to.

The Safe Mode uses the standard Microsoft VGA driver with a resolution of 640x480 and 16 colours. In Windows 2000/XP you need to log on as 'administrator' to have full access rights.

Safe Mode uses VGA display.

Strategies for Solving Startup Problems

Windows startup problems are often very stubborn but working systematically, you can solve them relatively quickly. Windows has many tools to help you restore your system to normal. The following checklist shows you how you can make your system startup properly again:



What should you do when Windows doesn't start properly?

<p>1st Attempt: Start in Safe Mode</p>	<p>You can make a quick repair using Safe Mode and its corresponding startup options. The system is started up with the necessary services only. Use Safe Mode particularly when an installed driver is causing problems for the system startup.</p> <p>If you are running Windows 98/Me/XP in Safe Mode, then as well as the Device Manager, you have the 'MSCONFIG' tool at your disposal, which you can activate by going to Start > Run, typing msconfig and clicking OK. You can correct and repair the Windows settings using these tools.</p> <p>If you are running Windows 2000/NT, you can download the msconfig application from http://www.perfectdrivers.com/howto/msconfig.html</p>
<p>2nd Attempt: Use the Recovery Console (Windows 2000/XP only)</p>	<p>To use this console, start your PC with the help of the original setup CD for Windows 2000/XP. You can perform different tasks with its command line interface; you can, for example, start and end services or connect to local drives (drives that are formatted with NTFS). You can see more information on how to use the Recovery Console in article X 8.</p>

3rd Attempt: Use the Emergency Repair	You can attempt to repair your existing installation of Windows using the original installation media, or an emergency boot disk (which you may have created when you first installed Windows). Put the disk in and re-boot your PC. From the installation options select Repair to recover any missing or corrupt systems files. For more information see article X 8.
4th Attempt: Re-install Windows	If none of the other measures have worked, as a last resort you can run the setup on your Windows CD again. During the installation process the important system files in the directory for the original Windows installation will be repaired. Old settings will be lost, and some drivers may need to be re-installed.



Finding the fault.

Testing different start configurations.

Troubleshooting Errors Using Different Start Configurations

Start your computer in Safe Mode and you can solve many problems by making changes to the system configuration (i.e. removing or re-configuring installed drivers).

If all of the settings seem to be in order but it is still only possible to start in Safe Mode, then there is only one method left to locate the faulty setting or driver that prevents your PC from starting up normally: you must find the error by using different boot configurations.

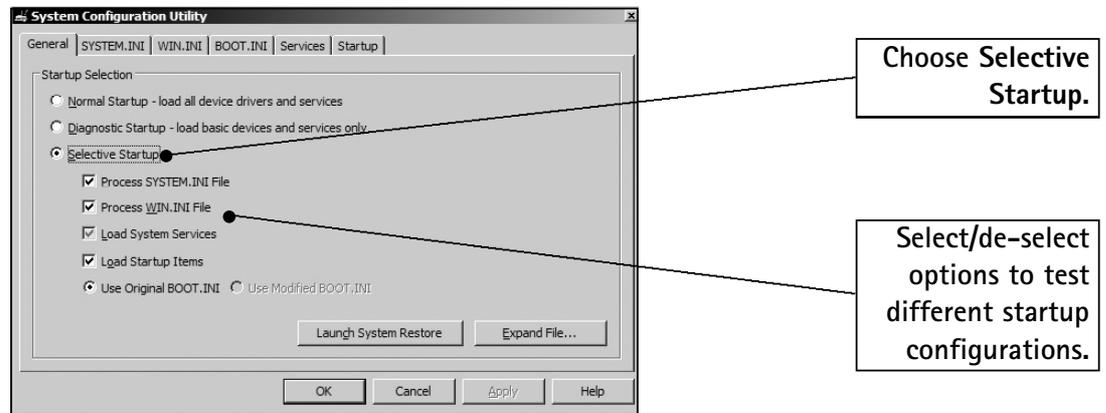
If Windows starts in Safe Mode, check the individual start options to establish whether a device or driver has loaded correctly or not. You can find a faulty entry or incorrect configuration as follows:

1. Click on **Start > Run**.
2. Type **msconfig** into the field that opens. Click **OK**.

Note: If you are running Windows 2000/NT, you



can download the MSCONFIG application from <http://www.perfectdrivers.com/howto/msconfig.html>



The Windows System Configuration program (MSCONFIG)

Start Options	Version	1st New Start	2nd New Start	3rd New Start
Use CONFIG.SYS	98/Me	Yes	No	Yes
Use AUTOEXEC.BAT	98/Me	Yes	No	Yes
Use WINSTART.BAT (if available)	98/Me	Yes	Yes	No
Load autostart group elements	98/Me	Yes	Yes	No
Process SYSTEM.INI File	All	No	Yes	Yes
Process WIN.INI File	All	No	Yes	Yes
Load System Services	XP	Yes	Yes	No
Load Startup Items	XP	Yes	Yes	No

First of all check the settings for the first new start. If Windows doesn't start normally with these settings, try it with the settings for the second new start.

If Windows starts up with the first start configuration, then the problem is to do with the SYSTEM.INI or WIN.INI files. In order to isolate the problem follow these steps:

Test with the first boot configuration as shown on the above table.



1. Start the System Configuration Utility again by going to **Start > Run**.
2. Type **msconfig** in the field that opens. Click **OK**.
(Note: if you have Windows 2000 or NT, MSCONFIG is not installed by default. You can download it from: <http://www.perfectdrivers.com/howto/msconfig.html>)
3. Click on the tab labelled **WIN.INI**.
4. In Windows 98/Me, double-click on the folder **Windows**. Remove everything from the control boxes **Load=** and **Run=**. In Windows 2000/XP simply remove the tick from the respective check box so that this will not be considered at the next startup.
5. Click **OK**.
6. When asked if you wish to restart your computer click **Yes**.

Test Windows startup ...

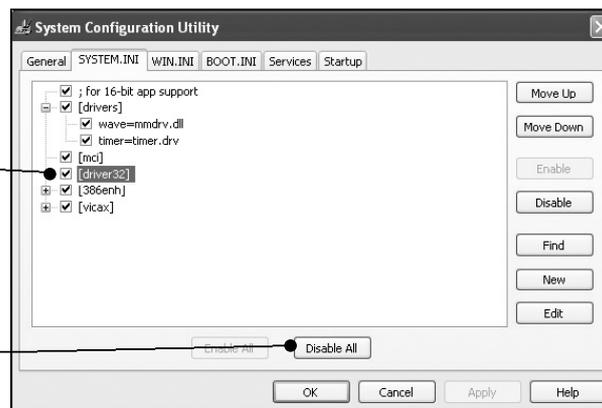
Windows starts up again. If the start process works properly then a program is being started in the WIN.INI or SYSTEM.INI file using 'Load' or 'Run' which is preventing a normal system startup. Using MSCONFIG, activate the entries in the WIN.INI and SYSTEM.INI files one by one.

... and use the process of elimination to find the faulty program.

After every change, restart your computer. When the error reappears, you have located the faulty entry in the system file. If you deactivate this entry, your system will run perfectly.

Remove the tick from the checkbox of each item you wish to disable on startup.

You can disable all selected items on startup by clicking here.



You can locate faulty start parameters using MSCONFIG in Windows XP

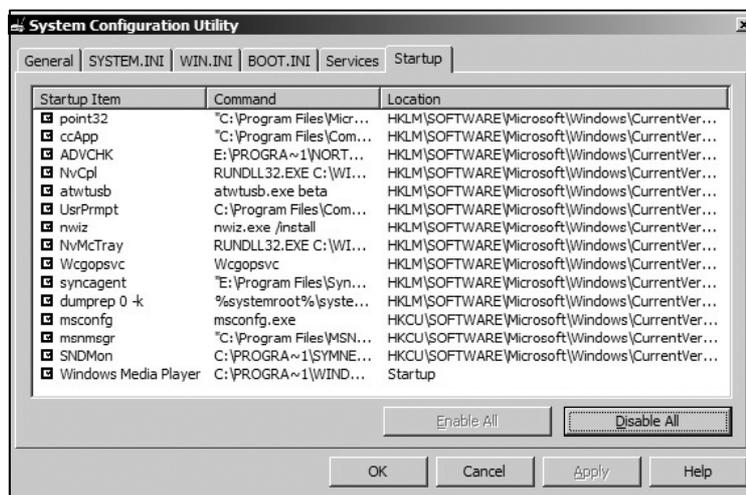
If the first start configuration doesn't function then try the settings for the second new start. If Windows can be started normally using these settings then the cause of the problems is a driver or a TSR (Terminate and Stay Resident) program that is loaded by the CONFIG.SYS or AUTOEXEC.BAT files.

If your PC still doesn't function correctly, then try the third configuration. If Windows loads up properly, the problem is with a program that is run during the start process. You can pinpoint the program using the following steps:

1. Start the system configuration program again by going to Start > Run.
2. Type msconfig in the field that opens, and click OK. (Note: if you have Windows 2000 or NT, MSCONFIG is not installed by default. You can download it from <http://www.perfectdrivers.com/howto/msconfig.html>)
3. Open the Startup tab and click the Disable All button to deactivate these startup programs.
4. Click on OK and restart your computer.

Test using the second configuration ...

... and if you are still having problems, test using the third configuration.



Solving start folder problems.

In the 'Startup' tab in the System Configuration Utility, you can find out what is loaded when Windows starts

If Windows now starts up without the entries from the Startup tab, you can now begin to narrow down the faulty entry.

Homing in on the faulty startup entry.

As in the previous examples, activate each line individually in the system configuration program and test each entry by restarting the computer.

As soon as the error recurs, you have located the faulty program. Remove it, re-install it or get in touch with the manufacturer.



Locating
hard to find
program errors.

Detailed Searching for Errors in Safe Mode

Even after you have identified the faulty program or settings using the System Configuration Utility in Safe Mode, the problem has not always been solved. Many programs and drivers are not loaded straight away at Windows startup; instead they are loaded as Windows is running various applications and will only then cause a crash. You can find and solve these errors by using the following methods:

Tools	Description	Operating System
Event Viewer	The event log lists all errors in the Event Viewer as if in a diary.	Windows 2000/XP
System Information	The System Information gives an overall view of the computer hardware, the system components and the software. Using this you can recognise possible faulty devices and conflicting devices.	Windows 98/Me/2000/XP
Start Log File	All events during startup are logged in the start log file 'NTBTLOG.TXT' (Windows 2000/XP) or 'BOOTLOG.TXT' (Windows 98/Me).	Windows 98/Me/2000/XP
Device Manager	Shows you conflicting or incompatible devices that may be causing a problem.	Windows 98/Me/2000/XP

Using the Event Viewer

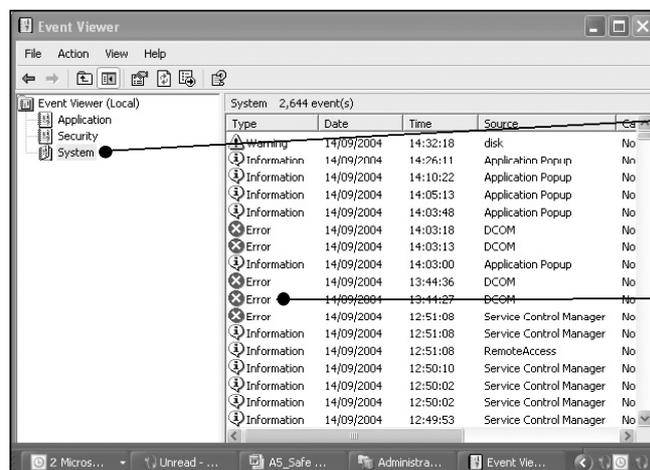
By going to 'Administrative Tools' in the Control Panel you can search for errors using Windows 2000/XP's Event Viewer, even in Safe Mode. The Event Viewer is, so to speak, the main log for your system. Here all actions are shown with an 'Event ID'.

The Event Viewer log provides Windows 2000 and XP users with additional information, which is helpful for diagnosing the cause of startup problems.



The Event Viewer is a useful tool to use in your search.

For Windows 2000/XP only.



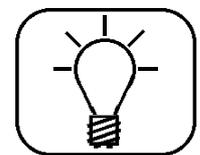
Choose the event category you wish to view.

Errors are marked in red, while warnings are shown in yellow.

Windows 2000/XP's Event Viewer is divided into three categories: Application, Security and System

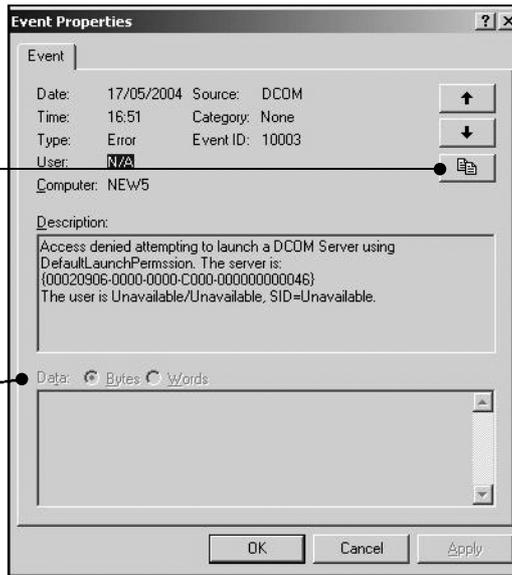
The structure of the report is identical for all events. As well as the expected type of event, it lists the time and date the event occurred.

Remember that a remote access attempt shown in the event log will always be time-stamped using the local time for the particular computer. The following illustration shows all the details for an event:



Using this button you can copy the event details to the clipboard, for placement in an email or document.

Choose to display the data in Bytes or Words.



The Event Viewer in detail

In the above illustration, the 'event source' is given as DCOM (Distributed Component Object Model). All parts of the system such as all of the services, like IIS (Internet Information Server), hardware with their drivers or installed applications could be a possible source.

The Event ID helps you look up further details about an event on the web.

The most important piece of information is the Event ID. This clearly identifies a specific event. As the description of the error is usually not very extensive, you need the ID to find out further information about the event. You can find this information on the following Windows websites on the Internet:

TechNet Events and Errors Message Centre	http://www.microsoft.com/technet/support/eventerrors.aspx
Windows 2000 Server event & error messages	http://www.microsoft.com/technet/support/ee/search.aspx?DisplayName=Windows%202000%20Server&ProdName=Windows%2000operating%20System&MajorMinor=5.0&LCID=1033



Using the System Information Tool

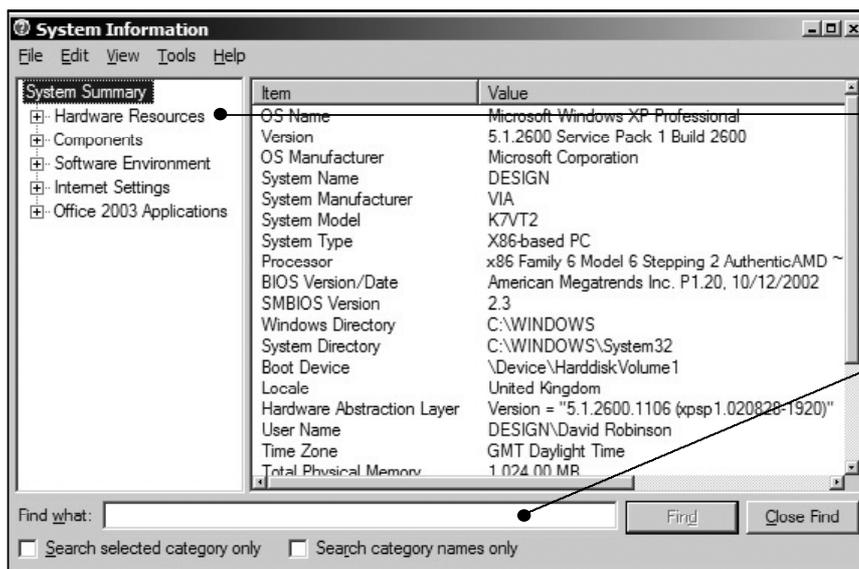
The System Information tool is useful when searching for faulty components and applications in Safe Mode. To launch it go to Start > Run, enter msinfo32 and click OK. You can now access information about your computer and the programs running on it.

It shows you all of the configuration data, such as the installed devices or the loaded device drivers. For example, you can establish the type of the graphic card and the status of the relevant driver.

In addition, you are offered various tools to help solve your problems such as the file signature recognition program or Dr. Watson. Primarily, the System Information tool is a reporting program that provides information about your system and logs any changes.

The System Information tool can help you identify faulty devices and software ...

... and fix them using other utilities.



Select the type of information you wish to view from the category list.

Search for specific information here.

Windows System Information tool



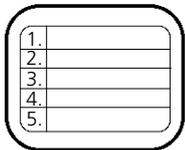
The startup logs can help you find out what is not loading correctly.

How to View Event Logs

Looking at the start log file also helps when experiencing startup problems. Note down the drivers and services that were not loaded up when the computer was started in Safe Mode. You can find this log file in the folder `\WINNT\NTBTLOG.TXT` in Windows 2000, `\WINDOWS\NTBTLOG` in Windows XP or `\Windows\BOOTLOG.TXT` (Windows 98/Me). All services and devices for the PC, loaded or not loaded, are found in this file.

You can view the log files using any text editor, such as Word or WordPad.

Check the services or devices that were not loaded with Services or Device Manager. Deactivate the services and devices as a test. Startup the computer normally. This way, you can filter out the cause of the problem and take appropriate action; for example, installing a new driver.



The Advanced Startup Options Menu helps with many problems; in particular those that cause errors when Windows starts up. Using the options available to you in Safe Mode not only allows you to diagnose what is causing the startup problems, but also allows you to easily fix the errors and return your computer to fully working order.